GARDENA CITY COUNCIL

Regular Meeting Notice and Agenda

Council Chamber at City Hall
1700 West 162nd Street, Gardena, California
Website: www.cityofgardena.org

Tuesday, July 26, 2022
Closed Session 7:00 p.m
Open Session 7:30 p.m.

TASHA CERDA, *Mayor*
RODNEY G. TANAKA, *Mayor Pro Tem*
MARK E. HENDERSON, *Council Member*
PAULETTE C. FRANCIS, *Council Member*
WANDA LOVE, *Council Member*

MINA SEMENZA, *City Clerk*
GUY H. MATO, *City Treasurer*
CLINT OSORIO, *City Manager*
CARMEN VASQUEZ, *City Attorney*
LISA KRANITZ, *Assistant City Attorney*

In order to minimize the spread of the COVID 19 virus Governor Newsom has signed AB 361. Please be advised that the Council Chambers are closed to the public and that some, or all, of the Gardena City Council Members may attend this meeting telephonically.
If you would like to participate in this meeting, you can participate via the following options:

1. VIEW THE MEETING live on SPECTRUM CHANNEL 22 or ONLINE at youtube.com/CityofGardena

2. PARTICIPATE BEFORE THE MEETING by emailing the Deputy City Clerk at publiccomment@cityofgardena.org by 5:00p.m. on the day of the meeting and write "Public Comment" in the subject line.

3. PARTICIPATE DURING THE MEETING VIA ZOOM WEBINAR
   - https://us02web.zoom.us/j/87034516714
     Phone number: US: +1 669 900 9128, Meeting ID: 870 3451 6714
     Press *9 to Raise your Hand and *6 to unmute when prompted.

   - If you wish to speak live on a specific agenda item during the meeting you, may use the “Raise your Hand” feature during the item you wish to speak on. For Non-Agenda Items, you would be allowed to speak during Oral Communications, and during a Public Hearing you would be allowed to speak when the Mayor opens the Public Hearing. Members of the public wishing to address the City Council will be given three (3) minutes to speak.

4. The City of Gardena, in complying with the Americans with Disabilities Act (ADA), requests individuals who require special accommodations to access, attend and/or participate in the City meeting due to disability, to please contact the City Clerk's Office by phone (310) 217-9565 or email bromero@cityofgardena.org at least 24 business hours prior to the scheduled general meeting to ensure assistance is provided. Assistive listening devices are available.

STANDARDS OF BEHAVIOR THAT PROMOTE CIVILITY AT ALL PUBLIC MEETINGS

- Treat everyone **courteously**;
- Listen to others **respectfully**;
- Exercise **self-control**;
- Give **open-minded** consideration to all viewpoints;
- Focus on the issues and **avoid personalizing debate**; and
- **Embrace respectful disagreement** and dissent as democratic rights, inherent components of an inclusive public process, and tools for forging sound decisions.

Thank you for your attendance and cooperation

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1. **ROLL CALL**

PUBLIC COMMENT ON CLOSED SESSION

The City Council will hear from the public only on the items that have been described on this agenda (GC §54954.3)

2. **CLOSED SESSION**

2.A CONFERENCE WITH LEGAL COUNSEL- EXISTING LITIGATION
Gov. Code Section 54956.9(d)(1)
Steven Prendergast v. City of Gardena
L.A. Sup. Ct. Case No. 20STCV17648

2.B CONFERENCE WITH LABOR NEGOTIATORS
Government Code Section 54957.6
Agency Designated Representative: Clint Osorio, City Manager
Employee Organizations:
1. Gardena Police Officers Association (GPOA), Matt Hassoldt, Association President
2. Gardena Management Employees Organization (GMEO), Vicky L. Barker, Attorney
3. Gardena Municipal Employees Association (GMEA), Fred G. Quiel, Attorney
4. Confidential / Unrepresented Employees

3. **PLEDGE OF ALLEGIANCE**

Connor Church
Boys & Girls Club Summer Camp

4. **INVOCATION**

Presented by Mayor Pro Tem Rodney G. Tanaka

5. **PRESENTATIONS**

5.A South Bay Regional Housing Trust Presentation - *To be presented by the South Bay Cities Council of Governments*

5.B CERTIFICATES OF RECOGNITION to Commission and Board Appointees of the Honorable Council Member Art Kaskanian, for dedicated community service

a. Sean Dixon, Human Services Commission
b. Kale Eaton, Planning and Environmental Quality Commission
c. Terri Haase, Recreation and Parks Commission
d. Martha A. Kirksey, Senior Citizens Commission
e. Dulce Ordonez, Gardena Youth Commission
f. Esther Trujillo, Gardena Beautification Commission
g. Zoraida Hernandez, Gardena Economic Business Advisory Commission
h. Robert K. Kwon, Gardena Economic Business Advisory Commission
i. Timothy McClone, Gardena Rent Mediation Board, Owner Representative
j. Woods Woolwine, Gardena Rent Mediation Board, At-Large Representative

Recognition Outgoing Commissioner - Dulce Ordonez - 7.26.22.pdf
Recognition Outgoing Commissioner - Esther Trujillo - 7.26.22.pdf
Recognition Outgoing Commissioner - Kale Eaton - 7.26.22.pdf
Recognition Outgoing Commissioner - Martha Kirksey - 7.26.22.pdf
Recognition Outgoing Commissioner - Robert Kwon - 7.26.22.pdf
Recognition Outgoing Commissioner - Terri Haase - 7.26.22.pdf
Recognition Outgoing Commissioner - Sean Dixon - 7.26.22.pdf
Recognition Outgoing Commissioner - Timothy McClone - 7.26.22.pdf
Recognition Outgoing Commissioner - Woods Woolwine - 7.26.22.pdf
Recognition Outgoing Commissioner - Zoraida Hernandez - 7.26.22.pdf

5.C Certificate of Recognition to Shirley Ann Lewis in appreciation of her service to the community as a Rent Mediation Board Member: Member-at-Large Representative
Recognition Outgoing Commissioner - Shirley Ann Lewis - 7.26.22.pdf

6. PROCLAMATIONS

7. APPOINTMENTS

7.A Reorganization of the City Council - Selection of Mayor Pro Tem

Select Mayor Pro Tem to serve from July 2022 to July 2023
COUNCIL BENCH SEATING POLICY-1997.pdf
MAYOR PRO TEMPORE thru 4-2022.pdf

7.B Reorganization of Council Assignments of Delegates and Alternates to Outside/City Committees
COUNCIL DELEGATES ALTERNATES - 07.26.22.pdf

8. CONSENT CALENDAR

NOTICE TO THE PUBLIC - Roll Call Vote Required On The Consent Calendar
All matters listed under the Consent Calendar will be enacted by one motion unless a Council Member requests Council discussion, in which case that item will be removed from the Consent Calendar and considered separately following this portion of the agenda.

8.A Waiver of Reading in Full of All Ordinances Listed on This Agenda and that they Be Read by Title Only
CONTACT: CITY CLERK

8.B Approve Minutes:
Regular Meeting of the City Council, July 12, 2022
CONTACT: CITY CLERK
07122022 REGULAR Minutes Gardena CC Meeting - FINAL.pdf

8.C Receive and File of Minutes:
Planning & Environmental Quality Commission, June 21, 2022
CONTACT: COMMUNITY DEVLEOPMENT
22_06_21 PCMIN (signed).pdf

8.D Approval of Warrants/Payroll Register, July 26, 2022
CONTACT: CITY TREASURER
Warrant-Payroll Register 07-26-22.pdf

8.E Monthly Investment Portfolio, June 2022
CONTACT: CITY TREASURER
June 2022 Investment Report.pdf

8.F Personnel Report P-2022-14 7-26-22
CONTACT: HUMAN RESOURCES
PERS_RPT_P-2022-14_7-26-22.pdf
Homeless Coordinator Job Description - Attachment 1.pdf
Classification and Compensation Schedule - Eff. July 26, 2022 - Attachment 2.pdf

8.G RESOLUTION NO. 6597, Making the legally required findings to Re-Authorize the use of Teleconferencing in accordance with Assembly Bill 361 for meetings of the Gardena City Council and other Commissions, Committees and Boards subject to State open meeting laws
CONTACT: CITY MANAGER
RESO NO 6597.pdf

8.H Approve One-Year Contract Between the City of Gardena and SPCALA for Animal Control and Sheltering Services
CONTACT: COMMUNITY DEVELOPMENT
PSA Animal Sheltering Contract 2022 with Exhibit.pdf

8.I Acceptance and Notice of Completion for the Van Ness Ave. and 139th Street Improvement Project, JN 952
CONTACT: PUBLIC WORKS
NOC_VAN NESS & 139_JN 952-AAA.pdf

8.J RESOLUTION NO. 6594, Authorizing the Filing of a Claim with the Los Angeles County Metropolitan Transportation Authority for Local Transportation Funds
CONTACT: TRANSPORTATION
Local Transportation Funds STA_TDA FY22-23 RESO No. 6594 7_26_22.pdf

8.K RESOLUTION NO. 6596, Authorizing the Filing of Federal Fiscal Year 2022 Grant Application for Transportation Assistance
CONTACT: TRANSPORTATION
FTA FY22 Grant RESO No. 6596_7_26_22.pdf

8.L Approve Agreement between the Los Angeles County Metropolitan Transportation Authority and the City of Gardena for Proposition C 5% Transit Security Funds
CONTACT: TRANSPORTATION
FY 23 Prop C 5% MOU - City of Gardena.pdf

8.M Approve Agreement between the Los Angeles County Metropolitan Transportation Authority and the City of Gardena for Proposition C 40% Discretionary Funds
CONTACT: TRANSPORTATION
Prop C 40% MOU Gardena_FY23.pdf

9. **EXCLUDED CONSENT CALENDAR**

10. **PLANNING & ENVIRONMENTAL QUALITY COMMISSION ACTION SHEET**

JULY 19, 2022 MEETING

10.A JULY 19, 2022 MEETING
Conditional Use Permit #5-22
The Planning Commission considered a request for a conditional use permit, to allow the on-site sale and consumption of beer and wine in a new karaoke bar located in the General Commercial (C-2) and Parking (P) zone with a Mixed-Use Overlay (MUO) and direction to staff to file a Notice of Exemption as an existing facilities project.
APPLICANT: Kyeang Linda Jo
LOCATION: 15210 S Western Ave

Commission Action: The Planning Commission approved Resolution No. PC 10-22, by vote of 4-0-1, approving the project and directing staff to file a Notice of Exemption.

City Council Action: Receive and file or Call for Review (By way of two votes from the City Council)

To view the complete Planning Commission packet **CLICK HERE**.
2022_07_19 PCAX

ORAL COMMUNICATIONS (LIMITED TO A 30-MINUTE PERIOD)

Oral Communications by the public will be heard for one-half hour at or before 8:30 p.m. or at the conclusion of the last agenda item commenced prior to 8:30 p.m. Oral Communications not concluded at that time shall be resumed at the end of the meeting after Council Reports. Speakers are to limit their remarks to three minutes, unless extended by the Mayor. An amber light will appear to alert the speaker when two minutes are complete, and a red light will appear when three minutes are over. Your cooperation is appreciated.

11. **DEPARTMENTAL ITEMS - ADMINISTRATIVE SERVICES**

11.A Approval of Blanket Purchase Orders for Fiscal Year 2022-2023

Staff Recommendation: Approve Blanket Purchase Orders
Exhibit A.pdf

12. **DEPARTMENTAL ITEMS - COMMUNITY DEVELOPMENT**

12.A Review of Revised 2021-2029 Housing Element

Staff Recommendation: Review and Discuss the Changes to the Adopted Housing Element for Resubmission to HCD
Agenda Staff Report 2021-2029 Housing Element.pdf
Exhibit A - HCD Review Letter
Exhibit B - Redlined version of 2021-2029 Housing Element
Exhibit C - Redlined version of Appendix E
Exhibit D - Overlay Maps
Exhibit E - Orange County Register Article

13. **DEPARTMENTAL ITEMS - ELECTED & CITY MANAGER'S OFFICES**

13.A COVID-19 Update

14. **DEPARTMENTAL ITEMS - POLICE**

14.A Authorization to Purchase Five (5) Patrol Vehicles from National Auto Fleet Group in the amount of $210,825.21 and expend Build-Out Costs in the amount of $95,876.30

Staff Recommendation: Authorize Purchase
Agenda Staff Report -7-26-22.pdf
SBRPCA Build-out Quote.pdf

15. **DEPARTMENTAL ITEMS - PUBLIC WORKS**

15.A Approve the Proposed Master Plan to proceed with the Design and Construction Document Phase of the Mas Fukai Park Improvements, JN 820.

Staff Recommendation: Approve the Proposed Master Plan
Mas Fukai Park Master Plan_June 2022.pdf

15.B Approve purchase of the 2023 TYMCO Model 600 Regenerative Air Sweeper from TYMCO in the amount of $443,177.44 for Public Works Street Sweeper Equipment Purchase, JN 515

Staff Recommendation: Approve Purchase
TYMCO 600 Street Sweeper Quote.pdf

16. **DEPARTMENTAL ITEMS - RECREATION & HUMAN SERVICES**

17. **DEPARTMENTAL ITEMS - TRANSPORTATION**

17.A Approve Purchase of Seven (7), 40-foot Compressed Natural Gas (CNG) Buses for $6,130,421 and Authorize Program Total of $6,743,463

Staff Recommendation: Approve Purchase and Program Total
Assignment Agreement_Gardena_Executed.pdf
Gardena Option Quote - (7) Buses 7-6-22.pdf
ENC Bus Breakdown_7 CNG Buses.pdf
Contract OP28367_Volume I_Group A_ENC_Final_Signed.pdf
Complete Amendments to OPS28367-000 (#1 to #20).pdf

18. **COUNCIL ITEMS**

18.A Discussion Regarding the Issuance of Cell Phones to Elected Officials

Discuss issuing cell phones to Elected Officials and provide staff direction regarding a Cell Phone Policy

19. **COUNCIL DIRECTIVES**

20. **CITY MANAGER REMARKS RE: DIRECTIVES / COUNCIL ITEMS**

21. **COUNCIL REMARKS**

1. COUNCIL MEMBER HENDERSON
2. COUNCIL MEMBER FRANCIS
3. MAYOR PRO TEM TANAKA
4. MAYOR CERDA
5. COUNCIL MEMBER LOVE

22. **ANNOUNCEMENT(S)**

23. **REMEMBRANCES**

Mr. Broderick May Sr.; 65 years of age. Mr. May lived in Gardena for more than 25 years, and worked several jobs in Gardena before working for the State of California. He also played Alto saxophone in the Gardena Marching Band. He has 2 sons and 2 step daughters, and had recently retired in 2020.

24. **ADJOURNMENT**

The Gardena City Council will adjourn to the Closed Session portion of the City Council Meeting at 7:00 p.m. followed by the Regular City Council Meeting at 7:30 p.m. on Tuesday, August 9, 2022.

I hereby certify under penalty of perjury under the laws of the State of California that the foregoing agenda was posted in the City Hall lobby not less than 72 hours prior to the meeting. A copy of said Agenda is available on our website at www.CityofGardena.org.

Dated this 22nd day of July 2022

/s/ MINA SEMENZA
MINA SEMENZA, City Clerk

Certificate of Recognition

presented to

Dulce Ordonez

In official acknowledgment and genuine appreciation of over 4 years of exemplary, dedicated community leadership and service as a

Member

Gardena Youth Commission

We, the Mayor and Members of the City Council of the City of Gardena, California, do hereby deem it a distinct honor and pleasure to commend you for your efforts and to extend sincere best wishes for good health, happiness, and well-deserved success in all future endeavors.

Presented this 26th day of July, 2022

CITY OF GARDENA
FREEWAY CITY
INCORPORATED 1930

Mayor Tasha Cerda

Councilmember Rodney G. Tanaka

Councilmember Mark E. Henderson

Councilmember Paulette C. Francis

Councilmember Wanda Love

Certificate of Recognition

presented to

Esther Trujillo

In official acknowledgment and genuine appreciation of over 5 years of exemplary, dedicated community leadership and service as a

Member

Gardena Beautification Commission

We, the Mayor and Members of the City Council of the City of Gardena, California, do hereby deem it a distinct honor and pleasure to commend you for your efforts and to extend sincere best wishes for good health, happiness, and well-deserved success in all future endeavors.

Presented this 26th day of July, 2022

CITY OF GARDENA
FREEWAY CITY
INCORPORATED 1930

Mayor Tasha Cerda

Councilmember Rodney G. Tanaka

Councilmember Mark E. Henderson

Councilmember Paulette C. Francis

Councilmember Wanda Love

Certificate of Recognition

presented to

Kale Eaton

In official acknowledgment and genuine appreciation of over 5 months of exemplary, dedicated community leadership and service as a

Member

Planning & Environmental Quality Commission

We, the Mayor and Members of the City Council of the City of Gardena, California, do hereby deem it a distinct honor and pleasure to commend you for your efforts and to extend sincere best wishes for good health, happiness, and well-deserved success in all future endeavors.

Presented this 26th day of July, 2022

Mayor Tasha Cerda

Councilmember Rodney G. Tanaka

Councilmember Mark E. Henderson

Councilmember Paulette C. Francis

Councilmember Wanda Love

Certificate of Recognition

presented to

Martha A. Kirksey

In official acknowledgment and genuine appreciation of over 23 years of exemplary, dedicated community leadership and service as a

Member

Senior Citizens Commission

We, the Mayor and Members of the City Council of the City of Gardena, California, do hereby deem it a distinct honor and pleasure to commend you for your efforts and to extend sincere best wishes for good health, happiness, and well-deserved success in all future endeavors.

Presented this 26th day of July, 2022

Tasha Cerda
Mayor Tasha Cerda

Councilmember Rodney G. Tanaka

Mark E. Henderson
Councilmember Mark E. Henderson

Paulette C. Francis
Councilmember Paulette C. Francis

Wanda Love
Councilmember Wanda Love

Certificate of Recognition

presented to

Robert K. Kwon

In official acknowledgment and genuine appreciation of over 5 years of exemplary, dedicated community leadership and service as a

Member

Gardena Economic Business Advisory Commission

We, the Mayor and Members of the City Council of the City of Gardena, California, do hereby deem it a distinct honor and pleasure to commend you for your efforts and to extend sincere best wishes for good health, happiness, and well-deserved success in all future endeavors.

Presented this 26th day of July, 2022

CITY OF GARDENA
FREEWAY CITY
INCORPORATED 1930

Mayor Tasha Cerda

Councilmember Rodney G. Tanaka

Councilmember Mark E. Henderson

Councilmember Paulette C. Francis

Councilmember Wanda Love

Certificate of Recognition

presented to

Terri Haase

In official acknowledgment and genuine appreciation of over 17 years of exemplary, dedicated community leadership and service as a

Member

Recreation & Parks Commission

We, the Mayor and Members of the City Council of the City of Gardena, California, do hereby deem it a distinct honor and pleasure to commend you for your efforts and to extend sincere best wishes for good health, happiness, and well-deserved success in all future endeavors.

Presented this 26th day of July, 2022

Mayor Tasha Cerda

Councilmember Rodney G. Tanaka

Councilmember Mark E. Henderson

Councilmember Paulette C. Francis

Councilmember Wanda Love

CITY OF GARDENA
FREEWAY CITY
INCORPORATED 1930

Certificate of Recognition

presented to

Sean Dixon

In official acknowledgment and genuine appreciation of over 5 years of exemplary, dedicated community leadership and service as a

Member

Human Services Commission

We, the Mayor and Members of the City Council of the City of Gardena, California, do hereby deem it a distinct honor and pleasure to commend you for your efforts and to extend sincere best wishes for good health, happiness, and well-deserved success in all future endeavors.

Presented this 26th day of July, 2022

CITY OF GARDENA
FREEWAY CITY
INCORPORATED 1930

Tasha Cerda
Mayor Tasha Cerda

Rodney G. Tanaka
Councilmember Rodney G. Tanaka

Mark E. Henderson
Councilmember Mark E. Henderson

Paulette C. Francis
Councilmember Paulette C. Francis

Wanda Love
Councilmember Wanda Love

Certificate of Recognition

presented to

Timothy McClone

In official acknowledgment and genuine appreciation of over 4 years of exemplary, dedicated community leadership and service as a

Owner Representative

Gardena Rent Mediation Board

We, the Mayor and Members of the City Council of the City of Gardena, California, do hereby deem it a distinct honor and pleasure to commend you for your efforts and to extend sincere best wishes for good health, happiness, and well-deserved success in all future endeavors.

Presented this 26th day of July, 2022

Mayor Tasha Cerda

Councilmember Rodney G. Tanaka

Councilmember Mark E. Henderson

Councilmember Paulette C. Francis

Councilmember Wanda Love

Certificate of Recognition

presented to

Woods Woolwine

In official acknowledgment and genuine appreciation of over 5 years of exemplary, dedicated community leadership and service as a

Member-at-Large

Gardena Rent Mediation Board

We, the Mayor and Members of the City Council of the City of Gardena, California, do hereby deem it a distinct honor and pleasure to commend you for your efforts and to extend sincere best wishes for good health, happiness, and well-deserved success in all future endeavors.

Presented this 26th day of July, 2022

CITY OF GARDENA
FREEWAY CITY
INCORPORATED 1930

Tasha Cerda
Mayor Tasha Cerda

Rodney G. Tanaka
Councilmember Rodney G. Tanaka

Mark E. Henderson
Councilmember Mark E. Henderson

Paulette C. Francis
Councilmember Paulette C. Francis

Wanda Love
Councilmember Wanda Love

Certificate of Recognition

presented to

Zoraida Hernandez

In official acknowledgment and genuine appreciation of over 5 years of exemplary, dedicated community leadership and service as a

Member

Gardena Economic Business Advisory Commission

We, the Mayor and Members of the City Council of the City of Gardena, California, do hereby deem it a distinct honor and pleasure to commend you for your efforts and to extend sincere best wishes for good health, happiness, and well-deserved success in all future endeavors.

Presented this 26th day of July, 2022

Tasha Cerda
Mayor Tasha Cerda

Councilmember Rodney G. Tanaka

Mark E. Henderson
Councilmember Mark E. Henderson

Paulette C. Francis
Councilmember Paulette C. Francis

Wanda Love
Councilmember Wanda Love

Certificate of Recognition

presented to

Shirley Ann Lewis

In official acknowledgment and genuine appreciation of over 12 years of exemplary, dedicated community leadership and service as a

Member-at-Large

Rent Mediation Board

We, the Mayor and Members of the City Council of the City of Gardena, California, do hereby deem it a distinct honor and pleasure to commend you for your efforts and to extend sincere best wishes for good health, happiness, and well-deserved success in all future endeavors.

Presented this 26th day of July, 2022

CITY OF GARDENA
FREEWAY CITY
INCORPORATED 1930

Mayor Tasha Cerda

Councilmember Rodney G. Tanaka

Councilmember Mark E. Henderson

Councilmember Paulette C. Francis

Councilmember Wanda Love

City of Gardena

Gardena City Council Meeting
AGENDA REPORT SUMMARY

Agenda Item No. 7.A
Section: APPOINTMENTS
Meeting Date: July 26, 2022

TO: THE HONORABLE MAYOR AND MEMBERS OF THE GARDENA CITY COUNCIL

AGENDA TITLE: Reorganization of the City Council - Selection of Mayor Pro Tem

COUNCIL ACTION REQUIRED:
Select Mayor Pro Tem to serve from July 2022 to July 2023

RECOMMENDATION AND STAFF SUMMARY:
Mayor Pro Tem appointments are rotated annually. A list of the names of City of Gardena Councilmembers who have served in the position of Mayor Pro Tem from April 1956 to July 2022 is provided.
The Councilmember selected to serve will be seated, as Mayor Pro Tem, at the August 09, 2022, City Council Meeting.
A copy of the Council Policy No. 97-30, Council Bench Seating, is also attached for your information.

FINANCIAL IMPACT/COST:
N/A

ATTACHMENTS:
COUNCIL BENCH SEATING POLICY-1997.pdf
MAYOR PRO TEMPORE thru 4-2022.pdf

COUNCIL POLICY

SUBJECT: COUNCIL BENCH SEATING

NO. 97-30 REV.
DATE April 22, 1997
Donald L. Dear
MAYOR

STATEMENT:

It is the desire of the City Council to memorialize the traditional informal seating for Council members at the Council bench as follows:

• Center Seat	The Mayor
• Seat to Right of Mayor	The Mayor Pro Tem
• Seat to Left of Mayor	The Most Senior Member of Council by Years of Service
• Seat to Far Right of Mayor	The Next Senior Member of Council by Years of Service
• Seat to Far Left of Mayor	The Member of Council having the Least Seniority by Years of Service

In the event that two or more seats on the Council would be vacated at one time, then seniority would be established by the number of votes received by the elected members, with the member having obtained the highest number of votes being declared the most senior member of the newly-elected council members.

MAYOR PRO TEMPORE

CITY OF GARDENA

(Incorporated – September 11, 1930)

April 1956 – April 1958..... Adams W. Bolton

April 1958 – April 1962..... L. Pete Jensen

April 1962 – April 1966..... Robert M. Firstman

April 1966 – April 1967..... Robert R. Kane

April 1967 – April 1970..... Donald H. Davidson

April 1970 – April 1971.....Edmond J. Russ

April 1971 – March 1974..... Donald L. Dear

March 1974 – March 1975..... William L. Cox

March 1975 – March 1976.....Masani (Mas) Fukai

March 1976 – March 1977.....Charles A. Nader

March 1977 – March 1978.....Vincent H. Okamoto

March 1978 – March 1979.....Masani (Mas) Fukai

March 1979 – April 1980.....Charles A. Nader

April 1980 – April 1981..... Donald L. Dear

April 1981 – April 1982.....Paul Y. Tsukahara

April 1982 – April 1983.....Masani (Mas) Fukai

April 1983 – April 1984.....James W. Cragin

April 1984 – April 1985..... Gwen Duffy

April 1985 – April 1986.....Paul Y. Tsukahara

April 1986 – April 1987.....Masani (Mas) Fukai

April 1987 – April 1988.....James W. Cragin

April 1988 – April 1989..... Gwen Duffy

April 1989 – April 1990.....Paul Y. Tsukahara

April 1990 – April 1991.....Masani (Mas) Fukai

April 1991 – April 1992.....James W. Cragin

April 1992 – April 1993..... Gwen Duffy

April 1993 – April 1994.....Paul Y. Tsukahara

April 1994 – April 1995.....Masani (Mas) Fukai

April 1995 – April 1996..... James W. Cragin

April 1996 – March 1997 ..... Gwen Duffy

April 1997 – March 1998 ..... Masani (Mas) Fukai

March 1998 – March 1999 ..... Steven C. Bradford

March 1999 – March 2000 ..... James W. Cragin

March 2000 – March 2001 ..... Paul K. Tanaka

March 2001 – April 2002 ..... Steven C. Bradford

April 2002 – March 2003 .....Grant J. Nakaoka

March 2003 – April 2004 ..... Paul K. Tanaka

April 2004 – March 2005 ..... Ronald K. Ikejiri

March 2005 – March 2006 ..... Steven C. Bradford

March 2006 – March 2007 .....Oscar Medrano Jr.

March 2007 – April 2008 ..... Rachel C. Johnson

April 2008 – April 2009 ..... Ronald K. Ikejiri

April 2009 – Sept. 2009..... Steven C. Bradford

Sept. 2009 – July 2010..... Dan Medina

July 2010 – April 2011..... Tasha Cerda

April 2011 – April 2012 ..... Rachel C. Johnson

April 2012 – March 2013 ..... Ronald K. Ikejiri

March 2013 – March 2014 ..... Dan Medina

March 2014 – April 2015 ..... Tasha Cerda

April 2015 – April 2016 ..... Terrence Terauchi

April 2016 – April 2017 .....Mark E. Henderson

April 2017 – April 2018 ..... Dan Medina

April 2018 – April 2019 ..... Rodney Tanaka

April 2019 – April 2020……..……Art Kaskanian

April 2020 – April 2021……Mark E. Henderson

April 2021 – July 2022……Rodney Tanaka

City of Gardena

Gardena City Council Meeting
AGENDA REPORT SUMMARY

Agenda Item No. 7.B
Section: APPOINTMENTS
Meeting Date: July 26, 2022

TO: THE HONORABLE MAYOR AND MEMBERS OF THE GARDENA CITY COUNCIL

AGENDA TITLE: Reorganization of Council Assignments of Delegates and Alternates to Outside/City Committees

COUNCIL ACTION REQUIRED:

RECOMMENDATION AND STAFF SUMMARY:
A list of proposed Council Delegate and Alternate assignments to Outside/City Committees is provided for Council's consideration.

FINANCIAL IMPACT/COST:
N/A

ATTACHMENTS:
COUNCIL DELEGATES ALTERNATES - 07.26.22.pdf

City of Gardena, California
COUNCIL *DELEGATES*
TO OUTSIDE / CITY COMMITTEES

Proposed: July 26, 2022, City Council Meeting

MAYOR TASHA CERDA
County of Los Angeles Sanitation District No. 5
City Selection Committee, LAFCO, Coastal and Transportation Commission
Los Angeles Metro Mayors Roundtable
California Cities Gaming Authority
Gardena Finance Committee

COUNCILMEMBER PAULETTE C. FRANCIS	COUNCILMEMBER MARK E. HENDERSON
Gardena Beautification Commission Greater Los Angeles Vector Control District West Basin Water Association	*Southern CA Association of Governments – Elected to be the District #28 Regional Council Representative Independent Cities Association
COUNCILMEMBER WANDA LOVE	**COUNCILMEMBER RODNEY G. TANAKA**
Gardena Finance Committee	South Bay Regional Public Communications Authority South Bay Cities Council of Governments League of California Cities Inglewood Fire Training Facility Authority Commission

(See page 2 for Council Alternates Assignments)

City of Gardena, California
COUNCIL *ALTERNATES*
TO OUTSIDE COMMITTEES

Proposed: July 26, 2022, City Council Meeting

MAYOR TASHA CERDA
South Bay Regional Public Communications Authority

COUNCILMEMBER PAULETTE C. FRANCIS

COUNCILMEMBER MARK E. HENDERSON
West Basin Water Association
Los Angeles Metro Mayors' Roundtable
County of Los Angeles Sanitation District No. 5

COUNCILMEMBER WANDA LOVE
City Selection Committee, LAFCO, Coastal and Transportation Commission
League of California Cities
Southern California Association of Governments
South Bay Cities Council of Governments

COUNCILMEMBER RODNEY G. TANAKA
California Cities Gaming Authority
Independent Cities Association

MINUTES
Regular Meeting Notice of the
Gardena City Council
Tuesday, July 12, 2022

In order to minimize the spread of the COVID 19 virus, Governor Newsom has signed Assembly Bill 361. Please be advised that the Council Chambers are closed to the public and that some, or all, of the Gardena City Council Members may attend this meeting telephonically.

The Regular Meeting Notice and Agenda of the Gardena City Council of the City of Gardena, California, was called to order at 7:33 PM on Tuesday, July 12, 2022, via Zoom, Mayor Tasha Cerda presiding.

1. ROLL CALL

Present: Mayor Tasha Cerda; Mayor Pro Tem Rodney G. Tanaka; Council Member Mark E. Henderson; Council Member Art Kaskanian; and Council Member Paulette C. Francis; Other City Officials and Employees present: City Manager Clint Osorio; City Attorney Carmen Vasquez; and City Clerk Mina Semenza.

PUBLIC COMMENT ON CLOSED SESSION - ***None***

2. CLOSED SESSION - *None*

3. PLEDGE OF ALLEGIANCE

Michelle Valencia led the Pledge of Allegiance. Michelle is a Recreation Leader I with the Recreation & Human Services Team; she just graduated from Lennox Academy and is now enrolled at California State University Long Beach where she will be a Political Science Major. Michelle works at our parks and in our Summer Day Camp programs. In her spare time, she enjoys baking and running.

4. INVOCATION

Presented by Mayor Pro Tem Rodney G. Tanaka

5. PRESENTATIONS

5.A ELECTION OFFICIAL'S CERTIFICATION OF OFFICIAL CANVASS OF MUNICIPAL ELECTION VOTES
RESOLUTION NO. 6593, Reciting the Fact of the General Municipal Election held on June 7, 2022 Declaring the Results and Such Other Matters as Provided by Law

RESOLUTION NO. 6593

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF GARDENA, CALIFORNIA, RECITING THE FACT OF THE GENERAL MUNICIPAL ELECTION HELD ON JUNE 7, 2022 DECLARING THE RESULT AND SUCH OTHER MATTERS AS PROVIDED BY LAW

City Clerk Mina Semenza presented the Staff Report.

It was moved by Council Member Francis, seconded by Mayor Pro Tem Tanaka, and carried by the following roll call vote to Adopt Resolution No. 6593:

Ayes: Council Member Francis, Mayor Pro Tem Tanaka, Council Members Henderson and Kaskanian, and Mayor Cerda
Noes: None
Absent: None

5.B RESOLUTION OF COMMENDATION to the Honorable Art Kaskanian in acknowledgment and recognition of Distinguished Service to the City and Community of Gardena as a Gardena Council Member

Mayor Cerda read the Resolution of Commendation and presented it to Mr. Kaskanian; a video was also presented. She also thanked and commended Mr. Kaskanian for doing an amazing job during these past five years.

The Honorable Art Kaskanian accepted his Recognition of Distinguished Service.

Council Member Kaskanian thanked and expressed his appreciation for all his supporters, especially his colleagues.

5.C RESOLUTION OF COMMENDATION to the Honorable Ingrid Tsukiyama in acknowledgement and recognition of Distinguished Service to the City and Community of Gardena as Gardena's City Treasurer; and, further, to bestow upon Her the Title of City Treasurer Emeritus

Mayor Cerda read the Resolution of Commendation and presented it to Ms. Tsukiyama.

The Honorable Ingrid Tsukiyama accepted her Recognition of Distinguished Service.

Mayor Cerda thanked Ms. Tsukiyama for her years of service.

5.D Oath of Office by Newly-Elected / Re-Elected Officials:

Tasha Cerda	Mayor
Rodney G. Tanaka	City Council Member
Wanda Love	City Council Member
Mina Semenza	City Clerk
Guy H. Mato	City Treasurer

Oaths of office were taken by the newly-elected and re-elected officials.

Mayor Cerda thanked all of her supporters and said she will continue to make the city move forward and grow.

Mayor Pro Tem Tanaka expressed his love and appreciation for everyone that was present and all his supporters. He specially thanked his “Gina” for all her support. He is looking to give the best four years that he can give and keeping his promises.

Council Member Love, thanked everyone who supported her and attended her swear-in. She promises to continue to be the person that she has been, the person you elected and will continue to do what she thinks is best for the city as a whole and promises to work as hard as she can on behalf of the residents, businesses, and constituents.

City Clerk Mina Semenza, thanked the community for all their support over the last nine years including her family and friends.

City Treasurer Guy H. Mato thanked and expressed his appreciation to the voters of Gardena. He promises to work very diligently and hard for all citizens of Gardena.

Mayor Tasha Cerda continued the Regular City Council Meeting and noted the presence of all the new and continuing Members of the City Council.

5.E Boards & Commissions Update - Recreation Commission
- Chair, Woods Woolwine, Jr., provided the update and video presentation.

5.F Certificate of Recognition to the Members of the City of Gardena Explorer Post #142 for their successes in the 2022 Central Valley Explorer Competition held in Tracy, CA
- Chief of Police Saffell came into the meeting and recognized his Police Explorer Post. Officers Saldana and Nash were present and expressed their appreciation and support.

6. PROCLAMATIONS

6.A Parks and Recreation Month - July 2022
- was proclaimed by Mayor Cerda

7. APPOINTMENTS – *No Appointments were made*

8. CONSENT CALENDAR

8.A Waiver of Reading in Full of All Ordinances Listed on This Agenda and that they Be read by Title Only
CONTACT: CITY CLERK

8.B Approve Minutes:
Regular Meeting of the City Council, June 28, 2022
CONTACT: CITY CLERK

8.C Approval of Warrants/Payroll Register, July 12, 2022
CONTACT: CITY TREASURER

July 12, 2022: Wire Transfer: 12193-12195; Prepay: 167985 -167988; Check Nos: 167989 -168154 – for a total Warrants issued in the amount of $2,872,922.04 Total Payroll Issued for July 1, 2022: $1,641,332.89.

8.D Personnel Report P-2022-13 7-12-22
CONTACT: HUMAN RESOURCES

8.E RESOLUTION NO. 6595, Making the legally required findings to Re-Authorize the use of Teleconferencing in accordance with Assembly Bill 361 for meetings of the Gardena City Council and other Commissions, Committees and Boards subject to State open meeting laws
CONTACT: CITY MANAGER

RESOLUTION NO. 6595

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF GARDENA, CALIFORNIA, MAKING THE LEGALLY REQUIRED FINDINGS TO RE-AUTHORIZE THE USE OF TELECONFERENCING IN ACCORDANCE WITH ASSEMBLY BILL 361 FOR MEETINGS OF THE GARDENA CITY COUNCIL AND OTHER COMMISSIONS, COMMITTEES AND BOARDS SUBJECT TO STATE OPEN MEETING LAWS

8.F Ratify Administrative Approval of the Elderly Nutrition Program Contract ENP202105 Amendment Ten
CONTACT: RECREATION AND HUMAN SERVICES

8.G Ratify Administrative Approval of the Supportive Services Program Contract SSP192003 Amendment Five
CONTACT: RECREATION AND HUMAN SERVICES

It was moved by Council Member Francis, seconded by Council Member Henderson, and carried by the following roll call vote to Approve all Items on the Consent Calendar with the exception of Items 8.F and 8.G:

Ayes: Council Members Francis and Henderson, Mayor Pro Tem Tanaka, Council Member Love, and Mayor Cerda
Noes: None
Absent: None

9. EXCLUDED CONSENT CALENDAR

8.F RECREATION AND HUMAN SERVICES - Ratify Administrative Approval of the Elderly Nutrition Program Contract ENP202105 Amendment Ten
- This Item was pulled by Council Member Francis

Council Member Francis asked if this increase is what we had before; and if it will this increase the number of Seniors who can attend the program.

City Manager Osorio responded to all of her questions.

8.G RECREATION AND HUMAN SERVICES - Ratify Administrative Approval of the Supportive Services Program Contract SSP192003 Amendment Five
- This Item was pulled by Council Member Francis

Council Member Francis asked if this is an increase and have, we added any new clients; she then asked if the funding is for the entire year and if we can go out and request additional funding and recoup an outreach effort or take care of what we have now. She also asked about the City's outreach efforts.

Council Member Love asked what the increased amount was, and if we got any new clients.

City Manager Osorio responded to all of Council Member Francis and Love's questions.

It was moved by Council Member Francis, seconded by Council Member Love, and carried by the following roll call vote to Approve Items 8.F and 8.G:

Ayes: Council Members Francis and Love, Mayor Pro Tem Tanaka, Council Member Henderson, and Mayor Cerda
Noes: None
Absent: None

10. PLANNING & ENVIRONMENTAL QUALITY COMMISSION ACTION SHEET

10.A July 5, 2022 MEETING - ***Meeting Cancelled***

ORAL COMMUNICATIONS – ***None***

11. DEPARTMENTAL ITEMS - ADMINISTRATIVE SERVICES – ***No Items***

12. DEPARTMENTAL ITEMS - COMMUNITY DEVELOPMENT – ***No Items***

13. DEPARTMENTAL ITEMS - ELECTED & CITY MANAGER'S OFFICES

13.A COVID-19 Update

City Manager Osorio presented the update.

Mayor Cerda and Council Member Love had questions and City Manager Osorio replied and answered all their questions.

14. DEPARTMENTAL ITEMS - PUBLIC WORKS – ***No Items***

15. DEPARTMENTAL ITEMS - RECREATION & HUMAN SERVICES – ***No Items***

17. DEPARTMENTAL ITEMS – TRANSPORTATION – ***No Items***

18. COUNCIL ITEMS

19. COUNCIL DIRECTIVES

Council Member Henderson

1. Asked if he can get information from Spectrum regarding our PEC channel and what we can do to add content to that channel and see what our agreement consist off. *Mayor Pro Tem Tanaka seconded it.*

Council Member Love

1. Asked City Manager Osorio if he can look into getting cell phones for all Council Members. *Council Member Francis seconded it.*

City Manager Osorio asked for clarification: A request is being made for the City to bring an agenda forward to modify and amend the City Council Policy relating to cell phones, because currently City Council and Mayor do not receive cell phones or a stipend. Council Member Love confirm that the directive was correct.

Mayor Cerda commented and asked to make an amendment as well.
Council Member Francis commented and voiced her opinion.

City Attorney Vasquez advised all members of the City Council that the directive has not been agendized and that the item will need to be placed on the agenda for the council to discuss and take a vote, whether the council members agreed to have cell phones including a staff report that will provide the budgeted amount and cost for council to consider at a later meeting.

20. CITY MANAGER REMARKS RE: DIRECTIVES / COUNCIL ITEMS

City Manager Osorio gave a verbal report of information to follow-up on matters that had been directed or requested by the Mayor and Members of Council. Those items were, as follows:

1. Memo regarding the digital message boards at the parks, dated July 5, 2022.
2. Memo regarding the drought related measures update, dated July 5, 2022.
3. Memo regarding the Legislative Advocacy update; highlighting the newest earmarks that the City of Gardena has received; approximately $4 million for digital equity for all; $2 million for the revitalization of Gardena Boulevard; and $1 million in federal earmark for Rosecrans Community Center. City Manager Osorio thanked State Senator Steven Bradford and Assemblymember Al Muratsuchi for the $6 million and Congresswoman Maxine Waters for the $1 million in federal earmark.
4. Video presentation highlighting the Recreation and Human Services Department current and future events:
   - City of Gardena's 4th of July Park Party, Monday, July 4, 2022, at Rowley Park.
   - Special Lunch for Seniors with Former Dodger Rudy Law.
   - City of Gardena's Dodger Day, Friday, July 8, 2022.

Upcoming Events

- Parks, Recreation, and Human Services Month Celebration! Wednesday, July 13, 2022; 1:30 p.m. – 3:30 p.m. at the City Hall Lawn.
- Gardena Police Department invites you to Ice Cream with a Cop on Saturday, July 16, 2022, from 11:00 a.m. – 12: 45 p.m., at Rowley Park and then from 1:15 p.m. to 3:00 p.m. at Arthur Johnson Park.
- Christmas in July – Candlelight Dinner & Show, Thursday, July 28, 2022, from 5:00 p.m. – 7:00 p.m., at Nakaoka Community Center Auditorium. Space is limited, Pre-Registration is required. For more information contact the Senior Bureau at (310)217-9552 or email: seniors@cityofgardena.org or register online at www.cityofgardena.org/events.
- Join the Gardena Police Department for a Night to Unite! Summer Block Party; Tuesday, August 2, 2022; 6:30 p.m.-8:30 p.m. on the City Hall Complex.
- Back-to-School Giveaway – Beginning Saturday, July 16, 2022. Register your child at www.cityofgardena.org/events; Supplies limited for grades K-12. Must be a resident of the City of Gardena or attend a Gardena COS school to be eligible to receive free supplies.

- City of Gardena is hosting a Summer UCLA Blood Drive on Thursday, August 11, 2022; 9:00 a.m. – 2 p.m. at Ruch Gym.
- City of Gardena Jazz Festival, Sunday, August 28, 2022, at Rowley Park. Tickets On Sale Now! To purchase tickets, visit www.gardenajazzfestival.com/tickets.
- Save the Date - Gardena 12th Annual Food, Wine & Brew; Saturday, September 24, 2022, 12:00 p.m. to 7:00 p.m. at the Gardena City Hall Complex.

City Manager Osorio thanked Council Member Kaskanian for five years of exemplary service and former City Treasurer Ingrid Tsukiyama. He also congratulated Mayor Cerda, Mayor Pro Tem Tanaka, Council Member Love, and City Clerk Mina Semenza and new City Treasurer Guy Mato. He also wished City Attorney Vasquez and Administrative Director Ray Beeman a Happy Birthday.

21. COUNCIL REMARKS

1) COUNCIL MEMBER FRANCIS – Council Member Francis shared some words to the family of Jane Hall. She was glad to have had the opportunity to meet Jane Hall, shared she was an active participant at the Council Meetings and may she rest in peace. Council Member Francis also shared it was a pleasure to serve with Council Member Kaskanian and wishes him all the best in the future. Congratulated and Welcomed Council Member Wanda Love, Guy Mato, Mina Semenza, Mayor Cerda, and Rodney Tanaka. She is looking forward to continuing the great work. Since the last meeting Council Member Francis attended the presentation of the new imaging machine at the Memorial Hospital of Gardena. She explained it is a state of the art 128 CT scanner that can look into the arteries and if anyone needs it, they just need to have a prescription from the doctor to get a screening. She also attended the State of the City for Hawthorne and was happy to hear the wonderful things that are happening. Lastly, encouraged everyone to stay safe and better days are ahead.

2) MAYOR PRO TEM TANAKA – Since the last meeting, Mayor Pro Tem Tanaka attended the City of Torrance 3290 Homeless Center ribbon cutting, he explained they are pallet houses by the Courthouse and Police Department. Also attended the LATA grant briefing meeting, visited Memorial Hospital to see the new CT scanner with Council Member Francis, COGS Homeless Task Force, Dodger Day and commented it was nice to see Council Member Kaskanian throw the first pitch, COGS Steering Committee meeting, and Hawthorne State of the City as they are celebrating their 100th anniversary. Mayor Pro Tem Tanaka shared some words about Jane Hall, Jane Hall was one of his biggest supporters and was part of the Rent Mediation Board, she will definitely be missed. Mayor Pro Tem Tanaka also thanked Council Member Kaskanian for his five years of service, appreciates his dedication and wishes him good luck.

3) COUNCIL MEMBER LOVE – Council Member Love thanked the community for their support and let the Council know that she is looking forward to the next four years working together. Council Member Love is excited for what's ahead and knows it's going to be challenging but believes that they can work together and get it done.

4) MAYOR CERDA – Since the last Council Meeting Mayor Cerda attended the Gardena Memorial Open House for the CT scanner and had the opportunity to present them with a certificate. Mayor Cerda also attended the memorial service for the two officers from

the City of El Monte they were Sergeant Michael Paredes and officer Joseph Santana, the Gardena Police Department along with the Honor Guard attended. She attended the 4th of July celebration at Rowley Park and commented it was one of the best shows they have ever had, attended Dodger Day commended Council Member Kaskanian and Council Member Henderson for throwing the first pitch, and attended the installation of the new officers for the Southern California Inka's Lions Club for the 2022-2023 new members. Lastly, attended a Realtors Event Council of Women's Forum and was excited because her sister is the President of the Southwest Real Estate Board. Mayor Cerda shared she will miss Jane Hall she was a dear friend of hers, also shared a few words about Jane Hall and her love for Gardena and was a strong advocate for mobile home parks. Mayor Cerda shared it was a pleasure serving with Council Member Kaskanian; he will be greatly missed and will be a hard act to follow. Congratulated City Attorney Vasquez and Director Beeman on their birthdays.

5) COUNCIL MEMBER HENDERSON – Thanked Council Member Kaskanian for his years of service and his dedication and passion and will miss their dialogue on finances and the budget, wishes him the best. Congratulated Mayor Cerda, Council Member Love, City Clerk Mina Semenza, City Treasurer Guy Mato. Council Member Henderson is looking forward to what they will be doing as a group and keep Gardena moving forward. Wished City Attorney Vasquez a Happy Birthday. Council Member Henderson shared some words about Jane Hall and asked to pray for her family and keep them in our prayers. Since the last meeting Council Member Henderson attended the Hawthorne State of the City, participated in a panel opportunity to talk about merits and draw backs of public private partnerships, South Bay COG Broadband initiative, SCAG meeting, and Dodger Day he enjoyed the game with his family. Lastly, expressed Gardena is the city of love and they all work together for the betterment of the community as Gardena is the jewel of the South Bay.

   Mayor Cerda also shared she also attended the City of Hawthorne State of the City and her and Mayor Alex Vargas go way back and the jokes they take on one another is all out of fun and love. Mayor Cerda was flattered that they wanted to do their State of the City like ours and the thanked all Gardena staff for their work.

22. ANNOUNCEMENT(S)

Mayor Cerda announced:

1. Gardena Police Department invites you to Ice Cream with a Cop on Saturday, July 16, 2022, from 11:00 a.m. – 12: 45 p.m., at Rowley Park and then from 1:15 p.m. to 3:00 p.m. at Arthur Johnson Park.

23. REMEMBRANCES

Jane Hall, 93 years of age, beloved Rent Mediation Board Member: Tenant Representative since 2002, and a long-time Gardena resident.

24. ADJOURNMENT

At 9:56 p.m., Mayor Cerda adjourned the Gardena City Council Meeting to the Closed Session portion of the City Council Meeting at 7:00 p.m., and the Regular City Council Meeting at 7:30 p.m. on Tuesday, July 26, 2022.

MINA SEMENZA
City Clerk of the City of Gardena and
Ex-officio Clerk of the Council

APPROVED:

_____
Tasha Cerda, Mayor

By:_____
Becky Romero, Deputy City Clerk

MINUTES

Regular PEQC Meeting Notice and Agenda of the Planning and Environmental Quality Commission Tuesday, June 21, 2022

The Regular PEQC Meeting Notice and Agenda of the Planning and Environmental Quality Commission of the City of Gardena, California, was called to order at 7:00 PM on Tuesday, June 21, 2022, in the 1700 W. 162nd Street, Gardena, California.

PARTICIPATE DURING THE MEETING VIA ZOOM

- Join Zoom Meeting Via the Internet or Via Phone Conference: https://us02web.zoom.us/j/82339137670
- Via Phone Conference Phone number: US +1 669 900 9128,
- Meeting ID: 890 5604 3939
  Press *9 to Raise Hand and *6 to unmute when prompted.
- If you wish to speak on a specific agenda item during the meeting you, may use the "Raise your Hand" feature during the item you wish to speak on. For Non-Agenda Items you will be allowed to speak during Oral Communications. Members of the public wishing to address the Commission/Committee/Board will be given three (3) minutes to speak.

1. **CALL MEETING TO ORDER**

2. **ROLL CALL**
   Present: Chair Stephen P Langley; Vice Chair Deryl Henderson; Commissioner Steve Sherman; Commissioner Jules Kanhan; Commissioner Kale Eaton.

3. **APPROVAL OF MINUTES**

   3.A May 17, 2022

   A motion was made by Vice Chair Henderson and seconded by Commissioner Eaton to approve the minutes of the meeting on May 17, 2022. The minutes were approved 5-0-0

Ayes:	Henderson, Eaton, Sherman, Langley, Kanhan,
Noes:	None
Absent:	None

4. **ORAL COMMUNICATIONS**
   Chair Langley invited anyone from the public to speak on any issues not on the agenda; however, there were no members of the public wishing to speak under oral communications.

5. PUBLIC HEARING ITEMS

5.A CONDITIONAL USE PERMIT #4-22

A request for a conditional use permit, per section 18.32.030.C of the Gardena Municipal Code, to operate an adult day care facility within an 11,830 square foot tenant space in an existing medical and professional office building located in the General Commercial (C-3) zone and direction to staff to file a Notice of Exemption as an Existing Facility.
APPLICANT: David Kim
LOCATION: 1045 Redondo Beach Blvd, Suites 150-190 (APN: 6114-028-050)

Planning Assistant, Kevin La, presented the Staff Report and recommended that Planning Commission open the public hearing, receive testimony from the public and adopt Resolution #9-22, approving Conditional Use Permit #4-22, subject to the attached Conditions of Approval, and directing staff to file a notice of exemption.

Chair Langley opened the public hearing and the discussion to the general public.

Vice Chair Henderson asked if the business has any relation to the existing day care facility near Western Avenue.

Chair Langley asked if the proposal is on the first floor and what is at the existing first floor of the building.

The applicant stated that they are not in any relation to the day care facility near Western Ave. and the business is on the first floor at suites 150 and 170. Currently, there is a learning center and veterans service center, but will be relocated to other suites in the same building. The applicant mentioned that they are opening additional facilities in surrounding cities and have successfully operating facilities and will be an immense service to the adult community in hopes for the Commission's consideration.

Chair Langley closed the public hearing.

MOTION: It was moved by Commissioner Eaton and seconded Commissioner Kanhan to adopt Resolution No. PC 9-22 approving Conditional Use Permit #4-22, subject to the attached Conditions of Approval, and directing staff to file a notice of exemption.

The motion passed by the following roll call vote:

Ayes:	Eaton, Kanhan, Langley, Henderson, Sharman
Noes:	None

5.B **ENVIRONMENTAL ASSESSMENT #5-21, ZONE TEXT AMENDMENT #2-21, ZONE CHANGE #1-21, CONDITIONAL USE PERMIT #1-21, SITE PLAN #3-21**

The applicant requests the following to develop a new U-Haul Moving, Storage, Retail store:

- Zone Text Amendment (ZTA #2-21) to amend Gardena Municipal Code Section 18.34.030, to allow for greater ground floor street frontage when a proposed self-storage facility is set back at least 50 feet from the public right-of-way in the Heavy Commercial (C-4) zone.
- Zone Change (ZC #1-19) to change the zoning of the site from General Commercial (C-3) with a Mixed-Use Overlay (MUO) to Heavy Commercial (C-4) with a MUO;
  Conditional Use Permit (CUP #1-21) to allow for the self-storage facility
- within the C-4 Zone;

Senior Planner, Amanda Acuna, presented the Staff Report and recommended that Planning Commission open the public hearing, receive testimony from the public and recommend approval to City Council the adoption of Resolution #10-22 for a Mitigated Negative Declaration (MND) and Mitigation Monitoring and Reporting Program and Resolution #11-22, recommending approval to City Council of Zone Text Amendment #2-21, Zone Change #1-21, and Conditional Use Permit #1-21 and approve Site Plan #3-21, subject to the attached Conditions of Approval.

Lisa Kranitz addressed a public comment regarding height of the proposed buildings and stated that the project complied with the maximum allowed height in the existing and proposed zoning district, in accordance with the Gardena Zoning Code.

Chair Langley opened the discussion to the general public.

Chair Langley inquired what other uses can be permitted in the zone and if a five-story medical office can be proposed on the same property.

Ms. Acuna responded that the zone is within the C-3/MUO zone and allows for general commercial uses such as offices, restaurants, etc., and the MUO zone allows for residential uses. The maximum height regardless of use is up to 65' for any permitted uses.

The applicant thanked Ms. Acuna for her presentation and is open to any public questions. The applicant also stated that U-Haul has been providing service to the City for over 40 years and wants to bring a modern-day facility to better serve the community.

Commissioner Kanhan asked how many self-storage units are currently on the site.

The applicant stated they have about 280 self-storage units on site.

Commissioner Henderson inquired if there will be more units and amenities than on-site currently.

The applicant responded that there will be more amenities and will have a display of 11 spaces at the shunting area and will propose roughly 25 tools and other amenities for storage.

Members of the Southwest Regional Council of Carpenters (SWRCC), Joseph Goldblatt, Raymond Dennis, Stephen Donhew, James Matthews, Roberto Ruiz, and Ruben, made requests that the applicant should hire local contractors for the construction of work to further stimulate the local economy and voiced concerns about the Environmental Impact Report (EIR).

Shereef Nasr, neighboring resident to the U-Haul project site, stated that he is currently impacted by U-Haul with extended hours not stated at their business, and other extraneous activities that he views is worrisome for the safety and wellbeing of the community. He strongly advised to not move forward.

Donnis Broussard, current employee for U-Haul, stated that the project would be a great addition to the community and local hiring will benefit the construction. He also stated that there were little to no negative impacts to the City and averages about 98% self-storage occupancy at the currently location.

Rachel Johnson stated that local hiring would be good, however, she believed that the five-story building would not be compatible with the neighborhood. Ms. Johnson mentions that there was no community input to local groups and that the applicants should have had a community input for the project. She also had concerns about the abandoned restaurant and possible illicit activities over the years.

A local resident commended U-Haul for wanting to modernize the project and expressed their like for the overall project. The resident also mentioned that self-storage would have little to no noise since there would not be an increase to traffic. He also wanted to have more local community input in the event that it is needed.

The applicant thanked the residents for their comments and issues they brought up. The applicant reiterated that traffic trip generation would be expected at about 30-31 trips to a weekday compared to thousands of trips on commercial uses. They went on to say that the project met the required parking on-site to inhibit cars parking on the street. In addressing the community's comments, the applicant stated that the existing restaurant building would be demolished and redeveloped to help beautify the street corner.

Vice Chair Henderson asked how all patrons of the existing U-Haul facility will be compensated for the displacement of the new facility during construction.

The applicant responded that the patrons will be moved to a neighboring facility and all transitions/accommodations will happen before demolition.

Commissioner Eaton inquired about the east façade and if the elevation would be completely concrete and/or have windows proposed.

The applicant answered that there will be a mix of materials with no windows. It will also have landscaping on the eastern side of the building and elaborated about the elevation's architectural details. They also confirmed that the subject façade will be architecturally pleasing, and there is an existing wall to block ground level parking views facing the neighboring residents. The questioned windows are only facing the front portion of the building facing the street for roadside appeal, but no other windows will be proposed along the east side of the building facing the residential building.

Chair Langley requests further elevation renderings to satisfy the community's comments.

Commissioner Eaton has concerns for the neighboring Rosecrans Place or if the applicant had talked to the Rosecrans Place to architecturally blend the projects.

Commissioner Sherman stated his opposition of the project at this point in time.

Commissioner Kanhan had concerns about the real estate pricing for the Rosecrans Place when the U-Haul building is finished with construction.

Vice Chair Henderson inquired if the two buildings proposed could be switched to soften the impact of the neighboring building's view.

Chair Langley stated he was leaning towards denial and wants additional renders and information to be in place before a formal decision.

The applicant proposed to conduct a community workshop to gain input on renderings of the areas of concern.

Chair Langley closed the public hearing.

MOTION: Vice Chair Henderson motions to continue the item to a future meeting which will be re-noticed in the Gardena Valley News and new mailers will be sent to all properties within a 300-foot radius of the project and Commissioner Eaton seconded.

The motion passed by the following roll call vote:

Ayes:	Henderson, Eaton, Langley, Kanhan
Noes:	Sherman

6. COMMUNITY DEVELOPMENT DIRECTOR'S REPORT

Mr. Tsujiuchi mentioned that the housing developers of the Moneta Pointe project located at 13633 Vermont Avenue had two approximately 800 square-foot townhomes dedicated to low-income families, were being advertised and applications were being accepted at that time.

Ms. Acuna requested that if the Planning Commissioners would like to order a nametag to contact staff if they had not already received one.

7. **PLANNING & ENVIORNMENTAL QUALITY COMISSIONERS' REPORTS**

Commissioner Eaton stated that he recently changed his surname to "Morita" and will need a new nametag.

Commissioner Kanhan inquired about the Moneta Pointe townhomes' pricing.

Mr. Tsujiuchi answered that those homes were being advertised at $150,300.

Chair Langley inquired about questions asked from the SWRCC.

Ms. Kranitz stated that the city does not have the authority to condition a project like the U-Haul project, to hire local.

Ms. Acuna presented her contact information to the public if they had questions or concerns about the U-Haul Project.

8. **ADJOURNMENT**

Chair Langley adjourned the meeting at 9:00 P.M.

Respectfully submitted,

GREG TSUJIUCHI, SECRETARY
Planning and Environmental Quality Commission

Stephen P. Langley

STEPHEN LANGLEY, CHAIR
Planning and Environmental Quality Commission

MEMORANDUM

TO: Honorable Mayor and City Council

FROM: City Treasurer's Office

DATE: July 21, 2022

SUBJECT: WARRANT REGISTER
PAYROLL REGISTER

July 26, 2022	TOTAL WARRANTS ISSUED:	$5,147,111.50

Wire Transfer:	12196-12204
Prepay:	168155-168157
Check Numbers:	168158-168356
Checks Voided:	

Total Pages of Register: 21

July 15, 2022	TOTAL PAYROLL ISSUED:	$2,268,447.94

Guy Mato, City Treasurer

cc: City Clerk

Bank code : usb

Voucher	Date	Vendor	Invoice	PO #	Description/Account	Amount
12196	6/30/2022	104058 ADMINSURE INC.	063022		WORKERS' COMP CLAIMS	77,206.19
					Total :	**77,206.19**
12197	6/30/2022	111894 HEALTHNOW ADMINISTRATIVE, SERVICES	U4734		HEALTH INSURANCE CLAIMS	23,892.50
					Total :	**23,892.50**
12198	7/6/2022	104058 ADMINSURE INC.	070122		WORKERS' COMP CLAIMS ADMINISTR/	14,847.11
					Total :	**14,847.11**
12199	7/8/2022	110183 ALLIANT INSURANCE SERVICES, INC.	10133279	023-01396	ANNUAL INSURANCE RENEWAL - FY 2(	202,860.14
					Total :	**202,860.14**
12200	7/8/2022	111894 HEALTHNOW ADMINISTRATIVE, SERVICES	JUNE 2022		HEALTH, DENTAL & LIFE INSURANCE	116,466.85
					Total :	**116,466.85**
12201	7/8/2022	111894 HEALTHNOW ADMINISTRATIVE, SERVICES	JULY 2022		HEALTH, DENTAL & LIFE INSURANCE	116,147.33
					Total :	**116,147.33**
12202	7/11/2022	111894 HEALTHNOW ADMINISTRATIVE, SERVICES	U4735		HEALTH INSURANCE CLAIMS	42,697.56
					Total :	**42,697.56**
12203	7/12/2022	104058 ADMINSURE INC.	071122		WORKERS' COMP CLAIMS	14,184.70
					Total :	**14,184.70**
12204	7/18/2022	101327 AUTHORITY FOR CALIFORNIA, CITIES EXCES	2021-16 02/08/21		RETROSPECTIVE PREMIUM PAYMENT	221,825.66
					Total :	**221,825.66**
168155	7/7/2022	619004 GOLDEN STATE WATER CO.	062022		WATER	19,532.59
					Total :	**19,532.59**
168156	7/7/2022	619003 SOUTHERN CALIFORNIA EDISON	062322		LIGHT & POWER	57,323.06
					Total :	**57,323.06**
168157	7/21/2022	109918 SHIGE'S FOREIGN CAR SERVICE, INC.	0630	035-01134	PD VARIOUS VEHICLE SERVICE & REP	7,158.15
					Total :	**7,158.15**
168158	7/26/2022	106086 ABC COMPANIES	3360863		GTRANS AUTO PARTS	151.54

Bank code : usb

Voucher	Date	Vendor	Invoice	PO #	Description/Account	Amount
168158	7/26/2022	106086 ABC COMPANIES	(Continued)			
			3361580		GTRANS AUTO PARTS	978.93
					Total :	**1,130.47**
168159	7/26/2022	111853 ACCESS	9454429		PD SHREDDING SERVICES	100.00
			9522260		PD SHREDDING SERVICES	100.00
					Total :	**200.00**
168160	7/26/2022	101748 AFTERMARKET PARTS COMPANY LLC, THE	82685429	037-10048	GTRANS AUTO PARTS	8.58
			82688362	037-10048	GTRANS AUTO PARTS	90.09
			82732297	037-10048	GTRANS AUTO PARTS	60.17
			82734933	037-10048	GTRANS AUTO PARTS	522.24
					Total :	**681.08**
168161	7/26/2022	101882 AMERICAN PUBLIC TRANSPORTATION, ASSO	398458	037-10135	ANNUAL MEMBERSHIP DUES	20,000.00
					Total :	**20,000.00**
168162	7/26/2022	101628 AQUA-FLO SUPPLY	SI1935852		PARK MAINT SUPPLIES	58.92
					Total :	**58.92**
168163	7/26/2022	103932 AQUARIUM OF THE PACIFIC	11669	331-00062	ADMISSIONS - SUMMER DAYS	960.50
			11671	331-00061	ADMISSIONS - SUMMER DAYS	1,243.10
					Total :	**2,203.60**
168164	7/26/2022	108625 ARAD OIL INC.	JUNE 2022		CAR WASH	420.00
					Total :	**420.00**
168165	7/26/2022	106965 ASSA ABLOY ENTRANCE, SYSTEMS US INC.	SEI/1529321	024-00847	CH MAIN ENTRY DOOR SERVICE REPA	4,354.89
			SEI/1529322	024-00847	COUNCIL CHAMBERS ENTRY DOOR SE	4,430.85
			SEI/1529323	024-00847	PD MAIN ENTRY DOOR SERVICE REPA	5,763.69
					Total :	**14,549.43**
168166	7/26/2022	104687 AT&T	18395339		TELEPHONE	395.59
			18421413		TELEPHONE	851.40
			18485601		TELEPHONE	405.82
			18485602		TELEPHONE	467.73
			18485912		TELEPHONE	16,178.70

Bank code : usb

Voucher	Date	Vendor	Invoice	PO #	Description/Account	Amount
168166	7/26/2022	104687 AT&T	(Continued)			
			18488721		TELEPHONE	565.04
			18519355		TELEPHONE	33.97
			18519356		TELEPHONE	86.89
			18519370		TELEPHONE	33.97
			18519378		TELEPHONE	33.97
			18519379		TELEPHONE	89.15
					Total :	**19,142.23**
168167	7/26/2022	616090 AT&T	3103232408 07/01/22		TELEPHONE	2,474.56
					Total :	**2,474.56**
168168	7/26/2022	111170 AT&T FIRSTNET	287290885074X7102022		CITYWIDE CELL PHONE ACCT #287290	1,962.20
			287293416290X6102022		PD CELL PHONE ACCT #287293416290	1,816.26
			287295242065X6102022		PD CELL PHONE ACCT #287295242065	231.11
			287298156560X7102022		COVID-19 FIRSTNET COMMUNICATION	1,694.15
			287303490376X7102022		BUS CELL PHONE ACCT #28730349037	442.64
					Total :	**6,146.36**
168169	7/26/2022	100474 AT&T LONG DISTANCE	071222		TELEPHONE	86.63
					Total :	**86.63**
168170	7/26/2022	100964 AT&T MOBILITY	828667974X07162022		CM CELL PHONE ACCT #828667974	86.46
					Total :	**86.46**
168171	7/26/2022	102880 AUTOPLEX, INC.	13998		2021 FORD INTRCPTR #1615788 OIL &	87.09
			14019		2018 FORD INTRCPTR #1554674 OIL &	45.54
					Total :	**132.63**
168172	7/26/2022	110686 AZTECH ELEVATOR COMPANY	AZ17288	024-00844	ELEVATOR MAINTENANCE - NCC	285.00
			AZ17289	024-00844	ELEVATOR MAINTENANCE - PW	285.00
			AZ17290	024-00844	ELEVATOR MAINTENANCE - CITY HALL	100.00
			AZ17291	024-00844	ELEVATOR MAINTENANCE - NCC	100.00
			AZ17292	037-10136	ELEVATOR MAINTENANCE - GTRANS A	285.00
			AZ17293	037-10136	ELEVATOR MAINTENANCE - GTRANS M	83.33
					Total :	**1,138.33**
168173	7/26/2022	105853 BABCOCK ASSOCIATES	RA-GREEN/MCKINNON		COVID-19 RENTAL ASSISTANCE PROG	4,950.00

Bank code : usb

Voucher	Date	Vendor		Invoice	PO #	Description/Account	Amount
168173	7/26/2022	105853	105853 BABCOCK ASSOCIATES	(Continued)		**Total :**	**4,950.00**
168174	7/26/2022	112179	BARBA, DANIELA	42431219		REFUND - MAINTENANCE DEPOSIT	100.00
						Total :	**100.00**
168175	7/26/2022	110190	BASNET FAMILY CHILD CARE	JUNE 2022		CHILD CARE PROVIDER	10,852.00
						Total :	**10,852.00**
168176	7/26/2022	102400	BAYSIDE MEDICAL CENTER	00142226		BLOOD DRAW	786.60
						Total :	**786.60**
168177	7/26/2022	103641	BECNEL UNIFORMS	47241		BUS UNIFORM SUPPLIES	547.40
				47343		BUS UNIFORM SUPPLIES	320.84
						Total :	**868.24**
168178	7/26/2022	104302	BEE N' WASP NEST REMOVAL, SERVICE, LLC	522368		HONEY BEE NEST REMOVAL - 13025 BI	95.00
				543774		HONEY BEE NEST REMOVAL - 1732 W	95.00
						Total :	**190.00**
168179	7/26/2022	107747	BENGAR PRODUCTIONS	7003		EMBROIDERY - COG LOGO ON POLO,	255.00
						Total :	**255.00**
168180	7/26/2022	102331	BLUE DIAMOND MATERIALS	2766473		STREET MAINT SUPPLIES	476.42
						Total :	**476.42**
168181	7/26/2022	108715	BOBBS FAMILY CHILDCARE	JUNE 2022		CHILD CARE PROVIDER	6,409.00
						Total :	**6,409.00**
168182	7/26/2022	103383	CALPORTLAND	95494040		STREET MAINT SUPPLIES	1,147.17
						Total :	**1,147.17**
168183	7/26/2022	110313	CALTIP	94-2022-JUN	037-10031	INSURANCE CLAIMS DEDUCTIBLE - JU	9,411.14
				CAL 2021-0177	037-10137	INSURANCE PREMIUM FY 2022-23	607,956.00
						Total :	**617,367.14**
168184	7/26/2022	110538	CANNON COMPANY	79811	024-00640	ARTESIA BLVD. STREET IMPROVEMEN	22,161.70
						Total :	**22,161.70**

Bank code : usb

Voucher	Date	Vendor	Invoice	PO #	Description/Account	Amount
168185	7/26/2022	110538 CANNON COMPANY	80874	024-00821	RBB ARTERIAL IMPROVEMENT PROJE	21,007.75
					Total :	**21,007.75**
168186	7/26/2022	110538 CANNON COMPANY	80692	024-00788	STORM DRAIN CATCH BASIN SCREEN	2,792.92
			80869	024-00808	VERMONT ST IMPROVEMENT (ROSECI	3,746.25
			80870	024-00807	VERMONT AVE IMPROVEMENTS (ARTE	15,234.70
			80872	024-00640	ARTESIA BLVD. STREET IMPROVEMEN	3,942.09
			80914	024-00628	170TH STREET IMPROVEMENT JN944	8,248.98
			80943	024-00788	STORM DRAIN CATCH BASIN SCREEN	631.00
					Total :	**34,595.94**
168187	7/26/2022	823003 CARL WARREN & COMPANY	JUNE 2022		CLAIMS MANAGEMENT	749.80
					Total :	**749.80**
168188	7/26/2022	112073 CAROLLO ENGINEERS, INC	FB24855	024-00828	PROFESSIONAL SERVICES - SEWER M	103,608.50
					Total :	**103,608.50**
168189	7/26/2022	112167 CAYENNE WELLNESS CENTER &, CHILDREN'	070522		DONATION PROCEEDS	420.00
					Total :	**420.00**
168190	7/26/2022	303331 CDTFA	APR-JUN 2022		UNDERGROUND STORAGE TANK MAIN	1,522.00
					Total :	**1,522.00**
168191	7/26/2022	303331 CDTFA	JUNE 2022		DIESEL FUEL EXEMPT BUS	112.00
					Total :	**112.00**
168192	7/26/2022	105122 CERDA, TASHA	CERDA 22/23		COMMUNITY PROMOTIONS	30.00
					Total :	**30.00**
168193	7/26/2022	103489 CF UNITED LLC	060122-063022		CAR WASH - JUNE 2022	48.00
					Total :	**48.00**
168194	7/26/2022	103127 CHILD 2 CHILD CONNECTION, FAMILY DAY CA	JUNE 2022		CHILD CARE PROVIDER	4,929.00
					Total :	**4,929.00**
168195	7/26/2022	503960 CITY OF GARDENA	KASKANIAN 21/22.		COMMUNITY PROMOTION	202.00
					Total :	**202.00**

Bank code : usb

Voucher	Date	Vendor	Invoice	PO #	Description/Account	Amount
168196	7/26/2022	111534 CLEAN ENERGY	CE12498774	037-10056	GTRANS OFFSITE CNG FUELING SERV	42,365.35
				037-10154		
			CE12506806	037-10154	GTRANS OFFSITE CNG FUELING SERV	49,776.43
			PJI00025331	037-10062	GTRANS FACILITY MODIFICATIONS	616,788.15
					Total :	**708,929.93**
168197	7/26/2022	109913 COSTAR REALTY INFORMATION INC.	120069479		COSTAR SUITE - JULY 2022	1,060.66
					Total :	**1,060.66**
168198	7/26/2022	120219 CYBER SECURITY SOURCE	11098		CYBERKEY ANNUAL SUPPORT	1,133.00
					Total :	**1,133.00**
168199	7/26/2022	112188 DALAYA LANE AS GUARDIAN AD, LITEM OF	T14-2018		FINAL SETTLEMENT	4,000.00
					Total :	**4,000.00**
168200	7/26/2022	110844 DATA GEAR, INC.	43535	035-01101	VIDEO POLICING SYSTEM CAMERA MA	3,315.00
					Total :	**3,315.00**
168201	7/26/2022	111377 DE NOVO PLANNING GROUP	3392	032-00088	PROFESSIONAL SERVICES - GARDENA	34,741.00
			3462	032-00088	PROFESSIONAL SERVICES - GARDENA	14,519.84
					Total :	**49,260.84**
168202	7/26/2022	303459 DEPARTMENT OF JUSTICE	589469		FINGERPRINT APPS - JUNE 2022	3,827.00
					Total :	**3,827.00**
168203	7/26/2022	303377 DEPARTMENT OF TRANSPORTATION	SL221051		SIGNALS & LIGHTING - ARTESIA BLVD	486.97
					Total :	**486.97**
168204	7/26/2022	312117 DEPARTMENT OF WATER & POWER	062922		LIGHT & POWER	67.48
					Total :	**67.48**
168205	7/26/2022	109416 E S SPORTS	11496		CUSTOM GRAPHICS FOR UNIT P18	834.26
			11503		CUSTOM GRAPHICS FOR UNIT P04~	834.26
					Total :	**1,668.52**
168206	7/26/2022	110532 ELECTRIC CAR SALES & SERVICE	30818		GTRANS AUTO PARTS	22.04
					Total :	**22.04**

Bank code : usb

Voucher	Date	Vendor	Invoice	PO #	Description/Account	Amount
168207	7/26/2022	107353 EMERGENCY RESPONSE CRIME SCENE, CLE	T2022-261		SANITIZE & CLEAN-UP POLICE VEHICL	325.00
					Total :	**325.00**
168208	7/26/2022	107690 ENLIGHTENMENT CHILD, DEVELOPMENT CEI	JUNE 2022		CHILD CARE PROVIDER	10,964.00
					Total :	**10,964.00**
168209	7/26/2022	107510 ESCALANTE, WENDY E.	JUNE 2022		CHILD CARE PROVIDER	8,664.00
					Total :	**8,664.00**
168210	7/26/2022	111928 EVANS, PEGGY	JUNE 2022		VOLUNTEER DRIVER	14.00
					Total :	**14.00**
168211	7/26/2022	110320 EYEDEAL INTERIORS INC	CG200430		INSTALLED VC TILES IN PD OFFICE	1,089.00
					Total :	**1,089.00**
168212	7/26/2022	100055 FAIR HOUSING FOUNDATION	JUNE 2022		CDBG CONSULTANT	428.84
					Total :	**428.84**
168213	7/26/2022	106109 FASTSIGNS	0094-105342		BUS SUPPLIES	657.43
					Total :	**657.43**
168214	7/26/2022	106129 FEDEX	7-805-58275		SHIPPING SERVICES	38.88
			7-813-14044		SHIPPING SERVICES	55.47
			7-813-48009		SHIPPING SERVICES	20.12
					Total :	**114.47**
168215	7/26/2022	112180 FERNANDEZ, ERICK	DR #21-1987		RETURN MONEY BOOKED AS EVIDENC	17,403.63
					Total :	**17,403.63**
168216	7/26/2022	103083 FIRST ADVANTAGE LNS OCC HEALTH, SOLUT	2504342206		DRUG TEST/ADMIN FEE	383.10
					Total :	**383.10**
168217	7/26/2022	106465 FOX FIRST AID & SAFETY INC	68008		SEWER PROGRAM SUPPLIES	66.15
			68009		STREET MAINT SUPPLIES	19.85
					Total :	**86.00**
168218	7/26/2022	112077 FRYMER CONSTRUCTION	PERMIT #16731		PERMIT DEPOSIT REFUND - 16819 NOI	1,000.00
			PERMIT #16779		PERMIT DEPOSIT REFUND - 16819 NOI	500.00

Bank code : usb

Voucher	Date	Vendor	Invoice	PO #	Description/Account	Amount
168218	7/26/2022	112077 112077 FRYMER CONSTRUCTION	(Continued)		**Total :**	**1,500.00**
168219	7/26/2022	112566 GALLS, LLC	BC1638812		PD UNIFORM SUPPLIES	184.29
			BC1644526		PD UNIFORM SUPPLIES	340.75
			BC1649965		PD UNIFORM SUPPLIES	950.44
					Total :	**1,475.48**
168220	7/26/2022	107724 GARCIA, CLAUDIA CRISTINA	JUNE 2022		CHILD CARE PROVIDER	11,966.00
					Total :	**11,966.00**
168221	7/26/2022	207133 GARCIA, NANCY C.	JUNE 2022		CHILD CARE PROVIDER	11,050.00
					Total :	**11,050.00**
168222	7/26/2022	112175 GARDENA 178TH ST. 2019, LLC	PERMIT #16561		PERMIT DEPOSIT REFUND - 1515 W 17	20,000.00
					Total :	**20,000.00**
168223	7/26/2022	107011 GARDENA VALLEY NEWS, INC.	00119157		NOTICE OF PUBLIC HEARING -	143.50
			00119158		NOTICE OF PUBLIC HEARING -	143.50
			00119529		NOTICE OF PUBLIC HEARING -	245.00
			00119530		NOTICE OF PUBLIC HEARING -	175.00
			00120431		PUBLIC NOTICE - GTRANS INVITES AN	84.00
			00120432		PUBLIC NOTICE - GTRANS INVITES AN	84.00
			00120522		NOTICE OF PUBLIC HEARING -	140.00
			0119840		SUMMARY OF ORDINANCE NO. 1842-	129.50
					Total :	**1,144.50**
168224	7/26/2022	619005 GAS COMPANY, THE	070522		GAS	5,701.10
			070822		CNG FUEL	2,256.69
					Total :	**7,957.79**
168225	7/26/2022	619005 GAS COMPANY, THE	070622		CARES UTILITY ASSISTANCE PROGRA	411.63
					Total :	**411.63**
168226	7/26/2022	111964 GCAP SERVICES, INC.	004	037-10116	CNG PROJECT LABOR COMPLIANCE A	285.00
					Total :	**285.00**
168227	7/26/2022	106470 GILLIG LLC	40933438	037-10049	GTRANS AUTO PARTS	817.02
			40936803	037-10049	GTRANS AUTO PARTS	484.59

Bank code : usb

Voucher	Date	Vendor	Invoice	PO #	Description/Account	Amount
168227	7/26/2022	106470 106470 GILLIG LLC	(Continued)		**Total :**	**1,301.61**
168228	7/26/2022	619004 GOLDEN STATE WATER CO.	070722		WATER	12,101.90
					Total :	**12,101.90**
168229	7/26/2022	107513 GRAINGER	9312301238		BUS FACILITY SUPPLIES	124.63
			9313732951		BUS FACILITY SUPPLIES	136.77
			9313732969		BUS FACILITY SUPPLIES	124.57
			9330307860		BUS FACILITY SUPPLIES	112.23
			9357109116		BUS FACILITY MAINT SUPPLIES	85.72
			9358668490		BUS FACILITY SUPPLIES	112.68
			9358971019		BUS FACILITY SUPPLIES	20.06
			9365909168		BUS FACILITY SUPPLIES	2,116.80
			9367229912		PW AUTO PARTS	83.16
			9368186046		PW AUTO PARTS	175.09
			9368186053		BUS FACILITY SUPPLIES	75.64
			9369512984		PW VEHICLE MAINT SUPPLIES	144.49
			9369512992		PW AUTO PARTS	28.03
			9373625988		BUS FACILITY SUPPLIES	245.84
					Total :	**3,585.71**
168230	7/26/2022	110435 GUERRERO, ANGELICA	JUNE 2022		CHILD CARE PROVIDER	10,545.00
					Total :	**10,545.00**
168231	7/26/2022	111484 HANNA, BROPHY, MACLEAN,, MCALEER & JEN	2074587		PROFESSIONAL SERVICES	25.00
			2074614		PROFESSIONAL SERVICES	460.00
					Total :	**485.00**
168232	7/26/2022	108607 HENDERSON-BATISTE, TANEKA	JUNE 2022		CHILD CARE PROVIDER	5,904.00
					Total :	**5,904.00**
168233	7/26/2022	112076 HERNANDEZ, ROSA	013		INTERN SERVICES - 06/16-06/30/22	1,365.00
			014		INTERN SERVICES - 06/30-07/13/2022	745.50
					Total :	**2,110.50**
168234	7/26/2022	108434 HOME DEPOT CREDIT SERVICES	0023496		GTRANS MAINT SUPPLIES	161.41
			0052031		STREET MAINT SUPPLIES	76.39
			0541035		PARK MAINT SUPPLIES	58.12

Bank code : usb

Voucher	Date	Vendor	Invoice	PO #	Description/Account	Amount
168234	7/26/2022	108434 HOME DEPOT CREDIT SERVICES	(Continued)			
			5524531		STREET MAINT SUPPLIES	12.05
					Total :	**307.97**
168235	7/26/2022	108430 HOME PIPE & SUPPLY	F38814		BLDG MAINT SUPPLIES	218.25
			F38926		BLDG MAINT SUPPLIES	214.67
					Total :	**432.92**
168236	7/26/2022	109198 HOWARD, NICOLA	063022		MGMT ANNUAL HEALTH BENEFIT	1,000.00
					Total :	**1,000.00**
168237	7/26/2022	109667 I.D. SYSTEMS & SUPPLIES CO.	43479		PD PROGRAM SUPPLIES	197.10
					Total :	**197.10**
168238	7/26/2022	111657 INDEPENDENT ROOFING, CONSULTANTS	0079315	024-00749	CH ROOF REHABILITATION PROJECT J	2,150.00
			0079316	024-00749	NCC ROOF REHABILITATION PROJECT	1,500.00
			0079345	024-00749	CH ROOF REHABILITATION PROJECT J	1,500.00
					Total :	**5,150.00**
168239	7/26/2022	105513 INDUSTRIAL CLEANING SYSTEMS, INC.	39811		SERVICE CALL	736.46
					Total :	**736.46**
168240	7/26/2022	111593 INTER-CON SECURITY SYSTEMS INC	BD0088397	037-10095	GTRANS SECURITY SERVICES - JUNE	6,954.74
					Total :	**6,954.74**
168241	7/26/2022	106714 INTERSTATE BATTERIES OF, CALIFORNIA CO.	140071763		GTRANS AUTO PARTS	513.04
					Total :	**513.04**
168242	7/26/2022	111715 ISLAND BREEZE APARTMENTS	RA-MARTIN		COVID-19 RENTAL ASSISTANCE PROGI	4,770.00
					Total :	**4,770.00**
168243	7/26/2022	103064 ITERIS, INC.	143324	024-00717	TRAFFIC SIGNAL PROJECT - VERMONT	990.00
					Total :	**990.00**
168244	7/26/2022	108579 J.D. FIELDS LUMBER COMPANY	4141		STREET MAINT SUPPLIES	48.06
			4230		STREET MAINT SUPPLIES	41.02
					Total :	**89.08**

Bank code : usb

Voucher	Date	Vendor	Invoice	PO #	Description/Account	Amount
168245	7/26/2022	110866 JA SALAZAR CONSTRUCTION	PERMIT #17294		PERMIT DEPOSIT REFUND - 1047 W. 13	1,000.00
			PERMIT #17295		PERMIT DEPOSIT REFUND - 135TH ST/	1,000.00
			PERMIT #17361		PERMIT DEPOSIT REFUND - 2030 135T	1,000.00
					Total :	**3,000.00**
168246	7/26/2022	108555 JALISCO TIRE & AUTO REPAIR	071122		(4) NEW TIRES & (1) FLAT REPAIR	930.00
					Total :	**930.00**
168247	7/26/2022	105226 JEKAL FAMILY CHILD CARE	JUNE 2022		CHILD CARE PROVIDER	10,663.00
					Total :	**10,663.00**
168248	7/26/2022	110853 JONES & MAYER	107907 BAL		ATTORNEY SERVICES	20.00
			108422 BAL		ATTORNEY SERVICES	90.00
					Total :	**110.00**
168249	7/26/2022	110456 KHAIRZADA FAMILY CHILD CARE	JUNE 2022		CHILD CARE PROVIDER	4,911.00
					Total :	**4,911.00**
168250	7/26/2022	112186 KIM, ESTHER	PERMIT #50022-0397		PERMIT CANCELLATION REFUND	534.00
					Total :	**534.00**
168251	7/26/2022	110385 KIMLEY-HORN AND ASSOCIATES, INC	21171627	032-00102	DEVELOPMENT SERVICES - NORMANI	5,601.33
					Total :	**5,601.33**
168252	7/26/2022	111517 KIRK'S AUTOMOTIVE INC.	1061536		GTRANS SHOP SUPPLIES	21.02
			1061678		GTRANS SHOP SUPPLIES	1,790.00
					Total :	**1,811.02**
168253	7/26/2022	111045 KJ SERVICES	2466	020-00035	BOTTLE & CAN RECYCLING PROGRAM	85.00
			2467		USED OIL PROGRAM EXPENSE - JUNE	85.00
					Total :	**170.00**
168254	7/26/2022	105900 KONECRANES, INC.	154671045	037-10032	PREVENTATIVE MAINT & INSPECTION	560.00
					Total :	**560.00**
168255	7/26/2022	312030 L.A. COUNTY ASSESSOR	22ASRE173		MAPS/POSTAGE	55.09
					Total :	**55.09**

Bank code : usb

Voucher	Date	Vendor	Invoice	PO #	Description/Account	Amount
168256	7/26/2022	312240 L.A. COUNTY DEPARTMENT OF, PUBLIC WOR	22061306984	024-00769	INDUSTRIAL WASTE SERVICES	9,612.48
			22061307297	024-00769	TRAFFIC SIGNAL MAINT-HIGHWAY SAF	2,757.31
					Total :	**12,369.79**
168257	7/26/2022	312248 L.A. COUNTY DEPARTMENT OF, PUBLIC WOR	IN220001011		LABOR & EQUIP CHARGES - TS 0981	309.69
					Total :	**309.69**
168258	7/26/2022	312039 L.A. COUNTY FIRE DEPARTMENT	C0010512	023-01387	FIRE PROTECTION SERVICES - AUGUS	875,190.22
					Total :	**875,190.22**
168259	7/26/2022	102082 L.A. COUNTY POLICE CHIEF'S, ASSOCIATION	SAFFELL 08/31-09/02		REGISTRATION - LACPCA 2022 STRATE	200.00
					Total :	**200.00**
168260	7/26/2022	104203 L.A. PAINT & BODY WORKS	23064	037-10161	BUS REPAIR FOR BUS #2008	4,639.28
					Total :	**4,639.28**
168261	7/26/2022	112015 LACERDA, DALVANICE	JUNE 2022		CHILD CARE PROVIDER	12,028.00
					Total :	**12,028.00**
168262	7/26/2022	112014 LAKESHORE LEARNING MATERIALS	147824061522	331-00058	FCC PROGRAM SUPPLIES	250.05
			165594061422	331-00058	FCC PROGRAM SUPPLIES	214.94
			183665062122	331-00058	FCC PROGRAM SUPPLIES	66.13
			184640061622	331-00058	FCC PROGRAM SUPPLIES	175.30
					Total :	**706.42**
168263	7/26/2022	106372 LANDSCAPE STRUCTURES, INC.	INV-113322		PARK MAINT SUPPLIES	1,041.39
					Total :	**1,041.39**
168264	7/26/2022	105874 LAWSON PRODUCTS, INC.	9309690685		BUS SHOP SUPPLIES	4.13
					Total :	**4.13**
168265	7/26/2022	102376 LEXISNEXIS RISK SOLUTIONS	1328345-20220630		MONTHLY SUBSCRIPTION FEE	1,830.22
					Total :	**1,830.22**
168266	7/26/2022	102376 LEXISNEXIS RISK SOLUTIONS	51527		REFUND - WRONG REPORT ORDERED	23.00
					Total :	**23.00**
168267	7/26/2022	102233 LITTLE PEOPLE DAY CARE	JUNE 2022		CHILD CARE PROVIDER	6,680.00

Bank code : usb

Voucher	Date	Vendor	Invoice	PO #	Description/Account	Amount
168267	7/26/2022	102233 102233 LITTLE PEOPLE DAY CARE	(Continued)		**Total :**	**6,680.00**
168268	7/26/2022	109517 LOAD N' GO BUILDING MATERIALS	23533		STREET MAINT SUPPLIES	174.16
					Total :	**174.16**
168269	7/26/2022	312665 LOS ANGELES SUPERIOR COURT	APR-JUN 2022	035-01128	PARKING CITATION SURCHARGE	52,771.00
					Total :	**52,771.00**
168270	7/26/2022	109563 LUCKY LADY CASINO	0850000174		ECONOMIC ASSISTANCE - JUNE 2022	32,916.21
					Total :	**32,916.21**
168271	7/26/2022	112615 LU'S LIGHTHOUSE, INC.	01222311	037-10063	GTRANS SHOP SUPPLIES	916.21
			01223070	037-10148	GTRANS SHOP SUPPLIES	539.72
					Total :	**1,455.93**
168272	7/26/2022	111949 M & M LIFTS	5696	037-10155	GTRANS VEHICLE BUCKET REPAIRS	13,377.80
					Total :	**13,377.80**
168273	7/26/2022	109578 MACIEL, MAYRA	070722		MGMT ANNUAL HEALTH BENEFIT	359.99
					Total :	**359.99**
168274	7/26/2022	104841 MAR-CO EQUIPMENT COMPANY	186749		PW MAINT SUPPLIES	392.66
			186854	024-00848	STREET SWEEPER PARTS	5,249.63
					Total :	**5,642.29**
168275	7/26/2022	107644 MARTINEZ, CHERYL NAOMI	JUNE 2022		CHILD CARE PROVIDER	11,914.00
					Total :	**11,914.00**
168276	7/26/2022	104773 MARTINEZ, KAMBY	JUNE 2022		CHILD CARE PROVIDER	12,011.00
					Total :	**12,011.00**
168277	7/26/2022	113046 MARX BROS. FIRE EXTINGUISHER, CO., INC.	P30748	037-10152	FIRE EXTINGUISHER SERVICE - GTRAI	2,145.72
					Total :	**2,145.72**
168278	7/26/2022	113064 MCMASTER-CARR SUPPLY COMPANY	80755260		GTRANS SHOP SUPPLIES	147.26
					Total :	**147.26**
168279	7/26/2022	112176 MEDIAVILLA, CLEMENCY	63790206598		REFUND -CREDIT CARD OVERCHARGI	28.80

Bank code : usb

Voucher	Date	Vendor		Invoice	PO #	Description/Account	Amount
168279	7/26/2022	112176	112176 MEDIAVILLA, CLEMENCY	(Continued)		**Total :**	**28.80**
168280	7/26/2022	108699	MEZIERE ENTERPRISES INC.	88063		ELECTRIC WATER PUMP	629.76
						Total :	**629.76**
168281	7/26/2022	110206	MICHELIN NORTH AMERICA, INC.	DA0050769820	037-10059	GTRANS' BUS TIRE LEASE SERVICES -	6,254.48
						Total :	**6,254.48**
168282	7/26/2022	102534	MONCADA, BARBARA	JUNE 2022		VOLUNTEER DRIVER	7.00
						Total :	**7.00**
168283	7/26/2022	113295	MUNISERVICES, LLC	INV06-014400		UUT WIRED COMPLIANCE SERVICES~	344.71
				INV06-014401		UUT CELLULAR COMPLIANCE SERVICI	393.11
						Total :	**737.82**
168284	7/26/2022	113605	MUTUAL LIQUID GAS & EQUIPMENT, CO., INC	609361		PROPANE GAS	365.00
						Total :	**365.00**
168285	7/26/2022	110819	NORTHERN SAFETY CO., INC.	904855574		BUS SHOP SUPPLIES	563.16
						Total :	**563.16**
168286	7/26/2022	110575	OCCUPATIONAL HEALTH CENTERS, OF CALIF	75815874		RANDOM BAT, PHYSICAL, TB SKIN TES	532.00
				75821227		RANDOM BAT	46.50
				75887336		FIRST AID SERVICES	66.50
				75889902		PHYSICAL RECERTIFICATION	103.00
						Total :	**748.00**
168287	7/26/2022	115168	OFFICE DEPOT	249922209		BUS OFFICE SUPPLIES	204.06
				250435187		FINANCE OFFICE SUPPLIES	63.84
				250846765		CT OFFICE SUPPLIES	22.55
				251779004		FCC OFFICE SUPPLIES	1,163.16
				251781107		FCC OFFICE SUPPLIES	46.08
				251832021		REC OFFICE SUPPLIES	268.37
				251832021-002		REC OFFICE SUPPLIES	4.16
				252166737		REC OFFICE SUPPLIES	47.39
				252166953		REC OFFICE SUPPLIES	19.37
						Total :	**1,838.98**

Bank code : usb

Voucher	Date	Vendor	Invoice	PO #	Description/Account	Amount
168288	7/26/2022	108921 OMEGA POLYGRAPH	01874		PRE-EMPLOYMENT POLYGRAPH EXAM	1,575.00
					Total :	**1,575.00**
168289	7/26/2022	111358 O'REILLY AUTO PARTS	205268		GTRANS AUTO PARTS	134.28
			205475		GTRANS AUTO PARTS	66.33
			240588		GTRANS AUTO PARTS	140.60
					Total :	**341.21**
168290	7/26/2022	109890 OWUSU FAMILY CHILD CARE	JUNE 2022		CHILD CARE PROVIDER	12,413.00
					Total :	**12,413.00**
168291	7/26/2022	110403 PENN RECORDS MANAGEMENT	0130685		OFF-SITE STORAGE SERVICES - JUNE	58.00
					Total :	**58.00**
168292	7/26/2022	112173 PEREZ, NATHALIE	062322		REIMBURSEMENT - WORK RELATED E	1,989.00
					Total :	**1,989.00**
168293	7/26/2022	112182 PETER ARANY CONSULTING	191025		PATROL UNIT BICYCLE GRIPS	852.89
					Total :	**852.89**
168294	7/26/2022	112187 PINELA, ELIZABETH	20220713152058		REFUND - CREDIT CARD CONVENIENC	2.75
					Total :	**2.75**
168295	7/26/2022	110223 PRISM	23100127	023-01397	ANNUAL INSURANCE RENEWAL - FY 22	150,892.00
			23300055	023-01397	ANNUAL INSURANCE RENEWAL - FY 22	691,046.00
					Total :	**841,938.00**
168296	7/26/2022	111883 PROJECT PARTNERS, INC.	10708	024-00783	PROJECT MANAGEMENT SERVICES	11,000.00
					Total :	**11,000.00**
168297	7/26/2022	102677 PROVIDENCE HEALTH & SERVICES	600000283 07/05/22		PRE-EMPLOYMENT PHYSICAL EXAMS	575.00
					Total :	**575.00**
168298	7/26/2022	106092 PRUDENTIAL OVERALL SUPPLY	42740759		UNIFORM & SUPPLY RENTAL	13.65
			42744647		UNIFORM & SUPPLY RENTAL	142.40
			42744648		UNIFORM & SUPPLY RENTAL	46.98
			42744649		UNIFORM & SUPPLY RENTAL	50.10
			42744650		UNIFORM & SUPPLY RENTAL	13.65

Bank code : usb

Voucher	Date	Vendor	Invoice	PO #	Description/Account	Amount
168298	7/26/2022	106092 PRUDENTIAL OVERALL SUPPLY	(Continued)			
			42744651		UNIFORM & SUPPLY RENTAL	19.00
			42744652		UNIFORM & SUPPLY RENTAL	91.60
			42744653		UNIFORM & SUPPLY RENTAL	11.60
			42746613		UNIFORM & SUPPLY RENTAL	142.20
			42746614		UNIFORM & SUPPLY RENTAL	46.98
			42746615		UNIFORM & SUPPLY RENTAL	50.10
					Total :	**628.26**
168299	7/26/2022	116575 PSYCHOLOGICAL CONSULTING, ASSOCIATES	525699		PEER SUPPORT TRAINING	1,540.00
					Total :	**1,540.00**
168300	7/26/2022	116721 PYRO SPECTACULARS	57975	034-00513	4TH OF JULY FIREWORKS DISPLAY @	17,500.00
					Total :	**17,500.00**
168301	7/26/2022	109242 QUACH, KHOI	063022		MGMT ANNUAL HEALTH BENEFIT	1,000.00
					Total :	**1,000.00**
168302	7/26/2022	100147 RCI IMAGE SYSTEMS	77035		MICROFICHE SCANNING - 16307 MANH	72.77
					Total :	**72.77**
168303	7/26/2022	103072 REACH	0722932		EAP SERVICES/REACHLINE NEWSLET	902.00
					Total :	**902.00**
168304	7/26/2022	118476 RICOH USA, INC.	5065037762		RICOH MPC3300SPF USAGE CHARGES	241.11
			5065037763		RICOH MPC3300SPF COPIER USAGE C	240.59
					Total :	**481.70**
168305	7/26/2022	118536 RIO HONDO COLLEGE	X22-42-ZGDA		TUITION - ENROLLEMNT / MATERIAL FI	228.00
					Total :	**228.00**
168306	7/26/2022	111867 RJM DESIGN GROUP	35108	024-00795	DESIGN & ENGINEERING SERVICES - A	37,281.80
					Total :	**37,281.80**
168307	7/26/2022	112169 ROCKLER	9830886	024-00843	BLDG MAINT SUPPLIES	3,922.29
					Total :	**3,922.29**
168308	7/26/2022	107551 RUIZ CONCRETE & PAVING INC	063022 #1/#2	024-00840	PEDESTRIAN SAFETY IMPROVEMENT	122,290.18

Bank code : usb

Voucher	Date	Vendor	Invoice	PO #	Description/Account	Amount
168308	7/26/2022	107551 107551 RUIZ CONCRETE & PAVING INC	(Continued)		**Total :**	**122,290.18**
168309	7/26/2022	119126 S.B.R.P.C.A.	04188		PD AUTO PARTS	230.42
			04189		PD AUTO PARTS	335.80
			04190		PD AUTO PARTS	455.77
			04191		PD AUTO PARTS	1,708.88
			04192		PD AUTO PARTS	1,708.88
					Total :	**4,439.75**
168310	7/26/2022	119022 SAFE MART OF SOUTHERN, CALIFORNIA, INC	93344		BLDG MAINT SUPPLIES	16.54
					Total :	**16.54**
168311	7/26/2022	119015 SAFETY-KLEEN CORPORATION	89157452		SERVICE AQUEOUS PARTS WASHER	1,106.42
					Total :	**1,106.42**
168312	7/26/2022	119016 SAM'S CLUB	6991 06/23/22		FCC PROGRAM SUPPLIES	329.55
					Total :	**329.55**
168313	7/26/2022	104451 SELECT ADVANTAGE	10347510		TRANSIT COACH OPERATOR & SUPER	285.00
					Total :	**285.00**
168314	7/26/2022	107006 SHAMROCK COMPANIES	2590568		STREET MAINT SUPPLIES	14.57
			2602815		STREET MAINT SUPPLIES	171.66
					Total :	**186.23**
168315	7/26/2022	110731 SHAW HR CONSULTING, INC	004457		PROFESSIONAL SERVICES - PERSONN	1,382.50
			004497		PROFESSIONAL SERVICES - PERSONN	370.00
					Total :	**1,752.50**
168316	7/26/2022	106050 SHEHATA, AMY	JUNE 2022		CHILD CARE PROVIDER	10,154.00
					Total :	**10,154.00**
168317	7/26/2022	109918 SHIGE'S FOREIGN CAR SERVICE, INC.	8091635	035-01134	2018 NISSAN FRONTIER #1529605 SER	519.41
			8091636	035-01134	2018 NISSAN FRONTIER #1529606 SER	304.00
			8091678	035-01134	2018 NISSAN FRONTIER #1529607 SER	358.66
			8091773		2017 FORD INTRCPTR #1368929 SERVI	1,415.96
			8091825		2016 FORD INTRCPTR #1484145 BATTE	317.68

Bank code : usb

Voucher	Date	Vendor	Invoice	PO #	Description/Account	Amount
168317	7/26/2022	109918 109918 SHIGE'S FOREIGN CAR SERVICE, INC. (Continued)			**Total :**	**2,915.71**
168318	7/26/2022	101649 SILVIA ESPINOZA FAMILY CHILD, CARE	JUNE 2022		CHILD CARE PROVIDER	9,182.00
					Total :	**9,182.00**
168319	7/26/2022	119378 SMARDAN SUPPLY CO.	S3747438		BLDG MAINT SUPPLIES	364.04
			S3825127		BUS FACILITY MAINT SUPPLIES	54.64
			S3838598		BLDG MAINT SUPPLIES	43.43
					Total :	**462.11**
168320	7/26/2022	119361 SMART & FINAL IRIS CO.	15903		SR BUREAU PROGRAM SUPPLIES	182.79
			38004		REC PROGRAM SUPPLIES	36.75
					Total :	**219.54**
168321	7/26/2022	109531 SMILLIN, MAGE	JUNE 2022		CHILD CARE PROVIDER	11,224.00
					Total :	**11,224.00**
168322	7/26/2022	107761 SOCAL STORMWATER RUNOFF, SOLUTION S	6706	037-10089	FACILITY STORMWATER COMPLIANCE	6,462.17
					Total :	**6,462.17**
168323	7/26/2022	119447 SOUTH BAY FORD	509645		2012 FORD FUSION SERVICE & REPAIF	195.00
					Total :	**195.00**
168324	7/26/2022	619003 SOUTHERN CALIFORNIA EDISON	071522		LIGHT & POWER	52,076.89
					Total :	**52,076.89**
168325	7/26/2022	619003 SOUTHERN CALIFORNIA EDISON	070622		CARES UTILITY ASSISTANCE PROGRA	444.60
					Total :	**444.60**
168326	7/26/2022	111778 SPCALA	2022-0430	032-00091	ANIMAL SHELTER SERVICES	9,141.50
			2022-0630	032-00091	ANIMAL SHELTER SERVICES	9,143.75
					Total :	**18,285.25**
168327	7/26/2022	104126 SPECTRUM	0851122071222		CABLE SERVICES - PD	75.89
					Total :	**75.89**
168328	7/26/2022	119594 STANLEY PEST CONTROL	COG 0622		PEST CONTROL SERVICE - 1670 W 16:	654.00
			COG 0622-1		PEST CONTROL SERVICE - 2320 W 149	517.00

Bank code : usb

Voucher	Date	Vendor	Invoice	PO #	Description/Account	Amount
168328	7/26/2022	119594 119594 STANLEY PEST CONTROL	(Continued)		**Total :**	**1,171.00**
168329	7/26/2022	119010 STAPLES ADVANTAGE	3510457346		PW OFFICE SUPPLIES	104.52
			3512488028		REC OFFICE SUPPLIES	131.72
					Total :	**236.24**
168330	7/26/2022	109877 STATEWIDE TRAFFIC SAFETY, AND SIGNS IN(	02028831	024-00819	SIGNS - 28" CONES "GPW ARROW BOA	3,108.63
			02029066		24"X8/6" BARRICADE	1,222.61
			02029187		28" CONES	1,151.34
			02029272		STENCIL BARRICADES 24"X8/6" "GPW"	1,953.94
					Total :	**7,436.52**
168331	7/26/2022	119662 STUDIO EFFECTS	26741		PD PATROL HATS WITH GPD LOGO	1,089.27
					Total :	**1,089.27**
168332	7/26/2022	111983 SWEETWATER SOUND	32319079	037-10123	GTRANS PROGRAM SUPPLIES	3,139.92
					Total :	**3,139.92**
168333	7/26/2022	110877 TAYLORING MINDS FAMILY CHILD, CARE	JUNE 2022		CHILD CARE PROVIDER	4,701.00
					Total :	**4,701.00**
168334	7/26/2022	111864 TCS RISK MANAGEMENT SERVICES	12187	023-01382	WORKERS COMPENSATION PROGRAM	6,375.00
					Total :	**6,375.00**
168335	7/26/2022	109351 TDX	INV4144964		GTRANS TIRE SUPPLIES	69.23
			INV4147538		GTRANS TIRE SUPPLIES	553.81
			INV4148241		GTRANS TIRE SUPPLIES	69.23
					Total :	**692.27**
168336	7/26/2022	109775 TOMS TRUCK CENTER NORTH COUNTY	1272861		GTRANS AUTO PARTS	1,307.99
			CM1270930		GTRANS AUTO PARTS	-508.05
					Total :	**799.94**
168337	7/26/2022	108863 TRACKIT LLC	2370la	037-10144	TRACKIT MANAGER SOFTWARE SYSTI	12,980.00
					Total :	**12,980.00**
168338	7/26/2022	106018 TRANE U.S. INC.	12421881		BUS FACILITY MAINT SUPPLIES	136.91

Bank code : usb

Voucher	Date	Vendor		Invoice	PO #	Description/Account	Amount
168338	7/26/2022	106018	106018 TRANE U.S. INC.	(Continued)		**Total :**	**136.91**
168339	7/26/2022	110851	TRAPEZE SOFTWARE GROUP, INC.	TSMAU220185	037-10145	SCHEDULING AND OPERATIONS MANA	18,438.00
						Total :	**18,438.00**
168340	7/26/2022	111481	TRIO COMMUNITY MEALS, LLC	INV2230013027	034-00480	SENIOR FEEDING PROGRAM	8,377.18
				INV2230013428	034-00480	SENIOR FEEDING PROGRAM	7,676.36
						Total :	**16,053.54**
168341	7/26/2022	109900	U.S. BANK CORPORATE PAYMENT, SYSTEMS	FCC 06/22/22		CAL CARD STATEMENT 05/24-06/22/22	1,504.71
				LEWIS 06/22/22		CAL CARD STATEMENT - 05/24-06/22/22	1,340.29
				OROZCO 06/22/22	020-00040	CAL CARD STATEMENT 05/24-06/22/22	3,836.15
				OROZCO 6/22/22		CAL CARD STATEMENT 05/24-06/22/22	600.00
				SAFFELL 06/22/22		CAL CARD STATEMENT 05/24-06/22/22	135.92
				SANTIN 06/22/22	034-00525	CAL CARD STATEMENT 05/24-06/22/22	14,808.42
				SANTOS 06/22/22		CAL CARD STATEMENT 05/24-06/22/22	67.13
						Total :	**22,292.62**
168342	7/26/2022	109220	U.S. BANK EQUIPMENT FINANCE	476046180		RICOH MPC4503 COPIER LEASE -CD	175.10
						Total :	**175.10**
168343	7/26/2022	103227	UNIPLAN ENGINEERING, INC.	800153-01R	024-00830	DESIGN & CMI SERVICES - PEDESTRIA	16,100.00
						Total :	**16,100.00**
168344	7/26/2022	121010	UNITED RENTALS	207733355		RENTAL - AUGER	151.51
						Total :	**151.51**
168345	7/26/2022	121407	UPS	649922282 07/09/22		SHIPPING SERVICE CHARGES	12.53
						Total :	**12.53**
168346	7/26/2022	106754	URBAN RESTORATION GROUP US, INC.	00033542		STREET MAINT SUPPLIES	1,083.94
						Total :	**1,083.94**
168347	7/26/2022	105549	VALDEZ, MATILDE	JUNE 2022		CHILD CARE PROVIDER	13,933.00
						Total :	**13,933.00**
168348	7/26/2022	111371	VERSADIAL SOLUTIONS	VS9063		GTRANS VOIP RECORDING SOFTWAR	900.00

Bank code : usb

Voucher	Date	Vendor	Invoice	PO #	Description/Account	Amount
168348	7/26/2022	111371 111371 VERSADIAL SOLUTIONS	(Continued)		**Total :**	**900.00**
168349	7/26/2022	122435 VISTA PAINT CORPORATION	2022-622172-00		GTRANS FACILITY PAINT	41.24
					Total :	**41.24**
168350	7/26/2022	112072 WELL BEFORE	685914		GTRANS COVID-19 EMERGENCY SUPF	2,374.75
					Total :	**2,374.75**
168351	7/26/2022	110370 WESTERN COLLISION CENTER, INC	1073	035-01136	2018 NISSN FRONTIER #1529606 BODY	331.96
			1079	035-01136	2018 FORD EXPLR #1555072 BODY REI	3,274.23
					Total :	**3,606.19**
168352	7/26/2022	119387 WEX BANK	82275795		FUEL PURCHASES	316.63
					Total :	**316.63**
168353	7/26/2022	105568 WORTHY, PATRICIA	JUNE 2022 CM		VOLUNTEER DRIVER	14.00
			JUNE 2022 HDM		VOLUNTEER DRIVER	28.00
			MAY 2022 CM		VOLUNTEER DRIVER	35.00
			MAY 2022 HDM		VOLUNTEER DRIVER	28.00
					Total :	**105.00**
168354	7/26/2022	125001 YAMADA COMPANY, INC.	82145		PARK MAINT SUPPLIES	7.33
					Total :	**7.33**
168355	7/26/2022	107051 ZAVALETA, MARITZA	JUNE 2022		CHILD CARE PROVIDER	5,816.00
					Total :	**5,816.00**
168356	7/26/2022	104934 ZUMAR INDUSTRIES, INC.	97198		SIGNS/SIGNALS SUPPLIES	837.97
					Total :	**837.97**

211 Vouchers for bank code : usb **Bank total : 5,147,111.50**

211 Vouchers in this report **Total vouchers : 5,147,111.50**

Bank code : usb

Voucher	Date	Vendor	Invoice	PO #	Description/Account	Amount

CLAIMS VOUCHER APPROVAL

I hereby certify that the demands or claims covered by the checks listed on pages 1 to 21 inclusive of the check register are accurate and funds are available for payment thereof.

By: _____
Director of Administrative Services

This is to certify that the claims or demands covered by checks listed on pages 1 to 21 inclusive of the check register have been audited by the City Council of the City of Gardena and that all of the said checks are approved for payment except check numbers:

_____

_____ 07/26/2022
Mayor Date

_____ _____
Councilmember Date

_____ _____
Councilmember Date

Acknowledged:

_____ _____
Councilmember Date

_____ _____
Councilmember Date

CITY OF GARDENA

INVESTMENT REPORT

June 2022

Prepared by Danny Rodriguez, Deputy City Treasurer
Reviewed by Ray Beeman, Director of Administrative Services

City of Gardena Consolidated - Account #10647

MONTHLY ACCOUNT STATEMENT

JUNE 1, 2022 THROUGH JUNE 30, 2022

Chandler Team:
For questions about your account, please call (800) 317-4747,
or contact **operations@chandlerasset.com**

CHANDLER ASSET MANAGEMENT
chandlerasset.com

Information contained herein is confidential. We urge you to compare this statement to the one you receive from your qualified custodian. Please see Important Disclosures.

City of Gardena Consolidated

Account #10647

Portfolio Summary

As of June 30, 2022

PORTFOLIO CHARACTERISTICS

Average Modified Duration	0.73
Average Coupon	1.22%
Average Purchase YTM	1.17%
Average Market YTM	1.89%
Average S&P/Moody Rating	AA/Aa1
Average Final Maturity	0.80 yrs
Average Life	0.76 yrs

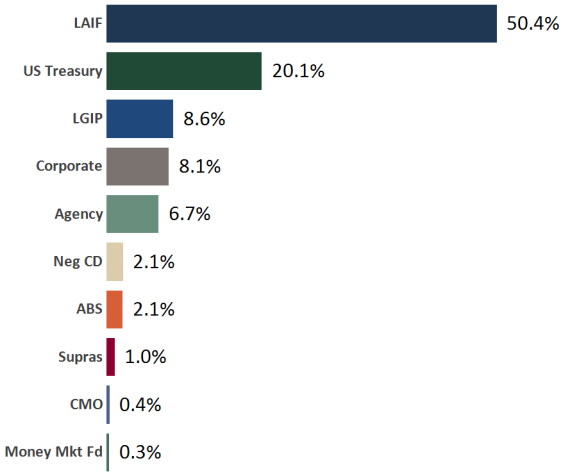
ACCOUNT SUMMARY

	Beg. Values as of 5/31/22	End Values as of 6/30/22
Market Value	49,868,043	74,667,194
Accrued Interest	108,999	153,793
Total Market Value	**49,977,042**	**74,820,987**
Income Earned	41,109	59,290
Cont/WD		
Par	44,619,619	69,659,087
Book Value	50,730,960	75,745,455
Cost Value	50,857,772	75,880,409

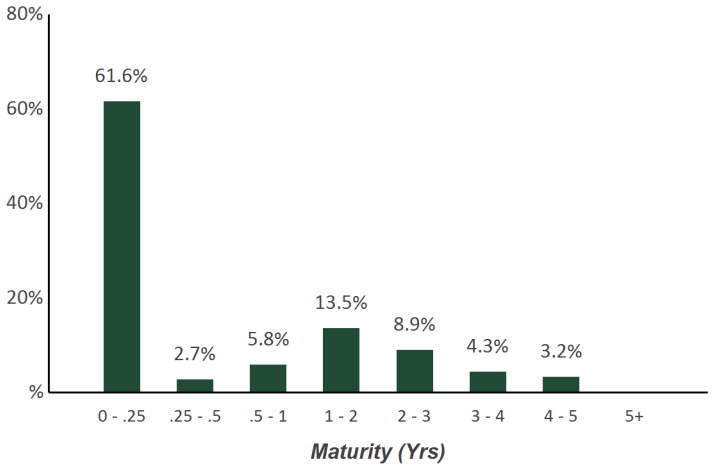
TOP ISSUERS

Local Agency Investment Fund	50.4%
Government of United States	20.1%
CalTrust	8.6%
Federal Home Loan Mortgage Corp	2.9%
Federal National Mortgage Assoc	1.5%
Federal Farm Credit Bank	1.5%
Federal Home Loan Bank	1.2%
Bank of Nova Scotia Houston	0.8%
Total	**87.1%**

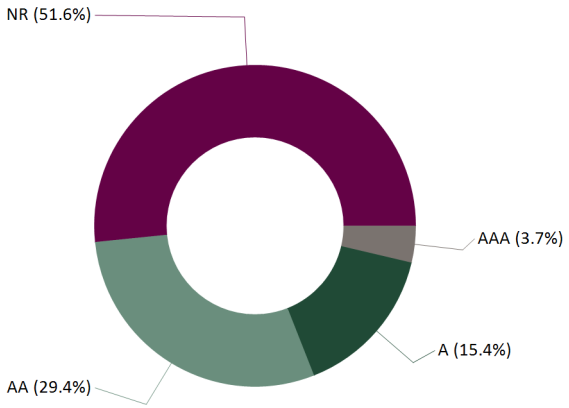
SECTOR ALLOCATION



MATURITY DISTRIBUTION



CREDIT QUALITY (S&P)



Holdings Report

As of June 30, 2022

CUSIP	Security Description	Par Value/Units	Purchase Date Book Yield	Cost Value Book Value	Mkt Price Mkt YTM	Market Value Accrued Int.	% of Port. Gain/Loss	Moody/S&P Fitch	Maturity Duration
ABS									
43815NAC8	Honda Auto Receivables Trust 2019-3 A3 1.78% Due 8/15/2023	23,155.21	08/20/2019 1.79%	23,155.02 23,155.20	99.90 2.37%	23,132.56 18.32	0.03% (22.64)	Aaa / AAA NR	1.13 0.17
92348AAA3	Verizon Owner Trust 2019-C A1A 1.94% Due 4/22/2024	26,992.56	10/01/2019 1.95%	26,990.47 26,991.73	99.88 2.40%	26,960.60 16.00	0.04% (31.13)	NR / AAA AAA	1.81 0.26
89232HAC9	Toyota Auto Receivable Own 2020-A A3 1.66% Due 5/15/2024	103,897.34	07/06/2020 0.70%	106,186.32 105,010.11	99.56 2.91%	103,441.54 76.65	0.14% (1,568.57)	Aaa / AAA NR	1.88 0.35
65479JAD5	Nissan Auto Receivables Owner 2019-C A3 1.93% Due 7/15/2024	41,197.02	10/16/2019 1.94%	41,194.85 41,196.08	99.70 2.98%	41,074.05 35.34	0.05% (122.03)	Aaa / AAA NR	2.04 0.29
43813KAC6	Honda Auto Receivables Trust 2020-3 A3 0.37% Due 10/18/2024	70,985.20	09/22/2020 0.38%	70,974.77 70,980.60	98.19 3.38%	69,699.66 9.48	0.09% (1,280.94)	NR / AAA AAA	2.30 0.60
58769KAD6	Mercedes-Benz Auto Lease Trust 2021-B A3 0.4% Due 11/15/2024	80,000.00	06/22/2021 0.40%	79,993.96 79,996.34	96.81 3.55%	77,449.84 14.22	0.10% (2,546.50)	NR / AAA AAA	2.38 1.02
09690AAC7	BMW Vehicle Lease Trust 2021-2 A3 0.33% Due 12/26/2024	50,000.00	09/08/2021 0.34%	49,994.84 49,996.63	97.07 3.49%	48,534.65 2.75	0.06% (1,461.98)	Aaa / NR AAA	2.49 0.93
89236XAC0	Toyota Auto Receivables 2020-D A3 0.35% Due 1/15/2025	57,111.58	10/06/2020 0.36%	57,100.95 57,105.23	98.50 3.19%	56,256.05 8.88	0.08% (849.18)	NR / AAA AAA	2.55 0.53
92290BAA9	Verizon Owner Trust 2020-B A 0.47% Due 2/20/2025	120,000.00	08/04/2020 0.48%	119,974.80 119,985.29	98.43 3.17%	118,111.92 17.23	0.16% (1,873.37)	Aaa / NR AAA	2.65 0.58
05601XAC3	BMW Vehicle Lease Trust 2022-1 A3 1.1% Due 3/25/2025	85,000.00	01/11/2022 1.11%	84,987.29 84,989.89	96.55 3.84%	82,067.08 15.58	0.11% (2,922.81)	NR / AAA AAA	2.74 1.27
43813GAC5	Honda Auto Receivables Trust 2021-1 A3 0.27% Due 4/21/2025	80,000.00	02/17/2021 0.27%	79,998.54 79,999.18	97.62 3.54%	78,098.80 6.00	0.10% (1,900.38)	Aaa / NR AAA	2.81 0.73
47788UAC6	John Deere Owner Trust 2021-A A3 0.36% Due 9/15/2025	60,000.00	03/02/2021 0.37%	59,988.47 59,992.66	96.15 3.93%	57,690.48 9.60	0.08% (2,302.18)	Aaa / NR AAA	3.21 1.08
43815GAC3	Honda Auto Receivables Trust 2021-4 A3 0.88% Due 1/21/2026	85,000.00	11/16/2021 0.89%	84,982.08 84,985.39	95.37 3.78%	81,067.31 20.78	0.11% (3,918.08)	Aaa / NR AAA	3.56 1.62
47789QAC4	John Deere Owner Trust 2021-B A3 0.52% Due 3/16/2026	70,000.00	07/13/2021 0.52%	69,993.76 69,995.38	94.89 3.90%	66,425.31 16.18	0.09% (3,570.07)	Aaa / NR AAA	3.71 1.53

Holdings Report

As of June 30, 2022

CUSIP	Security Description	Par Value/Units	Purchase Date Book Yield	Cost Value Book Value	Mkt Price Mkt YTM	Market Value Accrued Int.	% of Port. Gain/Loss	Moody/S&P Fitch	Maturity Duration
ABS									
89238JAC9	Toyota Auto Receivables Trust 2021-D A3 0.71% Due 4/15/2026	65,000.00	11/09/2021 0.71%	64,998.62 64,998.88	95.28 3.79%	61,933.50 20.51	0.08% (3,065.38)	NR / AAA AAA	3.79 1.56
43815BAC4	Honda Auto Receivables Trust 2022-1 A3 1.88% Due 5/15/2026	165,000.00	02/15/2022 1.89%	164,975.18 164,977.88	96.81 3.55%	159,731.22 137.87	0.21% (5,246.66)	Aaa / AAA NR	3.88 1.94
89238FAD5	Toyota Auto Receivables OT 2022-B A3 2.93% Due 9/15/2026	115,000.00	04/07/2022 2.95%	114,997.31 114,997.49	98.78 3.57%	113,602.19 149.76	0.15% (1,395.30)	Aaa / AAA NR	4.21 1.95
47787JAC2	John Deere Owner Trust 2022-A A3 2.32% Due 9/16/2026	130,000.00	03/10/2022 2.34%	129,971.24 129,973.65	97.45 3.74%	126,688.77 134.04	0.17% (3,284.88)	Aaa / NR AAA	4.22 1.82
02582JJT8	American Express Credit Trust 2022-2 A 3.39% Due 5/17/2027	185,000.00	05/17/2022 3.42%	184,959.08 184,960.51	99.89 3.46%	184,787.44 278.73	0.25% (173.07)	NR / AAA AAA	4.88 2.68
Total ABS		**1,613,338.91**	**1.42%**	**1,615,417.55 1,614,288.12**	**3.48%**	**1,576,752.97 987.92**	**2.11% (37,535.15)**	**Aaa / AAA AAA**	**3.30 1.35**
AGENCY									
3137EAET2	FHLMC Note 0.125% Due 7/25/2022	170,000.00	07/21/2020 0.24%	169,615.80 169,987.40	99.91 1.40%	169,849.38 92.08	0.23% (138.02)	Aaa / AA+ AAA	0.07 0.07
3130ADRG9	FHLB Note 2.75% Due 3/10/2023	350,000.00	04/11/2019 2.34%	355,330.50 350,940.68	100.12 2.57%	350,428.05 2,967.71	0.47% (512.63)	Aaa / AA+ NR	0.69 0.68
3137EAER6	FHLMC Note 0.375% Due 5/5/2023	305,000.00	05/05/2020 0.39%	304,871.90 304,963.90	97.91 2.89%	298,615.13 177.92	0.40% (6,348.77)	Aaa / AA+ AAA	0.85 0.83
3135G04Q3	FNMA Note 0.25% Due 5/22/2023	245,000.00	05/20/2020 0.35%	244,262.55 244,781.12	97.72 2.84%	239,426.01 66.35	0.32% (5,355.11)	Aaa / AA+ AAA	0.89 0.88
3137EAES4	FHLMC Note 0.25% Due 6/26/2023	300,000.00	06/24/2020 0.35%	299,124.00 299,712.00	97.33 3.01%	291,991.80 10.42	0.39% (7,720.20)	Aaa / AA+ AAA	0.99 0.97
3135G05G4	FNMA Note 0.25% Due 7/10/2023	250,000.00	07/08/2020 0.32%	249,462.50 249,816.42	97.35 2.88%	243,379.75 296.88	0.33% (6,436.67)	Aaa / AA+ AAA	1.03 1.01
3137EAEV7	FHLMC Note 0.25% Due 8/24/2023	300,000.00	08/19/2020 0.28%	299,694.00 299,883.23	97.03 2.90%	291,084.00 264.58	0.39% (8,799.23)	Aaa / AA+ AAA	1.15 1.13
3137EAEW5	FHLMC Note 0.25% Due 9/8/2023	300,000.00	09/11/2020 0.24%	300,093.00 300,037.06	96.95 2.88%	290,857.20 235.42	0.39% (9,179.86)	Aaa / AA+ AAA	1.19 1.17

Holdings Report

As of June 30, 2022

CUSIP	Security Description	Par Value/Units	Purchase Date Book Yield	Cost Value Book Value	Mkt Price Mkt YTM	Market Value Accrued Int.	% of Port. Gain/Loss	Moody/S&P Fitch	Maturity Duration
AGENCY									
3135G0U43	FNMA Note 2.875% Due 9/12/2023	350,000.00	09/25/2019 1.63%	366,702.00 355,055.62	100.04 2.84%	350,142.45 3,046.70	0.47% (4,913.17)	Aaa / AA+ AAA	1.20 1.16
3137EAEY1	FHLMC Note 0.125% Due 10/16/2023	225,000.00	10/14/2020 0.25%	224,160.75 224,638.24	96.51 2.89%	217,145.93 58.59	0.29% (7,492.31)	Aaa / AA+ AAA	1.30 1.28
3137EAEZ8	FHLMC Note 0.25% Due 11/6/2023	335,000.00	11/03/2020 0.28%	334,698.50 334,864.38	96.52 2.90%	323,339.66 127.95	0.43% (11,524.72)	Aaa / AA+ AAA	1.35 1.33
3130A0F70	FHLB Note 3.375% Due 12/8/2023	350,000.00	10/30/2019 1.72%	372,781.50 357,978.84	100.57 2.97%	351,987.30 754.69	0.47% (5,991.54)	Aaa / AA+ AAA	1.44 1.39
3130A1XJ2	FHLB Note 2.875% Due 6/14/2024	155,000.00	03/24/2020 0.99%	167,010.95 160,561.49	99.72 3.02%	154,567.71 210.43	0.21% (5,993.78)	Aaa / AA+ NR	1.96 1.88
3133ENKS8	FFCB Note 1.125% Due 1/6/2025	750,000.00	Various 1.60%	740,054.10 741,323.68	95.54 2.98%	716,561.25 3,984.38	0.96% (24,762.43)	Aaa / AA+ AAA	2.52 2.44
3133ENPG9	FFCB Note 1.75% Due 2/14/2025	415,000.00	02/10/2022 1.84%	413,891.95 414,029.57	96.80 3.03%	401,726.23 2,743.61	0.54% (12,303.34)	Aaa / AA+ AAA	2.63 2.52
3135G06G3	FNMA Note 0.5% Due 11/7/2025	350,000.00	11/18/2020 0.52%	349,639.50 349,756.55	91.91 3.06%	321,686.05 262.50	0.43% (28,070.50)	Aaa / AA+ AAA	3.36 3.28
Total Agency		**5,150,000.00**	**0.98%**	**5,191,393.50 5,158,330.18**	**2.86%**	**5,012,787.90 15,300.21**	**6.72% (145,542.28)**	**Aaa / AA+ AAA**	**1.56 1.52**
CMO									
3137BM6P6	FHLMC K721 A2 3.09% Due 8/25/2022	18,531.80	06/26/2019 2.09%	19,039.98 18,556.02	99.95 1.93%	18,522.35 47.72	0.02% (33.67)	Aaa / NR NR	0.15 0.13
3137B4GY6	FHLMC K032 A2 3.31% Due 5/25/2023	275,000.00	07/23/2019 2.21%	285,881.84 277,551.28	99.88 3.21%	274,674.68 151.71	0.37% (2,876.60)	NR / NR AAA	0.90 0.82
Total CMO		**293,531.80**	**2.20%**	**304,921.82 296,107.30**	**3.13%**	**293,197.03 199.43**	**0.39% (2,910.27)**	**Aaa / NR AAA**	**0.85 0.77**
CORPORATE									
24422ETV1	John Deere Capital Corp Note 2.15% Due 9/8/2022	305,000.00	04/17/2019 2.78%	298,851.20 304,656.46	99.98 2.26%	304,925.89 2,058.33	0.41% 269.43	A2 / A A	0.19 0.19
89236TEL5	Toyota Motor Credit Corp Note 2.7% Due 1/11/2023	200,000.00	04/25/2019 2.72%	199,856.00 199,979.35	99.69 3.29%	199,384.60 2,550.00	0.27% (594.75)	A1 / A+ A+	0.53 0.52

Holdings Report

As of June 30, 2022

CUSIP	Security Description	Par Value/Units	Purchase Date Book Yield	Cost Value Book Value	Mkt Price Mkt YTM	Market Value Accrued Int.	% of Port. Gain/Loss	Moody/S&P Fitch	Maturity Duration
CORPORATE									
037833DE7	Apple Inc Callable Note Cont 12/13/2022 2.4% Due 1/13/2023	200,000.00	11/21/2019 1.83%	203,350.00 200,496.18	99.98 2.44%	199,953.40 2,240.00	0.27% (542.78)	Aaa / AA+ NR	0.54 0.52
747525AR4	Qualcomm Inc Callable Note Cont 12/30/2022 2.6% Due 1/30/2023	500,000.00	Various 0.63%	512,557.50 504,892.40	99.82 2.91%	499,100.51 5,452.78	0.67% (5,791.89)	A2 / A NR	0.59 0.57
037833AK6	Apple Inc Note 2.4% Due 5/3/2023	200,000.00	03/11/2019 2.79%	196,968.00 199,386.38	99.53 2.97%	199,060.80 773.33	0.27% (325.58)	Aaa / AA+ NR	0.84 0.82
90331HNV1	US Bank NA Callable Note Cont 6/23/2023 3.4% Due 7/24/2023	250,000.00	05/17/2019 2.70%	256,695.00 251,599.81	99.93 3.46%	249,828.50 3,706.94	0.34% (1,771.31)	A1 / AA- AA-	1.07 1.02
06406FAD5	Bank of NY Mellon Corp Callable Note Cont 6/16/2023 2.2% Due 8/16/2023	200,000.00	04/11/2019 2.90%	194,298.00 198,520.50	98.99 3.11%	197,985.40 1,650.00	0.27% (535.10)	A1 / A AA-	1.13 1.09
594918BX1	Microsoft Callable Note Cont 12/6/2023 2.875% Due 2/6/2024	200,000.00	03/05/2020 1.06%	213,320.00 205,096.09	99.75 3.04%	199,497.20 2,315.97	0.27% (5,598.89)	Aaa / AAA AAA	1.61 1.53
89114QCB2	Toronto Dominion Bank Note 3.25% Due 3/11/2024	500,000.00	Various 1.52%	523,124.00 514,230.70	99.50 3.56%	497,479.00 4,965.28	0.67% (16,751.70)	A1 / A AA-	1.70 1.62
808513BN4	Charles Schwab Corp Callable Note Cont 2/18/2024 0.75% Due 3/18/2024	245,000.00	Various 0.58%	246,097.00 245,658.19	95.98 3.17%	235,154.43 525.73	0.31% (10,503.76)	A2 / A A	1.72 1.68
023135BW5	Amazon.com Inc Note 0.45% Due 5/12/2024	130,000.00	05/10/2021 0.50%	129,810.20 129,882.07	95.16 3.14%	123,703.97 79.63	0.17% (6,178.10)	A1 / AA AA-	1.87 1.83
91324PEB4	United Health Group Inc Callable Note Cont 5/15/2022 0.55% Due 5/15/2024	500,000.00	11/24/2021 1.07%	493,760.00 495,247.04	95.26 3.17%	476,303.50 351.39	0.64% (18,943.54)	A3 / A+ A	1.88 1.84
14913R2L0	Caterpillar Financial Service Note 0.45% Due 5/17/2024	500,000.00	Various 0.66%	497,344.65 498,075.78	94.79 3.33%	473,974.00 275.00	0.63% (24,101.78)	A2 / A A	1.88 1.84
89236TJH9	Toyota Motor Credit Corp Note 0.5% Due 6/18/2024	300,000.00	12/06/2021 1.07%	295,710.00 296,662.82	94.47 3.43%	283,422.00 54.17	0.38% (13,240.82)	A1 / A+ A+	1.97 1.93
79466LAG9	Salesforce.com Inc Callable Note Cont 7/15/2022 0.625% Due 7/15/2024	35,000.00	06/29/2021 0.64%	34,982.15 34,987.90	94.71 3.33%	33,148.99 100.87	0.04% (1,838.91)	A2 / A+ NR	2.04 1.99
69371RR40	Paccar Financial Corp Note 0.5% Due 8/9/2024	80,000.00	08/03/2021 0.52%	79,956.80 79,969.65	94.15 3.40%	75,323.68 157.78	0.10% (4,645.97)	A1 / A+ NR	2.11 2.06

Holdings Report

As of June 30, 2022

CUSIP	Security Description	Par Value/Units	Purchase Date Book Yield	Cost Value Book Value	Mkt Price Mkt YTM	Market Value Accrued Int.	% of Port. Gain/Loss	Moody/S&P Fitch	Maturity Duration
CORPORATE									
78015K7C2	Royal Bank of Canada Note 2.25% Due 11/1/2024	500,000.00	Various 0.88%	524,067.75 515,762.10	96.62 3.78%	483,081.00 1,875.00	0.65% (32,681.10)	A1 / A AA-	2.34 2.24
69371RR57	Paccar Financial Corp Note 0.9% Due 11/8/2024	175,000.00	11/02/2021 0.90%	174,989.50 174,991.75	94.49 3.35%	165,356.98 231.88	0.22% (9,634.77)	A1 / A+ NR	2.36 2.29
46647PAH9	JP Morgan Chase & Co Callable Note 2X 3/1/2024 3.22% Due 3/1/2025	500,000.00	Various 1.01%	531,052.10 518,090.44	98.28 4.00%	491,409.50 5,366.67	0.66% (26,680.94)	A2 / A- AA-	2.67 2.50
24422EWB1	John Deere Capital Corp Note 2.125% Due 3/7/2025	130,000.00	03/02/2022 2.14%	129,944.10 129,950.02	96.60 3.46%	125,579.87 874.79	0.17% (4,370.15)	A2 / A A	2.69 2.56
06406RBC0	Bank of NY Mellon Corp Callable Note Cont 3/25/2025 3.35% Due 4/25/2025	280,000.00	04/19/2022 3.35%	279,960.80 279,963.16	98.96 3.74%	277,085.76 1,693.61	0.37% (2,877.40)	A1 / A AA-	2.82 2.65
63743HFE7	National Rural Utilities Note 3.45% Due 6/15/2025	95,000.00	04/27/2022 3.46%	94,974.35 94,975.66	99.64 3.58%	94,659.33 518.94	0.13% (316.33)	A2 / A- A	2.96 2.77
857477BR3	State Street Bank Callable Note Cont 2/6/2025 1.746% Due 2/6/2026	90,000.00	02/02/2022 1.75%	90,000.00 90,000.00	94.48 3.82%	85,034.70 628.56	0.11% (4,965.30)	A1 / A AA-	3.61 3.40
931142ER0	Wal-Mart Stores Callable Note Cont 08/17/2026 1.05% Due 9/17/2026	40,000.00	09/08/2021 1.09%	39,924.40 39,936.28	91.05 3.34%	36,421.88 121.33	0.05% (3,514.40)	Aa2 / AA AA	4.22 4.05
Total Corporate		**6,155,000.00**	**1.49%**	**6,241,593.50 6,203,010.73**	**3.31%**	**6,006,874.89 38,567.98**	**8.08% (196,135.84)**	**A1 / A+ A+**	**1.71 1.64**
LAIF									
90LAIF$00	Local Agency Investment Fund State Pool	37,706,904.21	Various 0.94%	37,706,904.21 37,706,904.21	1.00 0.94%	37,706,904.21 36,236.18	50.44% 0.00	NR / NR NR	0.00 0.00
Total LAIF		**37,706,904.21**	**0.94%**	**37,706,904.21 37,706,904.21**	**0.94%**	**37,706,904.21 36,236.18**	**50.44% 0.00**	**NR / NR NR**	**0.00 0.00**

Holdings Report

As of June 30, 2022

CUSIP	Security Description	Par Value/Units	Purchase Date Book Yield	Cost Value Book Value	Mkt Price Mkt YTM	Market Value Accrued Int.	% of Port. Gain/Loss	Moody/S&P Fitch	Maturity Duration
LOCAL GOV INVESTMENT POOL									
09CATR$05	CalTrust Medium Term Fund	655,780.72	Various 2.47%	6,596,701.43 6,596,701.43	9.85 2.47%	6,459,440.07 0.00	8.63% (137,261.36)	NR / A+ NR	0.00 0.00
Total Local Gov Investment Pool		**655,780.72**	**2.47%**	**6,596,701.43** **6,596,701.43**	**2.47%**	**6,459,440.07** **0.00**	**8.63%** **(137,261.36)**	**NR / A+** **NR**	**0.00** **0.00**
MONEY MARKET FUND									
31846V203	First American Govt Obligation Fund Class Y	259,531.58	Various 0.97%	259,531.58 259,531.58	1.00 0.97%	259,531.58 0.00	0.35% 0.00	Aaa / AAA AAA	0.00 0.00
Total Money Market Fund		**259,531.58**	**0.97%**	**259,531.58** **259,531.58**	**0.97%**	**259,531.58** **0.00**	**0.35%** **0.00**	**Aaa / AAA** **AAA**	**0.00** **0.00**
NEGOTIABLE CD									
06417MQY4	Bank of Nova Scotia Houston Yankee CD 0.19% Due 7/28/2022	600,000.00	11/18/2021 0.26%	599,707.04 599,968.49	99.89 1.66%	599,311.80 1,070.33	0.80% (656.69)	P-1 / A-1 F-1+	0.08 0.08
86959RSN1	Svenska Handelsbanken NY Yankee CD 0.2% Due 8/23/2022	500,000.00	10/27/2021 0.27%	499,708.60 499,948.52	99.75 1.87%	498,751.50 866.67	0.67% (1,197.02)	P-1 / A-1+ F-1+	0.15 0.15
55380TXW5	MUFG Bank Yankee CD 0.3% Due 10/25/2022	500,000.00	10/27/2021 0.32%	499,899.59 499,967.82	99.34 2.36%	496,676.00 1,079.17	0.67% (3,291.82)	P-1 / A-1 F-1	0.32 0.32
Total Negotiable CD		**1,600,000.00**	**0.28%**	**1,599,315.23** **1,599,884.83**	**1.94%**	**1,594,739.30** **3,016.17**	**2.14%** **(5,145.53)**	**Aaa / AA+** **AAA**	**0.17** **0.17**
SUPRANATIONAL									
459058JM6	Intl. Bank Recon & Development Note 0.25% Due 11/24/2023	165,000.00	11/17/2020 0.32%	164,645.25 164,834.45	96.44 2.86%	159,124.68 42.40	0.21% (5,709.77)	Aaa / AAA AAA	1.40 1.38
459058GQ0	Intl. Bank Recon & Development Note 2.5% Due 3/19/2024	225,000.00	01/26/2021 0.26%	240,736.50 233,609.76	99.21 2.98%	223,211.25 1,593.75	0.30% (10,398.51)	Aaa / AAA AAA	1.72 1.66
4581X0DZ8	Inter-American Dev Bank Note 0.5% Due 9/23/2024	260,000.00	09/15/2021 0.52%	259,807.60 259,856.93	94.58 3.03%	245,897.60 353.89	0.33% (13,959.33)	Aaa / AAA NR	2.24 2.18

Holdings Report

As of June 30, 2022

CUSIP	Security Description	Par Value/Units	Purchase Date Book Yield	Cost Value Book Value	Mkt Price Mkt YTM	Market Value Accrued Int.	% of Port. Gain/Loss	Moody/S&P Fitch	Maturity Duration
SUPRANATIONAL									
45950KCR9	International Finance Corp Note 1.375% Due 10/16/2024	160,000.00	07/12/2021 0.54%	164,304.00 163,030.88	96.33 3.04%	154,132.48 458.33	0.21% (8,898.40)	Aaa / AAA NR	2.30 2.23
Total Supranational		**810,000.00**	**0.41%**	**829,493.35** **821,332.02**	**2.98%**	**782,366.01** **2,448.37**	**1.05%** **(38,966.01)**	**Aaa / AAA** **AAA**	**1.93** **1.88**
US TREASURY									
912828M80	US Treasury Note 2% Due 11/30/2022	750,000.00	Various 0.75%	761,879.29 753,886.75	99.85 2.35%	748,887.00 1,270.50	1.00% (4,999.75)	Aaa / AA+ AAA	0.42 0.41
912828YW4	US Treasury Note 1.625% Due 12/15/2022	750,000.00	02/15/2022 1.00%	753,837.89 752,122.28	99.64 2.41%	747,333.75 532.79	1.00% (4,788.53)	Aaa / AA+ AAA	0.46 0.45
912828ZD5	US Treasury Note 0.5% Due 3/15/2023	325,000.00	12/28/2021 0.47%	325,101.56 325,059.19	98.45 2.72%	319,959.90 476.90	0.43% (5,099.29)	Aaa / AA+ AAA	0.71 0.70
912828VB3	US Treasury Note 1.75% Due 5/15/2023	750,000.00	Various 0.79%	761,337.89 756,222.22	99.02 2.89%	742,675.50 1,676.29	0.99% (13,546.72)	Aaa / AA+ AAA	0.87 0.86
912828ZU7	US Treasury Note 0.25% Due 6/15/2023	750,000.00	02/15/2022 1.36%	739,130.86 742,162.54	97.50 2.92%	731,220.75 81.97	0.98% (10,941.79)	Aaa / AA+ AAA	0.96 0.94
912828T26	US Treasury Note 1.375% Due 9/30/2023	750,000.00	Various 1.05%	750,579.29 753,086.39	98.11 2.92%	735,849.75 2,592.22	0.99% (17,236.64)	Aaa / AA+ AAA	1.25 1.22
912828V80	US Treasury Note 2.25% Due 1/31/2024	750,000.00	Various 0.83%	776,144.53 766,620.79	98.94 2.94%	742,031.25 7,039.02	1.00% (24,589.54)	Aaa / AA+ AAA	1.59 1.53
912828B66	US Treasury Note 2.75% Due 2/15/2024	750,000.00	02/15/2022 1.58%	767,255.86 764,060.33	99.72 2.93%	747,891.00 7,748.62	1.01% (16,169.33)	Aaa / AA+ AAA	1.63 1.56
912828W71	US Treasury Note 2.125% Due 3/31/2024	750,000.00	Various 0.67%	775,839.84 768,950.44	98.60 2.95%	739,512.00 4,006.15	0.99% (29,438.44)	Aaa / AA+ AAA	1.75 1.69
91282CBV2	US Treasury Note 0.375% Due 4/15/2024	500,000.00	Various 0.37%	500,162.11 500,083.57	95.54 2.95%	477,695.50 394.47	0.64% (22,388.07)	Aaa / AA+ AAA	1.79 1.76
912828WJ5	US Treasury Note 2.5% Due 5/15/2024	750,000.00	Various 1.10%	779,783.21 769,239.83	99.18 2.95%	743,877.00 2,394.70	1.00% (25,362.83)	Aaa / AA+ AAA	1.88 1.81
91282CCG4	US Treasury Note 0.25% Due 6/15/2024	400,000.00	06/17/2021 0.43%	397,890.63 398,620.13	94.91 2.94%	379,640.80 43.72	0.51% (18,979.33)	Aaa / AA+ AAA	1.96 1.93

Holdings Report

As of June 30, 2022

CUSIP	Security Description	Par Value/Units	Purchase Date Book Yield	Cost Value Book Value	Mkt Price Mkt YTM	Market Value Accrued Int.	% of Port. Gain/Loss	Moody/S&P Fitch	Maturity Duration
US TREASURY									
912828Y87	US Treasury Note 1.75% Due 7/31/2024	300,000.00	01/31/2020 1.35%	305,203.13 302,409.97	97.57 2.96%	292,722.60 2,189.92	0.39% (9,687.37)	Aaa / AA+ AAA	2.09 2.01
91282CCT6	US Treasury Note 0.375% Due 8/15/2024	400,000.00	08/25/2021 0.45%	399,109.38 399,363.02	94.68 2.97%	378,734.40 563.54	0.51% (20,628.62)	Aaa / AA+ AAA	2.13 2.09
91282CDH1	US Treasury Note 0.75% Due 11/15/2024	750,000.00	11/18/2021 0.83%	748,125.00 748,509.62	94.90 2.99%	711,738.00 718.41	0.95% (36,771.62)	Aaa / AA+ AAA	2.38 2.32
912828Z52	US Treasury Note 1.375% Due 1/31/2025	750,000.00	02/17/2022 1.71%	742,822.27 743,707.83	96.00 2.99%	720,000.00 4,301.62	0.97% (23,707.83)	Aaa / AA+ AAA	2.59 2.50
912828ZF0	US Treasury Note 0.5% Due 3/31/2025	350,000.00	03/25/2021 0.58%	348,906.26 349,249.41	93.43 3.01%	326,990.30 439.89	0.44% (22,259.11)	Aaa / AA+ AAA	2.75 2.69
912828ZT0	US Treasury Note 0.25% Due 5/31/2025	365,000.00	02/25/2021 0.60%	359,653.32 361,338.13	92.38 3.00%	337,182.99 77.29	0.45% (24,155.14)	Aaa / AA+ AAA	2.92 2.87
9128284Z0	US Treasury Note 2.75% Due 8/31/2025	750,000.00	Various 0.98%	800,092.78 791,125.85	99.21 3.01%	744,081.76 6,893.69	1.00% (47,044.09)	Aaa / AA+ AAA	3.17 2.98
91282CAZ4	US Treasury Note 0.375% Due 11/30/2025	750,000.00	Various 0.88%	734,730.47 737,339.79	91.44 3.03%	685,810.50 238.21	0.92% (51,529.29)	Aaa / AA+ AAA	3.42 3.35
9128286L9	US Treasury Note 2.25% Due 3/31/2026	750,000.00	02/25/2022 1.91%	760,078.13 759,247.29	97.28 3.02%	729,609.00 4,241.80	0.98% (29,638.29)	Aaa / AA+ AAA	3.75 3.54
912828R36	US Treasury Note 1.625% Due 5/15/2026	250,000.00	10/14/2021 0.99%	257,148.44 256,041.78	94.89 3.03%	237,216.75 518.85	0.32% (18,825.03)	Aaa / AA+ AAA	3.88 3.70
912828YG9	US Treasury Note 1.625% Due 9/30/2026	300,000.00	12/28/2021 1.24%	305,296.88 304,735.46	94.46 3.02%	283,382.70 1,225.41	0.38% (21,352.76)	Aaa / AA+ AAA	4.25 4.04
912828U24	US Treasury Note 2% Due 11/15/2026	625,000.00	03/29/2022 2.56%	609,912.11 610,741.90	95.74 3.05%	598,388.75 1,596.47	0.80% (12,353.15)	Aaa / AA+ AAA	4.38 4.13
91282CEF4	US Treasury Note 2.5% Due 3/31/2027	750,000.00	Various 2.90%	736,449.21 736,642.27	97.71 3.02%	732,831.75 4,713.11	0.99% (3,810.52)	Aaa / AA+ AAA	4.75 4.41
912828X88	US Treasury Note 2.375% Due 5/15/2027	350,000.00	06/09/2022 3.09%	338,666.02 338,798.25	96.95 3.05%	339,335.85 1,061.65	0.45% 537.60	Aaa / AA+ AAA	4.88 4.54
Total US Treasury		**15,415,000.00**	**1.20%**	**15,535,136.36 15,489,365.03**	**2.91%**	**14,974,599.55 57,037.21**	**20.09% (514,765.48)**	**Aaa / AA+ AAA**	**2.27 2.18**

Holdings Report

As of June 30, 2022

CUSIP	Security Description	Par Value/Units	Purchase Date Book Yield	Cost Value Book Value	Mkt Price Mkt YTM	Market Value Accrued Int.	% of Port. Gain/Loss	Moody/S&P Fitch	Maturity Duration
				75,880,408.53		74,667,193.51	100.00%	Aa1 / AA	0.80
TOTAL PORTFOLIO		69,659,087.22	1.17%	75,745,455.43	1.89%	153,793.47	(1,078,261.92)	AAA	0.73
TOTAL MARKET VALUE PLUS ACCRUED						74,820,986.98			

Transaction Ledger

As of June 30, 2022

Transaction Type	Settlement Date	CUSIP	Quantity	Security Description	Price	Acq/Disp Yield	Amount	Interest Pur/Sold	Total Amount	Gain/Loss
ACQUISITIONS										
Purchase	06/01/2022	31846V203	202.52	First American Govt Obligation Fund Class Y	1.000	0.35%	202.52	0.00	202.52	0.00
Purchase	06/08/2022	31846V203	6,343.75	First American Govt Obligation Fund Class Y	1.000	0.35%	6,343.75	0.00	6,343.75	0.00
Purchase	06/08/2022	31846V203	350,000.00	First American Govt Obligation Fund Class Y	1.000	0.35%	350,000.00	0.00	350,000.00	0.00
Purchase	06/10/2022	912828X88	350,000.00	US Treasury Note 2.375% Due 5/15/2027	96.762	3.09%	338,666.02	587.30	339,253.32	0.00
Purchase	06/10/2022	91282CEF4	400,000.00	US Treasury Note 2.5% Due 3/31/2027	97.535	3.05%	390,140.62	1,939.89	392,080.51	0.00
Purchase	06/14/2022	31846V203	2,228.13	First American Govt Obligation Fund Class Y	1.000	0.35%	2,228.13	0.00	2,228.13	0.00
Purchase	06/15/2022	31846V203	7,531.25	First American Govt Obligation Fund Class Y	1.000	0.35%	7,531.25	0.00	7,531.25	0.00
Purchase	06/15/2022	31846V203	5,480.68	First American Govt Obligation Fund Class Y	1.000	0.35%	5,480.68	0.00	5,480.68	0.00
Purchase	06/15/2022	31846V203	12,215.19	First American Govt Obligation Fund Class Y	1.000	0.35%	12,215.19	0.00	12,215.19	0.00
Purchase	06/15/2022	31846V203	4,561.71	First American Govt Obligation Fund Class Y	1.000	0.35%	4,561.71	0.00	4,561.71	0.00
Purchase	06/15/2022	31846V203	5,465.44	First American Govt Obligation Fund Class Y	1.000	0.35%	5,465.44	0.00	5,465.44	0.00
Purchase	06/15/2022	31846V203	1,246.46	First American Govt Obligation Fund Class Y	1.000	0.35%	1,246.46	0.00	1,246.46	0.00
Purchase	06/15/2022	31846V203	26.67	First American Govt Obligation Fund Class Y	1.000	0.35%	26.67	0.00	26.67	0.00
Purchase	06/15/2022	31846V203	30.33	First American Govt Obligation Fund Class Y	1.000	0.35%	30.33	0.00	30.33	0.00
Purchase	06/15/2022	31846V203	18.00	First American Govt Obligation Fund Class Y	1.000	0.35%	18.00	0.00	18.00	0.00
Purchase	06/15/2022	31846V203	251.33	First American Govt Obligation Fund Class Y	1.000	0.35%	251.33	0.00	251.33	0.00

Transaction Ledger

As of June 30, 2022

Transaction Type	Settlement Date	CUSIP	Quantity	Security Description	Price	Acq/Disp Yield	Amount	Interest Pur/Sold	Total Amount	Gain/Loss
ACQUISITIONS										
Purchase	06/15/2022	31846V203	258.50	First American Govt Obligation Fund Class Y	1.000	0.35%	258.50	0.00	258.50	0.00
Purchase	06/15/2022	31846V203	365.84	First American Govt Obligation Fund Class Y	1.000	0.35%	365.84	0.00	365.84	0.00
Purchase	06/15/2022	31846V203	38.46	First American Govt Obligation Fund Class Y	1.000	0.35%	38.46	0.00	38.46	0.00
Purchase	06/15/2022	31846V203	280.79	First American Govt Obligation Fund Class Y	1.000	0.35%	280.79	0.00	280.79	0.00
Purchase	06/18/2022	31846V203	750.00	First American Govt Obligation Fund Class Y	1.000	0.35%	750.00	0.00	750.00	0.00
Purchase	06/21/2022	31846V203	18.00	First American Govt Obligation Fund Class Y	1.000	0.35%	18.00	0.00	18.00	0.00
Purchase	06/21/2022	31846V203	62.33	First American Govt Obligation Fund Class Y	1.000	0.35%	62.33	0.00	62.33	0.00
Purchase	06/21/2022	31846V203	47.00	First American Govt Obligation Fund Class Y	1.000	0.35%	47.00	0.00	47.00	0.00
Purchase	06/21/2022	31846V203	5,286.94	First American Govt Obligation Fund Class Y	1.000	0.35%	5,286.94	0.00	5,286.94	0.00
Purchase	06/21/2022	31846V203	5,115.69	First American Govt Obligation Fund Class Y	1.000	0.35%	5,115.69	0.00	5,115.69	0.00
Purchase	06/26/2022	31846V203	375.00	First American Govt Obligation Fund Class Y	1.000	0.35%	375.00	0.00	375.00	0.00
Purchase	06/27/2022	31846V203	35,312.48	First American Govt Obligation Fund Class Y	1.000	0.35%	35,312.48	0.00	35,312.48	0.00
Purchase	06/27/2022	31846V203	77.92	First American Govt Obligation Fund Class Y	1.000	0.35%	77.92	0.00	77.92	0.00
Purchase	06/27/2022	31846V203	13.75	First American Govt Obligation Fund Class Y	1.000	0.35%	13.75	0.00	13.75	0.00
Purchase	06/27/2022	31846V203	758.54	First American Govt Obligation Fund Class Y	1.000	0.35%	758.54	0.00	758.54	0.00
Purchase	06/30/2022	09CATR$05	611.16	CalTrust Medium Term Fund	9.850	2.47%	6,019.94	0.00	6,019.94	0.00
Subtotal			**1,194,973.86**				**1,179,189.28**	**2,527.19**	**1,181,716.47**	**0.00**

Transaction Ledger

As of June 30, 2022

Transaction Type	Settlement Date	CUSIP	Quantity	Security Description	Price	Acq/Disp Yield	Amount	Interest Pur/Sold	Total Amount	Gain/Loss
ACQUISITIONS										
Security Contribution	06/07/2022	90LAIF$00	25,000,000.00	Local Agency Investment Fund State Pool	1.000		25,000,000.00	0.00	25,000,000.00	0.00
Subtotal			**25,000,000.00**				**25,000,000.00**	**0.00**	**25,000,000.00**	**0.00**
TOTAL ACQUISITIONS			**26,194,973.86**				**26,179,189.28**	**2,527.19**	**26,181,716.47**	**0.00**
DISPOSITIONS										
Sale	06/10/2022	31846V203	731,333.83	First American Govt Obligation Fund Class Y	1.000	0.35%	731,333.83	0.00	731,333.83	0.00
Subtotal			**731,333.83**				**731,333.83**	**0.00**	**731,333.83**	**0.00**
Paydown	06/15/2022	02582JJT8	0.00	American Express Credit Trust 2022-2 A 3.39% Due 5/17/2027	100.000		0.00	365.84	365.84	0.00
Paydown	06/15/2022	43815BAC4	0.00	Honda Auto Receivables Trust 2022-1 A3 1.88% Due 5/15/2026	100.000		0.00	258.50	258.50	0.00
Paydown	06/15/2022	43815NAC8	5,423.05	Honda Auto Receivables Trust 2019-3 A3 1.78% Due 8/15/2023	100.000		5,423.05	42.39	5,465.44	0.00
Paydown	06/15/2022	47787JAC2	0.00	John Deere Owner Trust 2022-A A3 2.32% Due 9/16/2026	100.000		0.00	251.33	251.33	0.00
Paydown	06/15/2022	47788UAC6	0.00	John Deere Owner Trust 2021-A A3 0.36% Due 9/15/2025	100.000		0.00	18.00	18.00	0.00
Paydown	06/15/2022	47789JAD8	1,243.44	John Deere Owner Trust 2019-A A3 2.91% Due 7/17/2023	100.000		1,243.44	3.02	1,246.46	0.00
Paydown	06/15/2022	47789QAC4	0.00	John Deere Owner Trust 2021-B A3 0.52% Due 3/16/2026	100.000		0.00	30.33	30.33	0.00
Paydown	06/15/2022	58769KAD6	0.00	Mercedes-Benz Auto Lease Trust 2021-B A3 0.4% Due 11/15/2024	100.000		0.00	26.67	26.67	0.00

Transaction Ledger

As of June 30, 2022

Transaction Type	Settlement Date	CUSIP	Quantity	Security Description	Price	Acq/Disp Yield	Amount	Interest Pur/Sold	Total Amount	Gain/Loss
DISPOSITIONS										
Paydown	06/15/2022	65479JAD5	5,405.73	Nissan Auto Receivables Owner 2019-C A3 1.93% Due 7/15/2024	100.000		5,405.73	74.95	5,480.68	0.00
Paydown	06/15/2022	89232HAC9	12,054.79	Toyota Auto Receivable Own 2020-A A3 1.66% Due 5/15/2024	100.000		12,054.79	160.40	12,215.19	0.00
Paydown	06/15/2022	89236XAC0	4,543.73	Toyota Auto Receivables 2020-D A3 0.35% Due 1/15/2025	100.000		4,543.73	17.98	4,561.71	0.00
Paydown	06/15/2022	89238FAD5	0.00	Toyota Auto Receivables OT 2022-B A3 2.93% Due 9/15/2026	100.000		0.00	280.79	280.79	0.00
Paydown	06/15/2022	89238JAC9	0.00	Toyota Auto Receivables Trust 2021-D A3 0.71% Due 4/15/2026	100.000		0.00	38.46	38.46	0.00
Paydown	06/21/2022	43813GAC5	0.00	Honda Auto Receivables Trust 2021-1 A3 0.27% Due 4/21/2025	100.000		0.00	18.00	18.00	0.00
Paydown	06/21/2022	43813KAC6	5,263.43	Honda Auto Receivables Trust 2020-3 A3 0.37% Due 10/18/2024	100.000		5,263.43	23.51	5,286.94	0.00
Paydown	06/21/2022	43815GAC3	0.00	Honda Auto Receivables Trust 2021-4 A3 0.88% Due 1/21/2026	100.000		0.00	62.33	62.33	0.00
Paydown	06/21/2022	92290BAA9	0.00	Verizon Owner Trust 2020-B A 0.47% Due 2/20/2025	100.000		0.00	47.00	47.00	0.00
Paydown	06/21/2022	92348AAA3	5,063.87	Verizon Owner Trust 2019-C A1A 1.94% Due 4/22/2024	100.000		5,063.87	51.82	5,115.69	0.00
Paydown	06/27/2022	05601XAC3	0.00	BMW Vehicle Lease Trust 2022-1 A3 1.1% Due 3/25/2025	100.000		0.00	77.92	77.92	0.00
Paydown	06/27/2022	09690AAC7	0.00	BMW Vehicle Lease Trust 2021-2 A3 0.33% Due 12/26/2024	100.000		0.00	13.75	13.75	0.00
Paydown	06/27/2022	3137B4GY6	0.00	FHLMC K032 A2Due 5/25/2023	100.000		0.00	758.54	758.54	0.00
Paydown	06/27/2022	3137BM6P6	35,174.19	FHLMC K721 A2Due 8/25/2022	100.000		35,174.19	138.29	35,312.48	0.00
Subtotal			**74,172.23**				**74,172.23**	**2,759.82**	**76,932.05**	**0.00**

Transaction Ledger

As of June 30, 2022

Transaction Type	Settlement Date	CUSIP	Quantity	Security Description	Price	Acq/Disp Yield	Amount	Interest Pur/Sold	Total Amount	Gain/Loss
DISPOSITIONS										
Maturity	06/08/2022	3134GVJ66	350,000.00	FHLMC Note 0.25% Due 6/8/2022	100.000		350,000.00	0.00	350,000.00	0.00
Subtotal			**350,000.00**				**350,000.00**	**0.00**	**350,000.00**	**0.00**
TOTAL DISPOSITIONS			**1,155,506.06**				**1,155,506.06**	**2,759.82**	**1,158,265.88**	**0.00**
OTHER TRANSACTIONS										
Interest	06/08/2022	3130A0F70	350,000.00	FHLB Note 3.375% Due 12/8/2023	0.000		5,906.25	0.00	5,906.25	0.00
Interest	06/08/2022	3134GVJ66	350,000.00	FHLMC Note 0.25% Due 6/8/2022	0.000		437.50	0.00	437.50	0.00
Interest	06/14/2022	3130A1XJ2	155,000.00	FHLB Note 2.875% Due 6/14/2024	0.000		2,228.13	0.00	2,228.13	0.00
Interest	06/15/2022	912828YW4	750,000.00	US Treasury Note 1.625% Due 12/15/2022	0.000		6,093.75	0.00	6,093.75	0.00
Interest	06/15/2022	912828ZU7	750,000.00	US Treasury Note 0.25% Due 6/15/2023	0.000		937.50	0.00	937.50	0.00
Interest	06/15/2022	91282CCG4	400,000.00	US Treasury Note 0.25% Due 6/15/2024	0.000		500.00	0.00	500.00	0.00
Interest	06/18/2022	89236TJH9	300,000.00	Toyota Motor Credit Corp Note 0.5% Due 6/18/2024	0.000		750.00	0.00	750.00	0.00
Interest	06/26/2022	3137EAES4	300,000.00	FHLMC Note 0.25% Due 6/26/2023	0.000		375.00	0.00	375.00	0.00
Subtotal			**3,355,000.00**				**17,228.13**	**0.00**	**17,228.13**	**0.00**
Dividend	06/01/2022	31846V203	546,502.71	First American Govt Obligation Fund Class Y	0.000		202.52	0.00	202.52	0.00

Transaction Ledger

As of June 30, 2022

Transaction Type	Settlement Date	CUSIP	Quantity	Security Description	Price	Acq/Disp Yield	Amount	Interest Pur/Sold	Total Amount	Gain/Loss
OTHER TRANSACTIONS										
Dividend	06/30/2022	09CATR$05	655,169.56	CalTrust Medium Term Fund	0.000		6,019.94	0.00	6,019.94	0.00
Subtotal			**1,201,672.27**				**6,222.46**	**0.00**	**6,222.46**	**0.00**
TOTAL OTHER TRANSACTIONS			**4,556,672.27**				**23,450.59**	**0.00**	**23,450.59**	**0.00**

Income Earned

As of June 30, 2022

CUSIP	Security Description	Trade Date Settle Date Units	Book Value: Begin Book Value: Acq Book Value: Disp Book Value: End	Prior Accrued Inc. Received Ending Accrued Total Interest	Accr. Of Discount Amort. Of Premium Net Accret/Amort Income Earned	Total Income
FIXED INCOME						
023135BW5	Amazon.com Inc Note 0.45% Due 05/12/2024	05/10/2021 05/12/2021 130,000.00	129,876.87 0.00 0.00 129,882.07	30.88 0.00 79.63 48.75	5.20 0.00 5.20 53.95	53.95
02582JJT8	American Express Credit Trust 2022-2 A 3.39% Due 05/17/2027	05/17/2022 05/24/2022 185,000.00	184,959.38 0.00 0.00 184,960.51	121.95 365.84 278.73 522.62	1.13 0.00 1.13 523.75	523.75
037833AK6	Apple Inc Note 2.4% Due 05/03/2023	03/11/2019 03/13/2019 200,000.00	199,326.22 0.00 0.00 199,386.38	373.33 0.00 773.33 400.00	60.16 0.00 60.16 460.16	460.16
037833DE7	Apple Inc Callable Note Cont 12/13/2022 2.4% Due 01/13/2023	11/21/2019 11/25/2019 200,000.00	200,586.40 0.00 0.00 200,496.18	1,840.00 0.00 2,240.00 400.00	0.00 90.22 (90.22) 309.78	309.78
05601XAC3	BMW Vehicle Lease Trust 2022-1 A3 1.1% Due 03/25/2025	01/11/2022 01/19/2022 85,000.00	84,989.41 0.00 0.00 84,989.89	15.58 77.92 15.58 77.92	0.48 0.00 0.48 78.40	78.40
06406FAD5	Bank of NY Mellon Corp Callable Note Cont 6/16/2023 2.2% Due 08/16/2023	04/11/2019 04/15/2019 200,000.00	198,412.51 0.00 0.00 198,520.50	1,283.33 0.00 1,650.00 366.67	107.99 0.00 107.99 474.66	474.66
06406RBC0	Bank of NY Mellon Corp Callable Note Cont 3/25/2025 3.35% Due 04/25/2025	04/19/2022 04/26/2022 280,000.00	279,962.09 0.00 0.00 279,963.16	911.94 0.00 1,693.61 781.67	1.07 0.00 1.07 782.74	782.74
09690AAC7	BMW Vehicle Lease Trust 2021-2 A3 0.33% Due 12/26/2024	09/08/2021 09/15/2021 50,000.00	49,996.45 0.00 0.00 49,996.63	2.75 13.75 2.75 13.75	0.18 0.00 0.18 13.93	13.93
14913R2L0	Caterpillar Financial Service Note 0.45% Due 05/17/2024	Various Various 500,000.00	497,991.63 0.00 0.00 498,075.78	87.51 0.00 275.00 187.49	84.15 0.00 84.15 271.64	271.64

Income Earned

As of June 30, 2022

CUSIP	Security Description	Trade Date Settle Date Units	Book Value: Begin Book Value: Acq Book Value: Disp Book Value: End	Prior Accrued Inc. Received Ending Accrued Total Interest	Accr. Of Discount Amort. Of Premium Net Accret/Amort Income Earned	Total Income
24422ETV1	John Deere Capital Corp Note 2.15% Due 09/08/2022	04/17/2019 04/22/2019 305,000.00	304,507.10 0.00 0.00 304,656.46	1,511.87 0.00 2,058.33 546.46	149.36 0.00 149.36 695.82	695.82
24422EWB1	John Deere Capital Corp Note 2.125% Due 03/07/2025	03/02/2022 03/07/2022 130,000.00	129,948.49 0.00 0.00 129,950.02	644.58 0.00 874.79 230.21	1.53 0.00 1.53 231.74	231.74
3130A0F70	FHLB Note 3.375% Due 12/08/2023	10/30/2019 10/31/2019 350,000.00	358,434.78 0.00 0.00 357,978.84	5,676.56 5,906.25 754.69 984.38	0.00 455.94 (455.94) 528.44	528.44
3130A1XJ2	FHLB Note 2.875% Due 06/14/2024	03/24/2020 03/25/2020 155,000.00	160,795.17 0.00 0.00 160,561.49	2,067.20 2,228.13 210.43 371.36	0.00 233.68 (233.68) 137.68	137.68
3130ADRG9	FHLB Note 2.75% Due 03/10/2023	04/11/2019 04/12/2019 350,000.00	351,052.66 0.00 0.00 350,940.68	2,165.63 0.00 2,967.71 802.08	0.00 111.98 (111.98) 690.10	690.10
3133ENKS8	FFCB Note 1.125% Due 01/06/2025	Various Various 750,000.00	741,040.75 0.00 0.00 741,323.68	3,281.26 0.00 3,984.38 703.12	282.93 0.00 282.93 986.05	986.05
3133ENPG9	FFCB Note 1.75% Due 02/14/2025	02/10/2022 02/15/2022 415,000.00	413,999.21 0.00 0.00 414,029.57	2,138.40 0.00 2,743.61 605.21	30.36 0.00 30.36 635.57	635.57
3134GVJ66	FHLMC Note Due 06/08/2022	06/04/2020 06/08/2020 0.00	349,997.99 0.00 350,000.00 0.00	420.49 437.50 0.00 17.01	2.01 0.00 2.01 19.02	19.02
3135G04Q3	FNMA Note 0.25% Due 05/22/2023	05/20/2020 05/22/2020 245,000.00	244,760.92 0.00 0.00 244,781.12	15.31 0.00 66.35 51.04	20.20 0.00 20.20 71.24	71.24

Income Earned

As of June 30, 2022

CUSIP	Security Description	Trade Date Settle Date Units	Book Value: Begin Book Value: Acq Book Value: Disp Book Value: End	Prior Accrued Inc. Received Ending Accrued Total Interest	Accr. Of Discount Amort. Of Premium Net Accret/Amort Income Earned	Total Income
3135G05G4	FNMA Note 0.25% Due 07/10/2023	07/08/2020 07/10/2020 250,000.00	249,801.69 0.00 0.00 249,816.42	244.79 0.00 296.88 52.09	14.73 0.00 14.73 66.82	66.82
3135G06G3	FNMA Note 0.5% Due 11/07/2025	11/18/2020 11/19/2020 350,000.00	349,750.59 0.00 0.00 349,756.55	116.67 0.00 262.50 145.83	5.96 0.00 5.96 151.79	151.79
3135G0U43	FNMA Note 2.875% Due 09/12/2023	09/25/2019 09/26/2019 350,000.00	355,401.89 0.00 0.00 355,055.62	2,208.16 0.00 3,046.70 838.54	0.00 346.27 (346.27) 492.27	492.27
3137B4GY6	FHLMC K032 A2 3.31% Due 05/25/2023	07/23/2019 07/26/2019 275,000.00	277,784.63 0.00 0.00 277,551.28	151.71 758.54 151.71 758.54	0.00 233.35 (233.35) 525.19	525.19
3137BM6P6	FHLMC K721 A2 3.09% Due 08/25/2022	06/26/2019 06/28/2019 18,531.80	53,814.47 0.00 35,174.19 18,556.02	138.29 138.29 47.72 47.72	0.00 84.26 (84.26) (36.54)	(36.54)
3137EAER6	FHLMC Note 0.375% Due 05/05/2023	05/05/2020 05/07/2020 305,000.00	304,960.39 0.00 0.00 304,963.90	82.60 0.00 177.92 95.32	3.51 0.00 3.51 98.83	98.83
3137EAES4	FHLMC Note 0.25% Due 06/26/2023	06/24/2020 06/26/2020 300,000.00	299,688.00 0.00 0.00 299,712.00	322.92 375.00 10.42 62.50	24.00 0.00 24.00 86.50	86.50
3137EAET2	FHLMC Note 0.125% Due 07/25/2022	07/21/2020 07/23/2020 170,000.00	169,971.66 0.00 0.00 169,987.40	74.38 0.00 92.08 17.70	15.74 0.00 15.74 33.44	33.44
3137EAEV7	FHLMC Note 0.25% Due 08/24/2023	08/19/2020 08/21/2020 300,000.00	299,874.87 0.00 0.00 299,883.23	202.08 0.00 264.58 62.50	8.36 0.00 8.36 70.86	70.86

Income Earned

As of June 30, 2022

CUSIP	Security Description	Trade Date Settle Date Units	Book Value: Begin Book Value: Acq Book Value: Disp Book Value: End	Prior Accrued Inc. Received Ending Accrued Total Interest	Accr. Of Discount Amort. Of Premium Net Accret/Amort Income Earned	Total Income
3137EAEW5	FHLMC Note 0.25% Due 09/08/2023	09/11/2020 09/14/2020 300,000.00	300,039.63 0.00 0.00 300,037.06	172.92 0.00 235.42 62.50	0.00 2.57 (2.57) 59.93	59.93
3137EAEY1	FHLMC Note 0.125% Due 10/16/2023	10/14/2020 10/16/2020 225,000.00	224,615.25 0.00 0.00 224,638.24	35.16 0.00 58.59 23.43	22.99 0.00 22.99 46.42	46.42
3137EAEZ8	FHLMC Note 0.25% Due 11/06/2023	11/03/2020 11/05/2020 335,000.00	334,856.13 0.00 0.00 334,864.38	58.16 0.00 127.95 69.79	8.25 0.00 8.25 78.04	78.04
43813GAC5	Honda Auto Receivables Trust 2021-1 A3 0.27% Due 04/21/2025	02/17/2021 02/24/2021 80,000.00	79,999.14 0.00 0.00 79,999.18	6.00 18.00 6.00 18.00	0.04 0.00 0.04 18.04	18.04
43813KAC6	Honda Auto Receivables Trust 2020-3 A3 0.37% Due 10/18/2024	09/22/2020 09/29/2020 70,985.20	76,243.40 0.00 5,263.43 70,980.60	10.19 23.51 9.48 22.80	0.63 0.00 0.63 23.43	23.43
43815BAC4	Honda Auto Receivables Trust 2022-1 A3 1.88% Due 05/15/2026	02/15/2022 02/23/2022 165,000.00	164,977.25 0.00 0.00 164,977.88	137.87 258.50 137.87 258.50	0.63 0.00 0.63 259.13	259.13
43815GAC3	Honda Auto Receivables Trust 2021-4 A3 0.88% Due 01/21/2026	11/16/2021 11/24/2021 85,000.00	84,984.94 0.00 0.00 84,985.39	20.78 62.33 20.78 62.33	0.45 0.00 0.45 62.78	62.78
43815NAC8	Honda Auto Receivables Trust 2019-3 A3 1.78% Due 08/15/2023	08/20/2019 08/27/2019 23,155.21	28,578.24 0.00 5,423.05 23,155.20	22.61 42.39 18.32 38.10	0.01 0.00 0.01 38.11	38.11
4581X0DZ8	Inter-American Dev Bank Note 0.5% Due 09/23/2024	09/15/2021 09/23/2021 260,000.00	259,851.66 0.00 0.00 259,856.93	245.56 0.00 353.89 108.33	5.27 0.00 5.27 113.60	113.60

Income Earned

As of June 30, 2022

CUSIP	Security Description	Trade Date Settle Date Units	Book Value: Begin Book Value: Acq Book Value: Disp Book Value: End	Prior Accrued Inc. Received Ending Accrued Total Interest	Accr. Of Discount Amort. Of Premium Net Accret/Amort Income Earned	Total Income
459058GQ0	Intl. Bank Recon & Development Note 2.5% Due 03/19/2024	01/26/2021 01/28/2021 225,000.00	234,021.71 0.00 0.00 233,609.76	1,125.00 0.00 1,593.75 468.75	0.00 411.95 (411.95) 56.80	56.80
459058JM6	Intl. Bank Recon & Development Note 0.25% Due 11/24/2023	11/17/2020 11/24/2020 165,000.00	164,824.73 0.00 0.00 164,834.45	8.02 0.00 42.40 34.38	9.72 0.00 9.72 44.10	44.10
45950KCR9	International Finance Corp Note 1.375% Due 10/16/2024	07/12/2021 07/14/2021 160,000.00	163,139.39 0.00 0.00 163,030.88	275.00 0.00 458.33 183.33	0.00 108.51 (108.51) 74.82	74.82
46647PAH9	JP Morgan Chase & Co Callable Note 2X 3/1/2024 3.22% Due 03/01/2025	Various Various 500,000.00	518,981.60 0.00 0.00 518,090.44	4,025.00 0.00 5,366.67 1,341.67	0.00 891.16 (891.16) 450.51	450.51
47787JAC2	John Deere Owner Trust 2022-A A3 2.32% Due 09/16/2026	03/10/2022 03/16/2022 130,000.00	129,972.97 0.00 0.00 129,973.65	134.04 251.33 134.04 251.33	0.68 0.00 0.68 252.01	252.01
47788UAC6	John Deere Owner Trust 2021-A A3 0.36% Due 09/15/2025	03/02/2021 03/10/2021 60,000.00	59,992.40 0.00 0.00 59,992.66	9.60 18.00 9.60 18.00	0.26 0.00 0.26 18.26	18.26
47789JAD8	John Deere Owner Trust 2019-A A3 Due 07/17/2023	Various Various 0.00	1,245.87 0.00 1,243.44 0.00	1.61 3.02 0.00 1.41	0.00 2.43 (2.43) (1.02)	(1.02)
47789QAC4	John Deere Owner Trust 2021-B A3 0.52% Due 03/16/2026	07/13/2021 07/21/2021 70,000.00	69,995.23 0.00 0.00 69,995.38	16.18 30.33 16.18 30.33	0.15 0.00 0.15 30.48	30.48
58769KAD6	Mercedes-Benz Auto Lease Trust 2021-B A3 0.4% Due 11/15/2024	06/22/2021 06/29/2021 80,000.00	79,996.15 0.00 0.00 79,996.34	14.22 26.67 14.22 26.67	0.19 0.00 0.19 26.86	26.86

Income Earned

As of June 30, 2022

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594918BX1	Microsoft Callable Note Cont 12/6/2023 2.875% Due 02/06/2024	03/05/2020 03/09/2020 200,000.00	205,388.41 0.00 0.00 205,096.09	1,836.81 0.00 2,315.97 479.16	0.00 292.32 (292.32) 186.84	186.84
63743HFE7	National Rural Utilities Note 3.45% Due 06/15/2025	04/27/2022 05/04/2022 95,000.00	94,974.98 0.00 0.00 94,975.66	245.81 0.00 518.94 273.13	0.68 0.00 0.68 273.81	273.81
65479JAD5	Nissan Auto Receivables Owner 2019-C A3 1.93% Due 07/15/2024	10/16/2019 10/23/2019 41,197.02	46,601.65 0.00 5,405.73 41,196.08	39.97 74.95 35.34 70.32	0.16 0.00 0.16 70.48	70.48
69371RR40	Paccar Financial Corp Note 0.5% Due 08/09/2024	08/03/2021 08/09/2021 80,000.00	79,968.47 0.00 0.00 79,969.65	124.44 0.00 157.78 33.34	1.18 0.00 1.18 34.52	34.52
69371RR57	Paccar Financial Corp Note 0.9% Due 11/08/2024	11/02/2021 11/08/2021 175,000.00	174,991.46 0.00 0.00 174,991.75	100.63 0.00 231.88 131.25	0.29 0.00 0.29 131.54	131.54
747525AR4	Qualcomm Inc Callable Note Cont 12/30/2022 2.6% Due 01/30/2023	Various Various 500,000.00	505,698.83 0.00 0.00 504,892.40	4,369.45 0.00 5,452.78 1,083.33	0.00 806.43 (806.43) 276.90	276.90
78015K7C2	Royal Bank of Canada Note 2.25% Due 11/01/2024	Various Various 500,000.00	516,315.80 0.00 0.00 515,762.10	937.51 0.00 1,875.00 937.49	0.00 553.70 (553.70) 383.79	383.79
79466LAG9	Salesforce.com Inc Callable Note Cont 7/15/2022 0.625% Due 07/15/2024	06/29/2021 07/12/2021 35,000.00	34,987.41 0.00 0.00 34,987.90	82.64 0.00 100.87 18.23	0.49 0.00 0.49 18.72	18.72
808513BN4	Charles Schwab Corp Callable Note Cont 2/18/2024 0.75% Due 03/18/2024	Various Various 245,000.00	245,691.33 0.00 0.00 245,658.19	372.61 0.00 525.73 153.12	1.30 34.44 (33.14) 119.98	119.98

Income Earned

As of June 30, 2022

CUSIP	Security Description	Trade Date Settle Date Units	Book Value: Begin Book Value: Acq Book Value: Disp Book Value: End	Prior Accrued Inc. Received Ending Accrued Total Interest	Accr. Of Discount Amort. Of Premium Net Accret/Amort Income Earned	Total Income
857477BR3	State Street Bank Callable Note Cont 2/6/2025 1.746% Due 02/06/2026	02/02/2022 02/07/2022 90,000.00	90,000.00 0.00 0.00 90,000.00	497.61 0.00 628.56 130.95	0.00 0.00 0.00 130.95	130.95
89114QCB2	Toronto Dominion Bank Note 3.25% Due 03/11/2024	Various Various 500,000.00	514,920.39 0.00 0.00 514,230.70	3,611.11 0.00 4,965.28 1,354.17	0.00 689.69 (689.69) 664.48	664.48
89232HAC9	Toyota Auto Receivable Own 2020-A A3 1.66% Due 05/15/2024	07/06/2020 07/08/2020 103,897.34	117,248.47 0.00 12,054.79 105,010.11	85.55 160.40 76.65 151.50	0.00 183.57 (183.57) (32.07)	(32.07)
89236TEL5	Toyota Motor Credit Corp Note 2.7% Due 01/11/2023	04/25/2019 04/29/2019 200,000.00	199,976.16 0.00 0.00 199,979.35	2,100.00 0.00 2,550.00 450.00	3.19 0.00 3.19 453.19	453.19
89236TJH9	Toyota Motor Credit Corp Note 0.5% Due 06/18/2024	12/06/2021 12/08/2021 300,000.00	296,523.38 0.00 0.00 296,662.82	679.17 750.00 54.17 125.00	139.44 0.00 139.44 264.44	264.44
89236XAC0	Toyota Auto Receivables 2020-D A3 0.35% Due 01/15/2025	10/06/2020 10/13/2020 57,111.58	61,648.23 0.00 4,543.73 57,105.23	9.59 17.98 8.88 17.27	0.73 0.00 0.73 18.00	18.00
89238FAD5	Toyota Auto Receivables OT 2022-B A3 2.93% Due 09/15/2026	04/07/2022 04/13/2022 115,000.00	114,997.42 0.00 0.00 114,997.49	149.76 280.79 149.76 280.79	0.07 0.00 0.07 280.86	280.86
89238JAC9	Toyota Auto Receivables Trust 2021-D A3 0.71% Due 04/15/2026	11/09/2021 11/15/2021 65,000.00	64,998.85 0.00 0.00 64,998.88	20.51 38.46 20.51 38.46	0.03 0.00 0.03 38.49	38.49
90331HNV1	US Bank NA Callable Note Cont 6/23/2023 3.4% Due 07/24/2023	05/17/2019 05/21/2019 250,000.00	251,734.25 0.00 0.00 251,599.81	2,998.61 0.00 3,706.94 708.33	0.00 134.44 (134.44) 573.89	573.89

Income Earned

As of June 30, 2022

CUSIP	Security Description	Trade Date Settle Date Units	Book Value: Begin Book Value: Acq Book Value: Disp Book Value: End	Prior Accrued Inc. Received Ending Accrued Total Interest	Accr. Of Discount Amort. Of Premium Net Accret/Amort Income Earned	Total Income
912828Z0	US Treasury Note 2.75% Due 08/31/2025	Various Various 750,000.00	792,192.21 0.00 0.00 791,125.85	5,212.30 0.00 6,893.69 1,681.39	0.00 1,066.36 (1,066.36) 615.03	615.03
9128286L9	US Treasury Note 2.25% Due 03/31/2026	02/25/2022 02/28/2022 750,000.00	759,449.94 0.00 0.00 759,247.29	2,858.61 0.00 4,241.80 1,383.19	0.00 202.65 (202.65) 1,180.54	1,180.54
912828B66	US Treasury Note 2.75% Due 02/15/2024	02/15/2022 02/16/2022 750,000.00	764,770.45 0.00 0.00 764,060.33	6,039.36 0.00 7,748.62 1,709.26	0.00 710.12 (710.12) 999.14	999.14
912828M80	US Treasury Note 2% Due 11/30/2022	Various Various 750,000.00	754,653.87 0.00 0.00 753,886.75	40.98 0.00 1,270.50 1,229.52	0.00 767.12 (767.12) 462.40	462.40
912828R36	US Treasury Note 1.625% Due 05/15/2026	10/14/2021 10/15/2021 250,000.00	256,169.96 0.00 0.00 256,041.78	187.67 0.00 518.85 331.18	0.00 128.18 (128.18) 203.00	203.00
912828T26	US Treasury Note 1.375% Due 09/30/2023	Various Various 750,000.00	753,289.44 0.00 0.00 753,086.39	1,746.93 0.00 2,592.22 845.29	131.96 335.01 (203.05) 642.24	642.24
912828U24	US Treasury Note 2% Due 11/15/2026	03/29/2022 03/30/2022 625,000.00	610,474.23 0.00 0.00 610,741.90	577.45 0.00 1,596.47 1,019.02	267.67 0.00 267.67 1,286.69	1,286.69
912828V80	US Treasury Note 2.25% Due 01/31/2024	Various Various 750,000.00	767,481.98 0.00 0.00 766,620.79	5,640.54 0.00 7,039.02 1,398.48	0.00 861.19 (861.19) 537.29	537.29
912828VB3	US Treasury Note 1.75% Due 05/15/2023	Various Various 750,000.00	756,809.21 0.00 0.00 756,222.22	606.32 0.00 1,676.29 1,069.97	0.00 586.99 (586.99) 482.98	482.98

Income Earned

As of June 30, 2022

CUSIP	Security Description	Trade Date Settle Date Units	Book Value: Begin Book Value: Acq Book Value: Disp Book Value: End	Prior Accrued Inc. Received Ending Accrued Total Interest	Accr. Of Discount Amort. Of Premium Net Accret/Amort Income Earned	Total Income
912828W71	US Treasury Note 2.125% Due 03/31/2024	Various Various 750,000.00	769,840.13 0.00 0.00 768,950.44	2,699.80 0.00 4,006.15 1,306.35	0.00 889.69 (889.69) 416.66	416.66
912828WJ5	US Treasury Note 2.5% Due 05/15/2024	Various Various 750,000.00	770,083.68 0.00 0.00 769,239.83	866.17 0.00 2,394.70 1,528.53	0.00 843.85 (843.85) 684.68	684.68
912828X88	US Treasury Note 2.375% Due 05/15/2027	06/09/2022 06/10/2022 350,000.00	0.00 338,666.02 0.00 338,798.25	0.00 (587.30) 1,061.65 474.35	132.23 0.00 132.23 606.58	606.58
912828Y87	US Treasury Note 1.75% Due 07/31/2024	01/31/2020 01/31/2020 300,000.00	302,504.98 0.00 0.00 302,409.97	1,754.83 0.00 2,189.92 435.09	0.00 95.01 (95.01) 340.08	340.08
912828YG9	US Treasury Note 1.625% Due 09/30/2026	12/28/2021 12/29/2021 300,000.00	304,827.00 0.00 0.00 304,735.46	825.82 0.00 1,225.41 399.59	0.00 91.54 (91.54) 308.05	308.05
912828YW4	US Treasury Note 1.625% Due 12/15/2022	02/15/2022 02/16/2022 750,000.00	752,503.52 0.00 0.00 752,122.28	5,625.00 6,093.75 532.79 1,001.54	0.00 381.24 (381.24) 620.30	620.30
912828Z52	US Treasury Note 1.375% Due 01/31/2025	02/17/2022 02/18/2022 750,000.00	743,508.08 0.00 0.00 743,707.83	3,447.00 0.00 4,301.62 854.62	199.75 0.00 199.75 1,054.37	1,054.37
912828ZD5	US Treasury Note 0.5% Due 03/15/2023	12/28/2021 12/29/2021 325,000.00	325,066.09 0.00 0.00 325,059.19	344.43 0.00 476.90 132.47	0.00 6.90 (6.90) 125.57	125.57
912828ZF0	US Treasury Note 0.5% Due 03/31/2025	03/25/2021 03/29/2021 350,000.00	349,226.98 0.00 0.00 349,249.41	296.45 0.00 439.89 143.44	22.43 0.00 22.43 165.87	165.87

Income Earned

As of June 30, 2022

CUSIP	Security Description	Trade Date Settle Date Units	Book Value: Begin Book Value: Acq Book Value: Disp Book Value: End	Prior Accrued Inc. Received Ending Accrued Total Interest	Accr. Of Discount Amort. Of Premium Net Accret/Amort Income Earned	Total Income
912828ZT0	US Treasury Note 0.25% Due 05/31/2025	02/25/2021 02/26/2021 365,000.00	361,234.97 0.00 0.00 361,338.13	2.49 0.00 77.29 74.80	103.16 0.00 103.16 177.96	177.96
912828ZU7	US Treasury Note 0.25% Due 06/15/2023	02/15/2022 02/16/2022 750,000.00	741,488.83 0.00 0.00 742,162.54	865.38 937.50 81.97 154.09	673.71 0.00 673.71 827.80	827.80
91282CAZ4	US Treasury Note 0.375% Due 11/30/2025	Various Various 750,000.00	737,035.46 0.00 0.00 737,339.79	7.69 0.00 238.21 230.52	304.33 0.00 304.33 534.85	534.85
91282CBV2	US Treasury Note 0.375% Due 04/15/2024	Various Various 500,000.00	500,087.41 0.00 0.00 500,083.57	240.78 0.00 394.47 153.69	4.89 8.73 (3.84) 149.85	149.85
91282CCG4	US Treasury Note 0.25% Due 06/15/2024	06/17/2021 06/18/2021 400,000.00	398,562.23 0.00 0.00 398,620.13	461.54 500.00 43.72 82.18	57.90 0.00 57.90 140.08	140.08
91282CCT6	US Treasury Note 0.375% Due 08/15/2024	08/25/2021 08/26/2021 400,000.00	399,338.40 0.00 0.00 399,363.02	439.23 0.00 563.54 124.31	24.62 0.00 24.62 148.93	148.93
91282CDH1	US Treasury Note 0.75% Due 11/15/2024	11/18/2021 11/19/2021 750,000.00	748,458.10 0.00 0.00 748,509.62	259.85 0.00 718.41 458.56	51.52 0.00 51.52 510.08	510.08
91282CEF4	US Treasury Note 2.5% Due 03/31/2027	Various Various 750,000.00	346,321.10 390,140.62 0.00 736,642.27	1,482.24 (1,939.89) 4,713.11 1,290.98	180.55 0.00 180.55 1,471.53	1,471.53
91324PEB4	United Health Group Inc Callable Note Cont 5/15/2022 0.55% Due 05/15/2024	11/24/2021 11/29/2021 500,000.00	495,038.57 0.00 0.00 495,247.04	122.22 0.00 351.39 229.17	208.47 0.00 208.47 437.64	437.64

Income Earned

As of June 30, 2022

CUSIP	Security Description	Trade Date Settle Date Units	Book Value: Begin Book Value: Acq Book Value: Disp Book Value: End	Prior Accrued Inc. Received Ending Accrued Total Interest	Accr. Of Discount Amort. Of Premium Net Accret/Amort Income Earned	Total Income
92290BAA9	Verizon Owner Trust 2020-B A 0.47% Due 02/20/2025	08/04/2020 08/12/2020 120,000.00	119,984.83 0.00 0.00 119,985.29	17.23 47.00 17.23 47.00	0.46 0.00 0.46 47.46	47.46
92348AAA3	Verizon Owner Trust 2019-C A1A 1.94% Due 04/22/2024	10/01/2019 10/08/2019 26,992.56	32,055.40 0.00 5,063.87 26,991.73	19.00 51.82 16.00 48.82	0.20 0.00 0.20 49.02	49.02
931142ER0	Wal-Mart Stores Callable Note Cont 08/17/2026 1.05% Due 09/17/2026	09/08/2021 09/17/2021 40,000.00	39,935.04 0.00 0.00 39,936.28	86.33 0.00 121.33 35.00	1.24 0.00 1.24 36.24	36.24
			29,287,059.49 **728,806.64** **424,172.23**	**93,483.51** **17,460.76** **114,541.12**	**3,380.97** **12,641.49** **(9,260.52)**	
Total Fixed Income		**29,436,870.71**	**29,582,433.38**	**38,518.37**	**29,257.85**	**29,257.85**
CASH & EQUIVALENT						
06417MQY4	Bank of Nova Scotia Houston Yankee CD 0.19% Due 07/28/2022	11/18/2021 11/19/2021 600,000.00	599,933.47 0.00 0.00 599,968.49	975.33 0.00 1,070.33 95.00	35.02 0.00 35.02 130.02	130.02
31846V203	First American Govt Obligation Fund Class Y	03/25/2022 03/25/2022 259,531.58	546,502.71 444,362.70 731,333.83 259,531.58	0.00 202.52 0.00 202.52	0.00 0.00 0.00 202.52	202.52
55380TXW5	MUFG Bank Yankee CD 0.3% Due 10/25/2022	10/27/2021 10/28/2021 500,000.00	499,959.50 0.00 0.00 499,967.82	954.17 0.00 1,079.17 125.00	8.32 0.00 8.32 133.32	133.32

Income Earned

As of June 30, 2022

CUSIP	Security Description	Trade Date Settle Date Units	Book Value: Begin Book Value: Acq Book Value: Disp Book Value: End	Prior Accrued Inc. Received Ending Accrued Total Interest	Accr. Of Discount Amort. Of Premium Net Accret/Amort Income Earned	Total Income
86959RSN1	Svenska Handelsbanken NY	10/27/2021	499,919.38	783.33	29.14	112.48
	Yankee CD	10/27/2021	0.00	0.00	0.00	
	0.2% Due 08/23/2022	500,000.00	0.00	866.67	29.14	
			499,948.52	83.34	112.48	
			2,146,315.06	**2,712.83**	**72.48**	
			444,362.70	**202.52**	**0.00**	
			731,333.83	**3,016.17**	**72.48**	
Total Cash & Equivalent		**1,859,531.58**	**1,859,416.41**	**505.86**	**578.34**	**578.34**
LOCAL AGENCY INVESTMENT FUND						
90LAIF$00	Local Agency Investment Fund	Various	12,706,904.21	12,802.58	0.00	23,433.60
	State Pool	Various	25,000,000.00	0.00	0.00	
		37,706,904.21	0.00	36,236.18	0.00	
			37,706,904.21	23,433.60	23,433.60	
			12,706,904.21	**12,802.58**	**0.00**	
			25,000,000.00	**0.00**	**0.00**	
			0.00	**36,236.18**	**0.00**	
Total Local Agency Investment Fund		**37,706,904.21**	**37,706,904.21**	**23,433.60**	**23,433.60**	**23,433.60**

Income Earned

As of June 30, 2022

CUSIP	Security Description	Trade Date Settle Date Units	Book Value: Begin Book Value: Acq Book Value: Disp Book Value: End	Prior Accrued Inc. Received Ending Accrued Total Interest	Accr. Of Discount Amort. Of Premium Net Accret/Amort Income Earned	Total Income
INVESTMENT POOL						
09CATR$05	CalTrust	Various	6,590,681.49	0.00	0.00	6,019.94
	Medium Term Fund	Various	6,019.94	6,019.94	0.00	
		655,780.72	0.00	0.00	0.00	
			6,596,701.43	6,019.94	6,019.94	
			6,590,681.49	**0.00**	**0.00**	
			6,019.94	**6,019.94**	**0.00**	
			0.00	**0.00**	**0.00**	
Total Investment Pool		**655,780.72**	**6,596,701.43**	**6,019.94**	**6,019.94**	**6,019.94**
			50,730,960.25	**108,998.92**	**3,453.45**	
			26,179,189.28	**23,683.22**	**12,641.49**	
			1,155,506.06	**153,793.47**	**(9,188.04)**	
TOTAL PORTFOLIO		**69,659,087.22**	**75,745,455.43**	**68,477.77**	**59,289.73**	**59,289.73**

Cash Flow Report

As of June 30, 2022

Payment Date	Transaction Type	CUSIP	Quantity	Security Description	Principal Amount	Income	Total Amount
07/06/2022	Interest	3133ENKS8	750,000.00	FFCB Note 1.125% Due 1/6/2025	0.00	4,101.57	4,101.57
07/10/2022	Interest	3135G05G4	250,000.00	FNMA Note 0.25% Due 7/10/2023	0.00	312.50	312.50
07/11/2022	Interest	89236TEL5	200,000.00	Toyota Motor Credit Corp Note 2.7% Due 1/11/2023	0.00	2,700.00	2,700.00
07/13/2022	Interest	037833DE7	200,000.00	Apple Inc Callable Note Cont 12/13/2022 2.4% Due 1/13/2023	0.00	2,400.00	2,400.00
07/15/2022	Dividend	90LAIF$00	1,731,178,207.36	Local Agency Investment Fund State Pool	0.00	35,695.09	35,695.09
07/15/2022	Interest	79466LAG9	35,000.00	Salesforce.com Inc Callable Note Cont 7/15/2022 0.625% Due 7/15/2024	0.00	109.38	109.38
07/15/2022	Paydown	43815BAC4	165,000.00	Honda Auto Receivables Trust 2022-1 A3 1.88% Due 5/15/2026	0.00	258.50	258.50
07/15/2022	Paydown	89232HAC9	103,897.34	Toyota Auto Receivable Own 2020-A A3 1.66% Due 5/15/2024	6,458.70	143.72	6,602.42
07/15/2022	Paydown	89238FAD5	115,000.00	Toyota Auto Receivables OT 2022-B A3 2.93% Due 9/15/2026	0.00	280.79	280.79
07/15/2022	Paydown	43815NAC8	23,155.21	Honda Auto Receivables Trust 2019-3 A3 1.78% Due 8/15/2023	8,193.97	34.35	8,228.32
07/15/2022	Paydown	47787JAC2	130,000.00	John Deere Owner Trust 2022-A A3 2.32% Due 9/16/2026	0.00	251.33	251.33
07/15/2022	Paydown	65479JAD5	41,197.02	Nissan Auto Receivables Owner 2019-C A3 1.93% Due 7/15/2024	1,603.82	66.26	1,670.08
07/15/2022	Paydown	89236XAC0	57,111.58	Toyota Auto Receivables 2020-D A3 0.35% Due 1/15/2025	1,938.56	16.66	1,955.22
07/15/2022	Paydown	02582JJT8	185,000.00	American Express Credit Trust 2022-2 A 3.39% Due 5/17/2027	0.00	522.63	522.63
07/15/2022	Paydown	47788UAC6	60,000.00	John Deere Owner Trust 2021-A A3 0.36% Due 9/15/2025	0.00	18.00	18.00
07/15/2022	Paydown	47789QAC4	70,000.00	John Deere Owner Trust 2021-B A3 0.52% Due 3/16/2026	0.00	30.33	30.33
07/15/2022	Paydown	58769KAD6	80,000.00	Mercedes-Benz Auto Lease Trust 2021-B A3 0.4% Due 11/15/2024	0.00	26.67	26.67

Cash Flow Report

As of June 30, 2022

Payment Date	Transaction Type	CUSIP	Quantity	Security Description	Principal Amount	Income	Total Amount
07/15/2022	Paydown	89238JAC9	65,000.00	Toyota Auto Receivables Trust 2021-D A3 0.71% Due 4/15/2026	0.00	38.46	38.46
07/18/2022	Paydown	43813KAC6	70,985.20	Honda Auto Receivables Trust 2020-3 A3 0.37% Due 10/18/2024	4,165.31	21.89	4,187.20
07/20/2022	Paydown	92290BAA9	120,000.00	Verizon Owner Trust 2020-B A 0.47% Due 2/20/2025	3,727.28	47.00	3,774.28
07/20/2022	Paydown	92348AAA3	26,992.56	Verizon Owner Trust 2019-C A1A 1.94% Due 4/22/2024	1,144.80	43.64	1,188.44
07/21/2022	Paydown	3137BM6P6	0.00	FHLMC K721 A2 3.09% Due 8/25/2022	35,174.19	138.29	35,312.48
07/21/2022	Paydown	43813GAC5	80,000.00	Honda Auto Receivables Trust 2021-1 A3 0.27% Due 4/21/2025	0.00	18.00	18.00
07/21/2022	Paydown	43815GAC3	85,000.00	Honda Auto Receivables Trust 2021-4 A3 0.88% Due 1/21/2026	0.00	62.33	62.33
07/24/2022	Interest	90331HNV1	250,000.00	US Bank NA Callable Note Cont 6/23/2023 3.4% Due 7/24/2023	0.00	4,250.00	4,250.00
07/25/2022	Interest	3137BM6P6	18,531.80	FHLMC K721 A2 3.09% Due 8/25/2022	0.00	47.72	47.72
07/25/2022	Maturity	3137EAET2	170,000.00	FHLMC Note 0.125% Due 7/25/2022	170,000.00	106.25	170,106.25
07/25/2022	Paydown	05601XAC3	85,000.00	BMW Vehicle Lease Trust 2022-1 A3 1.1% Due 3/25/2025	0.00	77.92	77.92
07/25/2022	Paydown	09690AAC7	50,000.00	BMW Vehicle Lease Trust 2021-2 A3 0.33% Due 12/26/2024	0.00	13.75	13.75
07/25/2022	Paydown	3137B4GY6	275,000.00	FHLMC K032 A2 3.31% Due 5/25/2023	0.00	758.54	758.54
07/28/2022	Maturity	06417MQY4	600,000.00	Bank of Nova Scotia Houston Yankee CD 0.19% Due 7/28/2022	600,000.00	1,155.83	601,155.83
07/30/2022	Interest	747525AR4	500,000.00	Qualcomm Inc Callable Note Cont 12/30/2022 2.6% Due 1/30/2023	0.00	6,500.00	6,500.00
07/31/2022	Interest	912828Y87	300,000.00	US Treasury Note 1.75% Due 7/31/2024	0.00	2,625.00	2,625.00
07/31/2022	Interest	912828Z52	750,000.00	US Treasury Note 1.375% Due 1/31/2025	0.00	5,156.25	5,156.25

Cash Flow Report

As of June 30, 2022

Payment Date	Transaction Type	CUSIP	Quantity	Security Description	Principal Amount	Income	Total Amount
07/31/2022	Interest	912828V80	750,000.00	US Treasury Note 2.25% Due 1/31/2024	0.00	8,437.50	8,437.50
JUL 2022					**832,406.63**	**76,466.15**	**908,872.78**
08/06/2022	Interest	594918BX1	200,000.00	Microsoft Callable Note Cont 12/6/2023 2.875% Due 2/6/2024	0.00	2,875.00	2,875.00
08/06/2022	Interest	857477BR3	90,000.00	State Street Bank Callable Note Cont 2/6/2025 1.746% Due 2/6/2026	0.00	781.34	781.34
08/09/2022	Interest	69371RR40	80,000.00	Paccar Financial Corp Note 0.5% Due 8/9/2024	0.00	200.00	200.00
08/14/2022	Interest	3133ENPG9	415,000.00	FFCB Note 1.75% Due 2/14/2025	0.00	3,611.08	3,611.08
08/15/2022	Interest	91282CCT6	400,000.00	US Treasury Note 0.375% Due 8/15/2024	0.00	750.00	750.00
08/15/2022	Interest	912828B66	750,000.00	US Treasury Note 2.75% Due 2/15/2024	0.00	10,312.50	10,312.50
08/15/2022	Paydown	02582JJT8	185,000.00	American Express Credit Trust 2022-2 A 3.39% Due 5/17/2027	0.00	522.63	522.63
08/15/2022	Paydown	47789QAC4	70,000.00	John Deere Owner Trust 2021-B A3 0.52% Due 3/16/2026	0.00	30.33	30.33
08/15/2022	Paydown	58769KAD6	80,000.00	Mercedes-Benz Auto Lease Trust 2021-B A3 0.4% Due 11/15/2024	0.00	26.67	26.67
08/15/2022	Paydown	43815NAC8	23,155.21	Honda Auto Receivables Trust 2019-3 A3 1.78% Due 8/15/2023	7,718.79	22.19	7,740.98
08/15/2022	Paydown	65479JAD5	41,197.02	Nissan Auto Receivables Owner 2019-C A3 1.93% Due 7/15/2024	1,607.43	63.68	1,671.11
08/15/2022	Paydown	89232HAC9	103,897.34	Toyota Auto Receivable Own 2020-A A3 1.66% Due 5/15/2024	6,287.36	134.79	6,422.15
08/15/2022	Paydown	47787JAC2	130,000.00	John Deere Owner Trust 2022-A A3 2.32% Due 9/16/2026	0.00	251.33	251.33
08/15/2022	Paydown	89236XAC0	57,111.58	Toyota Auto Receivables 2020-D A3 0.35% Due 1/15/2025	1,932.78	16.09	1,948.87
08/15/2022	Paydown	89238FAD5	115,000.00	Toyota Auto Receivables OT 2022-B A3 2.93% Due 9/15/2026	0.00	280.79	280.79

Cash Flow Report

As of June 30, 2022

Payment Date	Transaction Type	CUSIP	Quantity	Security Description	Principal Amount	Income	Total Amount
08/15/2022	Paydown	43815BAC4	165,000.00	Honda Auto Receivables Trust 2022-1 A3 1.88% Due 5/15/2026	0.00	258.50	258.50
08/15/2022	Paydown	47788UAC6	60,000.00	John Deere Owner Trust 2021-A A3 0.36% Due 9/15/2025	0.00	18.00	18.00
08/15/2022	Paydown	89238JAC9	65,000.00	Toyota Auto Receivables Trust 2021-D A3 0.71% Due 4/15/2026	0.00	38.46	38.46
08/16/2022	Interest	06406FAD5	200,000.00	Bank of NY Mellon Corp Callable Note Cont 6/16/2023 2.2% Due 8/16/2023	0.00	2,200.00	2,200.00
08/18/2022	Paydown	43813KAC6	70,985.20	Honda Auto Receivables Trust 2020-3 A3 0.37% Due 10/18/2024	4,166.60	20.60	4,187.20
08/19/2022	Paydown	3137BM6P6	18,531.80	FHLMC K721 A2 3.09% Due 8/25/2022	8,732.74	17.99	8,750.73
08/20/2022	Paydown	92348AAA3	26,992.56	Verizon Owner Trust 2019-C A1A 1.94% Due 4/22/2024	1,147.38	41.79	1,189.17
08/20/2022	Paydown	92290BAA9	120,000.00	Verizon Owner Trust 2020-B A 0.47% Due 2/20/2025	3,728.74	45.54	3,774.28
08/21/2022	Paydown	43813GAC5	80,000.00	Honda Auto Receivables Trust 2021-1 A3 0.27% Due 4/21/2025	3,990.82	18.00	4,008.82
08/21/2022	Paydown	43815GAC3	85,000.00	Honda Auto Receivables Trust 2021-4 A3 0.88% Due 1/21/2026	0.00	62.33	62.33
08/23/2022	Maturity	86959RSN1	500,000.00	Svenska Handelsbanken NY Yankee CD 0.2% Due 8/23/2022	500,000.00	1,013.89	501,013.89
08/24/2022	Interest	3137EAEV7	300,000.00	FHLMC Note 0.25% Due 8/24/2023	0.00	375.00	375.00
08/25/2022	Interest	3137BM6P6	18,531.80	FHLMC K721 A2 3.09% Due 8/25/2022	0.00	25.23	25.23
08/25/2022	Paydown	3137B4GY6	275,000.00	FHLMC K032 A2 3.31% Due 5/25/2023	0.00	758.54	758.54
08/25/2022	Paydown	05601XAC3	85,000.00	BMW Vehicle Lease Trust 2022-1 A3 1.1% Due 3/25/2025	0.00	77.92	77.92
08/25/2022	Paydown	09690AAC7	50,000.00	BMW Vehicle Lease Trust 2021-2 A3 0.33% Due 12/26/2024	0.00	13.75	13.75

Cash Flow Report

As of June 30, 2022

Payment Date	Transaction Type	CUSIP	Quantity	Security Description	Principal Amount	Income	Total Amount
08/31/2022	Interest	9128284Z0	750,000.00	US Treasury Note 2.75% Due 8/31/2025	0.00	10,312.50	10,312.50
AUG 2022					**539,312.64**	**35,176.46**	**574,489.10**
09/01/2022	Interest	46647PAH9	500,000.00	JP Morgan Chase & Co Callable Note 2X 3/1/2024 3.22% Due 3/1/2025	0.00	8,050.00	8,050.00
09/07/2022	Interest	24422EWB1	130,000.00	John Deere Capital Corp Note 2.125% Due 3/7/2025	0.00	1,381.25	1,381.25
09/08/2022	Interest	3137EAEW5	300,000.00	FHLMC Note 0.25% Due 9/8/2023	0.00	375.00	375.00
09/08/2022	Maturity	24422ETV1	305,000.00	John Deere Capital Corp Note 2.15% Due 9/8/2022	305,000.00	3,278.75	308,278.75
09/10/2022	Interest	3130ADRG9	350,000.00	FHLB Note 2.75% Due 3/10/2023	0.00	4,812.50	4,812.50
09/11/2022	Interest	89114QCB2	500,000.00	Toronto Dominion Bank Note 3.25% Due 3/11/2024	0.00	8,125.00	8,125.00
09/12/2022	Interest	3135G0U43	350,000.00	FNMA Note 2.875% Due 9/12/2023	0.00	5,031.25	5,031.25
09/15/2022	Interest	912828ZD5	325,000.00	US Treasury Note 0.5% Due 3/15/2023	0.00	812.50	812.50
09/15/2022	Paydown	43815NAC8	23,155.21	Honda Auto Receivables Trust 2019-3 A3 1.78% Due 8/15/2023	7,242.46	10.74	7,253.20
09/15/2022	Paydown	47787JAC2	130,000.00	John Deere Owner Trust 2022-A A3 2.32% Due 9/16/2026	0.00	251.33	251.33
09/15/2022	Paydown	65479JAD5	41,197.02	Nissan Auto Receivables Owner 2019-C A3 1.93% Due 7/15/2024	1,611.05	61.09	1,672.14
09/15/2022	Paydown	58769KAD6	80,000.00	Mercedes-Benz Auto Lease Trust 2021-B A3 0.4% Due 11/15/2024	0.00	26.67	26.67
09/15/2022	Paydown	89232HAC9	103,897.34	Toyota Auto Receivable Own 2020-A A3 1.66% Due 5/15/2024	6,115.30	126.09	6,241.39
09/15/2022	Paydown	89238FAD5	115,000.00	Toyota Auto Receivables OT 2022-B A3 2.93% Due 9/15/2026	0.00	280.79	280.79
09/15/2022	Paydown	02582JJT8	185,000.00	American Express Credit Trust 2022-2 A 3.39% Due 5/17/2027	0.00	522.63	522.63

Cash Flow Report

As of June 30, 2022

Payment Date	Transaction Type	CUSIP	Quantity	Security Description	Principal Amount	Income	Total Amount
09/15/2022	Paydown	43815BAC4	165,000.00	Honda Auto Receivables Trust 2022-1 A3 1.88% Due 5/15/2026	0.00	258.50	258.50
09/15/2022	Paydown	47788UAC6	60,000.00	John Deere Owner Trust 2021-A A3 0.36% Due 9/15/2025	0.00	18.00	18.00
09/15/2022	Paydown	47789QAC4	70,000.00	John Deere Owner Trust 2021-B A3 0.52% Due 3/16/2026	0.00	30.33	30.33
09/15/2022	Paydown	89238JAC9	65,000.00	Toyota Auto Receivables Trust 2021-D A3 0.71% Due 4/15/2026	0.00	38.46	38.46
09/15/2022	Paydown	89236XAC0	57,111.58	Toyota Auto Receivables 2020-D A3 0.35% Due 1/15/2025	1,926.92	15.53	1,942.45
09/17/2022	Interest	931142ER0	40,000.00	Wal-Mart Stores Callable Note Cont 08/17/2026 1.05% Due 9/17/2026	0.00	210.00	210.00
09/18/2022	Interest	808513BN4	245,000.00	Charles Schwab Corp Callable Note Cont 2/18/2024 0.75% Due 3/18/2024	0.00	918.75	918.75
09/18/2022	Paydown	43813KAC6	70,985.20	Honda Auto Receivables Trust 2020-3 A3 0.37% Due 10/18/2024	4,167.88	19.32	4,187.20
09/19/2022	Interest	459058GQ0	225,000.00	Intl. Bank Recon & Development Note 2.5% Due 3/19/2024	0.00	2,812.50	2,812.50
09/19/2022	Paydown	3137BM6P6	18,531.80	FHLMC K721 A2 3.09% Due 8/25/2022	9,799.05	20.19	9,819.24
09/20/2022	Paydown	92290BAA9	120,000.00	Verizon Owner Trust 2020-B A 0.47% Due 2/20/2025	3,730.20	44.08	3,774.28
09/20/2022	Paydown	92348AAA3	26,992.56	Verizon Owner Trust 2019-C A1A 1.94% Due 4/22/2024	1,149.96	39.93	1,189.89
09/21/2022	Paydown	43813GAC5	80,000.00	Honda Auto Receivables Trust 2021-1 A3 0.27% Due 4/21/2025	3,991.79	17.10	4,008.89
09/21/2022	Paydown	43815GAC3	85,000.00	Honda Auto Receivables Trust 2021-4 A3 0.88% Due 1/21/2026	0.00	62.33	62.33
09/23/2022	Interest	4581X0DZ8	260,000.00	Inter-American Dev Bank Note 0.5% Due 9/23/2024	0.00	650.00	650.00
09/25/2022	Paydown	3137B4GY6	275,000.00	FHLMC K032 A2 3.31% Due 5/25/2023	0.00	758.54	758.54
09/25/2022	Paydown	05601XAC3	85,000.00	BMW Vehicle Lease Trust 2022-1 A3 1.1% Due 3/25/2025	0.00	77.92	77.92

Cash Flow Report

As of June 30, 2022

Payment Date	Transaction Type	CUSIP	Quantity	Security Description	Principal Amount	Income	Total Amount
09/25/2022	Paydown	09690AAC7	50,000.00	BMW Vehicle Lease Trust 2021-2 A3 0.33% Due 12/26/2024	0.00	13.75	13.75
09/30/2022	Interest	9128286L9	750,000.00	US Treasury Note 2.25% Due 3/31/2026	0.00	8,437.50	8,437.50
09/30/2022	Interest	912828T26	750,000.00	US Treasury Note 1.375% Due 9/30/2023	0.00	5,156.25	5,156.25
09/30/2022	Interest	912828W71	750,000.00	US Treasury Note 2.125% Due 3/31/2024	0.00	7,968.75	7,968.75
09/30/2022	Interest	912828YG9	300,000.00	US Treasury Note 1.625% Due 9/30/2026	0.00	2,437.50	2,437.50
09/30/2022	Interest	912828ZF0	350,000.00	US Treasury Note 0.5% Due 3/31/2025	0.00	875.00	875.00
09/30/2022	Interest	91282CEF4	750,000.00	US Treasury Note 2.5% Due 3/31/2027	0.00	9,375.00	9,375.00
SEP 2022					**344,734.61**	**73,400.82**	**418,135.43**
10/15/2022	Interest	91282CBV2	500,000.00	US Treasury Note 0.375% Due 4/15/2024	0.00	937.50	937.50
10/15/2022	Paydown	43815BAC4	165,000.00	Honda Auto Receivables Trust 2022-1 A3 1.88% Due 5/15/2026	0.00	258.50	258.50
10/15/2022	Paydown	89236XAC0	57,111.58	Toyota Auto Receivables 2020-D A3 0.35% Due 1/15/2025	1,921.01	14.97	1,935.98
10/15/2022	Paydown	89238FAD5	115,000.00	Toyota Auto Receivables OT 2022-B A3 2.93% Due 9/15/2026	0.00	280.79	280.79
10/15/2022	Paydown	02582JJT8	185,000.00	American Express Credit Trust 2022-2 A 3.39% Due 5/17/2027	0.00	522.63	522.63
10/15/2022	Paydown	47789QAC4	70,000.00	John Deere Owner Trust 2021-B A3 0.52% Due 3/16/2026	0.00	30.33	30.33
10/15/2022	Paydown	65479JAD5	41,197.02	Nissan Auto Receivables Owner 2019-C A3 1.93% Due 7/15/2024	1,614.67	58.50	1,673.17
10/15/2022	Paydown	58769KAD6	80,000.00	Mercedes-Benz Auto Lease Trust 2021-B A3 0.4% Due 11/15/2024	0.00	26.67	26.67
10/15/2022	Paydown	89232HAC9	103,897.34	Toyota Auto Receivable Own 2020-A A3 1.66% Due 5/15/2024	5,942.52	117.63	6,060.15

Cash Flow Report

As of June 30, 2022

Payment Date	Transaction Type	CUSIP	Quantity	Security Description	Principal Amount	Income	Total Amount
10/15/2022	Paydown	47787JAC2	130,000.00	John Deere Owner Trust 2022-A A3 2.32% Due 9/16/2026	0.00	251.33	251.33
10/15/2022	Paydown	47788UAC6	60,000.00	John Deere Owner Trust 2021-A A3 0.36% Due 9/15/2025	0.00	18.00	18.00
10/15/2022	Paydown	89238JAC9	65,000.00	Toyota Auto Receivables Trust 2021-D A3 0.71% Due 4/15/2026	0.00	38.46	38.46
10/16/2022	Interest	45950KCR9	160,000.00	International Finance Corp Note 1.375% Due 10/16/2024	0.00	1,100.00	1,100.00
10/16/2022	Interest	3137EAEY1	225,000.00	FHLMC Note 0.125% Due 10/16/2023	0.00	140.63	140.63
10/18/2022	Paydown	43813KAC6	70,985.20	Honda Auto Receivables Trust 2020-3 A3 0.37% Due 10/18/2024	4,169.17	18.03	4,187.20
10/20/2022	Paydown	92348AAA3	26,992.56	Verizon Owner Trust 2019-C A1A 1.94% Due 4/22/2024	1,152.55	38.07	1,190.62
10/20/2022	Paydown	92290BAA9	120,000.00	Verizon Owner Trust 2020-B A 0.47% Due 2/20/2025	3,731.66	42.62	3,774.28
10/21/2022	Paydown	43815GAC3	85,000.00	Honda Auto Receivables Trust 2021-4 A3 0.88% Due 1/21/2026	0.00	62.33	62.33
10/21/2022	Paydown	43813GAC5	80,000.00	Honda Auto Receivables Trust 2021-1 A3 0.27% Due 4/21/2025	3,992.76	16.20	4,008.96
10/25/2022	Interest	06406RBC0	280,000.00	Bank of NY Mellon Corp Callable Note Cont 3/25/2025 3.35% Due 4/25/2025	0.00	4,663.94	4,663.94
10/25/2022	Maturity	55380TXW5	500,000.00	MUFG Bank Yankee CD 0.3% Due 10/25/2022	500,000.00	1,562.50	501,562.50
10/25/2022	Paydown	3137B4GY6	275,000.00	FHLMC K032 A2 3.31% Due 5/25/2023	0.00	758.54	758.54
10/25/2022	Paydown	05601XAC3	85,000.00	BMW Vehicle Lease Trust 2022-1 A3 1.1% Due 3/25/2025	0.00	77.92	77.92
10/25/2022	Paydown	09690AAC7	50,000.00	BMW Vehicle Lease Trust 2021-2 A3 0.33% Due 12/26/2024	0.00	13.75	13.75
OCT 2022					**522,524.34**	**11,049.84**	**533,574.18**
11/01/2022	Interest	78015K7C2	500,000.00	Royal Bank of Canada Note 2.25% Due 11/1/2024	0.00	5,625.00	5,625.00

Cash Flow Report

As of June 30, 2022

Payment Date	Transaction Type	CUSIP	Quantity	Security Description	Principal Amount	Income	Total Amount
11/03/2022	Interest	037833AK6	200,000.00	Apple Inc Note 2.4% Due 5/3/2023	0.00	2,400.00	2,400.00
11/05/2022	Interest	3137EAER6	305,000.00	FHLMC Note 0.375% Due 5/5/2023	0.00	571.88	571.88
11/06/2022	Interest	3137EAEZ8	335,000.00	FHLMC Note 0.25% Due 11/6/2023	0.00	418.75	418.75
11/07/2022	Interest	3135G06G3	350,000.00	FNMA Note 0.5% Due 11/7/2025	0.00	875.00	875.00
11/08/2022	Interest	69371RR57	175,000.00	Paccar Financial Corp Note 0.9% Due 11/8/2024	0.00	787.50	787.50
11/12/2022	Interest	023135BW5	130,000.00	Amazon.com Inc Note 0.45% Due 5/12/2024	0.00	292.50	292.50
11/15/2022	Interest	912828U24	625,000.00	US Treasury Note 2% Due 11/15/2026	0.00	6,250.00	6,250.00
11/15/2022	Interest	912828VB3	750,000.00	US Treasury Note 1.75% Due 5/15/2023	0.00	6,562.50	6,562.50
11/15/2022	Interest	912828WJ5	750,000.00	US Treasury Note 2.5% Due 5/15/2024	0.00	9,375.00	9,375.00
11/15/2022	Interest	91282CDH1	750,000.00	US Treasury Note 0.75% Due 11/15/2024	0.00	2,812.50	2,812.50
11/15/2022	Interest	912828X88	350,000.00	US Treasury Note 2.375% Due 5/15/2027	0.00	4,156.25	4,156.25
11/15/2022	Interest	912828R36	250,000.00	US Treasury Note 1.625% Due 5/15/2026	0.00	2,031.25	2,031.25
11/15/2022	Interest	91324PEB4	500,000.00	United Health Group Inc Callable Note Cont 5/15/2022 0.55% Due 5/15/2024	0.00	1,375.00	1,375.00
11/15/2022	Paydown	43815BAC4	165,000.00	Honda Auto Receivables Trust 2022-1 A3 1.88% Due 5/15/2026	0.00	258.50	258.50
11/15/2022	Paydown	89232HAC9	103,897.34	Toyota Auto Receivable Own 2020-A A3 1.66% Due 5/15/2024	5,769.01	109.41	5,878.42
11/15/2022	Paydown	89238FAD5	115,000.00	Toyota Auto Receivables OT 2022-B A3 2.93% Due 9/15/2026	0.00	280.79	280.79

Cash Flow Report

As of June 30, 2022

Payment Date	Transaction Type	CUSIP	Quantity	Security Description	Principal Amount	Income	Total Amount
11/15/2022	Paydown	47787JAC2	130,000.00	John Deere Owner Trust 2022-A A3 2.32% Due 9/16/2026	0.00	251.33	251.33
11/15/2022	Paydown	65479JAD5	41,197.02	Nissan Auto Receivables Owner 2019-C A3 1.93% Due 7/15/2024	1,618.30	55.91	1,674.21
11/15/2022	Paydown	89236XAC0	57,111.58	Toyota Auto Receivables 2020-D A3 0.35% Due 1/15/2025	1,915.04	14.41	1,929.45
11/15/2022	Paydown	02582JJT8	185,000.00	American Express Credit Trust 2022-2 A 3.39% Due 5/17/2027	0.00	522.63	522.63
11/15/2022	Paydown	47788UAC6	60,000.00	John Deere Owner Trust 2021-A A3 0.36% Due 9/15/2025	2,490.67	18.00	2,508.67
11/15/2022	Paydown	47789QAC4	70,000.00	John Deere Owner Trust 2021-B A3 0.52% Due 3/16/2026	0.00	30.33	30.33
11/15/2022	Paydown	58769KAD6	80,000.00	Mercedes-Benz Auto Lease Trust 2021-B A3 0.4% Due 11/15/2024	0.00	26.67	26.67
11/15/2022	Paydown	89238JAC9	65,000.00	Toyota Auto Receivables Trust 2021-D A3 0.71% Due 4/15/2026	0.00	38.46	38.46
11/17/2022	Interest	14913R2L0	500,000.00	Caterpillar Financial Service Note 0.45% Due 5/17/2024	0.00	1,125.00	1,125.00
11/18/2022	Paydown	43813KAC6	70,985.20	Honda Auto Receivables Trust 2020-3 A3 0.37% Due 10/18/2024	4,170.45	16.75	4,187.20
11/20/2022	Paydown	92290BAA9	120,000.00	Verizon Owner Trust 2020-B A 0.47% Due 2/20/2025	3,733.12	41.16	3,774.28
11/20/2022	Paydown	92348AAA3	26,992.56	Verizon Owner Trust 2019-C A1A 1.94% Due 4/22/2024	1,155.14	36.21	1,191.35
11/21/2022	Paydown	43813GAC5	80,000.00	Honda Auto Receivables Trust 2021-1 A3 0.27% Due 4/21/2025	3,993.71	15.31	4,009.02
11/21/2022	Paydown	43815GAC3	85,000.00	Honda Auto Receivables Trust 2021-4 A3 0.88% Due 1/21/2026	0.00	62.33	62.33
11/22/2022	Interest	3135G04Q3	245,000.00	FNMA Note 0.25% Due 5/22/2023	0.00	306.25	306.25
11/24/2022	Interest	459058JM6	165,000.00	Intl. Bank Recon & Development Note 0.25% Due 11/24/2023	0.00	206.25	206.25
11/25/2022	Paydown	3137B4GY6	275,000.00	FHLMC K032 A2 3.31% Due 5/25/2023	0.00	758.54	758.54

Cash Flow Report

As of June 30, 2022

Payment Date	Transaction Type	CUSIP	Quantity	Security Description	Principal Amount	Income	Total Amount
11/25/2022	Paydown	05601XAC3	85,000.00	BMW Vehicle Lease Trust 2022-1 A3 1.1% Due 3/25/2025	0.00	77.92	77.92
11/25/2022	Paydown	09690AAC7	50,000.00	BMW Vehicle Lease Trust 2021-2 A3 0.33% Due 12/26/2024	0.00	13.75	13.75
11/30/2022	Interest	91282CAZ4	750,000.00	US Treasury Note 0.375% Due 11/30/2025	0.00	1,406.25	1,406.25
11/30/2022	Interest	912828ZT0	365,000.00	US Treasury Note 0.25% Due 5/31/2025	0.00	456.25	456.25
11/30/2022	Maturity	912828M80	750,000.00	US Treasury Note 2% Due 11/30/2022	750,000.00	7,500.00	757,500.00
NOV 2022					**774,845.44**	**57,161.54**	**832,006.98**
12/08/2022	Interest	3130A0F70	350,000.00	FHLB Note 3.375% Due 12/8/2023	0.00	5,906.25	5,906.25
12/13/2022	Call	037833DE7	200,000.00	Apple Inc Callable Note Cont 12/13/2022 2.4% Due 1/13/2023	200,000.00	2,000.00	202,000.00
12/14/2022	Interest	3130A1XJ2	155,000.00	FHLB Note 2.875% Due 6/14/2024	0.00	2,228.13	2,228.13
12/15/2022	Interest	63743HFE7	95,000.00	National Rural Utilities Note 3.45% Due 6/15/2025	0.00	2,012.02	2,012.02
12/15/2022	Interest	912828ZU7	750,000.00	US Treasury Note 0.25% Due 6/15/2023	0.00	937.50	937.50
12/15/2022	Interest	91282CCG4	400,000.00	US Treasury Note 0.25% Due 6/15/2024	0.00	500.00	500.00
12/15/2022	Maturity	912828YW4	750,000.00	US Treasury Note 1.625% Due 12/15/2022	750,000.00	6,093.75	756,093.75
12/15/2022	Paydown	65479JAD5	41,197.02	Nissan Auto Receivables Owner 2019-C A3 1.93% Due 7/15/2024	1,621.95	53.30	1,675.25
12/15/2022	Paydown	89232HAC9	103,897.34	Toyota Auto Receivable Own 2020-A A3 1.66% Due 5/15/2024	5,594.76	101.43	5,696.19
12/15/2022	Paydown	43815BAC4	165,000.00	Honda Auto Receivables Trust 2022-1 A3 1.88% Due 5/15/2026	0.00	258.50	258.50
12/15/2022	Paydown	47788UAC6	60,000.00	John Deere Owner Trust 2021-A A3 0.36% Due 9/15/2025	2,491.48	17.25	2,508.73

Cash Flow Report

As of June 30, 2022

Payment Date	Transaction Type	CUSIP	Quantity	Security Description	Principal Amount	Income	Total Amount
12/15/2022	Paydown	89238JAC9	65,000.00	Toyota Auto Receivables Trust 2021-D A3 0.71% Due 4/15/2026	0.00	38.46	38.46
12/15/2022	Paydown	02582JJT8	185,000.00	American Express Credit Trust 2022-2 A 3.39% Due 5/17/2027	0.00	522.63	522.63
12/15/2022	Paydown	47789QAC4	70,000.00	John Deere Owner Trust 2021-B A3 0.52% Due 3/16/2026	0.00	30.33	30.33
12/15/2022	Paydown	58769KAD6	80,000.00	Mercedes-Benz Auto Lease Trust 2021-B A3 0.4% Due 11/15/2024	0.00	26.67	26.67
12/15/2022	Paydown	47787JAC2	130,000.00	John Deere Owner Trust 2022-A A3 2.32% Due 9/16/2026	0.00	251.33	251.33
12/15/2022	Paydown	89236XAC0	57,111.58	Toyota Auto Receivables 2020-D A3 0.35% Due 1/15/2025	1,909.01	13.85	1,922.86
12/15/2022	Paydown	89238FAD5	115,000.00	Toyota Auto Receivables OT 2022-B A3 2.93% Due 9/15/2026	0.00	280.79	280.79
12/18/2022	Interest	89236TJH9	300,000.00	Toyota Motor Credit Corp Note 0.5% Due 6/18/2024	0.00	750.00	750.00
12/18/2022	Paydown	43813KAC6	70,985.20	Honda Auto Receivables Trust 2020-3 A3 0.37% Due 10/18/2024	4,171.74	15.46	4,187.20
12/20/2022	Paydown	92290BAA9	120,000.00	Verizon Owner Trust 2020-B A 0.47% Due 2/20/2025	3,734.58	39.70	3,774.28
12/20/2022	Paydown	92348AAA3	26,992.56	Verizon Owner Trust 2019-C A1A 1.94% Due 4/22/2024	1,157.74	34.34	1,192.08
12/21/2022	Paydown	43813GAC5	80,000.00	Honda Auto Receivables Trust 2021-1 A3 0.27% Due 4/21/2025	3,994.68	14.41	4,009.09
12/21/2022	Paydown	43815GAC3	85,000.00	Honda Auto Receivables Trust 2021-4 A3 0.88% Due 1/21/2026	0.00	62.33	62.33
12/25/2022	Paydown	05601XAC3	85,000.00	BMW Vehicle Lease Trust 2022-1 A3 1.1% Due 3/25/2025	0.00	77.92	77.92
12/25/2022	Paydown	09690AAC7	50,000.00	BMW Vehicle Lease Trust 2021-2 A3 0.33% Due 12/26/2024	0.00	13.75	13.75
12/25/2022	Paydown	3137B4GY6	275,000.00	FHLMC K032 A2 3.31% Due 5/25/2023	0.00	758.54	758.54
12/26/2022	Interest	3137EAES4	300,000.00	FHLMC Note 0.25% Due 6/26/2023	0.00	375.00	375.00

Cash Flow Report

As of June 30, 2022

Payment Date	Transaction Type	CUSIP	Quantity	Security Description	Principal Amount	Income	Total Amount
12/30/2022	Call	747525AR4	500,000.00	Qualcomm Inc Callable Note Cont 12/30/2022 2.6% Due 1/30/2023	500,000.00	5,416.67	505,416.67
DEC 2022					**1,474,675.94**	**28,830.31**	**1,503,506.25**
01/06/2023	Interest	3133ENKS8	750,000.00	FFCB Note 1.125% Due 1/6/2025	0.00	4,218.76	4,218.76
01/10/2023	Interest	3135G05G4	250,000.00	FNMA Note 0.25% Due 7/10/2023	0.00	312.50	312.50
01/11/2023	Maturity	89236TEL5	200,000.00	Toyota Motor Credit Corp Note 2.7% Due 1/11/2023	200,000.00	2,700.00	202,700.00
01/15/2023	Interest	79466LAG9	35,000.00	Salesforce.com Inc Callable Note Cont 7/15/2022 0.625% Due 7/15/2024	0.00	109.38	109.38
01/15/2023	Paydown	89232HAC9	103,897.34	Toyota Auto Receivable Own 2020-A A3 1.66% Due 5/15/2024	5,419.79	93.69	5,513.48
01/15/2023	Paydown	89236XAC0	57,111.58	Toyota Auto Receivables 2020-D A3 0.35% Due 1/15/2025	1,902.91	13.29	1,916.20
01/15/2023	Paydown	47788UAC6	60,000.00	John Deere Owner Trust 2021-A A3 0.36% Due 9/15/2025	2,492.28	16.51	2,508.79
01/15/2023	Paydown	43815BAC4	165,000.00	Honda Auto Receivables Trust 2022-1 A3 1.88% Due 5/15/2026	0.00	258.50	258.50
01/15/2023	Paydown	58769KAD6	80,000.00	Mercedes-Benz Auto Lease Trust 2021-B A3 0.4% Due 11/15/2024	6,150.46	26.67	6,177.13
01/15/2023	Paydown	89238JAC9	65,000.00	Toyota Auto Receivables Trust 2021-D A3 0.71% Due 4/15/2026	0.00	38.46	38.46
01/15/2023	Paydown	02582JJT8	185,000.00	American Express Credit Trust 2022-2 A 3.39% Due 5/17/2027	0.00	522.63	522.63
01/15/2023	Paydown	47787JAC2	130,000.00	John Deere Owner Trust 2022-A A3 2.32% Due 9/16/2026	0.00	251.33	251.33
01/15/2023	Paydown	47789QAC4	70,000.00	John Deere Owner Trust 2021-B A3 0.52% Due 3/16/2026	0.00	30.33	30.33
01/15/2023	Paydown	65479JAD5	41,197.02	Nissan Auto Receivables Owner 2019-C A3 1.93% Due 7/15/2024	1,625.60	50.69	1,676.29
01/15/2023	Paydown	89238FAD5	115,000.00	Toyota Auto Receivables OT 2022-B A3 2.93% Due 9/15/2026	0.00	280.79	280.79

Cash Flow Report

As of June 30, 2022

Payment Date	Transaction Type	CUSIP	Quantity	Security Description	Principal Amount	Income	Total Amount
01/18/2023	Paydown	43813KAC6	70,985.20	Honda Auto Receivables Trust 2020-3 A3 0.37% Due 10/18/2024	4,173.02	14.18	4,187.20
01/20/2023	Paydown	92290BAA9	120,000.00	Verizon Owner Trust 2020-B A 0.47% Due 2/20/2025	3,736.05	38.23	3,774.28
01/20/2023	Paydown	92348AAA3	26,992.56	Verizon Owner Trust 2019-C A1A 1.94% Due 4/22/2024	1,160.35	32.47	1,192.82
01/21/2023	Paydown	43813GAC5	80,000.00	Honda Auto Receivables Trust 2021-1 A3 0.27% Due 4/21/2025	3,995.65	13.51	4,009.16
01/21/2023	Paydown	43815GAC3	85,000.00	Honda Auto Receivables Trust 2021-4 A3 0.88% Due 1/21/2026	0.00	62.33	62.33
01/24/2023	Interest	90331HNV1	250,000.00	US Bank NA Callable Note Cont 6/23/2023 3.4% Due 7/24/2023	0.00	4,250.00	4,250.00
01/25/2023	Paydown	3137B4GY6	275,000.00	FHLMC K032 A2 3.31% Due 5/25/2023	0.00	758.54	758.54
01/25/2023	Paydown	09690AAC7	50,000.00	BMW Vehicle Lease Trust 2021-2 A3 0.33% Due 12/26/2024	4,161.13	13.75	4,174.88
01/25/2023	Paydown	05601XAC3	85,000.00	BMW Vehicle Lease Trust 2022-1 A3 1.1% Due 3/25/2025	0.00	77.92	77.92
01/31/2023	Interest	912828Z52	750,000.00	US Treasury Note 1.375% Due 1/31/2025	0.00	5,156.25	5,156.25
01/31/2023	Interest	912828V80	750,000.00	US Treasury Note 2.25% Due 1/31/2024	0.00	8,437.50	8,437.50
01/31/2023	Interest	912828Y87	300,000.00	US Treasury Note 1.75% Due 7/31/2024	0.00	2,625.00	2,625.00
JAN 2023					**234,817.24**	**30,403.21**	**265,220.45**
02/06/2023	Interest	857477BR3	90,000.00	State Street Bank Callable Note Cont 2/6/2025 1.746% Due 2/6/2026	0.00	785.70	785.70
02/06/2023	Interest	594918BX1	200,000.00	Microsoft Callable Note Cont 12/6/2023 2.875% Due 2/6/2024	0.00	2,875.00	2,875.00
02/09/2023	Interest	69371RR40	80,000.00	Paccar Financial Corp Note 0.5% Due 8/9/2024	0.00	200.00	200.00
02/14/2023	Interest	3133ENPG9	415,000.00	FFCB Note 1.75% Due 2/14/2025	0.00	3,631.25	3,631.25

Cash Flow Report

As of June 30, 2022

Payment Date	Transaction Type	CUSIP	Quantity	Security Description	Principal Amount	Income	Total Amount
02/15/2023	Interest	912828B66	750,000.00	US Treasury Note 2.75% Due 2/15/2024	0.00	10,312.50	10,312.50
02/15/2023	Interest	91282CCT6	400,000.00	US Treasury Note 0.375% Due 8/15/2024	0.00	750.00	750.00
02/15/2023	Paydown	43815BAC4	165,000.00	Honda Auto Receivables Trust 2022-1 A3 1.88% Due 5/15/2026	0.00	258.50	258.50
02/15/2023	Paydown	89238JAC9	65,000.00	Toyota Auto Receivables Trust 2021-D A3 0.71% Due 4/15/2026	0.00	38.46	38.46
02/15/2023	Paydown	02582JJT8	185,000.00	American Express Credit Trust 2022-2 A 3.39% Due 5/17/2027	0.00	522.63	522.63
02/15/2023	Paydown	47788UAC6	60,000.00	John Deere Owner Trust 2021-A A3 0.36% Due 9/15/2025	2,493.10	15.76	2,508.86
02/15/2023	Paydown	47789QAC4	70,000.00	John Deere Owner Trust 2021-B A3 0.52% Due 3/16/2026	0.00	30.33	30.33
02/15/2023	Paydown	58769KAD6	80,000.00	Mercedes-Benz Auto Lease Trust 2021-B A3 0.4% Due 11/15/2024	6,151.02	24.62	6,175.64
02/15/2023	Paydown	89238FAD5	115,000.00	Toyota Auto Receivables OT 2022-B A3 2.93% Due 9/15/2026	0.00	280.79	280.79
02/15/2023	Paydown	47787JAC2	130,000.00	John Deere Owner Trust 2022-A A3 2.32% Due 9/16/2026	0.00	251.33	251.33
02/15/2023	Paydown	89236XAC0	57,111.58	Toyota Auto Receivables 2020-D A3 0.35% Due 1/15/2025	1,896.74	12.74	1,909.48
02/15/2023	Paydown	65479JAD5	41,197.02	Nissan Auto Receivables Owner 2019-C A3 1.93% Due 7/15/2024	1,629.25	48.08	1,677.33
02/15/2023	Paydown	89232HAC9	103,897.34	Toyota Auto Receivable Own 2020-A A3 1.66% Due 5/15/2024	5,244.06	86.20	5,330.26
02/16/2023	Interest	06406FAD5	200,000.00	Bank of NY Mellon Corp Callable Note Cont 6/16/2023 2.2% Due 8/16/2023	0.00	2,200.00	2,200.00
02/18/2023	Paydown	43813KAC6	70,985.20	Honda Auto Receivables Trust 2020-3 A3 0.37% Due 10/18/2024	4,174.31	12.89	4,187.20
02/20/2023	Paydown	92290BAA9	120,000.00	Verizon Owner Trust 2020-B A 0.47% Due 2/20/2025	3,737.51	36.77	3,774.28

Cash Flow Report

As of June 30, 2022

Payment Date	Transaction Type	CUSIP	Quantity	Security Description	Principal Amount	Income	Total Amount
02/20/2023	Paydown	92348AAA3	26,992.56	Verizon Owner Trust 2019-C A1A 1.94% Due 4/22/2024	1,162.96	30.59	1,193.55
02/21/2023	Paydown	43813GAC5	80,000.00	Honda Auto Receivables Trust 2021-1 A3 0.27% Due 4/21/2025	3,996.61	12.61	4,009.22
02/21/2023	Paydown	43815GAC3	85,000.00	Honda Auto Receivables Trust 2021-4 A3 0.88% Due 1/21/2026	0.00	62.33	62.33
02/24/2023	Interest	3137EAEV7	300,000.00	FHLMC Note 0.25% Due 8/24/2023	0.00	375.00	375.00
02/25/2023	Paydown	3137B4GY6	275,000.00	FHLMC K032 A2 3.31% Due 5/25/2023	68,431.14	758.54	69,189.68
02/25/2023	Paydown	05601XAC3	85,000.00	BMW Vehicle Lease Trust 2022-1 A3 1.1% Due 3/25/2025	0.00	77.92	77.92
02/25/2023	Paydown	09690AAC7	50,000.00	BMW Vehicle Lease Trust 2021-2 A3 0.33% Due 12/26/2024	4,162.13	12.61	4,174.74
02/28/2023	Interest	9128284Z0	750,000.00	US Treasury Note 2.75% Due 8/31/2025	0.00	10,312.50	10,312.50
FEB 2023					**103,078.83**	**34,015.65**	**137,094.48**
03/01/2023	Interest	46647PAH9	500,000.00	JP Morgan Chase & Co Callable Note 2X 3/1/2024 3.22% Due 3/1/2025	0.00	8,050.00	8,050.00
03/07/2023	Interest	24422EWB1	130,000.00	John Deere Capital Corp Note 2.125% Due 3/7/2025	0.00	1,381.25	1,381.25
03/08/2023	Interest	3137EAEW5	300,000.00	FHLMC Note 0.25% Due 9/8/2023	0.00	375.00	375.00
03/10/2023	Maturity	3130ADRG9	350,000.00	FHLB Note 2.75% Due 3/10/2023	350,000.00	4,812.50	354,812.50
03/11/2023	Interest	89114QCB2	500,000.00	Toronto Dominion Bank Note 3.25% Due 3/11/2024	0.00	8,125.00	8,125.00
03/12/2023	Interest	3135G0U43	350,000.00	FNMA Note 2.875% Due 9/12/2023	0.00	5,031.25	5,031.25
03/15/2023	Maturity	912828ZD5	325,000.00	US Treasury Note 0.5% Due 3/15/2023	325,000.00	812.50	325,812.50
03/15/2023	Paydown	02582JJT8	185,000.00	American Express Credit Trust 2022-2 A 3.39% Due 5/17/2027	0.00	522.63	522.63

Cash Flow Report

As of June 30, 2022

Payment Date	Transaction Type	CUSIP	Quantity	Security Description	Principal Amount	Income	Total Amount
03/15/2023	Paydown	43815BAC4	165,000.00	Honda Auto Receivables Trust 2022-1 A3 1.88% Due 5/15/2026	0.00	258.50	258.50
03/15/2023	Paydown	47789QAC4	70,000.00	John Deere Owner Trust 2021-B A3 0.52% Due 3/16/2026	0.00	30.33	30.33
03/15/2023	Paydown	58769KAD6	80,000.00	Mercedes-Benz Auto Lease Trust 2021-B A3 0.4% Due 11/15/2024	6,151.59	22.57	6,174.16
03/15/2023	Paydown	89238FAD5	115,000.00	Toyota Auto Receivables OT 2022-B A3 2.93% Due 9/15/2026	0.00	280.79	280.79
03/15/2023	Paydown	47787JAC2	130,000.00	John Deere Owner Trust 2022-A A3 2.32% Due 9/16/2026	0.00	251.33	251.33
03/15/2023	Paydown	65479JAD5	41,197.02	Nissan Auto Receivables Owner 2019-C A3 1.93% Due 7/15/2024	1,632.92	45.46	1,678.38
03/15/2023	Paydown	89238JAC9	65,000.00	Toyota Auto Receivables Trust 2021-D A3 0.71% Due 4/15/2026	0.00	38.46	38.46
03/15/2023	Paydown	47788UAC6	60,000.00	John Deere Owner Trust 2021-A A3 0.36% Due 9/15/2025	2,493.91	15.01	2,508.92
03/15/2023	Paydown	89232HAC9	103,897.34	Toyota Auto Receivable Own 2020-A A3 1.66% Due 5/15/2024	5,067.62	78.94	5,146.56
03/15/2023	Paydown	89236XAC0	57,111.58	Toyota Auto Receivables 2020-D A3 0.35% Due 1/15/2025	1,890.52	12.18	1,902.70
03/17/2023	Interest	931142ER0	40,000.00	Wal-Mart Stores Callable Note Cont 08/17/2026 1.05% Due 9/17/2026	0.00	210.00	210.00
03/18/2023	Interest	808513BN4	245,000.00	Charles Schwab Corp Callable Note Cont 2/18/2024 0.75% Due 3/18/2024	0.00	918.75	918.75
03/18/2023	Paydown	43813KAC6	70,985.20	Honda Auto Receivables Trust 2020-3 A3 0.37% Due 10/18/2024	4,175.60	11.60	4,187.20
03/19/2023	Interest	459058GQ0	225,000.00	Intl. Bank Recon & Development Note 2.5% Due 3/19/2024	0.00	2,812.50	2,812.50
03/20/2023	Paydown	92348AAA3	26,992.56	Verizon Owner Trust 2019-C A1A 1.94% Due 4/22/2024	1,165.58	28.71	1,194.29
03/20/2023	Paydown	92290BAA9	120,000.00	Verizon Owner Trust 2020-B A 0.47% Due 2/20/2025	3,738.97	35.31	3,774.28
03/21/2023	Paydown	43815GAC3	85,000.00	Honda Auto Receivables Trust 2021-4 A3 0.88% Due 1/21/2026	0.00	62.33	62.33

Cash Flow Report

As of June 30, 2022

Payment Date	Transaction Type	CUSIP	Quantity	Security Description	Principal Amount	Income	Total Amount
03/21/2023	Paydown	43813GAC5	80,000.00	Honda Auto Receivables Trust 2021-1 A3 0.27% Due 4/21/2025	3,997.58	11.71	4,009.29
03/23/2023	Interest	4581X0DZ8	260,000.00	Inter-American Dev Bank Note 0.5% Due 9/23/2024	0.00	650.00	650.00
03/25/2023	Paydown	09690AAC7	50,000.00	BMW Vehicle Lease Trust 2021-2 A3 0.33% Due 12/26/2024	4,163.14	11.46	4,174.60
03/25/2023	Paydown	3137B4GY6	275,000.00	FHLMC K032 A2 3.31% Due 5/25/2023	68,643.27	569.79	69,213.06
03/25/2023	Paydown	05601XAC3	85,000.00	BMW Vehicle Lease Trust 2022-1 A3 1.1% Due 3/25/2025	0.00	77.92	77.92
03/31/2023	Interest	912828W71	750,000.00	US Treasury Note 2.125% Due 3/31/2024	0.00	7,968.75	7,968.75
03/31/2023	Interest	912828YG9	300,000.00	US Treasury Note 1.625% Due 9/30/2026	0.00	2,437.50	2,437.50
03/31/2023	Interest	9128286L9	750,000.00	US Treasury Note 2.25% Due 3/31/2026	0.00	8,437.50	8,437.50
03/31/2023	Interest	912828T26	750,000.00	US Treasury Note 1.375% Due 9/30/2023	0.00	5,156.25	5,156.25
03/31/2023	Interest	912828ZF0	350,000.00	US Treasury Note 0.5% Due 3/31/2025	0.00	875.00	875.00
03/31/2023	Interest	91282CEF4	750,000.00	US Treasury Note 2.5% Due 3/31/2027	0.00	9,375.00	9,375.00
MAR 2023					**778,120.70**	**69,793.78**	**847,914.48**
04/15/2023	Interest	91282CBV2	500,000.00	US Treasury Note 0.375% Due 4/15/2024	0.00	937.50	937.50
04/15/2023	Paydown	43815BAC4	165,000.00	Honda Auto Receivables Trust 2022-1 A3 1.88% Due 5/15/2026	0.00	258.50	258.50
04/15/2023	Paydown	89236XAC0	57,111.58	Toyota Auto Receivables 2020-D A3 0.35% Due 1/15/2025	1,884.22	11.63	1,895.85
04/15/2023	Paydown	47787JAC2	130,000.00	John Deere Owner Trust 2022-A A3 2.32% Due 9/16/2026	0.00	251.33	251.33
04/15/2023	Paydown	89238JAC9	65,000.00	Toyota Auto Receivables Trust 2021-D A3 0.71% Due 4/15/2026	0.00	38.46	38.46

Cash Flow Report

As of June 30, 2022

Payment Date	Transaction Type	CUSIP	Quantity	Security Description	Principal Amount	Income	Total Amount
04/15/2023	Paydown	02582JJT8	185,000.00	American Express Credit Trust 2022-2 A 3.39% Due 5/17/2027	0.00	522.63	522.63
04/15/2023	Paydown	47788UAC6	60,000.00	John Deere Owner Trust 2021-A A3 0.36% Due 9/15/2025	2,494.72	14.26	2,508.98
04/15/2023	Paydown	47789QAC4	70,000.00	John Deere Owner Trust 2021-B A3 0.52% Due 3/16/2026	0.00	30.33	30.33
04/15/2023	Paydown	65479JAD5	41,197.02	Nissan Auto Receivables Owner 2019-C A3 1.93% Due 7/15/2024	1,636.60	42.83	1,679.43
04/15/2023	Paydown	89238FAD5	115,000.00	Toyota Auto Receivables OT 2022-B A3 2.93% Due 9/15/2026	0.00	280.79	280.79
04/15/2023	Paydown	58769KAD6	80,000.00	Mercedes-Benz Auto Lease Trust 2021-B A3 0.4% Due 11/15/2024	6,152.15	20.52	6,172.67
04/15/2023	Paydown	89232HAC9	103,897.34	Toyota Auto Receivable Own 2020-A A3 1.66% Due 5/15/2024	4,890.42	71.93	4,962.35
04/16/2023	Interest	3137EAEY1	225,000.00	FHLMC Note 0.125% Due 10/16/2023	0.00	140.63	140.63
04/16/2023	Interest	45950KCR9	160,000.00	International Finance Corp Note 1.375% Due 10/16/2024	0.00	1,100.00	1,100.00
04/18/2023	Paydown	43813KAC6	70,985.20	Honda Auto Receivables Trust 2020-3 A3 0.37% Due 10/18/2024	4,176.89	10.31	4,187.20
04/20/2023	Paydown	92348AAA3	26,992.56	Verizon Owner Trust 2019-C A1A 1.94% Due 4/22/2024	1,168.20	26.83	1,195.03
04/20/2023	Paydown	92290BAA9	120,000.00	Verizon Owner Trust 2020-B A 0.47% Due 2/20/2025	3,740.44	33.84	3,774.28
04/21/2023	Paydown	43815GAC3	85,000.00	Honda Auto Receivables Trust 2021-4 A3 0.88% Due 1/21/2026	0.00	62.33	62.33
04/21/2023	Paydown	43813GAC5	80,000.00	Honda Auto Receivables Trust 2021-1 A3 0.27% Due 4/21/2025	3,998.55	10.81	4,009.36
04/25/2023	Interest	06406RBC0	280,000.00	Bank of NY Mellon Corp Callable Note Cont 3/25/2025 3.35% Due 4/25/2025	0.00	4,690.00	4,690.00
04/25/2023	Paydown	3137B4GY6	275,000.00	FHLMC K032 A2 3.31% Due 5/25/2023	68,856.07	380.44	69,236.51

Cash Flow Report

As of June 30, 2022

Payment Date	Transaction Type	CUSIP	Quantity	Security Description	Principal Amount	Income	Total Amount
04/25/2023	Paydown	05601XAC3	85,000.00	BMW Vehicle Lease Trust 2022-1 A3 1.1% Due 3/25/2025	0.00	77.92	77.92
04/25/2023	Paydown	09690AAC7	50,000.00	BMW Vehicle Lease Trust 2021-2 A3 0.33% Due 12/26/2024	4,164.15	10.32	4,174.47
APR 2023					**103,162.41**	**9,024.14**	**112,186.55**
05/01/2023	Interest	78015K7C2	500,000.00	Royal Bank of Canada Note 2.25% Due 11/1/2024	0.00	5,625.00	5,625.00
05/03/2023	Maturity	037833AK6	200,000.00	Apple Inc Note 2.4% Due 5/3/2023	200,000.00	2,400.00	202,400.00
05/05/2023	Maturity	3137EAER6	305,000.00	FHLMC Note 0.375% Due 5/5/2023	305,000.00	571.88	305,571.88
05/06/2023	Interest	3137EAEZ8	335,000.00	FHLMC Note 0.25% Due 11/6/2023	0.00	418.75	418.75
05/07/2023	Interest	3135G06G3	350,000.00	FNMA Note 0.5% Due 11/7/2025	0.00	875.00	875.00
05/08/2023	Interest	69371RR57	175,000.00	Paccar Financial Corp Note 0.9% Due 11/8/2024	0.00	787.50	787.50
05/12/2023	Interest	023135BW5	130,000.00	Amazon.com Inc Note 0.45% Due 5/12/2024	0.00	292.50	292.50
05/15/2023	Interest	912828X88	350,000.00	US Treasury Note 2.375% Due 5/15/2027	0.00	4,156.25	4,156.25
05/15/2023	Interest	91324PEB4	500,000.00	United Health Group Inc Callable Note Cont 5/15/2022 0.55% Due 5/15/2024	0.00	1,375.00	1,375.00
05/15/2023	Interest	912828U24	625,000.00	US Treasury Note 2% Due 11/15/2026	0.00	6,250.00	6,250.00
05/15/2023	Interest	91282CDH1	750,000.00	US Treasury Note 0.75% Due 11/15/2024	0.00	2,812.50	2,812.50
05/15/2023	Interest	912828WJ5	750,000.00	US Treasury Note 2.5% Due 5/15/2024	0.00	9,375.00	9,375.00
05/15/2023	Interest	912828R36	250,000.00	US Treasury Note 1.625% Due 5/15/2026	0.00	2,031.25	2,031.25
05/15/2023	Maturity	912828VB3	750,000.00	US Treasury Note 1.75% Due 5/15/2023	750,000.00	6,562.50	756,562.50

Cash Flow Report

As of June 30, 2022

Payment Date	Transaction Type	CUSIP	Quantity	Security Description	Principal Amount	Income	Total Amount
05/15/2023	Paydown	02582JJT8	185,000.00	American Express Credit Trust 2022-2 A 3.39% Due 5/17/2027	0.00	522.63	522.63
05/15/2023	Paydown	47789QAC4	70,000.00	John Deere Owner Trust 2021-B A3 0.52% Due 3/16/2026	3,040.41	30.33	3,070.74
05/15/2023	Paydown	65479JAD5	41,197.02	Nissan Auto Receivables Owner 2019-C A3 1.93% Due 7/15/2024	1,640.28	40.20	1,680.48
05/15/2023	Paydown	89238FAD5	115,000.00	Toyota Auto Receivables OT 2022-B A3 2.93% Due 9/15/2026	0.00	280.79	280.79
05/15/2023	Paydown	47787JAC2	130,000.00	John Deere Owner Trust 2022-A A3 2.32% Due 9/16/2026	0.00	251.33	251.33
05/15/2023	Paydown	47788UAC6	60,000.00	John Deere Owner Trust 2021-A A3 0.36% Due 9/15/2025	2,495.53	13.51	2,509.04
05/15/2023	Paydown	89232HAC9	103,897.34	Toyota Auto Receivable Own 2020-A A3 1.66% Due 5/15/2024	4,712.47	65.17	4,777.64
05/15/2023	Paydown	89236XAC0	57,111.58	Toyota Auto Receivables 2020-D A3 0.35% Due 1/15/2025	1,877.86	11.08	1,888.94
05/15/2023	Paydown	43815BAC4	165,000.00	Honda Auto Receivables Trust 2022-1 A3 1.88% Due 5/15/2026	0.00	258.50	258.50
05/15/2023	Paydown	58769KAD6	80,000.00	Mercedes-Benz Auto Lease Trust 2021-B A3 0.4% Due 11/15/2024	6,152.72	18.46	6,171.18
05/15/2023	Paydown	89238JAC9	65,000.00	Toyota Auto Receivables Trust 2021-D A3 0.71% Due 4/15/2026	2,936.23	38.46	2,974.69
05/17/2023	Interest	14913R2L0	500,000.00	Caterpillar Financial Service Note 0.45% Due 5/17/2024	0.00	1,125.00	1,125.00
05/18/2023	Paydown	43813KAC6	70,985.20	Honda Auto Receivables Trust 2020-3 A3 0.37% Due 10/18/2024	4,178.17	9.03	4,187.20
05/20/2023	Paydown	92348AAA3	26,992.56	Verizon Owner Trust 2019-C A1A 1.94% Due 4/22/2024	1,170.83	24.94	1,195.77
05/20/2023	Paydown	92290BAA9	120,000.00	Verizon Owner Trust 2020-B A 0.47% Due 2/20/2025	3,741.90	32.38	3,774.28
05/21/2023	Paydown	43813GAC5	80,000.00	Honda Auto Receivables Trust 2021-1 A3 0.27% Due 4/21/2025	3,999.51	9.91	4,009.42
05/21/2023	Paydown	43815GAC3	85,000.00	Honda Auto Receivables Trust 2021-4 A3 0.88% Due 1/21/2026	3,854.18	62.33	3,916.51

Cash Flow Report

As of June 30, 2022

Payment Date	Transaction Type	CUSIP	Quantity	Security Description	Principal Amount	Income	Total Amount
05/22/2023	Maturity	3135G04Q3	245,000.00	FNMA Note 0.25% Due 5/22/2023	245,000.00	306.25	245,306.25
05/24/2023	Interest	459058JM6	165,000.00	Intl. Bank Recon & Development Note 0.25% Due 11/24/2023	0.00	206.25	206.25
05/25/2023	Paydown	05601XAC3	85,000.00	BMW Vehicle Lease Trust 2022-1 A3 1.1% Due 3/25/2025	7,687.75	77.92	7,765.67
05/25/2023	Paydown	09690AAC7	50,000.00	BMW Vehicle Lease Trust 2021-2 A3 0.33% Due 12/26/2024	4,165.16	9.17	4,174.33
05/25/2023	Paydown	3137B4GY6	275,000.00	FHLMC K032 A2 3.31% Due 5/25/2023	69,069.52	190.52	69,260.04
05/31/2023	Interest	912828ZT0	365,000.00	US Treasury Note 0.25% Due 5/31/2025	0.00	456.25	456.25
05/31/2023	Interest	91282CAZ4	750,000.00	US Treasury Note 0.375% Due 11/30/2025	0.00	1,406.25	1,406.25
MAY 2023					**1,620,722.52**	**48,979.79**	**1,669,702.31**
06/08/2023	Interest	3130A0F70	350,000.00	FHLB Note 3.375% Due 12/8/2023	0.00	5,906.25	5,906.25
06/14/2023	Interest	3130A1XJ2	155,000.00	FHLB Note 2.875% Due 6/14/2024	0.00	2,228.13	2,228.13
06/15/2023	Interest	63743HFE7	95,000.00	National Rural Utilities Note 3.45% Due 6/15/2025	0.00	1,638.75	1,638.75
06/15/2023	Interest	91282CCG4	400,000.00	US Treasury Note 0.25% Due 6/15/2024	0.00	500.00	500.00
06/15/2023	Maturity	912828ZU7	750,000.00	US Treasury Note 0.25% Due 6/15/2023	750,000.00	937.50	750,937.50
06/15/2023	Paydown	89238FAD5	115,000.00	Toyota Auto Receivables OT 2022-B A3 2.93% Due 9/15/2026	0.00	280.79	280.79
06/15/2023	Paydown	02582JJT8	185,000.00	American Express Credit Trust 2022-2 A 3.39% Due 5/17/2027	0.00	522.63	522.63
06/15/2023	Paydown	47788UAC6	60,000.00	John Deere Owner Trust 2021-A A3 0.36% Due 9/15/2025	2,496.35	12.76	2,509.11
06/15/2023	Paydown	47789QAC4	70,000.00	John Deere Owner Trust 2021-B A3 0.52% Due 3/16/2026	3,040.69	29.02	3,069.71

Cash Flow Report

As of June 30, 2022

Payment Date	Transaction Type	CUSIP	Quantity	Security Description	Principal Amount	Income	Total Amount
06/15/2023	Paydown	58769KAD6	80,000.00	Mercedes-Benz Auto Lease Trust 2021-B A3 0.4% Due 11/15/2024	6,153.29	16.41	6,169.70
06/15/2023	Paydown	65479JAD5	41,197.02	Nissan Auto Receivables Owner 2019-C A3 1.93% Due 7/15/2024	1,643.97	37.56	1,681.53
06/15/2023	Paydown	89232HAC9	103,897.34	Toyota Auto Receivable Own 2020-A A3 1.66% Due 5/15/2024	4,533.79	58.65	4,592.44
06/15/2023	Paydown	47787JAC2	130,000.00	John Deere Owner Trust 2022-A A3 2.32% Due 9/16/2026	0.00	251.33	251.33
06/15/2023	Paydown	89236XAC0	57,111.58	Toyota Auto Receivables 2020-D A3 0.35% Due 1/15/2025	1,871.44	10.53	1,881.97
06/15/2023	Paydown	43815BAC4	165,000.00	Honda Auto Receivables Trust 2022-1 A3 1.88% Due 5/15/2026	0.00	258.50	258.50
06/15/2023	Paydown	89238JAC9	65,000.00	Toyota Auto Receivables Trust 2021-D A3 0.71% Due 4/15/2026	2,937.97	36.72	2,974.69
06/18/2023	Interest	89236TJH9	300,000.00	Toyota Motor Credit Corp Note 0.5% Due 6/18/2024	0.00	750.00	750.00
06/18/2023	Paydown	43813KAC6	70,985.20	Honda Auto Receivables Trust 2020-3 A3 0.37% Due 10/18/2024	4,179.46	7.74	4,187.20
06/20/2023	Paydown	92290BAA9	120,000.00	Verizon Owner Trust 2020-B A 0.47% Due 2/20/2025	3,743.37	30.91	3,774.28
06/20/2023	Paydown	92348AAA3	26,992.56	Verizon Owner Trust 2019-C A1A 1.94% Due 4/22/2024	1,173.46	23.05	1,196.51
06/21/2023	Paydown	43813GAC5	80,000.00	Honda Auto Receivables Trust 2021-1 A3 0.27% Due 4/21/2025	4,000.48	9.01	4,009.49
06/21/2023	Paydown	43815GAC3	85,000.00	Honda Auto Receivables Trust 2021-4 A3 0.88% Due 1/21/2026	3,855.08	59.51	3,914.59
06/23/2023	Call	90331HNV1	250,000.00	US Bank NA Callable Note Cont 6/23/2023 3.4% Due 7/24/2023	250,000.00	3,518.06	253,518.06
06/25/2023	Paydown	05601XAC3	85,000.00	BMW Vehicle Lease Trust 2022-1 A3 1.1% Due 3/25/2025	7,695.63	70.87	7,766.50
06/25/2023	Paydown	09690AAC7	50,000.00	BMW Vehicle Lease Trust 2021-2 A3 0.33% Due 12/26/2024	4,166.16	8.03	4,174.19

Cash Flow Report

As of June 30, 2022

Payment Date	Transaction Type	CUSIP	Quantity	Security Description	Principal Amount	Income	Total Amount
06/26/2023	Maturity	3137EAES4	300,000.00	FHLMC Note 0.25% Due 6/26/2023	300,000.00	375.00	300,375.00
JUN 2023					**1,351,491.14**	**17,577.71**	**1,369,068.85**
TOTAL					**8,679,892.44**	**491,879.40**	**9,171,771.84**

Important Disclosures

Chandler Asset Management, Inc. (“Chandler”) is an SEC registered investment adviser. For additional information about our firm, please see our current disclosures (Form ADV). To obtain a copy of our current disclosures, you may contact your client service representative by calling the number on the front of this statement or you may visit our website at www.chandlerasset.com.

Information contained in this monthly statement is confidential and is provided for informational purposes only and should not be construed as specific investment or legal advice. The information contained herein was obtained from sources believed to be reliable as of the date of this statement, but may become outdated or superseded at any time without notice.

Custody: Your qualified custodian bank maintains control of all assets reflected in this statement and we urge you to compare this statement to the one you receive from your qualified custodian. Chandler does not have any authority to withdraw or deposit funds from/to the custodian account.

Valuation: Prices are provided by IDC, an independent pricing source. In the event IDC does not provide a price or if the price provided is not reflective of fair market value, Chandler will obtain pricing from an alternative approved third party pricing source in accordance with our written valuation policy and procedures. Our valuation procedures are also disclosed in Item 5 of our Form ADV Part 2A.

Performance: Performance results are presented gross-of-advisory fees and represent the client’s Total Return. The deduction of advisory fees lowers performance results. These results include the reinvestment of dividends and other earnings. Past performance may not be indicative of future results. Therefore, clients should not assume that future performance of any specific investment or investment strategy will be profitable or equal to past performance levels. All investment strategies have the potential for profit or loss. Economic factors, market conditions or changes in investment strategies, contributions or withdrawals may materially alter the performance and results of your portfolio.

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Index returns assume reinvestment of all distributions. Historical performance results for investment indexes generally do not reflect the deduction of transaction and/or custodial charges or the deduction of an investment management fee, the incurrence of which would have the effect of decreasing historical performance results. It is not possible to invest directly in an index.

Ratings: Ratings information have been provided by Moody’s, S&P and Fitch through data feeds we believe to be reliable as of the date of this statement, however we cannot guarantee its accuracy.

Security level ratings for U.S. Agency issued mortgage-backed securities (“MBS”) reflect the issuer rating because the securities themselves are not rated. The issuing U.S. Agency guarantees the full and timely payment of both principal and interest and carries a AA+/Aaa/AAA by S&P, Moody’s and Fitch respectively.

CITY of GARDENA

Report No. P-2022-14

TO: THE HONORABLE MAYOR AND CITY COUNCIL

SUBJECT: PERSONNEL REPORT

1. Report the count of confirmed COVID-19 employee cases.
   Total Count: One-Hundred Ninety-Nine (199)
   a. Administrative Services Department: Eight (8)
   b. City Clerk's Office: Three (3)
   c. Elected & City Manager's Offices: One (1)
   d. Community Development Department: Five (5)
   e. Transportation Department: Sixty-Three (63)
   f. Police Department: Forty-Nine (49)
   g. Public Works Department: Thirty-Three (33)
   h. Recreation & Human Services Department: Thirty-Seven (37)

2. Request City Council approval to revise the City's Classification and Compensation Plan to add the new classification of Homeless Coordinator to Schedule 38 ($4,104 - $5,237/month). This position will be located in the Recreation Department. Job Description attached. *Attachment 1*

3. Request City Council approval to revise the City's Classification and Compensation Plan to adjust the salary schedule of Civil Engineer classification from Schedule 125 ($8,232 - $10,507/month) to Schedule 66 ($8,194 - $10,458/month). The schedule adjustment is to correctly place classification under GMEA Schedules. *Attachment 2*

4. Report the Appointment of the following individuals:

   a. ***ALEXA LUNA*** to the position of Police Service Officer**,** Schedule 42 ($4,531 - $5,783/month) with the Police Department effective July 18, 2022.
   b. ***EDWINA FARANI*** to the position of Police Service Officer**,** Schedule 42 ($4,531 - $5,783/month) with the Police Department effective July 19, 2022.

5. Report the Promotion of the following individuals:

   a. ***DIANA SCHNUR*** to the position of Human Resources Manager, Schedule 133 ($10,031 - $12,804/month) with the Administrative Services Department effective July 1, 2022.
   b. ***ADRIANNA RENTERIA*** to the position of Administrative Coordinator, Schedule 56 ($6,401 - $8,170/month) with the Recreation Department, effective July 19, 2022.

6. Report the Recruitment for the Open/Competitive position of Risk Management Analyst (Administrative Services Department). This recruitment is open until filled.

7. Report the Recruitment for the Open/Competitive position of Help Desk Technician (Administrative Services Department). This recruitment is open until filled.

8. Report the Recruitment for the Closed/Competitive position of Bus Operator (GTrans Department). This recruitment is scheduled to close August 1, 2022.

Homeless Coordinator

(Job Summary)

The City of Gardena is seeking applications for its Homeless Program Coordinator position. This position is grant-funded and will coordinate existing services for the homeless in areas such as prevention, early intervention, emergency, and support services; develop and implement new strategies in collaboration with other agencies; provide staff assistance in the Recreation and Human Services Department; organize and participate in public outreach, education, and advocacy efforts; perform research, report writing.

Representative Duties

Duties may include, but are not limited to:
Work with Senior staff to plan a daily schedule; Develop and coordinate a working group of representatives from city departments who will implement homeless prevention and intervention strategies.; Coordinate City's policies and activities with local, regional, state, and federal homeless programs. Maintain professional relationships with offices of local government, and City and County Departments.; Network with City departments and the business community to create expanded services and employment opportunities for homeless people; serve as liaison on homeless issues with non-profit and public agencies and coalitions.; Advocate for greater support and expansion of homeless programs at all appropriate levels of government.; Establish, maintain, and enhance cooperative relationships with local service providers and the homeless community.; Conduct and participate in public outreach and educational programs; advocate for and promote acceptance of homeless persons and/or programs in localities and neighborhoods.; Maintain data and statistics on the City's existing homeless population and services.; Operate a motor vehicle in the performance of assigned duties.; Provide linkages to resources available for the homeless population; Provide a presence and monitor homeless campsites throughout the City.; Assists with and coordinates homeless outreach and engagement efforts; provides assistance to the homeless population.; Participate in prevention activities by working with various departments, groups, and individuals on addressing issues, concerns, and complaints.; Administer public information programs and education programs to inform the homeless of the social service programs and outreach efforts occurring in the City. ; Prepare and present information regarding homeless efforts at administrative meetings, as required.; Coordinate and facilitate with other agencies and City departments regarding the needs of the homeless population within the city.; Confer with departments on initiatives, programs, and projects; provide input regarding strategic planning and implementation; Collaborate with staff to identify and seek co-sponsorship community outreach opportunities; Provide information to City management on emerging and urgent issues related to homelessness in the City; Maintain records and statistics related to homelessness. Performs other administrative tasks as needed; Build and maintains positive working relationships with co-workers, other City employees, and the public using principles of good customer service.; Manage funding associated with homeless programs and cleanup efforts; Drive City vehicles in a safe and knowledgeable manner; Perform related duties as assigned.

QUALIFICATIONS GUIDE

Education and Experience

Any combination of education and experience that is equivalent to the following minimum qualifications is acceptable:
Possession of a bachelor's degree from an accredited college or university with major course work in social sciences or a related field.
One year of progressively responsible experience in the field of social services with homeless or low-income services. Experience working with diverse agencies and community groups in a local government or non-profit agency preferred. Experience performing intakes and assessing social service needs

Knowledge and Abilities

Applicant must possess working knowledge of basic principles and practices of service provision to the homeless; Program planning, development, and coordination; Community outreach, advocacy, and public education; Methods and techniques of researching funding sources, fundraising, and grant writing; Municipal government and organization.
Applicants should possess a positive attitude, and the ability to comfortably interact with diverse populations, be energetic and independent and have a strong desire to learn; Good communication typing skills and computer proficiency, including Microsoft Office Suite; Work cooperatively with diverse agencies, service providers, and community groups; Develop creative and effective solutions to complex problems and issues; Develop and implement goals, objectives, policies, and procedures for programs; Coordinate activities with City staff and other

agencies; Communicate effectively in both oral and written form; Prepare clear and concise research reports, correspondence, and other written materials; Follow oral and written directions; Establish and maintain effective work relationships with those contacted in the performance of required duties; While performing the duties of this job, the employee is regularly required to walk; climb or balance, and stoop, kneel, crouch, or crawl. The employee must occasionally lift and/or move items over 25 pounds.

License

Possession of a valid California Driver's License – minimum "Class C" – to be maintained as a condition of continued employment.

Special Conditions

Per LA County Ordinance #2021-0066U, all City of Gardena employees performing duties under the Innovation Grant/Measure H must be fully vaccinated against COVID-19 as a condition of employment. Successful candidates for this position will be required to submit proof of vaccination against COVID-19 or request an exemption for qualifying medical or religious reasons during the onboarding process. Candidates should not present proof of vaccination until instructed to do so by the hiring department.

This position is dependent upon grant funding.

CITY OF GARDENA
CLASSIFICATION AND COMPENSATION PLAN
AS OF JULY 26, 2022

Add Grades to Class and Compensation Plan; Schedules 63-67
Adjust Civil Engineer - From Schedule 125 To Schedule 66
Add Homeless Coordinator - Schedule 38

6 Clerical Aide I
6 Police Aide

STEP	[redacted]	*4*	*5*	*6*
ANNUAL	[redacted]	29,952.00	31,452.00	33,024.00
MONTHLY	[redacted]	2,496.00	2,621.00	2,752.00
BI-WEEKLY	[redacted]	1,152.00	1,209.69	1,270.15
HOURLY	[redacted]	14.4000	15.1212	15.8769

7 Peer Advocate Counselor II
7 Storeroom Aide

STEP	[redacted]	*6*
ANNUAL	[redacted]	32,256.00
MONTHLY	[redacted]	2,688.00
BI-WEEKLY	[redacted]	1,240.62
HOURLY	[redacted]	15.5077

8 Community Aide I

STEP	[redacted]	*5*	*6*
ANNUAL	[redacted]	31,488.00	33,060.00
MONTHLY	[redacted]	2,624.00	2,755.00
BI-WEEKLY	[redacted]	1,211.08	1,271.54
HOURLY	[redacted]	15.1385	15.8942

13 Certified Nursing Assistant

STEP	[redacted]	*5*	*6*
ANNUAL	[redacted]	32,316.00	33,936.00
MONTHLY	[redacted]	2,693.00	2,828.00
BI-WEEKLY	[redacted]	1,242.92	1,305.23
HOURLY	[redacted]	15.5365	16.3154

14 Pool Cashier

STEP	[redacted]	*4*	*5*	*6*
ANNUAL	[redacted]	31,548.00	33,120.00	34,776.00
MONTHLY	[redacted]	2,629.00	2,760.00	2,898.00
BI-WEEKLY	[redacted]	1,213.38	1,273.85	1,337.54
HOURLY	[redacted]	15.1673	15.9231	16.7192

15

STEP	[redacted]	*4*	*5*	*6*
ANNUAL	[redacted]	32,328.00	33,948.00	35,640.00
MONTHLY	[redacted]	2,694.00	2,829.00	2,970.00
BI-WEEKLY	[redacted]	1,243.38	1,305.69	1,370.77
HOURLY	[redacted]	15.5423	16.3212	17.1346

16

STEP	[redacted]	*3*	*4*	*5*	*6*
ANNUAL		31,560.00	33,144.00	34,800.00	36,540.00
MONTHLY		2,630.00	2,762.00	2,900.00	3,045.00
BI-WEEKLY		1,213.85	1,274.77	1,338.46	1,405.38
HOURLY		15.1731	15.9346	16.7308	17.5673

17 Clerk Typist

STEP	[redacted]	*3*	*4*	*5*	*6*
ANNUAL		32,352.00	33,972.00	35,676.00	37,464.00
MONTHLY		2,696.00	2,831.00	2,973.00	3,122.00
BI-WEEKLY		1,244.31	1,306.62	1,372.15	1,440.92
HOURLY		15.5538	16.3327	17.1519	18.0115

18

STEP	[redacted]	*2*	*3*	*4*	*5*	*6*
ANNUAL		31,584.00	33,168.00	34,824.00	36,564.00	38,388.00
MONTHLY		2,632.00	2,764.00	2,902.00	3,047.00	3,199.00
BI-WEEKLY		1,214.77	1,275.69	1,339.38	1,406.31	1,476.46
HOURLY		15.1846	15.9462	16.7423	17.5788	18.4558

19 FCC Program Assistant I

STEP	[redacted]	*2*	*3*	*4*	*5*	*6*
ANNUAL	30,828.00	32,364.00	33,984.00	35,688.00	37,476.00	39,348.00
MONTHLY	2,569.00	2,697.00	2,832.00	2,974.00	3,123.00	3,279.00
BI-WEEKLY	1,185.69	1,244.77	1,307.08	1,372.62	1,441.38	1,513.38
HOURLY	14.8212	15.5596	16.3385	17.1577	18.0173	18.9173

20

STEP	*1*	*2*	*3*	*4*	*5*	*6*
ANNUAL	31,596.00	33,180.00	34,836.00	36,576.00	38,400.00	40,320.00
MONTHLY	2,633.00	2,765.00	2,903.00	3,048.00	3,200.00	3,360.00
BI-WEEKLY	1,215.23	1,276.15	1,339.85	1,406.77	1,476.92	1,550.77
HOURLY	15.1904	15.9519	16.7481	17.5846	18.4615	19.3846

21 Police Cadet

STEP	*1*	*2*	*3*	*4*	*5*	*6*
ANNUAL	32,388.00	34,008.00	35,712.00	37,500.00	39,372.00	41,340.00
MONTHLY	2,699.00	2,834.00	2,976.00	3,125.00	3,281.00	3,445.00
BI-WEEKLY	1,245.69	1,308.00	1,373.54	1,442.31	1,514.31	1,590.00
HOURLY	15.5712	16.3500	17.1692	18.0288	18.9288	19.8750

22 Geriatric Aide
22 Lifeguard/Instructor
22 Recreation Leader I

STEP	*1*	*2*	*3*	*4*	*5*	*6*
ANNUAL	33,192.00	34,848.00	36,588.00	38,412.00	40,332.00	42,348.00
MONTHLY	2,766.00	2,904.00	3,049.00	3,201.00	3,361.00	3,529.00
BI-WEEKLY	1,276.62	1,340.31	1,407.23	1,477.38	1,551.23	1,628.77
HOURLY	15.9577	16.7538	17.5904	18.4673	19.3904	20.3596

23 Community Aide II

STEP	*1*	*2*	*3*	*4*	*5*	*6*
ANNUAL	34,020.00	35,724.00	37,512.00	39,384.00	41,352.00	43,416.00
MONTHLY	2,835.00	2,977.00	3,126.00	3,282.00	3,446.00	3,618.00
BI-WEEKLY	1,308.46	1,374.00	1,442.77	1,514.77	1,590.46	1,669.85
HOURLY	16.3558	17.1750	18.0346	18.9346	19.8808	20.8731

24

STEP	*1*	*2*	*3*	*4*	*5*	*6*
ANNUAL	34,872.00	36,612.00	38,448.00	40,368.00	42,384.00	44,508.00
MONTHLY	2,906.00	3,051.00	3,204.00	3,364.00	3,532.00	3,709.00
BI-WEEKLY	1,341.23	1,408.15	1,478.77	1,552.62	1,630.15	1,711.85
HOURLY	16.7654	17.6019	18.4846	19.4077	20.3769	21.3981

25

STEP	*1*	*2*	*3*	*4*	*5*	*6*
ANNUAL	35,748.00	37,536.00	39,408.00	41,376.00	43,440.00	45,612.00
MONTHLY	2,979.00	3,128.00	3,284.00	3,448.00	3,620.00	3,801.00
BI-WEEKLY	1,374.92	1,443.69	1,515.69	1,591.38	1,670.77	1,754.31
HOURLY	17.1865	18.0462	18.9462	19.8923	20.8846	21.9288

26 Pool Supervisor

STEP	*1*	*2*	*3*	*4*	*5*	*6*
ANNUAL	36,636.00	38,472.00	40,392.00	42,408.00	44,532.00	46,764.00
MONTHLY	3,053.00	3,206.00	3,366.00	3,534.00	3,711.00	3,897.00
BI-WEEKLY	1,409.08	1,479.69	1,553.54	1,631.08	1,712.77	1,798.62
HOURLY	17.6135	18.4962	19.4192	20.3885	21.4096	22.4827

27

STEP	*1*	*2*	*3*	*4*	*5*	*6*
ANNUAL	37,548.00	39,420.00	41,388.00	43,452.00	45,624.00	47,904.00
MONTHLY	3,129.00	3,285.00	3,449.00	3,621.00	3,802.00	3,992.00
BI-WEEKLY	1,444.15	1,516.15	1,591.85	1,671.23	1,754.77	1,842.46
HOURLY	18.0519	18.9519	19.8981	20.8904	21.9346	23.0308

28 Meal Services Coordinator
28 Police Assistant
28 Recreation Leader II

STEP	*1*	*2*	*3*	*4*	*5*	*6*
ANNUAL	38,484.00	40,404.00	42,420.00	44,544.00	46,776.00	49,116.00
MONTHLY	3,207.00	3,367.00	3,535.00	3,712.00	3,898.00	4,093.00
BI-WEEKLY	1,480.15	1,554.00	1,631.54	1,713.23	1,799.08	1,889.08
HOURLY	18.5019	19.4250	20.3942	21.4154	22.4885	23.6135

29 Account Clerk
29 Customer Service Clerk I
29 Printing & Technology Intern
29 Recreation Therapist

STEP	*1*	*2*	*3*	*4*	*5*	*6*
ANNUAL	39,444.00	41,412.00	43,488.00	45,660.00	47,940.00	50,340.00
MONTHLY	3,287.00	3,451.00	3,624.00	3,805.00	3,995.00	4,195.00
BI-WEEKLY	1,517.08	1,592.77	1,672.62	1,756.15	1,843.85	1,936.15
HOURLY	18.9635	19.9096	20.9077	21.9519	23.0481	24.2019

30 Custodian I
30 FCC Education Assistant II
30 FCC Program Assistant II

	1	*2*	*3*	*4*	*5*	*6*
ANNUAL	40,428.00	42,444.00	44,568.00	46,800.00	49,140.00	51,600.00
MONTHLY	3,369.00	3,537.00	3,714.00	3,900.00	4,095.00	4,300.00
BI-WEEKLY	1,554.92	1,632.46	1,714.15	1,800.00	1,890.00	1,984.62
HOURLY	19.4365	20.4058	21.4269	22.5000	23.6250	24.8077

31 Paratransit Driver

STEP	*1*	*2*	*3*	*4*	*5*	*6*
ANNUAL	41,436.00	43,512.00	45,684.00	47,964.00	50,364.00	52,884.00
MONTHLY	3,453.00	3,626.00	3,807.00	3,997.00	4,197.00	4,407.00
BI-WEEKLY	1,593.69	1,673.54	1,757.08	1,844.77	1,937.08	2,034.00
HOURLY	19.9212	20.9192	21.9635	23.0596	24.2135	25.4250

32 Home Improvement Maintenance Helper
32 Right-of-Way Maintenance Worker

STEP	*1*	*2*	*3*	*4*	*5*	*6*
ANNUAL	42,468.00	44,592.00	46,824.00	49,164.00	51,624.00	54,204.00
MONTHLY	3,539.00	3,716.00	3,902.00	4,097.00	4,302.00	4,517.00
BI-WEEKLY	1,633.38	1,715.08	1,800.92	1,890.92	1,985.54	2,084.77
HOURLY	20.4173	21.4385	22.5115	23.6365	24.8192	26.0596

33 Customer Service Clerk II
33 Equipment Utility Worker I
33 Public Safety Officer
33 Relief Bus Operator Trainee

STEP	*1*	*2*	*3*	*4*	*5*	*6*
ANNUAL	43,524.00	45,696.00	47,976.00	50,376.00	52,896.00	55,536.00
MONTHLY	3,627.00	3,808.00	3,998.00	4,198.00	4,408.00	4,628.00
BI-WEEKLY	1,674.00	1,757.54	1,845.23	1,937.54	2,034.46	2,136.00
HOURLY	20.9250	21.9692	23.0654	24.2192	25.4308	26.7000

34 Custodian II
34 Graffiti Technician
34 Paratransit Dispatcher
34 Park Maintenance Worker I

STEP	*1*	*2*	*3*	*4*	*5*	*6*
ANNUAL	44,616.00	46,848.00	49,188.00	51,648.00	54,228.00	56,940.00
MONTHLY	3,718.00	3,904.00	4,099.00	4,304.00	4,519.00	4,745.00
BI-WEEKLY	1,716.00	1,801.85	1,891.85	1,986.46	2,085.69	2,190.00
HOURLY	21.4500	22.5231	23.6481	24.8308	26.0712	27.3750

35 Community Aide III
35 Help Desk Technician
35 Street Maintenance Worker

STEP	*1*	*2*	*3*	*4*	*5*	*6*
ANNUAL	45,732.00	48,024.00	50,424.00	52,944.00	55,596.00	58,380.00
MONTHLY	3,811.00	4,002.00	4,202.00	4,412.00	4,633.00	4,865.00
BI-WEEKLY	1,758.92	1,847.08	1,939.38	2,036.31	2,138.31	2,245.38
HOURLY	21.9865	23.0885	24.2423	25.4538	26.7288	28.0673

36 Intermediate Clerk Typist

STEP	*1*	*2*	*3*	*4*	*5*	*6*
ANNUAL	46,872.00	49,212.00	51,672.00	54,252.00	56,964.00	59,808.00
MONTHLY	3,906.00	4,101.00	4,306.00	4,521.00	4,747.00	4,984.00
BI-WEEKLY	1,802.77	1,892.77	1,987.38	2,086.62	2,190.92	2,300.31
HOURLY	22.5346	23.6596	24.8423	26.0827	27.3865	28.7538

37 Nutrition Services Coordinator
37 Relief Bus Operator

STEP	*1*	*2*	*3*	*4*	*5*	*6*
ANNUAL	48,048.00	50,448.00	52,968.00	55,620.00	58,404.00	61,320.00
MONTHLY	4,004.00	4,204.00	4,414.00	4,635.00	4,867.00	5,110.00
BI-WEEKLY	1,848.00	1,940.31	2,037.23	2,139.23	2,246.31	2,358.46
HOURLY	23.1000	24.2538	25.4654	26.7404	28.0788	29.4808

38 Activity Coordinator
38 Equipment Utility Worker II
38 Homeless Coordinator
38 Police Records Technician I
38 Police Service Technician
38 Purchasing Clerk
38 Senior Account Clerk
38 Senior Clerk Typist

STEP	*1*	*2*	*3*	*4*	*5*	*6*
ANNUAL	49,248.00	51,708.00	54,288.00	57,000.00	59,856.00	62,844.00
MONTHLY	4,104.00	4,309.00	4,524.00	4,750.00	4,988.00	5,237.00
BI-WEEKLY	1,894.15	1,988.77	2,088.00	2,192.31	2,302.15	2,417.08
HOURLY	23.6769	24.8596	26.1000	27.4038	28.7769	30.2135

39 Apprentice Mechanic
39 Home Improvement Lead Person
39 Park Maintenance Worker II
39 Records Management Coordinator

STEP	*1*	*2*	*3*	*4*	*5*	*6*
ANNUAL	50,484.00	53,004.00	55,656.00	58,440.00	61,368.00	64,440.00
MONTHLY	4,207.00	4,417.00	4,638.00	4,870.00	5,114.00	5,370.00
BI-WEEKLY	1,941.69	2,038.62	2,140.62	2,247.69	2,360.31	2,478.46
HOURLY	24.2712	25.4827	26.7577	28.0962	29.5038	30.9808

40 Engineering Aide
40 FCC Education Assistant III
40 FCC Program Assistant III
40 Public Works Coordinator
40 Sr. Transit Utility Specialist

STEP	*1*	*2*	*3*	*4*	*5*	*6*
ANNUAL	51,744.00	54,336.00	57,048.00	59,904.00	62,904.00	66,048.00
MONTHLY	4,312.00	4,528.00	4,754.00	4,992.00	5,242.00	5,504.00
BI-WEEKLY	1,990.15	2,089.85	2,194.15	2,304.00	2,419.38	2,540.31
HOURLY	24.8769	26.1231	27.4269	28.8000	30.2423	31.7538

41 Permit/Licensing Technician I

STEP	*1*	*2*	*3*	*4*	*5*	*6*
ANNUAL	53,040.00	55,692.00	58,476.00	61,404.00	64,476.00	67,704.00
MONTHLY	4,420.00	4,641.00	4,873.00	5,117.00	5,373.00	5,642.00
BI-WEEKLY	2,040.00	2,142.00	2,249.08	2,361.69	2,479.85	2,604.00
HOURLY	25.5000	26.7750	28.1135	29.5212	30.9981	32.5500

42 Community Center Coordinator
42 Community Services Officer
42 Police Records Technician II
42 Police Service Officer
42 Recreation Coordinator
42 Secretary
42 Tree Trimmer I

STEP	*1*	*2*	*3*	*4*	*5*	*6*
ANNUAL	54,372.00	57,096.00	59,952.00	62,952.00	66,096.00	69,396.00
MONTHLY	4,531.00	4,758.00	4,996.00	5,246.00	5,508.00	5,783.00
BI-WEEKLY	2,091.23	2,196.00	2,305.85	2,421.23	2,542.15	2,669.08
HOURLY	26.1404	27.4500	28.8231	30.2654	31.7769	33.3635

43 Administrative Aide
43 Building Maintenance Worker
43 Cement Finisher
43 Human Resources / Department Coordinator
43 Payroll / Personnel Technician
43 Senior Citizens Social Services Coordinator
43 Transit Maintenance Coordinator

STEP	*1*	*2*	*3*	*4*	*5*	*6*
ANNUAL	55,728.00	58,512.00	61,440.00	64,512.00	67,740.00	71,124.00
MONTHLY	4,644.00	4,876.00	5,120.00	5,376.00	5,645.00	5,927.00
BI-WEEKLY	2,143.38	2,250.46	2,363.08	2,481.23	2,605.38	2,735.54
HOURLY	26.7923	28.1308	29.5385	31.0154	32.5673	34.1942

44 Administrative Secretary
44 Building Aide
44 Building/Planning Technician
44 Permit/Licensing Technician II
44 Sewer Maintenance Worker
44 Tree Trimmer II

STEP	*1*	*2*	*3*	*4*	*5*	*6*
ANNUAL	57,120.00	59,976.00	62,976.00	66,120.00	69,432.00	72,900.00
MONTHLY	4,760.00	4,998.00	5,248.00	5,510.00	5,786.00	6,075.00
BI-WEEKLY	2,196.92	2,306.77	2,422.15	2,543.08	2,670.46	2,803.85
HOURLY	27.4615	28.8346	30.2769	31.7885	33.3808	35.0481

45 Street Sweeper Operator

STEP	*1*	*2*	*3*	*4*	*5*	*6*
ANNUAL	58,548.00	61,476.00	64,548.00	67,776.00	71,160.00	74,724.00
MONTHLY	4,879.00	5,123.00	5,379.00	5,648.00	5,930.00	6,227.00
BI-WEEKLY	2,251.85	2,364.46	2,482.62	2,606.77	2,736.92	2,874.00
HOURLY	28.1481	29.5558	31.0327	32.5846	34.2115	35.9250

46 Heavy Equipment Operator
46 Street Traffic Painter

STEP	*1*	*2*	*3*	*4*	*5*	*6*
ANNUAL	60,012.00	63,012.00	66,168.00	69,480.00	72,960.00	76,608.00
MONTHLY	5,001.00	5,251.00	5,514.00	5,790.00	6,080.00	6,384.00
BI-WEEKLY	2,308.15	2,423.54	2,544.92	2,672.31	2,806.15	2,946.46
HOURLY	28.8519	30.2942	31.8115	33.4038	35.0769	36.8308

47 Equipment Mechanic
47 Graphics Technician
47 Maintenance Painter
47 Senior Building Maintenance Worker
47 Transit Mechanic
47 Transit Parts/Storeroom Coordinator

STEP	*1*	*2*	*3*	*4*	*5*	*6*
ANNUAL	61,512.00	64,584.00	67,812.00	71,208.00	74,772.00	78,516.00
MONTHLY	5,126.00	5,382.00	5,651.00	5,934.00	6,231.00	6,543.00
BI-WEEKLY	2,365.85	2,484.00	2,608.15	2,738.77	2,875.85	3,019.85
HOURLY	29.5731	31.0500	32.6019	34.2346	35.9481	37.7481

48 Custodian-Lead
48 Financial Services Technician
48 Human Resources Technician
48 Junior Accountant
48 Payroll Specialist

STEP	*1*	*2*	*3*	*4*	*5*	*6*
ANNUAL	63,048.00	66,204.00	69,516.00	72,996.00	76,644.00	80,472.00
MONTHLY	5,254.00	5,517.00	5,793.00	6,083.00	6,387.00	6,706.00
BI-WEEKLY	2,424.92	2,546.31	2,673.69	2,807.54	2,947.85	3,095.08
HOURLY	30.3115	31.8288	33.4212	35.0942	36.8481	38.6885

49 Administrative Analyst I
49 Community Services Counselor
49 Program Coordinator
49 Recreation Supervisor

STEP	*1*	*2*	*3*	*4*	*5*	*6*
ANNUAL	64,620.00	67,848.00	71,244.00	74,808.00	78,552.00	82,476.00
MONTHLY	5,385.00	5,654.00	5,937.00	6,234.00	6,546.00	6,873.00
BI-WEEKLY	2,485.38	2,609.54	2,740.15	2,877.23	3,021.23	3,172.15
HOURLY	31.0673	32.6192	34.2519	35.9654	37.7654	39.6519

50 Case Management Supervisor/Instructor
50 Transit Dispatcher/Operations Assistant

STEP	*1*	*2*	*3*	*4*	*5*	*6*
ANNUAL	66,240.00	69,552.00	73,032.00	76,680.00	80,520.00	84,552.00
MONTHLY	5,520.00	5,796.00	6,086.00	6,390.00	6,710.00	7,046.00
BI-WEEKLY	2,547.69	2,675.08	2,808.92	2,949.23	3,096.92	3,252.00
HOURLY	31.8462	33.4385	35.1115	36.8654	38.7115	40.6500

51 Electrical/Signal Technician I
51 Emergency Preparedness Coordinator
51 Engineering Technician
51 Executive Assistant to Chief of Police
51 General Building Inspector
51 Information Technology Coordinator
51 Lead Equipment Mechanic
51 Planning Assistant

STEP	*1*	*2*	*3*	*4*	*5*	*6*
ANNUAL	67,896.00	71,292.00	74,856.00	78,600.00	82,536.00	86,664.00
MONTHLY	5,658.00	5,941.00	6,238.00	6,550.00	6,878.00	7,222.00
BI-WEEKLY	2,611.38	2,742.00	2,879.08	3,023.08	3,174.46	3,333.23
HOURLY	32.6423	34.2750	35.9885	37.7885	39.6808	41.6654

52

STEP	*1*	*2*	*3*	*4*	*5*	*6*
ANNUAL	69,588.00	73,068.00	76,716.00	80,556.00	84,588.00	88,812.00
MONTHLY	5,799.00	6,089.00	6,393.00	6,713.00	7,049.00	7,401.00
BI-WEEKLY	2,676.46	2,810.31	2,950.62	3,098.31	3,253.38	3,415.85
HOURLY	33.4558	35.1288	36.8827	38.7288	40.6673	42.6981

53 Code Enforcement Officer
53 FCC Education Coordinator
53 Park Maintenance Lead
53 Public Works Inspector
53 Public Works Lead
53 Transit Operations Training Coordinator

STEP	*1*	*2*	*3*	*4*	*5*	*6*
ANNUAL	71,328.00	74,892.00	78,636.00	82,572.00	86,700.00	91,032.00
MONTHLY	5,944.00	6,241.00	6,553.00	6,881.00	7,225.00	7,586.00
BI-WEEKLY	2,743.38	2,880.46	3,024.46	3,175.85	3,334.62	3,501.23
HOURLY	34.2923	36.0058	37.8058	39.6981	41.6827	43.7654

54 Administrative Analyst II
54 Building Maintenance Lead
54 Forensic Technician
54 Transit Marketing Coordinator

STEP	*1*	*2*	*3*	*4*	*5*	*6*
ANNUAL	73,116.00	76,776.00	80,616.00	84,648.00	88,884.00	93,324.00
MONTHLY	6,093.00	6,398.00	6,718.00	7,054.00	7,407.00	7,777.00
BI-WEEKLY	2,812.15	2,952.92	3,100.62	3,255.69	3,418.62	3,589.38
HOURLY	35.1519	36.9115	38.7577	40.6962	42.7327	44.8673

55 Electrical/Signal Technician II

STEP	*1*	*2*	*3*	*4*	*5*	*6*
ANNUAL	74,940.00	78,684.00	82,620.00	86,748.00	91,080.00	95,640.00
MONTHLY	6,245.00	6,557.00	6,885.00	7,229.00	7,590.00	7,970.00
BI-WEEKLY	2,882.31	3,026.31	3,177.69	3,336.46	3,503.08	3,678.46
HOURLY	36.0288	37.8288	39.7212	41.7058	43.7885	45.9808

56 Administrative Coordinator
56 Assistant Engineer
56 FCC Program Coordinator

STEP	*1*	*2*	*3*	*4*	*5*	*6*
ANNUAL	76,812.00	80,652.00	84,684.00	88,920.00	93,372.00	98,040.00
MONTHLY	6,401.00	6,721.00	7,057.00	7,410.00	7,781.00	8,170.00
BI-WEEKLY	2,954.31	3,102.00	3,257.08	3,420.00	3,591.23	3,770.77
HOURLY	36.9288	38.7750	40.7135	42.7500	44.8904	47.1346

57 Senior Accountant

STEP	*1*	*2*	*3*	*4*	*5*	*6*
ANNUAL	78,732.00	82,668.00	86,796.00	91,140.00	95,700.00	100,488.00
MONTHLY	6,561.00	6,889.00	7,233.00	7,595.00	7,975.00	8,374.00
BI-WEEKLY	3,028.15	3,179.54	3,338.31	3,505.38	3,680.77	3,864.92
HOURLY	37.8519	39.7442	41.7288	43.8173	46.0096	48.3115

58

STEP	*1*	*2*	*3*	*4*	*5*	*6*
ANNUAL	80,700.00	84,732.00	88,968.00	93,420.00	98,088.00	102,996.00
MONTHLY	6,725.00	7,061.00	7,414.00	7,785.00	8,174.00	8,583.00
BI-WEEKLY	3,103.85	3,258.92	3,421.85	3,593.08	3,772.62	3,961.38
HOURLY	38.7981	40.7365	42.7731	44.9135	47.1577	49.5173

59 Administrative Support Services Supervisor

STEP	*1*	*2*	*3*	*4*	*5*	*6*
ANNUAL	82,716.00	86,856.00	91,200.00	95,760.00	100,548.00	105,576.00
MONTHLY	6,893.00	7,238.00	7,600.00	7,980.00	8,379.00	8,798.00
BI-WEEKLY	3,181.38	3,340.62	3,507.69	3,683.08	3,867.23	4,060.62
HOURLY	39.7673	41.7577	43.8462	46.0385	48.3404	50.7577

60

STEP	*1*	*2*	*3*	*4*	*5*	*6*
ANNUAL	84,780.00	89,016.00	93,468.00	98,136.00	103,044.00	108,192.00
MONTHLY	7,065.00	7,418.00	7,789.00	8,178.00	8,587.00	9,016.00
BI-WEEKLY	3,260.77	3,423.69	3,594.92	3,774.46	3,963.23	4,161.23
HOURLY	40.7596	42.7962	44.9365	47.1808	49.5404	52.0154

61 Administrative Analyst III
61 Associate Engineer
61 Information Technology Systems Analyst - Transit
61 Transit Planning and Scheduling Analyst

STEP	*1*	*2*	*3*	*4*	*5*	*6*
ANNUAL	86,904.00	91,248.00	95,808.00	100,596.00	105,624.00	110,904.00
MONTHLY	7,242.00	7,604.00	7,984.00	8,383.00	8,802.00	9,242.00
BI-WEEKLY	3,342.46	3,509.54	3,684.92	3,869.08	4,062.46	4,265.54
HOURLY	41.7808	43.8692	46.0615	48.3635	50.7808	53.3192

62 Information Technology Supervisor

STEP	*1*	*2*	*3*	*4*	*5*	*6*
ANNUAL	89,076.00	93,528.00	98,208.00	103,116.00	108,276.00	113,688.00
MONTHLY	7,423.00	7,794.00	8,184.00	8,593.00	9,023.00	9,474.00
BI-WEEKLY	3,426.00	3,597.23	3,777.23	3,966.00	4,164.46	4,372.62
HOURLY	42.8250	44.9654	47.2154	49.5750	52.0558	54.6577

63

STEP	*1*	*2*	*3*	*4*	*5*	*6*
ANNUAL	91,308.00	95,868.00	100,656.00	105,684.00	110,964.00	116,508.00
MONTHLY	7,609.00	7,989.00	8,388.00	8,807.00	9,247.00	9,709.00
BI-WEEKLY	3,511.85	3,687.23	3,871.38	4,064.77	4,267.85	4,481.08
HOURLY	43.8981	46.0904	48.3923	50.8096	53.3481	56.0135

64

STEP	*1*	*2*	*3*	*4*	*5*	*6*
ANNUAL	93,588.00	98,268.00	103,176.00	108,336.00	113,748.00	119,436.00
MONTHLY	7,799.00	8,189.00	8,598.00	9,028.00	9,479.00	9,953.00
BI-WEEKLY	3,599.54	3,779.54	3,968.31	4,166.77	4,374.92	4,593.69
HOURLY	44.9942	47.2442	49.6038	52.0846	54.6865	57.4212

65

STEP	*1*	*2*	*3*	*4*	*5*	*6*
ANNUAL	95,928.00	100,728.00	105,768.00	111,060.00	116,616.00	122,448.00
MONTHLY	7,994.00	8,394.00	8,814.00	9,255.00	9,718.00	10,204.00
BI-WEEKLY	3,689.54	3,874.15	4,068.00	4,271.54	4,485.23	4,709.54
HOURLY	46.1192	48.4269	50.8500	53.3942	56.0654	58.8692

66 Civil Engineer

STEP	*1*	*2*	*3*	*4*	*5*	*6*
ANNUAL	98,328.00	103,248.00	108,408.00	113,832.00	119,520.00	125,496.00
MONTHLY	8,194.00	8,604.00	9,034.00	9,486.00	9,960.00	10,458.00
BI-WEEKLY	3,781.85	3,971.08	4,169.54	4,378.15	4,596.92	4,826.77
HOURLY	47.2731	49.6385	52.1192	54.7269	57.4615	60.3346

67

STEP	*1*	*2*	*3*	*4*	*5*	*6*
ANNUAL	100,788.00	105,828.00	111,120.00	116,676.00	122,508.00	128,628.00
MONTHLY	8,399.00	8,819.00	9,260.00	9,723.00	10,209.00	10,719.00
BI-WEEKLY	3,876.46	4,070.31	4,273.85	4,487.54	4,711.85	4,947.23
HOURLY	48.4558	50.8788	53.4231	56.0942	58.8981	61.8404

90 Bus Operator

STEP	*1*	*2*	*3*	*4*	*5*	*6*
ANNUAL	54,948.00	57,696.00	60,576.00	63,600.00	66,780.00	70,116.00
MONTHLY	4,579.00	4,808.00	5,048.00	5,300.00	5,565.00	5,843.00
BI-WEEKLY	2,113.38	2219.08	2329.85	2,446.15	2,568.46	2,696.77
HOURLY	26.4173	27.7385	29.1231	30.5769	32.1058	33.7096
Specialty - 5%	228.95	240.40	252.40	265.00	278.25	292.15

104

STEP	*1*	*2*	*3*	*4*	*5*	*6*
ANNUAL	58,800.00	61,740.00	64,824.00	68,064.00	71,472.00	75,048.00
MONTHLY	4,900.00	5,145.00	5,402.00	5,672.00	5,956.00	6,254.00
BI-WEEKLY	2,261.54	2,374.62	2,493.23	2,617.85	2,748.92	2,886.46
HOURLY	28.2692	29.6827	31.1654	32.7231	34.3615	36.0808
Lgy Bonus 20	122.50	128.63	135.05	141.80	148.90	156.35
Lgy Bonus 25	245.00	257.25	270.10	283.60	297.80	312.70
Lgy Bonus 30	367.50	385.88	405.15	425.40	446.70	469.05

105

STEP	*1*	*2*	*3*	*4*	*5*	*6*
ANNUAL	60,276.00	63,288.00	66,456.00	69,780.00	73,272.00	76,932.00
MONTHLY	5,023.00	5,274.00	5,538.00	5,815.00	6,106.00	6,411.00
BI-WEEKLY	2,318.31	2434.15	2556.00	2683.85	2818.15	2958.92
HOURLY	28.9788	30.4269	31.9500	33.5481	35.2269	36.9865
Lgy Bonus 20	125.58	131.85	138.45	145.38	152.65	160.28
Lgy Bonus 25	251.15	263.70	276.90	290.75	305.30	320.55
Lgy Bonus 30	376.73	395.55	415.35	436.13	457.95	480.83

106

STEP	*1*	*2*	*3*	*4*	*5*	*6*
ANNUAL	61,788.00	64,872.00	68,112.00	71,520.00	75,096.00	78,852.00
MONTHLY	5,149.00	5,406.00	5,676.00	5,960.00	6,258.00	6,571.00
BI-WEEKLY	2,376.46	2,495.08	2,619.69	2,750.77	2,888.31	3,032.77
HOURLY	29.7058	31.1885	32.7462	34.3846	36.1038	37.9096
Lgy Bonus 20	128.73	135.15	141.90	149.00	156.45	164.28
Lgy Bonus 25	257.45	270.30	283.80	298.00	312.90	328.55
Lgy Bonus 30	386.18	405.45	425.70	447.00	469.35	492.83

107

STEP	*1*	*2*	*3*	*4*	*5*	*6*
ANNUAL	63,336.00	66,504.00	69,828.00	73,320.00	76,992.00	80,844.00
MONTHLY	5,278.00	5,542.00	5,819.00	6,110.00	6,416.00	6,737.00
BI-WEEKLY	2,436.00	2,557.85	2,685.69	2,820.00	2,961.23	3,109.38
HOURLY	30.4500	31.9731	33.5712	35.2500	37.0154	38.8673
Lgy Bonus 20	131.95	138.55	145.48	152.75	160.40	168.43
Lgy Bonus 25	263.90	277.10	290.95	305.50	320.80	336.85
Lgy Bonus 30	395.85	415.65	436.43	458.25	481.20	505.28

108 Economic Development Analyst

STEP	*1*	*2*	*3*	*4*	*5*	*6*
ANNUAL	64,920.00	68,172.00	71,580.00	75,156.00	78,912.00	82,860.00
MONTHLY	5,410.00	5,681.00	5,965.00	6,263.00	6,576.00	6,905.00
BI-WEEKLY	2,496.92	2,622.00	2,753.08	2,890.62	3,035.08	3,186.92
HOURLY	31.2115	32.7750	34.4135	36.1327	37.9385	39.8365
Lgy Bonus 20	135.25	142.03	149.13	156.58	164.40	172.63
Lgy Bonus 25	270.50	284.05	298.25	313.15	328.80	345.25
Lgy Bonus 30	405.75	426.08	447.38	469.73	493.20	517.88

109

STEP	*1*	*2*	*3*	*4*	*5*	*6*
ANNUAL	66,540.00	69,864.00	73,356.00	77,028.00	80,880.00	84,924.00
MONTHLY	5,545.00	5,822.00	6,113.00	6,419.00	6,740.00	7,077.00
BI-WEEKLY	2,559.23	2,687.08	2,821.38	2,962.62	3,110.77	3,266.31
HOURLY	31.9904	33.5885	35.2673	37.0327	38.8846	40.8288
Lgy Bonus 20	138.63	145.55	152.83	160.48	168.50	176.93
Lgy Bonus 25	277.25	291.10	305.65	320.95	337.00	353.85
Lgy Bonus 30	415.88	436.65	458.48	481.43	505.50	530.78

110

STEP	*1*	*2*	*3*	*4*	*5*	*6*
ANNUAL	68,208.00	71,616.00	75,192.00	78,948.00	82,896.00	87,036.00
MONTHLY	5,684.00	5,968.00	6,266.00	6,579.00	6,908.00	7,253.00
BI-WEEKLY	2,623.38	2,754.46	2,892.00	3,036.46	3,188.31	3,347.54
HOURLY	32.7923	34.4308	36.1500	37.9558	39.8538	41.8442
Lgy Bonus 20	142.10	149.20	156.65	164.48	172.70	181.33
Lgy Bonus 25	284.20	298.40	313.30	328.95	345.40	362.65
Lgy Bonus 30	426.30	447.60	469.95	493.43	518.10	543.98

111

STEP	*1*	*2*	*3*	*4*	*5*	*6*
ANNUAL	69,912.00	73,404.00	77,076.00	80,928.00	84,972.00	89,220.00
MONTHLY	5,826.00	6,117.00	6,423.00	6,744.00	7,081.00	7,435.00
BI-WEEKLY	2,688.92	2,823.23	2,964.46	3,112.62	3,268.15	3,431.54
HOURLY	33.6115	35.2904	37.0558	38.9077	40.8519	42.8942
Lgy Bonus 20	145.65	152.93	160.58	168.60	177.03	185.88
Lgy Bonus 25	291.30	305.85	321.15	337.20	354.05	371.75
Lgy Bonus 30	436.95	458.78	481.73	505.80	531.08	557.63

112

STEP	*1*	*2*	*3*	*4*	*5*	*6*
ANNUAL	71,664.00	75,252.00	79,020.00	82,968.00	87,120.00	91,476.00
MONTHLY	5,972.00	6,271.00	6,585.00	6,914.00	7,260.00	7,623.00
BI-WEEKLY	2,756.31	2,894.31	3,039.23	3,191.08	3,350.77	3,518.31
HOURLY	34.4538	36.1788	37.9904	39.8885	41.8846	43.9788
Lgy Bonus 20	149.30	156.78	164.63	172.85	181.50	190.58
Lgy Bonus 25	298.60	313.55	329.25	345.70	363.00	381.15
Lgy Bonus 30	447.90	470.33	493.88	518.55	544.50	571.73

113

STEP	*1*	*2*	*3*	*4*	*5*	*6*
ANNUAL	73,452.00	77,124.00	80,976.00	85,020.00	89,268.00	93,732.00
MONTHLY	6,121.00	6,427.00	6,748.00	7,085.00	7,439.00	7,811.00
BI-WEEKLY	2,825.08	2,966.31	3,114.46	3,270.00	3,433.38	3,605.08
HOURLY	35.3135	37.0788	38.9308	40.8750	42.9173	45.0635
Lgy Bonus 20	153.03	160.68	168.70	177.13	185.98	195.28
Lgy Bonus 25	306.05	321.35	337.40	354.25	371.95	390.55
Lgy Bonus 30	459.08	482.03	506.10	531.38	557.93	585.83

114

STEP	*1*	*2*	*3*	*4*	*5*	*6*
ANNUAL	75,288.00	79,056.00	83,004.00	87,156.00	91,512.00	96,084.00
MONTHLY	6,274.00	6,588.00	6,917.00	7,263.00	7,626.00	8,007.00
BI-WEEKLY	2,895.69	3,040.62	3,192.46	3,352.15	3,519.69	3,695.54
HOURLY	36.1962	38.0077	39.9058	41.9019	43.9962	46.1942
Lgy Bonus 20	156.85	164.70	172.93	181.58	190.65	200.18
Lgy Bonus 25	313.70	329.40	345.85	363.15	381.30	400.35
Lgy Bonus 30	470.55	494.10	518.78	544.73	571.95	600.53

115 Deputy City Clerk/Records Management Officer
115 Deputy City Treasurer
115 Human Resources Analyst
115 Risk Management Analyst

STEP	*1*	*2*	*3*	*4*	*5*	*6*
ANNUAL	77,172.00	81,036.00	85,092.00	89,352.00	93,816.00	98,508.00
MONTHLY	6,431.00	6,753.00	7,091.00	7,446.00	7,818.00	8,209.00
BI-WEEKLY	2,968.15	3,116.77	3,272.77	3,436.62	3,608.31	3,788.77
HOURLY	37.1019	38.9596	40.9096	42.9577	45.1038	47.3596
Lgy Bonus 20	160.78	168.83	177.28	186.15	195.45	205.23
Lgy Bonus 25	321.55	337.65	354.55	372.30	390.90	410.45
Lgy Bonus 30	482.33	506.48	531.83	558.45	586.35	615.68

116

STEP	*1*	*2*	*3*	*4*	*5*	*6*
ANNUAL	79,104.00	83,064.00	87,216.00	91,572.00	96,156.00	100,968.00
MONTHLY	6,592.00	6,922.00	7,268.00	7,631.00	8,013.00	8,414.00
BI-WEEKLY	3,042.46	3,194.77	3,354.46	3,522.00	3,698.31	3,883.38
HOURLY	38.0308	39.9346	41.9308	44.0250	46.2288	48.5423
Lgy Bonus 20	164.80	173.05	181.70	190.78	200.33	210.35
Lgy Bonus 25	329.60	346.10	363.40	381.55	400.65	420.70
Lgy Bonus 30	494.40	519.15	545.10	572.33	600.98	631.05

117 Transportation Operations Supervisor

STEP	*1*	*2*	*3*	*4*	*5*	*6*
ANNUAL	81,084.00	85,140.00	89,400.00	93,876.00	98,568.00	103,500.00
MONTHLY	6,757.00	7,095.00	7,450.00	7,823.00	8,214.00	8,625.00
BI-WEEKLY	3,118.62	3,274.62	3,438.46	3,610.62	3,791.08	3,980.77
HOURLY	38.9827	40.9327	42.9808	45.1327	47.3885	49.7596
Lgy Bonus 20	168.93	177.38	186.25	195.58	205.35	215.63
Lgy Bonus 25	337.85	354.75	372.50	391.15	410.70	431.25
Lgy Bonus 30	506.78	532.13	558.75	586.73	616.05	646.88

118 Administrative Management Analyst I

STEP	*1*	*2*	*3*	*4*	*5*	*6*
ANNUAL	83,112.00	87,264.00	91,632.00	96,216.00	101,028.00	106,080.00
MONTHLY	6,926.00	7,272.00	7,636.00	8,018.00	8,419.00	8,840.00
BI-WEEKLY	3,196.62	3,356.31	3,524.31	3,700.62	3,885.69	4,080.00
HOURLY	39.9577	41.9538	44.0538	46.2577	48.5712	51.0000
Lgy Bonus 20	173.15	181.80	190.90	200.45	210.48	221.00
Lgy Bonus 25	346.30	363.60	381.80	400.90	420.95	442.00
Lgy Bonus 30	519.45	545.40	572.70	601.35	631.43	663.00

119 Accountant/Cost Accountant
119 Facilities Maintenance Supervisor
119 Fleet Maintenance Supervisor
119 Recreation Services Manager
119 Transit Training and Safety Supervisor

STEP	*1*	*2*	*3*	*4*	*5*	*6*
ANNUAL	85,188.00	89,448.00	93,924.00	98,616.00	103,548.00	108,720.00
MONTHLY	7,099.00	7,454.00	7,827.00	8,218.00	8,629.00	9,060.00
BI-WEEKLY	3,276.46	3,440.31	3,612.46	3,792.92	3,982.62	4,181.54
HOURLY	40.9558	43.0038	45.1558	47.4115	49.7827	52.2692
Lgy Bonus 20	177.48	186.35	195.68	205.45	215.73	226.50
Lgy Bonus 25	354.95	372.70	391.35	410.90	431.45	453.00
Lgy Bonus 30	532.43	559.05	587.03	616.35	647.18	679.50

120 Administrative Management Analyst II
120 Executive Office Assistant

STEP	*1*	*2*	*3*	*4*	*5*	*6*
ANNUAL	87,312.00	91,680.00	96,264.00	101,076.00	106,128.00	111,432.00
MONTHLY	7,276.00	7,640.00	8,022.00	8,423.00	8,844.00	9,286.00
BI-WEEKLY	3,358.15	3,526.15	3,702.46	3,887.54	4,081.85	4,285.85
HOURLY	41.9769	44.0769	46.2808	48.5942	51.0231	53.5731
Lgy Bonus 20	181.90	191.00	200.55	210.58	221.10	232.15
Lgy Bonus 25	363.80	382.00	401.10	421.15	442.20	464.30
Lgy Bonus 30	545.70	573.00	601.65	631.73	663.30	696.45

121

STEP	*1*	*2*	*3*	*4*	*5*	*6*
ANNUAL	89,496.00	93,972.00	98,676.00	103,608.00	108,792.00	114,228.00
MONTHLY	7,458.00	7,831.00	8,223.00	8,634.00	9,066.00	9,519.00
BI-WEEKLY	3,442.15	3,614.31	3,795.23	3,984.92	4,184.31	4,393.38
HOURLY	43.0269	45.1788	47.4404	49.8115	52.3038	54.9173
Lgy Bonus 20	186.45	195.78	205.58	215.85	226.65	237.98
Lgy Bonus 25	372.90	391.55	411.15	431.70	453.30	475.95
Lgy Bonus 30	559.35	587.33	616.73	647.55	679.95	713.93

122 Senior Human Resources Analyst
122 Senior Planner

STEP	*1*	*2*	*3*	*4*	*5*	*6*
ANNUAL	91,728.00	96,312.00	101,124.00	106,176.00	111,480.00	117,060.00
MONTHLY	7,644.00	8,026.00	8,427.00	8,848.00	9,290.00	9,755.00
BI-WEEKLY	3,528.00	3,704.31	3,889.38	4,083.69	4,287.69	4,502.31
HOURLY	44.1000	46.3038	48.6173	51.0462	53.5962	56.2788
Lgy Bonus 20	191.10	200.65	210.68	221.20	232.25	243.88
Lgy Bonus 25	382.20	401.30	421.35	442.40	464.50	487.75
Lgy Bonus 30	573.30	601.95	632.03	663.60	696.75	731.63

123

STEP	*1*	*2*	*3*	*4*	*5*	*6*
ANNUAL	94,020.00	98,724.00	103,656.00	108,840.00	114,288.00	120,000.00
MONTHLY	7,835.00	8,227.00	8,638.00	9,070.00	9,524.00	10,000.00
BI-WEEKLY	3,616.15	3,797.08	3,986.77	4,186.15	4,395.69	4,615.38
HOURLY	45.2019	47.4635	49.8346	52.3269	54.9462	57.6923
Lgy Bonus 20	195.88	205.68	215.95	226.75	238.10	250.00
Lgy Bonus 25	391.75	411.35	431.90	453.50	476.20	500.00
Lgy Bonus 30	587.63	617.03	647.85	680.25	714.30	750.00

124 Senior Administrative Analyst

STEP	*1*	*2*	*3*	*4*	*5*	*6*
ANNUAL	96,372.00	101,196.00	106,260.00	111,576.00	117,156.00	123,012.00
MONTHLY	8,031.00	8,433.00	8,855.00	9,298.00	9,763.00	10,251.00
BI-WEEKLY	3,706.62	3,892.15	4,086.92	4,291.38	4,506.00	4,731.23
HOURLY	46.3327	48.6519	51.0865	53.6423	56.3250	59.1404
Lgy Bonus 20	200.78	210.83	221.38	232.45	244.08	256.28
Lgy Bonus 25	401.55	421.65	442.75	464.90	488.15	512.55
Lgy Bonus 30	602.33	632.48	664.13	697.35	732.23	768.83

125

STEP	*1*	*2*	*3*	*4*	*5*	*6*
ANNUAL	98,784.00	103,728.00	108,912.00	114,360.00	120,084.00	126,084.00
MONTHLY	8,232.00	8,644.00	9,076.00	9,530.00	10,007.00	10,507.00
BI-WEEKLY	3,799.38	3,989.54	4,188.92	4,398.46	4,618.62	4,849.38
HOURLY	47.4923	49.8692	52.3615	54.9808	57.7327	60.6173
Lgy Bonus 20	205.80	216.10	226.90	238.25	250.18	262.68
Lgy Bonus 25	411.60	432.20	453.80	476.50	500.35	525.35
Lgy Bonus 30	617.40	648.30	680.70	714.75	750.53	788.03

126 Administrative Services Manager
126 Community Development Manager
126 Economic Development Manager
126 Family Child Care Manager
126 Recreation & Human Services Superintendent
126 Transportation Administrative Manager

STEP	*1*	*2*	*3*	*4*	*5*	*6*
ANNUAL	101,256.00	106,320.00	111,636.00	117,216.00	123,072.00	129,228.00
MONTHLY	8,438.00	8,860.00	9,303.00	9,768.00	10,256.00	10,769.00
BI-WEEKLY	3,894.46	4,089.23	4,293.69	4,508.31	4,733.54	4,970.31
HOURLY	48.6808	51.1154	53.6712	56.3538	59.1692	62.1288
Lgy Bonus 20	210.95	221.50	232.58	244.20	256.40	269.23
Lgy Bonus 25	421.90	443.00	465.15	488.40	512.80	538.45
Lgy Bonus 30	632.85	664.50	697.73	732.60	769.20	807.68

127

STEP	*1*	*2*	*3*	*4*	*5*	*6*
ANNUAL	103,788.00	108,972.00	114,420.00	120,144.00	126,156.00	132,468.00
MONTHLY	8,649.00	9,081.00	9,535.00	10,012.00	10,513.00	11,039.00
BI-WEEKLY	3,991.85	4,191.23	4,400.77	4,620.92	4,852.15	5,094.92
HOURLY	49.8981	52.3904	55.0096	57.7615	60.6519	63.6865
Lgy Bonus 20	216.23	227.03	238.38	250.30	262.83	275.98
Lgy Bonus 25	432.45	454.05	476.75	500.60	525.65	551.95
Lgy Bonus 30	648.68	681.08	715.13	750.90	788.48	827.93

128 Equipment Maintenance Superintendent
128 Finance and Administrative Services Manager
128 Financial Services Manager
128 Transit Maintenance Manager

STEP	*1*	*2*	*3*	*4*	*5*	*6*
ANNUAL	106,380.00	111,696.00	117,276.00	123,144.00	129,300.00	135,768.00
MONTHLY	8,865.00	9,308.00	9,773.00	10,262.00	10,775.00	11,314.00
BI-WEEKLY	4,091.54	4,296.00	4,510.62	4,736.31	4,973.08	5,221.85
HOURLY	51.1442	53.7000	56.3827	59.2038	62.1635	65.2731
Lgy Bonus 20	221.63	232.70	244.33	256.55	269.38	282.85
Lgy Bonus 25	443.25	465.40	488.65	513.10	538.75	565.70
Lgy Bonus 30	664.88	698.10	732.98	769.65	808.13	848.55

129

STEP	*1*	*2*	*3*	*4*	*5*	*6*
ANNUAL	109,044.00	114,492.00	120,216.00	126,228.00	132,540.00	139,164.00
MONTHLY	9,087.00	9,541.00	10,018.00	10,519.00	11,045.00	11,597.00
BI-WEEKLY	4,194.00	4,403.54	4,623.69	4,854.92	5,097.69	5,352.46
HOURLY	52.4250	55.0442	57.7962	60.6865	63.7212	66.9058
Lgy Bonus 20	227.18	238.53	250.45	262.98	276.13	289.93
Lgy Bonus 25	454.35	477.05	500.90	525.95	552.25	579.85
Lgy Bonus 30	681.53	715.58	751.35	788.93	828.38	869.78

130 Accounting/Finance Manager
130 Information Technology Manager
130 Park Maintenance Superintendent
130 Recreation Program Administrator
130 Street Maintenance Superintendent

STEP	*1*	*2*	*3*	*4*	*5*	*6*
ANNUAL	111,768.00	117,360.00	123,228.00	129,384.00	135,852.00	142,644.00
MONTHLY	9,314.00	9,780.00	10,269.00	10,782.00	11,321.00	11,887.00
BI-WEEKLY	4,298.77	4,513.85	4,739.54	4,976.31	5,225.08	5,486.31
HOURLY	53.7346	56.4231	59.2442	62.2038	65.3135	68.5788
Lgy Bonus 20	232.85	244.50	256.73	269.55	283.03	297.18
Lgy Bonus 25	465.70	489.00	513.45	539.10	566.05	594.35
Lgy Bonus 30	698.55	733.50	770.18	808.65	849.08	891.53

131 Plan Check Engineer
131 Transit Operations Manager

STEP	*1*	*2*	*3*	*4*	*5*	*6*
ANNUAL	114,564.00	120,288.00	126,300.00	132,612.00	139,248.00	146,208.00
MONTHLY	9,547.00	10,024.00	10,525.00	11,051.00	11,604.00	12,184.00
BI-WEEKLY	4,406.31	4,626.46	4,857.69	5,100.46	5,355.69	5,623.38
HOURLY	55.0788	57.8308	60.7212	63.7558	66.9462	70.2923
Lgy Bonus 20	238.68	250.60	263.13	276.28	290.10	304.60
Lgy Bonus 25	477.35	501.20	526.25	552.55	580.20	609.20
Lgy Bonus 30	716.03	751.80	789.38	828.83	870.30	913.80

132 FCC Therapist/Trainer II

STEP	*1*	*2*	*3*	*4*	*5*	*6*
ANNUAL	117,432.00	123,300.00	129,468.00	135,936.00	142,728.00	149,868.00
MONTHLY	9,786.00	10,275.00	10,789.00	11,328.00	11,894.00	12,489.00
BI-WEEKLY	4,516.62	4,742.31	4,979.54	5,228.31	5,489.54	5,764.15
HOURLY	56.4577	59.2788	62.2442	65.3538	68.6192	72.0519
Lgy Bonus 20	244.65	256.88	269.73	283.20	297.35	312.23
Lgy Bonus 25	489.30	513.75	539.45	566.40	594.70	624.45
Lgy Bonus 30	733.95	770.63	809.18	849.60	892.05	936.68

133 Human Resources Manager

STEP	*1*	*2*	*3*	*4*	*5*	*6*
ANNUAL	120,372.00	126,396.00	132,720.00	139,356.00	146,328.00	153,648.00
MONTHLY	10,031.00	10,533.00	11,060.00	11,613.00	12,194.00	12,804.00
BI-WEEKLY	4,629.69	4,861.38	5,104.62	5,359.85	5,628.00	5,909.54
HOURLY	57.8712	60.7673	63.8077	66.9981	70.3500	73.8692
Lgy Bonus 20	250.78	263.33	276.50	290.33	304.85	320.10
Lgy Bonus 25	501.55	526.65	553.00	580.65	609.70	640.20
Lgy Bonus 30	752.33	789.98	829.50	870.98	914.55	960.30

134 Assistant to the City Manager
134 Transit Administrative Officer
134 Transit Operations Officer

STEP	*1*	*2*	*3*	*4*	*5*	*6*
ANNUAL	123,384.00	129,552.00	136,032.00	142,836.00	149,976.00	157,476.00
MONTHLY	10,282.00	10,796.00	11,336.00	11,903.00	12,498.00	13,123.00
BI-WEEKLY	4,745.54	4,982.77	5,232.00	5,493.69	5,768.31	6,056.77
HOURLY	59.3192	62.2846	65.4000	68.6712	72.1038	75.7096
Lgy Bonus 20	257.05	269.90	283.40	297.58	312.45	328.08
Lgy Bonus 25	514.10	539.80	566.80	595.15	624.90	656.15
Lgy Bonus 30	771.15	809.70	850.20	892.73	937.35	984.23

135

STEP	*1*	*2*	*3*	*4*	*5*	*6*
ANNUAL	126,468.00	132,792.00	139,428.00	146,400.00	153,720.00	161,412.00
MONTHLY	10,539.00	11,066.00	11,619.00	12,200.00	12,810.00	13,451.00
BI-WEEKLY	4,864.15	5,107.38	5,362.62	5,630.77	5,912.31	6,208.15
HOURLY	60.8019	63.8423	67.0327	70.3846	73.9038	77.6019
Lgy Bonus 20	263.48	276.65	290.48	305.00	320.25	336.28
Lgy Bonus 25	526.95	553.30	580.95	610.00	640.50	672.55
Lgy Bonus 30	790.43	829.95	871.43	915.00	960.75	1008.83

136

STEP	*1*	*2*	*3*	*4*	*5*	*6*
ANNUAL	129,624.00	136,104.00	142,908.00	150,048.00	157,548.00	165,420.00
MONTHLY	10,802.00	11,342.00	11,909.00	12,504.00	13,129.00	13,785.00
BI-WEEKLY	4,985.54	5,234.77	5,496.46	5,771.08	6,059.54	6,362.31
HOURLY	62.3192	65.4346	68.7058	72.1385	75.7442	79.5288
Lgy Bonus 20	270.05	283.55	297.73	312.60	328.23	344.63
Lgy Bonus 25	540.10	567.10	595.45	625.20	656.45	689.25
Lgy Bonus 30	810.15	850.65	893.18	937.80	984.68	1033.88

137

STEP	*1*	*2*	*3*	*4*	*5*	*6*
ANNUAL	132,864.00	139,512.00	146,484.00	153,804.00	161,496.00	169,572.00
MONTHLY	11,072.00	11,626.00	12,207.00	12,817.00	13,458.00	14,131.00
BI-WEEKLY	5,110.15	5,365.85	5,634.00	5,915.54	6,211.38	6,522.00
HOURLY	63.8769	67.0731	70.4250	73.9442	77.6423	81.5250
Lgy Bonus 20	276.80	290.65	305.18	320.43	336.45	353.28
Lgy Bonus 25	553.60	581.30	610.35	640.85	672.90	706.55
Lgy Bonus 30	830.40	871.95	915.53	961.28	1009.35	1059.83

138 Principal Civil Engineer
138 Chief Fiscal Officer

STEP	*1*	*2*	*3*	*4*	*5*	*6*
ANNUAL	136,188.00	142,992.00	150,144.00	157,656.00	165,540.00	173,820.00
MONTHLY	11,349.00	11,916.00	12,512.00	13,138.00	13,795.00	14,485.00
BI-WEEKLY	5,238.00	5,499.69	5,774.77	6,063.69	6,366.92	6,685.38
HOURLY	65.4750	68.7462	72.1846	75.7962	79.5865	83.5673
Lgy Bonus 20	283.73	297.90	312.80	328.45	344.88	362.13
Lgy Bonus 25	567.45	595.80	625.60	656.90	689.75	724.25
Lgy Bonus 30	851.18	893.70	938.40	985.35	1034.63	1086.38

139

STEP	*1*	*2*	*3*	*4*	*5*	*6*
ANNUAL	139,596.00	146,580.00	153,912.00	161,604.00	169,680.00	178,164.00
MONTHLY	11,633.00	12,215.00	12,826.00	13,467.00	14,140.00	14,847.00
BI-WEEKLY	5,369.08	5,637.69	5,919.69	6,215.54	6,526.15	6,852.46
HOURLY	67.1135	70.4712	73.9962	77.6942	81.5769	85.6558
Lgy Bonus 20	290.83	305.38	320.65	336.68	353.50	371.18
Lgy Bonus 25	581.65	610.75	641.30	673.35	707.00	742.35
Lgy Bonus 30	872.48	916.13	961.95	1010.03	1060.50	1113.53

140

STEP	*1*	*2*	*3*	*4*	*5*	*6*
ANNUAL	143,088.00	150,240.00	157,752.00	165,636.00	173,916.00	182,616.00
MONTHLY	11,924.00	12,520.00	13,146.00	13,803.00	14,493.00	15,218.00
BI-WEEKLY	5,503.38	5,778.46	6,067.38	6,370.62	6,689.08	7,023.69
HOURLY	68.7923	72.2308	75.8423	79.6327	83.6135	87.7962
Lgy Bonus 20	298.10	313.00	328.65	345.08	362.33	380.45
Lgy Bonus 25	596.20	626.00	657.30	690.15	724.65	760.90
Lgy Bonus 30	894.30	939.00	985.95	1035.23	1086.98	1141.35

141

STEP	*1*	*2*	*3*	*4*	*5*	*6*
ANNUAL	146,664.00	153,996.00	161,700.00	169,788.00	178,272.00	187,188.00
MONTHLY	12,222.00	12,833.00	13,475.00	14,149.00	14,856.00	15,599.00
BI-WEEKLY	5,640.92	5,922.92	6,219.23	6,530.31	6,856.62	7,199.54
HOURLY	70.5115	74.0365	77.7404	81.6288	85.7077	89.9942
Lgy Bonus 20	305.55	320.83	336.88	353.73	371.40	389.98
Lgy Bonus 25	611.10	641.65	673.75	707.45	742.80	779.95
Lgy Bonus 30	916.65	962.48	1010.63	1061.18	1114.20	1169.93

142

STEP	*1*	*2*	*3*	*4*	*5*	*6*
ANNUAL	150,336.00	157,848.00	165,744.00	174,036.00	182,736.00	191,868.00
MONTHLY	12,528.00	13,154.00	13,812.00	14,503.00	15,228.00	15,989.00
BI-WEEKLY	5,782.15	6,071.08	6,374.77	6,693.69	7,028.31	7,379.54
HOURLY	72.2769	75.8885	79.6846	83.6712	87.8538	92.2442
Lgy Bonus 20	313.20	328.85	345.30	362.58	380.70	399.73
Lgy Bonus 25	626.40	657.70	690.60	725.15	761.40	799.45
Lgy Bonus 30	939.60	986.55	1035.90	1087.73	1142.10	1199.18

143

STEP	*1*	*2*	*3*	*4*	*5*	*6*
ANNUAL	154,092.00	161,796.00	169,884.00	178,380.00	187,296.00	196,656.00
MONTHLY	12,841.00	13,483.00	14,157.00	14,865.00	15,608.00	16,388.00
BI-WEEKLY	5,926.62	6,222.92	6,534.00	6,860.77	7,203.69	7,563.69
HOURLY	74.0827	77.7865	81.6750	85.7596	90.0462	94.5462
Lgy Bonus 20	321.03	337.08	353.93	371.63	390.20	409.70
Lgy Bonus 25	642.05	674.15	707.85	743.25	780.40	819.40
Lgy Bonus 30	963.08	1011.23	1061.78	1114.88	1170.60	1229.10

144

STEP	*1*	*2*	*3*	*4*	*5*	*6*
ANNUAL	157,944.00	165,840.00	174,132.00	182,844.00	191,988.00	201,588.00
MONTHLY	13,162.00	13,820.00	14,511.00	15,237.00	15,999.00	16,799.00
BI-WEEKLY	6,074.77	6,378.46	6,697.38	7,032.46	7,384.15	7,753.38
HOURLY	75.9346	79.7308	83.7173	87.9058	92.3019	96.9173
Lgy Bonus 20	329.05	345.50	362.78	380.93	399.98	419.98
Lgy Bonus 25	658.10	691.00	725.55	761.85	799.95	839.95
Lgy Bonus 30	987.15	1036.50	1088.33	1142.78	1199.93	1259.93

145

STEP	*1*	*2*	*3*	*4*	*5*	*6*
ANNUAL	161,892.00	169,992.00	178,488.00	187,416.00	196,788.00	206,628.00
MONTHLY	13,491.00	14,166.00	14,874.00	15,618.00	16,399.00	17,219.00
BI-WEEKLY	6,226.62	6,538.15	6,864.92	7,208.31	7,568.77	7,947.23
HOURLY	77.8327	81.7269	85.8115	90.1038	94.6096	99.3404
Lgy Bonus 20	337.28	354.15	371.85	390.45	409.98	430.48
Lgy Bonus 25	674.55	708.30	743.70	780.90	819.95	860.95
Lgy Bonus 30	1011.83	1062.45	1115.55	1171.35	1229.93	1291.43

146

STEP	*1*	*2*	*3*	*4*	*5*	*6*
ANNUAL	165,936.00	174,228.00	182,940.00	192,084.00	201,684.00	211,764.00
MONTHLY	13,828.00	14,519.00	15,245.00	16,007.00	16,807.00	17,647.00
BI-WEEKLY	6,382.15	6,701.08	7,036.15	7,387.85	7,757.08	8,144.77
HOURLY	79.7769	83.7635	87.9519	92.3481	96.9635	101.8096
Lgy Bonus 20	345.70	362.98	381.13	400.18	420.18	441.18
Lgy Bonus 25	691.40	725.95	762.25	800.35	840.35	882.35
Lgy Bonus 30	1037.10	1088.93	1143.38	1200.53	1260.53	1323.53

147

STEP	*1*	*2*	*3*	*4*	*5*	*6*
ANNUAL	170,088.00	178,596.00	187,524.00	196,896.00	206,736.00	217,068.00
MONTHLY	14,174.00	14,883.00	15,627.00	16,408.00	17,228.00	18,089.00
BI-WEEKLY	6,541.85	6,869.08	7,212.46	7,572.92	7,951.38	8,348.77
HOURLY	81.7731	85.8635	90.1558	94.6615	99.3923	104.3596
Lgy Bonus 20	354.35	372.08	390.68	410.20	430.70	452.23
Lgy Bonus 25	708.70	744.15	781.35	820.40	861.40	904.45
Lgy Bonus 30	1063.05	1116.23	1172.03	1230.60	1292.10	1356.68

148

STEP	*1*	*2*	*3*	*4*	*5*	*6*
ANNUAL	174,336.00	183,048.00	192,204.00	201,816.00	211,908.00	222,504.00
MONTHLY	14,528.00	15,254.00	16,017.00	16,818.00	17,659.00	18,542.00
BI-WEEKLY	6,705.23	7,040.31	7,392.46	7,762.15	8,150.31	8,557.85
HOURLY	83.8154	88.0038	92.4058	97.0269	101.8788	106.9731
Lgy Bonus 20	363.20	381.35	400.43	420.45	441.48	463.55
Lgy Bonus 25	726.40	762.70	800.85	840.90	882.95	927.10
Lgy Bonus 30	1089.60	1144.05	1201.28	1261.35	1324.43	1390.65

149

STEP	*1*	*2*	*3*	*4*	*5*	*6*
ANNUAL	178,692.00	187,632.00	197,016.00	206,868.00	217,212.00	228,072.00
MONTHLY	14,891.00	15,636.00	16,418.00	17,239.00	18,101.00	19,006.00
BI-WEEKLY	6,872.77	7,216.62	7,577.54	7,956.46	8,354.31	8,772.00
HOURLY	85.9096	90.2077	94.7192	99.4558	104.4288	109.6500
Lgy Bonus 20	372.28	390.90	410.45	430.98	452.53	475.15
Lgy Bonus 25	744.55	781.80	820.90	861.95	905.05	950.30
Lgy Bonus 30	1116.83	1172.70	1231.35	1292.93	1357.58	1425.45

150 Joint Powers Authority Accountant

STEP	*1*	*2*	*3*	*4*	*5*	*6*
ANNUAL	156,000.00					
MONTHLY	13,000.00					
BI-WEEKLY	6,000.00					
HOURLY	75.0000					

200 Police Trainee

STEP	*1*	*2*	*3*	*4*	*5*	*6*
ANNUAL	76,368.00	-	-	-	-	-
MONTHLY	6,364.00	-	-	-	-	-
BI-WEEKLY	2,937.23	-	-	-	-	-
HOURLY	36.7154	-	-	-	-	-

201 Police Officer

STEP	*1*	*2*	*3*	*4*	*5*	*6*
ANNUAL	89,844.00	94,332.00	99,060.00	104,004.00	109,212.00	114,672.00
MONTHLY	7,487.00	7,861.00	8,255.00	8,667.00	9,101.00	9,556.00
BI-WEEKLY	3,455.54	3,628.15	3,810.00	4,000.15	4,200.46	4,410.46
HOURLY	43.1942	45.3519	47.6250	50.0019	52.5058	55.1308
EDUCATIONAL INCENTIVE BONUS						
AA	1,303.96	1,303.96	1,303.96	1,303.96	1,303.96	1,303.96
BA	1,819.96	1,819.96	1,819.96	1,819.96	1,819.96	1,819.96
SPECIALIST	637.58	637.58	637.58	637.58	637.58	637.58
Lgy Bonus 7	365.00	365.00	365.00	365.00	365.00	365.00
Lgy Bonus 12	520.00	520.00	520.00	520.00	520.00	520.00
Lgy Bonus 20	894.35	913.05	932.75	953.35	975.05	997.80
Lgy Bonus 26	1,268.70	1,306.10	1,345.50	1,386.70	1,430.10	1,475.60

203 Police Sergeant

STEP	*1*	*2*	*3*	*4*	*5*	*6*
ANNUAL	114,828.00	120,564.00	126,588.00	132,924.00	139,572.00	146,556.00
MONTHLY	9,569.00	10,047.00	10,549.00	11,077.00	11,631.00	12,213.00
BI-WEEKLY	4,416.46	4,637.08	4,868.77	5,112.46	5,368.15	5,636.77
HOURLY	55.2058	57.9635	60.8596	63.9058	67.1019	70.4596
EDUCATIONAL INCENTIVE BONUS						
AA	1,612.53	1,612.53	1,612.53	1,612.53	1,612.53	1,612.53
BA	2,230.53	2,230.53	2,230.53	2,230.53	2,230.53	2,230.53
SPECIAL DUTY PAY	420.00	420.00	420.00	420.00	420.00	420.00
Lgy Bonus 7	326.00	326.00	326.00	326.00	326.00	326.00
Lgy Bonus 12	520.00	520.00	520.00	520.00	520.00	520.00
Lgy Bonus 20	998.45	1,022.35	1,047.45	1,073.85	1,101.55	1,130.65
Lgy Bonus 26	1,476.90	1,524.70	1,574.90	1,627.70	1,683.10	1,741.30

227 Police Lieutenant

STEP	*1*	*2*	*3*	*4*	*5*	*6*
ANNUAL	150,204.00	157,716.00	165,600.00	173,880.00	182,580.00	191,712.00
MONTHLY	12,517.00	13,143.00	13,800.00	14,490.00	15,215.00	15,976.00
BI-WEEKLY	5,777.08	6,066.00	6,369.23	6,687.69	7,022.31	7,373.54
HOURLY	72.2135	75.8250	79.6154	83.5962	87.7788	92.1692
EDUCATIONAL INCENTIVE BONUS						
BA	1,766.44	1,837.84	1,912.84	1,991.56	2,074.24	2,161.00
CA POST Mgmt. Cert.	625.85	657.15	690.00	724.50	760.75	798.80
Lgy Bonus 20	625.85	657.15	690.00	724.50	760.75	798.80
Lgy Bonus 26	1,251.70	1,314.30	1,380.00	1,449.00	1,521.50	1,597.60

231 Police Captain

STEP	*1*	*2*	*3*	*4*	*5*	*6*
ANNUAL	178,584.00	187,512.00	196,884.00	206,724.00	217,056.00	227,904.00
MONTHLY	14,882.00	15,626.00	16,407.00	17,227.00	18,088.00	18,992.00
BI-WEEKLY	6,868.62	7,212.00	7,572.46	7,950.92	8,348.31	8,765.54
HOURLY	85.8577	90.1500	94.6558	99.3865	104.3538	109.5692
EDUCATIONAL INCENTIVE BONUS						
BA	2,036.08	2,120.92	2,209.96	2,303.56	2,401.84	2,505.04
CA POST Mgmt. Cert.	744.10	781.30	820.35	861.35	904.40	949.60
Lgy Bonus 20	744.10	781.30	820.35	861.35	904.40	949.60
Lgy Bonus 26	1,488.20	1,562.60	1,640.70	1,722.70	1,808.80	1,899.20

232 Deputy Police Chief

STEP	*1*
ANNUAL	227,436.00
MONTHLY	18,953.00
BI-WEEKLY	8,747.54
HOURLY	109.3442
EDUCATIONAL INCENTIVE BONUS	
BA	2,474.36
CA POST Mgmt. Cert.	947.65
Lgy Bonus 20	947.65
Lgy Bonus 26	1,895.30

301 Mayor

STEP	*1*	*2*	*3*	*4*	*5*	*6*
ANNUAL	11,400.00					
MONTHLY	950.00					
BI-WEEKLY	438.46					
HOURLY	5.4808					

302 Councilmember

STEP	*1*	*2*	*3*	*4*	*5*	*6*
ANNUAL	7,800.00					
MONTHLY	650.00					
BI-WEEKLY	300.00					
HOURLY	3.7500					

303 City Clerk

STEP	*1*	*2*	*3*	*4*	*5*	*6*
ANNUAL	12,000.00					
MONTHLY	1,000.00					
BI-WEEKLY	461.54					
HOURLY	5.7692					

304 City Treasurer

STEP	*1*	*2*	*3*	*4*	*5*	*6*
ANNUAL	6,000.00					
MONTHLY	500.00					
BI-WEEKLY	230.77					
HOURLY	2.8846					

305 Youth Commissioner

STEP	*1*	*2*	*3*	*4*	*5*	*6*
ANNUAL	300.00	-	-	-	-	-
MONTHLY	25.00	-	-	-	-	-
BI-WEEKLY	11.54	-	-	-	-	-
HOURLY	0.1442	-	-	-	-	-

306 Human Services Commissioner
306 Recreation Commissioner
306 Rent Mediation Board Member
306 Senior Citizens Commissioner

STEP	*1*	*2*	*3*	*4*	*5*	*6*
ANNUAL	600.00	-	-	-	-	-
MONTHLY	50.00	-	-	-	-	-
BI-WEEKLY	23.08	-	-	-	-	-
HOURLY	0.2885	-	-	-	-	-

307

STEP	*1*	*2*	*3*	*4*	*5*	*6*
ANNUAL	900.00	-	-	-	-	-
MONTHLY	75.00	-	-	-	-	-
BI-WEEKLY	34.62	-	-	-	-	-
HOURLY	0.4327	-	-	-	-	-

308 Planning Commissioner

STEP	*1*	*2*	*3*	*4*	*5*	*6*
ANNUAL	1,200.00	-	-	-	-	-
MONTHLY	100.00	-	-	-	-	-
BI-WEEKLY	46.15	-	-	-	-	-
HOURLY	0.5769	-	-	-	-	-

330 Department Heads

STEP	*1*	*2*	*3*	*4*	*5*	*6*
ANNUAL	169,272.00	177,732.00	186,624.00	195,960.00	205,764.00	216,048.00
MONTHLY	14,106.00	14,811.00	15,552.00	16,330.00	17,147.00	18,004.00
BI-WEEKLY	6,510.46	6,835.85	7,177.85	7,536.92	7,914.00	8,309.54
HOURLY	81.3808	85.4481	89.7231	94.2115	98.9250	103.8692
Lgy Bonus 20	352.65	370.28	388.80	408.25	428.68	450.10
Lgy Bonus 25	705.30	740.55	777.60	816.50	857.35	900.20
Lgy Bonus 30	1057.95	1110.83	1166.40	1224.75	1286.03	1350.30

339 Assistant City Manager

STEP	*1*	*2*	*3*	*4*	*5*	*6*
ANNUAL	185,808.00	195,096.00	204,852.00	215,100.00	225,852.00	237,144.00
MONTHLY	15,484.00	16,258.00	17,071.00	17,925.00	18,821.00	19,762.00
BI-WEEKLY	7,146.46	7,503.69	7,878.92	8,273.08	8,686.62	9,120.92
HOURLY	89.3308	93.7962	98.4865	103.4135	108.5827	114.0115

340 Police Chief

STEP	*1*
ANNUAL	253,356.00
MONTHLY	21,113.00
BI-WEEKLY	9,744.46
HOURLY	121.8058
Edu Incentive Pay	2,733.56
CA POST Mgmt. Cert.	1,055.65
Lgy Bonus 26	2,111.30

350 City Manager

STEP	*1*
ANNUAL	299,565.00
MONTHLY	24,963.75
BI-WEEKLY	11,521.73
HOURLY	144.0216

RESOLUTION NO. 6597

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF GARDENA, CALIFORNIA, MAKING THE LEGALLY REQUIRED FINDINGS TO RE-AUTHORIZE THE USE OF TELECONFERENCING IN ACCORDANCE WITH ASSEMBLY BILL 361 FOR MEETINGS OF THE GARDENA CITY COUNCIL AND OTHER COMMISSIONS, COMMITTEES AND BOARDS SUBJECT TO STATE OPEN MEETING LAWS

THE CITY COUNCIL OF THE CITY OF GARDENA DOES HEREBY RESOLVE AS FOLLOWS:

WHEREAS, international, national, state, and local health and governmental authorities are responding to an outbreak of respiratory disease caused by a novel coronavirus named "SARS-CoV-2," and the disease it causes has been named "coronavirus disease 2019," abbreviated COVID-19, ("COVID-19"); and

WHEREAS, on March 4, 2020, the Governor of the State of California, Gavin Newsom declared a State of Emergency in California to make additional resources available, formalize emergency actions already underway across multiple state agencies and departments, and help the State prepare for broader spread of COVID-19; and

WHEREAS, on March 4, 2020, the Los Angeles County Board of Supervisors and Department of Public Health declared a local emergency and local public health emergency to aid the regional healthcare and governmental community in responding to COVID-19; and

WHEREAS, on March 13, 2020, the President of the United States declared a National Emergency due to the continue spread and the effects of COVID-19; and

WHEREAS, on March 16, 2020, the City Manager, as the City's Director of Emergency Services, did proclaim the existence of a local emergency as authorized by Government Code section 8630 and Gardena Municipal Code Chapter 2.56.060; and

WHEREAS, the Governor's March 4, 2021, declaration of a state of emergency based on the COVID-19 pandemic remains in place; and

WHEREAS, the Proclamation of Existence of a Local Emergency issued by the City Manager, as the City's Director of Emergency Services on March 16, 2020, has been ratified by the City Council via Resolution 6441 on March 19, 2020 and reaffirmed by Resolution No. 6454 on May 12, 2020, Resolution No 6469 on July 14, 2020, Resolution No. 6478 on September 8, 2020, Resolution No. 6483 on October 27, 2020, Resolution

No. 6489 on December 15, 2020, Resolution No. 6495 on February 9, 2021, Resolution No. 6503 on March 23, 2021, Resolution No. 6512 on May 11, 2021, Resolution No. 6521 on June 22, 2021, Resolution No. 6526 on August 10, 2021, Resolution No. 6533 on October 26, 2021, Resolution No. 6538 on December 14, 2021, Resolution No. 6559 on February 8, 2022, Resolution No. 6567 on March 22, 2022, Resolution No. 6574 on May 10, 2022 and Resolution No. 6590 on June 28, 2022, with the result that the proclamation of a local emergency based on the COVID-19 pandemic remains in place; and

WHEREAS, Paragraph 3 of Executive Order N-29-20, issued by the Governor on March 17, 2020, among other things, suspended the Brown Act requirements for teleconferencing, provided that notice and accessibility requirements were met, the public was allowed to observe and address the legislative body at the meeting, and the legislative body had a procedure for receiving and swiftly resolving requests for reasonable accommodation for individuals with disabilities, specifying that this suspension would remain in place during the period in which state or local public health officials have imposed or recommended social distancing measures; and

WHEREAS, paragraph 42 of Executive Order N-08-21, issued by the Governor on June 11, 2021, withdrew, and replaced paragraph 3 of Executive Order N-29-20's suspension of the Brown Act requirements for teleconferencing with a similar suspension of those requirements that it specified would remain in place only through September 30, 2021; and

WHEREAS, on September 16, 2021, the Governor signed into law Assembly Bill No. 361 ("AB 361"), which, until January 1, 2024, authorizes a local agency to use teleconferencing without complying with the teleconferencing requirements imposed by the Brown Act when a legislative body of a local agency holds a meeting during a declared state of emergency, as that term is defined, when state or local health officials have imposed or recommended measures to promote social distancing or when the legislative body has determined that meeting in person would present imminent risks to the health or safety of attendees; and

WHEREAS, AB 361 requires legislative bodies that hold teleconferenced meetings under its abbreviated teleconferencing procedures to give notice of the meeting and post agendas, as described, to allow members of the public to access the meeting and address

the legislative body, to give notice of the means by which members of the public may access the meeting and offer public comment, including an opportunity for all persons to attend via a call-in option or an internet-based service option, and to conduct the meeting in a manner that protects the statutory and constitutional rights of the parties and the public appearing before the legislative body; and

WHEREAS, AB 361 requires the legislative body to take no further action on agenda items when there is a disruption which prevents the public agency from broadcasting the meeting, or in the event of a disruption within the local agency's control which prevents members of the public from offering public comments, until public access is restored; and

WHEREAS, AB 361 prohibits the legislative body from requiring public comments to be submitted in advance of the meeting and specifies that the legislative body must provide an opportunity for the public to address the legislative body and offer comment in real time; and

WHEREAS, AB 361 prohibits the legislative body from closing the public comment period and the opportunity to register to provide public comment, until the public comment period has elapsed or until a reasonable amount of time has elapsed, as specified; and

WHEREAS, when there is a continuing state of emergency, or when state or local officials have imposed or recommended measures to promote social distancing, AB 361 requires a legislative body to make specified findings not later than 30 days after the first teleconferenced meeting pursuant to these provisions, and to make those findings every 30 days thereafter, in order to continue to meet under AB 361's abbreviated teleconferencing procedures; and

WHEREAS, this body previously adopted a Resolution, which made the findings required by AB 361 to allow the City Council and all City Commissions, Committees and Boards to continue to meet under AB 361's abbreviated teleconferencing procedures, and authorized the City Council and all City Commissions, Committees and Boards to conduct meetings under AB 361's abbreviated teleconferencing procedures, without complying with the requirements set forth in Government Code Section 54953(b)(3), subject to compliance with the requirements set forth in Government Code Section 54953(e)(2); and

WHEREAS, in light of the continuing State and local declarations of emergency resulting from the COVID-19 pandemic, the continuing recommendation by Los Angeles County Public Health officials of measures to promote social distancing, and the imminent risks to the health of safety of attendees at meetings conducted in person, the City Council desires to again make the findings required by AB 361 to allow the City Council and all City Commissions, Committees and Boards to continue to meet under AB 361's abbreviated teleconferencing procedures.

NOW, THEREFORE, THE CITY COUNCIL OF THE CITY OF GARDENA, CALIFORNIA, DOES HEREBY FIND, DETERMINE, AND RESOLVE, AS FOLLOWS:

SECTION 1. The Recitals set forth above are true and correct and are incorporated into this Resolution by this reference.

SECTION 2. The City Council finds that the State and local declarations of emergency resulting from the COVID-19 pandemic remain in place, and that the state of emergency continues to directly impact the ability to meet safely in person.

SECTION 3. The City Council finds that local officials, namely, the Los Angeles County Department of Public Health, has continued to recommend measures to promote social distancing.

SECTION 4. As a result of the findings in Sections 1 through 3 above, the City Council and all City Commissions, Committees and Boards are authorized to conduct meetings under AB 361's abbreviated teleconferencing procedures, without complying with the requirements set forth in Government Code Section 54953(b)(3), subject to compliance with the requirements set forth in Government Code Section 54953(e)(2).

SECTION 5. If any section, subsection, sentence, clause, or phrase of this Resolution is for any reason held to be invalid or unconstitutional by a decision of any court of competent jurisdiction, such decision shall not affect the validity of the remaining portions of this Resolution. The City Council hereby declares that it would have passed this Resolution and each and every section, subsection, sentence, clause, or phrase not declared invalid or unconstitutional without regard to whether any portion of this Resolution would be subsequently declared invalid or unconstitutional.

BE IT FURTHER RESOLVED that the City Clerk shall certify to the passage and adoption of this Resolution; shall cause the same to be entered among the original Resolutions of said City; and shall make a minute of the passage and adoption thereof in the records of the proceedings of the City Council of said City in the minutes of the meeting at which the same is passed and adopted.

Passed, approved, and adopted this 26th day of July 2022.

TASHA CERDA, Mayor

ATTEST:

MINA SEMENZA, City Clerk

APPROVED AS TO FORM:

CARMEN VASQUEZ, City Attorney

City of Gardena

Gardena City Council Meeting
AGENDA REPORT SUMMARY

Agenda Item No. 8.H
Section: CONSENT CALENDAR
Meeting Date: July 26, 2022

TO: THE HONORABLE MAYOR AND MEMBERS OF THE GARDENA CITY COUNCIL

AGENDA TITLE: Approve One-Year Contract Between the City of Gardena and SPCALA for Animal Control and Sheltering Services
CONTACT: COMMUNITY DEVELOPMENT

COUNCIL ACTION REQUIRED:

RECOMMENDATION AND STAFF SUMMARY:
In 2018/19 Los Angeles County first informed all contracted cities that significant rate increases would begin to occur for animal control and sheltering services. During FY 2020/21, In order to ensure that both the services and cost would be provided at competitive rates, the City reached out to a number of 3rd party providers of animal control and sheltering services, including the SPCALA. At that time it was determined that a significant cost savings could occur by entering into a contract with SPCALA rather than renewing an annual contract with Los Angeles County at a new rate of $233,334.
In May of 2021, the City Council approved a contract with SPCALA for a 12-month term beginning on July 1, 2021. Staff has had a chance to evaluate the services during FY 2021/22 and has been completely satisfied with the services provided. The SPCALA has been both accessible and responsive in assisting our animal control division. In addition to providing services, the City obtained a significant cost savings of approximately $155,612 during the past fiscal year, when comparing to Los Angeles County's new rate schedule.
Staff recommends that the City Council approve the contract between the City and SPCALA which allows for an initial one year term ending in August 2023, with the option to extend for an additional one year term.

FINANCIAL IMPACT/COST:
Budgeted General Fund Expenditure of $110,400 for FY 2022-2023

ATTACHMENTS:
PSA Animal Sheltering Contract 2022 with Exhibit.pdf

APPROVED:

_____

Clint Osorio, City Manager

AGREEMENT BETWEEN THE
THE CITY OF GARDENA
AND
THE LOS ANGELES SOCIETY FOR THE PREVENTION OF CRUELTY TO ANIMALS
(SPCALA)

This contract, hereinafter referred to as Agreement, is entered into by and between THE CITY OF GARDENA ("City") and THE LOS ANGELES SOCIETY FOR THE PREVENTION OF CRUELTY TO ANIMALS, a California Corporation ("Consultant"). Based on the mutual promises and covenants contained herein, the Parties hereto agree as follows:

1. Recitals.

A. City is desirous of obtaining services necessary to provide Animal Sheltering Services.

B. Consultant is qualified by virtue of experience, training, education and expertise to provide these services.

C. City has determined that the public interest, convenience and necessity require the execution of this Agreement.

2. Services.

A. The services to be performed by Consultant shall consist of the following ("Services"): As specified in Exhibit "A", attached hereto and incorporated herein by reference, unless otherwise instructed by City.

B. The Services shall be performed in accordance with the Project Schedule set forth in Exhibit A. Consultant shall not be liable for any failure or delay in furnishing proposed services resulting from fire, explosion, flood, storm, Act of God, governmental acts, orders or regulations, hostilities, civil disturbances, strikes, labor difficulties, difficulty in obtaining parts, supplies, or shipping facilities, inability to obtain or delays in obtaining suitable material or facilities required for performance, temporary unavailability of qualified personnel, failure by City to provide appropriate access to equipment or personnel, or other causes beyond Consultant's reasonable control.

3. Additional Services. If City determines that additional services are required to be provided by Consultant in addition to the Services set forth above, City shall authorize Consultant to perform such additional services in writing ("Additional Services"). Such Additional Services shall be specifically described and approved by City in writing prior to the performance thereof. Consultant shall be compensated for such Additional Services in accordance with the amount agreed upon in writing by the Parties. No compensation shall be paid to Consultant for Additional Services which are not

specifically approved by City in writing.

4. Agreement Administrator. For purposes of this Agreement, City designates Greg S. Tsujiuchi as the Agreement Administrator who shall monitor Consultant's performance under this Agreement. All notices, invoices or other documents shall be addressed to the Agreement Administrator, as well as all substantive issues relating to this contract. City reserves the right to change this designation upon written notice to Consultant.

5. Consultant's Proposal. This Agreement shall include Consultant's proposal or bid which is incorporated herein as Exhibit A. In the event of any inconsistency between the terms of the proposal and this Agreement, this Agreement shall govern.

6. Timing of Performance. Time is of the essence with respect to Consultant's performance of the Services required by this Agreement. Consultant shall diligently and timely pursue and complete the performance of the Services required of it by this Agreement as set forth in Exhibit A. City, in its sole discretion, may extend the time for performance of any Service.

7. Compensation. Compensation for the Services shall be billed as specified in Exhibit A. The Compensation is inclusive of all costs that may be incurred by Consultant in performance of the Services, including but not limited to such items as travel, copies, delivery charges, phone charges, and facsimile charges, unless otherwise noted.

8. Term of Agreement/Termination.

A. This Agreement shall be in effect for one year as of the date of execution by the City with the option to extend for an additional one year period, and shall remain in effect until all Services are completed or until terminated as provided for herein.

B. City may terminate this Agreement without cause by providing written notice to Consultant not less than three days prior to an effective termination date. City's only obligation in the event of termination will be payment of fees and allowed expenses incurred up to and including the effective date of termination.

C. Unless for cause, Consultant may not terminate this Agreement. If Consultant is terminating this Agreement for cause, it must provide the City with thirty (30) days written notice.

D. Upon receipt of a termination notice, Consultant shall: (1) promptly discontinue all Services, unless the notice directs otherwise; and (2) within ten (10) days, deliver to City all files, data, reports, estimates, summaries, and such other information and materials as may have been accumulated or prepared to date by Consultant in performing the Services under this Agreement, whether completed or in progress. Consultant shall provide these documents by both hard copy and in electronic format if available. In the event of termination for other than cause

attributable to Consultant, Consultant shall be entitled to reasonable compensation for the services it performs up to the date of termination and shall be deemed released from liability for any work assigned but not completed as of the effective date of termination.

9. Invoices and Payments.

A. Payment shall be made upon receipt and approval of invoices for Services rendered. In order for payment to be made, Consultant's invoice must include an itemization as to the services rendered, date(s) of service, direct and/or subcontract costs, and be submitted on an official letterhead or invoice with Consultant's name, address, and telephone number referenced.

B. The Agreement Administrator shall review the invoices to determine whether services performed and documents submitted are consistent with this Agreement. Payment shall be made within forty-five (45) days following receipt of the invoice or the Agreement Administrator shall provide Consultant with a written statement objecting to the charges and stating the reasons therefore.

C. Payment by City under this Agreement shall not be deemed a waiver of defects, even if such defects were known to City at the time of payment.

10. Records/Audit.

A. Consultant shall be responsible for ensuring accuracy and propriety of all billings and shall maintain all supporting documentation for a minimum of three (3) years from the completion date of the Services under this agreement the following records:

1. All accounts and records, including personnel, property and financial, adequate to identify and account for all costs pertaining to this Agreement and assure proper accounting for all funds;

2. Records which establish that Consultant and any subconsultant who renders Services under this Agreement are in full compliance with the requirements of this Agreement and all federal, state and local laws and regulations

3. Any additional records deemed necessary by City to assume verification of full compliance with this Agreement.

B. City shall have the right to audit Consultant's invoices and all supporting documentation for purposes of compliance with this Agreement for a period of three years following the completion of Services under this Agreement.

C. Upon reasonable notice from City or any other governmental agency, Consultant shall cooperate fully with any audit of its billings conducted by, or of, City and shall permit access to its books, records and accounts as may be necessary to

conduct such audits.

11. Successors and Assignment. This Agreement covers professional services of a specific and unique nature. Except as otherwise provided herein, Consultant shall not assign or transfer its interest in this Agreement or subcontract any services to be performed without amending this Agreement. This Agreement shall be binding upon the heirs, executors, administrators, successors and assigns of the parties hereto.

12. Change in Name, Ownership or Control. Consultant shall notify the Agreement Administrator, in writing, of any change in name, ownership or control of Consultant's firm or subconsultant. Change of ownership or control of Consultant's firm may require an amendment to the Agreement.

13. Key Personnel. City has relied upon the professional training and ability of Consultant to perform the services hereunder as a material inducement to enter into this Agreement. Consultant shall provide properly skilled professional and technical personnel to perform all services under this Agreement. In the event that City, in its sole discretion, at any time during the Agreement, desires the removal of any person or persons assigned by Consultant to perform Services pursuant to this Agreement, Consultant shall remove any such person immediately upon receiving notice from City.

14. Performance By Consultant. Consultant shall maintain or exceed the level of competency presently maintained by other similar practitioners in the State of California, for professional and technical soundness, accuracy and adequacy of all work, advice and material furnished under this Agreement

15. Use of Materials.

A. City shall make available to Consultant such materials from its files as may be required by Consultant to perform Services under this Agreement. Such materials shall remain the property of City while in Consultant's possession. Upon termination of this Agreement and payment of outstanding invoices of Consultant, or completion of work under this Agreement, Consultant shall return to City any property of City in its possession and any calculations, notes, reports, electronic files, or other materials prepared by Consultant in the course of performance of this Agreement.

B. City may utilize any material prepared or work performed by Consultant pursuant to this Agreement, including computer software, in any manner, which City deems proper without additional compensation to Consultant. Consultant shall have no responsibility or liability for any revisions, changes, or corrections made by City, or any use or reuse pursuant to this paragraph unless Consultant accepts such responsibility in writing.

16. Nonuse of Intellectual Property of Third Parties. Consultant shall not use, disclose or copy any intellectual property of any third parties in connection with work carried out under this Agreement, except for intellectual property for which Consultant

has a license. Consultant shall indemnify and hold City harmless against all claims raised against City based upon allegations that Consultant has wrongfully used intellectual property of others in performing work for City, or that City has wrongfully used intellectual property developed by Consultant pursuant to this Agreement.

17. Ownership of Work Product. All documents or other information created, developed, or received by Consultant shall, for purposes of copyright law, be deemed worked made for hire for City by Consultant and shall be the sole property of City. Consultant shall provide City with copies of these items upon demand, and in any event, upon termination of this Agreement.

18. Legal Requirements.

A. Consultant shall secure and maintain all licenses or permits required by law, including a City business license, and shall comply with all ordinances, laws, orders, rules, and regulations pertaining to the work.

B. Consultant warrants that it shall perform the Services required by this Agreement in compliance with all applicable Federal and California employment laws, including, but not limited to, those laws related to minimum hours and wages; occupational health and safety; fair employment and employment practices; workers' compensation insurance and safety in employment; and all other Federal, State and local laws and ordinances applicable to the services required under this Agreement. Consultant shall indemnify and hold harmless City from and against all claims, demands, payments, suits, actions, proceedings, and judgments of every nature and description including attorneys' fees and costs, presented, brought, or recovered against City for, or on account of any liability under any of the above-mentioned laws, which may be incurred by reason of Consultant's performance under this Agreement.

C. Consultant covenants that thee shall be no discrimination based upon race, color, creed, religion, sex, marital status, age, handicap, national origin or ancestry, or any other category forbidden by law in performance of this Agreement.

19. Conflict of Interest and Reporting.

A. Consultant shall at all times avoid conflicts of interest or the appearance of a conflict of interest in the performance of this Agreement. If required, Consultant shall comply with the City's Conflict of Interest reporting requirements. Consultant understands that pursuant to Gardena Municipal Code sections 2.24.020H and 2.24.025G, it is forbidden to make any contribution to a candidate or committee of a candidate for a municipal office of the City, or to an officeholder, until the completion of services to be performed under this Agreement.

B. Consultant and its representatives shall refrain from lobbying City of Gardena officials, employees and representatives for the duration of this Agreement.

20. Guarantee and Warranty. Consultant warrants to City that the material, analysis, data, programs and SERVICES to be delivered or rendered hereunder will be of the kind and quality designated and will be performed by qualified personnel. Without waiver of City's other rights or remedies, City may require Consultant to re-perform any of said services, which were not performed in accordance with these standards. Consultant shall perform the remedial services at its sole expense.

21. Insurance.

A. Commencement of Work. Consultant shall not commence work under this Agreement until it has obtained City approved insurance. Before beginning work hereunder, during the entire period of this Agreement, for any extensions hereto, and for periods after the end of this Agreement as may be indicated below, Consultant must have and maintain in place all of the insurance coverage required in this Section. Consultant's insurance shall comply with all items specified by this Agreement. Any subcontractors shall be subject to all of the requirements of this Section and Consultant shall be responsible to obtain evidence of insurance from each subcontractor and provide it to City before the subcontractor commences work. Alternatively, Consultant's insurance may cover all subcontractors.

B. Insurance Company Requirements. All insurance policies used to satisfy the requirements imposed hereunder shall be issued by insurers admitted to do business in the State of California. Insurers shall have a current Best's rating of not less than A-:VII, unless otherwise approved by City.

C. Coverage, Limits and Policy Requirements. Consultant shall maintain the types of coverage and limits indicated below:

1. Commercial General Liability Insurance - a policy for occurrence coverage for bodily injury, personal injury and property damage, including all coverage provided by and to the extent afforded by Insurance Services Office Form CG 2010 ed. 10/93 or 11/85, with no special limitations affecting City. The limit for all coverage under this policy shall be no less than one million dollars ($1,000,000.00) per occurrence.

2. Commercial Auto Liability Insurance - a policy including all coverage provided by and to the extent afforded by Insurance Services Office form CA 0001, ed. 12/93, including Symbol 1 (any auto) with no special limitations affecting City. The limit for bodily injury and property damage liability shall be no less than one million dollars ($1,000,000.00) per accident.

3. Policy Requirements. The policies set forth above shall comply with the following, as evidenced by the policies or endorsements to the policies:

a. The City, its appointed and elected officers, employees, agents and volunteers shall be added as additional insured to the policy.

b. The insurer shall agree to provide City with thirty (30) days prior written notice, return receipt requested, of any cancellation, non-renewal or material change in coverage.

c. For any claims with respect to the Services covered by this Agreement, Consultant's insurance coverage shall be primary insurance as respects the City, its elected and appointed officers, employees, agents and volunteers. Any insurance or self-insurance maintained by the City, its elected and appointed officers, employees, agents and volunteers shall be excess of Consultant's insurance and shall not contribute with it.

4. Worker's Compensation and Employer's Liability Insurance - a policy which meets all statutory benefit requirements of the Labor Code, or other applicable law, of the State of California. The minimum coverage limits for said insurance shall be no less than one million dollars per claim. The policy shall be issued by an insurance company which is admitted to do business in the State of California and shall contain a clause that the policy may not be canceled without thirty (30) days prior written notice, return receipt requested, is mailed to City.

D. Additional Requirements. The procuring of such required policies of insurance shall not be construed to limit Consultant's liability hereunder or to fulfill the indemnification provisions and requirements of this Agreement. There shall be no recourse against City for payment of premiums or other amounts with respect thereto. City shall notify Consultant in writing of changes in the insurance requirements. If Consultant does not deposit copies of acceptable insurance policies or endorsements with City incorporating such changes within sixty (60) days of receipt of such notice, Consultant shall be deemed in default hereunder.

E. Deductibles. Any deductible or self-insured retention over $25,000 per occurrence must be declared to and approved by City. Any deductible exceeding an amount acceptable to City shall be subject to the following changes: either the insurer shall eliminate or reduce such deductibles or self-insured retentions with respect to City, its officers, employees, agents and volunteers (with additional premium, if any, to be paid by Consultant); or Consultant shall provide satisfactory financial guarantee for payment of losses and related investigations, claim administration and defense expenses.

F. Verification of Compliance. Consultant shall furnish City with original policies or certificates and endorsements effecting coverage required by this Agreement. The endorsements are to be signed by a person authorized by the insurer to bind coverage on its behalf. All endorsements are to be received and approved by City before work commences. Not less than fifteen (15) days prior to the expiration date of any policy of insurance required by this Agreement, Consultant shall deliver to City a binder or certificate of insurance with respect to each renewal policy, bearing a notation evidencing payment of the premium therefore, or accompanied by other proof of

payment satisfactory to City. Consultant shall provide full copies of any requested policies to City within three (3) days of any such request by City.

G. Termination for Lack of Required Coverage. If Consultant, for any reason, fails to have in place, at all times during the term of this Agreement, including any extension hereto, all required insurance and coverage, City may immediately obtain such coverage at Consultant's expense and/or terminate this Agreement.

22. Indemnity.

A. Consultant assumes all risk of injury to its employees, agents, and contractors, including loss or damage to property.

B. Consultant agrees to defend, indemnify, hold free and harmless the City, its elected officials, officers, agents, employees and volunteers, at Consultant's sole expense, from and against any and all claims, actions, suits or other legal proceedings brought against the City, its elected officials, officers, agents, employees and volunteers arising out of the performance of the Consultant, its employees, and/or authorized subcontractors, of the work undertaken pursuant to this Agreement. The defense obligation provided for hereunder shall apply without any advance showing of negligence or wrongdoing by the Consultant, its employees, and/or authorized subcontractors, but shall be required whenever any claim, action, complaint, or suit asserts as its basis the negligence, errors, omissions or misconduct of the Consultant, its employees, and/or authorized subcontractors, and/or whenever any claim, action, complaint or suit asserts liability against the City, its elected officials, officers, agents, employees and volunteers based upon the work performed by the Consultant, its employees, and/or authorized subcontractors under this Agreement, whether or not the Consultant, its employees, and/or authorized subcontractors are specifically named or otherwise asserted to be liable. Notwithstanding the foregoing, the Consultant shall not be liable for the defense or indemnification of the City for claims, actions, complaints or suits arising out of the sole negligence or willful misconduct of the City. This provision shall supersede and replace all other indemnity provisions contained either in the City's specifications or Consultant's Proposal, which shall be of no force and effect.

C. No official, employee, agent or volunteer of City shall be personally liable for any default or liability under this Agreement.

23. Independent Contractor. Consultant agrees to furnish consulting services in the capacity of an independent contractor and neither Consultant nor any of its employees shall be considered to be an employee or agent of City.

24. PERS Eligibility Indemnification. In the event that Consultant or any employee, agent, or subcontractor of Consultant providing services under this Agreement claims or is determined by a court of competent jurisdiction or the California Public Employees Retirement System (PERS) to be eligible for enrollment in PERS as an employee of the City, Consultant shall indemnify, defend, and hold harmless City for the payment of any

employee and/or employer contributions for PERS benefits on behalf of Consultant or its employees, agents, or subcontractors, as well as for the payment of any penalties and interest on such contributions, which would otherwise be the responsibility of City.

Notwithstanding any other agency, state or federal policy, rule, regulation, law or ordinance to the contrary, Consultant and any of its employees, agents, and subcontractors providing service under this Agreement shall not qualify for or become entitled to, and hereby agree to waive any claims to, any compensation, benefit, or any incident of employment by City, including but not limited to eligibility to enroll in PERS as an employee of City and entitlement to any contribution to be paid by City for employer contribution and/or employee contributions for PERS benefits.

25. Notices. Any notice or communication given under this Agreement shall be effective when deposited, postage prepaid, with the United States Postal Service and addressed to the contracting parties. Name, address, telephone and facsimile numbers of the parties are as follows:

City of Gardena:
1700 West 162nd Street
Gardena, California 90247-3732
Attn: Greg S. Tsujiuchi
Telephone Number: (310) 217-9526
E-mail: gtsujiuchi @cityofgardena.org

SPCALA
Project Manager: Denise Jakcsy
Telephone Number: (310) 676-1149
Facsimile Number:
E-mail: DJakcsy@spcala.com

Either party may change the information to which notice, or communication is to be sent by providing advance written notice to the other party.

26. Severability. If any provision of this Agreement shall be held illegal, invalid, or unenforceable, in whole or in part, such provision shall be modified to the minimum extent necessary to make it legal, valid, and enforceable, and the legality, validity, and enforceability of the remaining provisions shall not be affected thereby.

27. Jurisdiction and Venue. This Agreement shall be deemed a contract under the laws of the State of California and for all purposes shall be interpreted in accordance with such laws. Both parties hereby agree and consent to the exclusive jurisdiction of the courts of the State of California and that the venue of any action brought hereunder shall be Los Angeles County, California.

28. Waiver. No delay or failure by either Party to exercise or enforce at any time any

right or provision of this Agreement shall be considered a waiver thereof or of such Party's right thereafter to exercise or enforce each and every right and provision of this Agreement. To be valid a waiver shall be in writing but need not be supported by consideration. No single waiver shall constitute a continuing or subsequent waiver.

29. Entire Agreement.

A. This writing contains the entire agreement of the Parties relating to the subject matter hereof; and the Parties have made no agreements, representations, or warranties either written or oral relating to the subject matter hereof which are not set forth herein. Except as provided herein, this Agreement may not be modified or altered without formal amendment thereto.

B. Notwithstanding the foregoing, and to realize the purpose of this Agreement, the Agreement Administrator may issue a written modification to the Scope of Work, if this modification will not require a change to any other term of this Agreement.

30. Joint Drafting. Each party acknowledges that it has had an adequate opportunity to review each and every provision in this Agreement and to submit the same to counsel and other consultants for review and comment and that the parties jointly drafted this Agreement. No provision of this Agreement or any Assignment shall be construed more strictly against one party than the other party by reason that one or the other party proposed, drafted or modified such provision or any other existing or proposed provision.

31. Public Records Act Disclosure. Consultant has been advised and is aware that this Agreement and all reports, documents, information and data, including, but not limited to, computer tapes, discs or files furnished or prepared by Consultant, or any of its subcontractors, pursuant to this Agreement and provided to City may be subject to public disclosure as required by the California Public Records Act (California Government Code section 6250 *et seq.*). Exceptions to public disclosure may be those documents or information that qualify as trade secrets, as that term is defined in the California Government Code section 6254.7, and of which Consultant informs City of such trade secret. The City will endeavor to maintain as confidential all information obtained by it that is designated as a trade secret. The City shall not, in any way, be liable or responsible for the disclosure of any trade secret including, without limitation, those records so marked if disclosure is deemed to be required by law or by order of the Court.

32. Authority to Execute. The persons executing this Agreement on behalf of the parties warrant that they are duly authorized to execute this Agreement.

33. Attorney's Fees. In the event that legal action is necessary to enforce the provisions of this Agreement, or to declare the rights of the parties hereunder, the parties agree that the prevailing party in the legal action shall be entitled to recover

attorney's fees and court costs from the opposing party.

34. Section Headings. The Section headings used in this Agreement are for reference purposes only and shall have no binding effect.

35. Counterparts. This Agreement may be executed in one or more counterparts, each of which shall be deemed an original. All counterparts shall be construed together and shall constitute one agreement.

IN WITNESS WHEREOF, the parties have hereunto affixed their names as of the day and year written below.

CITY OF GARDENA

By_____
Clint D. Osorio, MPA
City Manager

Date_____

ACCEPTED: The Los Angeles Society for the Prevention of Cruelty to Animals

By_____
Madeline Bernstein, President

Date_____

APPROVED AS TO FORM:

_____
CARMEN VASQUEZ, City Attorney

EXHIBIT A

ANIMAL SHELTERING SERVICES CONTRACT

This AGREEMENT is entered into on this _____ day of _____, 2022 between the City of Gardena, a general law city and municipal corporation, ("CITY") and THE LOS ANGELES SOCIETY FOR THE PREVENTION OF CRUELTY TO ANIMALS, a California Corporation ("CONTRACTOR").

In consideration of the mutual promises, covenants and conditions hereinafter set forth, CITY and CONTRACTOR hereby agree as follows:

1. **SCOPE OF SERVICES.** CONTRACTOR will serve as the Director of Animal Sheltering for CITY in accordance with holding periods required by applicable law. CONTRACTOR will accept stray animals turned in by citizens of the CITY. CONTRACTOR will also accept owned animals relinquished by citizens of the CITY **[upon payment of the CONTRACTOR'S fee for such services]**. To fulfill this responsibility CONTRACTOR will maintain an animal shelter located at 12910 Yukon Avenue in the City of Hawthorne during the term of this Agreement. CONTRACTOR may, in its sole discretion move animals to another suitable sheltering facility for any reason, including but not limited to: for maintenance, business necessity, a natural disaster or a pandemic. CITY agrees to ensure that all ill or injured animals receive emergency medical care as required by applicable law before depositing said animal with CONTRACTOR. CONTRACTOR agrees not to provide animals for scientific research. Upon CITY's request, CONTRACTOR will teach up to four (4), one-hour educational classes and/or workshops for the community, at a cost of $100 per session. These classes will present various topics on how to be a good pet owner; all dates, times, and topics will be determined upon mutual agreement of CITY and CONTRACTOR and will be free-of-charge to the attendees.

2. **FEES.** CITY agrees to pay CONTRACTOR a sum equal to nine thousand one hundred forty three dollars & 75/100 ($9,143.75) per month for CONTRACTOR'S services and Fifty Dollars ($50.00) per day per animal held in excess of the CITY'S mandated holding period at the CITY'S request. For a new contract, this monthly fee is based upon costs to the CONTRACTOR and upon initial estimates of animal intake activity provided by the City. For a renewal contract, the fee is based upon historical animal intake activity data. In either circumstances, the CITY'S animal intake activity will be reviewed periodically by the CONTRACTOR during the contract term to determine if said activity warrants a fee adjustment. Should an adjustment be deemed necessary, it will take effect in the first billing period subsequent to that determination. CONTRACTOR will invoice CITY each month. CITY agrees to pay each invoice within fourteen (14) days after receipt of an invoice.

3. **TERM.** The term of this Agreement is from July 1, 2022 to August 31, 2023. The term of this Agreement shall automatically renew for additional one year(s) terms unless either party provides written notice to the other at least thirty (30) days prior to the end of the initial term or any renewal term. Fees payable during any renewal term will be adjusted by CONTRACTOR to reflect the prevailing rates in effect at the time of renewal.

4. **TAXPAYER IDENTIFICATION NUMBER.** CONTRACTOR will provide CITY with a taxpayer identification number.

5. **PERMITS AND LICENSES.** CONTRACTOR, at its sole expense, will maintain during the term of this Agreement, all necessary permits, licenses, and certificates that may be required in connection with the performance of services under this Agreement.

6. **PROJECT COORDINATION AND SUPERVISION.**

(a) Denise Jakcsy will be assigned as CONTRACTOR'S Project Manager and will be responsible for coordination with CITY'S Project Manager for the services described herein.

(b) _____ will be assigned as CITY'S Project Manager and will be personally in charge of and personally supervise the Project on a day-to-day basis on behalf of CITY and will maintain direct communication with CONTRACTOR'S Project Manager to facilitate CONTRACTOR'S provision of the services described herein.

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7. **TERMINATION FOR CONVENIENCE.**

(a) Notwithstanding anything to the contrary set forth in Section 3, either party may terminate this Agreement for convenience at any time with or without cause upon (30) days' written notice.

(b) CONTRACTOR and CITY each waive any and all claims for damages that might otherwise arise from termination of this Agreement pursuant to this Section.

8. **INDEMNIFICATION.** To the fullest extent permitted by law, the parties agree to save, indemnify, defend, and hold harmless each other, and its affiliates, and their directors, officers, employees, agents, successors and assigns, from any and all liability, claims, suits, actions, arbitration proceedings, administrative proceedings, and regulatory proceedings, losses, expenses, or any injury or damage of any kind whatsoever, whether actual, alleged or threatened, attorney fees, expert fees, court costs, and any other costs of any nature without restriction incurred in relation to, as a consequence of, or arising out of, the performance of this Agreement, and attributable to the fault of the other. Following a determination of the percentage of fault and or liability by agreement between the Parties or a court of competent jurisdiction, the party responsible for liability to the other will indemnify the other party to this Agreement for the percentage of liability determined. It is expressly understood and agreed that the foregoing will survive termination of this Agreement.

9. **ASSIGNABILITY.** This agreement is for CONTRACTOR'S unique services. CONTRACTOR may not assign the benefits or burdens of this Agreement without CITY'S prior written consent.

10. **INDEPENDENT CONTRACTOR.** CITY and CONTRACTOR agree that CONTRACTOR will act as an independent contractor and will have control of the method and manner in which the services are performed hereunder. CONTRACTOR is free to contract for similar services to be performed for other entities while this Agreement is in effect with CITY. CONTRACTOR is not an agent or employee of CITY and is not entitled to participate in any pension plan, insurance, bonus or similar benefits CITY provides for its employees. Any provision in this Agreement that may appear to give CITY the right to direct CONTRACTOR as to the details of how the services are provided or to exercise a measure of control over the services means that CONTRACTOR will follow the direction of the CITY as to end results only.

11. **RECORDS RETENTION.**

(a) CONTRACTOR will maintain full and accurate records with respect to all services provided under this Agreement. CONTRACTOR will retain such records for at least three (3) years after termination or final payment under this Agreement.

(b) RECORDS, AUDIT AND RETENTION. The CONTRACTOR shall maintain accounts and records, including personnel, property, and financial records, adequate to identify and account for all costs incurred under this Agreement, and records related to the housing, medical care, treatment and adoption status of animals housed by CONTRACTOR pursuant to this Agreement, for a period of at least three (3) years after the expiration of this Agreement. Such aforementioned records relate solely to CONTRACTOR'S retention of an animal during the Holding Period.

12. **INSURANCE.**

(a) At all times during the term of this Agreement, CONTRACTOR will maintain the following types of insurance with coverage limits complying, at a minimum, with the limits set forth below.

Type of Insurance	Limits (Combined Single)
Commercial general liability:	$1,000,000
Business automobile liability:	$1,000,000
Workers compensation:	Statutory limits

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(b) Commercial general liability insurance will meet or exceed the requirements of ISO-CGL Form No. CG 00 01 10 01. The amount of insurance set forth above will be $1,000,000 per occurrence -- $2,000,000 aggregate for bodily injury, personal injury, and property damage for the policy coverage. Liability policies will be endorsed to name CITY, its officials, and employees as "additional insured" under said insurance coverage and to state that such insurance will be deemed "primary" such that any other insurance that may be carried by CITY will be excess thereto. Such insurance will be on an "occurrence", not a "claims made," basis and will not be cancelable except upon thirty (30) days prior written notice to CITY.

(c) Automobile coverage will be written on ISO Business Auto Coverage Form CA 00 01 07 97, or similar form for CONTRACTOR owned autos.

(d) CONTRACTOR will furnish to CITY duly authenticated Certificates of Insurance and Endorsements evidencing the insurance required under this Agreement and such other evidence of insurance or copies of policies as may be reasonably required by CITY from time to time. Insurance must be placed with insurers with a current A.M. Best Company rating of "A:VII."

(e) Should CONTRACTOR, for any reason fail to maintain the insurance required by this Agreement, CITY may, after providing reasonable written notice to CONTRACTOR, obtain such coverage at CONTRACTOR'S expense and deduct the cost of such insurance from payments due to CONTRACTOR under this Agreement or terminate this Agreement pursuant to Section 7.

13. NOTICES. All written communications by one party to the other will be sent as follows:

CITY	CONTRACTOR
City of Gardena 1700 W. 162nd st. Gardena, CA 90247	Madeline Bernstein spcaLA 5026 W. Jefferson Blvd. Los Angeles, CA 90016

Any such written communications will be conclusively deemed to have been received by the addressee at the time of actual delivery when sent by certified or registered mail, return receipt requested, postage prepaid. Changes may be made in the names or addresses of persons to whom notices are to be given by giving notices in the manner prescribed in this paragraph.

14. **INTERPRETATION.** This Agreement will be construed in accordance with the laws of the State of California, and exclusive venue for any dispute involving this Agreement will be in Los Angeles County.

15. **ENTIRE AGREEMENT.** This Agreement sets forth the entire understanding of the parties. There are no other understandings, terms or other Agreements express or implied, oral or written. This Agreement will bind and inure to the benefit of the parties to this Agreement and any subsequent successors and assigns.

16. **EFFECT OF CONFLICT.** In the event of any conflict or inconsistency between any provision of this Agreement, and any other document or agreement, whether oral or written, the provisions of this Agreement will govern and control.

17. **RULES OF CONSTRUCTION.** Each Party had the opportunity to independently review this Agreement with legal counsel. Accordingly, this Agreement will be construed simply, as a whole, and in accordance with its fair meaning; it will not be interpreted strictly for or against either party.

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18. **SEVERABILITY.** If any portion of this Agreement is declared by a court of competent jurisdiction to be invalid or unenforceable, then such portion will be deemed modified to the extent necessary in the opinion of the court to render such portion enforceable and, as so modified, such portion and the balance of this Agreement will continue in full force and effect.

19. **AUTHORITY/MODIFICATION.** The Parties represent and warrant that all necessary action has been taken by the parties to authorize the undersigned to execute this Agreement and to engage in the actions described herein. This Agreement may be modified by written amendment executed by both parties. CITY'S city manager, or designee, may execute any such amendment on behalf of CITY.

20. **COVENANTS AND CONDITIONS.** The Parties agree that all of the provisions hereof will be construed as both covenants and conditions, the same as if the words importing such covenants and conditions had been used in each separate paragraph.

21. **CAPTIONS.** The captions of the paragraphs of this Agreement are for convenience of reference only and not affect the interpretation of this Agreement.

22. **FORCE MAJEURE.** Should performance of this Agreement be prevented due to acts of God, fire, flood, earthquake, explosion, hostilities, war, strikes, embargo, riots, government action, civil or military authority, the natural elements, pandemics, or other similar causes beyond the parties' control, then this Agreement will immediately terminate without obligation of either party to the other.

23. **TIME IS OF ESSENCE.** Time is of the essence for each and every provision of this Agreement.

24. **COUNTERPARTS.** This Agreement may be executed in any number or counterparts, each of which will be an original, but all of which together will constitute one instrument executed on the same date.

[SIGNATURE PAGE FOLLOW]

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THE PARTIES HERETO AGREE TO THE FOREGOING AS EVIDENCED BY THEIR SIGNATURES BELOW.

spcaLA

By: _____

Name: Madeline Bernstein

Title: 7/8/22

Date Signed: President

CONTRACTOR

By: _____

Name: _____

Title: _____

Date Signed: _____

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City of Gardena

Gardena City Council Meeting
AGENDA REPORT SUMMARY

Agenda Item No. 8.I
Section: CONSENT CALENDAR
Meeting Date: July 26, 2022

TO: THE HONORABLE MAYOR AND MEMBERS OF THE GARDENA CITY COUNCIL

AGENDA TITLE: Acceptance and Notice of Completion for the Van Ness Ave. and 139th Street Improvement Project, JN 952
CONTACT: PUBLIC WORKS

COUNCIL ACTION REQUIRED:

RECOMMENDATION AND STAFF SUMMARY:
Staff respectfully recommends that City Council accept the work and order the recordation of the Notice of Completion for the Van Ness Ave. and 139th Street Improvement Project, JN 952.

This project overlaid approximately 250,000 square feet of pavement on Van Ness Ave. and 139th Street. It also included the construction of 22 new curb ramps, 6,000 square feet of sidewalk, 960 linear feet of curb and gutter, 4,800 square feet of cross gutter, 3,100 square feet of driveways and planted 21 new trees.

Sufficient funds to complete this project were appropriated by the City Council during the fiscal year 2020-2021 Capital Improvement Budget using Measure M and Prop C funding.

FINANCIAL IMPACT/COST:
Amount of Expense: $1,516,164.54 (Construction & Construction Administration)
Funding Source: Measure M and Prop C

ATTACHMENTS:
NOC_VAN NESS & 139_JN 952-AAA.pdf

APPROVED:

_____
Clint Osorio, City Manager

RECORDING REQUEST BY AND MAIL TO:

Mina Semenza, City Clerk
City of Gardena
1700 W. 162nd Street
Gardena, CA 90247

SPACE ABOVE THIS LINE RESERVED FOR RECORDER'S USE

NOTICE OF COMPLETION

NOTICE IS HEREBY GIVEN, that:

1. The undersigned is the duly authorized representative of the City of Gardena, a Municipal Corporation of the State of California located within the County of Los Angeles in said State at 1700 West 162 Street, Gardena, California 90247.
2. That on the 28th day of September 2021, the City Council of said City entered into contract with All American Asphalt whose address is 400 E. 6th St., Corona, CA 92879 for the improvement titled Van Ness Ave. and 139th Street Improvement Project, JN 952 in accordance with City of Gardena Plans and Specifications.
3. That all of the work and improvement was located at Van Ness Ave. and 139th Street in said City. The owner of the location is the City of Gardena.
4. That all of the work and improvement contemplated in and under said contract was substantially completed on March 23rd, 2022.
5. That the City Council formally accepted this work and improvement on July 19, 2022.

The undersigned, being first duly sworn, states: That he is the duly authorized representative of the City of Gardena, the political subdivision of the State of California which conducted the proceedings for the improvement titled Van Ness Ave. and 139th Street Improvement Project, JN 952 in said City, that he has read the foregoing "Notice of Completion" and knows the facts recited therein are true.

IN WITNESS THEREOF, I have hereunto subscribed my name as the duly authorized representative of said City this ___ day of _____2022.

City of Gardena

_____
Jose Espinoza

City of Gardena

Gardena City Council Meeting
AGENDA REPORT SUMMARY

Agenda Item No. 8.J
Section: CONSENT CALENDAR
Meeting Date: July 26, 2022

TO: THE HONORABLE MAYOR AND MEMBERS OF THE GARDENA CITY COUNCIL

AGENDA TITLE: RESOLUTION NO. 6594, Authorizing the Filing of a Claim with the Los Angeles County Metropolitan Transportation Authority for Local Transportation Funds
CONTACT: TRANSPORTATION

COUNCIL ACTION REQUIRED:

RECOMMENDATION AND STAFF SUMMARY:
Staff recommends the City Council adopt Resolution No. 6594, which authorizes the filing of a claim with the Los Angeles County Metropolitan Transportation Authority (Metro) for Local Transportation Funds for Fiscal Year 2022-2023.

The attached resolution provides the necessary authority to file a claim with Metro for Local Transportation Funds in support of GTrans. These funds have been included in the City of Gardena's Fiscal Year budget for 2022-2023 previously approved by City Council.

FINANCIAL IMPACT/COST:
There is no impact to the General Fund.
Anticipated Revenue and Expense:

SB325 TDA Article 4 LTF	$ 7,023,418
TDA-STAF	$ 1,428,103

ATTACHMENTS:
Local Transportation Funds STA_TDA FY22-23 RESO No. 6594 7_26_22.pdf

APPROVED:

_____
Clint Osorio, City Manager

RESOLUTION NO. 6594

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF GARDENA, CALIFORNIA, AUTHORIZING THE FILING OF A CLAIM WITH THE LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY FOR LOCAL TRANSPORTATION FUNDS

WHEREAS, Transportation Development Act of 1971 ("Act"), Chapter 1400, Statues 1971 (SB 325), and amendments thereto, makes certain funds available for public transportation systems; and

WHEREAS, the Gardena City Council has adopted a budget for the Gardena Municipal Bus Lines for Fiscal Year 2022-2023, evidencing the need for financial assistance; and

WHEREAS, the Los Angeles County Metropolitan Transportation Authority (LACMTA) has been charged in the Act with the responsibility for the general administration of local transportation funds established through the Act;

NOW, THEREFORE, THE CITY COUNCIL OF THE CITY OF GARDENA, CALIFORNIA, DOES HEREBY FIND, DETERMINE, AND RESOLVE AS FOLLOWS:

SECTION 1. That the City Manager or designee of the City of Gardena is hereby authorized to file a claim with the Los Angeles County Metropolitan Transportation Authority for local transportation funds in an amount to be determined by LACMTA based on preliminary estimates of funds available.

SECTION 2. That this Resolution shall be effective immediately.

BE IT FURTHER RESOLVED that the City Clerk shall certify to the passage and adoption of this Resolution; shall cause the same to be entered among the original Resolutions of said City; and shall make a minute of the passage and adoption thereof in the records of the proceedings of the City Council of said City in the minutes of the meeting at which the same is passed and adopted.

Passed, approved, and adopted this 26th day of July 2022.

_____
TASHA CERDA, Mayor

ATTEST:

_____
MINA SEMENZA, City Clerk

APPROVED AS TO FORM:

_____
CARMEN VASQUEZ, City Attorney

City of Gardena

Gardena City Council Meeting
AGENDA REPORT SUMMARY

Agenda Item No. 8.K
Section: CONSENT CALENDAR
Meeting Date: July 26, 2022

TO: THE HONORABLE MAYOR AND MEMBERS OF THE GARDENA CITY COUNCIL

AGENDA TITLE: RESOLUTION NO. 6596, Authorizing the Filing of Federal Fiscal Year 2022 Grant Application for Transportation Assistance
CONTACT: TRANSPORTATION

COUNCIL ACTION REQUIRED:

RECOMMENDATION AND STAFF SUMMARY:
The City of Gardena's GTrans is eligible to receive a formula allocation of federal capital funding through the Federal Transit Administration. In order to access these funds, GTrans is required to file an electronic grant application through the FTA's Transit Award Management System (TrAMS).

GTrans has one grant application for submittal to the Federal Transit Administration (FTA), CA-1640-2022, requesting a total of $7,138,215 for bus replacements and associated spare parts. GTrans will provide $869,186 in available local capital matching funds for a combined total of $8,007,401 requested in the grant. These funds, along with funds already in approved FTA grants, will support the purchase of 21 Compressed Natural Gas (CNG) buses.

It is recommended that Council adopt Resolution No. 6596 and authorize the Director of Transportation or his designee to execute the grants. Projects are included either in capital budgets previously approved by the City Council or in future budgets for Council consideration. GTrans anticipates to begin drawing down these funds upon grant execution in October, 2022.

FINANCIAL IMPACT/COST:
GTrans will provide a local match of $869,186 representing a combination of State and Local funds (LCTOP and Proposition C Discretionary and MOSIP) available to GTrans, along with eligible Transportation Development Credits (TDCs). There is no impact to the General Fund.

ATTACHMENTS:
FTA FY22 Grant RESO No. 6596_7_26_22.pdf

APPROVED:

_____

Clint Osorio, City Manager

RESOLUTION NO. 6596

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF GARDENA, CALIFORNIA, AUTHORIZING THE FILING OF APPLICATION WITH THE FEDERAL TRANSIT ADMINISTRATION, AN OPERATING ADMINISTRATION OF THE UNITED STATES DEPARTMENT OF TRANSPORTATION, FOR FEDERAL TRANSPORTATION ASSISTANCE AUTHORIZED BY 49 U.S.C. CHAPTER 53, TITLE 23 UNITED STATES CODE, AND OTHER FEDERAL STATUTES ADMINISTERED BY THE FEDERAL TRANSIT ADMINISTRATION

WHEREAS, the Federal Transportation Administrator has been delegated authority to award Federal financial assistance for transportation projects; and

WHEREAS, the grants or cooperative agreements for Federal financial assistance will impose certain obligations upon the Applicant, and may require the applicant to provide the local share of the project cost; and

WHEREAS, the Applicant has or will provide all annual certifications and assurances to the Federal Transit Administration required for the project;

NOW, THEREFORE, THE CITY COUNCIL OF THE CITY OF GARDENA, CALIFORNIA, DOES HEREBY FIND, DETERMINE, AND RESOLVE AS FOLLOWS:

SECTION 1. The Director of Transportation or designee is authorized to execute applications and amendments to grants for Federal assistance on behalf of the City of Gardena with the Federal Transit Administration for Federal assistance authorized by 49 U.S.C. Chapter 53, Title 23, United States Code, or other Federal statutes authorizing a project administered by the Federal Transit Administration.

SECTION 2. The Applicant (City of Gardena) has received authority from the Designated Recipient, Southern California Association of Governments (SCAG), to apply for Urbanized Area Formula Program assistance in accordance with 49 U.S.C. § 5307.

SECTION 3. The Director of Transportation, or designee is authorized to execute and file with its applications, the annual certifications and assurances and other documents the Federal Transportation Administration requires before awarding a Federal assistance grant or cooperative agreement.

SECTION 4. The Director of Transportation or designee is authorized to execute grant and cooperative agreements with the Federal Transit Administration on behalf of the City of Gardena.

SECTION 5. That this resolution shall be effective immediately.

BE IT FURTHER RESOLVED that the City Clerk shall certify to the passage and adoption of this resolution; shall cause the same to be entered among the original resolutions of said City; and shall make a minute of the passage and adoption thereof in the records of the proceedings of the City Council of said City in the minutes of the meeting at which the same is passed and adopted.

Passed, approved, and adopted this 26th day of July 2022.

_____
Tasha Cerda, Mayor
City of Gardena, California

ATTEST:

_____
Mina Semenza, City Clerk

APPROVED AS TO FORM:

_____
Carmen Vasquez, City Attorney

City of Gardena

Gardena City Council Meeting
AGENDA REPORT SUMMARY

Agenda Item No. 8.L
Section: CONSENT CALENDAR
Meeting Date: July 26, 2022

TO: THE HONORABLE MAYOR AND MEMBERS OF THE GARDENA CITY COUNCIL

AGENDA TITLE: Approve Agreement between the Los Angeles County Metropolitan Transportation Authority and the City of Gardena for Proposition C 5% Transit Security Funds
CONTACT: TRANSPORTATION

COUNCIL ACTION REQUIRED:

RECOMMENDATION AND STAFF SUMMARY:
The voters of Los Angeles County passed Proposition C in 1990, establishing a one-half percent sales tax for public transit purposes, of which five percent must be designated to improve and expand rail and bus security. Each year, these transit security funds are allocated to Included and Eligible LA County municipal bus operators, including GTrans, through the established Formula Allocation Procedure (FAP).

The funding agreement provides for an annual disbursement of funds to GTrans over a five-year period, July 1, 2022 through June 30, 2027. Each year, GTrans is required to submit an invoice along with required eligible project documentation to LACMTA in order to receive the allocation. GTrans uses these funds to support its Transit Security Program, which includes expenditures for a full-time City of Gardena transit police officer, security training and facility security.

Therefore, it is recommended that Council authorize the execution of the attached funding agreement between Metro and the City of Gardena for Proposition C 5% Transit Security Funds.

FINANCIAL IMPACT/COST:
For FY23, GTrans is eligible to receive $259,483 in Proposition C 5% Transit Security Funds to be used for its security related operating expenses. There is no impact to General Fund.

ATTACHMENTS:
FY 23 Prop C 5% MOU - City of Gardena.pdf

APPROVED:

_____

Clint Osorio, City Manager

MEMORANDUM OF UNDERSTANDING
FOR PROPOSITION C 5% TRANSIT SECURITY FUNDS

This Memorandum of Understanding ("MOU") is entered into as of July 1, 2022, by and between the Los Angeles County Metropolitan Transportation Authority (“LACMTA”) and City of Gardena ("GRANTEE").

RECITALS:

A. On November 6, 1990, the voters of the County of Los Angeles approved by majority vote Proposition C, an ordinance establishing a one-half percent sales tax for public transit purposes; and

B. The Proposition C ordinance states that 5% of the Proposition C Funds are to be used to improve and expand rail and bus security (the "Prop C 5% Security Funds"); and

C. California Public Utilities Code Section 99285 (j) (SB-1755 Calderon) directs a formula allocation of Prop C 5% Security Funds based on transit ridership to all Eligible/Included Operators; and

D. LACMTA, as the agency responsible for administering the tax, has designated this formula allocation of Prop C 5% Security Funds as the funding source for the Transit Security Funds ("TSF") described and programmed by this MOU; and

E. At this time, the other Eligible/Included Operators can elect to pay and receive services from the various local LEAs or provide for their transit security needs. Therefore, the Eligible/Included Operators can elect to direct their TSF in one of the following ways: (1) allocate 100% of their share of TSF to the LACMTA for the relevant law enforcement transit security services as specified in the Service LOA, as defined in Recital H below; (2) allocate a portion of their share of TSF to the LACMTA for law enforcement transit security services as specified in the Service LOA and retain the remaining portion of the TSF to provide for their own transit security as specified in the Security Plan, as defined in Section 4.2 below; or (3) receive 100 % of their share of the TSF to provide for their own transit security as specified in the Security Plan; and

F. Commencing with FY 2023, to the extent that a LEA will provide transit security service to any Eligible/Included Operator, such service will not begin and no payments will be made until the Eligible/Included Operator, the law enforcement agency and the LACMTA enter into a letter of agreement (the "Service LOA"). The Service LOA shall specify the level of service to be provided to those Eligible/Included Operators electing to allocate either 100% or a portion of their TSF to the LACMTA for relevant transit security services provider; and

G. GRANTEE is an Eligible/Included Operator and desires to allocate its share of TSF as provided in this MOU; and

H. LACMTA and GRANTEE desire to enter into this MOU to allocate GRANTEE's share of TSF and to agree to the terms and conditions of the TSF.

NOW, THEREFORE, in consideration of the mutual terms and conditions contained herein, LACMTA and GRANTEE hereby agree as follows:

ARTICLE 1 – TERM

1.1. This MOU will be in effect from July l, 2022, through June 30, 2027, unless terminated earlier as provided herein.

1.2. The LACMTA reserves the right to terminate this MOU and withhold TSF if it is determined that the GRANTEE has not used best efforts to adhere to all the terms and conditions contained herein.

1.3. This MOU is subject to the "Calderon Bill" to the extent applicable.

ARTICLE 2- ALLOCATION OF TSF FUNDS AND INVOICE PROCEDURE

2.1. Each fiscal year, to the extent TSF is available, LACMTA staff, in coordination with the Eligible/Included Operators, will develop the Annual Proposition C 5% Transit Security Funding Allocation (the "Annual Security Allocation") which will describe (1) Grantee's share of the TSF pursuant to California Public Utilities Code Section 99285 (j); and (2) the distribution of Grantee's share of the TSF. Grantee shall have the opportunity to review and comment on the Annual Security Allocation prior to LACMTA staff submitting the Annual Security Allocation to the LACMTA Board for approval.

2.2. For each fiscal year covered by this MOU, GRANTEE hereby directs LACMTA to allocate Grantee's share of TSF pursuant to the Annual Security Allocation approved annually by the LACMTA Board. Attached as Exhibit A is the Annual Security Allocation for FY 2023. GRANTEE shall receive two hundred fifty-nine thousand four hundred eighty-three dollars ($259,483) in FY23 only. Future allocations will be determined by the LACMTA Board. If LACMTA staff, in coordination with the Eligible/Included Operators, develops a mid-year reallocation of the Annual Security Allocation, which is approved by the LACMTA board, Grantee hereby directs LACMTA to make such mid-year adjustments to its Annual Security Allocation as approved by the LACMTA Board if applicable.

2.3. To the extent GRANTEE directs that the LACMTA retain any TSF to pay for relevant law enforcement transit security services for GRANTEE, GRANTEE hereby authorizes LACMTA to take such funds and apply such funds to LACMTA's contract with the appropriate LEA. GRANTEE and LACMTA understand that LACMTA will not be authorized to take Grantee's TSF and apply such funds to LACMTA's contracts with appropriate LEA and Grantee shall not receive any transit security services from the appropriate LEA until such time the parties enter into a Service LOA specifying the level

of service to be provided to GRANTEE. GRANTEE will not need to submit an invoice for any amounts retained by LACMTA to pay appropriate LEA.

2.4. To the extent GRANTEE directs that it receive any TSF, each fiscal year, GRANTEE shall send LACMTA one invoice for such appropriate amount consistent with the amount shown on the applicable Annual Security Allocation. LACMTA shall not be obligated to forward any TSF to GRANTEE until it receives an invoice and the Security Plan, unless otherwise agreed to by the parties. LACMTA shall make payments to GRANTEE on a quarterly basis, unless otherwise agreed to by the parties.

ARTICLE 3 - USE OF FUNDS

3.1. GRANTEE shall use any TSF provided herein to provide transit security as provided in its Security Plan.

3.2. LACMTA shall use any TSF received hereunder to pay relevant LEA to provide transit security services to GRANTEE as specified in the Service LOA.

3.3. GRANTEE understands if it decides to allocate either 100% or a portion of its TSF to the LACMTA for relevant LEA transit security services, it will need to enter into a Service LOA.

3.4. To the extent Grantee receives any TSF, GRANTEE shall not use the TSF to supplement or pay for general police or other security services not related to transit.

3.5. To the extent Grantee receives any TSF, GRANTEE shall use TSF for operating or capital security assistance and shall not use TSF to substitute for any other funds, service, or project not specified in this MOU or the Service LOA.

ARTICLE 4 - AUDIT AND REPORTING REQUIRMENTS

4.1. LACMTA or its designee shall have the right to conduct a financial and compliance audit(s) of the program. To the extent Grantee receives the TSF, GRANTEE agrees to establish and maintain proper accounting procedures and cash management records and documents in accordance with conditions defined by this MOU. GRANTEE shall maintain financial records for three (3) years after the end of the fiscal year within which the TSF was dispersed. LACMTA may audit as provided herein up to three years after the end of the fiscal year within which the TSF was dispersed.

4.2. Pursuant to California Public Utilities Code Section 99285 (j), GRANTEE shall file a cost-effective security program to provide transit security (the "Security Plan") with the LACMTA prior to receiving all or a portion of TSF.

4.3. For those Eligible/Included Municipal Operators who directly receive their TSF, the Security Plan shall be submitted annually with the annual invoice. For those Eligible/Included Municipal Operators who direct all TSF to the LACMTA for the

relevant LEA, the Security Plan stating such may be filed once with the LACMTA for the duration of the MOU unless there are any changes to the Security Plan in which event, the Eligible/Included Municipal Operator shall once again be required to submit its Security Plan annually with the annual invoice.

ARTICLE 5 - MISCELLANEOUS

5.1. This MOU along with the Annual Security Allocation, the Service LOA, if any, and the Security Plan, if any, constitute the entire agreement between the parties with respect to the subject matter described herein. No amendments or modifications to this MOU shall be binding upon either party unless such amendment or modification is in writing and duly executed by both parties. This MOU shall not be amended or modified by any acts or conduct of the parties.

5.2. GRANTEE agrees to comply with all applicable local, state and federal laws and regulations in the provision of public transit services.

5.3. GRANTEE is not a contractor, agent or employee of the LACMTA. GRANTEE shall not represent itself as a contractor, agent or employee of the LACMTA and shall have no power to bind the LACMTA in contract or otherwise.

5.4. To the extent GRANTEE receives the TSF, GRANTEE understands and agrees that in programming the TSF, LACMTA is acting pursuant to its statutory authority and LACMTA shall have no liability in connection with the use of such TSF. GRANTEE agrees to indemnify LACMTA for all liability arising out of GRANTEE'S performance in the provision of public transit security services paid for by TSF.

5.5. GRANTEE understands and agrees that in programming the Prop C 5% Security Funds and entering into this MOU, LACMTA is acting pursuant to its statutory authority and shall have no liability in connection with the use of Prop C 5% Security Funds for public transit purposes. GRANTEE shall fully indemnify, defend and hold the LACMTA, it directors, officers, employee and agents harmless from and against any liability and expenses, including without limitation, defense costs, any costs or liability on account of bodily injury, death or personal injury of any person or for damage to or loss of risk of property, any environmental obligation, legal fees and any claims for damages of any nature whatsoever arising out of (i) breach of GRANTEE's obligations under this MOU; (ii) misuse of the Prop C 5% Security Funds by GRANTEE or its officers, agents, employees, contractors or subcontractors; (iii) any act or omission of the GRANTEE or its officers, agents, employees, contractors or subcontractors in the performance and/or provision of the services provided under this MOU.

IN WITNESS WHEREOF, the parties hereto have caused this Memorandum of Understanding to be duly executed as of the dates below with all the formalities required by law.

GRANTEE
CITY OF GARDENA

By:_____
Tasha Cerda
Mayor

Date:_____

APPROVED AS TO FORM:

By: _____
Carmen Vasquez
City Attorney

ATTEST:

By: _____
Mina Semenza
City Clerk

Date: _____

LOS ANGELES COUNTY
METROPOLITAN TRANSPORTATION
AUTHORITY

By:_____
Stephanie N. Wiggins
Chief Executive Officer

Date: _____

APPROVED AS TO FORM:

DAWYN R. HARRISON
Acting County Counsel

By: _____
Deputy

Date: 7/11/2022

Exhibit A

LACMTA
Transit Security Funding Allocation
Fiscal Year 2023

Operators	Funding Allocation
Arcadia	$3,858
Claremont	$1,541
Commerce	$24,796
Culver City	$366,724
Foothill Transit	$1,321,336
Gardena	$259,483
La Mirada	$2,503
Long Beach	$3,057,135
Montebello	$425,185
Norwalk	$151,822
Redondo Beach	$35,996
Santa Monica	$1,088,936
Torrance	$405,759
Antelope Valley	$198,045
LADOT	$1,854,633
Santa Clarita	$319,501
TOTAL	**$9,517,253**

City of Gardena

Gardena City Council Meeting
AGENDA REPORT SUMMARY

Agenda Item No. 8.M
Section: CONSENT CALENDAR
Meeting Date: July 26, 2022

TO: THE HONORABLE MAYOR AND MEMBERS OF THE GARDENA CITY COUNCIL

AGENDA TITLE: Approve Agreement between the Los Angeles County Metropolitan Transportation Authority and the City of Gardena for Proposition C 40% Discretionary Funds
CONTACT: TRANSPORTATION

COUNCIL ACTION REQUIRED:

RECOMMENDATION AND STAFF SUMMARY:
The voters of California passed Proposition C on November 6, 1990 establishing a one-half percent sales tax for public transit purposes. Each year The Los Angeles County Metropolitan Transportation Authority (Metro) includes in its annual budget process an allocation of Proposition C 40% Discretionary Funds to the included and eligible Los Angeles County municipal bus operators, including GTrans, through the established Formula Allocation Procedure (FAP).

The funding agreement provides for an annual disbursement of funds to GTrans over a ten-year period, July 1, 2022 through June 30, 2032. Each year, GTrans is required to submit an invoice along with required eligible project documentation to Metro in order to receive the allocation. GTrans uses these funds to support the operations of its transit services.

Therefore, it is recommended that Council authorize the execution of the attached funding agreement between Metro and the City of Gardena for Proposition C 40% Discretionary Funds.

FINANCIAL IMPACT/COST:
For FY23, GTrans is eligible to receive $ 1,181,001 in Proposition C 40% Discretionary Funds to be used for the operation of its services. There is no impact to General Fund.

ATTACHMENTS:
Prop C 40% MOU Gardena_FY23.pdf

APPROVED:

_____

Clint Osorio, City Manager

MOU# MOU.PC23GAR2

MEMORANDUM OF UNDERSTANDING TO ALLOCATE PROPOSITION C 40% DISCRETIONARY FUNDS

This Memorandum of Understanding ("MOU") is entered into as of July 1, 2022, by and between the Los Angeles County Metropolitan Transportation Authority ("LACMTA") and City of Gardena ("GRANTEE").

WHEREAS, on November 6, 1990, the voters of the County of Los Angeles approved by majority Proposition C, an ordinance establishing a one-half percent sales tax for public transit purposes; and

WHEREAS, the LACMTA, is the agency responsible for administering the tax; and

WHEREAS, from time to time, the LACMTA Board has identified, Proposition C 40% Discretionary Funds (the "FUNDS") as the funding source for the following programs: Proposition C Interest Funds ("PCI"), Transit Service Expansion ("TSE"), Foothill Mitigation ("FMIT"), Recession Mitigation ("RM"), Fair Share Allocation ("SHARE"), Bus System Improvement Plan ("BSIP") and Base Restructuring ("BASE").

WHEREAS, the GRANTEE is an eligible operator and desires to receive the FUNDS from LACMTA for the following programs (please check as applicable) (referred to, individually as a "Program" and collectively, as "Programs."):

_____ Prop C. Interest Funds
__X__ Transit Service Expansion
__X__ Bus System Improvement Plan
__X_ Foothill Mitigation
____ Base Restructuring

WHEREAS, LACMTA and GRANTEE desire to agree to the terms and conditions of the grant of FUNDS for the GRANTEE's Programs ("MOU").

NOW THEREFORE, in consideration of the mutual term and conditions contained herein, LACMTA and GRANTEE hereby agree as follows:

ARTICLE 1 - TERM

1.1. This MOU will be in effect from July 1, 2022, through June 30, 2032, unless terminated earlier as provided herein.

ARTICLE 2 – ALLOCATION OF PROPOSITION C DISCRETIONARY FUNDS AND INVOICE PROCEDURE

2.1. Each fiscal year, to the extent the FUNDS are available, LACMTA staff, in coordination with

the Eligible/Included Operators, will develop funding marks for those Programs to be funded that fiscal year (the" Annual Funding Marks"). The Annual Funding Marks will describe GRANTEE's share of the FUNDS for GRANTEE's Programs to the extent such Programs are funded that fiscal year. GRANTEE shall have the opportunity to review and comment on the applicable Annual Funding Marks prior to LACMTA staff submitting the Annual Funding Marks to the LACMTA Board for approval.

2.2. For each fiscal year covered by this MOU, GRANTEE hereby directs LACMTA to allocate GRANTEE's share of the FUNDS pursuant to the applicable Annual Funding Marks for that fiscal year as approved by the LACMTA Board. Attached as "Exhibit A" are the applicable Annual Funding Marks for GRANTEE's Projects in FY 2023. If LACMTA staff, in coordination with the Eligible/Included Operators, develops a mid-year reallocation of any Annual Funding Marks that is approved by the LACMTA Board, GRANTEE hereby directs and authorizes LACMTA to make such mid-year adjustments to its Annual Funding Marks, as approved by the LACMTA Board, if applicable.

2.3. Each fiscal year, GRANTEE shall send LACMTA one invoice for each GRANTEE Program in an amount consistent with the amount shown on the applicable Annual Funding Marks. LACMTA shall not be obligated to forward the FUNDS for a particular Program to GRANTEE until it receives an invoice. For each Program, LACMTA shall make payments to GRANTEE on a quarterly basis, unless otherwise agreed to in writing by the parties.

ARTICLE 3 - USE OF FUNDS

3.1. GRANTEE shall utilize the FUNDS (i) in accordance with the LACMTA Proposition C 40% Discretionary Guidelines (the "GUIDELINES") (as adopted by LACMTA in May 1992, (ii) only for operating assistance of the applicable Program transit services in the year of allocation for which GRANTEE has received FUNDS, and cannot be carried over to the next fiscal year and (iii) in accordance with LACMTA Board action in approving the FUNDS to GRANTEE.

3.2. GRANTEE shall not use any FUNDS received for a particular Program to substitute for any other funds, service, or project except as otherwise specifically provided for in this MOU.

3.3. GRANTEE shall utilize the BSIP FUNDS for services that will relieve overcrowding for the most transit dependent customers and results in improving service quality for the transit dependent.

3.4. GRANTEE shall not use any FUNDS received for the SHARE or RM Program to substitute for other funds; provided, however, GRANTEE may use the FUNDS received for the SHARE or RM Program to substitute for the following funds only: (I) Formula Allocation Procedure funds; (ii) Proposition A Discretionary funds; (iii) if GRANTEE has incurred debts or is planning to incur debts to balance its operating and capital budgets for the same fiscal year in which the FUNDS were programmed (the "Same Fiscal Year"), GRANTEE may use the FUNDS received for the SHARE or RM Program in lieu of such borrowings; and/or (iv) Proposition A & C Local Return funds budgeted for the Same Fiscal Year which

were originally programmed as operating revenues and which have been reprogrammed for capital purposes; provided, however, the total amount of FUNDS received for the SHARE or RM Program budgeted in the Same Fiscal Year as operating revenues does not decrease as a result of such reprogramming and the Maintenance of Effort continues to be met.

3.5. Any unspent FUNDS received for a particular Program must be returned to LACMTA no later than 60 days after the completion of any required fiscal and compliance audits of such program performed either by the LACMTA or GRANTEE, unless otherwise agreed to in writing by the parties.

ARTICLE 4 – AUDIT AND REPORTING REQUIREMENTS

4.1. Each fiscal year, LACMTA or its designee shall have the right to conduct a financial and compliance audit(s) of GRANTEE's Programs. GRANTEE agrees to establish and maintain proper accounting procedures and cash management records and documents in accordance with conditions defined by this MOU. GRANTEE shall maintain financial records for three (3) years after the end of the fiscal year within which the FUNDS were dispersed. LACMTA may audit as provided herein up to three years after the end of the fiscal year within which the FUNDS were dispersed.

4.2. GRANTEE shall comply with all Federal National Transit Database reporting requirements and shall annually submit a completed copy of said report to LACMTA by January 31st of each fiscal year.

4.3. By January 31st of each fiscal year, the GRANTEE shall submit to the LACMTA a completed TPM form which separately reports prior fiscal year data pertaining to all non formula service.

4.4. By December 31st of each fiscal year, the GRANTEE shall submit to the LACMTA an annual financial audit report which identifies the use of the FUNDS for transit purposes.

ARTICLE 5 - MISCELLANEOUS

5.1. Each grant given pursuant to an Annual Funding Mark shall be a one-time grant subject to the terms and conditions agreed to herein and in the GUIDELINES. Notwithstanding the term of this MOU, each grant does not imply nor obligate any future funding commitment on the part of the LACMTA.

5.2. GRANTEE understands and agrees that in programming the FUNDS and entering into this MOU, LACMTA is acting pursuant to its statutory authority and shall have no liability in connection with the use of these FUNDS for public transit purposes or for any of the Programs. GRANTEE shall fully indemnify, defend and hold the LACMTA, its directors, officers, employees and agents harmless from and against any liability and expenses, including without limitation, defense costs, any costs or liability on account of bodily injury, death or personal injury of any person or for damage to or loss of risk of property, any environmental obligation, legal fees and any claims for damages of any nature

whatsoever arising out of (i) breach of GRANTEE'S obligations under this MOU; (ii) misuse of the FUNDS by GRANTEE, or its officers, agents, employees or subcontractors; (iii) any act or omission of the GRANTEE or its officers, agents, employees or subcontractors in the performance and/or provision of the services provided under the GRANTEE'S Programs.

5.3. GRANTEE agrees to comply with all applicable local, state and federal laws and regulations in the provision of public transit services and any services rendered for the GRANTEE's Programs.

5.4. The LACMTA reserves the right to terminate this MOU and withhold the FUNDS if it is determined that the GRANTEE has not complied with all the terms and conditions contained herein or in the GUIDELINES.

5.5. Any withholding of FUNDS, termination of the MOU, or imposition of any financial penalty against GRANTEE pursuant to the GUIDELINES is subject to nine (9) affirmative votes by the governing board of the LACMTA.

5.6. No amendment or modification to this MOU shall be binding upon either party unless such amendment or modification is in writing duly executed by both parties. This MOU shall not be amended or modified by any acts or conduct of the parties.

5.7. GRANTEE is not a contractor, agent or employee of the LACMTA. GRANTEE shall not represent itself as a contractor, agent or employee of the LACMTA and shall have no power to bind the LACMTA in contract or otherwise.

5.8. This MOU constitutes the entire agreement between the parties with respect to the subject matter of this Agreement and supersedes all prior and contemporaneous agreements and understandings.

IN WITNESS WHEREOF, the parties hereto have caused this Memorandum of Understanding to be duly executed as of the dates below with all the formalities required by law.

GRANTEE
CITY OF GARDENA

By:_____
Tasha Cerda
Mayor

Date:_____

LOS ANGELES COUNTY
METROPOLITAN TRANSPORTATION
AUTHORITY

By:_____
Stephanie N. Wiggins
Chief Executive Officer

Date: _____

APPROVED AS TO FORM:

By: _____
Carmen Vasquez
City Attorney

Date: 7/14/2022

APPROVED AS TO FORM:

DAWYN R. HARRISON
Acting County Counsel

By: _____
Deputy

Date: 7/12/2022

ATTEST:

By: _____
Mina Semenza
City Clerk

Date: _____

Exhibit A

	Zero-fare Compensation	Foothill Transit Mitigation	Transit Service Expansion	Discretionary Base Restruct.	BSIP Overcrowding Relief	TOTAL
INCLUDED OPERATORS						
Metro Bus Ops.	$ -	$ 12,412,094	$ -	$ -	$ 12,511,239	$ 24,923,334
Arcadia	-	15,102	-	-	23,608	38,710
Claremont	-	4,967	-	-	-	4,967
Commerce	900,736	13,963	-	270,194	-	1,184,893
Culver City	-	264,274	260,439	-	181,996	706,709
Foothill	-	-	360,470	2,163,140	1,007,098	3,530,708
Gardena	-	242,417	748,595	-	189,989	1,181,001
La Mirada	-	3,689	-	-	-	3,689
Long Beach	-	1,094,897	2,471,477	-	892,094	4,458,468
Montebello	-	388,746	-	1,233,930	235,485	1,858,161
Norwalk	-	151,212	-	-	60,928	212,140
Redondo Beach DR/MB	-	34,947	-	-	4,325	39,272
Santa Monica	-	964,893	-	-	863,105	1,827,998
Torrance	-	313,760	876,524	785,150	260,598	2,236,032
Subtotal Included	900,736	3,492,867	4,717,505	4,452,414	3,719,226	17,282,748
						-
ELIGIBLE OPERATORS						-
Antelope Valley	-	29,840	408,166	-	51,804	489,810
Santa Clarita	-	24,953	213,483	-	55,413	293,849
LADOT Local/Express	-	602,942	2,932,371	-	162,427	3,697,740
Foothill BSCP	-	-	-	-	-	-
Subtotal Eligible	-	657,735	3,554,020	-	269,644	4,481,399
						-
City of Lynwood Trolley			233,639	-	-	233,639
						-
Total Municipal Operators	900,736	4,150,602	8,505,164	4,452,414	3,988,870	21,997,786
						-
T O T A L	$ 900,736	$ 16,562,696	$ 8,505,164	$ 4,452,414	$ 16,500,109	46,921,120

PLANNING AND ENVIRONMENTAL QUALITY COMMISSION

Regular PEQC Meeting Notice and Agenda

Website: www.cityofgardena.org

Tuesday, July 19, 2022 – 7:00 PM

1700 W. 162nd Street, Gardena, California

5. **PUBLIC HEARING ITEMS**

5.A **CONDITIONAL USE PERMIT #5-22**

The Planning Commission considered a request for a conditional use permit, to allow the on-site sale and consumption of beer and wine in a conjunction with a karaoke bar, which is subject to an approved entertainment permit that will be brought before the City Council at a future meeting date. The subject property is located in the General Commercial (C-2) and Parking (P) zone with a Mixed-Use Overlay (MUO). The project qualified for a categorical exemption from the provisions of CEQA as an existing facility project.

Project Location: 15210 S Western Ave

Applicant: Kyeang Linda Jo

Staff Report (5-22) .pdf

Resolution No. 10-22 (5-22).pdf

Exhibit A Conditions of Approval (5-22).pdf

Exhibit B - Project Plans (5-22).pdf

Commission Action: The Planning Commission approved Resolution No. PC 10-22, by vote of 4-0-1, approving the project and directing staff to file a Notice of Exemption.

City of Gardena

Gardena City Council Meeting
AGENDA REPORT SUMMARY

Agenda Item No. 11.A
Section: DEPARTMENTAL ITEMS - ADMINISTRATIVE SERVICES
Meeting Date: July 26, 2022

TO: THE HONORABLE MAYOR AND MEMBERS OF THE GARDENA CITY COUNCIL

AGENDA TITLE: Approval of Blanket Purchase Orders for Fiscal Year 2022-2023

COUNCIL ACTION REQUIRED:
Staff Recommendation: Approve Blanket Purchase Orders

RECOMMENDATION AND STAFF SUMMARY:

A blanket purchase order authorizes the City to buy goods or services with predetermined terms or conditions. Since these vendors either have individual contracts, are piggybacking on State contracts or provide vital services which the City is mandated to use, it is only necessary for the requisitioner to request one purchase order for the estimated amount of the expenditure for the fiscal year. The blanket purchase order is limited by a dollar amount, as approved by Council, and the Purchasing Officer can issue releases for goods or services until the pre-established dollar amount is reached.

Per the City's Purchasing Policy, Section 3.B. "the purchase of goods or services in excess of $30,000 must be authorized by the City Council". Therefore, as the estimated budgeted expenditure amount exceeds $30,000, it is requested that Council approve the following Blanket Purchase Orders for FY 22-23 as specified in Exhibit A.

FINANCIAL IMPACT/COST:

General Fund	$1,883,637
GTrans	$1,409,229
Other Funds	$637,622
Total Budgeted Expenditures	$3,930,488

ATTACHMENTS:
Exhibit A.pdf

APPROVED:

_____

Clint Osorio, City Manager

EXHIBIT A

VENDOR	AMOUNT	DESCRIPTION OF SERVICE	FUNDING SOURCE	DEPT
City of Hawthorne	$95,000	Mark 43 (CAD/RMS)	General Fund	PD
PSI	$39,101	Business License/Permit Software	General Fund	CITYWIDE
Data Gear	$100,000	Video Policing Camera Maintenance	General Fund	PD
Enterprise FM Trust	$140,405	Patrol & City lease fleet	General Fund	CITYWIDE
JL Group	$77,000	Investigative Services	General Fund	PD
Jones & Mayer	$127,059	City Attorney services	General Fund	CM
Kent Behrends	$40,800	IT consulting services	General Fund	ADMIN
LA Superior Court	$430,000	Parking Citation Fees	General Fund	PD
HNAS	$200,000	Health Insurance TPA	General Fund	ADMIN
Phoenix Group	$140,000	Citation Billing Services	General Fund	PD
Pinnacle Petroleum	$130,000	Fuel (Public Works)	General Fund	PW
Prudential Overall Supply	$ 44,000	Uniforms	General Fund	PW, REC
Pun Group LLC	$53,127	Annual Audit Services	General Fund	ADMIN
Race Communication	$54,724	Annual Fiber Internet Services	General Fund	ADMIN
Shige's Foreign Car Service	$50,000	Vehicle Repairs	General Fund	PD
Spicers Paper	$30,000	Paper	General Fund	ADMIN
Tyler Technologies	$52,421	Annual ERP Software Maintenance	General Fund	ADMIN
Western Collision Center	$50,000	Vehicle Repairs	General Fund	PD
Williams-Scotsman	$30,000	Rental for Mobile Building	General Fund	PD
Sub Total General Fund	**$1,883,637**			
Aftermarket Parts	$150,000	Budgeted bus replacement parts	GTrans	GTRANS
Gillig LLC	$45,000	Budgeted bus replacement parts	GTrans	GTRANS
Michelin North America, Inc.	$70,000	Tire lease and service for GTrans	GTrans	GTRANS
Pinnacle Petroleum	$1,117,746	Fuel	GTrans	GTRANS
Pun Group LLC	$14,139	Annual Audit Services	GTrans	GTRANS
Race Communication	$12,344	Annual Fiber Internet Services	GTrans	GTRANS
Sub Total GTrans	**$1,409,229**			
Enterprise FM Trust	$44,268	Patrol & City lease fleet	AQMD	CITYWIDE
LA County, Dept. of Public Works	$173,000	Traffic Signal Maintenance, NPDES	Gas Tax	PW
Mariposa Landscape, Inc.	$106,368	Citywide Median Landscape Maintenance	Gas Tax	PW
Mariposa Landscape, Inc.	$115,731	Citywide Tree Trimming Maintenance	Gas Tax	PW
McCain, Inc.	$65,000	Traffic Controllers and Ancillary Equipment	Gas Tax	PW
Micro Electronics	$30,000	Computer Replacement Parts	Internal Service Fund	ADMIN
Pun Group LLC	$13,442	Annual Audit Services	GFCC	REC
Golden Bell	$39,813	Insect coating for manholes/Roach Control	Sewer Fund	PW
Adminsure Inc.	$50,000	TPA, Workers Compensation	Internal Service Fund	ADMIN
Sub Total Other Funds	**$637,622**	**Grand Total Budgeted Funds**		**$3,930,488**

City of Gardena

Gardena City Council Meeting
AGENDA REPORT SUMMARY

Agenda Item No. 12.A
Section: DEPARTMENTAL ITEMS - COMMUNITY DEVELOPMENT
Meeting Date: July 26, 2022

TO: THE HONORABLE MAYOR AND MEMBERS OF THE GARDENA CITY COUNCIL

AGENDA TITLE: Review of Revised 2021-2029 Housing Element

COUNCIL ACTION REQUIRED:

Staff Recommendation: Review and Discuss the Changes to the Adopted Housing Element for Resubmission to HCD

RECOMMENDATION AND STAFF SUMMARY:

State law requires that each city adopt a General Plan to guide land use and development. Among the required "elements" of the General Plan is the Housing Element which sets forth goals, policies, and programs that address the future housing needs for all income levels in the City over an eight-year planning period which coincides with the Regional Housing Needs Assessment (RHNA) projection period. The RHNA is mandated by State Housing Law as part of the periodic process of updating local housing elements of the General Plan.

The City has been working on its 2021-2029 Housing Element since December 2019 when it entered into a consultant agreement with Veronica Tam & Associates. In January 2022, the City Council adopted the Housing Element. However, the California Department of Housing and Community Development (HCD) did not find the Housing Element to be compliant with State law.

As a result of HCD's review, staff has diligently been working with our Housing Consultant to make revisions to the Housing Element. The additional changes which have been made, primarily to comply with HCD's correspondence with regard to new or modified goals, policies and programs.

FINANCIAL IMPACT/COST:

None.

ATTACHMENTS:

Agenda Staff Report 2021-2029 Housing Element.pdf
Exhibit A - HCD Review Letter
Exhibit B - Redlined version of 2021-2029 Housing Element
Exhibit C - Redlined version of Appendix E
Exhibit D - Overlay Maps
Exhibit E - Orange County Register Article

APPROVED:

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Clint Osorio, City Manager

City of Gardena
City Council Meeting

Agenda Item No.: 12.A
Department: Community Development
Meeting Date: July 26, 2022

AGENDA STAFF REPORT

AGENDA TITLE:

Review of Revised 2021-2029 Housing Element

RECOMMENDATION:

Staff respectfully recommends that Council review and discuss the changes to the Adopted Housing Element for resubmission to HCD.

BACKGROUND:

State law requires that each city adopt a General Plan to guide land use and development. Among the required "elements" of the General Plan is the Housing Element which sets forth goals, policies, and programs that address the future housing needs for all income levels in the City over an eight-year planning period which coincides with the Regional Housing Needs Assessment (RHNA) projection period. The RHNA is mandated by State Housing Law as part of the periodic process of updating local housing elements of the General Plan.

The City has been working on its 2021-2029 Housing Element since December 2019 when it entered into a consultant agreement with Veronica Tam & Associates (VTA). In January 2022, the City Council adopted the Housing Element. However, the California Department of Housing and Community Development (HCD) did not find the Housing Element to be compliant with State law. (Gardena is in good company in this regard as HCD has only found 19 out of 197 jurisdictions to have a compliant housing element as of July 8, 2022.) HCD's review letter of April 8, 2022 is attached hereto as Exhibit A. As a result of HCD's review, staff has diligently been working with our Housing Consultant to make revisions to the Housing Element. A revised version of the Element is attached hereto as Exhibit B and the revised Appendix E: Affirmatively Furthering Fair Housing (AFFH) is attached as Exhibit C; all the revisions are shown in blue highlight.

ANALYSIS:

RHNA quantifies the need for housing within each jurisdiction during specified planning periods. The City's RHNA allocation for the 6th Cycle Housing Element is as follows:

- Very Low 1,485
- Low 761
- Moderate 894
- Above Mod. 2,595

  TOTAL 5,735

The purpose of tonight's item is ***not*** to amend any part of the Housing Element which HCD has already reviewed, but for the City Council to review the additional changes which have been made, primarily to comply with HCD's correspondence with regard to new or modified goals, policies and programs.

Revisions to Remaining RHNA

When the City Council adopted the 2021-2029 Housing Element in January 2022 there were 648 units which were entitled or pending, including six lower income units that had been approved. There are now 686 units which have been approved, including 7 low income units and 8 very low income units.

HCD allows the City to take credit for ADUs based on the historical trend of the number of ADUs approved over the past three years. Additionally, HCD sets the proportion of ADUs assigned to each income category. Based on this, Gardena can only take credit for 20 ADUs a year at the income categories set forth below. With the credits that are allowed for ADUs and the approved projects, this leaves the following RHNA numbers to be satisfied:

Income Category	ADUs	Pipeline Projects	RHNA	Remaining RHNA
Extremely Low/ Very Low	28	8	1,485	1,449
Low	68	7	761	686
Moderate	10	--	894	884
Above Moderate	54	671	2,595	1,870
Total	160	686	5,735	4,889

HCD recommends that the City have a buffer in the housing element inventory of at least 15 to 30 percent capacity more than required, especially for lower income categories.

Buffers are needed to satisfy the requirement that the City always maintain an adequate inventory of sites for each income category. When a property develops with less than the number of affordable units which has been assigned to it in the sites inventory, the City is required to make findings that adequate sites still exist. For example, the recent development project on the vacant lot at 2545 Marine Avenue included 2 low income units. However, under the adopted Housing Element, this property was shown to be consolidated with other adjoining properties and developed with both moderate and lower income units. The Planning Commission had to include a finding that there were still sufficient sites to satisfy the remaining housing needs. If the available sites ever drop below the threshold of meeting the City's affordable housing needs, the City must rezone other property to accommodate the deficiency within 6 months. The City is not allowed to deny a housing project that meets all objective criteria based on the fact that it does not provide the amount of affordable units on the site that were identified in the Housing Element. As recommended by HCD, the sites inventory continues to provide a buffer of approximately 22% for lower income units.

Pursuant to state law, only properties that are at least 0.5 acres can be counted towards lower income housing and these properties must be allowed to have a minimum of 30 dwelling units to the acre which can be approved by right.

Because Gardena is 99 percent built out, the only way to provide for the required sites is to create an overlay zone on commercial and industrial areas. In order to meet the RHNA assigned to Gardena, the City Council previously established 4 Housing Overlay zones with the following densities as shown on the maps attached as Exhibit D:

- O3 – 12-20 units/acre
- O4 – 21-30 units/acre
- O5 – 31-50 units/acre
- O6 – 51-70 units/acre

These sites were identified and densities adjusted after a number of public meetings with both the Planning Commission and City Council.

HCD requires that the City justify the site selection. The most recent draft of the Housing Element includes modifications to Appendix C: Sites Inventory that better explains the criteria used to select sites for inclusion. However, in going through this exercise, seven sites were removed because they did not meet the criteria and two other sites were removed because housing developments had since been approved on those locations.

As a reminder, in addition to placing an overlay on the identified sites, the overlays were also placed on adjoining properties in order to create a more coherent zoning pattern and allow for better development opportunities.

New Additions to Housing Element

The following are the more substantive changes set forth in the revised Housing Element. Changes are shown with underline. The full discussion of goals, policies, and programs can be found in Chapter V of the Housing Element.

Policy 5.5 (Under Affirmatively Further Fair Housing): Ensure each City commission with the responsibility of advising or making decisions related to housing to has at least one member from Northern Gardena.

Program 1.1 – Housing Rehabilitation Programs: Increase program outreach in northern Gardena where there are concentrated disproportionate housing needs.

Program 2.2 – Senior Housing Development: Annually convene a developers workshop to explore affordable housing opportunities in the City, including housing for seniors, persons with disabilities, and large households. Specifically, explore affordable housing opportunities in northern Gardena where there are concentrated disproportionate housing needs.

Program 2.2 – Affordable Housing Development:

- **Collaborate with Affordable Housing Developers:** Affordable housing developers work to develop, conserve and promote rental and ownership affordable housing. The City will convene a housing developers workshop to explore opportunities for affordable housing development (including for extremely low income households and households with special needs).
- **Prioritize Review for Affordable Housing:** The City will prioritize the review of housing projects with an affordable housing component exceeding 20 percent of total units.
- Conduct annual developers outreach and consultation. Specifically, explore affordable housing opportunities in northern Gardena where there are concentrated disproportionate housing needs.
- Achieve the development of 200 affordable housing units over eight years, with an emphasis on addressing affordable housing needs of special populations.

Program 2.3 – Homeownership Opportunities: By 2022, provide links to LACDA and CalHFA homebuyer assistance programs on City website. Increase program outreach in northern Gardena where there are concentrated disproportionate housing needs.

Program 2.5 – Housing Choice Vouchers: The Housing Choice Voucher (Section 8 Rental Assistance) program assists extremely low- and very low-income households in paying their monthly rent. Under the program, the tenant contributes 30 percent of their monthly income toward rent, while the HCV program will pay for the remainder. The LACDA currently administers rental assistance on behalf of the City, and provides assistance to approximately 700 Gardena households. This program represents the most significant program in terms of impact (number and depth of subsidies) for addressing the housing needs of extremely low income households.

Program 4.1 – Adequate Sites for RHNA: Pursuant to SB 330, establish development standards to implement Housing Overlay zones (including parking, setbacks, height, etc.) and ensure standards are appropriate to facilitate the development of housing at the allowable densities.

Program 5.3 Place-Based Strategy for Neighborhood Improvements

The Northern Gardena neighborhoods are comprised of older housing stock and with concentrated issues such as overcrowding and cost burden. The City's RHNA strategy includes introducing new housing opportunities in order to ease overcrowding and displacement pressure. Northern Gardena areas, while representing optimal locations for new housing due to the declining existing uses and high demand for housing, require increased neighborhood services and amenities to serve the existing and new residents. To facilitate residential development in these areas and to ensure quality of life improvements, the City will pursue neighborhood-focused strategies.

Responsible Agencies: City Manager's Office; Community Development
Funding Sources: General funds
Program Objectives:

- Code Enforcement: Beginning in 2023, the City will undertake focused outreach to Northern Gardena to conduct code enforcement services in response to complaints. The idea is to encourage residents (particularly tenants) to report substandard housing conditions.
- Increased Fair Housing Outreach: Beginning in mid-2023 the City will engage its fair housing service provider (currently the Fair Housing Foundation) to conduct increased fair housing/landlord counseling in Northern Gardena. Specifically, pop-up events will be conducted in Rowley Park.
- Incentives for Affordable Housing: By October 2022 as part of the rezoning to create the Housing Overlay, the City will develop incentives to encourage affordable housing in Northern Gardena. Incentives may include priority for project review and financial assistance as funding permits.
- Micro Transit: The City is working to expand its micro transit service, which is–paired with paratransit service to provide "mini uber" services for all residents. By 2023, the City will create new stops (with high ridership) to better connect residents with services and community amenities. Rowley Park can be included as a new stop for this service.
- Neighborhood Representation: As part of this Housing Element update, the City will adopt a policy to ensure each city commission that has influence on housing related policies to have at least one representative from Northern Gardena.

- Neighborhood Amenities: By the end of 2022, create a marketing brochure to promote Northern Gardena and its changing demographics to entice needed services such as supermarkets.
- Coordinated Neighborhood Improvements: By the end of 2022, expand police meetings in each of the City's three police districts to include representatives from other departments to provide better community access to City issues.
- Employment Services: Beginning in 2022, host an annual job fair at Rowley Park, or other appropriate location in the vicinity, with the South Bay Workforce Investment Board.
- Digital Divide: By end of 2023, bridge the digital divide by providing free wifi in Rowley Park to allow residents to have internet access which would allow students to complete homework assignments and provide ability to search and apply for jobs.

Program 7: Affirmatively Furthering Fair Housing (AFFH) - Action Matrix

The following table summarizes the City's implementation actions to further fair housing. Individual housing programs may have different impacts on furthering housing choices, but are not specifically categorized as fair housing programs. Fair housing actions are grouped into the five themes:

- Fair housing outreach and enforcement
- Housing mobility through expanded choices in housing types and locations
- New opportunities in high resource areas
- Place-based strategies for neighborhood improvements
- Tenant protection and anti-displacement

Housing programs are often implemented throughout the City. However, individual programs may have targeted locations for specific attention, increased outreach efforts, and/or priority for allocation of resources.

Table V-1: AFFH Action Matrix

Program	Specific Commitment	Timeline	Geographic Targeting	Eight-Year Metrics
Fair Housing Outreach and Enforcement				
5.1: Fair Housing Outreach and Enforcement	Conduct fair housing outreach and education workshops targeted for Gardena residents and property owners.	Annually	Northern Gardena	Outreach to 1,200 residents, landlords, and housing professionals
	Make available multi-lingual fair housing materials at various media platforms and at public counters and community locations	By the end of 2022	Not applicable	Not applicable
	Conduct fair housing testing.	Bi-annually	Not applicable	20 paired tests
Housing Mobility				
2.1: Senior Housing Development	Convene a developer workshop to explore affordable housing opportunities.	Annually	Northern Gardena	100 affordable housing units in Northern Gardena (50 senior housing units)
2.2: Affordable Housing Development	Conduct developer outreach and consultation	Annually	Northern Gardena	
2.5: Housing Choice Vouchers	Work with LACDA to promote acceptance of HCVs.	2021-2029	Not applicable	Increase voucher use in Gardena by 10 percent
Place-Based Strategy for Neighborhood Improvements				
1.1: Housing Rehabilitation Program	Increase program outreach where there are concentrated disproportionate housing needs.	Beginning 2023	Northern Gardena	40% of all rehabilitation goals
5.3: Place-Based Strategy for Neighborhood Improvements	Code Enforcement: Undertake focused outreach to conduct code enforcement services in response to complaints.	Beginning in 2023	Northern Gardena	Make 400 code compliant cases

Table V-1: AFFH Action Matrix

Program	Specific Commitment	Timeline	Geographic Targeting	Eight-Year Metrics
	Increased Fair Housing Outreach: Conduct increased fair housing/ landlord counseling.	Beginning in mid-2022	Northern Gardena	16 outreach events
	Incentives for Affordable Housing: Develop incentives to encourage affordable housing in Northern Gardena.	By October 2022	Northern Gardena	100 affordable housing units in Northern Gardena (50 senior housing units) – See Programs 2.1 and 2.2
	Micro Transit: Create new stops (with high ridership) to better connect residents with services and community amenities.	By 2023	Rowley Park	New micro transit stop
	Neighborhood Representation: Adopt a policy to ensure each city commission that has influence on housing related policies to have at least one representative from Northern Gardena.	By October 2022	Northern Gardena	All commissions with influence on housing issues have representatives from Northern Gardena
	Neighborhood Amenities: Create a marketing brochure to promote Northern Gardena and its changing demographics to entice needed services such as supermarkets.	By mid-2022	Northern Gardena	New neighborhood serving uses (groceries, banks, coffee houses, etc.)
	Coordinated Neighborhood Improvements: Expand police meetings in each of the City's three police districts to include representatives from other departments to provide better community access to City issues.	By mid-2022	Not applicable	24 neighborhood meetings with participation from multiple city departments

Table V-1: AFFH Action Matrix

Program	Specific Commitment	Timeline	Geographic Targeting	Eight-Year Metrics
	Employment Services: Beginning in 2022, host an annual job fair at Rowley Park, or other appropriate location in the vicinity, with the South Bay Workforce Investment Board.	Annually	Northern Gardena	Eight job fairs
	Digital Divide: Provide free wifi in Rowley Park to allow residents to have internet access which would allow students to complete homework assignments and provide ability to search and apply for jobs.	By end of 2023	Rowley Park	Wifi service installed
New Opportunity in High Resource Areas				
2.4: Inclusionary Housing	Conduct feasibility study for inclusionary housing and if feasible, adopt an inclusionary housing program.	By the end of 2022	Not applicable	Not applicable
4.1: Adequate Sites for RHNA	Amend the Zoning Code to establish the Housing Overlay to designate adequate candidate sites with the objective of meeting the City's remaining RHNA of 5,047 units.	By October 15, 2023	Rezone to create new housing opportunities in High Resource areas in Central and Southeast Gardena	Capacity for 1,014 new units in Northern Gardena
4.5: Accessory Dwelling Units	Facilitate development of ADUs	2021-2029	High Resource areas	25 percent of ADUs created in High Resource tracts
Tenant Protection and Anti-Displacement				
1.2: Preservation of At-Risk Units	Work to preserve all at-risk housing units	2021-2029	Not applicable	278 at-risk units
2.3: Homeownership Opportunities	Increase program outreach	2021-2029	Northern Gardena	Increase rate of homeownership in Northern Gardena

Table V-1: AFFH Action Matrix

Program	Specific Commitment	Timeline	Geographic Targeting	Eight-Year Metrics
5.4: Rent Mediation Board – Anti-Displacement	Provide rent mediation and arbitration assistance to renters in disputes with landlords.	Ongoing	Not applicable	Mediate all rent increase disputes

Timing

Since the start of the housing element process, cities in the SCAG region have been under an almost impossible deadline. At the time the process started, the law provided that cities were supposed to adopt their housing elements by October 15, 2021, but had to do so by February 12, 2022. If the housing element was adopted within this time frame, the city would be given 3 years to implement any zoning changes required by the housing element. No extensions were given to cities for the Pandemic. Failure to have a compliant housing element can lead to penalties which can include referral to the State Attorney General, ineligibility for grants and other funding, and monetary fines.

Gardena adopted its 2021-2029 Housing Element in January 2022. However, while the City was working on its Housing Element, the Legislature changed the rules for those cities that were already in process. Instead of needing to have an adopted housing element by February 12, 2022, the law changed to require that the jurisdiction have a housing element that was found by HCD to be in substantial compliance with housing element law by February 12, 2022. If the jurisdiction did not meet this deadline, then all rezoning required by the Housing Element is required to be completed within one year from the statutory deadline. For Gardena and other cities in the SCAG region, this means rezoning is to be completed by October 15, 2022.[1] Pursuant to the revisions to Government Code § 65588 which became effective January 1, 2022, the Housing Element will not be considered to be in compliance until the rezoning takes place, even if all other requirements are met.

On June 30, 2022 Governor Newsom signed SB 197 into law which provides for appropriations related to the Budget Bill so it takes effect immediately. Included as part of this bill is the addition of Government Code section 65583.4. Under this new section *if* a jurisdiction in the SCAG region has an adopted housing element that HCD has found to be in substantial compliance with the housing element law, the jurisdiction will have until February 12, 2025 to complete its rezoning. However, the "help" provided by this bill is illusory for most all of the jurisdictions in the SCAG region. In order to take advantage of this, the housing element would essentially have to be adopted by August 16, 2022 without any further changes being required by HCD. As Gardena still needs to resubmit this draft of the Housing Element to HCD for approval, comments will not even be received until late September which will not allow sufficient time to make any further changes and have advertised public hearings before both the Planning Commission and the City Council which are required for readoption.

Although HCD has not approved the Housing Element, Gardena has already started the environmental work relating to the rezoning, as additional changes should not impact the environmental impacts associated with rezoning. Nevertheless, it may be difficult to complete this rezoning by October 15, 2022.

[1] See the article from the Orange County Register on this law, attached hereto as Exhibit E.

Once the City Council approves the changes, the document will be sent to HCD for further review. Hopefully this round of changes will satisfy HCD, although many cities have received three and four letters on their draft housing elements.

The revised Housing Element has been posted on the City's website since July 19, 2022. A minimum of 7 days posting is required before the Housing Element can be resubmitted to HCD.

CONCLUSION

Staff respectfully recommends that Council review these changes and make any changes deemed appropriate. Staff will then forward the document to HCD.

Submitted by: Greg Tsujiuchi Date: July 19, 2022
Prepared by: Lisa Kranitz/Amanda Acuna

Attachments:

- Exhibit A – HCD Review Letter
- Exhibit B – Redlined version of 2021-2029 Housing Element
- Exhibit C – Redlined version of Appendix E
- Exhibit D – Overlay maps
- Exhibit E – Orange County Register Article

DEPARTMENT OF HOUSING AND COMMUNITY DEVELOPMENT
DIVISION OF HOUSING POLICY DEVELOPMENT
2020 W. El Camino Avenue, Suite 500
Sacramento, CA 95833
(916) 263-2911 / FAX (916) 263-7453
www.hcd.ca.gov

April 8, 2022

Clint Osorio, City Manager
City of Gardena
1700 West 162nd Street
Gardena, CA 90247

Dear Clint Osorio:

RE: The City of Gardena's 6th Cycle (2021-2029) Adopted Housing Element

Thank you for submitting the City of Gardena's (City) or housing element adopted January 26, 2022 and received for review on February 7, 2022. Pursuant to Government Code section 65585, subdivision (h), the California Department of Housing and Community Development (HCD) is reporting the results of its review. In addition, HCD considered comments from Californians for Homeownership pursuant to Government Code section 65585, subdivision (c). Our review was facilitated by a telephone conversation on March 8, 2022 with City staff members including Amanda Acuna, Gregory McClain, Greg Tsujiuchi, Kevin La, and the City's consultant Veronica Tam.

The adopted housing element addresses most statutory requirements described in HCD's December 6, 2021 review; however, additional revisions are necessary to fully comply with State Housing Element Law (Article 10.6 of the Gov. Code), see enclosed Appendix.

For your information, pursuant to Assembly Bill 1398 (Chapter 358, Statutes of 2021), if a local government fails to adopt a compliant housing element within 120 days of the statutory deadline (October 15, 2021), then any rezoning to accommodate the regional housing needs allocation (RHNA), including for lower-income households, shall be completed no later than one year from the statutory deadline. Otherwise, the local government's housing element will no longer comply with State Housing Element Law, and HCD may revoke its finding of substantial compliance pursuant to Government Code section 65585, subdivision (i).

Public participation in the development, adoption and implementation of the housing element is essential to effective housing planning. Throughout the housing element process, the City should continue to engage the community, including organizations that represent lower- income and special needs households, by making information regularly available and considering and incorporating comments where appropriate. Additionally, pursuant to Government Code section 65585, subdivision (b) (AB 215, Statutes of

2021), any subsequent draft revision, the local government must post the draft revisions on its website and email a link to all individuals and organizations that have previous requested notices related to local governments housing element at least seven days before resubmitting to HCD.

For your information, some general plan element updates are triggered by housing element adoption. HCD reminds the City to consider timing provisions and welcomes the opportunity to provide assistance. For information, please see the Technical Advisories issued by the Governor's Office of Planning and Research at: http://opr.ca.gov/docs/OPR_Appendix_C_final.pdf and http://opr.ca.gov/docs/Final_6.26.15.pdf.

Several federal, state, and regional funding programs consider housing element compliance as an eligibility or ranking criteria. For example, the CalTrans Senate Bill (SB) 1 Sustainable Communities grant; the Strategic Growth Council and HCD's Affordable Housing and Sustainable Communities programs; and HCD's Permanent Local Housing Allocation consider housing element compliance and/or annual reporting requirements pursuant to Government Code section 65400. With a compliant housing element, the City meets housing element requirements for these and other funding sources.

We are committed to assisting the City in addressing all statutory requirements of State Housing Element Law. If you have any questions or need additional technical assistance, please contact Sohab Mehmood, of our staff, at sohab.mehmood@hcd.ca.gov.

Sincerely,

Paul McDougall
Senior Program Manager

Enclosure

APPENDIX
CITY OF GARDENA

The following changes are necessary to bring the City's housing element into compliance with Article 10.6 of the Government Code. Accompanying each recommended change, we cite the supporting section of the Government Code.

Housing element technical assistance information is available on HCD's website at http://www.hcd.ca.gov/community-development/housing-element/housing-element-memos.shtml. Among other resources, the housing element section contains HCD's latest technical assistance tool, *Building Blocks for Effective Housing Elements (Building Blocks),* available at http://www.hcd.ca.gov/community-development/building-blocks/index.shtml and includes the Government Code addressing State Housing Element Law and other resources.

A. Housing Needs, Resources, and Constraints

1. *Affirmatively further[ing] fair housing in accordance with Chapter 15 (commencing with Section 8899.50) of Division 1 of Title 2…shall include an assessment of fair housing in the jurisdiction. (Gov. Code, § 65583, subd. (c)(10)(A).)*

   Sites Inventory: While the revised element analyzed sites relative to all components of the fair housing assessment, it did not analyze sites impact on fair housing conditions, specifically whether sites improve or exacerbate current conditions.

   Fair Housing Issues: The element was not revised to address this finding. Please see HCD's prior review.

   Metrics, Milestones, Strategies and Actions: While the element included some revisions, it generally did not address HCD's prior review. Specifically, as stated in HCD's review, several programs did not include 1) metrics to measure program effectiveness 2) timelines for implementation 3) firm commitments and 4) demonstrate that actions directly respond to the City's identified fair housing issues and meaningfully overcome contributing factors. Lastly, as stated in HCD's prior review, programs must generally address enhancing housing mobility strategies, encourage development of new affordable housing in higher resourced areas, implement place-based strategies focused on specific census tracts to encourage community conservation and revitalization and address displacement risk. HCD will follow-up under a separate cover with additional information.

2. *An inventory of land suitable and available for residential development, including vacant sites and sites having realistic and demonstrated potential for redevelopment during the planning period to meet the locality's housing need for a designated income level, and an analysis of the relationship of zoning and public facilities and services to these sites. (Gov. Code, § 65583, subd. (a)(3).)*

   Realistic Capacity: The element was not revised to address this finding. As stated in HCD's prior review, the element identifies sites in zones that allow for 100 percent

nonresidential uses and must demonstrate the likelihood of residential. To demonstrate the likelihood for residential development in these zones, the element could describe recent residential and nonresidential trends such as the occurrence of 100 percent nonresidential uses, any performance standards mandating a specified portion of residential and any factors, policies or programs increasing the potential for residential development.

Suitability of Nonvacant Sites: The revised element now includes a list of factors that were utilized in identifying sites and reflected those factors in the actual inventory including existing uses, floor area ratio (FAR), building age, building square footage, and which of the various factors were applied to each site. However, as stated in HCD's prior review, the element must describe how and why these factors demonstrate these sites are suitable for housing development. For example, the element included a list of several projects indicating affordability and existing uses (Table IV-5 and IV-6). The element could relate these examples to support the factors that were utilized in identifying nonvacant sites with redevelopment potential. Specifically, for each project listed, the element could include information on the FAR, building age, existing uses, conditions of structures prior to redevelopment, and any other information that is reflective of the criteria used in identifying sites.

Additionally, while the revised element was updated to include a narrative discussion of demand for existing commercial and industrial uses (p. 60), the element generally did not address this finding. As stated in HCD's prior review, the element should analyze whether existing uses will impede additional residential development. The element can summarize past experiences converting existing uses to higher density residential development, include current market demand for the existing use, provide analysis of existing leases or contracts that would perpetuate the existing use or prevent additional residential development and include current information on development trends and market conditions in the City and relate those trends to the sites identified.

For your information, the element relies on nonvacant sites to accommodate 50 percent or more of the housing needs for lower-income households, which triggers requirements to make findings based on substantial evidence that the existing use is not an impediment and will likely discontinue in the planning period. While the resolution of adoption includes the appropriate findings, any changes to the analysis should be reflected in future re-adoption of the element.

Environmental Constraints: While the revised element now generally describes environmental conditions within the City (p. 55), as stated in HCD's prior review, it must describe how these conditions relate to identified sites including any other known environmental constraints within the City that could impact housing development in the planning period.

Availability of Infrastructure: While the element was revised to state that all sites are served by infrastructure (p. 58) the element must describe sufficient water, sewer, and infrastructure capacity to meet the Regional Housing Needs Allocation (RHNA).

3. *An analysis of potential and actual governmental constraints upon the maintenance,*

improvement, or development of housing for all income levels, including the types of housing identified in paragraph (1) of subdivision (c), and for persons with disabilities as identified in the analysis pursuant to paragraph (7), including land use controls, building codes and their enforcement, site improvements, fees and other exactions required of developers, and local processing and permit procedures. The analysis shall also demonstrate local efforts to remove governmental constraints that hinder the locality from meeting its share of the regional housing need in accordance with Government Code section 65584 and from meeting the need for housing for persons with disabilities, supportive housing, transitional housing, and emergency shelters identified pursuant to paragraph (7). Transitional housing and supportive housing shall be considered a residential use of property, and shall be subject only to those restrictions that apply to other residential dwellings of the same type in the same zone. (Gov. Code, § 65583, subd. (a)(5).)

Land-Use Controls: While the revised element included a discussion of policy changes to parking requirements, as stated in HCD's prior review, the element must specifically analyze requirements related to multifamily parking (number of required spaces and garage requirements). The analysis should address any impacts on cost, supply, housing choice, affordability, timing, approval certainty and ability to achieve maximum densities and include programs to address identified constraints.

Processing and Permit Procedures: While the revised element stated that site plan review is often required of projects that need other discretionary permits, this did not address HCD's prior review. Specifically, HCD prior review stated that the analysis should address the approval body, the number of public hearings, if any, approval findings, and any other relevant information such as any design review requirements for multifamily projects. The analysis should address impacts on housing cost, supply, timing, and approval certainty. For example, while the element discussed that a site plan review is often required and that some projects require City Council and Planning Commission review, it should identify timing, approval findings, and criteria for approvals.

4. *Analyze any special housing needs such as elderly; persons with disabilities, including a developmental disability; large families; farmworkers; families with female heads of households; and families and persons in need of emergency shelter. (Gov. Code, § 65583, subd. (a)(7).)*

   Extremely Low Income (ELI) and Large Households: As stated in HCD's prior review, while the element includes a general discussion of ELI and large households (p.28) and resources to address these households, it should also assess the gap in current resources, and proposed policies and funding to help address the gaps.

B. Housing Programs

1. *Identify actions that will be taken to make sites available during the planning period with appropriate zoning and development standards and with services and facilities to accommodate that portion of the city's or county's share of the regional housing need for each income level that could not be accommodated on sites identified in the inventory*

*completed pursuant to paragraph (3) of subdivision (a) without rezoning, and to comply with the requirements of Government Code section 65584.09. Sites shall be identified as needed to facilitate and encourage the development of a variety of types of housing for all income levels, including multifamily rental housing, factory-built housing, mobilehomes, housing for agricultural employees, supportive housing, single-room occupancy units, emergency shelters, and transitional housing. (*Gov. Code, § *65583, subd. (c)(1).)*

As noted in Finding A2, the element does not include a complete site analysis; therefore, the adequacy of sites and zoning were not established. Based on the results of a complete sites inventory and analysis, the City may need to add or revise programs to address a shortfall of sites or zoning available to encourage a variety of housing types.

2. *Address and, where appropriate and legally possible, remove governmental and nongovernmental constraints to the maintenance, improvement, and development of housing, including housing for all income levels and housing for persons with disabilities. The program shall remove constraints to, and provide reasonable accommodations for housing designed for, intended for occupancy by, or with supportive services for, persons with disabilities. (Gov. Code, § 65583, subd. (c)(3).)*

   As noted in Finding(s) A3, the element requires a complete analysis of potential governmental. Depending upon the results of that analysis, the City may need to revise or add programs and address and remove or mitigate any identified constraints. In addition, the element should be revised as follows:

   Program 3.1 – Zoning Code Amendments: As stated in HCD's prior review, the City currently excludes group homes of seven or more in some residential zones and subjects these uses to a conditional use permit (CUP). While the program was revised to permitting these uses with objective standards, it must also commit to allowing these uses in all residential zones.

3. *Promote and affirmatively further fair housing opportunities and promote housing throughout the community or communities for all persons regardless of race, religion, sex, marital status, ancestry, national origin, color, familial status, or disability, and other characteristics protected by the California Fair Employment and Housing Act (Part 2.8 (commencing with Section 12900) of Division 3 of Title 2), Section 65008, and any other state and federal fair housing and planning law. (Gov. Code, § 65583, subd. (c)(5).)*

   As noted in Finding A1, several programs meant to address fair housing issues lack specific commitments, definitive timelines, metrics to evaluate progress, and do not meaningfully overcome contributing factors.

C. Quantified Objectives

Establish the number of housing units, by income level, that can be constructed, rehabilitated, and conserved over a five-year time frame. (Gov. Code, § 65583, subd. (b)(1 & 2).)

The element was not revised to address this finding. Please see HCD's prior review.

City of Gardena

2021-2029 Housing Element

Adopted January 2022

With Revisions in July 2022

Community Development Department

1700 West 162nd Street

Gardena, CA 90247

Table of Contents

I. Introduction 1
A. Community Context 1
B. Role and Organization of the Housing Element 2
C. Data Sources and Methods 3
D. Relationship to Other General Plan Elements 4
E. Public Participation 4
II. Housing Needs Assessment 6
A. Population Profile 7
B. Employment Characters 10
C. Household Characteristics 12
D. Housing Characteristics 15
E. Housing Costs and Affordability 17
F. Special Needs 20
G. Publicly Assisted Housing 31
H. Housing Needs 35
III. Housing Constraints 38
A. Market Constraints 38
B. Governmental Constraints 40
C. Environmental and Infrastructure Constraints 55
IV. Housing Resources 60
A. Regional Housing Needs Assessment (RHNA) 60
B. Development Credit 61
C. Residential Sites Inventory 64
D. Summary of RHNA Strategies 73
E. Provision for a Variety of Housing Types 74
F. Financial Resources 82
G. Opportunities for Energy Conservation 84
V. Housing Plan 85
A. Goals and Policies 85
B. Housing Programs 87
Appendix A: Acronym Index A-1
Appendix B: Community Meetings B-1
Appendix C: Sites Inventory C-1
A. Criteria for Selecting Sites C-1

Appendix D: Evaluation of Accomplishments under the 2014-2021 Housing Element D-D-1

List of Tables

Table II-1: Regional Population Trends (2000-2020) 7
Table II-2: Population and Household Growth Forecast (2016-2045) 8
Table II-3: Age Composition (2014-2018) 9
Table II-4: Employment Trends (2010-2020)..... 10
Table II-5: Civilian Employed Population Distribution by Occupation (2014-2018)..... 11
Table II-6: Occupation Distribution of Gardena Residents (2007-11 and 2014-18)..... 11
Table II-7: Household Growth (2000-2020)..... 12
Table II-8: Household Tenure (2007-2018) 12
Table II-9: Household Characteristics (2007-2018)..... 13
Table II-10: Distribution of Households by Income..... 14
Table II-11: Distribution by Income Category 14
Table II-12: Housing Growth (1960-2020)..... 15
Table II-13: Housing Type (2020)..... 16
Table II-14: Age Distribution of Existing Housing Stock 16
Table II-15: Average Rent by Unit Size (2020)..... 18
Table II-16: Housing Affordability Matrix (2021) – Los Angeles County 19
Table II-17: Summary of Special Needs Populations 20
Table II-18: Senior Householders by Tenure..... 21
Table II-19: Persons with Disability Employment Status 23
Table II-20: Persons with Disabilities by Type..... 24
Table II-21: Licensed Community Care Facilities 25
Table II-22: Developmentally Disabled Residents by Age..... 26
Table II-23: Female Householders 28
Table II-24: Household Size by Tenure 28
Table II-25: Assisted Rental Housing Projects 32
Table II-26: Required Rental Subsidies..... 33
Table II-27: Household Cost Burden by Tenure 35
Table II-28: Lower Income Household Cost Burden by Tenure..... 36
Table II-29: Household Crowding by Tenure..... 37
Table II-30: Regional Housing Needs Allocation for Gardena (2021-2029)..... 37
Table III-1: Land Costs 39
Table III-2: National Annual Average Mortgage Interest Rates 40
Table III-3: Residential Land Use Categories..... 41
Table III-4: Specific Plans..... 43
Table III-5: Parking Requirements..... 45
Table III-6: Development Standards in Residential Zones 47
Table III-7: Residential Development Standards in Mixed-Use Zones 48
Table III-8: Typical Planning and Zoning Fees 49
Table III-9: Right-of-Way Standards..... 50
Table III-10: Residential Project Approval Processing Time..... 51

Table IV-1 : Regional Housing Needs Assessment (RHNA) 61
Table IV-2: ADU Projections and Affordability 61
Table IV-3: Approved or Pending Residential Development 63
Table IV-4: Credits and Remaining RHNA 64
Table IV-5: Recently Completed and Approved Residential Development in R-3 Zone 65
Table IV-6: Residential Development in Commercial, MUO, and Industrial Zones 67
Table IV-7: Residential Development on Nonvacant Sites 69
Table IV-8: Income/Affordability Assumptions 71
Table IV-9: Summary of Candidate Housing Overlay Sites 72
Table IV-10: Potential Housing Growth 73
Table IV-11: Housing Types by Zone Category 74
Table V-1: Summary of Candidate Housing Overlay Sites 93
Table V-2: Quantified Objectives 99
Table V-3: AFFH Action Matrix 101

List of Figures

Figure I-1: Regional Setting 2
Figure II-1: Race/Ethnicity (2011-2018) 10
Figure II-2: Median Home Prices, 2020 17
Figure III-1: Seismic Hazard Zones 58
Figure IV-1: 2021 General Plan Land Use Policy Map 80
Figure IV-2: Potential Emergency Shelter Sites in M-1 81

I. Introduction

A. Community Context

Located in the South Bay region of Los Angeles County, 13 miles south of downtown Los Angeles, Gardena is a dense urban community encompassing 5.7 square miles. Nicknamed the Freeway City, Gardena is situated near four major freeways: Harbor (I-110), San Diego (I-405), Century (I-105), and Artesia (SR-91). Surrounding communities are Hawthorne and Los Angeles County to the north and west, Torrance to the south and west, and Los Angeles to the south and east. Figure I-1 shows the location of Gardena in relation to the region.

After its incorporation in 1930, Gardena experienced its fastest growth during the 1950s when population more than doubled and the number of housing units grew by more than 150 percent. Part of this growth was the result of annexation of the northwest portion of the city. Growth slowed during the 1960s and 70s, but over the past 20 years the City grew marginally by approximately 6 percent.

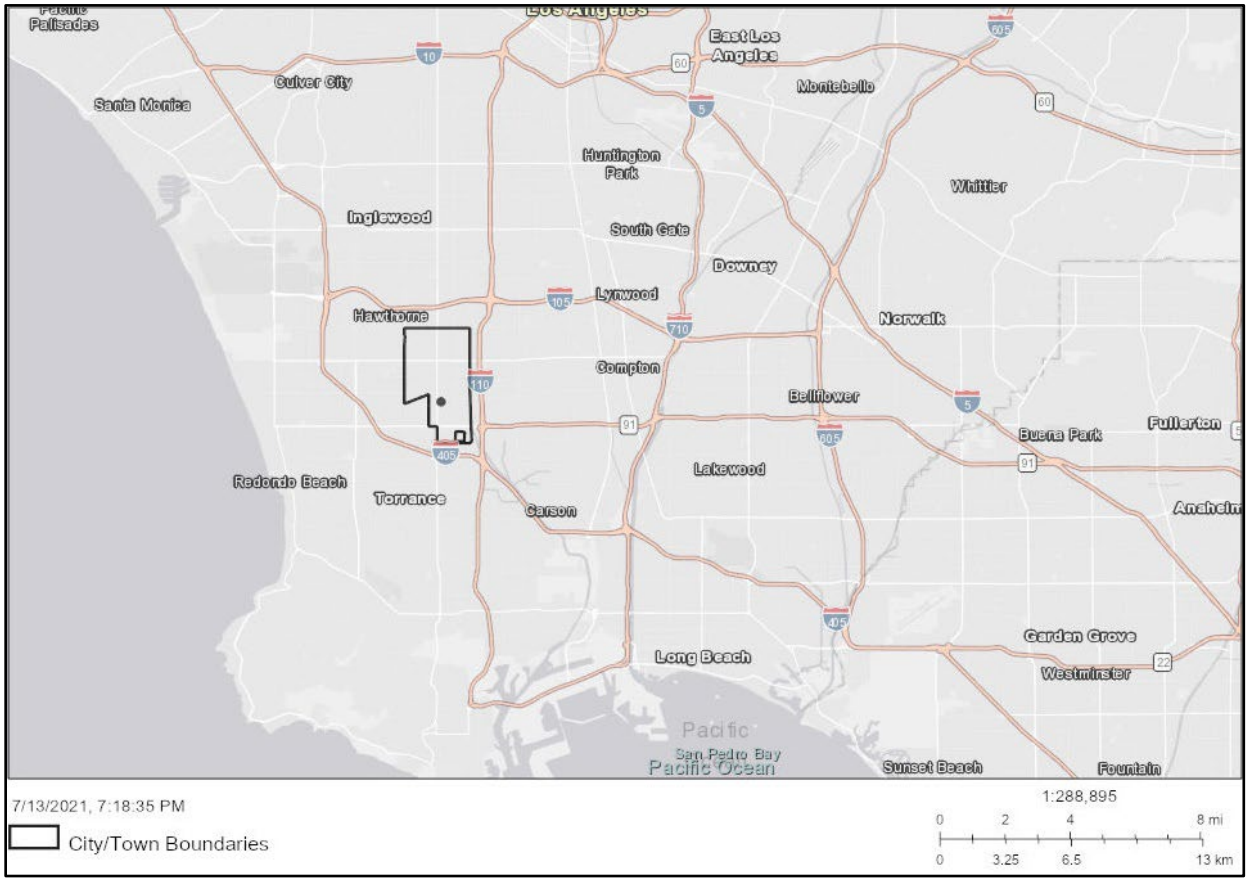
Housing in Gardena originally consisted almost entirely of single-family homes. However, as the City grew and vacant land became more limited, higher density housing was necessary to accommodate the population. The housing stock now consists of a balance between single-family homes and multi-family units.[1] During the 1980s, a majority of the housing growth was attributable to the replacement of single-family dwellings with multi-family units.

Much of the recent new housing construction in Gardena occurred through the implementation of specific plans. The first three (Emerald Square, Redondo Village, and Gardena Village) were adopted in 1999 and resulted in 283 net new residential units. There are now 12 specific plans in Gardena, 11 for residential development and one for mixed use. The Gardena Transit Oriented Development Specific Plan, adopted in 2021, is the newest residential specific plan in Gardena. In total, almost 1,000 residential units have or will be developed in the specific plan areas.

Although Gardena is built out and lacks available vacant land for development, the City must look at creative methods to provide decent affordable housing for all economic segments of the population. The 2021-2029 Housing Element continues the City's focus on maintenance of the housing stock and existing housing programs designed to increase homeownership in the community, incentives for the development of affordable housing and other programs aimed at meeting the needs of lower-income households and special needs populations are increasingly important priorities.

[1] The Gardena Municipal Code defines a "multiple dwelling" as a residential building having an occupancy of more than two separate living quarters. The term "multi-family" as used in the Housing Element means any building/development designed for two or more living quarters

Figure I-1: Regional Setting



Source: California Department of Housing and Community Development (HCD), 2021.

B. Role and Organization of the Housing Element

This Housing Element is an eight-year program extending from 2021 through 2029. Housing Element law, first enacted in 1969, mandates that local governments adequately plan to meet the existing and projected housing needs of all economic segments of the community. The law provides that in order for the private market to adequately address housing needs and demand, local governments must adopt land use plans and regulatory systems that provide opportunities for, and do not unduly constrain, housing production. Housing Element statutes also require the State Department of Housing and Community Development (HCD) to review local housing elements for compliance with State law and to report their findings to the local government.

California's Housing Element law requires that each city and county develop local housing programs to meet its share of existing and future housing needs for all income groups. The Southern California Association of Governments (SCAG) is responsible for assigning these regional needs, in the form of a Regional Housing Need Assessment (RHNA), to the six-county Southern California region (Los Angeles, Orange, Riverside, San Bernardino, Ventura, and Imperial). The 6th Cycle of the SCAG RHNA Allocation Plan,

which was adopted in 2021, indicates that between 2021 and 2029, the City of Gardena will need to accommodate the development of 5,735 units.

The Gardena 2021-2029 Housing Element identifies strategies and programs that focus on: 1) conserving and improving existing affordable housing; 2) providing adequate sites for residential development; 3) assisting in the provision of affordable housing; 4) removing governmental and other constraints on housing development; and 5) affirmatively furthering fair housing.

The Housing Element is organized into the following main sections:

Housing Needs Assessment – Includes a city profile and assessment of the City's population, housing characteristics, employment trend and special housing needs. The Needs Assessment also includes the City's share of the regional housing needs. (Chapter II)

Housing Constraints – Includes an analysis of actual and potential governmental and non- governmental constraints upon the development, improvement, or maintenance of housing, including construction costs, government regulations, financial costs, permit fees, regional constraints, etc. (Chapter III)

Housing Resources – Identifies land suitable for residential development, opportunities for recycling, redevelopment, and rezoning as well as financial resources for the development of housing. (Chapter IV)

Evaluation of Accomplishments under 2014-2021 Housing Element – summarizes the City's progress in implementing the 5th cycle Housing Element. (Appendix D)

Housing Plan – Includes the City's goals, policies and programs to be undertaken during the 2021-2029 period of the Housing Element are identified in this chapter. (Chapter V)

Affirmatively Furthering Fair Housing (AFFH) – Includes an analysis of fair housing issues including fair housing enforcement and outreach, segregation patterns, access to opportunities, and disproportionate housing needs. (Appendix E)

C. Data Sources and Methods

In preparing the 2021-2029 Housing Element, various sources of information were consulted. The 2020 Department of Finance (DOF) and the American Community Survey (2014-2018 and 2015-2019 5-Year Estimates) (ACS) provide the basis for much of the population, households and employment information. Other information sources used in this Housing Element include:

- Economic Development Department (EDD) 2020 employment trends and projections
- Los Angeles Homeless Services Authority (LAHSA) 2020 Homeless Count

- U.S. Department of Housing and Urban Development (HUD) Comprehensive Housing Affordability Strategy (CHAS) data to estimate housing problems including cost burden
- California Department of Housing and Community Development (HCD) Affirmatively Furthering Fair Housing (AFFH) Data Viewer
- 2021 HCD Income Limits
- 2021 HUD Fair Market Rents

D. Relationship to Other General Plan Elements

The Gardena General Plan was updated in 2006. The City consolidated the seven mandated topics into four elements: Community Development Element (Land Use Plan, Economic Development Plan, Community Design Plan, and Circulation Plan); Community Resources Element (Open Space Plan and Conservation Plan); Community Safety Element (Safety Plan and Noise Plan); and Housing Element.

As the Housing Element is updated, the City will review the other elements for consistency and modify if necessary. Specifically, this Housing Element proposes land use changes to accommodate housing growth over the next eight years. The Land Use Element will be amended to be consistent with this proposal. Furthermore, the City has updated the Safety Element and adopted an Environmental Justice Element to address new requirements in State law.

Pursuant to SB 1087, the City will provide the adopted Housing Element to its water and sewer service providers within 30 days of adoption.

E. Public Participation

As required by State law, all economic segments of the community must be provided an opportunity to review and comment on the Housing Element. In compliance with this requirement, the City held multiple virtual meetings during the development of the Housing Element.

- February 4, 2021 – An introductory workshop on the Housing Element update and challenges in meeting the Regional Housing Needs Assessment (RHNA)
- March 31, 2021 – A Housing Element Workshop to obtain additional input on needs and potential sites strategy
- May 4, 2021 – Planning Commission (Sites Inventory)
- May 11, 2021 – City Council (Sites Inventory)
- June 1, 2021 – Joint City Council/Planning Commission (Housing Programs/ Site Inventory)
- September 14, 2021 – Presentation of the Draft Housing Element to the City Council

- September 21, 2021 – Presentation of the Housing Element to the Planning Commission
- January 4, 2022 – Noticed public hearing before Planning Commission
- January 26, 2022 – Noticed public hearing before City Council for adoption of Housing Element
- July 26, 2022 – Review of changes by the City Council

Notifications of the community meetings were published on the City's website and social media platforms. Copies of the published notices, the notice flyers and outreach mailing list are included in Appendix B. In addition, the community meeting notices were posted at City Hall, Gardena Nakaoka Community Center, and the library. Notices were also sent to Gardena's City Council, Planning and Environmental Quality Commission members, housing advocacy groups, lenders, real estate agencies, and local housing agencies. The community meetings were announced on the City's official website: www.cityofgardena.org.

The City responded to community input by conducting additional public meetings to discuss the RHNA sites strategy and by continuing to refine the sites inventory. Programs such as religious facility overlay and inclusionary housing were also included in the Housing Element in response to community input.

The Draft Housing Element was available for review on the City's website beginning September 7, 2021, three weeks prior to initiating the mandatory HCD-review.

The revisions to the adopted Housing Element were available for review on the City's website beginning July 19, 2022, at least seven days prior to resubmitting the Housing Element to HCD.

II. Housing Needs Assessment

Assuring the availability of adequate and affordable housing for current and future residents is an important goal for Gardena. The City's housing production needs stem from both local and regional conditions. These conditions include the following:

- New housing is needed as regional employment and population growth generate a demand for new housing throughout Southern California.
- New housing is needed as Gardena's current population increases and ages.
- New construction housing is needed to replace some of Gardena's older housing stock that is too deteriorated to rehabilitate.
- New housing is needed when vacancy rates are low to ensure reasonable levels of choice and mobility in the marketplace.

A strategy to determine the housing needs of a community must be based on an understanding of its socioeconomic and housing characteristics. This entails a review of the human environment of the City.

Demographic and socioeconomic trends of a community such as population growth, household income, and changing age distribution among residents affect the types and quantities of needed housing. The characteristics of a city's current housing stock, defined as the collection of all housing units located within the city jurisdiction, serve as a baseline for future conditions and goals. The Housing Needs Assessment chapter presents a demographic profile and housing stock analysis of Gardena pursuant to Government Code Sections 65583(a)(1) and 65583(a)(2) to help guide this Housing Element to attain all future housing goals for the planning period of 2021 to 2029. The Housing Needs Assessment chapter is comprised of the following components:

- Population Profile
- Employment Characteristics
- Household Characteristics
- Housing Characteristics
- Special Needs
- Share of Region's Housing Needs

A. Population Profile

This section includes demographic and socioeconomic characteristics for Gardena residents, divided into the following subsections: population growth; age composition; and racial/ethnic characteristics. The information provides a database upon which decisions concerning policies and programs for the provision of adequate housing can be based.

1. Population Growth

After incorporation in 1930, Gardena experienced significant growth, and during the 1950s the population more than doubled and housing units grew by more than 150 percent. The rapid growth of the City was a result of the overall growth experienced throughout Los Angeles County and as a result of land annexed to the City. Growth slowed during the 1960s and 70s. By 2000 Gardena had a population of 57,746 residents. In 2010 Gardena's population had increased by 1.9 percent from a decade earlier to 58,829 residents. As shown in Table II-1, according to the latest 2020 DOF estimates, the population of Gardena was 60,937, an increase of 2,108 residents or 3.6 percent from 2010. During the 2010-2020 period, the neighboring city, Hawthorne, had the highest growth rate in the area after Gardena, at 3.1 percent. The City of Los Angeles had a higher growth rate of 5.7 percent, while the County grew at the same rate as Gardena.

Table II-1: Regional Population Trends (2000-2020)

Jurisdiction	2000	2010	2020	Growth	
				2000-2010	2010-2020
Gardena	57,746	58,829	60,937	1,083 1.9%	2,108 3.6%
Carson	89,730	91,714	93,108	1,984 2.2%	1,394 1.5%
Hawthorne	84,112	84,293	86,903	181 0.2%	2,610 3.1%
Lawndale	31,711	32,769	32,799	1,058 3.3%	30 0.09%
Los Angeles	3,694,820	3,792,621	4,010,684	97,801 2.6%	218,063 5.7%
Torrance	137,946	145,438	145,546	7,492 5.4%	108 0.1%
Los Angeles Co.	9,528,330	9,818,605	10,172,951	290,275 3.0%	354,346 3.6%

Source: 2000 Census (Table P001), Department of Finance (DOF) E-5: Population and Housing Estimates, 2010-2020.

The Southern California Association of Governments forecasts growth for the cities and six counties within its region. In 2016, SCAG adopted its Final RHNA Methodology and accompanying population and household projections for years 2020-2045. The SCAG forecasts for the City of Gardena are shown in Table II-2. Total population within the City is forecast to increase from 61,042 in 2020 to 65,681 in 2045, an increase of 4,639 or 7.6 percent. Total households in Gardena are forecast to increase from 21,333 in 2020 to 23,695 in 2045, which represents an increase of 2,362 households or 11.1 percent.[2]

Table II-2: Population and Household Growth Forecast (2016-2045)

Forecast	2016	2020	2045	Growth 2020-2045	Percent Growth
Population	60,628	61,042	65,681	4,639	7.6%
Households	20,817	21,333	23,695	2,362	11.1

Source: SCAG Final Methodology Data Appendix 2020-2045, 2016.

2. Age Composition

Different lifestyles, family types and sizes, income levels and housing preferences are associated with specific age groups. For instance, young adults tend to reside alone or in small households of unrelated persons and prefer condominiums and other small housing units. The need for detached single-family housing is prevalent among middle aged households, and increased household sizes necessitate larger housing units. Additional requirements such as proximity to schools and recreational facilities, job centers, and entertainment venues are important factors in assessing the needs of adult households, especially in households with children.

Table II-3 shows the age distribution of Gardena residents and Los Angeles County residents between 2014 and 2018. Gardena's working adults (ages 25 to 64) represented 55.2 percent of the total population, while students (ages 5 to 24) represented 22.9 percent. Seniors (ages 65 and over) made up 16.2 percent and youth ages (4 and under) represented 5.7 percent of the total population of Gardena. Compared to Los Angeles County, Gardena's population was older with a median age 40.5 years as compared to 36.2 years in the County. The larger senior population is also evident in the 65 years and over category, where seniors in Gardena represented 16.2 percent as compared to 12.9 percent countywide.

[2] This local growth rate is unrelated to the Regional Housing Needs Allocation, which is projected statewide and allocated to the region. Local growth rate is based on actual City trends. Furthermore, RHNA is a only a planning goal.

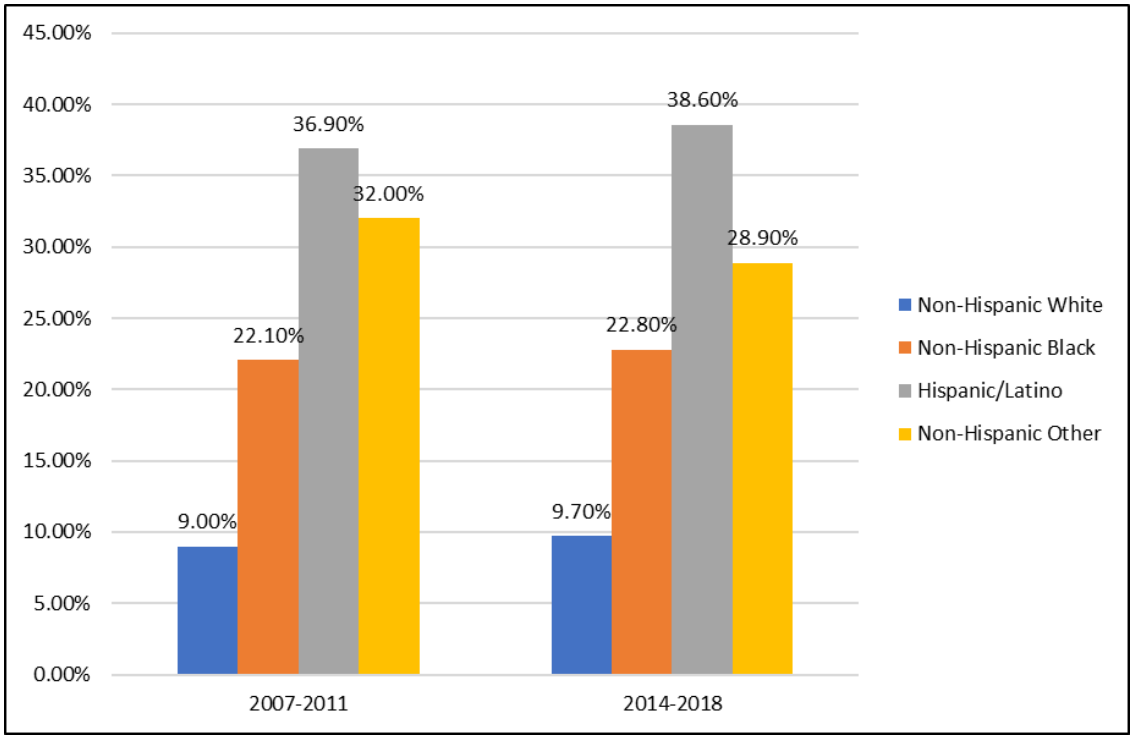
Table II-3: Age Composition (2014-2018)

Age Groups	City of Gardena		Los Angeles County	
	Total	Percent	Total	Percent
0-4 years	3,391	5.7%	624,745	6.2%
5-19	10,445	17.4%	1,889,402	18.7
20-24	3,305	5.5%	738,416	7.3
25-34	8,088	13.5%	1,609,935	15.9
35-44	8,586	14.3%	1,387,454	13.7
45-54	8,361	14.0%	1,369,838	13.6
55-64	8,040	13.4%	1,178,985	11.7
65 & over	9,708	16.2%	1,299,277	12.9
Total	**59,924**	100.0%	**10,098,052**	100.0
Median Age	40.5		36.2	
Source: ACS 2014-2018 (5-Year Estimates), Table S0101.				

3. Race and Ethnicity

Gardena residents pride themselves on being a racially, ethnically and culturally diverse community. Figure II-1 illustrates the racial/ethnic breakdown of Gardena residents. Since 2011, the fastest growing racial/ethnic group in the City was Hispanic/Latino. From 2014 to 2018, the Hispanic/Latino ethnic group represented the largest share of the City's ethnic population at 38.6 percent. This is lower than the countywide share of 48.5 percent. The second largest ethnic/racial group was the Asian/Other population at 28.9 percent, followed by the African American/Black population at 22.8 percent, and Non-Hispanic White population at 9.7 percent. According to the American Community Survey (ACS), Gardena's racial/ethnic composition changed modestly between 2007-2011 and 2014-2018.

Figure II-1: Race/Ethnicity (2011-2018)



Source: ACS 2007-2011 and 2014-2018 (5-Year Estimates), Table DP05.

B. Employment Characters

Employment trends for Gardena and Los Angeles County are shown in Table II-4. According to the California Economic Development Department (EDD), the total estimated employment in the City grew from 25,900 jobs in 2010 to 29,400 jobs in 2020, a 14.8 percent increase, or 3,800 jobs. Countywide, the number of jobs increased at a slightly higher rate during the same ten-year period (16.5 percent).

Table II-4: Employment Trends (2010-2020)

Jurisdiction	2010	2020	Growth 2010-2020	Percent Growth
City of Gardena	25,600	29,400	3,800	14.8%
Los Angeles Co.	4,256,700	4,956,900	700,200	16.5
Source: State of California EDD, January 2010 and 2020.				

Table II-5 shows the estimated civilian employment population age 16 and over by occupation for Gardena and Los Angeles County between 2014 and 2018. According to the 2014-2018 ACS, only 30.0 percent of Gardena residents have occupations in the highly skilled fields, which are identified as management/professional, as compared to 37.0 percent for all county residents. The occupational categories that usually require the highest training and skill levels are those considered management and business and financial operations or those that fall under professional and related occupations. However, Gardena residents have higher

proportions of employment in the occupational categories of sales and office, production, transportation and material moving, and service, as compared to the countywide averages in the same categories.

Table II-5: Civilian Employed Population Distribution by Occupation (2014-2018)

Occupation Category	City of Gardena	Los Angeles County
Management/Professional	30.0%	37.0%
Service	21.9%	18.9
Sales and Office	27.2%	22.7
Natural Resources, Construction, Extraction & Maintenance	6.3%	7.6
Production, Transportation & Material Moving	14.6%	13.8
Total	**28,562**	**4,869,658**
Source: ACS 2014-2018 (5-Year Estimates), Table DP03.		

The ACS data presented in Table II-6 indicates the proportion of Gardena residents employed in relatively high-paying management/professional occupations increased slightly from 28.8 percent to 30.0 percent between the 2007-2011 and 2014-2018 surveys. There was an increase in the proportion of those employed in relatively lower-paying service-related occupations, from 17.3 percent to 21.9 percent. The share of Gardena residents employed in all other occupations declined slightly between the two reporting periods despite an increase in more than 2,200 employed residents. This trend demonstrates the growing prevalence of white-collar and service occupations and a relative decline in the traditional blue-collar occupations (i.e., manufacturing and logistics).

Table II-6: Occupation Distribution of Gardena Residents (2007-11 and 2014-18)

Occupation	2007 – 2011		2014 – 2018	
	Number	Percent	Number	Percent
Management/Professional	7,575	28.8%	8,577	30.0%
Service	4,551	17.3%	6,249	21.9
Sales and Office	8,273	31.5%	7,759	27.2
Natural Resources, Construction, Extraction & Maintenance	1,937	7.4%	1,801	6.3
Production, Transportation & Material Moving	3,953	15.0%	4,176	14.6
Total	**26,289**	100.0%	**28,562**	100.0
Source: ACS 2007-2011 and 2014-2018 (5-Year Estimates), Table DP03.				

C. Household Characteristics

The U.S. Census Bureau defines a “household” as one or more persons who occupy a housing unit. This includes persons living alone, families related through marriage or blood, or unrelated persons sharing a dwelling. People living in retirement or convalescent homes, school dormitories or other group living situations are not considered households but are considered part of the group quarters population. Household characteristics are an important indicator of housing need in a community. The household characteristics section is divided into the following components: household growth, household type, household tenure, household composition and size, household income, and special needs groups and households.

1. Household Growth

Household trends for the City and County are shown in Table II-7. The total number of households (as indicated by occupied housing units) in the City increased by 234 units between 2000 and 2010 for a total of 20,558 households, an increase of 1.15 percent. During the same period, countywide households increased by 3.37 percent. In the last ten years, it is estimated that Gardena had a net gain of 667 households or 3.24 percent, while the County experienced an increase of 4.06 percent.

Table II-7: Household Growth (2000-2020)

Jurisdiction	2000	2010	2020	Growth 2000 – 2010	Growth 2010 – 2020
Gardena	20,324	20,558	21,225	234 1.15%	667 3.24%
Los Angeles Co.	3,133,774	3,239,280	3,370,663	105,506 3.37%	131,383 4.06%
Source: 2000 U.S. Census; DOF E-5: Population and Housing Estimates, 2010-2020,					

2. Tenure

As presented in Table II-8, Gardena's household tenure between 2014 and 2018, was 51.1 percent renters and 48.9 percent owners. Household tenure trends, though slight, indicate that the proportion of household renters is declining as owners are proportionately increasing in the City.

Table II-8: Household Tenure (2007-2018)

Tenure	2007-2011		2014 – 2018	
Owner	10,113	47.60%	10,090	48.9%
Renter	11,129	52.40%	10,529	51.1
Total Occupied	21,242	100.00%	20,619	100.0
Source: ACS 2007-2011 and 2014-2018 (5-Year Estimates), Table DP04.				

3. Household Composition and Size

Table II-9 summarizes the distribution of household types (families and nonfamilies) between 2007 to 2011 and 2014 to 2018. The share of households consisting of families increased slightly from 65.0 percent between 2007 and 2011 to 68.0 percent between 2014 and 2018. This increase in family households was accompanied by a slight increase in average household size during this same period, from 2.73 to 2.87 persons per household. The average household size of the County has been higher. It increased from 2.99 in 2011 to 3.00 in 2018.

Table II-9: Household Characteristics (2007-2018)

Household Type	2007-2011	2014 - 2018
Families	13,798 65.0%	14,020 68.0%
Nonfamilies	7,444 35.0%	6,599 32.0%
Total Households	21,242	20,619
Average Household Size	2.73	2.87
Source: ACS 2007-2011 and 2014-2018 (5-Year Estimates), Table DP02.		

4. Household Income

Household income in Gardena has typically been below that of Los Angeles County as a whole, with a greater percentage of households falling into the lower income categories of very low and low income. Table II-10, which reflects the results of the 2014-2018 ACS, presents the household income distribution for households in Gardena and Los Angeles County. Approximately 21.2 percent of the households in the City had an annual income under $25,000 during this period compared to 19.9 percent of households countywide. An estimated 45.9 percent of all households in Gardena had incomes under $50,000 annually, while 40.1 percent of county households fell into this income category. The same relationships are valid at the upper end of the household income spectrum. An estimated 23.7 percent of all households in Gardena had incomes over $100,000 between 2014 and 2018, considerably lower than the 31.7 percent observed at the County level. The median household income in Gardena during the 2014 – 2018 period was $55,351 compared to Los Angeles County's $64,251, a difference of $8,900.[3]

[3] In April 2020, the State HCD published the official 2020 Federal and State Income Limits, which reported that the median income for a four-person household in Los Angeles County was $77,300.

Table II-10: Distribution of Households by Income

Income Category	Gardena - Percentage	Los Angeles County - Percentage
Less than $10,000	7.1%	5.8%
$10,000 to $14,999	4.9	5.1
$15,000 to $24,999	9.2	9.0
$25,000 to $34,999	10.9	8.5
$35,000 to $49,999	13.8	11.7
$50,000 to $74,999	17.6	16.2
$75,000 to $99,999	12.7	12.0
$100,000 to $149,999	13.9	15.1
$150,000 to $199,999	5.0	7.3
$200,000 or more	4.8	9.3
Median Household Income	$55,351	$64,251
Source: ACS 2014-2018 (5-Year Estimates), Table DP03,		

SCAG, in projecting and allocating housing growth, provides estimates of jurisdictional income distribution based on Area Median Income (AMI). Data provided by SCAG allocates households into four income categories:

- Very Low Income – up to 50 percent AMI
- Low Income – 51-80 percent AMI
- Moderate Income – 81-120 percent AMI
- Above Moderate Income – more than 120 percent AMI

As shown in Table II-11, existing income distribution in Gardena is skewed toward the lower income levels compared to the County.

Table II-11: Distribution by Income Category

Income Category	Gardena Percentage	Los Angeles County Percentage
Very Low Income	29%	26%
Low Income	19	15
Moderate Income	17	16
Above Moderate Income	34	43
Source: SCAG RHNA Calculator, March 2021		

D. Housing Characteristics

1. Housing Growth

As shown in Table II-12, Gardena's housing supply increased over the decades from 11,526 units in 1960 to 21,982 units in 2020. Much of the increase since 1960 was the result of annexation of unincorporated county land. Some of the increase between 1990 and 2010 was through development of residential specific plans. For example, in 1999, the implementation of the Emerald Square Specific Plan resulted in the development of 159 single-family units, and in 2004 the Carnelian Specific Plan resulted in the construction of 101 new single-family units. However, with very little vacant land available for residential development, most of the housing growth since 2010 came from recycling of developed land to higher-density residential uses. With the significant demand in housing, the City anticipates that most future housing growth will involve the recycling of older commercial and industrial uses, and continuing intensification of existing residential uses.

Table II-12: Housing Growth (1960-2020)

Year	Number of Units	Percent Change
1960	11,526	--
1970	14,694	27.5%
1980	17,540	19.4
1990	19,037	8.5
2000	21,037	10.5
2010	21,472	2.1
2020	21,982	2.4
Source: 2010 U.S. Census; DOF E-5: Population and Housing Estimates, 2020.		

2. Housing Type

Gardena is primarily a residential community with almost 45 percent of the total land area designated for residential use in the General Plan. According to the DOF estimates, there were 21,982 housing units in Gardena in 2020. Table II-13 shows that in 2020 over 52 percent of the total units in Gardena were single-family units and 42.1 percent were multiple-family units. Mobile homes accounted for the remaining 5.7 percent of the housing stock. In comparison, the 2020 countywide housing total of approximately 3.59 million units was 54.8 percent single-family, 43.6 percent multiple-family units and 1.6 percent to mobile homes.

Table II-13: Housing Type (2020)

Jurisdiction	Single-Family		Multiple-Family		Mobile Homes	Total
	Detached	Attached	2 to 4 units	5+ units		
Gardena	9,783 44.5%	1,711 7.8%	2,571 11.7%	6,672 30.4%	1,245 5.7%	21,982
Los Angeles Co.	1,732,045 48.2%	234,107 6.5%	295,700 8.2%	1,270,425 35.4%	58,297 1.6%	3,590,574
Source: DOF E-5: Population and Housing Estimates, 2020.						

3. Housing Stock Age and Condition

Most of the City's housing stock is in good condition. However, homes built more than 30 years ago are likely to require structural renovation and maintenance. As shown in Table II-14, nearly 89 percent of the existing housing stock in Gardena was built prior to 1990. In general, older buildings require greater maintenance, which results in higher costs. Thus, maintenance is often deferred, leading to the further physical deterioration of the City's housing units. In addition, older, deteriorated structures often do not meet current building code standards and lack safety features such as fire suppression, home security devices and seismic safety retrofits. In fact, stringent seismic safety codes were not developed until after the 1971 Sylmar earthquake. After that event, building codes were revised to ensure structures could withstand seismic activity of similar magnitude and motion characteristics. Therefore, the current age of Gardena's housing stock strongly suggests there will be an increased need for structural improvements during the next decade.

Based on estimates from the Code Enforcement division, as of December 2021, 250 to 300 units, or 1.4 percent of the housing stock in the City are considered substandard. The majority of these units are suitable for rehabilitation. Less than five percent (12 to 15 units) of the substandard units would need to be completely demolished and replaced.

Table II-14: Age Distribution of Existing Housing Stock

Year of Construction	Units Constructed	Percent of Total
2010 or later	279	1.3 %
2000-2009	670	3.1
1990-1999	1,449	6.8
1980-1989	2,306	10.8
1970-1979	2,387	11.1
1960-1969	3,585	16.7
1950-1959	7,123	33.2
1940-1949	2,414	11.3
Prior to 1939	1,228	5.7
Source: ACS 2014-2018 (5-Year Estimates), Table DP04.		

4. Vacancy Rates

A certain number of vacant units are needed to moderate the cost of housing, allow sufficient choice for prospective residents, and provide an incentive for unit upkeep and repair. Vacancy rates are generally higher among rental properties, as rentals have greater attrition than owner-occupied units. A healthy vacancy rate—one which facilitates choice and mobility among a variety of housing units—is considered to be two to three percent for ownership units and five to six percent for rental units.

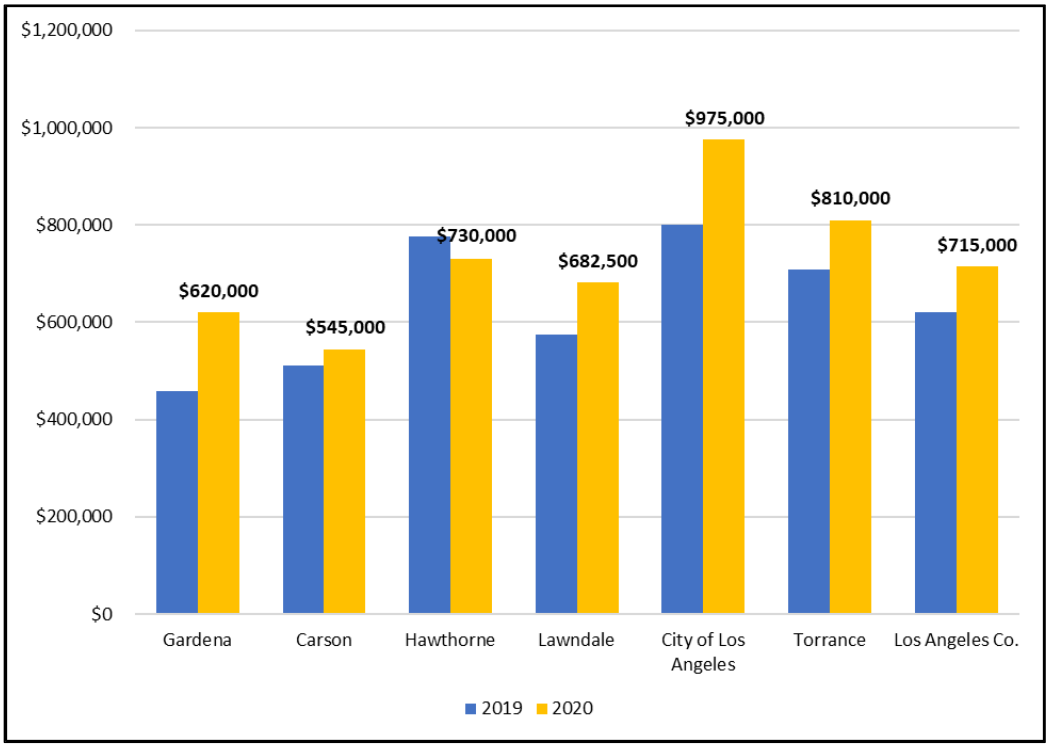
According to the 2014-2018 ACS, the vacancy rate was 1.1 percent for homeowners and 2.9 percent for renters. The low homeowner and rental vacancy rates in Gardena indicate high demand for housing regardless of tenure.

E. Housing Costs and Affordability

1. Home Prices

Homes located in Gardena are comparable to nearby cities and Los Angeles County as a whole (Figure II-2). The median home sale price in Gardena in 2020 was $620,000, lower than most of the neighboring cities and the county. Median home sale prices in the City have increased 27.8 percent since 2019. Nearby cities and the county also increased between 2019 and 2020, with the exception of Hawthorne, but to a lesser extent than Gardena.

Figure II-2: Median Home Prices, 2020



Source: Corelogic.com California Home Sale Activity by City, October 2020.

2. Average Rents

Information on current rental rates in the City was obtained through a review of advertisements on Zillow and Westside Rentals during December 2020. Table II-15 summarizes average rental prices by unit size. The average list price for rental units in December 2020 was $2,281. Of the 92 rentals found to be available, approximately 49 percent were 2-bedroom units, 22 percent were 3-bedroom units, 19 percent were 1-bedroom units, 8 percent were studios, and 3 percent were 4-bedroom units. Overall, available rental housing costs ranged from $1,299 for single room studios to $3,600 for four-bedroom units.

Table II-15: Average Rent by Unit Size (2020)

Studio	1-Bedroom	2-Bedroom	3-Bedroom	4-Bedroom	5+ Bedroom
$1,299	$1,587	$2,138	$2,784	$3,600	N/A

Note: There were no rentals available with 5+ bedrooms.

Source: www.zillow.com and Westside Rentals, accessed December 2020

3. Affordability Gap Analysis

The costs of homeownership and renting can be compared to a household's ability to pay for housing to determine affordability in a community. Housing affordability is defined as paying no more than 30 percent of the gross household income on housing expenses.

Table II-16 summarizes affordable rents and purchase prices by income category based on the 2021 HCD median income of $80,000 in Los Angeles County.[4] General cost assumptions for utilities, taxes, and property insurance are also shown. Affordable purchase price assumes a three percent interest rate with a 30-year fixed rate mortgage loan and a 10-percent down payment. Given the high costs of homeownership, lower and moderate income households are usually confined to rental housing, but the affordability problem also persists in the rental market. The situation is exacerbated for large households with lower and moderate incomes given the limited supply of large rental units, and for seniors with their fixed incomes.

The extremely low income households are the most vulnerable group. With limited income, 81.2 percent of the households in this income group experienced one or more housing problems, compared to just 50.3 percent citywide, 73.3 percent of very low income households, and 58.3 percent of low income households.[5] More importantly, severe housing cost burden (spending half of the household income on housing) impacted 67.8 percent of the extremely low income households, compared to 30.4 percent of very low income households, 14.5 percent of low income households, and 22.9 percent of households citywide. Households with severe cost burdens are most at risk of becoming homeless.

4 State and federal income limits differ. For the Housing Element, State income limits are used, which are usually higher than the federal levels used in the City's Consolidated Plan and other related documents.

5 Housing and Urban Development Department (HUD) Comprehensive Housing Affordability Strategy (CHAS) data, 2020 (based on 2013-2017 ACS).

Table II-16: Housing Affordability Matrix (2021) – Los Angeles County

Income	Annual Income	Affordable Monthly Housing Costs	Utilities	Taxes, Ins., HOA (Ownership)	Maximum Affordable Price	
					Rent	Sale
Extremely Low Income (<50% AMI)						
1-Person	$24,850	$621	$151	$217	$471	$66,715
2-Person	$28,400	$710	$166	$249	$544	$77,877
3-Person	$31,950	$799	$190	$280	$608	$86,667
4-Person	$35,450	$886	$223	$310	$664	$93,135
5-Person	$38,300	$958	$264	$335	$694	$94,447
Very Low Income (50% AMI)						
1-Person	$41,400	$1,035	$151	$362	$884	$137,592
2-Person	$47,300	$1,183	$166	$414	$1,017	$158,818
3-Person	$53,200	$1,330	$190	$466	$1,140	$177,672
4-Person	$59,100	$1,478	$223	$517	$1,255	$194,418
5-Person	$63,850	$1,596	$264	$559	$1,332	$203,868
Low Income (80% AMI)						
1-Person	$66,250	$1,656	$151	$580	$1,506	$244,014
2-Person	$75,700	$1,893	$166	$662	$1,727	$280,444
3-Person	$85,150	$2,129	$190	$745	$1,938	$314,501
4-Person	$94,600	$2,365	$223	$828	$2,142	$346,450
5-Person	$102,200	$2,555	$264	$894	$2,291	$368,105
Moderate Income (120% AMI)						
1-Person	$67,200	$1,680	$151	$588	$1,529	$248,083
2-Person	$76,800	$1,920	$166	$672	$1,754	$285,154
3-Person	$86,400	$2,160	$190	$756	$1,970	$319,854
4-Person	$96,000	$2,400	$223	$840	$2,177	$352,446
5-Person	$103,700	$2,593	$264	$907	$2,329	$374,529

Notes:

Assumptions: 2021 HCD income limits; Health and Safety code definitions of affordable housing costs (30% of household income); Los Angeles County Development Authority (LACDA) 2020 utility allowance schedule; 35% of monthly affordable cost for taxes and insurance; 10% down payment; and 3% interest rate for a 30-year fixed-rate mortgage loan. Taxes and insurance apply to owner costs only; renters do not usually pay taxes or insurance.

Los Angeles County: 4-person household median income = $80,000

According to the 2020 HCD State Income Limits Briefing Materials Report, the very low income limit does not equal 50% and the low income limit does not equal 80% of the AMI due to "adjustments for high housing cost relative to income, the application of state nonmetropolitan income limits in low income areas, and the national maximums in high income areas."

Sources: State Department of Housing and Community Development 2021 Income Limits; Los Angeles County Utility Allowance Schedule, 2020; Veronica Tam and Associates, 2021

F. Special Needs

Certain segments of the population experience conditions that make it difficult for them to access affordable housing. Physical or medical conditions, particular space or supportive service requirements, incomes, or other factors may impede a household's ability to obtain decent and affordable housing. Government Code Section 65583(a)(7) requires the housing element to analyze characteristics and conditions of the following population groups: elderly persons; persons with disabilities (including persons with developmental disabilities); female-headed households; large households (defined by the U.S. Census Bureau as families containing five or more persons); farmworkers; and the homeless.

Table II-17 summarizes the special needs populations in Gardena based on available information from the 2014-2018 ACS and the Los Angeles Homeless Services Authority. Each population group, as well as its specific circumstances and housing needs, are described below.

Table II-17: Summary of Special Needs Populations

Special Needs Groups[1]	Persons or Households	Percent
Seniors/Elderly (65 years and over)	9,708	16.2 %
With a Disability	3,275	33.7
Senior-Headed Households	5,578	27.1
Renter	1,817	32.6
Owner	3,761	67.4
Disabled Persons	6,651	11.2
Single Female-Headed Households	3,484	16.9
With Related Children (<18)	1,248	6.1
Large Households (5+ persons)	2,601	12.6
Renter	1,217	46.8
Owner	1,384	53.2
Farmworkers[2]	49	0.2
Homeless Persons	97	0.2

1. Each group is a separate category, but can be overlapping category with another special needs group. Percent represent that group as a proportion of the total population or total households in the City and not intended to total across different special needs groups.
2. Persons employed in agriculture, forestry, fishing, and hunting occupations.

Source: ACS 2014-2018 (5-Year Estimates), Tables S0101, S1810, S2502, DP02, B25009, S2403), Los Angeles Homeless Services Authority, 2020.

1. Seniors

Seniors or the elderly (persons aged 65 and older) are persons with special needs. Special needs for the elderly stem from three different sources: (1) relatively low fixed incomes; (2) high health care costs; and (3) physical disabilities. A low fixed income makes it difficult for many of the elderly to obtain adequate housing. This is further compounded by rising health care costs, which are a product of health problems associated with aging. If an elderly person is disabled, health care costs may be even higher, and housing may be more difficult to find due to accessibility issues. Other special needs relevant to this demographic group include transportation and home modification such as wheelchair ramps, enlarged doorways, modified bathrooms and kitchens.

As presented in Table II-18, there were 5,578 elderly householders in Gardena between 2014 and 2018. Of the elderly householders, 67.4 percent owned their home, while 32.57 percent rented. As presented previously in Table II-3, the 65 years and older population represents 16.2 percent of the total population of Gardena.

Table II-18: Senior Householders by Tenure

Age	Owner	Renter	Total
65-74 years	1,934 61.11%	1,231 38.89%	3,165
75 plus years	1,827 75.71%	586 (24.29%)	2,413
Total	3,761 67.43%	1,817 32.57%	5,578
Source: ACS 2014-2018 (5-Year Estimates), Table B25007.			

Resources Available

In order to help meet the needs of elderly residents, the City promotes affordable housing conservation through the following rehabilitation assistance programs.

- **Residential Rebate Program:** Designed to cover expenses for major household repairs. It is available for low to moderate income homes and mobile homeowners. The refund is a 50 percent cash rebate up to a maximum of $3,000.
- **Handy-worker Fix-Up Program:** Designed to provide qualified low and moderate-income households with free home improvement assistance. Housing units must be owner-occupied single-family or mobile homes. This program offers free handy-worker crew labor and materials up to $600 for qualifying improvements, including health and safety corrections and ADA improvements.
- **Mobile Home Rehabilitation Program:** Offers up to $10,000 in City housing rehabilitation loan assistance to low-income mobile homeowner-occupants residing within the City of Gardena.

According to the California Department of Social Services, as of December 2020 there were five residential care facilities within the City that serve the elderly with a combined capacity to serve 132 residents. In addition, the Gardena Senior Citizens Day Care Center located at 14517 South Crenshaw Boulevard provides services to the elderly population. The Center is a social day care and provides supportive socialization and rehabilitation programs for older

adults who are experiencing memory loss, dementia, or Alzheimer's disease. Respite and support services to caregivers and family members are also provided, as well as transportation for Gardena residents.

Additional assistance to elderly Gardena residents is provided by the Senior Citizens Bureau, a division of the City's Human Services Division. The office of the Senior Citizens Bureau is located at 1670 West 162nd Street in the Kiyoto "Ken" Nakaoka Community Center. The Senior Citizens Bureau provides a variety of support services to seniors. These services include: information and referral services; case management; in-home support; daily nutritional meals at seven community sites and home-delivered meals; health clinics; escort and shopping services; specialized care for people suffering from Alzheimer's Disease; and programs for the chronically mentally ill who live in board and care and family group homes.

The City owns and operates Gardena Transportation (GTrans). GTrans routes transverse the southwest region of Los Angeles County and extend into downtown Los Angeles. To address the specific transportation needs of the elderly and disabled, GTrans also operates the Gardena Special Transit system. Gardena Special Transit is a demand- response service for elderly and handicapped persons, operating seven days a week at a nominal cost to patrons. This service provides portal-to-portal service (demand/ response service) for the elderly and handicapped who qualify under predetermined program guidelines. It is operated with a fleet that is 100 percent wheelchair accessible. The system augments the regular fixed-route and commuter services and currently serves the cities of Gardena and Hawthorne and the Alondra Park and Del Aire neighborhoods of Los Angeles County.

2. Persons with Disabilities

Federal laws define a person with a disability as "any person who has a physical or mental impairment that substantially limits one or more major life activities; has a record of such impairment; or is regarded as having such an impairment." In general, a physical or mental impairment includes hearing, mobility and visual impairments, chronic alcoholism, chronic mental illness, AIDS, AIDS Related Complex, and intellectual disability that substantially limits one or more major life activities. Major life activities include walking, talking, hearing, seeing, breathing, learning, performing manual tasks, and caring for oneself.

The U.S. Census Bureau classifies disabilities into the following categories:

- **Hearing difficulty**: Deaf or having serious difficulty hearing
- **Vision difficulty**: Blind or having serious difficulty seeing, even when wearing glasses
- **Cognitive difficulty**: Because of a physical, mental, or emotional problem, having difficulty remembering, concentrating, or making decisions
- **Ambulatory difficulty**: Having serious difficulty walking or climbing stairs
- **Self-care difficulty**: Having difficulty bathing or dressing
- **Independent living difficulty**: Because of a physical, mental, or emotional problem, having difficulty doing errands alone such as visiting a doctor's office or shopping

The Housing Element must analyze potential and actual constraints upon the development, maintenance, and improvement of housing for persons of disabilities and include programs for the removal of such constraints or provide reasonable accommodation for housing designed for persons with disabilities.

Disability status does not necessarily indicate a need for special need/supportive housing, and data on the total number of disabled persons needing supportive housing in the City is not available. Using the national standard of one to three percent of the disabled population needing supportive housing, it can be estimated that the City has approximately 67 to 201 disabled individuals in need of supportive housing.

Individuals with disabilities can often have difficulties participating in the labor force or finding employment, whether because of an inability to leave one's home, an inability to meet the physical requirements of the job, discrimination on the part of prospective employers, or other factors. Table II-19 provides a breakdown of working-age individuals with disabilities by employment status. According to the 2014-2018 ACS, of the 3,019 working-age (18-64) disabled persons in Gardena, more than 55 percent were not in the labor force. Of the remaining 44 percent, approximately 95 percent were employed. The low labor force participation among working-age disabled persons indicates a need for low-cost housing.

Table II-19: Persons with Disability Employment Status

Persons with a Disability	Number	Percent
Employed Persons with a Disability	1,273	42.2 %
Not Employed Persons with a Disability	71	2.4
Persons Not in Labor Force with Disability	1,675	55.5
Total Working-age Persons with a Disability	3,019	100

Note: Civilian non-institutionalized population aged 18-64.
Source: ACS 2014-2018 (5-Year Estimates), Table C18120.

Table II-20 gives a breakdown of the population of persons with disabilities in the 64 and under-age group and the 65 years and over age group between 2014 and 2018. The types of disability by the age groups are also presented. Approximately half of the total persons with disabilities in Gardena were in the 65 years and over age group. Persons with ambulatory disabilities represented a significant portion of both age groups. Approximately 50 percent of the total persons with disabilities were in the 64 and under-age group and 57 percent of those 65 years and over had ambulatory disabilities. For persons with disabilities in the 65 years and over-age group, about 71 percent also suffered from sensory disabilities (hearing and vision) and 53 percent had an independent living difficulty.

Table II-20: Persons with Disabilities by Type

Population	Number	Percent
Total Persons with Disabilities	6,651	100.0%
Persons with Disabilities Aged 64 and younger	3,376	50.8
Hearing Difficulty	601	17.8
Vision Difficulty	888	26.3
Cognitive Difficulty	1,375	40.7
Ambulatory Difficulty	1,681	49.8
Self-Care Difficulty	895	26.5
Independent Living Difficulty	1,005	29.8
Persons with Disabilities Ages 65 and Over	3,275	49.3
Hearing Difficulty	1,404	42.9
Vision Difficulty	907	27.7
Cognitive Difficulty	1,041	31.8
Ambulatory Difficulty	1,866	57.0
Self-Care Difficulty	888	27.1
Independent Living Difficulty	1,746	53.3

Notes:

1. Independent Living Difficulty does not include persons under 18.
2. Disability type categories are not mutually exclusive; individuals may have more than one disability. Thus, the sum of all categories for a particular age group will be greater than the total for the same age group.

Source: ACS 2014-2018 (5-Year Estimates), Table S1810.

Resources Available

Special housing needs for persons with disabilities fall into two general categories: physical design to address mobility impairments and in-home social, educational, and medical support to address developmental and mental impairments. According to California Department of Social Services records, 40 State-licensed community care facilities operate in Gardena. Table II-21 summarizes the facilities by type and capacity. These facilities have a total capacity of 553 persons. There are four types of facilities within Gardena:

- **Adult Day Care:** Serves seniors and developmentally disabled adults who are able to live at home but require a certain level of care during the day. Some adult day care facilities provide health care services, while others provide non-medical care in the form of personal hygiene and meals.
- **Adult Residential Facilities:** Facilities of any capacity that provide 24-hour non-medical care for adults ages 18 through 59 who are unable to provide for their own daily needs. Adults may be physically handicapped, developmentally disabled, or intellectually disabled.
- **Residential Care Facilities for the Elderly:** Provide care and supervision for persons aged 60 and above and assistance with activities of daily living, such as bathing and grooming. They may also provide incidental medical services under special care plans.

- **Small Family Homes:** Provide 24-hour-a-day care in the licensee's family residence for six or fewer children who are mentally disabled, developmentally disabled, or physically handicapped, and who require special care and supervision as a result of such disabilities.

Table II-21: Licensed Community Care Facilities

Facility Type	Facilities	Capacity
Adult Day Care	6	262
Adult Residential	19	107
Residential Care – Elderly	5	132
Small Family Home	2	8
Total	40	553
Source: Department of Social Services, Community Care Licensing Division, December 2020.		

Title 24 of the California Building Standards Code, which has been adopted by the City of Gardena, includes requirements to provide adequate housing to meet the needs of people with disabilities.[6] The State updates the Building Standards Code every three years. Title 24 provides regulations for adaptability and accessibility of apartments units to provide for the safety and welfare of physically handicapped residents and visitors. An adaptable apartment is one that has accessible floor entry and circulation, and that can be easily adapted in the future to meet the specific needs of a handicapped person. The adaptations include installation of wider doors, grab bars, lower cabinets, and lower light switches, as well as sidewalk-to-front-door ramps.

The City offers home improvement programs that provide for handicapped access improvements. Furthermore, the City contracts with the Fair Housing Foundation to provide fair housing and landlord/tenant services which benefit many disabled people that are denied reasonable accommodations.

The Gardena Socialization Center for the Mentally Disabled is a daily social, recreation, and educational program for chronically mentally ill adults who reside in private homes and board and care homes in the City. The program enhances a participant's independence and ability to live in the least restrictive environment possible. The Center is funded in part by Los Angeles County Department of Mental Health and is part of the Gardena Human Services Division. The Socialization Program is offered at Recreation Park, located at 15800 South Brighton Avenue, and Freeman Park, located at 2100 West 154th Place.

[6] The State updates the California Building Standards Code as set forth in Title 24 of the California Code of Regulations. The City is then required to adopt the most recent edition. The most recent adoption by the City was in 2020 when it adopted the 2019 California Building Standards Code.

3. Persons with Developmental Disabilities

As defined by State law, "developmental disability" means a substantial disability of an individual which:

- Is attributable to mental retardation, cerebral palsy, epilepsy, autism, or disabling conditions found to be closely related to mental retardation or to require treatment similar to that required for individuals with mental retardation;
- Is manifested before the individual attains age 18;[7]
- Is likely to continue indefinitely;
- Results in major impairment of cognitive and/or social functioning, representing sufficient impairment to require interdisciplinary planning and coordination of special or generic services to assist the individual in achieving maximum potential; and,
- Results in substantial functional limitations in three or more of the following areas of major life activity: (a) self-care; (b) receptive and expressive language; (c) learning; (d) mobility; (e) self- direction; (f) capacity for independent living; or (g) economic self-sufficiency.

According to Table II-22, as of December 2020, there were a total of 1,041 persons in the three zip codes that include Gardena addresses who have been diagnosed with developmental disabilities. According to the State Department of Developmental Services, about 51 percent of these persons were children under the age of 18 and 78 percent were living at home with parents or guardians.

Table II-22: Developmentally Disabled Residents by Age

Zip Code*	0-17 Years	18+ Years	Total
90247	297	240	537
90248	69	59	128
90249	163	213	376
Total	529	512	1041

Source: California Department of Developmental Services, December 2020.

* Each of Gardena's zip codes include areas outside of the City's boundaries.

Resources Available

Many developmentally disabled persons can live and work independently within a conventional housing environment. More severely disabled individuals require a group living environment where supervision is provided. The most severely affected individuals may require an institutional environment where medical attention and physical therapy are provided. Because developmental disabilities exist before adulthood, the first issue in

[7] The State of California defines developmental disabilities slightly differently than federal law. The main difference is at the manifestation age, where federal definition established that threshold at age 22.

supportive housing for the developmentally disabled is the transition from the person's living situation as a child to an appropriate level of independence as an adult.

The State Department of Developmental Services (DDS) currently provides community-based services to persons with developmental disabilities and their families through a statewide system of regional centers, developmental centers, and community-based facilities. The South Central Los Angeles Regional Center (SCLARC), which serves Gardena, is a non-profit organization that works in partnership with the State to offer a wide range of services to individuals with developmental disabilities and their families.

Multiple housing types are appropriate for people living with a development disability: rent subsidized homes; licensed and unlicensed single-family homes; inclusionary housing; Section 8 Housing Choice Vouchers; special programs for home purchase; HUD housing; and SB 962 homes. The design of housing-accessibility modifications, the proximity to services and transit, and the availability of group living opportunities represent some of the types of considerations that are important in serving this need group. Almost all public housing units in the county are reserved for seniors and disabled persons. Incorporating 'barrier-free' design in all, new multifamily housing (as required by California and Federal Fair Housing laws) is especially important to provide the widest range of choices for disabled residents. Special consideration should also be given to the affordability of housing, as people with disabilities may be living on a fixed income.

4. Female Heads of Households

Female-headed households, especially single parent households, typically have lower incomes and a greater need for affordable housing. In addition, these households can have needs for items such as accessible day care and health care, as well as other supportive services. The relatively low incomes earned by female-headed households, combined with the increased need for supportive services, severely limit the housing options available to them.

As shown in Table II-23, there was a total of 3,484 female-headed households from 2014 to 2018, representing 16.9 percent of total households in the City. There were 1,516 female-headed households with children under 18 years of age, representing 7.4 percent of the total households. Of the households under the poverty level, 669 total (3.2 percent) female head of households in the City lived below the federal poverty line, but this group accounts for nearly half of Gardena households living in poverty.

Table II-23: Female Householders

Householder Type	Number	Percent of Total Households
Total Households	20,619	100.0%
Total Female Heads-of-Household	3,484	16.9
Female Heads-of-Household with Children under 18	1,516	7.4
Total Households Under Federal Poverty Level	1,556	7.6
Female Headed Households Under Federal Poverty Level	669	3.2
Source: ACS 2014-2018 (5-Year Estimates), Tables B17012, S1702.		

Resources Available

Assistance for female-headed households includes the Gardena Family Child Care Program (GFCC), which was established in 1976 to provide quality child-care and child-development services to school-age children whose parents live or work in the city. The GFCC is provided at low or no cost, depending on family income, and is available to low-income and high-risk families with children 12 years of age or younger. Childcare services are also provided in licensed private Family Child Care Homes within the city.

Female heads of households in Gardena can also benefit from general programs and services for lower-and moderate-income households, including the Housing Choice Voucher program, and various community and social services provided by non-profit organizations in the region.

5. Large Households

Large households are defined as those with five or more members. These households are usually families with two or more children or multi-generational families. It can also include multiple families living in one housing unit. Large households are a special needs group because the availability of adequately sized, affordable housing units is limited. To save for necessities such as food, clothing, and medical care, lower- and moderate-income large households may reside in smaller units, resulting in overcrowding.

As shown in Table II-24, the 2014-2018 ACS identified 2,601 large households in Gardena, representing 12.6 percent of all households. Among the City's large households, 46.8 percent were renters, while 53.2 percent owned their home.

Table II-24: Household Size by Tenure

	1-4 persons		5+ Persons		Total	
	Number	Percent	Number	Percent	Number	Percent
Owner	8,706	48.3%	1,384	53.2%	10,090	48.9%
Renter	9,312	51.7	1,217	46.8	10,529	51.1
Total	18,018	100.0	2,601	100.0	20,619	100.0
Source: ACS 2014-2018 (5-Year Estimates), Table B25009.						

Resources Available

Large households in Gardena can also benefit from general programs and services for lower- and moderate-income persons, including Housing Choice Vouchers, and various community and social services provided by non-profit organizations in the region.

6. Homeless Persons

A homeless individual or family is defined by federal regulations as those that lack a fixed, regular, and adequate nighttime residence. Homeless individuals and families have differing housing needs. Both groups are in crisis and need food, clothing and shelter. Long-term transitional shelters, however, have different emphases for individuals and families. An individual would do well in transitional housing such as cooperative or single-room occupancy facilities. Families require more housing amenities to accommodate their size and diverse age-related needs; thus, lower income reentry housing such as single or multi-family units are more appropriate. Both groups require supportive housing and social services. The needs of homeless families are more complicated than those of homeless individuals. Childcare, pediatric care, and education are additional to basic health, mental health, employment, and other supportive social and housing needs.

The Los Angeles Homeless Services Authority (LAHSA) enumerated 79 homeless persons in the City of Gardena in 2020 and an estimated 4,560 homeless persons in the South Bay Service Planning Area (SPA).[8] Approximately 81 percent of the homeless were individuals and 19 percent were families. LAHSA estimated that 29 percent of the homeless were survivors of domestic violence and 35 percent suffered from substance abuse. An additional 20 percent were estimated to be mentally disabled and nearly 24 percent suffered from physical disability.

Resources Available

The Gardena Human Services Division responds to homeless individuals and families, as well as lower income persons threatened with homelessness, through the Emergency Services Program. This program gives referrals and transportation vouchers to shelters and provides food vouchers and clothing. The Human Services Division assists approximately 32 persons identified as homeless annually through the Emergency Services Program.

The Emergency Services Program refers homeless families and individuals to the following facilities for assistance and daytime shelter:

- Los Angeles Homeless Services Authority (LAHSA)
- Los Angeles County Department of Mental Health
- Harbor Interfaith Services (670 W. 9th Street, San Pedro)
- Rainbow Services (453 W. 7th Street, San Pedro)
- Los Angeles County Department of Children and Family Services (3530 Wilshire Boulevard Suite 400, Los Angeles)

Additionally, the Human Services Division refers homeless families, women, children, and abused persons to an appropriate location for overnight shelter:

- 1736 Family Crisis Center (21707 Hawthorne Boulevard, Torrance)
- House of Yahweh Social Services (4046 Marine Avenue, Lawndale)

[8] 2020 Greater Los Angeles Homeless Count (https://www.lahsa.org/news?article=726-2020-greater-los-angeles-homeless-count-results&ref=hc)

- Harbor Interfaith Services (670 West Ninth Street, San Pedro)

Single homeless men are referred to the Beacon Light Mission located at 525 Broad Avenue in Wilmington. Mentally disabled persons, both homeless and other mentally disabled persons in need of emergency assistance, are referred to Harbor View House located at 921 South Beacon Street, San Pedro.

In addition to the Emergency Services Program, the City operates the following programs to address the supportive service needs of the homeless and those threatened with homelessness: employment and training programs; child care programs; senior meals; case management and counseling for youth and families; socialization centers for the mentally ill; recreation opportunities for the developmentally disabled; and low cost bus services for elderly, disabled, and other residents.

Government Code section 65583(a) includes a requirement that the analysis of special housing needs include an analysis of families and persons in need of emergency shelter based on annual and seasonal need, as well as an identification of zones(s) where emergency shelters are allowed as a permitted use. The City amended the Gardena Municipal Code in 2012 to allow emergency shelters in the Industrial (M-1) and General Industrial (M-2) zones and will provide additional amendments to meet the new requirements relating to employee parking requirements.

7. Extremely Low Income Households

Extremely low-income households earn up to 30 percent of the Area Median Income. This group is considered a special needs groups because of the limited housing options available to them. Extremely low-income households also tend to include a higher proportion of seniors or disabled persons. In Gardena, 4,260 households were considered extremely low-income according to the 2013-2017 Comprehensive Housing Affordability Strategy (CHAS) data by HUD, which represents about 21 percent of the overall households. Approximately 64 percent of the extremely low income households were renters. Furthermore, 81 percent of the extremely low-income households were experiencing at least one housing problem (overcrowding, cost burden, or inadequate housing). Specifically, 84 percent of the extremely low-income renters and 75 percent of the extremely low-income owners were experiencing at least one housing problem.

Resources Available

Housing Choice Vouchers (HCV) represent a significant resource for extremely low-income households as HUD policy requires that at least 70 percent of all new HCV be available to this income group. Furthermore, the City has four publicly assisted rental developments for seniors.

8. Farmworkers

Farmworkers are identified as persons whose primary source of income is seasonal agricultural labor. Their housing needs stem from their relatively low income and job instability. Permanent and seasonal farmworker data is available only at the county level. According to the 2017 Census of Agriculture, there were 3,266 farmworkers in Los Angeles County. Of the farmworkers countywide, 1,749 (54 percent) were employed 150 days or more and 1,517 (46

percent) were employed for less than 150 days. While there is a substantial farmworker population in the County, very few reside in Gardena. According to the 2014-2018 ACS, 24 residents in the City were employed in the farming, fishing, and forestry category, comprising less than 0.1 percent of the total employed population. Gardena is located in a highly urbanized area of Los Angeles County and any major agricultural uses in the immediate vicinity ceased decades ago. There is no evidence of a sizeable community of migrant farm workers residing within City limits, as the great distance between the City and agricultural areas makes the commuting cost prohibitive. Given that so few residents are employed in this industry, the housing needs of farmworkers can be addressed by the overall programs for affordable housing, such as rent subsidies, and affordable new incentives for construction.

G. Publicly Assisted Housing

1. Los Angeles County Development Authority

The Los Angeles County Development Authority (LACDA) administers the Housing Choice Voucher Program (HCV) for Gardena residents. Approximately 630 Gardena households were receiving HCVs as of 2019. Appendix E, Affirmatively Furthering Fair Housing, includes a map showing the concentration of HCVs by census tract. LACDA has been allocated 25,696 HCVs according to the 2021-2022 FY Annual Plan. LACDA's Section 8 program has a wait list of 37,388 applicants, 29 percent of which are elderly and 30 percent disabled. According to LACDA, as of August 2021, there are 439 registrants currently residing in the City of Gardena on the Section 8 Waiting List, 16 percent of which are elderly and 25 percent disabled.

2. Units at Risk of Converting to Market-Rate Housing

According to California Government Code Section 65583(a)(8) and (c)(6), jurisdictions must evaluate the potential for currently rent restricted low-income housing units to convert to non-low-income housing in ten years and propose programs to preserve or replace these units. For this Housing Element, this ten-year analysis period covers from October 15, 2021, through October 15, 2031. This section identifies the City's assisted units at-risk of conversion to market rate housing.

3. Assisted Housing Inventory

Currently four assisted rental housing projects are located in the City; these are:

- **Gardena Valley Towers:** Gardena Valley Towers, located at 1715 West 158th Street, Gardena, is an 80-unit project built for seniors. The project was financed under the HUD Section 202 program, which provides capital advances to non-profit sponsors to finance the development of rental housing with support services for the elderly. The advance is interest free and does not have to be repaid as long as the units remain affordable for at least 40 years. The affordability controls under Section 202 extend until 2038 but are contingent upon the continued availability of Section 8 funding.
- **South Park Manor:** South Park Manor, located at 17100 South Park Lane, Gardena, is a126 unit senior housing project. This project was also financed under the HUD

Section 202 program. The affordability controls extend until 2026 but are contingent upon the continued renewal of Section 8 funding.

- **Meadowlark Manor:** Meadowlark Manor, located at 17150 South Park Lane, Gardena, is a 73-unit project restricted to seniors. Similar to the other two projects, Meadowlark Manor was financed under the HUD Section 202 program. The affordability controls extend until 2031 but are contingent upon the continued renewal of Section 8 funding.
- **Spring Park Senior Villa:** In 2015, the Spring Park Senior Villas, a 37-unit affordable housing project, was completed in Gardena. The project was awarded HOME funds, with an affordability covenant of 50 years.

Table II-25 details the assisted housing projects in the City. According to the inventory, the four projects contain 314 assisted rental units. Three were financed under the HUD Section 202 funds and maintain Section 8 contracts. One recent project was funded with HOME funds. These projects are housing for the elderly and are owned and operated by non-profit corporations. The long-term affordability of the projects is fairly secure based on their non-profit status and, therefore, the risk levels are considered low. However, two of the assisted housing projects located in Gardena may expire in less than ten years. The newly constructed Spring Park Senior Villa is not considered at risk during the ten-year analysis period.

In addition, a three-bedroom unit located at Casimir Avenue offers affordable housing to three persons in a group home situation. This type of affordable accommodation is not covered under the at-risk analysis.

Table II-25: Assisted Rental Housing Projects

Assisted Housing Projects	Address	Assisted Units	Total Units	Overall Exp. Date	Owner	Risk Level
Gardena Valley Towers	1715 W 158th St	79	80	3/29/2038	Non-Profit	Low
Meadowlark Manor	17150 S Park Ln	73	74	2/1/2031	Non-Profit	Low
South Park Manor	17100 S Park Ln	126	126	3/1/2026	Non-Profit	Low
Spring Park Senior Villa	2010 W El Segundo Blvd	36	37	2065	Non-Profit	Low
Total		314	317			
Source: City of Gardena, December 2020.						

4. Preservation and Replacement Options

Preservation or replacement of at-risk projects can be achieved in several ways: 1) transfer of ownership to non-profit organizations; 2) provision of rental assistance other than through the Section 8 program; 3) replacement or development of new assisted multi-family housing units; 4) purchase of affordability covenants; and/or 5) refinance of mortgage revenue bonds on bond funded units. These options are described below, along with a general cost estimate for each.

Transfer of Ownership

Non-profit corporations currently own all of the assisted-housing projects in Gardena. Therefore, transfer of ownership is not needed. However, the following entities serving Los

Angeles County may have the potential capacity to acquire and preserve the at-risk units identified:

- Los Angeles County Development Authority (LACDA)
- Innovative Housing Opportunities, Inc.
- Jamboree Housing
- Mercy Housing
- Meta Housing
- National CORE

Rental Assistance

The future availability of Section 8 funding is uncertain. In the event that Section 8 funding is no longer available, rent subsidies can be used to maintain affordability by using local, state or other funding sources. The subsidies can be structured to mirror the Section 8 program, whereby tenants receive the difference between the Fair Market Rent (determined by HUD and the local housing authority) and the maximum affordable rent of the tenant (30 percent of household income).

The feasibility of this alternative depends on the property owners' willingness to accept rental vouchers. In this case, the owners are likely to accept vouchers given that non-profit corporations own all three projects, and the projects currently maintain rental subsidies.

Given the bedroom mix of the 278 Section 8 assisted rental units, the total cost of subsidizing the rent for the units is $173,486 per month, as shown in Table II-26. This translates into approximately $2.1 million annually or $41.6 million over a 20-year period.

Table II-26: Required Rental Subsidies

Unit Size	Total Units	Fair Market Rents	HH Size	Very Low Income Limits	Affordable Cost	Utility	Per Unit Subsidy	Monthly Subsidy
Studio	52	$1,369	1	$39,450	$986	$151	$533	$27,716
1-Bdrm	226	$1,605	2	$45,050	$1,126	$166	$645	$145,770
Total	278							$173,486
Source: HUD Fair Market Rent Documentation, 2021.								

Construction of Replacement Units

The construction of new low-income housing units is a means of replacing at-risk units that are converted to market rate. The cost of developing housing depends upon a variety of factors, including density, the size of the units, location, land costs, and the type of construction. In 2015, the Spring Park Senior Villas, a 37-unit affordable housing project, was completed in Gardena. Of the 37 units, 36 are assisted units affordable to lower income households, and one is a manager's unit. The project was awarded HOME funds. Total development cost of the project was approximately $9.3 million. The City owns the land and leases it for one dollar per year, up until the year 2088. The project totals 40,800 square feet of internal building space, which includes the residential units, subterranean parking garage, communal space and accessory space. Each tenant unit is 540 square feet and includes one bedroom. The one manager's unit is 800 square feet and includes two bedrooms. Based on the project costs, the average development cost per unit is approximately $250,000. This represents approximately $250 per square foot of building space. This includes the residential units, common space areas, subterranean parking and other amenities.

Assuming the average size of a studio apartment is 450 square feet, and the average size of a one-bedroom apartment is 600 square feet, construction to replace the 278 at risk-units would cost approximately $39,750,000.

Purchase of Affordability Covenants

Another option that will preserve the affordability of at-risk projects is providing an incentive package to owners to induce them to maintain the units as low-income housing. Incentives could include an interest rate write-down on the remaining loan balance or supplementing the Section 8 subsidy to achieve market rents. The feasibility of this option depends on both the physical and financial condition of the complex. If the complex requires rehabilitation or is too highly leveraged, the cost of affordability covenants goes up.

Cost Comparisons

Rental assistance provides the most feasible alternative for preserving Gardena's three assisted-housing projects with affordable contracts expiring within the next ten years, given the willingness of the non-profit owners to accept alternate subsidies if Section 8 contracts are not renewed, compared to the high cost of constructing new affordable units. Transfer of ownership is unnecessary since non-profit corporations own all three assisted projects. The purchase of affordability covenants would also be a viable option, and could be used in conjunction with rent subsidies, lump sum financial assistance or mortgage interest rate subsidies.

H. Housing Needs

This section provides an overview of existing housing needs in Gardena. It focuses on four categories:

- Housing need resulting from housing cost burden;
- Housing need resulting from overcrowding;
- Housing need resulting from population growth and demolition of the existing housing stock; and,
- Housing needs of special needs groups such as elderly persons, large households, persons with disabilities, female-headed households, homeless persons, farmworkers, and college students.

1. Housing Cost Burden

Housing cost burden is generally defined as households paying more than 30 percent of their gross income on housing related expenses, including rent or mortgage payments and utilities. For renters, housing costs include rent paid by the tenant plus utilities. For owners, housing costs include mortgage payment, taxes, insurance, and utilities. High housing costs can cause households to spend a disproportionate percentage of their income on housing. This may result in payment problems, deferred maintenance or overcrowding.

Based on the 2014-2018 ACS presented in Table II-27, 9,527 households or 47.8 percent of the total household were overpaying (over 30 percent of household income) and 5,401 or 22.7 percent were severely overpaying (over 50 percent of household income). Of those severely overpaying households, almost two-thirds (63.7 percent) were renters and just over one-third (36.3 percent) were homeowners.

Table II-27: Household Cost Burden by Tenure

Cost Burden	Renters	Owners	Total HHs
<10%	290	2,172	2,462
10% to 14.9%	515	1,053	1,568
15% to 19.9%	1,146	1,127	2,273
20% to 24.9%	899	1,211	2,110
25% to 29.9%	1,141	866	2,007
30% to 34.9%	914	573	1,487
35% to 39.9%	835	508	1,343
40% to 49.9%	1,357	806	2,163
>50%	2,890	1,644	4,534
Total Households	9,987	9,960	19,947

Note: Cost burden was not computed for 542 renter and 130 owner households.
Source: ACS *2014-2018 (5-Year Estimates), Table B25009.*

Table II-28 presents rates of cost burden for lower income households in Gardena. Extremely low and very low income renters have the highest rate of cost burden of 83.3 percent and 83.5 percent, respectively. For all income levels, cost burden is more common amongst renter

households. Of all lower income households (extremely low, very low, and low), 67.2 percent are cost burdened including 75 percent of lower income renters and 54 percent of lower income owners. Cost burden amongst lower income households is significantly more common than cost burden amongst moderate and above moderate income households. Only 9.7 percent of renter households and 19.3 percent of owner households earning more than 80 percent of the AMI are cost burdened.

Table II-28: Lower Income Household Cost Burden by Tenure

Income Category	Renters	Owners	Total HHs
Extremely Low Income <=30% AMI	83.3%	68.4%	78.0%
Very Low Income 30-50% AMI	83.5%	43.8%	70.4%
Low Income 50-80% AMI	56.4%	50.0%	53.8%
Source: HUD CHAS Data (based on 2014-2018 ACS), 2021.			

2. Overcrowding

A persistent problem affecting housing conditions is overcrowding. The U.S. Census defines overcrowding as 1.01 persons per room or more excluding kitchen, bathrooms, and hallways. Severe overcrowding is defined as more than 1.5 persons per room. Overcrowding is often an indicator of households that may be financially unable to obtain adequate space for their needs, or households that are required to house extended family members. It is not necessarily a reflection of inadequate physical conditions of the housing units themselves.

As presented in Table II-28, households with 1.01 or more persons per room totaled 2,000 or 9.7 percent of the total households in Gardena. Additionally, 824 households or 4.0 percent lived in severely overcrowded conditions (at least 1.51 persons per room).

Renters were much more likely to experience overcrowding than homeowners. While approximately half (51.1 percent) of Gardena households rent their units, the number of overcrowded renter households was about two times as large as the number of overcrowded homeowners. Renters represented over two-thirds (69.2 percent) of all overcrowded households in the City — indicating a need for more three-bedroom rental units to accommodate larger renter households. Households that own homes generally are able to take advantage of the ample stock of single-family houses in Gardena, most of which have three or more bedrooms; thus, severe overcrowding is not as much of a problem for owners as it is for renters, and the latter group would benefit more than the former from large units.

Table II-29: Household Crowding by Tenure

Persons per Room	Renters	Owners	Total Households
0.5 or Less	4,651	6,308	10,959
0.51 to 1	4,491	3,169	7,660
1.01 to 1.5	761	415	1,176
1.51 to 2	482	130	612
2.01 or More	144	68	212
Total Households	10,529	10,090	20,619
Source: ACS 2014-2018 (5-Year Estimates), Table B24014.			

3. Future Housing Need

For this Housing Element period, the City of Gardena was allocated a RHNA of 5,735 units, as shown in Table II-29. Approximately 39.2 percent of these units should accommodate lower income households.

The 2014-2021 Housing Element demonstrated that based on the adequate sites inventory of vacant land, underutilized land and prime opportunity sites, the City could accommodate 1,358 units, more than the 2014-2021 RHNA of 397 units. However, Gardena's 2021-2029 RHNA is significantly higher than the previous Housing Element cycle. The 2021-2029 Housing Element proposes housing programs and zone amendments, including a residential overlay, to increase the potential for housing units. Implementation of these programs would adequately accommodate the potential shortfall in the need for affordable units in the City. Chapter IV of this Housing Element demonstrates the City strategies for meeting this RHNA.

Table II-30: Regional Housing Needs Allocation for Gardena (2021-2029)

Income Category	Dwelling Units	
	Number	Percent
Extremely Low/Very Low-Income	1,485	25.9%
Low-Income	761	13.3%
Moderate-Income	894	15.6%
Above Moderate-Income	2,595	45.2%
Total	5,735	100.0%
Note: *50% (742 units) of the very low income units are designated as extremely low income units.* Source: SCAG RHNA – Planning Period 2021-2029		

III. Housing Constraints

There are many factors that contribute to the cost, supply, and distribution of housing. A review of these factors provides an understanding of the private market forces impacting the sales price and rent distribution of both existing and new housing supply in Gardena. Gardena's proximity to major employment centers in southern Los Angeles County, as well as to Los Angeles International Airport (LAX) and downtown Los Angeles, its accessibility to major transportation corridors such as I-110, I-405, I-105, and SR 91, and its mild climate and air quality are positive factors contributing to the desire to live in the City. However, various market, governmental, environmental and infrastructure factors may serve as a potential constraints to housing development and improvements.

A. Market Constraints

Construction costs, land costs, and the availability of financing all contribute to the cost of housing production, which can hinder the development of affordable housing. To a large degree, the City has little control over these constraints, as the market dictates the costs. Through programs such as home ownership assistance, and the use of flexible design standards, the City can take steps to lessen these constraints.

1. Construction Costs

Construction costs can be a major impediment to the ability of a community to augment its housing stock, and influence rents and sale prices when new units are placed on the market. According to the National Association of Home Builders (NAHB), construction costs (i.e., permit and impact fees, excavation, materials, etc.) for a single-family market-rate home increased from $184,125 in 2011 to $296,625 in 2019.[9] The NAHB construction cost survey indicated the average size of single-family homes has decreased from 2,802 square feet in 2015 to 2,594 square feet in 2019. In 2019, total construction cost of a home accounted for 61.1 percent of the total sales price.

2. Land Costs

Expenses related to land include the cost of the raw land, site improvements, and all other costs associated with obtaining government approvals for development. Land costs vary significantly in Gardena dependent primarily on location, size, zoning, and difficulty of development. It is estimated that these costs contribute about 20 percent to the final sales price of a dwelling unit. Left alone, the escalating market price of land will tend to encourage mainly higher priced development. Higher density zoning could reduce the per unit cost of land, but land zoned for higher densities commands a higher market price.

Undeveloped land in Gardena is limited. A survey of lots for sale in Gardena was conducted on December 7, 2021 on Realtor.com (**Table** III-1). The survey found three lots listed, two

[9] National Association of Home Builders (NAHB), Cost of Constructing a Home (Special Studies), 2020.

vacant and one developed with an older single-family home and duplex. Cost per unit if built at maximum capacity ranged from $120,000 to $233,000.

Table III-1: Land Costs

Address	Lot Size (acres)	Density Allowed (Max.)	Listing Price	Per Unit Land Cost
16705 S. Berendo Ave.	0.16	R-3 (17 du/ac) – 3 units	$699,000	$233,000
1452 W. Artesia Blvd.	0.23	MUO (20 du/ac) – 5 units	$600,000	$120,000
15617 & 15701 S. Normandie Ave.*	0.37	R-4 (25 du/ac) – 9 units	$1,900,000	$211,111

Note:
* Contingent lots already developed with older single-family home and duplex.
Source: Survey of Realtor.com, assessed December 7, 2021.

3. Availability of Mortgage and Rehabilitation Financing

Financial constraints affect the decisions of consumers and developers alike. Nearly all homebuyers must obtain a loan to purchase property, and loan variables such as interest rates and insurance costs play an important role in the decisions of homebuyers. Homeowners also consider the initial costs of improvements following the purchase of a home. These costs could be related to making necessary repairs or tailoring a home to meet individual tastes. While the City does not control these costs directly, City activities, such as code enforcement, are related to the maintenance of the housing stock.

Mortgage rates have a strong influence over the affordability of housing. The availability of financing affects a person's ability to purchase or make improvements on a home. Increases in interest rates decrease the number of persons able to afford a home purchase, and decreases in interest rates result in more potential homebuyers introduced into the market.

According to the Federal Home Loan Mortgage Corporation's (Freddie Mac) monthly interest rate survey from 2016 to 2020, as shown in Table III-1, annual average mortgage interest rates have declined significantly, from 3.65 percent in 2016 to 3.11 percent in 2020.

Rates are initially lower for graduated payment mortgages, adjustable mortgages and buy-down mortgages. However, the risks to which both buyers and lenders are exposed when taking on adjustable-rate loans are well documented. As a result, some of the more affordable mortgage options will be less accessible to prospective Gardena homebuyers as financial institutions exercise greater caution in their lending practices.

The City has limited financial resources. Housing and community development resources currently available to the City include: CDBG; State HOME funds; CalHOME funds; General funds; HUD Section 8 Rental Assistance Program through the County; and State Transportation funds.

Table III-2: National Annual Average Mortgage Interest Rates

Year	Average Interest Rate
2016	3.65%
2017	3.99
2018	4.54
2019	3.94
2020	3.11
Source: Federal Home Loan Mortgage Corporation, Primary Mortgage Market Survey.	

4. Density and Timing

With limited vacant land available for residential development, the City has been accommodating new housing construction through the recycling of lower-density residential uses and underutilized nonresidential uses into higher intensity multi-family developments.

Developers in the R-3 zone have been able to achieve maximum densities. Developers in the R-4 and MUO zones have not achieved the maximum density allowed by the zones not because of constraints imposed by the City, but because of the choice of housing that is being developed. With the exception of the 265-unit apartment building on Crenshaw Boulevard approved in 2021, developers are choosing to build two- to three-story townhome style condominiums. In 2019 the City hosted a workshop with developers and architects to discuss impediments to development. The workshop identified development constraints related to parking. Parking requirements and other constraints discussions related to this workshop are further described in Section 4, *Residential Development Standards*, below.

Residential development has been active in Gardena, with limited delays between entitlement and building permit issuance. Typically, the time between receiving entitlements and the issuance of building permits is approximately six months based on review of projects over the past five years, depending on how quickly corrections are made by the developer.

B. Governmental Constraints

Actions by the City can have an impact on the price and availability of housing in the city. Land use controls, building codes, fees, and other local programs intended to improve the overall quality of housing may also serve as a constraint to housing development.

1. Transparency in Development Regulations

The City of Gardena complies the requirement to demonstrate transparency in development regulations by providing information online and at public counters:

- General Plan - https://cityofgardena.org/general-plan/
- Zoning Information - https://cityofgardena.org/zoning-information/
- Permits and Fees - https://cityofgardena.org/community-development-permits-and-fees/

2. Land Use Controls

The Land Use Plan of the Gardena General Plan's Community Development Element sets forth the policies for guiding local development. These policies, together with existing zoning regulations, establish the amount and distribution of land to be allocated for different uses within the city. Housing supply and costs are affected by the amount of land designated for residential use and the density at which development is permitted. Approximately 50 percent of the total acreage in Gardena is designated for residential use or mixed-use (Low-, Medium-, High-Density Residential, Mixed-Use, Specific Plan or Mixed-Use Overlay).

The Zoning Code allows for a wide range of residential uses, with densities ranging from a maximum of 9 units per acre in lower density residential zones (R-1), up to 30 units per acre in the higher density multi-family and mixed-use overlay zones (R-4 and MUO) and as high as 34 units per acre in the mixed-use C-R zone. Table III-2 summarizes the residential land use categories and their corresponding zone designations and previous Figure I-2 shows the General Plan Land Use Map.

Table III-3: Residential Land Use Categories

General Plan Land Use Category	Zoning Designations	Max. Density (DUs/Acre)	Residential Types
Low-Density Residential	R-1	9, limited to 1 per lot	Single Family Residences
Medium-Density Residential	R-2, R-3	17	Multiple-Family Residential
High-Density Residential	R-4	25 if <.5 acre 27 if .5 – 1.0 acre 30 if > 1.0 acre	Multiple-Family Residential
Mixed-Use	C-R H-B	34 9, limited to 1 per lot	Commercial/residential mixed use
Specific Plan	SP	At Least 20	Any
Mixed Use Overlay	MUO	20 if <.5 acre 25 if .5 – 1.0 acre 30 if > 1.0 acre	Commercial/residential mixed use
Source: Land Use Element, Gardena General Plan 2013			

Each residential designation is defined as follows:

Low Density Residential - The single-family areas within Gardena are recognized as the backbone of the community and serve as one of its most important assets. The Low- Density Residential designation is implemented by the Single-Family Residential (R-1) zone, which provides for the development of conventional single-family detached houses.

Medium Density Residential - The Medium-Density Residential designation is intended to provide a quality multiple-family living environment. This category is implemented by the Low-Density Multiple-Family Residential (R-2) and Medium-Density Multiple-Family Residential (R-3) zones. It typically includes lower density multi-unit residential development and higher density single-family residential development such as those in the specific plan areas.

High Density Residential - The High-Density Residential designation provides for a high quality, compact, multiple-family living environment. This category is implemented by the High-Density Multiple-Family Residential (R-4) zone and consists of two to three story multi-unit buildings.

Mixed Use - The Mixed-Use designation is intended to provide for the co-existence of residential and commercial, office or industrial uses in the same building or on the same lot. It is implemented by the Commercial-Residential (C-R) and Home Business (H-B) zones. This land use designation can be found in two areas of the City – southern Gardena between 178th Street and 182nd Street and the downtown area along Gardena Boulevard between Normandie Avenue and Vermont Avenue. If development is all residential, there is a minimum density of 24 units per acre. The maximum density of the H-B zone is 9 units per acre.

Mixed Use Overlay - The Mixed-Use Overlay permits mixed use development and solely residential development pursuant to a site plan review. A conditional use permit (CUP) is required for live-work units that are developed in conjunction with a restaurant or any use that may result in noise levels that exceed the City residential noise standards. The site plan review and CUP requirements are the same for all zones in the City and are detailed in this section's discussion of permit and processing procedures. The purpose of this land use designation is to allow greater flexibility of development alternatives. The minimum permitted residential density for any mixed use project approved after August 1, 2012 is 20 units per acre.

3. Specific Plans

Specific plans are either advisory or regulatory documents that provide more focused guidance and regulation for particular areas. Specific plans are a useful tool to implement planning and development goals within selected areas by adopting unique standards and requirements. Generally, specific plans include land use, circulation and infrastructure plans, development standards, design guidelines, as well as phasing, financing, and implementation plans.

As presented in Table III-3, there are 12 specific plans within the City. The land use for 11 of the specific plans is residential and the Artesia Corridor Specific Plan includes mixed-residential and commercial uses. Each specific plan is summarized in the following table and illustrated on the General Plan Land Use Plan map.

Section 18.39.025 (Residential Density) of the Municipal Code states that any specific plan adopted by the City after March 2012 shall provide a minimum residential density of at least 20 units per acre on portions of the specific plan where residential units are allowed.

Table III-4: Specific Plans

Specific Plans	Adoption Year	Location	Land Use Plan Description	Status
Emerald Square	1999	177th St. between Budlong Ave. and Vermont Ave.	159 single-family homes within a 21.5-acre gated community.	Built out
Redondo Village	1999	Redondo Beach Blvd. west of Van Ness Ave.	Two gated residential communities consisting of 65 detached condominium units within a 5-acre gated community.	Built out
Gardena Village	1999	North side of Artesia Blvd. between Denker St. and Western Ave.	59 detached condominium units within a 5.7-acre gated community.	Built out
Cottage Place	2003	Budlong Ave. between 144th St. and 146th St.	35 detached condominium units within a 2.9-acre gated community.	Built out
Carnellian	2004	Vermont Ave. between 141st St. and 135th St.	101 single-family detached homes within an 11.4-acre gated community.	Built out
Artesia Corridor	2006	South side of Artesia Blvd. between Western Ave. and Normandie Ave.	375,000 square feet of General Commercial, 40,000 square feet of restaurant and up to 300 residential units on 44-acre area.	Built out*
Normandie Place	2008	14532 – 14602 Normandie Ave.	12 single-family homes within a 38,280 square foot area.	Built out
Ascot Village	2011	1249 W. 139th St.	14 single-family homes with.in a 43,000 square foot area	Built out
Platinum Row	2015	14504 S. Normandie Ave.	96 townhome development on a 4.69-acre property	Built out
Western Avenue	2017	16958 Western Avenue	46 attached condominium units within a 2.31-acre property.	Built out
Normandie Estates /Normandie Courtyard	2004/ 2019	Southeast corner of Normandie Ave. and 168th St., and property to the east	30 detached condominium units within a 2.21-acre area	Phase I, 21 units built out
Gardena Transit Orientated Development	2021	12850-12900 Crenshaw Blvd.	265 residential units within a 1.33-acre property.	Approved 2021, in plan check

Source: City of Gardena, 2021.

*158 residential units were built; the remaining area is required to be commercial.

4. Residential Development Standards

The City regulates the type, location, density, and scale of residential development primarily through the Zoning Code. Zoning regulations are designed to protect and promote the health, safety, and welfare of the public, as well as implement the policies of the General Plan. The Zoning Code also serves to preserve the character and integrity of existing neighborhoods. Table III-4 summarizes the City zoning requirements relating to residential development standards, including density, lot area, lot coverage, and parking.

Parking and Site Requirements

In a workshop hosted by the City in 2019, developers and architects identified parking requirements as a possible development constraint. As a result of this workshop, the City revised its parking standards for high-density developments. The City implemented the following revisions in the R-4 and MUO zones:

- Tandem parking allowed;
- Parking for studio units reduced to one space per unit;
- Of the two spaces per unit for units larger than a studio, only one must be in an enclosed garage (the other requires covering only);
- 25 percent of guest parking may be compact;
- Stall length reduced for parking spaces; and
- Garage spaces reduced from 20’ x 20’ to 19’ x 19’.

These changes allowed developers to increase the density of their projects and reduce costs. Residential parking in the multi-family zones requires 0.5 guest spaces per unit. In accordance with State law, parking is reduced for density bonus projects.

Parking for SRO facilities are required at the rate of one space per unit. The City has approved three SRO projects in its manufacturing zones. Two of these projects are providing parking through puzzle parking systems (mechanical structures that can shuffle around multiple platforms), saving valuable space.

Parking requirements are show in Table III-5. The site development requirements are summarized in Table III-4 and Table III-5.

Table III-5: Parking Requirements

	Spaces/Unit	Dimensions (in ft)	Guest Parking Required?	Guest Parking Rate
R-1 zone	2	20 x 20[1]	no	
Multi-family residential, <20 units	2	20 x 20	yes	0.5
Multi-family residential, >20 units	2	20 x 20[2]	yes	0.5
R-4 zone, MUO	2	19 x 19[3]	yes	0.5
Studio units in all zones	1			
Senior and income restricted units in R-4 zone	1			
C-R zone studio or 1 bedroom	1		yes	0.25
C-R zone larger than 1 bedroom	2			

[1.] Municipal Code Section 18.40.020(E) was amended in 2012 to provide a waiver of this requirement for the expansion of existing residences if it was not physically possible to provide such a garage.

[2.] At least one space must be in a garage or in an enclosed parking facility and the other space can be in a covered parking area.

[3.] R-4 and MUO zones allow tandem parking.

Unit Sizes

The Zoning Code generally requires a single-family unit to be at least 800 square feet. For multi-family units, the minimum sizes are 400 square feet for a studio, 600 square feet for a one-bedroom unit, 800 square feet for a two-bedroom unit, and 1,000 square feet for a three-bedroom unit. There is no minimum unit size for multi-family units with an affordable housing agreement.

Cumulative Impact of Development Standards

Gardena's multi-family zones (R-2, R-3, R-4, C-R, and MUO) contain development standards relating to density, height, setbacks, parking and usable open space. In the R-2 and R-3 zones, these standards generally allow the construction to achieve the higher end of the density range for these zones. However, in the R-4 zones development standards can interfere with reaching the maximum density for the types of units that are currently being developed, i.e., three-story condominiums. There are no floor area ratio requirements in these zones.

In the R-2 and R-3 zones, the minimum lot size is 5,000 square feet, while the minimum lot width is 50 feet. Assuming a hypothetical lot of the minimum size meets these standards, the depth of this lot would be 100 feet. At 17 units per acre (the density for these zones), the lot should accommodate two dwelling units. The front, side and rear yard setbacks create a building envelope of 60 by 70 feet, or 4,200 square feet. Subtracting 1,400 square feet for four parking spaces (350 square feet per space) leaves an envelope of 2,800 square feet. The two units will require a total of 1,200 square feet of usable open space (600 square feet per unit). The rear yard, at 10 feet by 50 feet, can provide 500 square feet of this requirement. Subtracting the remaining 700 square feet from the building envelope leaves 2,100 square

feet for the two dwelling units, or 1,050 square feet per unit. Open space can include balconies and roof-top decks.

This is more than enough room to accommodate two, two-bedroom units (minimum of 800 square feet each) in a single-story building. Three-bedroom units, however, require at least 1,000 square feet. A developer wishing to construct these larger units may have to build them in two stories, perhaps with garages tucked under the upper floor. The major constraint on the supply of housing in these two zones is the R-2 zone's maximum of two units on any single lot; however, this impediment could be avoided by subdividing larger R-2 parcels or obtaining a specific plan designation. On larger R-3 parcels, this density would be even easier to achieve, as the setbacks would account for a smaller percentage of the lot and thus allow for a larger building envelope in which the structure and parking facilities could be configured more flexibly.

The R-4 zone has a stepped maximum density standard, ranging from 25 du/ac on sites of less than 0.5 acre, 27 du/ac on sites 0.5 to 1.0 acre, and 30 du/ac on sites of 1.0 acre or greater. In general, the smallest sites in each density category can accommodate the maximum number of units permitted under the code in a two-story configuration with either at-grade, tuck-under garages or a subterranean garage.

In the case of the R-4 zone, the open space requirement was reduced to 300 square feet to support additional density on sites over one acre). On sites smaller than one acre but larger than half acre, the density remained the same as before the zone amendment. Many small R-4 sites in the City are already developed at close to 27 du/ac under the previous development standards, so these small lots presumably will have minimal issues achieving the new maximum densities in the future.

In the Mixed-Use Overlay zone, the development standards were similarly reviewed and revised to accommodate higher densities. The open space requirement for residential uses was reduced to 150 square feet and reduced further to 100 square feet for live/work uses. As a result, most mixed-use projects will likely be able to build the maximum number of units allowed if they include at-grade podium or subterranean parking.

The development standards of the C-R zone have also been reviewed and revised to accommodate higher densities by increasing the densities from 20 to 34 units per acre and providing for a minimum density of 24 units per acre if the development is solely residential. Development standards were reduced for minimum lot size, unit size, parking, setbacks, and open space. Additionally, the FAR requirement was eliminated.

Table III-6: Development Standards in Residential Zones

	R-1 (Single-Family)	R-2 (Low Density)	R-3 (Medium Density)	R-4 (High Density)
Min. Lot Size	5,000 sf	5,000 sf	5,000 sf	5,000 sf
Min. Lot Width	50 ft, corner lot = 55 ft	50 ft, corner lot = 55 ft	50 ft, corner lot = 55 ft	50 ft, corner lot = 55 ft
Min. Lot Depth	80 ft	80 ft	80 ft	80 ft
Max. Density	9 du/acre 1 du/lot except ADUs	17 du/acre 2 du/lot	17 du/acre	25 du/ac if <½ acre 27 du/ac if ½ to 1 acre 30 du/ac if >1 acre
Min. Density	N/A	N/A	N/A	20 du/ac
Max. Height	25 ft	30 ft	35 ft	40 ft
Min. Front Yard	20 ft	20 ft	20 ft	15 ft
Min. Side Yard	5 ft, 10 ft street side corner lot	5 ft, 10 ft street side corner lot, 10 ft if bldg fronts side yard, 10 ft semi-sub parking	5 ft. for 1 or 2 stories, 7½ ft. for 2 stories with semi-sub parking or 3 stories, 10 ft. if bldg abuts R-1 or R-2, 10 ft street side corner lots, 10 ft if bldg fronts side yard	5 ft, 10 ft street side corner lots, 10 ft if bldg height ≤35 ft or bldg abuts R-1 or R-2, 15 ft if bldg height >35 ft and abuts R-1 or R-2
Min. Rear Yard	10 ft. for new 5 ft for existing 1 story	10 ft	5 ft for 1 or 2 stories, 7½ ft. for 2 stories with semi-sub. parking or 3 stories, 10 ft if bldg abuts R-1 or R-2, 10 ft. if bldg fronts rear yard	5 ft, 10 ft. street side corner lots, 10 ft. if bldg height ≤35 ft or bldg. abuts R-1 or R-2, 15 ft if bldg height is >35 ft and abuts R-1 or R-2
Min. Open Space	Not applicable	600 sf per unit	600 sf per unit	300 sf per unit
Min. Landscaping	50% front yard	50% front yard	50% front yard	50% front yard

Table III-7: Residential Development Standards in Mixed-Use Zones

	MUO (Mixed Use Overlay)	C-R (Commercial Residential)	H-B (Home Business)
Min. Lot Size	1 acre (with some exceptions)	5,000 sf	5,000 sf
Min. Lot Width	80 ft w/curb cuts, 50 ft w/o	50 ft	50 ft
Min. Lot Depth	N/A	N/A.	N/A
Max. Density	20 du/ac if <½ acre 25 du/ac if ½ to 1 acre 30 du/ac if >1 acre	34 du/acre	9 du/acre (1 unit per lot
Min. Density	20 du/acre	24 du/acre if all residential	N/A
Max. Building Height	40 ft if adj to R-1 or R-2 or adj collector/major or collector street 55 ft if adj to any zone other than R-1 or R-2, or adj to arterial street	45 ft if <0.5 acres 55 ft if ≥0.5 acres 4 story limit for residential	25 ft
Min. Front Yard	5 ft public ROW to bldgs w/o front doors facing street 20 ft public ROW to bldgs w/ front doors facing street 12 ft from face of curb for all else	Mixed use 0 ft on 1-2nd, 5 ft on 3-4th floors Residential only 5 ft on 1-2nd, 10 ft on 3-4th floors	20 ft
Min. Side Yard	10 ft if bldg ≤35 ft & abuts R-1 or R-2 15 ft if bldg >35 ft & abuts R-1 or R-2 5 ft if bldg does not abut R-1 or R-2 10 ft if street side corner lot	Mixed use 5 ft for 1 or 2 story bldg 10ft if bldg 2+ stories 10 ft if street side corner lot 10 ft if fronts side yard of multi-family Residential Only 5 ft if bldg ≤2 stories, 10 ft for others	5 ft if on front half of lot
Min. Rear Yard	10 ft. if bldg ≤35 ft & abuts R-1 or R-2 15 ft. if bldg >35 ft & abuts R-1 or R-2 5 ft. if bldg does not abut R-1 or R-2 10 ft if street side corner lot	5 ft if adj to commercial 10 ft on 1-2nd if adj to multi-family 15 ft on 3-4th if adj to multi-family Residential Only 20 ft on 3-4th if adj to MFR & >45 ft	N/A
Min. Open Space	150 sf per unit, 100 sf if live/work	150 SF per unit	N/A
Min. Landscaping	N/A	50% of setback if all residential	N/A

5. Planning and Development Fees

The City assesses various development fees to cover the costs of permit processing, as well as the costs of providing public services to the developments. Table III-6 presents a summary of total development fees for a residential development.

The City exacts from all new-construction residential development projects a multi-family development impact fee at the rate of $1,000 per unit. The rationale of the City in charging the fee, as articulated in the Municipal Code, is that additional multi-family development creates a burden on public service provision, and that additional revenue is needed to offset the cost of these increased services [Gardena Municipal Code Section 15.48.010]. Revenue collected from the fee is placed in a development impact fund, to be applied to the increased public service costs. Overall, planning and development fees total to about $7,000 per unit. However, this varies, as permit fees are based off of valuation of the work.

The multi-family development impact fee imposes an additional cost on the construction of each individual unit, and may have an impact on the financial feasibility of larger-scale development. For this reason, the fee could be considered a constraint on affordable housing production. Non-profit multi-family developments for seniors are exempted from the fee. Additionally, the City, as part of a recent Municipal Code update, adopted Section 15.48.090 to waive the fee for affordable units in multi-family projects that will be kept affordable to lower-income households (i.e., those whose income is less than or equal to 80 percent of AMI). Resolution No. 6433, adopted May 12, 2020, waives Quimby fees for lower income units with 30-year restrictions and reduces Quimby fees by 50 percent for moderate income units with 30-year restrictions.

Table III-8: Typical Planning and Zoning Fees

Service	Department	Fee
Site Plan Review (Admin. Approval)	Multi-department	$2,181.00
Environmental Impact Report (EIR)	Community Development	$600.00 + actual cost
Public Noticing	Community Development	$350.00
Building Permit Issuance	Community Development	$66.00
Building/Demolition	Community Development	$34.00 to $7,679 + $5.50 / $1000 valuation*
Building Plan Check	Community Development	100% of Building Permit
Building Plan Check (Title 24, Part 6, Part 11 & Energy)SMIP	Community Development	Valuation x 0.00013%
Job Fee	Community Development	$1 per $1,000 of the total of building contract
Appeal of Planning Commission Decisions to City Council	Multi-department	$2,097.00
Appeal of CD Director Decisions to Planning Commission	Community Development	$1,265.00
Appeal of City Manager Decisions/Staff Determination to City Council	Multi-department	$1,257.00
Conditional Use Permits	Multi-department	$4,352.00

Table III-8: Typical Planning and Zoning Fees

Service	Department	Fee
General Plan Amendment	Multi-department	$5,351.00
Land Division – Parcel Map/Tract Map$4,352.00 Lot-Line Adjustment/Parcel Map Merger	Multi-department	$1,349.00
Specific Plan	Multi-department	$4,352.00
Variance	Multi-department	$4,352.00
Zone Change	Multi-department	$5,351.00
Residential Unit Fee	Community Development	$1,000
Quimby (park in-lieu) Fee	Community Development	$10,000 per unit; no fee for lower income units with 30-year agreement.
School District Fee (LAUSD)	LAUSD	$4.08 per sf
* For residential building; cost depends on building valuation. Source: Gardena Community Development Department, City Fees FY 2020-2021.		

6. On/Off Site Improvements

According to service providers and utility companies, the City's present infrastructure is adequate to accommodate planned growth levels, and since the City is fully developed, streets, sidewalks and curbs are already in place. If the City determines that a street dedication or improvement is required, the street shall be in accordance with the width, standards and right of way lines of the General Plan Circulation Element which are presented in Table III-7.

Table III-9: Right-of-Way Standards

Street Classification	Right-of-Way Width (Feet)	Roadway Width (Feet)
Arterial 6 Lane	100	84
Arterial 4 Lane	100	80
Major Collector	80	72
Commercial-Industrial Collector	60	42
Residential Collector	60	40
Local	54	36
Source: Gardena General Plan Circulation Element.		

7. Permit and Processing Procedures

Development processing time is relatively short and expeditious due to a one-stop counter, streamlined procedures, and concurrent processing. Single-family units are ministerially approved. Any development of four or more units or projects located on Western Avenue, Redondo Beach Boulevard, and Rosecrans Avenue, and any development that needs any discretionary permit (i.e., map, General Plan amendment, zone change) requires a site plan review. Administrative projects generally require only

one hearing before the Planning Commission. However, the City Council has requested review of many residential projects, requiring an additional public hearing.

Residential use is allowed by-right in all the existing residential zoning districts and will be a by-right use in the new housing overlays. Currently, there is no design review requirements for multi-family projects in the City. The Gardena Municipal Code does call for a Site Plan Review for all new multi-family developments of four or more units (see discussions below). A multi-family residential project that is requesting an approval for a site plan review would be subject to one public hearing before the Planning Commission, unless called for review by the City Council. In September of 2021, an ordinance was adopted to change the procedure of calling for review of a project to require a two-councilmember vote, instead of the previous one councilmember vote. This was done to limit any delays and increase in costs to development projects. Housing projects that do not require legislative actions and meet development standards have not been rejected.

The City's development approval process and time frame for both single-family and multi-family developments are very similar; development of less than four homes outside of the MUO or CR zone and not located on Western Avenue, Redondo Beach Boulevard, or Rosecrans Avenue, does not require site plan review. Of course, larger developments may require additional time. Table III-8 presents the general processing time by level of approval required for a typical residential development project:

Table III-10: Residential Project Approval Processing Time

Process	Required Time Period	Review and Approval
Site Plan Review*	3-4 months	Community Development Dept. (CDD), Planning Commission (PC)
Plan Check/Building Permit	3-11 months	CDD, Public Works, Building and Safety, Fire Department
Conditional Use Permit	3-6 months	CDD, PC
Variance	3-6 months	CDD, PC
Subdivision	1-12 months	CDD, PC, LA County
Zone Change w/ EIR and Public Hearing	11-18 months	CDD, PC, City Council
* Not required for single-family homes Source: Gardena Community Development Department.		

Expedited Review

In 2012, the City adopted Ordinance No. 1737, which facilitates priority processing of projects involving affordable housing, senior housing, mixed-use housing and housing meeting LEED standards. Through this ordinance, the environmental review process may be started prior to the submission of complete application and materials, and an accelerated plan review process may occur if the applicant pays the cost of the City hiring an outside consultant.

Site Plan Review

In addition to other entitlements that may be required, site plan review is required for any of the following types of residential development:

- Development that requires a zone change, general plan amendment, conditional use permit, variance, tract map, or other discretionary permit;
- Development on Western Avenue;
- Development on Redondo Beach Boulevard;
- Development on Rosecrans Avenue;
- Multi-family developments of four units or more;
- Any multi-family development, transitional housing, and supportive housing in the C-R zone;
- Any use allowed by right or by conditional use permit pursuant to the mixed use overlay zone, but not including any use allowed by itself in the underlying zone; and
- Any development in the R-1 or R-2 zone where the proposed development is out of character with the surrounding residential properties as determined by the community development director, based on floor area ratio.

Each of these reviews requires approval by the Planning Commission at a noticed, public hearing. Notice requires newspaper publication and the mailing of notice to owners and occupants within a 300-foot radius of the site. Each applicant must fill out a form, submit copies of the site plan and pay a filing fee.

A site plan will be approved if the proposed development, is consistent with the intent and general purpose of the general plan and the Gardena Municipal Code and will not adversely affect the general welfare. Factors the Planning Commission may consider include: dimensions, shape and orientation of the parcel; placement of buildings and structures; height, setbacks, bulk and building materials; distance between buildings or structures; off-street parking; landscaping; lighting; signs; and the screening. The Planning Commission may impose conditions. The Planning Commission's decision may be appealed to the City Council or it may be called for review by a council member.

Once approved, the site plan must be utilized within 12 months, meaning that a building permit must be issued by that time or the approval becomes null and void. However, the developer may request an extension of up to six months from the Community Development Director prior to the expiration of the 12-month period. The Director may grant up to two extensions of up to six months each upon a showing of good cause.

The process is more fully spelled out in Chapter 18.44 of the Gardena Municipal Code.

Conditional Use Permit

A residential mixed-use development in the Mixed-Use Overlay zone would require a CUP only if it included a live-work use in conjunction with a restaurant or any use that would result in exterior or interior noise levels in excess of the City's residential noise standards. The CUP process involves a public hearing before the Planning Commission,

which also requires noticing in a newspaper and mailing to owner and occupants within a 300-foot radius of the site. The Planning Commission's decision may be appealed to the City Council or it may be called for review by a council member. The CUP process is governed by Municipal Code Chapter 18.46 which lays out the Commission's criteria for approval or denial as follows:

In determining whether to issue or deny a CUP, the Commission shall consider the following factors:

- The nature of the proposed use;
- The compatibility of the use with surrounding area and uses;
- The distance between the proposed use and residential areas, schools, houses of worship, and parks;
- The number of similar uses in the surrounding area and the distances between such uses;
- The input of person residing in the community regarding the proposed use and community support or opposition;
- The cumulative effect of the proposed use in the community; and
- Whether, under the circumstances of the particular application, the establishment and maintenance or operation of the use will be detrimental to the health, safety, or general welfare of persons residing or working in the neighborhood of such proposed use or be detrimental in injurious to property and improvements in the neighborhood or the city.

As with Site Plan Review, once the CUP is approved, it must be utilized within 12 months. After that time, the CUP becomes null and void. However, the developer may request an extension of up to six months from the Commission prior to the expiration of the 12-month period. The Commission, after due consideration, may deny or approve the extension. Upon showing good cause, the Commission may grant up to two extensions of up to six months each.

8. Building Codes and Enforcement

In addition to land use controls, the local building codes also affect the cost of housing. The City has adopted the California Building Standards Code (CBC) with minor amendments as allowed by State law. The CBC establishes the minimum standards for new construction. The City amended the Building Code for Gardena based mostly on local climatic and geological conditions relating to wind, fire, and earthquakes. Options in the Building Code that would not be allowed in Gardena based on seismic and climatic conditions were removed for clarification. These changes are insignificant as they relate to construction costs.

The City also adopted the State Housing Law Regulations, various provisions of the Uniform Housing Code and the Uniform Code for the Abatement of Dangerous Buildings which, in conjunction with provisions of the California Health and Safety Code, provide standards for the maintenance of existing residential structures.

The City's code enforcement is administered on a complaint basis. Code enforcement focuses on health-and-safety and public nuisance violations that negatively affect quality of life in the community. For example, violations include:

- A building or structure that constitutes a health or fire hazard or a danger to human life
- A property that causes erosion or water runoff that may be harmful to people or adjacent property
- Abandonment of property in a way that leaves it vulnerable to unauthorized occupation

Code enforcement based on "deferred maintenance or deterioration that harms property values in the area or interferes with the peaceful use of nearby land use and structures" would also qualify for code enforcement under other objective standards listed above and in Section 8.64.020 of the Gardena Municipal Code. For example, past code enforcement actions have addressed hoarder houses where both the interior and exterior were filled with trash and debris. These houses not only diminish the aesthetic appeal of neighborhoods, but also create health and fire hazards due to lack of plumbing facilities, accumulation of flammable material, and vermin living among the debris. Other examples include homes with boarded windows, damage to exterior walls and windows, visible roof damage, and unpermitted electrical work.

The code enforcement program places high priority on voluntary compliance and neighborhood empowerment, but includes citation, prosecution, and abatement activities when necessary to achieve its goals.

9. Constraints to Housing for Persons with Disabilities

Housing that accommodates individuals with disabilities can require the incorporation of special features, such as front door ramps, special bath facilities, grab bars, and lower cabinets and light switches. The uncommon nature of these features makes them potentially expensive and difficult to implement, especially if they have to be retrofitted into an existing structure. Additionally, some people with disabilities may require residential care in a facility where they receive assistance in performing routine tasks. As stated previously in Chapter II, it is estimated that over 6,600 Gardena residents have a disability.

The City of Gardena adopted and currently enforces the 2019 California Building Standards Code. Gardena has not added any standards or restrictions that substantially differ from those used throughout the State. All regulations specified in Title 24 regarding the accessibility and adaptability of housing units for persons with disabilities currently are applied to all residential development in the city.

A Group Facility is any type of residential facility, which, by State law, is required to be treated as a residential use of property when serving six or fewer persons. The Gardena Municipal Code, in compliance the State law, explicitly permits care facilities of this size as a by-right single-family use. Licensed care facilities for the disabled with more than six residents are allowed by CUP in the R-2, R-3 and R-4 zones, a requirement that is consistent with State law.

The City offers reasonable accommodation with respect to zoning, permit processing and building code standards if they feel that they qualify for such an accommodation under Fair Housing Laws, and that their requests will be reviewed by City staff. The request will be approved or denied once determinations have been made as to the following:

- Qualifying status of the individual;
- Necessity of the accommodation; and
- Financial or administrative burden on the City.

In May 2022 the City adopted Ordinance No. 1840 codifying the reasonable accommodation procedures.

The City's Handy Worker Program, operated by the Public Works Department, provides free repairs to low-moderate income qualified applicants for improvements related to ADA accessibility. Eligible items include health and safety conditions, disability modifications, grip bars, wheelchair ramps, etc.

C. Environmental and Infrastructure Constraints

1. Environmental Constraints

Seismic Conditions

Southern California is a region of high seismic activity. The City, which is in the southwestern portion of the region, is subject to risks and hazards associated with potentially destructive earthquakes. Faults that could affect the City include the regional San Andreas and San Jacinto faults and the local Newport-Inglewood, Charnock, Whittier-Elsinore, Sierra Madre-Cucamonga, San Fernando and Raymond Hill fault systems. These regional and local fault systems have the potential to generate the highest site acceleration when considering the maximum expected earthquake for each fault. According to the California Department of Conservation, an Alquist-Priolo Earthquake Fault Zone is located at the northeast portion of the City in the vicinity of El Segundo Boulevard and Vermont Avenue. This is a known active fault zone delineated by the State Geologist and is considered part of the Newport-Inglewood fault system. The potential impacts related to fault rupture within the City are significant.

Figure III-1 illustrates the location of the local and regional fault zones in the vicinity of the city. Each of these faults is capable of an earthquake large enough to cause significant damage in the City and its vicinity. The probability of an earthquake affecting Gardena is dependent on the distance to the fault and the type and intensity of seismic activity.

Liquefaction

The area located along Artesia Boulevard and the Dominguez Flood Control Channel in the southern portion of the City is within a liquefaction zone identified in the Seismic Hazard Zones Map prepared by the California Department of Conservation, Division of Mines and Geology (Inglewood Quadrangle 1999 and Torrance Quadrangle 1999). Figure III-1 illustrates the area subject to potential liquefaction. Liquefaction zones are defined as areas where historic occurrence of liquefaction, or local geological, geotechnical and groundwater conditions indicate a potential for permanent ground

displacements such that mitigation as defined in Public Resources Code Section 2693(c) would be required.

Liquefaction is caused by a shock or strain from an earthquake and involves the sudden loss of soil strength and cohesion and the temporary transformation of soil into a fluid mass. Therefore, older structures within the liquefaction area are vulnerable to loss if they have not been constructed or reinforced to meet seismic standards.

The properties on the south side of Artesia Boulevard which are identified for the O6 zone lie partially within a liquefaction zone. Like the other residential development in this area along Artesia Boulevard, this would not constrain the development of housing. Development would be required to comply with the recommendations in geotechnical reports. Sites identified to meet the 2021-2029 RHNA are further described in Chapter IV, *Housing Resources*.

Hazardous Sites

The following sites are listed on the Environmental Protection Agency's (EPA) Superfund Enterprise Management System (SEMS) database as sites of hazardous substances as of July 2021:

- Electronic Planting Services, Inc. – 13021 S. Budlong Avenue
- Gardena Sumps – Southwest corner of Artesia Boulevard and Normandie Avenue
- Hawthorne Printing – 2140 ½ W. 139th Street
- Sonic Planting Co. – 1930 W. Rosecrans Avenue

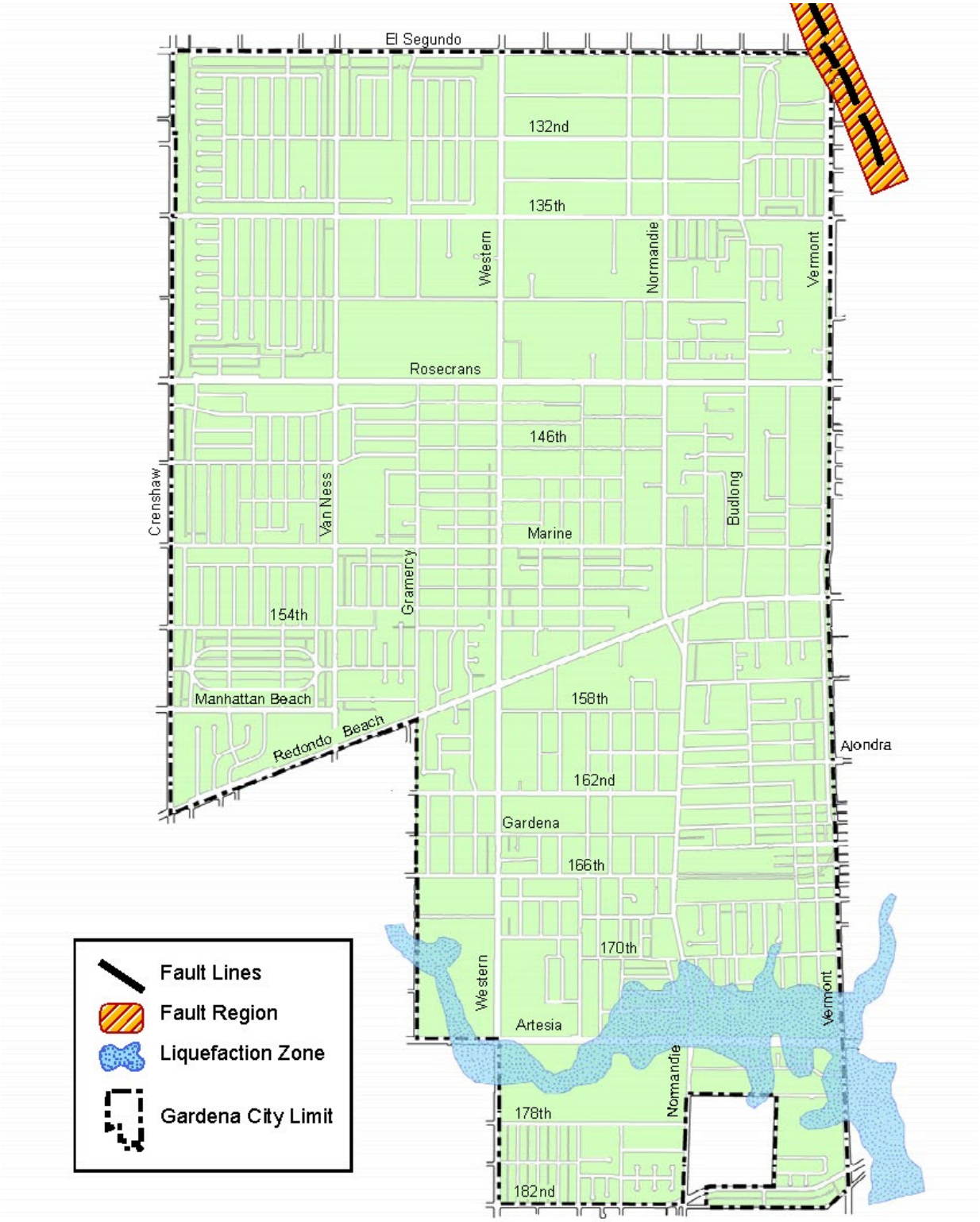
All sites listed on SEMS are active. Though none of the sites are included on the National Priority List (NPL), Gardena Sumps is part of the ongoing State cleanup program categorized as a site needing long-term attention. Atlantic Richfield has completed a Remedial Investigation/Feasibility Study and prepared a Remedial Action Plan based on a remedy that this study indicates would, if implemented, effectively protect the health of Gardena residents and the environment from unreasonable risks due to this site's environmental conditions. The California Department of Toxic Substances Control is reviewing this Plan which, when this agency approves it, Atlantic Richfield will be required to undertake.

There are 120 properties identified by the State Water Resources Control Board's Leaking Underground Storage Tank (LUST) database (GeoTracker) as potential contaminated sites. The contamination of the sites could affect not only the soil but also underlying groundwater resources. Three LUST cases in Gardena are open for remediation, two are open but eligible for closure, two are open for site assessment, and one is open for assessment and interim remedial action. All other LUST cases are completed and closed.

The Brownfield Program is the result of a grant from the Federal Environmental Protection Agency (EPA) to conduct environmental site assessments of existing industrial and commercial facilities that cannot redevelop or expand as a result of real or perceived environmental contamination. In 2021, there were 40 Brownfield sites within the City.

Many areas of Gardena have contamination so Phase I environmental reports are required by the City for all development in industrial areas. However, Phase I reports are routinely done by developers as part of their due diligence in purchasing property. A Phase I report generally costs between $3,000 and $5,000. Many residential projects in Gardena develop on contaminated sites. By way of example, a 113-unit residential development was built on a site listed on DTSC's Voluntary Cleanup Program database and subject to a Response Plan that included excavating contaminated soil for disposal and installation of a vapor intrusion mitigation system. Similarly, a 265-unit project on Crenshaw Boulevard required an impermeable vapor membrane, and a 114-unit development on 178th Street was also subject to a Remedial Action Plan.

Figure III-1: Seismic Hazard Zones



Source: City of Gardena General Plan Community Safety Element, 2006.

Stormwater Quality/Quantity

The Los Angeles County Municipal National Pollutant Discharge Elimination System permit (NPDES), to which the City of Gardena is a party, requires the inclusion of stormwater quality and quantity considerations in the conservation, housing, land use, and open space elements of the General Plan.

The NPDES program requires specific controls for housing developments that involve the construction of 10 or more units or has a project area over one acre. For housing developments in already built-out areas such as Gardena, the most cost effective and efficient way to mitigate runoff pollution is to create as much landscaped area as possible and to direct runoff from roof tops and other hardscaped areas to landscaped areas. If this is not possible because of space limitations, sub-surface infiltration systems should be required (e.g., storm water chambers, dry wells, French drains).

The NPDES program also requires such controls for any project that discharges adjacent to or discharges directly to an environmentally sensitive area (ESA) where the development will:

- Discharge storm water and urban runoff that is likely to impact a sensitive biological species or habitat; and
- Create 2,500 square feet or more of impervious surface area.

The City has one ESA: the Gardena Willows Wetlands Preserve. Runoff from adjacent projects have the potential to adversely impact biota and wildlife that exist in the wetlands. Any such project will be subject to a rigorous CEQA evaluation, to determine if pollution reduction controls are required as mitigation measures during and following construction.

2. Infrastructure Constraints

As an entirely urbanized community, Gardena already has in place all the necessary infrastructure to support future development. All sites included in the Residential Sites Inventory are adequately served by water, wastewater, stormwater, and dry utilities for energy and communications, although such systems may need to be upgraded. There should be no significant problems with connecting potential developments on these sites to the City's utility grid.

IV. Housing Resources

This section describes and analyzes the resources available for development, rehabilitation, and preservation of housing in Gardena. This includes the availability of land resources and the ability to satisfy the City's share of the regional housing need, and financial resources available to support the provision of affordable housing. Energy conservation techniques are also discussed as ways to reduce utility costs.

A. Regional Housing Needs Assessment (RHNA)

California General Plan law requires each city and county to have land zoned to accommodate its fair share of the regional housing need. HCD allocates a numeric regional housing goal to the Southern California Association of Governments (SCAG). SCAG is then mandated to distribute the housing goal among the cities and counties in the region. This share for the SCAG region is known as the Regional Housing Needs Assessment, or RHNA. The SCAG region encompasses six counties (Imperial, Los Angeles, Orange, Riverside, San Bernardino, and Ventura) and 191 cities in an area covering more than 38,000 square miles. The major goal of the RHNA is to assure a distribution of housing among cities and counties within the SCAG region so that every community provides for a mix of housing for all economic segments. The housing allocation targets are not building requirements; rather, they are planning goals for each community to accommodate through appropriate planning policies and land use regulations. Allocation targets are intended to assure that adequate sites and zoning are made available to address anticipated housing demand during the planning period.

The current RHNA for the SCAG region covers an eight-year planning period (2021 to 2029) and is divided into four income categories: very low, low, moderate, and above moderate. As determined by SCAG, the City of Gardena's allocation is 5,735 new housing units during this planning cycle, with the units divided among the four income categories as shown in Table IV-1.

Table IV-1 : Regional Housing Needs Assessment (RHNA)

Income Level	Units	Percent
Very Low Income	1,485	25.9%
Low Income	761	13.3%
Moderate Income	894	15.6%
Above Moderate Income	2,595	45.2%
Total	5,735	100.0%

Source: Southern California Association of Governments (SCAG), 2021.

Note: The City has a RHNA allocation of 1,485 very low-income units (inclusive of extremely low-income units. Pursuant to State law (AB 2634), the City must project the number of extremely low-income housing needs based on Census income distribution or assume 50 percent of the very low income units as extremely low. Assuming an even split, the City's RHNA allocation of 1,485 very low-income units may be divided into 743 very low and 742 extremely low-income units. However, for purposes of identifying adequate sites for the RHNA allocation, State law does not mandate the separate accounting for the extremely low-income category

B. Development Credit

1. Accessory Dwelling Units (ADUs)

Since 2017, State laws have been passed that substantially relax development standards and procedures for the construction of ADUs. Gardena has seen a steady growth of ADUs in the community with 12 units permitted in 2018, 18 units in 2019, 23 units in 2020, and 26 units in 2021 for an average of 19.75 ADUs per year. Gardena anticipates permitting at least 20 ADUs per year for a total of 160 in the eight-year planning period based on the annual 2018-2020 average in conjunction with additional incentives to be provided by the City to facilitate ADU development. The City will monitor the number of permitted ADUs and affordability every year and continue to evaluate if these ADU trends and assumptions are consistent. The monitoring of ADUs in the City has been added to the Housing Element Accessory Dwelling Unit program.

Table IV-2: ADU Projections and Affordability

Income Category	Units	SCAG ADU Affordability
Extremely Low	24	15.0%
Very Low	4	2.0%
Low	68	43.0%
Moderate	10	6.0%
Above Moderate	54	34.0%
Total	160	100.0%

Source: Southern California Association of Governments (SCAG) Regional Accessory Dwelling Unit Affordability Analysis – LA County I, 2020.

2. Entitled or Pending Units

There are currently several residential development projects with completed entitlements and one pending project in Gardena, totaling 686 units, including 15 lower income units. The following approved projects have been conditioned to require affordable housing agreements with the City, ensuring lower income units will be developed:

- 1341 Gardena Boulevard – one very low income unit
- Melia Moneta (13615 S. Vermont Avenue) – two low income units
- Normandie Place (15717 & 15725 S. Normandie Avenue) – three low income units
- Marine Place (2545 Marine Avenue) – two low income units
- SRO on Western (13126 S. Western Avenue) – seven very low income units

The approved and pending projects are shown in Table IV-3. All these projects can be completed within the timeframe of this Housing Element.

Table IV-3: Approved or Pending Residential Development

Address	Project Name	APN/s	Existing Use	General Plan	Zone	Total Acres	Density (du/ac)	Very Low Income Units	Low Income Units	Above Mod. Income Units	Total Units	Approval
1341 Gardena Blvd		6113-016-036	Commercial Building/Parking Lot	Mixed-Use	C-R	0.28	50	1		13	14	2017
1515 W. 178th Street	Melia Homes 178th (Ph II)	6106-013-040, 6106-013-041	Industrial Building	HDR	R-4	5.64	20	--	--	35	35	2019
1348 W. 168th Street		6111-012-003	SFD/Vacant Land	SP	NESP	0.71	13	--	--	9	9	2019
13615 S. Vermont Avenue	Melia Moneta	6115-019-042, 6115-019-043, 6115-019-044, 6115-019-045	Nursery, Motel	HDR	R-4	4.15	20.24	--	2	82	84	2020
1335 W. 141st Street	Olson - 141st	6115-013-007, 6115-013-008, 6115-013-009, 6115-013-010, 6115-013-011	Nursery	HDR	R-4	2.02	25	--	--	48	48	2020
2500 W. Rosecrans Avenue	Walnut Place	4064-003-028, 4064-003-040	Vacant Restaurant Building, Vacant Lot	MUO	MUO	2.36	22	--	--	52	52	2021
12850 Crenshaw Boulevard	GTODSP	4060-004-039	Vacant Warehouse	SP	GTOD SP	1.33	199	--	--	265	265	2021
15717 & 15725 S. Normandie Avenue	Normandie Place	6105-009-008, 6105-009-009	Storefront, Warehouse, Parking Lot	HDR	R-4	0.91	33	--	3	27	30	2021
2545 Marine Avenue	Marine Place	4064-023-018	Vacant Lot	MUO	MUO	0.72	31	--	2	20	22	2022
13126 S Western Ave	SROs On Western Ave	6102-006-013	Industrial Building/ Auto Repair	Industrial	M-1	1.01	121	7	--	114	121	2022
1031 Magnolia Avenue	Gardena Havens	6113-035-015	Residential Duplex	MDR	R-3	0.34	18	--	--	6	6	Pending
Total								8	7	671	686	

HDR = High Density Residential
MUO = Mixed Use Overlay/Mixed Use Overlay Zone
NESP = Normandie Estates Specific Plan
MDR = Medium Density Residential
R-3 = Medium Density Multiple-Family Residential Zone
GTODSP = Gardena Transit-Oriented Development Specific Plan
SP = Specific Plan
R-4 = High Density Multiple-Family Residential Zone

3. Remaining RHNA

Based on the pipeline projects described in Table IV-3 and the anticipated ADUs shown in Table IV-2, the City has a remaining RHNA of 4,889 units. The remaining RHNA is presented by income category in Table IV-4 below. The City is required to provide adequate sites for the remaining RHNA of 2,144 lower income units, 884 moderate income units, and 1,899 above moderate income units. The Site Inventory includes a 22 percent buffer to address the No Net Loss (SB 166) requirements in line with HCD's recommendations.

Table IV-4: Credits and Remaining RHNA

Income Category	ADUs	Pipeline Projects	RHNA	Remaining RHNA
Extremely Low/ Very Low	28	8	1,485	1,449
Low	68	7	761	686
Moderate	10	--	894	884
Above Moderate	54	671	2,595	1,870
Total	160	686	5,735	4,889

C. Residential Sites Inventory

The RHNA period extends from June 30, 2021, to October 15, 2029. A jurisdiction may meet the RHNA requirement using potential development on suitable vacant and/or nonvacant sites within the community. A jurisdiction must document how zoning and development standards on the sites facilitate housing to accommodate the remaining RHNA identified in Table IV-4.

1. Housing Overlay

The City has limited vacant or underutilized properties within the existing residential and mixed-use zones to accommodate the significant RHNA number without changes to its land use policy and zoning regulations. Sites are considered suitable for residential development if zoned appropriately and available for residential use during the planning period. To accommodate the RHNA number for each income category, the City is introducing a housing overlay in this Housing Element to be created within the next two years. The City identified 122 sites (468 parcels consolidated) that will receive the overlay designation and are included considered viable for housing development. The actual overlays will be larger that these sites to allow for exploitation of residential development opportunities should they arise. Detailed parcel data for sites receiving the overlay designation is included in Appendix C, Sites Inventory. Of the 468 parcels, 74 were previously included in the 2014-2021 Housing Element, the rest were identified during this 6th Cycle planning period. The overlay provides for four density categories, shown below:

- O3 – 12-20 units/acre
- O4 – 21-30 units/acre

- O5 – 31-50 units/acre
- O6 – 51-70 units/acre

The City's 468 candidate parcels for rezoning to Housing Overlay can accommodate an estimated 6,586 units with application of the new overlay. Most of these sites also have the potential for lot consolidation and were selected based on the following criteria:

- Presence of vacant lots within the site
- Presence of low-intensity or low-value uses, such as small structures surrounded by large parking lots
- High or long-term business vacancies, indicating that the value of the existing use is impaired
- Extensive and/or severe physical blighting conditions that may be impairing the value of the existing use, such as structural problems; dilapidation/deterioration caused by long-term neglect; and obsolete design or construction
- Presence of multiple lots that are already under single or City ownership, potentially easing the process of site acquisition
- Presence of development opportunities on adjoining land

Gardena has had robust housing development since 2015. Table IV-5, below, presents recently completed and approved projects in the R-3 zone which allows 0-17 du/acre. The City originally proposed an overlay zone for 0-17 du/acre But this was changed to include a density range of 12-20 du/acre in the O3 overlay. The estimate of 17 du/acre for the O3 overlay remains, but is now in the middle of the range rather than at the high end. Most recent developments in the R-3 zone were built to full capacity at 17 units per acre, with the exception of 1715 E. 149th Street (15 units per acre) and 1333 168th Street (13 units per acre). The City assumes the O3 Overlay sites will be built to 17 units per acre based on the achieved densities of similarly sized R-3 projects.

Table IV-5: Recently Completed and Approved Residential Development in R-3 Zone

Address	APN	Year Approved	Lot Size/ Project Description	Max. Allowed Units	Units Achieved	Density Achieved
15808 Dalton Ave.	6105013014	2015	0.17 acres; 1,012 sf single-story dwelling	2.9	3	17 du/ac
15927 Brighton Ave.	6105014022	2017	0.17 acres; 1,992 sf 2-unit 2-story apartment building	2.9	3	17 du/ac
1715 W. 149th Street*	6103022091	2018	0.34 acres; five townhome units	5.5	5	15 du/ac
15309 S. Normandie Ave.	6103007036	2018	0.19 acres; 1,309 sf 2-story SFD	3.1	3	17 du/ac
1333 168th Street*	6111010041	2019	0.24 acres; three townhome units	4.07	3	13 du/ac
1938 W. 146th Street	4062007025	2020	0.33 acres; six townhome units	5.6	6	17 du/ac
1621 W. 147th Street	6103031075	2021	0.33 acres; six townhome units	5.5	6	17 du/ac

*Original project called for maximum allowed density.

The O4 zone will be changed to 21-30 units/acre. As this density is similar to the R-4 and MUO zones which have averaged 23 units/acre, the estimate for the O4 zone is similarly 23 units/acre. The O5 zone is 31-50 units per acre and the O6 zone is 51-70 units/acre. Both of these zones have been estimated at the minimum densities that can be built.

Three project-based Specific Plans have been developed since the 2014-2021 Housing Element. The densities were 20.47 du/acre, 19.91 du/acre, and 200 du/acre. Additionally, another 5.26 acre industrial site is being proposed for a residential specific plan for 349 units or 66.3 units/acre.

Under Provision of Adequate Sites under Housing Programs, the City has included amendments to the R-4 and MUO zone to eliminate the middle step so that anything 0.5 acres and over will be allowed to develop at 30 du/acre. This amendment should encourage small lot consolidation to facilitate higher density developments.

City staff reached out to three of the major housing developers in Gardena (Olson Company, Melia Homes, and G3 Urban) who are responsible for more than 500 housing units in 8 developments since 2015 regarding looking at sites in commercial/industrial properties. All three developers indicated that one of the important factors in considering commercial/industrial sites was proximity to residential areas. Almost all of the sites listed in the Housing Overlay Sites Inventory are adjacent or very close to residential areas. Size and infrastructure were other considerations. As the City is fully built out, infrastructure is available throughout the City. And while some sites are smaller than 0.5 acres, by themselves, the inventory sites can be assembled to create larger parcels.

As shown in Table IV-6, industrial and commercial development has not been an impediment to developing residential properties in Gardena. Since 2015, there have been seven projects approved, and one pending project, that included a request to rezone the property from a nonresidential zone to a residential zone or specific plan to allow for high density residential uses. Between these eight projects a total of 1,067 residential units will be developed, which accounts for approximately 70 percent of the total housing development since 2015. Many sites identified in the inventory have buildings that have not undergone any major improvements in decades and are near the end of the building's useful life. The lack of significant improvements is also an indication of the oversupply of Class B and Class C commercial/industrial spaces in the City. According to the 2021 Kidder Mathews report on Industrial Market Trends, Gardena has 28.7 million square feet of industrial space, second only to Carson among the South Bay communities. Vacancy rate is 1.6 percent, higher than the South Bay subregional average of 1.5 percent, and also commanding lower than average rent.

Table IV-6: Residential Development in Commercial, MUO, and Industrial Zones

Address	GP/Zone	GPA/ ZC?	Land Use Change?	Description	Previous Uses	Units	Acres	Density (du/ac)	Approval
16958 S. Western Ave	[Specific Plan] Western Avenue Specific Plan	Yes	Yes	Residential Townhomes	Vacant, recreational vehicle storage	46	2.31	20	2017
14031 S. Vermont, 1017-1101 W. 141Street	Medium Density Residential/R-3	Yes	Yes	Residential Townhomes	Vacant, surface parking	63	3.9	16	2019
1515 W 178th Street	High Density Residential/R-4	Yes	Yes	Residential Townhomes	Industrial trucking and distribution facility	114	4.49	25	2019
13615 S. Vermont Ave	High Density Residential/R4	Yes	Yes	Residential Townhomes	Plant Nursery	84	1.37	61	2020
12850 Crenshaw Blvd	[Specific Plan] GTODSP	Yes	Yes	Apartment rental units	Warehouse use	265	1.33	199	2021
16831-16911 S. Normandie Ave	[Specific Plan]	Yes	Yes	Apartment rental units/Residential Townhomes	Warehouse use	349	5.3	66	Pending
14504 S Normandie Ave	[Specific Plan] Platinum Row Specific Plan	Yes	Yes	Residential Townhomes	Plant Nursery	96	4.69	20	2015
1335 W. 141st Street	High Density Residential/R4	Yes	Yes	Residential Townhomes	Plant Nursery	50	2.02	25	2020
14321 S. Van Ness Ave	General Commercial-Mixed Use/C-3 - MUO	No	Yes	35 Residential Townhomes; 5 Live/Work Units	Vacant lot, previous auto dealership	40	2.04	20	2018
13919 S. Normandie Ave	Industrial/M-1	No	Yes	100% Residential (SROs)	Vacant lot	20	0.35	57	2018
16819 S. Normandie Ave	Industrial/M-1	No	Yes	100% Residential (SROs)	Plant Nursery	63	0.69	91	2018
2101/2129 Rosecrans Ave	General Commercial-Mixed Use/C-3 - MUO	No	Yes	100% Residential	Warehouse use	113	5.47	21	2020
2500 Rosecrans Ave	General Commercial-Mixed Use/C-3 - MUO	No	Yes	49 Residential Townhomes; 3Live/Work Units	Vacant stand alone restaurant	52	2.35	22	2020
15717 S. Normandie Ave	High Density Residential/R-4	No	Yes	100% Residential & Density Bonus	Industrial uses, recreational vehicle storage	30	0.91	33	2021
13126 S. Western Ave	Industrial/M-1	No	Yes	100% Residential & Density Bonus (SROs)	Auto repair, stand alone repair store	121	1.01	120	2022
2545 Marine Ave	General Commercial/C-3 - MUO	No	Yes	100% Residential, & Density Bonus (22 Townhomes)	Vacant lot	22	0.91	24	2022

Many of the sites included in the City's sites inventory are nonvacant. Based on recent development trends in Gardena, nonvacant sites will not impede future residential development. Table IV-7 shows recent residential development projects, on nonvacant sites. Nonvacant site conditions and factors where residential development was achieved are comparable to conditions of nonvacant sites included in the sites inventory. Quality classes for buildings on nonvacant RHNA sites are included in Appendix C: Sites Inventory of this Housing Element.

In selecting sites for meeting the RHNA, the following criteria are used:

1. Developer interest or property owner interest to redevelop site
2. Vacant lot, parking lot, or open storage that includes only minimal existing improvements on site
3. Dilapidated buildings
4. Buildings with high vacancy and/or high turnover rates
5. Existing uses that are similar to uses that have been recycled
6. Buildings that are older than 30 years
7. Buildings that have existing FAR lower than 0.60, similar to the range of existing uses being recycled
8. Lot is part of a group of lots already under single or City ownership

Sites that meet criteria #1, 2, 3, OR 4 are included in the sites inventory. In addition, sites that meet two of the four criteria under #5 through #8 are also included due to trends exhibited in the City as shown in the Table IV-7.

Table IV-7: Residential Development on Nonvacant Sites

Address	Previous/ Existing Use	FAR	Year Built	Build -ing SF	Quality Class Bldf 1	Criteria
14321 S. Van Ness Ave	Vacant lot, vacant building	0.010	1960	900	CX	Presence of vacant lots within the site Presence of low-intensity or low-value uses, such as small structures surrounded by large parking lots High or long-term business vacancies, indicating that the value of the existing use is impaired Extensive and/or severe physical blighting conditions that may be impairing the value of the existing use, such as structural problems; dilapidation/deterioration caused by long-term neglect; and obsolete design or construction Presence of multiple lots that are already under single or City ownership, potentially easing the process of site acquisition
16819 S. Normandie Ave	Plant Nursery	0.08	1973	2400	C55B	Presence of low-intensity or low-value uses, such as small structures surrounded by large parking lots High or long-term business vacancies, indicating that the value of the existing use is impaired Extensive and/or severe physical blighting conditions that may be impairing the value of the existing use, such as structural problems; dilapidation/deterioration caused by long-term neglect; and obsolete design or construction"
1348 W 168th Street	Single Family Home	0.042	1992	1286	D4A/D5A	Presence of low-intensity or low-value uses, such as small structures surrounded by large parking lots Extensive and/or severe physical blighting conditions that may be impairing the value of the existing use, such as structural problems; dilapidation/deterioration caused by long-term neglect; and obsolete design or construction
14031 S. Vermont, 1017-1101 W. 141 St	Vacant, surface parking	0.058	1955	9,924	C6B/C6	Presence of vacant lots within the site Presence of low-intensity or low-value uses, such as small structures surrounded by large parking lots Presence of multiple lots that are already under single or City ownership, potentially easing the process of site acquisition Presence of development opportunities on adjoining land
1515 W 178th Street	Industrial trucking and distribution facility	0.537	1961	10503 6	C6A/DX	Presence of low-intensity or low-value uses
2101/2129 Rosecrans Ave	Warehouse use	0.169	1976	40382	C65B/SI/ DX/DX	Presence of vacant lots within the site Presence of low-intensity or low-value uses, such as small structures surrounded by large parking lots Presence of multiple lots that are already under single or City ownership, potentially easing the process of site acquisition
2500 Rosecrans Ave	Vacant stand alone restaurant	0.068	1991	6961	C65	Presence of vacant lots within the site Presence of low-intensity or low-value uses, such as small structures surrounded by large parking lots High or long-term business vacancies, indicating that the value of the existing use is impaired Presence of development opportunities on adjoining land
13615 S. Vermont Ave	Plant Nursery	0.377	1959	22498	D55/D35/ DX/DX	Presence of vacant lots within the site Presence of low-intensity or low-value uses, such as small structures surrounded by large parking lots High or long-term business vacancies, indicating that the value of the existing use is impaired Extensive and/or severe physical blighting conditions that may be impairing the value of the existing use, such as structural problems; dilapidation/deterioration caused by long-term neglect; and obsolete design or construction Presence of multiple lots that are already under single or City

Address	Previous/ Existing Use	FAR	Year Built	Build -ing SF	Quality Class Bldf 1	Criteria
						ownership, potentially easing the process of site acquisition
1335 W. 141st Street	Plant Nursery	0.191	1951	16770	D5A/DX/ D6B/DX	Presence of vacant lots within the site Presence of low-intensity or low-value uses, such as small structures surrounded by large parking lots High or long-term business vacancies, indicating that the value of the existing use is impaired Extensive and/or severe physical blighting conditions that may be impairing the value of the existing use, such as structural problems; dilapidation/deterioration caused by long-term neglect; and obsolete design or construction Presence of multiple lots that are already under single or City ownership, potentially easing the process of site acquisition
15717 & 15725 S. Normandie Ave	Industrial uses, recreational vehicle storage	0.169	1964	6680	DX	Presence of low-intensity or low-value uses, such as small structures surrounded by large parking lots High or long-term business vacancies, indicating that the value of the existing use is impaired
12850 Crenshaw Blvd	Warehouse use	0.216	1958	12500	DX	Presence of low-intensity or low-value uses, such as small structures surrounded by large parking lots High or long-term business vacancies, indicating that the value of the existing use is impaired Extensive and/or severe physical blighting conditions that may be impairing the value of the existing use, such as structural problems; dilapidation/deterioration caused by long-term neglect; and obsolete design or construction
13126 S. Western Ave	Auto repair, stand alone repair store	0.138	1976	6090	SX/C6A	Presence of low-intensity or low-value uses, such as small structures surrounded by large parking lots High or long-term business vacancies, indicating that the value of the existing use is impaired
16831-16911 S. Normandie Ave	Warehouse use	0.500	1976	11542 4	DX/CX/ C55C	High or long-term business vacancies, indicating that the value of the existing use is impaired Extensive and/or severe physical blighting conditions that may be impairing the value of the existing use, such as structural problems; dilapidation/deterioration caused by long-term neglect; and obsolete design or construction Presence of multiple lots that are already under single or City ownership, potentially easing the process of site acquisition Presence of development opportunities on adjoining land
14600 S Western Ave	Industrial Building	0.585	1999	30600	C5A/SX	High or long-term business vacancies, indicating that the value of the existing use is impaired

Table IV-8 illustrates how the candidate sites are being assigned an income/affordability level for RHNA purposes. Potential units have been calculated using a density of 17 units per acre for O3 sites, 23 units per acre for O4 sites, 31 units per acre for O5 sites, and 51 units per acre for O6 sites as a conservative estimate. Recent and pipeline projects in Table IV-3 demonstrate that projects on R-3 (0-17 du/ac) sites can max out at the allowable density. R-4 (20-30 du/ac) projects average to about 25 du/ac. For the new density ranges offered by O5 and O6, this sites capacity analysis uses the minimum density.

Candidate sites with the O5 and O6 Overlay are distributed into 50 percent lower income, 15 percent moderate income, and 35 percent above moderate income. It should be noted that based on the allowable density in the O5 Overlay (31-50 units/acre) and O6 Overlay (51-70 units/acre), all O5 and O6 Overlay sites are considered suitable for lower income units.

Table IV-8: Income/Affordability Assumptions

Housing Overlay	Density Assumption	Parcel Size	Lower	Moderate	Above Moderate
O3 (12-20 du/ac)	17 du/ac	---			✓
O4 (21-30 du/ac)	23 du/ac	---		✓	
O5 (31-50 du/ac)	31 du/ac	<0.5 acre		✓	
		≥0.5 acre	✓ (50%)	✓ (15%)	✓ (35%)
O6 (51-70 du/ac)	51 du/ac	<0.5 acre		✓	
		≥0.5 acre	✓ (50%)	✓ (15%)	✓ (35%)

O3 Overlay Sites

The O3 Overlay sites can accommodate 300 above moderate-income units. The 66 O3 Overlay sites are currently zoned for General Commercial (C-3), Industrial (M-1), or Home Business (H-B). Existing uses include vacant lots, vacant buildings, parking lots, and other uses such as office buildings, manufacturing buildings, and strip malls containing aging structures or vacancies. None of the candidate rezone sites using the O3 Overlay have been used in previous Housing Element cycles.

O4 Overlay Sites

The O4 Overlay sites can accommodate 1,004 moderate income units. The City selected 95 candidate O4 Overlay sites. All sites are currently zoned either General Commercial (C-3) or Industrial (M-1 or M-2). Existing uses include vacant lots, vacant buildings, warehouses, auto services and other manufacturing/commercial businesses. A majority of these sites contain aging structures, low floor-area-ratios (FAR), or vacancies. None of the candidate rezone sites using the O4 overlay were used in previous Housing Element cycles.

O5 Overlay Sites

The O5 Overlay sites can accommodate a total of 934 lower-income units, 283 moderate income units, and 660 above moderate-income units. Of the 181 candidate O5 sites, 25 were used in the previous 2014-2021 Housing Element. Most O5 sites are currently zoned for General Commercial (C-3), Industrial (M-1 or M-2), or Home Business (H-B). Many of the candidate sites in the C-3 zone are also in the Mixed-Use Overlay (MUO). Four sites are zoned Official (O) and one Parking (P). Existing uses include vacant lots or buildings, parking lots, offices, small restaurants, strip malls, and other commercial/industrial uses. A majority of the selected sites have old or deteriorating buildings, low FARs, vacancies, or large unused spaces (i.e., unused parking lots or open space).

O6 Overlay Sites

The O6 Overlay sites can accommodate a total of 1,702 lower-income units, 510 moderate-income units, and 1,193 above moderate-income units. Of the 126 O6 Overlay sites, most are currently zoned for either General Commercial (C-3) or Industrial (M-1 or

M-2). Two of these sites are in the Artesia Corridor Specific Plan. However, instead of receiving an overlay, these two sites are to be rezoned to a density matching the O6 overlay to eliminate the ability to redevelop the sites with commercial or industrial uses. Existing uses include vacant buildings, parking lots, auto services, industrial parks, warehouses, and other commercial/industrial uses. Most of the sites selected for the O6 Overlay have low FARs, contain aging or dilapidated buildings, or have vacancies or permanent closures. A total of 49 candidate O6 Overlay sites were used in the previous 2014-2021 Housing Element.

Summary

A detailed list of the candidate sites for the housing overlay are included in Appendix C. Table IV-5 below shows the potential rezone sites by Housing Overlay and affordability. The Housing Overlay rezone sites can accommodate a total of 6,586 units, including 2,636 lower income units (very low and low income) and 3,950 market-rate units (moderate and above moderate income) units.

Table IV-9: Summary of Candidate Housing Overlay Sites

Housing Overlay	Density Assumption	# of Sites	Total Acres	Lower Income Units	Moderate Income Units	Above Moderate Income Units	Total Units
O3 (12-20 du/ac)	17 du/ac	66	17.0	--	--	300	300
O4 (21-30 du/ac)	23 du/ac	95	44.2	--	1,004	--	1,004
O5 (31-50 du/ac)	31 du/ac	181	62.3	934	283	660	1,877
O6 (51-70 du/ac)	51 du/ac	126	68.2	1,702	510	1,193	3,405
Total		468	191.8	2,636	1,797	2,595	6,586

2. Density Bonus

Another way in which density may be increased in the City is through the Density Bonus Ordinance, which was originally adopted as Ordinance 1739 in June 2012 and added as Chapter 18.43 of the Municipal Code. The purpose of the Ordinance is to satisfy the requirements of State law which requires cities to provide a density bonus and concessions or incentives to applicants proposing to develop affordable housing, donate land, or provide childcare facilities within the City. The State Density Bonus law has been amended numerous times in recent years to enhance the density incentives for affordable housing and the City's Density Bonus provisions have been amended accordingly. This Housing Element includes a program to continue updating the City's Density Bonus Ordinance to be consistent with State law if other changes are made.

3. Lot Consolidation

The most promising opportunities for adding to Gardena's housing stock through lot consolidation of Housing Overlay sites lie along underutilized stretches of the City's commercial and industrial corridors that are zoned for General Commercial (C-3) or

Industrial (M-1 and M-2). These sites are candidates for consolidation and redevelopment using the Housing Overlay described above. Additional opportunities lie on underutilized sites in the H-B, O and P zones, as well as two sites in the Artesia Corridor Specific Plan (ACSP). Of the 468 Housing Overlay parcels identified, 429 are suitable for consolidation. The 429 lot consolidation parcels occupy 173.9 acres and could yield a net gain of 6,128 units.

Lots are suitable for consolidation due to the contiguous location and similar existing conditions. In most cases, these sites consist of multiple parcels that are either developed with small or obsolete buildings exhibiting signs of blight or are vacant but cannot be developed individually due to regulatory obstacles. The City will continue to help consolidate these parcels through a variety of means, including making use of the specific plan process and potentially using federal CDBG and State HOME funds to help assemble properties. All sites with existing structures will require such buildings to be demolished before the sites can be developed to their full potential. Appendix C lists the potential lot consolidation sites under existing zoning and presents the net increase in housing units.

All parcels suitable for lot consolidation are candidate sites for the Housing Overlay. The 429 parcels can be consolidated into a total of 91 sites. As shown in Table IV-3, most current and pipeline projects involve lot consolidation.

D. Summary of RHNA Strategies

As previously discussed, entitled or pending development projects, ADUs, and the proposed Housing Overlay, including lot consolidation strategies, can increase the city's housing stock. Table IV-6 reflects Gardena's total potential increase in housing units. It assumes housing densities of 17 units per acre on O3 sites, 23 units per acre on O4 sites, 30 units per acre on O5 sites, and 50 units per acre on O6 sites.

Table IV-10: Potential Housing Growth

Source	Lower-Income Units	Moderate-Income Units	Above Moderate-Income Units	Total Units
RHNA	2,246	894	2,595	5,735
Credits	111	10	725	846
Entitled/Pending	15	0	671	686
ADUs	96	10	54	160
Sites Inventory	2,636	1,797	2,153	6,586
O3	0	0	300	300
O4	0	1,004	0	1,004
O5	934	283	660	1,877
O6	1,702	510	1,193	3,405
Surplus[1]	+501	+913	+283	+1,697
	22%	102%	11%	30%

1. HCD recommends buffer in the housing element inventory of at least 15 to 30 percent capacity more than required, especially to accommodate the lower income RHNA.

The 686 units from entitled or pending development projects, 160 ADUs, and the potential 6,586 units resulting from implementation of the Housing Overlay could result in 7,432 units, exceeding the total RHNA allocation for Gardena by 1,697 units or 30 percent. This buffer is necessary to address the No Net Loss (SB 166) requirement of maintaining an inventory of sites adequate to accommodate the City's remaining RHNA throughout the planning period as development occurs on the selected sites that may result in fewer units than assumed in this inventory.

Only one site (Site 60) has an existing residential unit. This unit is accounted for and is not included in the housing growth estimate. A detailed description of the sites identified for the Housing Overlay, including lot consolidation potential, is provided in Appendix C.

E. Provision for a Variety of Housing Types

Housing element law specifies that jurisdictions must identify adequate sites through appropriate zoning and development standards, to encourage the development of various types of housing. This includes, single family housing, multifamily housing, mobile homes, emergency shelters, and transitional housing, among others. The various housing types permitted in Gardena are summarized in Table IV-7 and described below.

Table IV-11: Housing Types by Zone Category

Housing Types Permitted	Zone Category											
	R-1	R-2	R-3	R-4	H-B	C-R	C-P	C-2	C-3	C-4	MUO	M-1/M-2
Residential Uses												
Single-Family	P	P	P	---	P	---	---	---	---	---	---	---
Two-Family	---	P	P	P	---	P	---	---	---	---	P**	---
Multiple-Family	---	---	P*	P*	---	P**	---	---	---	---	P**	---
Mobile Home	P	P	P	P	P	C**	---	---	---	---	---	---
Mobile Home Park	---	---	C	C	---	---	---	---	---	---	---	---
ADU	P	P	P	P	P	P	---	---	---	---	P	---
Other Residential Uses												
Lodging house	---	C	C	C	---	---	---	---	---	---	---	---
Residential Group	P	P	P	P	---	---	---	---	---	---	---	---
Community Care (7 or more)	---	---	---	---	---	---	C	C	C	C	---	---
Group Care	---	C	C	C	---	---	C	C	C	C	---	---
Transitional Housing	P	P	P*	P*	---	P**	---	---	---	---	P	---
Supportive Housing	P	P	P*	P*	---	P**	---	---	---	---	P	---
Emergency Shelters	---	---	---	---	---	---	---	---	---	---	---	P
SRO	---	---	---	---	---	---	---	---	---	---	---	C

Low Barrier Navigation Centers	---	---	---	---	---	P	---	---	---	---	P	---

Note: P = Permitted
C = Conditionally Permitted
*Site Plan Review for all projects with 4 or more units
**Site Plan Review for all projects
Source: Gardena Municipal Zoning Code.

1. Multi-Family Housing

Multi-family developments are permitted in the R-2, R-3, R-4, MUO and C-R zones and in any zone that has been designated as a Housing Overlay site once the appropriate changes are made to the General Plan and Zoning Ordinance. The maximum densities are 17 dwelling units per acre in the R-2 and R-3 zones, 30 dwelling units per acre in R-4 and MUO zones, and 34 dwelling units per acre in the C-R zone.

In 2019, in an effort to increase housing production, the City held a workshop with developers, architects, and others to understand impediments to producing multi-family housing in the city. As a result, the City amended the Zoning Code in 2019 through Ordinance 1804, and again in 2020 through Ordinance No. 1820 to allow developers more flexibility in residential development design. Ordinance No. 1804 made the requirements for open space more flexible, allowed an increase in building height in the R-4 zones, reduced side and rear yard setbacks in the MOU zone, and allowed tandem parking for 50 percent of residential and live/work units in the MOU zone. The Ordinance also gave the Community Development Director some flexibility to make administrative adjustments. Ordinance No. 1820 updated development standards and removed the minimum dwelling size for affordable units in the R-2, R-3, R-4, and MUO zones, and altered standards related to parking, garage spaces, lighting, and Site Plan Review time limits.

The Housing Overlay will allow up to 20 units per acre in the O3 zone, 30 units per acre in the O4 zone, 50 per acre in the O5 zone, and 70 per acre in the O6 zone. The City will amend the Zoning Code within two years of the Housing Element statutory deadline to establish the Housing Overlay.

2. Accessory Dwelling Units and Junior ADUs

Section 18.13.030 (Accessory Dwelling Units and Junior Accessory Dwelling Units) of Title 18 (Zoning) of the Gardena Municipal Code permits ADUs in any residential zone, including mixed-use zoned lots where a single-family dwelling exists or is proposed or where a multi-family dwelling exists in accordance with State law. The purpose of the ADU law is to facilitate the production of housing, especially for special needs groups such as students, the elderly, disabled persons, below the market-rate cost. The Gardena Municipal Code was amended in 2020 to comply with recent changes to State ADU laws, related to impact fee exemptions, review time, and other barriers preventing ADU production. Program 4.5, Accessory Dwelling Units, includes the City's plan to incentivize ADU production per AB 671 (see Chapter V, Housing Plan).

As defined in Section 18.04.163 of the Municipal Code, an accessory dwelling unit is an independent residential unit providing living, sleeping, eating, cooking, and sanitation facilities on the same parcel of land as a single-family dwelling or multifamily dwelling. A junior ADU is defined as a unit that is no more than 500 square feet and contained entirely within a single-family dwelling, not including an attached garage or other attached accessory structure.

ADUs include efficiency units and manufacturing homes as defined in Sections 17958.1 and 18007 of the Health and Safety Code, provided that such units shall be subject to all development standards applicable to ADUs. ADUs are subject to the following key standards:

1. Maximum floor area of 850 square feet for a studio or one bedroom or 1,000 square feet for a unit that contains more than one bedroom;
2. Minimum size is 150 square feet;
3. Must be located behind the front yard setback unless the ADU is being constructed in the exact location and to the same dimensions as a previously existing approved accessory structure, including an attached or detached garage;
4. No higher than the primary residence or exceeding 25 feet;
5. One parking space required per ADU but none for an ADU created in an existing living space (no parking is required if within ½ a mile walking distance of a public transit stop);
6. Setbacks must comply with respective zone, but side and rear setbacks are not required to be greater than 4 feet;
7. Utility installations should be place underground;
8. Design should be consistent in architectural style, materials, colors, and appearances with the existing or proposed dwelling and the quality of the materials shall be the same or exceed that of the primary residence
9. Requires a separate entrance from the primary residence;
10. Windows will maintain privacy between the ADU, primary residence, and neighbors;
11. If new or separate utility connection between the accessory dwelling unit and the utility, a connection charge that is proportionate to the burden of the proposed ADU based on the size or number of plumbing fixtures.

To facilitate ADU development, the City will explore increasing the maximum unit size to 1,200 square feet for units with more than one bedroom.

3. Mobile Homes/Manufactured Housing

According to the 2015-2019 ACS, there are 971 mobile homes in the City, representing 4.5 percent of the housing stock. Individual mobile homes and manufactured housing are permitted in all residential zones and conditionally permitted in the C-R zone. Mobile home parks are conditionally permitted in the R-3 and R-4 zones. Individual mobile homes

and manufactured housing are subject to all of the property development standards required by the Zoning Ordinance.

4. Transitional and Supportive Housing

Gardena Municipal Code Section 18.04.472 defines transitional housing as "buildings configured as rental housing developments, but operated under program requirements that call for the termination of assistance and recirculation of the assisted unit to another eligible program recipient at some predetermined future point in time, which shall be no less than six months." Per Municipal Code Section 18.04.454, supportive housing is "housing with no limit on length of stay that is occupied by the target population as defined in Health and Safety Code Section 50675.14 and that is linked to on-site or off-site services that assist the supportive housing resident in retaining the housing, improving his or her health status, and maximizing his or her ability to live and, when possible, work in the community." Transitional and supportive housing is permitted in all residential zones and pursuant to a site plan review approval in the C-R zone. The Municipal Code was amended during the 5th cycle Housing Element planning period to permit transitional and supportive housing in the MUO zone.

In processing development applications, transitional and supportive housing are subject to the same development standards as any permitted residential use under these zones. The City will continue to comply with State law and allow transitional and supportive housing as a normal residential use with no added restrictions.

Additionally, the Municipal Code also includes lodging houses as an additional housing option that could potentially serve the needs of persons in need of transitional or supportive housing. A "lodging house" is defined as "a building with at least three guest rooms where, for compensation, lodging is provided with or without meals." The definition of lodging house includes "recovery houses or other similar facilities providing group living arrangements for persons recovering from alcoholism or drug addiction where the facility provides no care or supervision, unless such persons are functioning as a family." Lodging houses are permitted only in the R-2, R-3, and R-4 zones, subject to a CUP.

However, additional amendments to the City's Zoning Code are required to address AB 2162, which streamlines affordable housing developments that include 100 percent affordable developments that include a percentage of supportive housing units, either 25 percent or 12 units whichever is greater, on sites that are zoned for residential use. Such supportive housing, if located within ½ mile from transit, is not subject to minimum parking requirements.

5. Residential Group Facilities

A Residential Group Facility is any type of residential facility, which, by State law, is required to be treated as a residential use of property when serving six or fewer persons. These facilities are allowed by right in the R-1, R-2, R-3, and R-4 zones.

6. Community Care Facilities

Community Care Facilities are defined in Section 18.04.125 of the Gardena Municipal Code as a "nonmedical residential care, day treatment, adult day care, of foster family

agency services for children, adults or children and adults, including but not limited to, the physically handicapped, mentally disordered, or incompetent persons, and abused or neglected children and includes those facilities and programs described in Health & Safety Code section 1502 et seq. as the same may be amended from time to time". These facilities are permitted with a CUP in the C-2, C-3, C-4 and C-P zones, provided they serve at least seven persons.

7. Group Care Facilities

Group care facilities are 24-hour residential facilities authorized, certified, or licensed by the State to provide medical or nonmedical care for seven or more individuals such as children, the elderly, mentally disordered person, developmentally disabled persons, or others handicapped persons. Group care facilities are allowed in the R-2, R-3, R-4, C-2, C-3, C-4, and C-P zones with a CUP.

In determining the issuance or denial for a CUP, the City must consider factors such as land use compatibility, distance from uses such as schools and parks, concentration of similar uses, and input from surrounding residents. This Housing Element includes a program to review the various provisions for Lodging Houses, Residential Group Facilities, Community Care Facilities, and Group Care Facilities in order to clarify definitions and to establish objective standards in order to ensure certainty in outcomes.

8. Single Room Occupancy (SRO)

Typically, SRO units typically consist of a single room housing of one or two people, with minimal amenities and shared kitchen facilities and are often created by converting former hotels. The Municipal Code permits SROs in the M-1 and M-2 zones with a CUP.

9. Emergency Shelters

Emergency shelters are permitted in the M-1 and M-2 zones without a CUP or other discretionary permit. As required by State law, the identified zones (M-1 and M-2) must have sufficient capacity to accommodate the emergency shelter, and at a minimum provide capacity for at least one year-round shelter. Emergency shelters are subject to the following design requirements according to Section 18.36.020 of the Municipal Code:

- The maximum number of beds or clients permitted to be served nightly shall not exceed one per 125 square feet of floor area;
- Parking is required at the rate of one space for every two rooms, plus one space per six rooms for employee parking with a minimum of three employee spaces. AB 139 requires that parking for emergency shelters be based on staffing level only. Therefore, the City intends to amend its Zoning Code to comply with State law requirements;
- The waiting and client intake area shall be a minimum of one hundred square feet of gross floor area, plus an additional ten square feet for every person which the shelter can serve over ten;
- Emergency shelters shall not be located within three hundred feet of each other.

According to LAHSA, there were 79 people experiencing homelessness in Gardena in 2020 (see Chapter II, Section F.6). Although the M-1 and M-2 zones are extensively developed with commercial and industrial uses, there are sufficient vacant, underutilized, and blighted properties within these zones to facilitate the development of a new structure or conversion of an existing structure to accommodate 79 homeless individuals. The City's General Plan Land Use Map in Figure IV-1 shows the industrial areas in Gardena. Sample sites appropriate for emergency shelters are included in Figure IV-2.

The M-1 and M-2 zones offer the benefit of enhanced access to transit bus service, as Metro lines 124, 125 and 209, Gardena Municipal Bus lines 2 and 4, and Torrance Transit line 2 all pass through or near the zones. Additionally, the M-1 and M-2 zones afford a greater degree of compatibility with surrounding uses compared to the residential and commercial zones. The City could, depending on the level of funds available, acquire and assemble property or assist in gap-financing for non-profit organizations in the rehabilitation of existing structures for an emergency shelter.

10. Low Barrier Navigation Centers

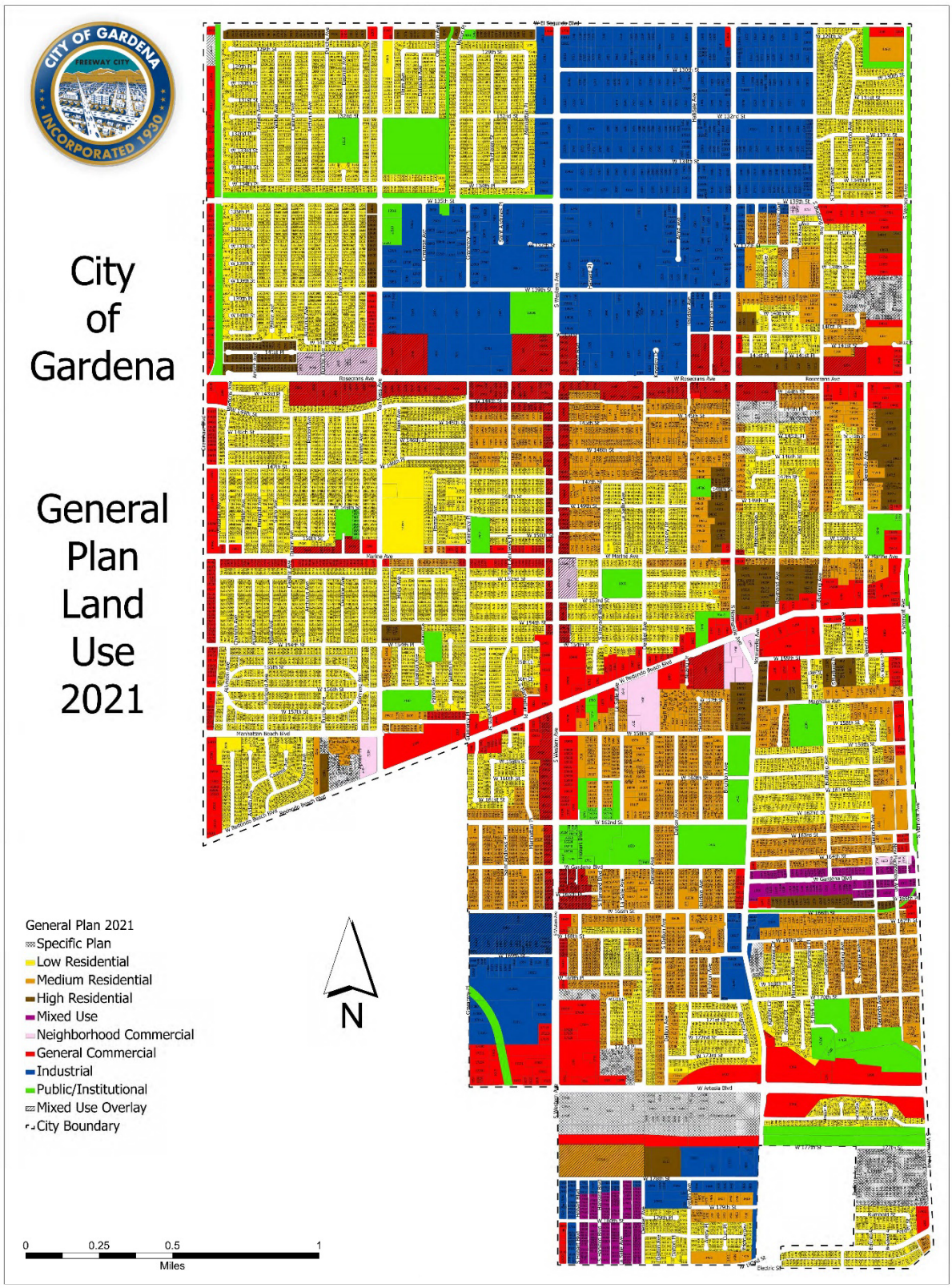
Ordinance No. 1821 was adopted in 2021 and amended the Zoning Code to include Low Barrier Navigation Centers as allowed in the MUO and C-R zones. Low Barrier Navigation Centers are defined as a Housing First, low-barrier, service-enriched shelter focused on moving people into permanent housing that provides temporary living facilities while case managers connect individuals experiencing homelessness to income, public benefits, health services, shelter, and housing.

11. Farmworker and Employee Housing

The City does not have any active farming activities and does not have an agricultural zoning district or district that allows commercial farming. The City is not required to address farmworker housing in its Zoning Code.

The Employee Housing Act (Health and Safety Code Section 17021.5) specifies that any employee housing providing accommodations for six or fewer employees shall be deemed a single-family structure with a residential land use designation. The City will amend the Zoning Code to address employee housing.

Figure IV-1: 2021 General Plan Land Use Policy Map



Source: Gardena General Plan Land Use Plan, revised April 2021.

Figure IV-2: Potential Emergency Shelter Sites in M-1

Site A: Blighted residential parcel on 130th Street between Western Avenue and Halldale Avenue (0.9 acres).

Site B: Vacant parcels on130th Street between Western Avenue and Halldale Avenue (0.9 acres).

Site C: Vacant parcel on the southwest corner of 139th Street and Normandie Avenue (0.3 acres).

F. Financial Resources

There are a variety of potential funding sources available for housing activities in the City. In many cases, a variety of funding sources must be used to complete a project, due to the high costs of development and limitations on the uses of the funds. Gardena previously utilized State HOME funds and CalHome funds to undertake housing rehabilitation programs; however, the City's HOME and CalHome agreements expired at the end of FY 2016-2017 and the City will have to apply for these competitive grants in the future. The City's primary funding source is the Community Development Block Grant Program, described below.

1. Community Development Block Grant (CDBG) Funds

Through the CDBG program, HUD provides funds to local governments to fund a wide range of community development activities for low-income persons. The CDBG program provides formula funding to larger cities and counties, while cities with less than 50,000 population generally compete for funds that are allocated by the County. Gardena's population size enables the City to receive its own allocation of CDBG funds directly from HUD, and in Fiscal Year 2021, the City of Gardena received $637,637.

The CDBG program is flexible in that the funds can be used for a range of activities. The City uses approximately 78 percent of its allocation for fair housing services, public services for low income residents, affordable housing preservation, and homelessness prevention.

2. Low Income Housing Tax Credits (LIHTC)

Created by the 1986 Tax Reform Act, the LIHTC program has been used to encourage the construction and rehabilitation of rental housing for lower-income households. The program allows investors an annual tax credit over a ten-year period, provided that the housing meets the low-income occupancy requirements: a minimum of 20 percent of the units must be affordable to households at 50 percent of area median income (AMI), or 40 percent affordable to those at 60 percent of AMI. The tax credit is typically sold to large investors at a syndication value.

3. SB2, LEAP, and PLHA Grant Funds

In 2017, Governor Brown signed a $15 billion housing package aimed at addressing the State's housing shortage and high housing costs. Specifically, it included the Building Homes and Jobs Act (SB 2, 2017), which establishes a $75 recording fee on real estate documents to be used towards increasing the supply of affordable homes in California. Because the number of real estate transactions recorded in each county vary from year to year, the revenues collected fluctuate. The first year the State administered Planning Grants knowns as SB2 Grants, and the following year a second planning grant program, Local Early Action Planning, or LEAP grants, was made available to cities. Gardena applied for and obtained founding for both of these grant opportunities.

SB 2 Grant

The City of Gardena applied for $310,000 in SB2 grant funding for the following:

- Update the Housing Element
- Update the Zoning Ordinance
- General Plan consistency between Housing Element and other elements
- Local process improvements that eliminate the need for project-specific discretionary review

LEAP Grant

The City of Gardena applied for $300,000 in LEAP grant funding for the following:

- Rezoning by updating planning documents and zoning ordinance
- Eliminate the need for project-specific environmental review
- Revamping planning review process to expedite housing production
- Improve ADU ordinance and review process
- Upzoning to intensify land use patterns in strategic locations
- Preparing and adopting Housing Element
- Other improvements that accelerate housing production

Permanent Local Housing Allocation (PLHA)

SB2 also created a block grant for affordable housing programs and activities. The City of Gardena is eligible to receive $329,877 from the FY 2019 allocation and $512,732 from the FY 2020 allocation.

G. Opportunities for Energy Conservation

1. Title 24 of the California Code of Regulations

State law requires all new construction to comply with “energy budget” standards that establish maximum allowable energy use from non-renewable sources (Title 24 of the California Code of Regulations). These requirements apply to such design components as structural insulation, air infiltration and leakage control, setback features on thermostats, water heating system insulation (tanks and pipes) and swimming pool covers if a pool is equipped with a fossil fuel or electric heater. State law also requires that a tentative map provide for future passive or natural heating or cooling opportunities in the subdivision, including designing the lot sizes and configurations so that structures are oriented to take advantage of a southern exposure, shade or prevailing breezes. The City amended the Municipal Code in 2020 in compliance with the 2019 California Building Standards Code, including the California Energy Code.

2. Title 24 – California Green Building Standards Code (“Cal Green”)

The State requires all local agencies to adopt the California Green Building Standards Code (CALGreen). CALGreen sets efficiency and sustainability standards for residential and non-residential buildings. The mandatory measures are minimum baselines that must be met in order for a building to be approved. These measures include, among other things, water efficiency, indoor air quality, and sustainable building materials. CALGreen also has two tiers of voluntary standards that local jurisdictions can adopt as they deem appropriate. Gardena amended the Municipal Code in June 2020 in compliance with the 2019 CALGreen standards. The City also amended the Municipal Code to increase the electric vehicle parking space requirements for new multi-family housing from 10 percent to 25 percent.

Currently the City’s Building Division, through its review process, ensures that energy conservation features of Title 24 are incorporated into the design of residential developments. The City will incorporate already established programs and projects that encourage green development and energy conservation. The City will also continue to promote the Owner-Occupied Housing Rehabilitation Loan Program, which currently incorporates energy efficient (“Energy STAR”) appliances, water heaters and heating and air systems in its housing rehabilitation standards.

3. Brownfield Program

The City of Gardena, in partnership with the U.S. Environmental Protection Agency (EPA), has participated in the Brownfield Program since 2000. The Brownfield Program promotes cleaning up environmentally contaminated sites and spurs site developments ranging from housing to commercial and retail developments. As part of the Brownfield Program, all projects are encouraged to incorporate energy conservation design measures.

V. Housing Plan

Sections II through IV established the housing needs, opportunities, and constraints present within the City. The Housing Plan presented in this section sets forth the quantified housing goals, policies, and programs to address the identified housing needs.

A. Goals and Policies

The goals and policies set forth in this Housing Element address five major issue areas: 1) maintain and preserve the housing stock and the neighborhoods; 2) provide a variety of housing types; 3) minimize the impact of governmental constraints on housing construction; 4) provide adequate sites for the development of new hosing; and 5) affirmatively further fair housing for all residents. Each issue area is discussed in greater detail below.

1. Maintenance and Preservation

GOAL 1.0: Maintain and enhance the stability of the City's housing stock and residential neighborhoods.

Policy 1.1: Encourage the upkeep, maintenance, and rehabilitation of existing housing units.

Policy 1.2: Continue to explore programs and funding sources designed to maintain and improve the existing housing stock.

Policy 1.3: Preserve the affordability of assisted rental projects located in the City.

Policy 1.4: Encourage room additions in the existing housing stock to alleviate overcrowding.

2. Provide for a Variety of Housing Options

GOAL 2.0: Provide opportunity for increasing the supply of affordable housing within the City with special emphasis on housing for special needs groups.

Policy 2.1: Pursue funding to support the development of housing for lower- and moderate-income households (including extremely low-income) and households with special needs, such as seniors, persons with disabilities (including persons with developmental disabilities), and large households.

Policy 2.2: Provide incentives for new housing construction, to encourage the production of affordable units. Encourage provision of units of various sizes to accommodate the diverse needs of the community, including seniors, students and young workers, and large households.

Policy 2.3: Pursue strategies that expand homeownership opportunities for lower income and moderate income households.

Policy 2.4: Participate in or provide rental assistance programs to lower income households.

Policy 2.5: Discourage the conversion of affordable rental units to condominium ownership.

Policy 2.6: Cooperate with neighboring cities to identify resources for sheltering homeless persons.

3. Removal of Constraints

GOAL 3.0: Minimize the impact of governmental constraints on housing construction and cost.

Policy 3.1: Periodically review development standards and project review/approval procedures to remove or mitigate constraints to residential development.

Policy 3.2: Encourage the utilization of innovative construction and design techniques to reduce housing costs.

Policy 3.3: Encourage the use of specific plans, overlays, and other mechanisms to allow flexibility in housing developments.

4. Provide Adequate Sites for Residential Development

GOAL 4.0: Provide adequate residential sites through appropriate land use and zoning to accommodate the City's share of regional housing needs.

Policy 4.1: Implement land use policies that allow for a range of residential densities.

Policy 4.2: Maintain an inventory of sites and assist residential developers in identifying land suitable for housing development.

Policy 4.3: Encourage residential development within the new Housing Overlay.

Policy 4.4: Encourage development at maximum attainable densities and encourage use of density bonuses for inclusion of affordable units.

Policy 4.5: Ensure the production of affordable units throughout the community to avoid over concentration in specific neighborhoods.

Policy 4.6: Facilitate the development of mixed income projects.

5. Affirmatively Further Fair Housing

GOAL 5.0: Promote equal opportunity for all residents to reside in the housing of their choice.

Policy 5.1: Enforce the fair housing laws prohibiting arbitrary discrimination in the building, financing, selling, or renting of housing on the basis of classes protected by State and Federal fair housing laws.

Policy 5.2: Provide a range of housing options, locational choices, and price points to accommodate the diverse needs in Gardena and to allow for housing mobility.

Policy 5.3: Target and prioritize resources to implement neighborhood improvements to bridge disparities in access to opportunities among the city's various neighborhoods.

Policy 5.4: Pursue actions to reduce or mitigate the displacement of existing tenants.

Policy 5.5: Ensure each City commission with the responsibility of advising or making decisions related to housing has at least one member from Northern Gardena.

B. Housing Programs

The goals and policies contained in the Housing Element address the identified needs from the Needs Assessment and are implemented by a series of programs offered through City departments. The housing programs define the specific actions the City will undertake to achieve specific goals and policies. The housing plan for addressing unmet needs, removing constraints, and achieving quantitative objectives described in this section are organized around the same five issue areas described in the previous section. The housing programs discussed here include existing programs as well as new programs added to address unmet housing needs.

1. Maintenance and Preservation of the Housing Stock

Preserving the existing housing stock, including maintaining the affordability of assisted rental units, is an important goal for the City. Through neighborhood and home improvement programs, the City maintains the condition of existing housing units.

1.1 Housing Rehabilitation Programs

With limited funding, the City offers two housing rehabilitation programs for lower income homeowners:

- **Handy-Worker Fix Up:** Through the CDBG-funded Handy-Worker Fix Up program, the City provides a free labor crew with up to $600 in materials for activities including health and safety compliance, energy conservation, handicapped access, door and window replacement, smoke alarms, plumbing, heating and electrical.
- **Residential Rebate Program:** Through the CDBG funded Light Housing Rehabilitation program, the City provides rebates of 50 percent to a maximum of $3,000 for repairs such as plumbing, and heating.

Responsible Agencies: City Manager's Office

Funding Sources: CDBG

Program Objectives:

- Handy-Worker Fix Up – 25 households annually for a total of 200 households over eight years.
- Residential Rebate – 3 households annually for a total of 24 households over eight years.

- Annually pursue funding available at the State HCD to reinstate residential rehabilitation programs.
- Increase program outreach in northern Gardena where there are concentrated disproportionate housing needs.

1.2 Preservation of At-Risk Units

Gardena currently has four assisted rental projects (Gardena Valley Towers, Gardena South Park Manor, Meadowlark Manor, and Spring Park Senior Villa) that are owned and operated by non-profit corporations. The long-term affordability of these projects is fairly secure because of their non-profit status and the risk of conversion is low. However, three of these projects (278 units) with Section 8 project-based assistance are subject to contract renewal and may be considered as at low risk of losing the Section 8 assistance.

Responsible Agencies: City Manager's Office

Funding Sources: HUD Section 8 funds

Program Objectives:

- Annually monitor the status of Gardena Valley Towers, Gardena South Park Manor, and Meadowlark Manor in their Section 8 contract renewal status.
- Should a notice of intent be filed by any project owner to opt out of affordable housing, the City will ensure the project owner follows State noticing requirements (three-year, one-year, and six-month) prior to conversion.
- In the unlikely event that the Section 8 contracts are not renewed by HUD, work with LACDA to assist the tenants in accessing other rental assistance such as the HCVs.
- Contact interested nonprofit housing providers with the capacity to acquire and manage the at-risk units.
- Support applications of current or potential project owners for state and federal funds to improve housing conditions or to enhance affordability.

2. Provision of a Variety of Housing Options

The City is committed to providing a variety of housing types to meet the needs of all residents. Through the development of senior housing units, the City has shown a commitment to meeting the needs of the lower income elderly population. In addition, through the use of homeownership programs, the City can increase homeownership opportunities for residents.

2.1 Senior Housing Development

The City places special emphasis on meeting the housing needs of the elderly. With the 2012 adoption of Ordinance 1737, the City facilitates priority processing of projects involving senior housing projects. Through this ordinance, the environmental review process may be started prior to the submission of complete application and materials, and an accelerated plan review process can occur if the applicant pays the cost of the

City hiring an outside consultant. The ordinance also reduced the parking requirements for senior and low income housing projects in the R-4 zone.

Responsible Agencies: Community Development

Funding Sources: None required

Program Objectives:

- By 2022, provide information about Ordinance 1737 on City website.
- Annually convene a developers workshop to explore affordable housing opportunities in the City, including housing for seniors, persons with disabilities, and large households. Specifically, explore affordable housing opportunities in northern Gardena where there are concentrated disproportionate housing needs.
- Support applications for federal and state funding for quality senior developments by providing the information on the City's website and making it available at the City's Community Development Department counter.

2.2 Affordable Housing Development

With limited funding, the City will rely on the following actions to encourage affordable housing production during the planning period:

- **Collaborate with Affordable Housing Developers:** Affordable housing developers work to develop, conserve and promote rental and ownership affordable housing. The City will convene a housing developers workshop to explore opportunities for affordable housing development (including for extremely low income households and households with special needs).
- **Provide Financial Assistance:** The City will waive Quimby fee and the Residential Impact Fee of $1,000 per unit for affordable housing.
- **Provide Letters of Support for Funding Applications:** The City will support developers' application of funding (such as Low Income Housing Tax Credit or State HOME funds) for affordable housing.
- **Prioritize Review for Affordable Housing:** The City will prioritize the review of housing projects with an affordable housing component exceeding 20 percent of total units.

Responsible Agencies: City Manager's Office; Community Development

Funding Sources: General Funds

Program Objectives:

- Conduct annual developers outreach and consultation. Specifically, explore affordable housing opportunities in northern Gardena where there are concentrated disproportionate housing needs.
- Annually pursue affordable housing funds available at State HCD for new construction and acquisition/rehabilitation of affordable housing.

- Achieve the development of 200 affordable housing units over eight years, with an emphasis on addressing affordable housing needs of special populations.

2.3 Homeownership Opportunities

The City will pursue affordable ownership housing opportunities for lower and moderate income households. Specifically, the City will provide information on homebuyer assistance programs available to Gardena residents:

- **Mortgage Credit Certificate (MCC)** – Administered by LACDA, the MCC program offers qualified first-time homebuyers a Federal income tax credit. The credit can reduce potential Federal income tax liability, creating additional net spendable income for qualified first-time homebuyers to possibly use toward their monthly mortgage payment. This MCC Program enables qualified first-time homebuyers to convert a portion of their annual mortgage interest into a direct dollar-for-dollar tax credit on their U.S. individual income tax returns.
- **California Housing Finance Agency (CalHFA) Loan Programs** – Gardena residents can access homebuyer assistance programs available from CalHFA. These include first mortgage programs and down payment assistance programs.

Responsible Agencies: City Manager's Office

Funding Sources: None required

Program Objectives:

- By 2022, provide links to LACDA and CalHFA homebuyer assistance programs on City website. Increase program outreach in northern Gardena where there are concentrated disproportionate housing needs.
- By 2023 and at least every other year, pursue funding available at HCD to provide a local homebuyer assistance program that is tailored for the local housing market.

2.4 Inclusionary Housing

Without redevelopment funding, inclusionary housing may be an effective tool to creating affordable housing opportunities in the community. The City will explore the feasibility of an inclusionary housing program to expand affordable housing opportunities in the City.

Responsible Agencies: Community Development

Funding Sources: General funds/departmental budget

Program Objectives:

- By the end of 2022, conduct a feasibility study for inclusionary housing and if feasible and appropriate, adopt an inclusionary housing program within one year.

2.5 Housing Choice Vouchers (HCV)

The Housing Choice Voucher (Section 8 Rental Assistance) program assists extremely low- and very low-income households in paying their monthly rent. Under the program,

the tenant contributes 30 percent of their monthly income toward rent, while the HCV program will pay for the remainder. The LACDA currently administers rental assistance on behalf of the City, and provides assistance to approximately 700 Gardena households. This program represents the most significant program in terms of impact (number and depth of subsidies) for addressing the housing needs of extremely low income households.

Responsible Agencies: LACDA; City Manager's Office

Funding Sources: HUD Section 8 funds

Program Objectives:

- By 2022, provide information on the HCV program on City website, and update information semi-annually.
- Work with LACDA to promote acceptance of HCVs through outreach and education to renters, and rental property owners, and managers. Specifically, California legislature passed SB 329, which redefines source of income as "lawful, verifiable income paid directly to a tenant or to a representative of a tenant, or paid to a housing owner or landlord on behalf of a tenant, including federal, state or local public assistance, and federal, state, or local housing subsidies, including, but not limited to, federal housing assistance vouchers issues under Section 8 of the United States Housing Act of 1937." SB 222 passed in 2019 also extends the same protection to VASH (Veterans Affairs Supportive Housing) voucher recipients.

2.6 Homeless Assistance

The City participates in the County's Continuum of Care to assist homeless persons to transition towards self-sufficiency. Through the Emergency Services Program the City offers emergency and supportive services to individuals and families at risk of becoming homeless.

Responsible Agencies: City Manager's Office

Funding Sources: CDBG

Program Objectives:

- Assist 350 persons at risk of becoming homeless annually.

3. Removal of Constraints

The City is committed to removing governmental constraints that hinder the production and improvement of housing, especially for affordable housing and housing for special needs populations.

3.1 Zoning Code Amendments

Zoning Code amendments are needed to address various recent changes to State law or to facilitate housing production:

- **Emergency and Transitional Housing (AB 139):** Local governments may include parking requirements for emergency shelters specifying that adequate

parking must be provided for shelter staff only, but overall parking requirements for shelters may not exceed the requirements for residential and commercial uses in the same zone.

- **Emergency Shelter Distance Requirement:** Revise the distance requirement between two shelters to a maximum of 300 feet.
- **Supportive Housing (AB 2162):** AB 2162 requires supportive housing projects of 50 units or fewer to be permitted by right in zones where multi-family and mixed-use developments are permitted, when the development meets certain conditions. The bill also prohibits minimum parking requirements for supportive housing within ½ mile of a public transit stop.
- **Employee Housing:** State Employee Housing Act (Health and Safety Code Section 17021.5) specifies that any employee housing providing accommodations for six or fewer employees shall be deemed a single-family structure with a residential land use designation.
- **Minimum Unit Sizes:** Eliminate the minimum unit sizes in the MUO (Mixed Use Overlay) zone.
- **Group Homes for Seven or More Persons:** Currently, the City regulates group housing for seven or more persons under different provisions (lodge houses, group care facilities, and community care facilities). The City will review the various provisions and conditions for approval and revise the Zoning Code to ensure objective standards are in place to provide certainty of outcomes.
- **Reasonable Accomodation Ordinance:** Adopt an official reasonable accommodation ordinance to address flexibility in zoning and development standards to accommodate the special needs of persons with disabilities. (Completed in May 2022)

Responsible Agencies: Community Development

Funding Sources: None required

Program Objectives:

- By the end of 2022, amend the Zoning Code to address affordable and special needs housing as outlined in this program.

3.2 Development Review Procedures

To facilitate residential development and to comply with State law, the City will address the following:

- **Affordable Housing Streamlined Approval (SB 35)**: Establish a streamlined, ministerial review process for qualifying multi-family residential projects.
- **Objective Design Standards (SB 330):** Develop objective design standards that will provide a preliminary application process for residential development.

Responsible Agencies: Community Development

Funding Sources: Departmental budget

Program Objectives:

- By the end of 2022, develop procedures to address the streamlining requirements of SB 35 and objective design requirements of SB 330.

4. Provision of Adequate Sites

Meeting the housing needs of all residents of the community requires the provision of adequate sites for all types of housing.

4.1 Adequate Sites for RHNA with By-Right Approval of Projects with 20 Percent Affordable Units and Replacement Requirement

The City of Gardena has been assigned a RHNA of 5,735 units. Accounting for ADUs and pipeline projects, the City has a remaining RHNA of 4,889 units:

- 1,449 very low income units
- 686 low income units
- 884 moderate income units
- 1,870 above moderate income units

The City must identify adequate sites with appropriate density and development standards to accommodate this RHNA. Without adjustments to the City's land use policy and zoning standards, the City would not be able to fully accommodate the remaining RHNA. As part of this Housing Element update, the City has identified candidate sites to be designated with a Housing Overlay as shown in Table V-1. Detailed information on the candidate sites is provided in Appendix C.

Table V-1: Summary of Candidate Housing Overlay Sites

Housing Overlay	Density Assumption	# of Sites	Total Acres	Total Units
O3 (0-17 du/ac)	17 du/ac	66	17.0	300
O4 (20-30 du/ac)	23 du/ac	95	44.2	1,004
O5 (31-50 du/ac)	30 du/ac	181	62.3	1,877
O6 (51-70 du/ac)	50 du/ac	126	68.2	3,405
Total		468	191.8	6,586

To ensure that the City monitors its compliance with SB 166 (No Net Loss), the City will develop and implement a formal ongoing (project-by-project) evaluation procedure pursuant to Government Code Section 65863. Should an approval of development result in a reduction of capacity below the residential capacity needed to accommodate the remaining need for lower income households, the City will identify and if necessary rezone sufficient sites to accommodate the shortfall and ensure "no net loss" in capacity to accommodate the RHNA.

Only one parcel in the sites inventory includes existing residential use (one single-family home). Nevertheless, the City will establish procedures to comply with the housing

requirements pursuant to AB 1397. Residential development on sites with existing housing units deed restricted for or occupied by lower income households are required to provide one-to-one replacement, consistent with the Density Bonus Law.

Responsible Agencies: Community Development

Funding Sources: General funds

Program Objectives:

- By October 15, 2023, amend the Zoning Code to establish the Housing Overlay to designate adequate candidate sites with the objective of meeting the City's remaining RHNA of 5,047 units. For sites to accommodate the remaining lower-income RHNA of 2,144 units, the Housing Overlay must meet the requirements of Government Code 65583.2. Among other things, the sites must have a density of at least 30 units per acre, be large enough to permit at least 16 units, and be zoned to allow housing by right with at least 20 percent of the units affordable to lower-income households. Furthermore, amend the Zoning Code to require replacement of units that are either deed restricted or occupied by lower income households pursuant to AB 1397.
- Pursuant to SB 330, establish development standards to implement Housing Overlay zones (including parking, setbacks, height, etc.) and ensure standards are appropriate to facilitate the development of housing at the allowable densities.
- Provide the inventory of sites on the City's website and update the inventory at least semi-annually.
- Promote lot consolidation (Program 4.3) and housing construction, particularly affordable housing (see also Program 2.2) by facilitating communications between interested property owners and potential developers.
- Conduct developer workshops at least every other year to solicit development interests and understand market trends. Adjust development incentives as necessary.

4.2 Adequate Sites Monitoring (SB 166 – No Net Loss)

To ensure that the net future housing capacity is maintained to accommodate the City's RHNA figures, the City will continue to maintain an inventory of adequate housing sites for each income category. This inventory details the amount, type, size and location of vacant land, recyclable properties and parcels that are candidates for consolidation to assist developers in identifying land suitable for residential development. In addition, the City will continuously and at least annually monitor the sites inventory and the number of net units constructed in each income category. If the inventory indicates a shortage of adequate sites to accommodate the remaining regional housing need, the City will identify alternative sites so that there is no net loss of residential capacity pursuant to Government Code Section 65863.

To facilitate annual evaluation, the City will implement a formal ongoing project-by-project procedure pursuant to Government Code Section 65863 which will evaluate identified capacity in the sites inventory relative to projects or other actions potentially reducing

density and identity additional sites as necessary. This procedure and annual evaluation will address non-residentially or mixed use zoned land to determine whether these sites are being developed for uses other than residential. If a shortfall in sites capacity occurs, the City will identify replacement sites within six months.

Responsible Agencies: Community Development

Funding Sources: General funds

Program Objectives:

- By the end of 2022, develop a formal ongoing procedure to evaluate identified capacity and identify additional sites as necessary
- Continue to perform project-by-project evaluation to determine if adequate capacity remains for the remaining RHNA.

4.3 Lot Consolidation

Consolidation of small lots allows a development to utilize the land more efficiently, achieve economies of scale, and offer opportunity for improved site design and amenities. The City encourages the consolidation of small lots to facilitate the development of mixed-use and multi-family developments, particularly for affordable housing by:

- Maintaining an inventory of sites on the City's website.
- Assisting developers in identification of parcels with lot consolidation potential.
- Continuing to utilize a ministerial process for lot consolidation unless other discretionary reviews are required as part of the project.
- Considering incentives to facilitate lot consolidation, which may include reduced or waived fees, expedited processes, graduated density based on consolidated lot size, flexibility in parking standards and requirements, or other feasible options.

Responsible Agencies: Community Development

Funding Sources: None required

Program Objectives:

- Develop incentives for lot consolidation by October 15, 2023, along with the establishment of the Housing Overlay.
- Beginning in 2024, market lot consolidation incentives to property owners, interested developers, and real estate brokers.

4.4 Religious Facility and Institutional Use Housing Overlay

State law encourages the development of affordable housing in partnership with religious facilities by providing parking relief and density bonus for affordable housing on sites occupied by religious facilities. This development trend gained popularity in recent years and many communities in the State are exploring expanding this concept to other institutional uses. This is often achieved through an Overlay to permit residential uses on the excess parking areas on site or conversion of surplus building area into residential uses.

Responsible Agencies: Community Development

Funding Sources: General funds

Program Objectives:

- By 2023, explore the feasibility of establishing a Housing Overlay on religious and institutional uses.

4.5 Accessory Dwelling Units

ADUs are an important alternative option for affordable housing. To facilitate ADU development, the City will consider the following:

- Provide technical and resources guides online and pre-approved plans.
- Replace the requirement for architectural consistency with the main residential unit with architectural compatibility.
- Allow ADUs up to 1,200 square feet via discretionary review.
- Pursue State funding available to assist lower- and moderate-income homeowners in the construction of ADUs.
- Conduct increased outreach and education on ADU options and requirements.

However, the City does not rely on ADUs to fulfill its RHNA obligations. The projected 160 ADUs represents less than three percent of the City's RHNA.

Responsible Agencies: Community Development

Funding Sources: General funds

Program Objectives:

- By the end of 2022, update City website to provide resources for ADU construction, including links to the California Housing Finance Agency (CalHFA) program that provides $25,000 grant to homeowners for ADU construction.
- Develop incentives for ADUs by the end of 2023. Incentives may include preapproved plans, expedited review, reduced/deferred fees, and/or technical assistance.
- Achieve 160 ADUs over eight years. By 2025, assess the City's progress in ADU construction and if the City is not meeting its construction goal, adjust the incentives as appropriate. If ADU production is lower than anticipated and remaining residential sites capacity is not able to compensate for the shortfall, amend the zoning within six months to identify additional capacity (see also Program 4.2).

5. Affirmatively Furthering Fair Housing

In order to fully meet the community's housing needs, the City must assure that housing is accessible to all residents, regardless of their special characteristics (as protected by State and Federal fair housing laws). The City will implement meaningful actions to affirmatively further fair housing.

5.1 Fair Housing Outreach and Enforcement

The City contracts with the Fair Housing Foundation, a non-profit educational foundation, to provide housing information and assistance to the public. Services include housing discrimination response, landlord-tenant relations, and housing information counseling. The City provides information on the Fair Housing Program on the City website, as well as informational material in both English and Spanish at the Community Center and City Hall. Section 14.04.280 of the Municipal Code also sets forth penalties for landlords who fail to provide the Rent Mediation and Arbitration Procedures Booklet, which provides information on renter's rights, to tenants.

Responsible Agencies: City Manager's Office; Fair Housing Foundation

Funding Sources: CDBG

Program Objectives:

- Conduct annual fair housing outreach and education workshops targeted for Gardena residents and property owners.
- By 2022, make available multi-lingual fair housing materials at various media platforms and at public counters and community locations. Fair housing materials will include the new Source of Income Protection under State law (SB 329 and SB 222), which prohibits landlords from rejecting applicants due to the use of public assistance (such as Section 8 Housing Choice Vouchers) for rent payments (see also Program 2.5).
- Conduct fair housing testing at least bi-annually, tailoring testing to emerging trends and changing socioeconomic profile of residents.

5.2 Expand Housing Opportunities

To diversify the City's housing choices, the City must expand opportunities for housing throughout the City.

Responsible Agencies: Community Development

Funding Sources: None required

Program Objectives:

- By October 2023, establish the Housing Overlay to increase housing opportunities throughout the City (Program 4.1).
- By the end of 2023, amend Zoning Code to facilitate the development of a variety of housing types (Program 3.1).

5.3 Place-Based Strategy for Neighborhood Improvements

The Northern Gardena neighborhoods are comprised of older housing stock and with concentrated issues such as overcrowding and cost burden. The City's RHNA strategy includes introducing new housing opportunities in order to ease overcrowding and displacement pressure. Northern Gardena areas, while representing optimal locations for new housing due to the declining existing uses and high demand for housing, require increased neighborhood services and amenities to serve the existing and new residents.

To facilitate residential development in these areas and to ensure quality of life improvements, the City will pursue neighborhood-focused strategies.

Responsible Agencies: City Manager's Office; Community Development

Funding Sources: General funds

Program Objectives:

- Code Enforcement: Beginning in 2023, the City will undertake focused outreach to Northern Gardena to conduct code enforcement services in response to complaints. The idea is to encourage residents (particularly tenants) to report substandard housing conditions.
- Increased Fair Housing Outreach: Beginning in mid-2023, the City will engage its fair housing service provider (currently the Fair Housing Foundation) to conduct increased fair housing/landlord counseling in Northern Gardena. Specifically, pop-up events will be conducted in Rowley Park.
- Incentives for Affordable Housing: By October 2022 as part of the rezoning to create the Housing Overlay, the City will develop incentives to encourage affordable housing in Northern Gardena. Incentives may include priority for project review and financial assistance as funding permits.
- Micro Transit: The City is working to expand its micro transit service, which is–paired with paratransit service to provide "mini Uber" services for all residents. By 2023, the City will create new stops (with high ridership) to better connect residents with services and community amenities. Rowley Park can be included as a new stop for this service.
- Neighborhood Representation: As part of this Housing Element update, the City will adopt a policy to ensure each city commission that has influence on housing related policies to have at least one representative from Northern Gardena.
- Neighborhood Amenities: By the end of 2022, create a marketing brochure to promote Northern Gardena and its changing demographics to entice needed services such as supermarkets.
- Coordinated Neighborhood Improvements: By the end of 2022, expand police meetings in each of the City's three police districts to include representatives from other departments to provide better community access to City issues.
- Employment Services: Beginning in 2022, host an annual job fair at Rowley Park, or other appropriate location in the vicinity, with the South Bay Workforce Investment Board.
- Digital Divide: By end of 2023, bridge the digital divide by providing free wifi in Rowley Park to allow residents to have internet access which would allow students to complete homework assignments and provide ability to search and apply for jobs.

5.4 Rent Mediation Board – Anti-Displacement

The Gardena Rent Mediation Board provides rent mediation and arbitration to assist renters in disputes with landlords. The Rent Mediation Board assures that renters are not subject to excessive and unwarranted rent increases and substandard housing conditions. An annual survey is conducted to determine rental housing conditions. Also contained in the survey is the rental vacancy rate, which the board monitors and uses to restrict the number of apartments converting to condominiums if the vacancy becomes too low.

Responsible Agencies: City Manager's Office; Fair Housing Foundation

Funding Sources: CDBG

Program Objectives:

- Continue providing rent mediation and arbitration assistance to renters in disputes with landlords.
- Continue conducting the annual survey of rental housing units.

6. Summary of Quantified Objectives

According to Government Code Section 65583(b), local governments' housing elements are required to establish quantified objectives for the maximum number of housing units which can be constructed, rehabilitated, and conserved over the planning period. The objective for units to be conserved should include a subtotal for the number of at-risk units developed pursuant to Government Code Section 65583(a)(8)(A). Table V-2 presents the Housing Element's quantified housing objectives for the 2021-2029 planning period.

Table V-2: Quantified Objectives

Category	Extremely Low Income	Very Low Income	Low Income	Moderate Income	Above Moderate Income	Total
New Construction	743	742	761	894	2,595	5,735
Preservation	80	72	72	---	---	224
Conservation (Units at Risk)	70	70	140	---	---	280
Conservation (Code Enforcement)[1]	0	50	50	100	50	250

1. Income distribution is general estimate only since code enforcement activities do not track income level of owners. However, it is generally assumed that higher proportions of homeowners are moderate and above moderate income compared to other programs that are only eligible to lower income households.

7. Affirmatively Furthering Fair Housing (AFFH) - Action Matrix

The following table summarizes the City's implementation actions to further fair housing. Individual housing programs may have different impacts on furthering housing choices, but are not specifically categorized as fair housing programs. Fair housing actions are grouped into the five themes:

- Fair housing outreach and enforcement
- Housing mobility through expanded choices in housing types and locations
- New opportunities in high resource areas
- Place-based strategies for neighborhood improvements
- Tenant protection and anti-displacement

Housing programs are often implemented throughout the City. However, individual programs may have targeted locations for specific attention, increased outreach efforts, and/or priority for allocation of resources.

Table V-3: AFFH Action Matrix

Program	Specific Commitment	Timeline	Geographic Targeting	Eight-Year Metrics
Fair Housing Outreach and Enforcement				
5.1: Fair Housing Outreach and Enforcement	Conduct fair housing outreach and education workshops targeted for Gardena residents and property owners.	Annually	Northern Gardena	Outreach to 1,200 residents, landlords, and housing professionals
	Make available multi-lingual fair housing materials at various media platforms and at public counters and community locations	By the end of 2022	Not applicable	Not applicable
	Conduct fair housing testing.	Bi-annually	Not applicable	20 paired tests
Housing Mobility				
2.1: Senior Housing Development	Convene a developer workshop to explore affordable housing opportunities.	Annually	Northern Gardena	100 affordable housing units in Northern Gardena (50 senior housing units)
2.2: Affordable Housing Development	Conduct developer outreach and consultation	Annually	Northern Gardena	
2.5: Housing Choice Vouchers	Work with LACDA to promote acceptance of HCVs.	2021-2029	Not applicable	Increase voucher use in Gardena by 10 percent
Place-Based Strategy for Neighborhood Improvements				
1.1: Housing Rehabilitation Program	Increase program outreach where there are concentrated disproportionate housing needs.	Beginning 2023	Northern Gardena	40% of all rehabilitation goals
5.3: Place-Based Strategy for Neighborhood Improvements	Code Enforcement: Undertake focused outreach to conduct code enforcement services in response to complaints.	Beginning in 2023	Northern Gardena	Make 400 code compliant cases

Table V-3: AFFH Action Matrix

Program	Specific Commitment	Timeline	Geographic Targeting	Eight-Year Metrics
	Increased Fair Housing Outreach: Conduct increased fair housing/ landlord counseling.	Beginning in mid-2022	Northern Gardena	16 outreach events
	Incentives for Affordable Housing: Develop incentives to encourage affordable housing in Northern Gardena.	By October 2022	Northern Gardena	100 affordable housing units in Northern Gardena (50 senior housing units) – See Programs 2.1 and 2.2
	Micro Transit: Create new stops (with high ridership) to better connect residents with services and community amenities.	By 2023	Rowley Park	New micro transit stop
	Neighborhood Representation: Adopt a policy to ensure each city commission that has influence on housing related policies to have at least one representative from Northern Gardena.	By October 2022	Northern Gardena	All commissions with influence on housing issues have representatives from Northern Gardena
	Neighborhood Amenities: Create a marketing brochure to promote Northern Gardena and its changing demographics to entice needed services such as supermarkets.	By mid-2022	Northern Gardena	New neighborhood serving uses (groceries, banks, coffee houses, etc.)
	Coordinated Neighborhood Improvements: Expand police meetings in each of the City's three police districts to include representatives from other departments to provide better community access to City issues.	By mid-2022	Not applicable	24 neighborhood meetings with participation from multiple city departments

Table V-3: AFFH Action Matrix

Program	Specific Commitment	Timeline	Geographic Targeting	Eight-Year Metrics
	Employment Services: Beginning in 2022, host an annual job fair at Rowley Park, or other appropriate location in the vicinity, with the South Bay Workforce Investment Board.	Annually	Northern Gardena	Eight job fairs
	Digital Divide: Provide free wifi in Rowley Park to allow residents to have internet access which would allow students to complete homework assignments and provide ability to search and apply for jobs.	By end of 2023	Rowley Park	Wifi service installed
New Opportunity in High Resource Areas				
2.4: Inclusionary Housing	Conduct feasibility study for inclusionary housing and if feasible, adopt an inclusionary housing program.	By the end of 2022	Not applicable	Not applicable
4.1: Adequate Sites for RHNA	Amend the Zoning Code to establish the Housing Overlay to designate adequate candidate sites with the objective of meeting the City's remaining RHNA of 5,047 units.	By October 15, 2023	Rezone to create new housing opportunities in High Resource areas in Central and Southeast Gardena	Capacity for 1,014 new units in Northern Gardena
4.5: Accessory Dwelling Units	Facilitate development of ADUs	2021-2029	High Resource areas	25 percent of ADUs created in High Resource tracts
Tenant Protection and Anti-Displacement				
1.2: Preservation of At-Risk Units	Work to preserve all at-risk housing units	2021-2029	Not applicable	278 at-risk units
2.3: Homeownership Opportunities	Increase program outreach	2021-2029	Northern Gardena	Increase rate of homeownership in Northern Gardena

Table V-3: AFFH Action Matrix

Program	Specific Commitment	Timeline	Geographic Targeting	Eight-Year Metrics
5.4: Rent Mediation Board – Anti-Displacement	Provide rent mediation and arbitration assistance to renters in disputes with landlords.	Ongoing	Not applicable	Mediate all rent increase disputes

Appendix A: Acronym Index

Acronym	Meaning
ACS	American Community Survey
ADA	Americans with Disabilities Act
AMI	Area Median Income
BCRC	Brownfield Community Relations Committee
BMP	Best Management Practice
CALGreen	California Green Building Standards Code
CAPER	Consolidated Annual Performance and Evaluation Report
CARE	California Alternate Rates for Energy
CBC	California Building Standards Code
CDBG	Community Development Block Grant
CDD	Community Development Department
CEQA	California Environmental Quality Act
CHAS (HUD)	Comprehensive Housing Affordability Strategy
CUP	Conditional Use Permit
DOF	Department of Finance
EDD	California Employment Development Department
EMP	Energy Management Program
EPA	Federal Environmental Protection Agency
ESAP	Energy Savings Assistance Program
FERA	Family Electric Rate Assistance
FHA	Federal Housing Administration
HAMFI	HUD Area Median Family Income
HCD	State Department of Housing and Community Development
HOME	Home Investment Partnership Program
HUD	U. S. Department of Housing and Urban Development
LACDA	Los Angeles County Development Authority
LAHSA	Los Angeles Homeless Services Authority
LAUSD	Los Angeles Unified School District
LIHTC	Low Income Housing Tax Credit
LUST	Leaking Underground Storage Tank

Acronym	Meaning
NAHB	National Association of Home Builders
PC	Planning Commission
RHNA	Regional Housing Need Assessment
RTP/SCS	Regional Transportation Plan/Sustainable Communities Strategy
RWQCB	Regional Water Quality Control Board
SBCCOG	South Bay Cities Council of Governments
SCAG	Southern California Association of Governments
SRO	Single Room Occupancy

Zoning	
R-1	Single-Family Residential
R-2	Low Density Multiple-Family Residential
R-3	Medium Density Multiple-Family Residential
R-4	High Density Multiple-Family Residential
MUO	Mixed Use Overlay
C-R	Commercial Residential
P	Parking
O	Official
C-P	Business Professional Office
H-B	Home Business
C-2	Commercial
C-3	General Commercial
C-4	Heavy Commercial
M-1	Industrial
M-2	General Industrial

Appendix B: Community Meetings

Appendix C: Sites Inventory

The sites inventory, totaling 191.8 acres and 6,586 units, for the Housing Overlay is shown in Table C-1. The sites are also shown geographically in Figure C-1. The Site ID shows the potential for consolidation. The sites are further broken down in Table C-2 to show how units were allocated by income level.

A. Criteria for Selecting Sites

In selecting sites for meeting the RHNA, the following criteria are used:

1. Developer interest or property owner interest to redevelop site
2. Vacant lot, parking lot, or open storage that includes only minimal existing improvements on site
3. Dilapidated buildings
4. Buildings with high vacancy and/or high turnover rates
5. Existing uses that are similar to uses that have been recycled
6. Buildings that are older than 30 years
7. Buildings that have existing FAR lower than 0.60, similar to the range of existing uses being recycled
8. Lot is part of a group of lots already under single or City ownership

Sites that meet criteria #1, 2, 3, OR 4 are included in the sites inventory. In addition, sites that meet two of the four criteria under #5 through #8 are also included due to trends exhibited in the City as shown in the Table IV-7.

Table C-1: Housing Overlay Sites

ID	APN	Address	5th HE?	Acres	GP	Zoning	Overlay	Density Factor (du/ac)	Total Units	Existing Use/Feasibility	FAR	Year of Building	Bldg SF	Criteria	Quality Class Bldf 1
1	4060004040	13430 CRENSHAW BLVD		0.46	General Commercial	C3	O6	50	**23**	General Store; Dilapidated	0.46	1954	9232	Met Criteria: 3, 5, 6, and 7 Presence of low-intensity or low-value uses, Extensive and/or severe physical blighting conditions that may be impairing the value of the existing use, Presence of multiple lots that are already under single or City ownership	C5A
1	4060004021	13226 CRENSHAW BLVD		0.3	General Commercial	C3	O6	50	**15**	Manufacturing; Old, Dilapidated	0.50	1978	6554	Met Criteria: 3, 5, 6, and 7 Extensive and/or severe physical blighting conditions that may be impairing the value of the existing use	C6A
1	4060004038	13400 CRENSHAW BLVD		0.23	General Commercial	C3	O6	50	**12**	Car Wash; Old car wash, Dilapidated	0.17	1964	1672	Met Criteria: 3, 5, 6, and 7 Presence of low-intensity or low-value uses, Extensive and/or severe physical blighting conditions that may be impairing the value of the existing use	DX
1	4060004035	13236 CRENSHAW BLVD		0.19	General Commercial	C3	O6	50	**10**	Manufacturing	0.54	1979	4480	Met Criteria: 3, 5, 6, and 7 Extensive and/or severe physical blighting conditions that may be impairing the value of the existing use	CX
1	4060004025	13424 CRENSHAW BLVD		0.26	General Commercial	C3	O6	50	**13**	Baskin Robins; Small FAR, Old Building	0.08	1958	944	Met Criteria: 3, 5, 6, 7, and 8 Presence of low-intensity or low-value uses, Extensive and/or severe physical blighting conditions that may be impairing the value of the existing use, Presence of multiple lots that are already under single or City ownership	SX
1	4060004027	13416 CRENSHAW BLVD		0.15	General Commercial	C3	O6	50	**8**	Fast Food; Small FAR	0.15	1961	954	Met Criteria: 3, 5, 6, 7, and 8 Presence of low-intensity or low-value uses, Extensive and/or severe physical blighting conditions that may be impairing the value of the existing use, Presence of multiple lots that are already under single or City ownership	DX
1	4060004041	NA		0.15	General Commercial	C3	O6	50	**8**	Parking Lot; Parking Lot to Fast Food	0	0	0	Met Criteria: 2, 3, 5, 6, 7, and 8 Presence of low-intensity or low-value uses, Extensive and/or severe physical blighting conditions that may be	

														impairing the value of the existing use, Presence of multiple lots that are already under single or City ownership, Presence of development opportunities on adjoining land	
1	4060004022	13214 CRENSHAW BLVD		0.44	General Commercial	C3	O6	50	**22**	Manufacturing ; Old building,	0.52	1956	9900	Met Criteria: 2, 3, 5, 6, 7, and 8 Extensive and/or severe physical blighting conditions that may be impairing the value of the existing use, Presence of development opportunities on adjoining land	CX
1	4060004037	13310 CRENSHAW BLVD		0.26	General Commercial	C3	O6	50	**13**	Auto Services	0.27	1961	3060	Met Criteria: 3, 5, 6, 7, and 8 Extensive and/or severe physical blighting conditions that may be impairing the value of the existing use	CX
1	4060004013	13100 CRENSHAW BLVD		0.47	General Commercial	C3	O6	50	**24**	Metal Manufacturing	0.30	1955	6100	Met Criteria: 3, 5, 6, 7, and 8 Presence of multiple lots that are already under single or City ownership	CX
1	4060004023	13208 CRENSHAW BLVD		0.17	General Commercial	C3	O6	50	**8**	Auto Services	0.34	1987	2496	Met Criteria: 3, 5, 6, 7, and 8 Extensive and/or severe physical blighting conditions that may be impairing the value of the existing use, Presence of multiple lots that are already under single or City ownership	C4A
1	4060004011	13120 CRENSHAW BLVD		0.33	General Commercial	C3	O6	50	**16**	Auto Service	0.05	1956	680	Met Criteria: 3, 5, 6, and 7 Presence of low-intensity or low-value uses, Extensive and/or severe physical blighting conditions that may be impairing the value of the existing use	CX
1	4060004012	13112 CRENSHAW BLVD		0.63	General Commercial	C3	O6	50	**31**	Manufacturing	0.41	1954	11209	Met Criteria: 5, 6, 7, and 8 Presence of multiple lots that are already under single or City ownership	C5A
1	4060004010	13204 CRENSHAW BLVD		0.26	General Commercial	C3	O6	50	**13**	Auto Service	0.68	1956	7700	Met Criteria: 5, 6, and 8 Extensive and/or severe physical blighting conditions that may be impairing the value of the existing use, Presence of multiple lots that are already under single or City ownership	CX
2	4059022015	NA		0.13	General Commercial	C3	O6	50	**6**	Parking Lot to Auto	0.99	1959	5600	Met Criteria: 2, 5, and 6 Presence of low-intensity or low-value uses	DX
2	4059022014	13610 CRENSHAW BLVD		0.13	General Commercial	C3	O6	50	**6**	Auto Services	0.28	1962	1608	Met Criteria: 3, 5, 6, and 7 Presence of low-intensity or low-value uses, Extensive and/or severe physical blighting conditions that may be impairing the value of the existing use	C4B

2	4059022024	13500 CRENSHAW BLVD		0.38	General Commercial	C3	O6	50	**19**	Auto Services; Vacant building, fenced	0.44	1978	7268	Met Criteria: 2, 3, 4, 5, 6, and 7 High or long-term business vacancies, indicating that the value of the existing use is impaired, Extensive and/or severe physical blighting conditions that may be impairing the value of the existing use	C6B
2	4059022018	13514 CRENSHAW BLVD		0.16	General Commercial	C3	O6	50	**8**	Auto Services	0.43	1958	3000	Met Criteria: 3, 5, 6, and 7 Extensive and/or severe physical blighting conditions that may be impairing the value of the existing use	D8A
2	4059022019	13510 CRENSHAW BLVD		0.19	General Commercial	C3	O6	50	**10**	Liquor Store	0.32	1957	2647	Met Criteria: 3, 6, and 7 Extensive and/or severe physical blighting conditions that may be impairing the value of the existing use	D6B
2	4059022016	13600 CRENSHAW BLVD		0.13	General Commercial	C3	O6	50	**6**	Auto Services	0.37	1959	2080	Met Criteria: 3, 5, 6, and 7 Extensive and/or severe physical blighting conditions that may be impairing the value of the existing use	DX
2	4059022017	13520 CRENSHAW BLVD		0.16	General Commercial	C3	O6	50	**8**	Religious Institution; Dilapidated	0.43	1958	3000	Met Criteria: 3, 5, 6, and 7 Extensive and/or severe physical blighting conditions that may be impairing the value of the existing use	D6A
3	4059021017	13920 CRENSHAW BLVD		0.14	General Commercial	C3	O6	50	**7**	Auto Services	0.53	1960	3248	Met Criteria: 3, 5, 6, and 7 Extensive and/or severe physical blighting conditions that may be impairing the value of the existing use	CX
3	4059021018	13904 CRENSHAW BLVD		0.15	General Commercial	C3	O6	50	**7**	Manufacturing ; Dilapidated, old	0.37	1959	2400	Met Criteria: 3, 5, 6, and 7 Extensive and/or severe physical blighting conditions that may be impairing the value of the existing use	DX
3	4059022026	NA		0.26	General Commercial	C3	O6	50	**13**	Auto Services	0.24	1966	2760	Met Criteria: 3, 5, 6, and 7 Presence of low-intensity or low-value uses, Extensive and/or severe physical blighting conditions that may be impairing the value of the existing use	C65B
4	4059021004	14160 CRENSHAW BL.		0.13	General Commercial	C3	O6	50	**6**	Auto Services	0.66	1968	3722	Met Criteria: 3, 5, and 6 Presence of development opportunities on adjoining land	C5C
4	4059021009	14100 CRENSHAW BLVD		0.26	General Commercial	C3	O6	50	**13**	Strip Mall; Vacant store fronts	0.48	1960	5400	Met Criteria: 4, 5, 6, and 7 High or long-term business vacancies	DX
4	4059021005	14150 CRENSHAW BLVD		0.13	General Commercial	C3	O6	50	**6**	Auto Services	0.34	1976	1900	Met Criteria: 3, 5, 6, and 7 Presence of development opportunities on adjoining land	CX
4	4059021013	14008 CRENSHAW BLVD		0.13	General Commercial	C3	O6	50	**6**	Parking Lot; Parking lot to Restaurant	0.57	1963	3200	Met Criteria: 2, 3, 5, 6, 7 and 8 Presence of multiple lots that are already under single or City ownership,	DX

														Presence of development opportunities on adjoining land	
4	4059021014	NA		0.13	General Commercial	C3	O6	50	**6**	Parking Lot; Parking Lot to Restaurant	0.88	1963	5000	Met Criteria: 2, 3, 5, 6, and 8 Presence of multiple lots that are already under single or City ownership, Presence of development opportunities on adjoining land	DX
4	4059021015	NA		0.13	General Commercial	C3	O6	50	**6**	Restaurant; Old, declining	0.88	1963	5000	Met Criteria: 3, 6, and 8 Presence of multiple lots that are already under single or City ownership, Presence of development opportunities on adjoining land	DX
4	4059021011	NA		0.13	General Commercial	C3	O6	50	**6**	Parking Lot; Parking Lot to Medical	0.99	1964	5600	Met Criteria: 2, 5, and 6 Presence of low-intensity or low-value uses	DX
4	4059021021	14124 CRENSHAW BLVD		0.39	General Commercial	C3	O6	50	**19**	Auto Services; Old, Dilapidated	0.46	1979	7800	Met Criteria: 3, 5, 6, and 7 Extensive and/or severe physical blighting conditions that may be impairing the value of the existing use	C6A
4	4059021010	14044 CRENSHAW BLVD		0.26	General Commercial	C3	O6	50	**13**	Strip Mall; Vacant store fronts	0.48	1960	5400	Met Criteria: 2, 4, 5, 6, and 7 High or long-term business vacancies	DX
4	4059021012	14030 CRENSHAW BLVD		0.13	General Commercial	C3	O6	50	**6**	Medical Practice	0.41	1961	2318	Met Criteria: 6 and 7 Presence of low-intensity or low-value uses	D9A
4	4059021003	14160 CRENSHAW BLVD		0.13	General Commercial	C3	O6	50	**6**	Auto Services	0	0	0	Met Criteria: 5 and 7 Presence of low-intensity or low-value uses	
5	4064012009	14516 CRENSHAW BLVD		0.18	General Commercial	C3	O5	30	**4**	Vacant Store	0.49	1965	3848	Met Criteria: 4, 5, 6, and 7 High or long-term business vacancies	C5A
5	4064012011	14504 CRENSHAW BLVD		0.18	General Commercial	C3	O5	30	**4**	Strip Mall; Old Strip Mall	0.39	1957	3055	Met Criteria: 5, 6, 7, and 8 Extensive and/or severe physical blighting conditions that may be impairing the value of the existing use, Presence of multiple lots that are already under single or City ownership	C5A
5	4064012024	14626 CRENSHAW BLVD		0.38	General Commercial	C3	O5	30	**8**	Strip Mall and Rest.; Two story strip mall with vacancy	0.10	1973	1600	Met Criteria: 4, 5, 6, and 7 Presence of low-intensity or low-value uses, High or long-term business vacancies, indicating that the value of the existing use is impaired	C55C
5	4064012027	14600 CRENSHAW BLVD		0.18	General Commercial	C3	O5	30	**4**	Party Store; Dilapidated,	0.50	1961	3936	Met Criteria: 3, 5, 6, and 7 Extensive and/or severe physical blighting conditions that may be impairing the value of the existing use	D6A

5	4064012029	14520 CRENSHAW BLVD		0.18	General Commercial	C3	O5	30	**4**	Vacant Store; Dilapidated	0.50	1960	3900	Met Criteria: 3, 4,5, 6, and 7 High or long-term business vacancies, indicating that the value of the existing use is impaired, Extensive and/or severe physical blighting conditions that may be impairing the value of the existing use	D5A
5	4064012028	14526 CRENSHAW BLVD		0.18	General Commercial	C3	O5	30	**4**	Vacant Store; For Lease, Dilapidated	0.50	1954	3900	Met Criteria: 3, 4, 5, 6, and 7 High or long-term business vacancies, indicating that the value of the existing use is impaired, Extensive and/or severe physical blighting conditions that may be impairing the value of the existing use	C65
5	4064012025	14614 CRENSHAW BLVD		0.18	General Commercial	C3	O5	30	**4**	3 stores; Old, Dilapidated	0.74	1956	5812	Met Criteria: 3, 5, and 6 Extensive and/or severe physical blighting conditions that may be impairing the value of the existing use	D6A
5	4064012010	14510 CRENSHAW BLVD		0.18	General Commercial	C3	O5	30	**4**	Vacant Store	0.50	1958	3900	Met Criteria: 4, 6, 5, and 7 High or long-term business vacancies	D6A
5	4064012026	14604 CRENSHAW BLVD		0.36	General Commercial	C3	O5	30	**7**	8 Small Businesses; 3 vacancies, Dilapidated	0.50	1955	7800	Met Criteria: 3, 4, 5, 6, and 7 High or long-term business vacancies, indicating that the value of the existing use is impaired, Extensive and/or severe physical blighting conditions that may be impairing the value of the existing use	D55A
5	4064012030	14426 CRENSHAW BLVD		0.36	General Commercial	C3	O5	30	**7**	Strip Mall; Strip Mall has vacancies	0.27	1990	4160	Met Criteria: 4, 6, 7, and 8 High or long-term business vacancies, indicating that the value of the existing use is impaired, Presence of multiple lots that are already under single or City Ownership	C55B
6	4060001029	2200 W EL SEGUNDO BLVD		0.65	General Commercial	C3	O5	30	**20**	Strip Mall; Strip Mall and Vacant Restaurant	0.35	1980	9956	Met Criteria: 4, 6, and 7 High or long-term business vacancies	C6B
7	4061001029	12816 VAN NESS AVE		0.3	General Commercial	C3	O5	30	**9**	Restaurant	0.40	1959	5250	Met Criteria: 3, 6, and 7 Extensive and/or severe physical blighting conditions that may be impairing the value of the existing use	C55B
7	4061001012	2150 W EL SEGUNDO BLVD		0.36	General Commercial	C3	O5	30	**11**	Restaurant; Old	0.12	1984	1923	Met Criteria: 3, 6, and 7 Presence of low-intensity or low-value uses, Extensive and/or severe physical blighting conditions that may be impairing the value of the existing use	D6

8	4059017031	14007 VAN NESS AVE		0.2	General Commercial	C3	O3	17	**3**	Dentistry businesses; Old	0.48	1959	4200	Met Criteria: 3, 6, and 7 Extensive and/or severe physical blighting conditions that may be impairing the value of the existing use	D5A
8	4059017027	14115 VAN NESS AVE		0.61	General Commercial	C3	O3	17	**10**	Business strip; Vacancies, old	0.48	1959	12705	Met Criteria: 3, 4, 6, and 7 High or long-term business vacancies, indicating that the value of the existing use is impaired, Extensive and/or severe physical blighting conditions that may be impairing the value of the existing use	D5A
8	4059017028	14111 VAN NESS AVE		0.2	General Commercial	C3	O3	17	**3**	Medical center	0.59	1959	5162	Met Criteria: 3, 6, and 7 Extensive and/or severe physical blighting conditions that may be impairing the value of the existing use	C55B
8	4059017029	14017 VAN NESS AVE		0.2	General Commercial	C3	O3	17	**3**	Medical office	0.36	1959	3171	Met Criteria: 6, and 7 Extensive and/or severe physical blighting conditions that may be impairing the value of the existing use	D75B
8	4059017030	14015 VAN NESS AVE		0.2	General Commercial	C3	O3	17	**3**	Office building; Old	0.74	1960	6404	Met Criteria: 3 and 6 Extensive and/or severe physical blighting conditions that may be impairing the value of the existing use	C65
8	4059017033	13971 VAN NESS AVE		0.2	General Commercial	C3	O3	17	**3**	Business strip; Vacancy, old	0.38	1961	3300	Met Criteria: 3, 4, 6, and 7 High or long-term business vacancies, indicating that the value of the existing use is impaired, Extensive and/or severe physical blighting conditions that may be impairing the value of the existing use	D5
8	4059017035	13945 VAN NESS AVE		0.4	General Commercial	C3	O3	17	**7**	Business strip; Vacancies	0.38	1959	6600	Met Criteria: 4, 6, and 7 High or long-term business vacancies	DX
8	4059017034	13961 VAN NESS AVE		0.2	General Commercial	C3	O3	17	**3**	Business strip; old	0.42	1962	3630	Met Criteria: 3, 6, and 7 Extensive and/or severe physical blighting conditions that may be impairing the value of the existing use	D5
8	4059017036	13931 VAN NESS AVE		0.2	General Commercial	C3	O3	17	**3**	Office building; Small office building, old	0.55	1987	4780	Met Criteria: 3, 6, and 7 Presence of low-intensity or low-value uses, Extensive and/or severe physical blighting conditions that may be impairing the value of the existing use	D55A
8	4059017037	13901 VAN NESS AVE		0.42	General Commercial	C3	O3	17	**7**	Business Strip; Vacancy	0.38	1960	6891	Met Criteria: 4, 6, and 7 High or long-term business vacancies	D5
9	4061013001	13151 S WESTERN AVE		2.45	Industrial	M2	O4	23	**56**	Vacant Building; Vacant	0.47	1954	50112	Met Criteria: 3, 4, 6, and 7 High or long-term business vacancies	C5B

										Building, Old, For Sale					
10	6102001023	1735 W 130TH ST		0.46	Industrial	M1	O5	30	**14**	Lumber Yard Building	0.30	1962	6000	Met Criteria: 5, 6, 7, and 8 Presence of low-intensity or low-value uses, Presence of multiple lots that are already under single or City ownership	S1
10	6102001022	1727 W 130TH ST		0.46	Industrial	M1	O5	30	**14**	Manufacturing Buildings; Old	0.50	1991	10000	Met Criteria: 3, 5, 6, and 7 Extensive and/or severe physical blighting conditions that may be impairing the value of the existing use	C55
10	6102001024	1751 W 130TH ST		0.91	Industrial	M1	O5	30	**27**	Lumber Yard	0.06	1979	2400	Met Criteria: 5, 6, 7, and 8 Presence of low-intensity or low-value uses, Presence of multiple lots that are already under single or City ownership	DX
10	6102001005	1748 W EL SEGUNDO BLVD		0.88	Industrial	M1	O5	30	**26**	House with car lot in back; Small house and several cars in back lot	0.04	1939	1530	Met Criteria: 3, 6, and 7 Presence of low-intensity or low-value uses, Extensive and/or severe physical blighting conditions that may be impairing the value of the existing use	D5
10	6102001020	1721 W 130TH ST		0.43	Industrial	M1	O5	30	**13**	Manufacturing Buildings; Old	0.52	1974	9776	Met Criteria: 3, 5, 6, and 7 Presence of low-intensity or low-value uses	C5B
10	6102001021	NA		0.03	Industrial	M1	O5	30	**1**	Manufacturing Buildings; Old	0	0	0	Met Criteria: 3, 5, 6, and 7 Presence of low-intensity or low-value uses	
10	6102001025	12918 S WESTERN AVE		1	Industrial	M1	O5	30	**30**	Lumber Yard	0.06	1979	2400	Met Criteria: 5, 6, 7, and 8 Presence of low-intensity or low-value uses, Presence of multiple lots that are already under single or City ownership	DX
10	6102001006	1734 W EL SEGUNDO BLVD		0.44	Industrial	M1	O6	50	**22**	Manufacturing building; Old building. Deteriorating	0.20	1957	3796	Met Criteria: 3, 5, 6, 7, and 8 Presence of low-intensity or low-value uses, Extensive and/or severe physical blighting conditions that may be impairing the value of the existing use, Presence of multiple lots that are already under single or City ownership	CX
10	6102001010	1714 W EL SEGUNDO BLVD		0.44	Industrial	M1	O6	50	**22**	Crane service business; Large lot with vehicles/machines in back	0.05	0	988	Met Criteria: 2, 5, and 7 Presence of low-intensity or low-value uses	

10	6102001007	1726 W EL SEGUNDO BLVD		0.44	Industrial	M1	O6	50	**22**	Heavy equipment business; Large lot filled with vehicles and machines	0.10	1961	19000	Met Criteria: 2, 5, 6, 7, and 8 Presence of low-intensity or low-value uses, Presence of multiple lots that are already under single or City ownership	DX
10	6102001026	1720 W EL SEGUNDO BLVD		0.44	Industrial	M1	O6	50	**22**	Heavy equipment business; Large lot filled with vehicles and machines	0.05	1959	900	Met Criteria: 3, 5, 6, 7, and 8 Presence of low-intensity or low-value uses, Presence of multiple lots that are already under single or City ownership	S1
11	6102001016	1643 W 130TH ST		0.91	Industrial	M1	O5	30	**27**	Vacant Lot; Available Vacant lot.	0	0	0	Met Criteria: 2, 5, and 7 Presence of vacant lots within the site	
11	6102001017	1651 W 130TH ST		0.91	Industrial	M1	O5	30	**27**	Dirt lot with House; Low FAR	0.03	1947	1210	Met Criteria: 2, 5, 6, and 7 Presence of low-intensity or low-value uses	D5B
11	6102002022	1613 W 130TH ST		0.11	Industrial	M1	O5	30	**3**	Old buildings, industrial business; Old and deteriorating buildings	0.17	1964	814	Met Criteria: 3, 5, 6, 7, and 8 Presence of low-intensity or low-value uses, Extensive and/or severe physical blighting conditions that may be impairing the value of the existing use, Presence of multiple lots that are already under single or City ownership	DX
11	6102002025	1613 W 130TH ST		0.23	Industrial	M1	O5	30	**7**	Old buildings, industrial business; Old and deteriorating buildings	0.40	1956	3996	Met Criteria: 3, 5, 6, 7, and 8 Extensive and/or severe physical blighting conditions that may be impairing the value of the existing use, Presence of multiple lots that are already under single or City ownership	C5A
11	6102002023	NA		0.11	Industrial	M1	O5	30	**3**	Old buildings, industrial business; Old and deteriorating buildings	0	0	0	Met Criteria: 3, 5, 7, and 8 Presence of low-intensity or low-value uses, Extensive and/or severe physical blighting conditions that may be impairing the value of the existing use, Presence of multiple lots that are already under single or City ownership	
11	6102002026	1621 W 130TH ST		0.23	Industrial	M1	O5	30	**7**	Old buildings, industrial business; Old and deteriorating buildings	0.28	1953	2803	Met Criteria: 3, 5, 6, 7, and 8 Extensive and/or severe physical blighting conditions that may be impairing the value of the existing use, Presence of multiple lots that are already under single or City ownership	D6A
11	6102001015	1635 W 130TH ST		0.91	Industrial	M1	O5	30	**27**	Rental business; Old condition	0.04	1959	1500	Met Criteria: 2, 3, 6, 7, and 8 Presence of low-intensity or low-value uses,	D5A

										house on a large lot				Presence of multiple lots that are already under single or City ownership	
11	6102002027	1619 W 130TH ST		0.23	Industrial	M1	O5	30	**7**	Old buildings, industrial business; Old and deteriorating buildings	0.31	1956	3150	Met Criteria: 3, 5, 6, 7, and 8 Extensive and/or severe physical blighting conditions that may be impairing the value of the existing use, Presence of multiple lots that are already under single or City ownership	D6A
12	6102002020	1563 W 130TH ST		0.46	Industrial	M1	O5	30	**14**	Metal fabrication business	0.45	1969	9080	Met Criteria: 5, 6, 7, and 8 Presence of multiple lots that are already under single or City ownership	C5B
12	6102002019	1559 W 130TH ST		0.46	Industrial	M1	O5	30	**14**	Metal fabrication business	0.45	1980	9080	Met Criteria: 5, 6, 7, and 8 Presence of multiple lots that are already under single or City ownership	C7
12	6102002005	1564 W EL SEGUNDO BLVD		0.44	Industrial	M1	O6	50	**22**	Lots with cars/vehicles	0.05	0	1048	Met Criteria: 2, 5, 6, 7, and 8 Presence of low-intensity or low-value uses, Presence of multiple lots that are already under single or City ownership	
12	6102002006	1556 W EL SEGUNDO BLVD		0.44	Industrial	M1	O6	50	**22**	Lots with cars/vehicles	0	0	0	Met Criteria: 2, 5, 6, 7, and 8 Presence of low-intensity or low-value uses, Presence of multiple lots that are already under single or City ownership	
13	6102002016	1535 W 130TH ST		0.91	Industrial	M1	O5	30	**27**	Plastic fabrication business	0.23	1957	9134	Met Criteria: 5, 6, and 7 Presence of low-intensity or low-value uses	S1
13	6102002030	12801 HALLDALE AVE		1.12	Industrial	M1	O6	50	**56**	Manufacturing /trucking business; Old brick building	0.41	1979	20000	Met Criteria: 3, 5, 6, and 7 Extensive and/or severe physical blighting conditions that may be impairing the value of the existing use	DX
13	6102002028	1530 W EL SEGUNDO BLVD		1.76	Industrial	M1	O6	50	**88**	Manufacturing /industrial building; Old brick building, permanently closed	0.40	1973	30500	Met Criteria: 3, 4, 5, 6, and 7 High or long-term business vacancies, indicating that the value of the existing use is impaired, Extensive and/or severe physical blighting conditions that may be impairing the value of the existing use	DX
14	6102003004	1434 W EL SEGUNDO BLVD		0.47	Industrial	M1	O6	50	**23**	pipe supply business; Low FAR, small building large lot, old building	0.10	1978	20400	Met Criteria: 2, 3, 5, 6, and 7 Presence of low-intensity or low-value uses, Extensive and/or severe physical blighting conditions that may be impairing the value of the existing use	DX
14	6102003005	1428 W EL SEGUNDO BLVD		0.41	Industrial	M1	O6	50	**21**	pipe supply business; Low FAR, small building large	0.40	1964	7000	Met Criteria: 2, 3, 5, 6, and 7 Presence of low-intensity or low-value uses, Extensive and/or severe physical	C5B

										lot, old building				blighting conditions that may be impairing the value of the existing use	
14	6102003024	1440 W EL SEGUNDO BLVD		1.1	Industrial	M1	O6	50	**55**	Business and industrial supply; Large old building	0.65	1977	31074	Met Criteria: 3, 5, 6, and 7 Extensive and/or severe physical blighting conditions that may be impairing the value of the existing use	C6B
15	6102003017	12919 S NORMANDIE AVE		0.15	Industrial	M1	O5	30	**5**	Small manufacturing /business;	0.12	1957	800	Met Criteria: 5, 6, and 7 Presence of low-intensity or low-value uses	D5A
15	6102003026	12901 S NORMANDIE AVE		0.27	Industrial	M1	O5	30	**8**	Party supply store; Old building, available for rent.	0.15	1954	1800	Met Criteria: 3, 4, 6, and 7 Presence of low-intensity or low-value uses, Extensive and/or severe physical blighting conditions that may be impairing the value of the existing use	D6A
15	6102003010	12927 S NORMANDIE AVE		0.2	Industrial	M1	O5	30	**6**	Liquor Store; Old building	0.19	1954	1680	Met Criteria: 3, 6, and 7 Presence of low-intensity or low-value uses, Extensive and/or severe physical blighting conditions that may be impairing the value of the existing use	D5A
15	6102003007	12829 S NORMANDIE AVE		0.59	General Commercial	C3	O6	50	**30**	Strip mall; Has vacancies, old building, and underground and below building parking	0.04	1967	1064	Met Criteria: 3, 4, 6, and 7 Presence of low-intensity or low-value uses, High or long-term business vacancies, indicating that the value of the existing use is impaired	CX
16	6115001012	12903 S BUDLONG AVE		0.52	Industrial	M1	O4	23	**12**	Industrial building; Old brick building	0.26	1968	5900	Met Criteria: 3, 5, 6,and 7 Extensive and/or severe physical blighting conditions that may be impairing the value of the existing use	C5B
16	6115001011	1200 W EL SEGUNDO BLVD		0.59	Industrial	M1	O4	23	**14**	Industrial building; Old brick building	0.62	1981	15826	Met Criteria: 3, 5, 6, and 7 Extensive and/or severe physical blighting conditions that may be impairing the value of the existing use	C5A
16	6115001017	1243 W 130TH ST		0.91	Industrial	M1	O5	30	**27**	Vitamin warehouse business;	0.278	1957	10800	Met Criteria: 5, 6, 7, and 8 Presence of multiple lots that are already under single or City ownership	C5A
16	6115001019	1303 W 130TH ST		0.61	Industrial	M1	O5	30	**18**	Manufacturing ; Old building	0.23	1965	6000	Met Criteria: 5, 6, and 7 Presence of low-intensity or low-value uses	C5A
16	6115001026	12902 S NORMANDIE AVE		0.12	Industrial	M1	O5	30	**4**	Home? Small business;	0.10	1953	504	Met Criteria: 6 and 7 Presence of low-intensity or low-value uses	D55B

16	6115001015	1239 W 130TH ST		0.46	Industrial	M1	O5	30	**14**	Health technology business;	0.21	1955	4263	Met Criteria: 6, 7, and 8 Presence of low-intensity or low-value uses, Presence of multiple lots that are already under single or City ownership	DX
16	6115001018	1255 W 130TH ST		0.6	Industrial	M1	O5	30	**18**	Manufacturing /industrial; Old building	0.12	1962	3200	Met Criteria: 5, 6, and 7 Presence of low-intensity or low-value uses	C55A
16	6115001016	1239 W 130TH ST		0.46	Industrial	M1	O5	30	**14**	Health technology business;	0.55	1955	10924	Met Criteria: 6, 7, and 8 Presence of multiple lots that are already under single or City ownership	C5A
16	6115001035	1311 W 130TH ST		0.61	Industrial	M1	O5	30	**18**	Manufacturing /Towing Business; Old brick building	0.53	1982	14135	Met Criteria: 3, 5, 6, and 7 Extensive and/or severe physical blighting conditions that may be impairing the value of the existing use	C7C
16	6115001028	12912 S NORMANDIE AVE		0.2	Industrial	M1	O5	30	**6**	Manufacturing ;	0.59	1952	5160	Met Criteria: 5, 6, and 7 Presence of development opportunities on adjoining land	D5A
16	6115001029	1341 W 130TH ST		0.2	Industrial	M1	O5	30	**6**	Manufacturing ;	0.54	1962	4668	Met Criteria: 5, 6, and 7 Presence of development opportunities on adjoining land	C5A
16	6115001027	12908 S NORMANDIE AVE		0.1	Industrial	M1	O5	30	**3**	Insulation Manufacturing ;	0.38	1955	1645	Met Criteria: 5, 6, and 7 Presence of development opportunities on adjoining land	C5A
16	6115001003	1320 W EL SEGUNDO BLVD		0.88	Industrial	M1	O6	50	**44**	Air conditioner manufacturing ; Old building, graffiti	0.49	1986	18927	Met Criteria: 3, 5, 6, and 7 Extensive and/or severe physical blighting conditions that may be impairing the value of the existing use	C6
16	6115001004	1308 W EL SEGUNDO BLVD		0.88	Industrial	M1	O6	50	**44**	Construction material supply; Old buildings	0.06	1963	2400	Met Criteria: 5, 6, and 7 Presence of low-intensity or low-value uses	S1
16	6115001005	1254 W EL SEGUNDO BLVD		0.76	Industrial	M1	O6	50	**38**	Parking lot to food business;	0	0	0	Met Criteria: 2, 5, 7, and 8 Presence of low-intensity or low-value uses, Presence of multiple lots that are already under single or City ownership	
16	6115001032	1342 W EL SEGUNDO BLVD		0.25	Industrial	M1	O6	50	**13**	76 Gas Station	0.01	1981	78	Met Criteria: 5, 6, and 7 Presence of development opportunities on adjoining land	S5
16	6115001034	1246 W EL SEGUNDO BLVD		1.42	Industrial	M1	O6	50	**71**	Food supply business; Old building	0.36	1956	22392	Met Criteria: 6, 7, and 8 Presence of multiple lots that are already under single or City ownership	CX
16	6115001002	1332 W EL SEGUNDO BLVD		0.88	Industrial	M1	O6	50	**44**	Large lot with small building	0	0	0	Met Criteria: 2 and 7 Presence of low-intensity or low-value uses	

16	6115001033	12816 S NORMANDIE AVE		0.36	Industrial	M1	O6	50	**18**	Clothing store warehouse; Old brick building	0.57	1976	8898	Met Criteria: 3, 5, 6, and 7 Extensive and/or severe physical blighting conditions that may be impairing the value of the existing use	C6
16	6115001800	1218 W EL SEGUNDO BLVD		1.23	Industrial	M1	O6	50	**61**	Industrial yard	0.04	0	1975	Met Criteria: 5, 6, and 7 Presence of low-intensity or low-value uses	
16	6115001006	1254 W EL SEGUNDO BLVD		0.12	Industrial	M1	O6	50	**6**	Parking lot to food business	0	0	0	Met Criteria: 2, 5, 7, and 8 Presence of low-intensity or low-value uses, Presence of multiple lots that are already under single or City ownership	
17	6115001031	12923 S BUDLONG AVE		0.92	Industrial	M1	O4	23	**21**	Manufacturing building; Old, uneven paint	0.10	1954	4000	Met Criteria: 3, 5, 6, and 7 Presence of low-intensity or low-value uses	C5
18	6115002023	1215 W 132ND ST		2.06	Industrial	M1	O4	23	**47**	Water bottle business; Low FAR	0.16	1959	14640	Met Criteria: 5, 6, and 7 Presence of low-intensity or low-value uses	S1
18	6115002032	13021 S BUDLONG AVE		1.14	Industrial	M1	O4	23	**26**	Industrial building; Old building	0.25	1959	12550	Met Criteria: 3, 5, 6, 7, and 8 Extensive and/or severe physical blighting conditions that may be impairing the value of the existing use, Presence of multiple lots that are already under single or City ownership	C5A
18	6115002031	1220 W 130TH ST		0.91	Industrial	M1	O4	23	**21**	Electronic manufacturing ; Old building	0.39	1967	15400	Met Criteria: 3, 5, 6, 7, and 8 Extensive and/or severe physical blighting conditions that may be impairing the value of the existing use, Presence of multiple lots that are already under single or City ownership	C5A
19	6115004017	13423 S BUDLONG AVE		0.32	Industrial	M1	O4	23	**7**	Marble manufacturing business; Old building	0.61	1957	8520	Met Criteria: 3, 5, and 6 Extensive and/or severe physical blighting conditions that may be impairing the value of the existing use	C5
20	6115004019	13437 S BUDLONG AVE		0.18	Industrial	M1	O4	23	**4**	Industrial machinery shop; Old building	0.70	1980	5500	Met Criteria: 3, 5, 6, and 8 Extensive and/or severe physical blighting conditions that may be impairing the value of the existing use, Presence of multiple lots that are already under single or City ownership	C55
20	6115004032	13441 S BUDLONG AVE		0.17	Industrial	M1	O4	23	**4**	Industrial machinery shop; Old building	0.28	1958	2034	Met Criteria: 3, 5, 6, 7, and 8 Extensive and/or severe physical blighting conditions that may be impairing the value of the existing use, Presence of multiple lots that are already under single or City ownership	D5A
20	6115004020	1203 W 135TH ST		0.41	Industrial	M1	O4	23	**9**	Manufacturing building; Old building	0.64	1961	11440	Met Criteria: 3, 5, and 6	C5

														Extensive and/or severe physical blighting conditions that may be impairing the value of the existing use	
21	4062004041	14401 S WESTERN AVE	YES	0.14	General Commercial	C3	O6	50	**7**	Plumbing business	0.46	1926	2820	Met Criteria: 6 and 7 Presence of low-intensity or low-value uses	C45A
22	6115020008	1124 W 135TH ST		1.21	General Commercial	C3	O4	23	**28**	Plastic manufacturing supply business; Old building	0.12	0	6400	Met Criteria: 5, 6, and 7 Presence of low-intensity or low-value uses	S1
22	6115020012	1144 W 135TH ST		0.75	General Commercial	C3	O4	23	**17**	Industrial business; Old buildings	0.25	1951	8200	Met Criteria: 3, 5, 6, 7, and 8 Extensive and/or severe physical blighting conditions that may be impairing the value of the existing use, Presence of multiple lots that are already under single or City ownership	C5B
22	6115020006	1100 W 135TH ST		0.87	General Commercial	C3	O4	23	**20**	Laundromat; Old building	0.26	1971	10000	Met Criteria: 3, 6, and 7 Extensive and/or severe physical blighting conditions that may be impairing the value of the existing use	C6A
22	6115020014	1110 W 135TH ST		1.01	General Commercial	C3	O4	23	**23**	Industrial park; Old buildings	0.44	1987	19280	Met Criteria: 3, 5, 6, and 7 Extensive and/or severe physical blighting conditions that may be impairing the value of the existing use	C55B
22	6115020009	13530 S BUDLONG AVE		0.42	General Commercial	C3	O4	23	**10**	Manufacturing business	0.71	1952	12900	Met Criteria: 3, 5, and 6 Extensive and/or severe physical blighting conditions that may be impairing the value of the existing use	C45B
22	6115020013	1156 W 135TH ST		0.28	General Commercial	C3	O4	23	**6**	Medical supply business; Old building	0.49	1987	6015	Met Criteria: 3, 5, 6, 7, and 8 Extensive and/or severe physical blighting conditions that may be impairing the value of the existing use, Presence of multiple lots that are already under single or City ownership	C55
23	6102010008	13429 S NORMANDIE AVE		0.17	Industrial	M1	O4	23	**4**	Store fronts; Vacant, severely deteriorated, graffiti	0.75	1956	5520	Met Criteria: 3, 4, 5, and 6 High or long-term business vacancies, indicating that the value of the existing use is impaired, Extensive and/or severe physical blighting conditions that may be impairing the value of the existing use	C45
23	6102010009	1415 W 135TH ST		0.38	Industrial	M1	O4	23	**9**	Fabrication center; Old Building	0.73	1979	12095	Met Criteria: 5, 6, and 8 Presence of multiple lots that are already under single or City ownership	C6B
23	6102010006	1414 W 134TH ST		0.78	Industrial	M1	O4	23	**18**	Manufacturing business; Old building	0.22	1961	7480	Met Criteria: 5, 6, 7, and 8 Presence of low-intensity or low-value uses,	C5B

														Presence of multiple lots that are already under single or City ownership	
23	6102010017	1435 W 135TH ST		0.75	Industrial	M1	O4	23	**17**	Vehicle yard; Machinery, cars, other vehicles	0.07	1949	2400	Met Criteria: 2, 5, 6, and 7 Presence of low-intensity or low-value uses	S1
23	6102010007	13421 S NORMANDIE AVE		0.55	Industrial	M1	O4	23	**13**	Manufacturing business; Old building	0.15	1961	3600	Met Criteria: 5, 6, and 7 Presence of low-intensity or low-value uses	C5B
23	6102010005	1436 W 134TH ST		0.78	Industrial	M1	O4	23	**18**	Manufacturing business;	0.15	1980	5000	Met Criteria: 5, 6, 7, and 8 Presence of low-intensity or low-value uses, Presence of multiple lots that are already under single or City ownership	C5
23	6102010016	1421 W 135TH ST		0.75	Industrial	M1	O4	23	**17**	Furniture warehouse; Old building	0.37	1979	12095	Met Criteria: 5, 6, 7, and 8 Presence of multiple lots that are already under single or City ownership	C6B
24	6115004031	13428 S NORMANDIE AVE		0.5	Industrial	M1	O4	23	**11**	2 commercial buildings; Old buildings, small businesses	0.37	1959	8100	Met Criteria: 3, 5, 6, and 7 Presence of low-intensity or low-value uses, Extensive and/or severe physical blighting conditions that may be impairing the value of the existing use	C5
25	6102016013	13615 S NORMANDIE AVE		0.55	Industrial	M2	O4	23	**13**	Auto services; Old building, graffiti	0.52	1967	12384	Met Criteria: 3, 5, 6, and 7 Extensive and/or severe physical blighting conditions that may be impairing the value of the existing use	C5B
25	6102016020	13609 S NORMANDIE AVE		0.29	Industrial	M2	O4	23	**7**	Manufacturing building; Old building	0.63	1956	8000	Met Criteria: 3, 5, and 6 Extensive and/or severe physical blighting conditions that may be impairing the value of the existing use	C5A
25	6102016023	NA		0.07	Industrial	M2	O4	23	**2**	Storage driveway; Adjacent to printing business	0.98	1956	3000	Met Criteria: 2, 3, 5, and 6 Extensive and/or severe physical blighting conditions that may be impairing the value of the existing use	DX
25	6102017030	13725 S NORMANDIE AVE		0.13	Industrial	M1	O4	23	**3**	Extension of Office Building; Old building	0.52	1963	2926	Met Criteria: 3, 6, and 7 Extensive and/or severe physical blighting conditions that may be impairing the value of the existing use	C5A
25	6102016025	1580 W 139TH ST		0.07	Industrial	M2	O4	23	**2**	Driveway to printing business;	0.14	0	425	Met Criteria: 2, 5, and 7 Presence of low-intensity or low-value uses	DX
25	6102017026	NA		0.08	Industrial	M1	O4	23	**2**	Parking lot; Parking lot for motel	0	0	0	Met Criteria: 2, 5, 7, and 8 Presence of low-intensity or low-value uses, Presence of multiple lots that are already under single or City ownership	

25	6102016022	13507 S NORMANDIE AVE		0.37	Industrial	M2	O4	23	**8**	Food manufacturer; Old building	0.62	1957	10000	Met Criteria: 3, 5, and 6 Extensive and/or severe physical blighting conditions that may be impairing the value of the existing use	C5A
25	6102016024	13527 S NORMANDIE AVE		0.36	Industrial	M2	O4	23	**8**	Printing business; Old building, new paint	0.83	1957	13000	Met Criteria: 3, 5, and 6 Extensive and/or severe physical blighting conditions that may be impairing the value of the existing use	C5A
25	6102017033	13717 S NORMANDIE AVE		1.03	Industrial	M1	O4	23	**24**	Office building; Old building	0.27	1963	12000	Met Criteria: 3, 5, 6, and 7 Extensive and/or severe physical blighting conditions that may be impairing the value of the existing use	C6A
25	6102017044	13705 S NORMANDIE AVE		1.03	Industrial	M1	O4	23	**24**	Packaging supply business; Old building	0.57	1979	25421	Met Criteria: 3, 5, 6, and 7 Extensive and/or severe physical blighting conditions that may be impairing the value of the existing use	C55B
25	6102017040	1425 W 139TH ST		0.45	Industrial	M1	O4	23	**10**	Home; Surrounded by many cars	0.09	1959	1821	Met Criteria: 2, 3, 6, and 7 Presence of low-intensity or low-value uses, Extensive and/or severe physical blighting conditions that may be impairing the value of the existing use	D7B
25	6102017045	13807 S NORMANDIE AVE		0.25	Industrial	M1	O4	23	**6**	Auto services	0.15	1962	1584	Met Criteria: 5, 6, and 7 Presence of low-intensity or low-value uses	C4A
25	6102017027	13815 S NORMANDIE AVE		0.5	Industrial	M1	O4	23	**12**	Motel; Old building	0.89	1960	19360	Met Criteria: 3, 6, and 8 Extensive and/or severe physical blighting conditions that may be impairing the value of the existing use, Presence of multiple lots that are already under single or City ownership	DX
25	6102017039	1433 W 139TH ST		1.87	Industrial	M1	O4	23	**43**	Home with a large lot in back; Junkyard, scrap yard, car lot	0.11	1930	8750	Met Criteria: 2, 6, and 7 Presence of low-intensity or low-value uses	DX
26	6115005045	13606 S NORMANDIE AVE		0.15	Industrial	M1	O4	23	**3**	Auto Services; Old building	0.64	1959	4176	Met Criteria: 3, 5, and 6 Extensive and/or severe physical blighting conditions that may be impairing the value of the existing use	C5
26	6115005042	13616 S NORMANDIE AVE		0.46	Industrial	M1	O4	23	**11**	Auto Services; Old Building	0.60	1962	12000	Met Criteria: 3, 5, 6, and 7 Extensive and/or severe physical blighting conditions that may be impairing the value of the existing use	C5
26	6115005044	13612 S NORMANDIE AVE		0.16	Industrial	M1	O4	23	**4**	Auto Services; Old building	0.65	1965	4524	Met Criteria: 3, 5, and 6 Extensive and/or severe physical blighting conditions that may be impairing the value of the existing use	C45

26	6115005036	13602 S NORMANDIE AVE		0.15	Industrial	M1	O4	23	**4**	Auto services; Old brick building	0.54	1982	3500	Met Criteria: 3, 5, 6, and 7 Extensive and/or severe physical blighting conditions that may be impairing the value of the existing use	C55A
26	6115005047	13526 S NORMANDIE AVE		0.23	Industrial	M1	O4	23	**5**	Auto services; Old brick building	0.60	1979	6000	Met Criteria: 3, 5, 6, and 7 Extensive and/or severe physical blighting conditions that may be impairing the value of the existing use	C55A
26	6115005037	13518 S NORMANDIE AVE		0.38	Industrial	M1	O4	23	**9**	Furniture warehouse business; Old building	0.59	1966	9796	Met Criteria: 3, 5, 6, and 7 Extensive and/or severe physical blighting conditions that may be impairing the value of the existing use	C55
26	6115005038	13506 S NORMANDIE AVE		0.3	Industrial	M1	O4	23	**7**	Nozzle manufacturing ; Old building	0.61	1969	7900	Met Criteria: 3, 5, and 6 Extensive and/or severe physical blighting conditions that may be impairing the value of the existing use	C55A
27	6115009011	13722 S NORMANDIE AVE		0.32	Industrial	M1	O4	23	**7**	Plastic manufacturing business; Old building	0.56	1961	7848	Met Criteria: 3, 5, 6, and 7 Extensive and/or severe physical blighting conditions that may be impairing the value of the existing use	CX
27	6115009010	13714 S NORMANDIE AVE		0.32	Industrial	M1	O4	23	**7**	Powder coating business; Old building	0.56	1961	7848	Met Criteria: 3, 5, 6, and 7 Extensive and/or severe physical blighting conditions that may be impairing the value of the existing use	C5
27	6115009014	13706 S NORMANDIE AVE		0.29	Industrial	M1	O4	23	**7**	Two small structures; Includes a small garage, old buildings	0.05	1960	632	Met Criteria: 3, 6, and 7 Presence of low-intensity or low-value uses, Extensive and/or severe physical blighting conditions that may be impairing the value of the existing use	D5A
27	6115009078	13850 S NORMANDIE AVE		0.84	Industrial	M1	O4	23	**19**	Strip mall and restaurant; Old buildings	0.06	1992	2025	Met Criteria: 3, 6, and 7 Presence of low-intensity or low-value uses, Extensive and/or severe physical blighting conditions that may be impairing the value of the existing use	D55B
28	6102013011	13618 S WESTERN AVE		0.51	Industrial	M2	O5	30	**15**	Manufacturing ; Vacancy	0.52	1961	11645	Met Criteria: 3, 4, 5, 6, and 7 High or long-term business vacancies, indicating that the value of the existing use is impaired, Presence of multiple lots that are already under single or City Ownership	C5A
28	6102013019	1746 W 135TH ST		0.51	Industrial	M2	O5	30	**15**	Vacant Building; Vacant Building	0.48	1961	10696	Met Criteria: 4, 5, 6, and 7 High or long-term business vacancies	C55A
28	6102013017	13610 S WESTERN AVE		0.42	Industrial	M2	O5	30	**13**	Parking Lot; Parking Lot for Business	0.04	1961	800	Met Criteria: 2, 5, 6, and 7 Presence of low-intensity or low-value uses	SX

														Presence of multiple lots that are already under single or City ownership	
28	6102013020	13528 S WESTERN AVE		1.01	Industrial	M2	O5	30	**30**	Vacant Building; Vacant Building	0.23	1963	10251	Met Criteria: 4, 5, 6, and 7 Presence of low-intensity or low-value uses, High or long-term business vacancies, indicating that the value of the existing use is impaired	C5B
28	6102013010	13614 S WESTERN AVE		0.54	Industrial	M2	O5	30	**16**	Manufacturing ; Vacancy	0.42	1957	9900	Met Criteria: 4, 5, 6, 7, and 8 High or long-term business vacancies, indicating that the value of the existing use is impaired, Presence of multiple lots that are already under single or City Ownership	D5A
28	6102013014	13610 S WESTERN AVE		0.66	Industrial	M2	O5	30	**20**	Bus Business;	0.17	1959	4850	Met Criteria: 5, 6, 7, and 8 Presence of low-intensity or low-value uses, Presence of multiple lots that are already under single or City ownership	DX
29	4061026005	NA		0.26	Industrial	M2	O5	30	**8**	Trailer/Truck Lot	0.11	1980	1200	Met Criteria: 2, 5, 6, 7, and 8 Presence of low-intensity or low-value uses, Presence of multiple lots that are already under single or City ownership	DX
29	4061026002	NA		0.26	Industrial	M2	O5	30	**8**	Trailer/Truck Lot	0.11	1980	1200	Met Criteria: 2, 5, 6, 7, and 8 Presence of low-intensity or low-value uses, Presence of multiple lots that are already under single or City ownership	DX
29	4061026030	NA		0.26	Industrial	M2	O5	30	**8**	Trailer/Truck Lot	0.99	1980	11200	Met Criteria: 2, 5, 6, and 8 Presence of low-intensity or low-value uses, Presence of multiple lots that are already under single or City ownership	DX
29	4061026006	NA		0.26	Industrial	M2	O5	30	**8**	Trailer/Truck Lot	0.11	1980	1200	Met Criteria: 2, 5, 6, 7, and 8 Presence of low-intensity or low-value uses, Presence of multiple lots that are already under single or City ownership	DX
29	4061026036	13511 S WESTERN AVE		0.52	Industrial	M2	O5	30	**16**	Trailer/Truck Lot	0.06	1950	1236	Met Criteria: 2, 5, 6, 7, and 8 Presence of low-intensity or low-value uses, Presence of multiple lots that are already under single or City ownership	DX
29	4061026007	NA		0.26	Industrial	M2	O5	30	**8**	Trailer/Truck Lot	0.99	1980	11200	Met Criteria: 2, 5, 6, and 8 Presence of low-intensity or low-value uses, Presence of multiple lots that are already under single or City ownership	DX

29	4061026034	NA		0.26	Industrial	M2	O5	30	**8**	Trailer/Truck Lot	0.11	1980	1200	Met Criteria: 2, 5, 6, 7, and 8 Presence of low-intensity or low-value uses, Presence of multiple lots that are already under single or City ownership	DX
30	4061026032	13715 S WESTERN AVE		1.29	Industrial	M2	O5	30	**39**	Manufacturing	0.27	1964	15280	Met Criteria: 3, 5, 6, and 7 Extensive and/or severe physical blighting conditions that may be impairing the value of the existing use	C55B
30	4061026023	13801 S WESTERN AVE		0.26	Industrial	M2	O5	30	**8**	Manufacturing	0.28	1952	3200	Met Criteria: 3, 5, 6, 7, and 8 Extensive and/or severe physical blighting conditions that may be impairing the value of the existing use, Presence of multiple lots that are already under single or City ownership	D5A
30	4061026022	13727 S WESTERN AVE		0.52	Industrial	M2	O5	30	**15**	Manufacturing	0	0	0	Met Criteria: 5, 7, and 8 Presence of low-intensity or low-value uses, Presence of multiple lots that are already under single or City ownership	
31	4061027006	14119 S WESTERN AVE		0.77	General Commercial	C3	O6	50	**39**	Auto Services; Old Buildings	0.50	1988	16800	Met Criteria: 3, 5, 6, and 7 Presence of low-intensity or low-value uses, Extensive and/or severe physical blighting conditions that may be impairing the value of the existing use	C5C
31	4061027004	14101 S WESTERN AVE		0.39	General Commercial	C3	O6	50	**19**	Impound Lot	0.03	1954	480	Met Criteria: 2, 5, 6, 7, and 8 Presence of low-intensity or low-value uses, Presence of multiple lots that are already under single or City ownership	SX
31	4061027005	14107 S WESTERN AVE		0.39	General Commercial	C3	O6	50	**19**	Impound Lot	0.20	1996	3312	Met Criteria: 2, 5, 7, and 8 Presence of low-intensity or low-value uses, Presence of multiple lots that are already under single or City ownership	C6B
31	4061027014	1835 W ROSECRANS AVE		3.6	General Commercial	C3	O6	50	**180**	Building products business	0.05	1951	8400	Met Criteria: 5, 6, 7, and 8 Presence of low-intensity or low-value uses, Presence of multiple lots that are already under single or City ownership	C5A
31	4061027013	1859 W ROSECRANS AVE		1.02	General Commercial	C3	O6	50	**51**	Building products business	0.09	1952	3920	Met Criteria: 5, 6, 7, and 8 Presence of low-intensity or low-value uses, Presence of multiple lots that are already under single or City ownership	S1
32	4062003008	1957 W 144TH ST	YES	0.22	General Commercial	C3	O6	50	**11**	Vacant Building; Old brick building	1.02	1954	9760	Met Criteria: 4, 5, 6, and 8 High or long-term business vacancies, indicating that the value of the existing use is impaired,	C5A

														Presence of multiple lots that are already under single or City Ownership	
32	4062003027	1930 W ROSECRANS AVE	YES	0.2	General Commercial	C3	O6	50	**10**	Warehouse; Old	0.38	1948	3263	Met Criteria: 3, 5, 6, and 7 Extensive and/or severe physical blighting conditions that may be impairing the value of the existing use	SX
32	4062003028	1922 W ROSECRANS AVE	YES	0.43	General Commercial	C3	O6	50	**21**	Warehouse; Old	0.21	1956	4000	Met Criteria: 5, 6, and 7 Presence of low-intensity or low-value uses	S1
32	4062003022	1939 W 144TH ST	YES	0.46	General Commercial	C3	O6	50	**23**	Vacant building; Old brick building	0.64	1956	12848	Met Criteria: 4, 5, 6, and 8 High or long-term business vacancies, indicating that the value of the existing use is impaired, Presence of multiple lots that are already under single or City ownership	C5B
32	4062003024	1954 W ROSECRANS AVE	YES	0.19	General Commercial	C3	O6	50	**10**	Auto services	0.40	1948	3340	Met Criteria: 5, 6, and 7 Presence of development opportunities on adjoining land	D55A
32	4062003037	1119 W 144TH PL	YES	0.22	General Commercial	C3	O6	50	**11**	Parking lot	0.88	1964	8400	Met Criteria: 2, 5, 6, and 8 Presence of multiple lots that are already under single or City ownership, Presence of development opportunities on adjoining land	DX
32	4062003029	1916 W ROSECRANS AVE	YES	0.2	General Commercial	C3	O6	50	**10**	Industrial yard	0.28	1948	2460	Met Criteria: 2, 5, 6, 7, and 8 Presence of multiple lots that are already under single or City ownership	SX
32	4062003030	1910 W ROSECRANS AVE	YES	0.2	General Commercial	C3	O6	50	**10**	Cake Shop	0.29	1950	2500	Met Criteria: 6 and 7 Presence of development opportunities on adjoining land	S1
32	4062003021	1919 W 144TH ST	YES	0.23	General Commercial	C3	O6	50	**12**	Industrial yard	1.00	1956	10000	Met Criteria: 2, 5, 6, and 8 Presence of multiple lots that are already under single or City ownership	DX
33	4062003023	NA	YES	0.23	General Commercial	C3	O6	50	**12**	Parking lot; Parking lot to vacant building	1.00	1954	10000	Met Criteria: 2, 4, 5, and 6 High or long-term business vacancies	DX
32	4062003031	1900 W ROSECRANS AVE	YES	0.2	General Commercial	C3	O6	50	**10**	Auto services; Old	0.56	1969	4897	Met Criteria: 3, 5, 6, and 7 Extensive and/or severe physical blighting conditions that may be impairing the value of the existing use, Presence of development opportunities on adjoining land	C55A
32	4062003036	1901 W 144TH ST	YES	0.21	General Commercial	C3	O6	50	**10**	Industrial brick building; Old brick building	0.71	1979	6494	Met Criteria: 5, 6, and 8 Presence of multiple lots that are already under single or City ownership	C55

33	4062004008	1839 W 144TH ST	YES	0.26	General Commercial	C3	O6	50	**13**	Industrial yard	0	0	0	Met Criteria: 2, 5, 7, and 8 Presence of low-intensity or low-value uses, Presence of multiple lots that are already under single or City ownership	
33	4062004032	1847 W 144TH ST	YES	0.13	General Commercial	C3	O6	50	**6**	Industrial building; Old	0.35	1952	1988	Met Criteria: 5, 6, 7, and 8 Presence of multiple lots that are already under single or City ownership	DX
33	4062004036	1850 W ROSECRANS AVE	YES	0.22	General Commercial	C3	O6	50	**11**	Industrial building/yard;	0.02	1940	176	Met Criteria: 2, 5, 6, 7, and 8 Presence of low-intensity or low-value uses, Presence of multiple lots that are already under single or City ownership	DX
33	4062004033	NA	YES	0.13	General Commercial	C3	O6	50	**6**	Industrial yard	0	0	0	Met Criteria: 2, 5, 7, and 8 Presence of low-intensity or low-value uses, Presence of multiple lots that are already under single or City ownership	
33	4062004082	14314 S ST ANDREWS PL	YES	0.46	General Commercial	C3	O6	50	**23**	Auto services; Old brick building	0.55	1983	11097	Met Criteria: 2, 5, 6, and 7 Extensive and/or severe physical blighting conditions that may be impairing the value of the existing use, Presence of development opportunities on adjoining land	C5
33	4062004079	1830 W ROSECRANS AVE	YES	1.18	General Commercial	C3	O6	50	**59**	Banquet Hall; Large parking lot included	0.03	1967	1720	Met Criteria: 2, 5, 6, and 7 Presence of low-intensity or low-value uses	DX
34	6102014040	1617 W ROSECRANS AVE		2.31	Industrial	M2	O6	50	**116**	Industrial park; Furniture business, martial arts, etc	0.60	1973	60000	Met Criteria: 5, 6, and 7 Presence of development opportunities on adjoining land	C5L
34	6102014048	1701 W ROSECRANS AVE		1.05	Industrial	M2	O6	50	**53**	Industrial Park; Older building, Fading paint	0.55	1979	25016	Met Criteria: 3, 5, 6, and 7 Extensive and/or severe physical blighting conditions that may be impairing the value of the existing use	C6A
34	6102014046	1725 W ROSECRANS AVE		2.38	Industrial	M2	O6	50	**119**	Industrial Park; Older building, Fading paint	0.49	1979	50400	Met Criteria: 3, 5, 6, and 7 Extensive and/or severe physical blighting conditions that may be impairing the value of the existing use	C6A
34	6102014041	1639 W ROSECRANS AVE		4.62	Industrial	M2	O6	50	**231**	Fitness equipment manufacturing ; Large old building	0.50	1969	100000	Met Criteria: 3, 5, 6, and 7 Extensive and/or severe physical blighting conditions that may be impairing the value of the existing use, Presence of development opportunities on adjoining land	C55B
34	6102014039	1601 W ROSECRANS AVE		0.22	Industrial	M2	O6	50	**11**	Air control engineering;	0.52	0	5000	Met Criteria: 3, 5, and 7 Presence of low-intensity or low-value uses,	C5A

										Small old building				Extensive and/or severe physical blighting conditions that may be impairing the value of the existing use	
34	6102014069	1735 W ROSECRANS AVE		1.19	Industrial	M2	O6	50	**60**	Industrial Park; Older building, Fading paint	0.48	1979	25016	Met Criteria: 3, 5, 6, and 7 Extensive and/or severe physical blighting conditions that may be impairing the value of the existing use	C6A
34	6102014038	1611 W ROSECRANS AVE		2.1	Industrial	M2	O6	50	**105**	Industrial distribution; Several big trucks parked	0.50	1960	45350	Met Criteria: 2, 5, 6, and 7 Presence of development opportunities on adjoining land	C5A
35	6103002035	1718 W ROSECRANS AVE		0.22	General Commercial	C3	O6	50	**11**	Industrial business; Old building, old paint, deteriorating	0.41	1964	3904	Met Criteria: 3, 5, 6, and 7 Extensive and/or severe physical blighting conditions that may be impairing the value of the existing use	C5B
35	6103002033	1732 W ROSECRANS AVE		0.22	General Commercial	C3	O6	50	**11**	Liquor store	0.33	1969	3204	Met Criteria: 6 and 7 Presence of development opportunities on adjoining land	C6A
35	6103002034	NA		0.12	General Commercial	C3	O6	50	**6**	Industrial business; Old building, old paint, deteriorating	0	0	0	Met Criteria: 3, 5, and 7 Presence of low-intensity or low-value uses, Extensive and/or severe physical blighting conditions that may be impairing the value of the existing use	
36	6103004037	1650 W ROSECRANS AVE		1.36	General Commercial	C3	O6	50	**68**	Home furniture warehouse; Old building, vacant, deteriorating	0.55	1964	32256	Met Criteria: 3, 4, 5, 6, and 7 High or long-term business vacancies, indicating that the value of the existing use is impaired, Extensive and/or severe physical blighting conditions that may be impairing the value of the existing use	C5A
36	6103004021	1600 W ROSECRANS AVE		1.03	General Commercial	C3	O6	50	**52**	Metal manufacturing ; Large, old industrial building. Deteriorating, boarded up windows	0.57	1979	25506	Met Criteria: 3, 4, 5, 6, and 7 Extensive and/or severe physical blighting conditions that may be impairing the value of the existing use	C6B
37	6103005027	NA	YES	0.15	General Commercial	C3	O6	50	**8**	Building material lot; Open lot with building materials, sparce small structures	0	0	0	Met Criteria: 2, 5, 7, and 8 Presence of low-intensity or low-value uses, Presence of multiple lots that are already under single or City ownership	

37	6103005025	1560 W ROSECRANS AVE	YES	0.35	General Commercial	C3	O6	50	**18**	Auto services; Large shop with large back lot	0.55	1960	8400	Met Criteria: 2, 5, 6, 7, and 8 Presence of multiple lots that are already under single or City ownership, Presence of development opportunities on adjoining land	C45A
37	6103005028	NA	YES	0.06	General Commercial	C3	O6	50	**3**	Building material lot; Open lot with building materials, sparce small structures	0	0	0	Met Criteria: 2, 5, and 7 Presence of low-intensity or low-value uses, Presence of development opportunities on adjoining land	
37	6103005034	1560 W ROSECRANS AVE	YES	0.42	General Commercial	C3	O6	50	**21**	Auto services; Large shop with large back lot	1.04	1960	19000	Met Criteria: 2, 5, 6, and 8 Presence of multiple lots that are already under single or City ownership, Presence of development opportunities on adjoining land	DX
37	6103005058	1536 W ROSECRANS AVE	YES	0.19	General Commercial	C3	O6	50	**9**	Building material lot; Open lot with building materials, sparce small structures	0	1964	0	Met Criteria: 2, 5, 6, 7, and 8 Presence of low-intensity or low-value uses, Presence of multiple lots that are already under single or City ownership	DX
37	6103005057	NA	YES	0.24	General Commercial	C3	O6	50	**12**	Building material lot; Open lot with building materials, sparce small structures	0	0	0	Met Criteria: 2, 5, 7, and 8 Presence of multiple lots that are already under single or City ownership, Presence of development opportunities on adjoining land	
37	6103005051	1522 W ROSECRANS AVE	YES	0.34	General Commercial	C3	O6	50	**17**	Work boot warehouse	0.49	1961	7200	Met Criteria: 5, 6, and 7 Presence of development opportunities on adjoining land	CXB
37	6103005029	1510 W ROSECRANS AVE	YES	0.3	General Commercial	C3	O6	50	**15**	Fast food restaurant; Old building	0.16	1977	2116	Met Criteria: 6 and 7 Presence of low-intensity or low-value uses	DX
37	6103005052	1520 W ROSECRANS AVE	YES	0.34	General Commercial	C3	O6	50	**17**	Auto registration business; Old building, vacancy	0.49	1961	7200	Met Criteria: 4, 5, 6, and 7 High or long-term business vacancies	CXB
37	6103005053	1518 W ROSECRANS AVE	YES	0.4	General Commercial	C3	O6	50	**20**	Furniture store	0.56	1962	9800	Met Criteria: 6 and 7 Presence of development opportunities on adjoining land	CXB
37	6103005026	1536 W ROSECRANS AVE	YES	0.29	General Commercial	C3	O6	50	**14**	Building material lot; Open lot with building	0.38	1961	4810	Met Criteria: 2, 5, 6, 7, and 8 Presence of multiple lots that are already under single or City ownership,	

										materials, sparce small structures				Presence of development opportunities on adjoining land	
37	6103005054	14315 HALLDALE AVE	YES	0.34	General Commercial	C3	O6	50	**17**	Cabinet store; Old building	0.53	1965	7840	Met Criteria: 6 and 7 Presence of development opportunities on adjoining land	C5A
38	6103009063	14315 S NORMANDIE AVE		1.2	General Commercial	C3	O6	50	**60**	Building material businesses; Old brick building	0.48	1977	25076	Met Criteria: 3, 5, 6, and 7 Extensive and/or severe physical blighting conditions that may be impairing the value of the existing use, Presence of development opportunities on adjoining land	C6C
38	6103009057	1408 W ROSECRANS AVE		0.43	General Commercial	C3	O6	50	**22**	Gas Station	0.05	1982	846	Met Criteria: 5, 6, and 7 Presence of low-intensity or low-value uses	S6
39	6114019021	1122 W ROSECRANS AVE		1.14	General Commercial	P	O5	30	**34**	Welding supply business; Old business, large parking lot	0.09	1953	4500	Met Criteria: 2, 5, 6, 7, and 8 Presence of low-intensity or low-value uses, Presence of multiple lots that are already under single or City ownership	CXC
39	6114019017	1102 W ROSECRANS AVE		0.27	General Commercial	C3	O5	30	**8**	Welding supply business; Old business, large parking lot	1.02	0	12000	Met Criteria: 2, 5, and 8 Presence of low-intensity or low-value uses, Presence of multiple lots that are already under single or City ownership	
40	4062003003	1920 W 144TH ST	YES	0.45	General Commercial	C3	O6	50	**23**	Industrial brick building; Old brick building	0.63	1960	12260	Met Criteria: 3, 5, 6, and 8 Extensive and/or severe physical blighting conditions that may be impairing the value of the existing use, Presence of multiple lots that are already under single or City ownership, Presence of development opportunities on adjoining land	C5A
40	4062003001	1900 W 144TH ST	YES	0.23	General Commercial	C3	O6	50	**12**	Industrial building; Old	0.37	1961	3724	Met Criteria: 3, 5, 6, and 7 Extensive and/or severe physical blighting conditions that may be impairing the value of the existing use, Presence of development opportunities on adjoining land	C5A
40	4062003005	1940 W 144TH ST	YES	0.23	General Commercial	C3	O6	50	**11**	Industrial building; Old	0.52	1954	5178	Met Criteria: 3, 5, 6, and 7 Extensive and/or severe physical blighting conditions that may be impairing the value of the existing use, Presence of development opportunities on adjoining land	C5

40	4062003006	1946 W 144TH ST	YES	0.23	General Commercial	C3	O6	50	**11**	Industrial building; Old building	0.50	1954	4956	Met Criteria: 3, 5, 6, and 7 Extensive and/or severe physical blighting conditions that may be impairing the value of the existing use, Presence of development opportunities on adjoining land	C4
40	4062003007	14404 GRAMERCY PL	YES	0.22	General Commercial	C3	O6	50	**11**	Manufacturing building; Old brick building	0.57	1960	5416	Met Criteria: 3, 5, 6, and 7 Extensive and/or severe physical blighting conditions that may be impairing the value of the existing use, Presence of development opportunities on adjoining land	C5A
40	4062003002	1910 W 144TH ST	YES	0.22	General Commercial	C3	O6	50	**11**	Industrial brick building; Old brick building and includes parking lot	0.53	1975	5040	Met Criteria: 2, 3, 5, 6, 7, and 8 Extensive and/or severe physical blighting conditions that may be impairing the value of the existing use, Presence of multiple lots that are already under single or City ownership, Presence of development opportunities on adjoining land	C5A
40	4062003004	1934 W 144TH ST	YES	0.23	General Commercial	C3	O6	50	**11**	Industrial building; Old building	0.55	1955	5456	Met Criteria: 3, 5, 6, and 7 Extensive and/or severe physical blighting conditions that may be impairing the value of the existing use, Presence of development opportunities on adjoining land	C5B
41	4062004009	1858 W 144TH ST	YES	0.25	General Commercial	C3	O6	50	**13**	Auto services; Permanently closed	0.27	1951	2908	Met Criteria: 4, 5, 6, and 7 High or long-term business vacancies, indicating that the value of the existing use is impaired, Presence of development opportunities on adjoining land	S1
41	4062004026	1848 W 144TH ST	YES	0.25	General Commercial	C3	O6	50	**13**	Manufacturing building; Old building	0.36	1960	3952	Met Criteria: 3, 5, 6, and 7 Extensive and/or severe physical blighting conditions that may be impairing the value of the existing use, Presence of development opportunities on adjoining land	SX
41	4062004022	NA	YES	0.14	General Commercial	C3	O6	50	**7**	Parking Lot; Parking Lot for plumbing business	0	0	0	Met Criteria: 2, 5, 7, and 8 Presence of low-intensity or low-value uses, Presence of multiple lots that are already under single or City ownership	
41	4062004021	NA	YES	0.15	General Commercial	C3	O6	50	**7**	Parking Lot; Parking Lot for plumbing business	0	0	0	Met Criteria: 2, 5, 7, and 8 Presence of low-intensity or low-value uses, Presence of multiple lots that are already under single or City ownership	

41	4062004029	1830 W 144TH ST	YES	0.13	General Commercial	C3	O6	50	**6**	Manufacturing building; Old	0.48	1980	2730	Met Criteria: 5, 6, and 7 Presence of development opportunities on adjoining land	C55
41	4062004031	1818 W 144TH ST	YES	0.25	General Commercial	C3	O6	50	**13**	Industrial Building; Old	0.28	1972	3000	Met Criteria: 5, 6, 7, and 8 Presence of multiple lots that are already under single or City ownership, Presence of development opportunities on adjoining land	S1
41	4062004023	14415 S WESTERN AVE	YES	0.14	General Commercial	C3	O6	50	**7**	Vacant Building; Old	0.63	1924	3863	Met Criteria: 4 and 6 High or long-term business vacancies	DX
41	4062004027	1838 W 144TH ST	YES	0.25	General Commercial	C3	O6	50	**13**	Industrial building; Old	0.61	1956	6610	Met Criteria: 3, 5, and 6 Extensive and/or severe physical blighting conditions that may be impairing the value of the existing use, Presence of development opportunities on adjoining land	C55A
41	4062004030	1828 W 144TH ST	YES	0.25	General Commercial	C3	O6	50	**13**	Industrial building; Leasing	0.38	1940	4100	Met Criteria: 5, 6, 7, and 8 Presence of multiple lots that are already under single or City ownership, Presence of development opportunities on adjoining land	SX
41	4062004081	1834 W 144TH ST	YES	0.12	General Commercial	C3	O6	50	**6**	Industrial building; Old	0.46	1974	2425	Met Criteria: 5, 6, and 7 Presence of development opportunities on adjoining land	C5A
41	4062004083	14421 S WESTERN AVE	YES	0.3	General Commercial	C3	O6	50	**15**	Auto services	0.05	1957	700	Met Criteria: 5, 6, and 7 Presence of low-intensity or low-value uses	D4A
42	4062005002	14507 S WESTERN AVE	YES	0.14	General Commercial	C3	O5	30	**4**	Small business	0.21	1936	1288	Met Criteria: 3, 6, 7, and 8 Presence of low-intensity or low-value uses, Extensive and/or severe physical blighting conditions that may be impairing the value of the existing use, Presence of multiple lots that are already under single or City ownership	D5A
42	4062005003	NA	YES	0.14	General Commercial	C3	O5	30	**4**	Parking Lot; Parking Lot to plumbing	0	0	0	Met Criteria: 2, 3, 5, 7, and 8 Presence of low-intensity or low-value uses, Extensive and/or severe physical blighting conditions that may be impairing the value of the existing use, Presence of multiple lots that are already under single or City ownership	
42	4062005025	14525 S WESTERN AVE	YES	0.14	General Commercial	C3	O5	30	**4**	Construction business;	0.51	1936	3133	Met Criteria: 5, 6, 7, and 8 Presence of multiple lots that are already under single or City ownership	DX

42	4062005001	14501 S WESTERN AVE	YES	0.16	General Commercial	C3	O5	30	**5**	Parking Lot; Parking Lot to building	0	0	0	Met Criteria: 2, 5, and 6 Presence of low-intensity or low-value uses	
42	4062005024	14519 S WESTERN AVE	YES	0.13	General Commercial	C3	O5	30	**4**	Plumbing business	0.52	1948	2915	Met Criteria: 6, 7, and 8 Presence of multiple lots that are already under single or City ownership	D5A
42	4062005004	NA	YES	0.13	General Commercial	C3	O5	30	**4**	Parking Lot; Parking Lot to plumbing	0	0	0	Met Criteria: 2, 5, 7, and 8 Presence of low-intensity or low-value uses, Presence of multiple lots that are already under single or City ownership	
43	4062005067	1817 W 146TH ST	YES	0.15	General Commercial	C3	O5	30	**5**	Barbershop; Old, low FAR	0.10	1952	641	Met Criteria: 6 and 7 Presence of low-intensity or low-value uses	D3A
44	4062006033	NA	YES	0.15	General Commercial	C3	O5	30	**4**	Plumbing Business; Large parking lot	0	0	0	Met Criteria: 2, 5, 7, and 8 Presence of low-intensity or low-value uses, Presence of multiple lots that are already under single or City ownership	
44	4062006032	NA	YES	0.15	General Commercial	C3	O5	30	**5**	Plumbing Business; Large parking lot	0	0	0	Met Criteria: 2, 5, 7, and 8 Presence of low-intensity or low-value uses, Presence of multiple lots that are already under single or City ownership	
44	4062006048	14609 S WESTERN AVE	YES	0.3	General Commercial	C3	O5	30	**9**	Plumbing Business; Large parking lot	0.18	1946	2400	Met Criteria: 2, 5, 6, 7, and 8 Presence of low-intensity or low-value uses, Presence of multiple lots that are already under single or City ownership	DX
45	6103030014	14690 S WESTERN AVE	YES	0.37	General Commercial	C3	O5	30	**11**	Auto services	0.10	1954	1587	Met Criteria: 5, 6, and 7 Presence of low-intensity or low-value uses	SX
45	6103030015	14632 S WESTERN AVE	YES	0.18	General Commercial	C3	O5	30	**5**	Auto services	0.17	1944	1313	Met Criteria: 5, 6, and 7 Presence of low-intensity or low-value uses	D3A
46	4062016037	14807 S WESTERN AVE		0.11	General Commercial	C3	O5	30	**3**	Business Strip; Old	0.63	1955	3000	Met Criteria: 3, 6, and 8 Extensive and/or severe physical blighting conditions that may be impairing the value of the existing use, Presence of multiple lots that are already under single or City ownership	D6A
46	4062016036	14801 S WESTERN AVE		0.11	General Commercial	C3	O5	30	**3**	Business Strip; Old	0.63	1953	3000	Met Criteria: 3, 6, and 8 Extensive and/or severe physical blighting conditions that may be impairing the value of the existing use, Presence of multiple lots that are already under single or City ownership	DX

46	4062016038	14817 S WESTERN AVE		0.09	General Commercial	C3	O5	30	**3**	Business Strip; Old	0.61	1957	2400	Met Criteria: 3, 6, and 8 Extensive and/or severe physical blighting conditions that may be impairing the value of the existing use, Presence of multiple lots that are already under single or City ownership	D6A
46	4062016039	14855 S WESTERN AVE		0.23	General Commercial	C3	O5	30	**7**	Motel; Old	0.38	1956	3832	Met Criteria: 3, 6, and 7 Extensive and/or severe physical blighting conditions that may be impairing the value of the existing use	D6
47	4062017013	14921 S WESTERN AVE		0.15	General Commercial	C3	O5	30	**4**	Electric supply store; Old	0.59	1928	3884	Met Criteria: 3, 5, 6, and 7 Extensive and/or severe physical blighting conditions that may be impairing the value of the existing use, Presence of development opportunities on adjoining land	C6A
47	4062017011	14901 S WESTERN AVE		0.11	General Commercial	C3	O5	30	**3**	Restaurant; Old	0.51	1960	2450	Met Criteria: 3, 6, and 7 Extensive and/or severe physical blighting conditions that may be impairing the value of the existing use, Presence of development opportunities on adjoining land	D5A
47	4062017012	NA		0.06	General Commercial	C3	O5	30	**2**	Driveway	0	0	0	Met Criteria: 2 and 7 Presence of low-intensity or low-value uses, Presence of development opportunities on adjoining land	
47	4062017014	14929 S WESTERN AVE		0.23	General Commercial	C3	O5	30	**7**	Car Wash; Deteriorating, old, declining	0.17	1964	1728	Met Criteria: 3, 5, 6, and 7 Presence of low-intensity or low-value uses, Extensive and/or severe physical blighting conditions that may be impairing the value of the existing use	CX
48	6103021002	14920 S WESTERN AVE	YES	0.2	General Commercial	C3	O5	30	**6**	Parking Lot; Parking Lot for Furniture store	0.06	1922	517	Met Criteria: 2, 3, 5, 6, and 7 Presence of low-intensity or low-value uses, Presence of development opportunities on adjoining land	D3A
48	6103021026	1744 W 149TH ST	YES	0.2	General Commercial	C3	O5	30	**6**	Jewelry Store; Old	0.37	1938	3200	Met Criteria: 3, 6, and 7 Extensive and/or severe physical blighting conditions that may be impairing the value of the existing use, Presence of development opportunities on adjoining land	DX
48	6103021025	14914 S WESTERN AVE	YES	0.37	General Commercial	C3	O5	30	**11**	Motel	0.32	1948	5100	Met Criteria: 3, 6, and 7 Extensive and/or severe physical blighting conditions that may be impairing the value of the existing use, Presence of development opportunities on adjoining land	D6C

49	6103021033	15020 S WESTERN AVE		0.19	General Commercial	C3	O5	30	**6**	Car Lot	0.98	1985	8098	Met Criteria: 2, 5, 6, and 8 Presence of multiple lots that are already under single or City ownership, Presence of development opportunities on adjoining land	DX
49	6103021053	15014 S WESTERN AVE		0.2	General Commercial	C3	O5	30	**6**	Car Lot	0.99	1961	8600	Met Criteria: 2, 5, 6, and 8 Presence of multiple lots that are already under single or City ownership, Presence of development opportunities on adjoining land	DX
4949	6103021054	15014 S WESTERN AVE		0.2	General Commercial	C3	O5	30	**6**	Car Lot	0.99	1961	8600	Met Criteria: 2, 5, 6, and 8 Presence of multiple lots that are already under single or City ownership, Presence of development opportunities on adjoining land	DX
50	6103021031	15032 S WESTERN AVE		0.2	General Commercial	C3	O5	30	**6**	Donut Shop; Old	0.09	1950	810	Met Criteria: 6 and 7 Presence of low-intensity or low-value uses	D5A
51	4062017047	15019 S WESTERN AVE		0.18	General Commercial	C3	O5	30	**6**	Pastor Mobely; Large open space	0.22	1950	1728	Met Criteria: 2, 6, 7, and 8 Presence of low-intensity or low-value uses, Presence of multiple lots that are already under single or City ownership	D55A
51	4062017050	15019 S WESTERN AVE		0.14	General Commercial	C3	O5	30	**4**	Pastor Mobely; Large open space	0.98	1955	6000	Met Criteria: 2, 6, and 8 Presence of multiple lots that are already under single or City ownership	DX
51	4062017049	15001 S WESTERN AVE		0.23	General Commercial	C3	O5	30	**7**	Grocery store; Low FAR	0.24	1952	2400	Met Criteria: 6 and 7 Presence of low-intensity or low-value uses	DX
52	4062017042	NA		0.14	General Commercial	C3	O3	17	**2**	Vacant Lot; Vacant Lot with cars on it	0	0	0	Met Criteria: 2, 5, 7, and 8 Presence of vacant lots within the site, Presence of multiple lots that are already under single or City ownership	
52	4062017038	1819 MARINE AVE		0.14	General Commercial	C3	O3	17	**2**	Auto Services	0.29	1953	1776	Met Criteria: 5, 6, 7, and 8 Presence of multiple lots that are already under single or City ownership	DX
52	4062017040	1829 MARINE AVE		0.14	General Commercial	C3	O3	17	**2**	Vacant building; Vacant building	0.32	1946	1920	Met Criteria: 4, 5, 6, and 7 High or long-term business vacancies	CX
52	4062017037	1813 MARINE AVE		0.14	General Commercial	C3	O3	17	**2**	Auto Services	0.13	1959	798	Met Criteria: 5, 6, and 7 Presence of low-intensity or low-value uses	D3A
52	4062017039	1823 MARINE AVE		0.14	General Commercial	C3	O3	17	**2**	Auto Services	0.25	1966	1500	Met Criteria: 5, 6, and 7 Presence of low-intensity or low-value uses	CX

52	4062017041	NA		0.14	General Commercial	C3	O3	17	**2**	Vacant Lot; Vacant Lot with cars on it	0	0	0	Met Criteria: 2, 5, and 7 Presence of vacant lots within the site	
53	4062017044	1845 MARINE AVE		0.14	General Commercial	C3	O3	17	**2**	Vacant Building; Vacant Building	0.25	1954	1500	Met Criteria: 4, 5, 6, and 7 Presence of low-intensity or low-value uses, High or long-term business vacancies, indicating that the value of the existing use is impaired	DX
54	4063005006	1820 MARINE AVE		0.16	General Commercial	C3	O3	17	**3**	Business/Home; Business in front, unit it back	0.26	1941	1828	Met Criteria: 3, 6, 7, and 8 Extensive and/or severe physical blighting conditions that may be impairing the value of the existing use, Presence of multiple lots that are already under single or City ownership	D5B
54	4063005005	1816 MARINE AVE		0.16	General Commercial	C3	O3	17	**3**	Auto Services	0.29	1972	2000	Met Criteria: 5, 6, 7, and 8 Presence of multiple lots that are already under single or City ownership	D5A
55	4063005047	15103 S WESTERN AVE		0.2	General Commercial	C3	O5	30	**6**	Valero Gasoline Station;	0.05	1963	400	Met Criteria: 5, 6, and 7 Presence of low-intensity or low-value uses	S6
55	4063005050	15109 S WESTERN AVE		0.42	General Commercial	C3	O5	30	**13**	Business strip; Vacancies, old	0.14	1972	2536	Met Criteria: 4, 6, and 7 Presence of low-intensity or low-value uses, High or long-term business vacancies, indicating that the value of the existing use is impaired	D65A
56	4063006002	15225 S WESTERN AVE		0.11	General Commercial	C3	O5	30	**3**	Business strip; Old building	0.99	1961	4760	Met Criteria: 3 and 6 Extensive and/or severe physical blighting conditions that may be impairing the value of the existing use, Presence of development opportunities on adjoining land	D6A
56	4063006004	1808 W 152ND ST		0.25	General Commercial	C3	O5	30	**8**	Chiropractor Business; Old building	0.42	1955	4552	Met Criteria: 3 and 6 Extensive and/or severe physical blighting conditions that may be impairing the value of the existing use, Presence of development opportunities on adjoining land	D5
56	4063006003	15219 S WESTERN AVE		0.12	General Commercial	C3	O5	30	**3**	Business strip; Old building	0.92	1961	4800	Met Criteria: 3 and 6 Extensive and/or severe physical blighting conditions that may be impairing the value of the existing use, Presence of development opportunities on adjoining land	D6B
57	6103018025	15112 S WESTERN AVE	YES	2.95	General Commercial	C2	O5	30	**88**	Strip Mall; Vacancies	0.11	1955	13750	Met Criteria: 4, 6, and 7 Presence of low-intensity or low-value uses, High or long-term business vacancies,	DX

														indicating that the value of the existing use is impaired	
58	4063007002	15345 S WESTERN AVE		0.11	General Commercial	C3	O5	30	**3**	Vacant building; Vacant building currently leasing	0.19	1947	891	Met Criteria: 4, 5, 6, 7, and 8 Presence of low-intensity or low-value uses, High or long-term business vacancies, indicating that the value of the existing use is impaired, Presence of multiple lots that are already under single or City ownership	D45B
58	4063007003	15325 S WESTERN AVE		0.11	General Commercial	C3	O5	30	**3**	Restaurant; Small business, old	0.34	1959	1629	Met Criteria: 6, 7, and 8 Presence of multiple lots that are already under single or City ownership	DX
58	4063007001	15351 S WESTERN AVE		0.14	General Commercial	C3	O5	30	**4**	Restaurant; Small business, old	0.21	1949	1297	Met Criteria: 6 and 7 Presence of low-intensity or low-value uses	D45B
58	4063007004	15325 S WESTERN AVE		0.06	General Commercial	C3	O5	30	**2**	Drive way; Driveway to restaurant	0	0	0	Met Criteria: 2, 4, 7, and 8 Presence of low-intensity or low-value uses, High or long-term business vacancies, indicating that the value of the existing use is impaired, Presence of multiple lots that are already under single or City ownership	
58	4063007005	15301 S WESTERN AVE		0.2	General Commercial	C3	O5	30	**6**	Vacant gasoline station; Deteriorating, old	0.15	1957	1300	Met Criteria: 3, 4, 5, 6, and 7 High or long-term business vacancies, indicating that the value of the existing use is impaired, Extensive and/or severe physical blighting conditions that may be impairing the value of the existing use	D4A
59	6103015025	15300 S WESTERN AVE		0.13	General Commercial	C3	O5	30	**3**	Dentist Office;	0.39	1954	2207	Met Criteria: 3, 6, and 7 Extensive and/or severe physical blighting conditions that may be impairing the value of the existing use, Presence of development opportunities on adjoining land	D5B
59	6103015026	15324 S WESTERN AVE		0.22	General Commercial	C3	O5	30	**6**	Small strip mall; Old	0.43	1970	4148	Met Criteria: 6 and 7 Presence of development opportunities on adjoining land	C6B
59	6103015027	15340 S WESTERN AVE		0.34	General Commercial	C3	O5	30	**10**	Motel;	0.40	1945	5927	Met Criteria: 3, 6, and 7 Extensive and/or severe physical blighting conditions that may be impairing the value of the existing use, Presence of development opportunities on adjoining land	D7C

60	4063008001	15417 S WESTERN AVE		0.11	General Commercial	C3	O5	30	**3**	Business strip; Vacancy, declining conditions	0.23	1962	1100	Met Criteria: 3, 4, 6, and 7 High or long-term business vacancies	D5B
60	4063008002	15401 S WESTERN AVE		0.24	General Commercial	C3	O5	30	**7**	Office and store fronts; Vacancy, declining conditions	0.39	1956	4032	Met Criteria: 3, 4, 6, and 7 High or long-term business vacancies	D55A
61	6105008032	1450 W REDONDO BEACH BLVD	YES	4.43	General Commercial	C3	O5	30	**133**	Bank of America;	0.16	1978	29906	Met Criteria: 6 and 7 Presence of low-intensity or low-value uses, Presence of development opportunities on adjoining land	D65A
61	6105008030	NA	YES	0.07	General Commercial	C3	O5	30	**2**	Bank of America;	0	0	0	Met Criteria: 6 and 7 Presence of low-intensity or low-value uses, Presence of development opportunities on adjoining land	
61	6105008031	NA	YES	0.1	General Commercial	C3	O5	30	**3**	Bank of America;	0	0	0	Met Criteria: 6 and 7 Presence of low-intensity or low-value uses, Presence of development opportunities on adjoining land	
62	4063005017	1914 MARINE AVE		0.16	General Commercial	C3	O3	17	**3**	Vacant Building; Vacant Building	0.13	1948	911	Met Criteria: 4, 6, and 7 Presence of low-intensity or low-value uses, High or long-term business vacancies, indicating that the value of the existing use is impaired	D45
63	4063005025	1958 MARINE AVE		0.18	General Commercial	C3	O3	17	**3**	Old building	0.34	1961	2628	Met Criteria: 6 and 7 Presence of low-intensity or low-value uses	C6B
64	4062013018	2003 MARINE AVE		0.25	General Commercial	C3	O3	17	**4**	Auto Services;	0.09	1960	960	Met Criteria: 5, 6, and 7 Presence of low-intensity or low-value uses	S6
65	4062013020	2021 MARINE AVE		0.34	General Commercial	C3	O3	17	**6**	Business strip; Several vacancies	0.15	1947	2240	Met Criteria: 4, 6, and 7 Presence of low-intensity or low-value uses, High or long-term business vacancies, indicating that the value of the existing use is impaired	D5A
66	4064023034	2315 MARINE AVE	YES	1.04	General Commercial	C3	O5	30	**31**	Vacant 3 story build; Vacant 3 story building	0.49	1966	22278	Met Criteria: 4, 6, and 7 High or long-term business vacancies	CX
67	4064023019	2421 MARINE AVE	YES	0.11	General Commercial	C3	O5	30	**3**	Swim School;	0.15	1960	731	Met Criteria: 6 and 7 Presence of low-intensity or low-value uses	D4

67	4064023020	2415 MARINE AVE	YES	0.26	General Commercial	C3	O5	30	**8**	Strip Mall; Vacancy	0.43	1962	4815	Met Criteria: 4, 6, and 7 High or long-term business vacancies	D5B
67	4064023021	2403 MARINE AVE	YES	0.17	General Commercial	C3	O5	30	**5**	Strip Mall; Vacancy	0.28	1953	2086	Met Criteria: 4, 6, and 7 High or long-term business vacancies	D5B
67	4064023035	NA	YES	0.31	General Commercial	C3	O5	30	**9**	Vacant Lot; Vacant Lot	0.52	1966	7000	Met Criteria: 2, 6, and 7 Presence of vacant lots within the site	DX
68	4069003002	2912 MARINE AVE		0.15	General Commercial	C3	O3	17	**3**	3 businesses; Vacancies, old building	0.65	1956	4271	Met Criteria: 4 and 6 High or long-term business vacancies	C5A
68	4069003001	2918 MARINE AVE		0.15	General Commercial	C3	O3	17	**3**	Office Space; Vacancies, old building	0.87	1959	5658	Met Criteria: 4 and 6 High or long-term business vacancies	DXB
69	4069004027	2938 MARINE AVE		0.23	General Commercial	C3	O5	30	**5**	Small store;	0.13	1972	1250	Met Criteria: 6 and 7 Presence of low-intensity or low-value uses	D5A
69	4069004026	15115 ATKINSON AVE		0.16	General Commercial	C3	O5	30	**3**	Vacant Building; Vacant Building, old	0.32	1960	2237	Met Criteria: 4, 6, and 7 High or long-term business vacancies	C55B
70	4069004002	15340 CRENSHAW BLVD		0.16	General Commercial	C3	O5	30	**3**	Restaurant; Old, low FAR	0.43	1986	2978	Met Criteria: 6, 7, and 8 Presence of low-intensity or low-value uses, Presence of multiple lots that are already under single or City ownership	D6A
70	4069004001	15342 CRENSHAW BLVD		0.16	General Commercial	C3	O5	30	**3**	Restaurant; Old, low FAR	1.15	1985	8014	Met Criteria: 6 and 8 Presence of low-intensity or low-value uses, Presence of multiple lots that are already under single or City ownership	DX
71	4069019002	15406 CRENSHAW BLVD		0.19	General Commercial	C3	O4	23	**4**	Vacant Store; low FAR	0.32	1944	2605	Met Criteria: 4, 6, and 7 Presence of low-intensity or low-value uses, High or long-term business vacancies, indicating that the value of the existing use is impaired	D8A
71	4069019001	15400 CRENSHAW BLVD		0.2	General Commercial	C3	O4	23	**5**	Dentist; Old, dilapidated, low FAR	0.20	1973	1781	Met Criteria: 3, 6, and 7 Presence of low-intensity or low-value uses, Extensive and/or severe physical blighting conditions that may be impairing the value of the existing use	D5A
72	4069019024	15416 CRENSHAW BLVD		0.37	General Commercial	C3	O4	23	**8**	5 travel and medical;	0.39	1994	6318	Met Criteria: 7, and 8 Presence of development opportunities on adjoining land	C6B

73	4069019009	15520 CRENSHAW BLVD		0.49	General Commercial	C3	O4	23	**11**	6 business; 3 Vacancies	0.56	1946	12031	Met Criteria: 4, 5, 6, and 7 High or long-term business vacancies	D65B
74	4069020002	15622 S CRENSHAW		0.14	General Commercial	C3	O4	23	**3**	3 business strip mall;	0.57	1977	3500	Met Criteria: 6 and 7 Presence of low-intensity or low-value uses, Presence of development opportunities on adjoining land	D6A
75	4069020005	15706 CRENSHAW BLVD		0.13	General Commercial	C3	O4	23	**3**	School Related; School Business	0.37	1944	2073	Met Criteria: 6, 7, and 8 Presence of multiple lots that are already under single or City ownership	DX
75	4069020006	15712 CRENSHAW BLVD		0.13	General Commercial	C3	O4	23	**3**	Parking Lot; Parking Lot for Business	0.44	1979	2500	Met Criteria: 2, 5, 6, 7, and 8 Presence of low-intensity or low-value uses, Presence of multiple lots that are already under single or City ownership	
75	4069020007	15716 CRENSHAW BLVD		0.12	General Commercial	C3	O4	23	**3**	Psychic;	0.26	1944	1374	Met Criteria: 6 and 7 Presence of development opportunities on adjoining land	D6A
75	4069020008	15722 CRENSHAW BLVD		0.18	General Commercial	C3	O4	23	**4**	Restaurant; Old	0.10	1970	760	Met Criteria: 6 and 7 Presence of low-intensity or low-value uses	DX
76	4066012033	15915 S WESTERN AVE	YES	0.47	General Commercial	C3	O5	30	**14**	Strip Mall; Vacancies	0.33	1987	6721	Met Criteria: 4, 6,and 7 High or long-term business vacancies	D6C
77	4066012004	16017 S WESTERN AVE		0.28	General Commercial	C3	O5	30	**8**	Auto services;	0.12	1957	1500	Met Criteria: 5, 6, and 7 Presence of low-intensity or low-value uses	D65
78	4066012026	16127 S WESTERN AVE		0.29	General Commercial	C3	O5	30	**9**	Business strip; Old	0.45	1963	5625	Met Criteria: 3, 6, and 7 Extensive and/or severe physical blighting conditions that may be impairing the value of the existing use, Presence of development opportunities on adjoining land	C6A
78	4066012028	16119 S WESTERN AVE		0.46	General Commercial	C3	O5	30	**14**	Inn	0.08	1966	1654	Met Criteria: 6 and 7 Presence of low-intensity or low-value uses, Presence of development opportunities on adjoining land	D6C
79	4066013025	16303 S WESTERN AVE		0.15	General Commercial	C3	O5	30	**4**	Strip mall, office building; Old	0.46	1991	3000	Met Criteria: 3, 6, 7, and 8 Extensive and/or severe physical blighting conditions that may be impairing the value of the existing use, Presence of multiple lots that are already under single or City ownership	D65A

79	4066013014	16229 S WESTERN AVE		0.19	General Commercial	C3	O5	30	**6**	Strip mall, office building; Old	0.54	1982	4450	Met Criteria: 3, 6, 7, and 8 Extensive and/or severe physical blighting conditions that may be impairing the value of the existing use, Presence of multiple lots that are already under single or City ownership	D65A
79	4066013016	16311 S WESTERN AVE		0.3	General Commercial	C3	O5	30	**9**	School/academy; Old	0.32	1956	4212	Met Criteria: 3, 6, and 7 Extensive and/or severe physical blighting conditions that may be impairing the value of the existing use, Presence of development opportunities on adjoining land	DX
79	4066013024	16225 S WESTERN AVE		0.1	General Commercial	C3	O5	30	**3**	Office building; Old, parking lot	1.47	1985	6415	Met Criteria: 2, 3, 6, and 8 Extensive and/or severe physical blighting conditions that may be impairing the value of the existing use, Presence of multiple lots that are already under single or City ownership	DX
79	4066013023	16219 S WESTERN AVE		0.15	General Commercial	C3	O5	30	**4**	Office building; Old	0.80	1985	5256	Met Criteria: 3, 6, and 8 Extensive and/or severe physical blighting conditions that may be impairing the value of the existing use, Presence of multiple lots that are already under single or City ownership	C55A
79	4066013022	16213 S WESTERN AVE		0.15	General Commercial	C3	O5	30	**4**	Glass store; Old	0.84	1953	5473	Met Criteria: 3, 6, and 8 Extensive and/or severe physical blighting conditions that may be impairing the value of the existing use, Presence of multiple lots that are already under single or City ownership	D55
79	4066013026	16321 S WESTERN AVE		0.3	General Commercial	C3	O5	30	**9**	Fast food; Old	0.07	1966	872	Met Criteria: 6 and 7 Presence of low-intensity or low-value uses	D7
80	4066025015	16401 S WESTERN AVE		0.13	General Commercial	C3	O5	30	**4**	Church Parking Lot;	1.01	1956	5700	Met Criteria: 2 and 6 Presence of low-intensity or low-value uses	DX
80	4066025017	16417 S WESTERN AVE		0.14	General Commercial	C3	O5	30	**4**	Church Parking Lot/ Vacant Lot;	0	0	0	Met Criteria: 2 and 7 Presence of vacant lots within the site	
80	4066025020	16501 S WESTERN AVE		0.14	General Commercial	C3	O5	30	**4**	Bail bond business; Old	0.72	1921	4399	Met Criteria: 3 and 6 Extensive and/or severe physical blighting conditions that may be impairing the value of the existing use	CX
80	4066025016	16411 S WESTERN AVE		0.14	General Commercial	C3	O5	30	**4**	Church Parking Lot/ Vacant Lot;	1.03	1924	6303	Met Criteria: 2 and 6 Presence of vacant lots within the site, Presence of low-intensity or low-value uses	C5B

8080	4066025021	16505 S WESTERN AVE		0.13	General Commercial	C3	O5	30	**4**	Business strip; Old, vacancy	0.40	1969	2250	Met Criteria: 4, 6, and 7 High or long-term business vacancies	C6A
81	4066025025	16531 S WESTERN AVE		0.14	General Commercial	C3	O5	30	**4**	Liquor store and bar; Old	1.07	1930	6500	Met Criteria: 3 and 6 Presence of low-intensity or low-value uses, Extensive and/or severe physical blighting conditions that may be impairing the value of the existing use	C65A
81	4066025024	16523 S WESTERN AVE		0.14	General Commercial	C3	O5	30	**4**	Restaurant;	0.41	1922	2500	Met Criteria: 3, 6, and 7 Presence of low-intensity or low-value uses, Extensive and/or severe physical blighting conditions that may be impairing the value of the existing use	D55A
82	6105010021	15830 S WESTERN AVE		0.39	General Commercial	C3	O5	30	**12**	Inn;	0.66	1969	11174	Met Criteria: 6, 7, and 8 Presence of multiple lots that are already under single or City ownership, Presence of development opportunities on adjoining land	D6
82	6105010024	15926 S WESTERN AVE		0.42	General Commercial	C3	O5	30	**13**	Cafe;	0.16	1968	2865	Met Criteria: 6 and 7 Presence of low-intensity or low-value uses	DX
82	6105010018	15820 S WESTERN AVE		0.32	General Commercial	C3	O5	30	**10**	Inn;	0.58	1955	8096	Met Criteria: 6 and 7 Presence of development opportunities on adjoining land	D55B
82	6105010060	15824 S WESTERN AVE		0.42	General Commercial	C3	O5	30	**13**	Inn;	0.79	1959	14481	Met Criteria: 6 and 8 Presence of multiple lots that are already under single or City ownership, Presence of development opportunities on adjoining land	D6B
82	6105010062	15930 S WESTERN AVE		0.43	General Commercial	C3	O5	30	**13**	Vacant Lot;	0	0	0	Met Criteria: 2, 5, and 7 Presence of vacant lots within the site	
82	6105010026	15934 S WESTERN AVE		0.42	General Commercial	C3	O5	30	**13**	Bakery;	0.33	1979	6032	Met Criteria: 6 and 7 Presence of development opportunities on adjoining land	C5B
83	6105010043	16102 S WESTERN AVE		0.2	General Commercial	C3	O5	30	**6**	Commercial building;	0.32	1950	2800	Met Criteria: 5, 6, and 7 Presence of development opportunities on adjoining land	D6A
83	6105010044	16108 S WESTERN AVE		0.2	General Commercial	C3	O5	30	**6**	Restaurant; Old	0.34	1967	2938	Met Criteria: 3, 6, and 7 Extensive and/or severe physical blighting conditions that may be impairing the value of the existing use	C55A
83	6105010045	16116 S WESTERN AVE		0.19	General Commercial	C3	O5	30	**6**	Veterinarian Hospital;	0.42	1955	3511	Met Criteria: 6 and 7 Presence of development opportunities on adjoining land	D65B

83	6105010064	16016 S WESTERN AVE		0.85	General Commercial	C3	O5	30	**25**	Medical Offices;	0.03	1955	1100	Met Criteria: 6 and 7 Presence of low-intensity or low-value uses	D5A
83	6105010048	1735 W 162ND ST		0.9	General Commercial	C3	O5	30	**27**	Elks Lodge Building; Old Brick Building	0.31	1956	12000	Met Criteria: 6 and 7 Presence of development opportunities on adjoining land	CX
83	6105010047	1743 W 162ND ST		0.28	General Commercial	C3	O5	30	**9**	Parking Lot; Parking Lot to Business Strip	0.09	1962	1131	Met Criteria: 2, 6, 7, and 8 Presence of low-intensity or low-value uses, Presence of multiple lots that are already under single or City ownership	C5A
8383	6105010046	16126 S WESTERN AVE		0.52	General Commercial	C3	O5	30	**16**	Business Strip; Vacancies	0.48	1954	10835	Met Criteria: 4, 6, 7, and 8 High or long-term business vacancies, indicating that the value of the existing use is impaired, Presence of multiple lots that are already under single or City ownership	D6B
84	6105004045	16240 S WESTERN AVE		0.52	Public/Institutional	O	O5	30	**15**	Motel;	0.70	1958	15850	Met Criteria: 3, 6, and 8 Extensive and/or severe physical blighting conditions that may be impairing the value of the existing use, Presence of multiple lots that are already under single or City ownership	D6B
84	6105004036	16224 S WESTERN AVE		0.33	Public/Institutional	O	O5	30	**10**	Motel;	0.53	1966	7650	Met Criteria: 3, 6, 7, and 8 Extensive and/or severe physical blighting conditions that may be impairing the value of the existing use, Presence of multiple lots that are already under single or City ownership	D6B
85	6105004046	1735 W GARDENA BLVD		0.7	Public/Institutional	O	O5	30	**21**	Auto Services;	0.23	1952	7050	Met Criteria: 5, 6, and 7 Presence of low-intensity or low-value uses	C5B
85	6105004043	16320 S WESTERN AVE		0.34	Public/Institutional	O	O5	30	**10**	Strip Mall; Old	0.37	1979	5502	Met Criteria: 3, 6, and 7 Extensive and/or severe physical blighting conditions that may be impairing the value of the existing use	D65C
86	6105001010	1747 W 166TH ST		0.12	General Commercial	C3	O5	30	**4**	Parking Lot; Parking Lot to Org/Community Center and Businesses	0.96	1956	5000	Met Criteria: 2, 6, and 8 Presence of low-intensity or low-value uses, Presence of multiple lots that are already under single or City ownership	DX
86	6105001002	16520 S WESTERN AVE		0.05	General Commercial	C3	O5	30	**1**	Organization/ Cultural center;	0.88	1930	1920	Met Criteria: 6 and 8 Presence of multiple lots that are already under single or City ownership	CX
86	6105001003	16516 S WESTERN AVE		0.08	General Commercial	C3	O5	30	**2**	Business Strip; Vacancies, old, deteriorating	0.92	1948	3200	Met Criteria: 3, 4, 6, and 8 High or long-term business vacancies, indicating that the value of the existing use is impaired, Extensive and/or severe physical	CX

														blighting conditions that may be impairing the value of the existing use, Presence of multiple lots that are already under single or City ownership	
86	6105001001	16522 S WESTERN AVE		0.08	General Commercial	C3	O5	30	**2**	Organization/ Cultural center;	0.70	1921	2450	Met Criteria: 6 and 8 Presence of multiple lots that are already under single or City ownership	C5
86	6105001030	16510 S WESTERN AVE		0.27	General Commercial	C3	O5	30	**8**	Office Building	0.86	1985	10065	Met Criteria: 6 and 8 Presence of multiple lots that are already under single or City ownership	C7A
87	6106003003	16816 S WESTERN AVE		0.15	General Commercial	C3	O5	30	**4**	Auto Services	0.24	1906	1543	Met Criteria: 5, 6, and 7 Presence of low-intensity or low-value uses	D6A
87	6106003004	16820 S WESTERN AVE		0.15	General Commercial	C3	O5	30	**4**	Auto Services	0.17	1906	1128	Met Criteria: 5, 6, and 7 Presence of low-intensity or low-value uses	
87	6106003034	16910 S WESTERN AVE		0.56	General Commercial	C3	O5	30	**17**	Auto Services	0.09	1947	2148	Met Criteria: 5, 6, and 7 Presence of low-intensity or low-value uses	SX
87	6106003028	16822 S WESTERN AVE		0.12	General Commercial	C3	O5	30	**4**	Plumbing Business; Old	0.37	1960	1925	Met Criteria: 3, 5, 6, and 7 Extensive and/or severe physical blighting conditions that may be impairing the value of the existing use	D5B
87	6106003030	16826 S WESTERN AVE		0.12	General Commercial	C3	O5	30	**4**	Home	0.21	1926	1088	Met Criteria: 6 and 7 Presence of low-intensity or low-value uses	DX
87	6106003026	16924 S WESTERN AVE		0.21	General Commercial	C3	O5	30	**6**	Liquor Store	0.23	1959	2094	Met Criteria: 6 and 7 Presence of low-intensity or low-value uses	D55A
88	6106009001	17014 S WESTERN AVE		0.27	General Commercial	C3	O5	30	**8**	Auto Services	0.04	1949	480	Met Criteria: 5, 6, and 7 Presence of low-intensity or low-value uses	DX
88	6106009014	17018 S WESTERN AVE		0.56	General Commercial	C3	O5	30	**17**	Auto Services	0.10	1993	2340	Met Criteria: 5, 6, and 7 Presence of low-intensity or low-value uses, Presence of development opportunities on adjoining land	C5A
88	6106009015	17000 S WESTERN AVE		2.04	General Commercial	C3	O5	30	**61**	Manufacturing Offices;	0.34	1957	30000	Met Criteria: 5, 6, and 7 Presence of development opportunities on adjoining land	C5
89	6106009008	17124 S WESTERN AVE		0.42	General Commercial	C3	O5	30	**13**	Manufacturing Building; Vacant, leasing	0.42	1966	7760	Met Criteria: 4, 5, 6, and 7 High or long-term business vacancies	C5C
89	6106009009	17128 S WESTERN AVE		0.42	General Commercial	C3	O5	30	**13**	House with car lot; Large	0.03	1949	600	Met Criteria: 2, 6, and 7 Presence of low-intensity or low-value uses	DX

										lot with cars in the back					
90	6106013053	1650 W ARTESIA BLVD		4.18	Specific Plan	ACSP	O6	50	**209**	Manufacturing Warehouse; Old	0.43	1986	77568	Met Criteria: 5, 6, and 7 Presence of development opportunities on adjoining land	C7
90	6106013049	1610 W ARTESIA BLVD		3.43	Specific Plan	ACSP	O6	50	**171**	Auto Services	0.13	1979	18900	Met Criteria: 5, 6, and 7 Presence of low-intensity or low-value uses	C6
91	6106030016	NA		0.3	Industrial	M1	O4	23	**7**	Lot for Manufacturing building; Old building	0	0	0	Met Criteria: 2, 3, 5, 7, and 8 Presence of low-intensity or low-value uses, Extensive and/or severe physical blighting conditions that may be impairing the value of the existing use, Presence of multiple lots that are already under single or City ownership	
91	6106030015	16835 S NORMANDIE AVE		0.49	Industrial	M1	O4	23	**11**	Manufacturing business; Old building	0.45	1957	9600	Met Criteria: 3, 5, 6, 7, and 8 Presence of low-intensity or low-value uses, Extensive and/or severe physical blighting conditions that may be impairing the value of the existing use, Presence of multiple lots that are already under single or City ownership	CX
91	6106030011	16829 S NORMANDIE AVE		0.57	Industrial	M1	O4	23	**13**	Manufacturing Business; Old building	0.04	1963	880	Met Criteria: 5, 6, 7, and 8 Presence of low-intensity or low-value uses, Presence of multiple lots that are already under single or City ownership	DX
92	6106027039	16617 NORMANDIE AVE		1.01	Industrial	M1	O4	23	**23**	Liquor Store; Large building	0.48	1976	21200	Met Criteria: 6 and 7 Presence of low-intensity or low-value uses	C5A
93	6106027026	16610 BRIGHTON AVE		0.17	Industrial	M1	O4	23	**4**	Parking lot to business	0.56	1979	4140	Met Criteria: 2, 5, 6, 7, and 8 Presence of low-intensity or low-value uses, Presence of multiple lots that are already under single or City ownership	DX
93	6106027023	16601 S NORMANDIE AVE		0.15	Industrial	M1	O4	23	**3**	Welding business	0.32	1940	2064	Met Criteria: 5, 6, and 7 Presence of development opportunities on adjoining land	DX
93	6106027027	16611 S NORMANDIE AVE		0.11	Industrial	M1	O4	23	**2**	Plumbing Business; Small business	0.17	1953	800	Met Criteria: 5, 6, and 7 Presence of low-intensity or low-value uses	
93	6106027040	1414 W 166TH ST		0.27	Industrial	M1	O4	23	**6**	Manufacturing business; Old building	0.49	1958	5723	Met Criteria: 3, 5, 6, and 7 Extensive and/or severe physical blighting conditions that may be	DX

														impairing the value of the existing use, Presence of development opportunities on adjoining land	
94	6111007016	NA		0.11	General Commercial	C3	O4	23	**2**	Vacant Lot	0	0	0	Met Criteria: 2, 5, 7, and 8 Presence of vacant lots within the site, Presence of multiple lots that are already under single or City ownership	
94	6111007017	NA		0.21	General Commercial	C3	O4	23	**5**	Vacant Lot	0	0	0	Met Criteria: 2, 5, 7, and 8 Presence of vacant lots within the site, Presence of multiple lots that are already under single or City ownership	
94	6111007032	1345 W 166TH ST		0.5	General Commercial	C3	O4	23	**11**	Engineering Business; Old Building	0.42	1979	9196	Met Criteria: 3, 5, 6, and 7 Extensive and/or severe physical blighting conditions that may be impairing the value of the existing use	C5A
95	6111024009	17901 S VERMONT AVE		0.22	General Commercial	C3	O3	17	**4**	Strip Mall; Old Building	0.67	1959	6400	Met Criteria: 3, 6, and 8 Extensive and/or severe physical blighting conditions that may be impairing the value of the existing use, Presence of multiple lots that are already under single or City ownership	D5A
95	6111024010	NA		0.24	General Commercial	C3	O3	17	**4**	Strip Mall; Old Building	0.91	1959	9500	Met Criteria: 3, 6, and 8 Extensive and/or severe physical blighting conditions that may be impairing the value of the existing use, Presence of multiple lots that are already under single or City ownership	
96	6106036015	6106036015		1.33	Industrial	M2	O4	23	**31**	Manufacturing building;	0.76	1970	44235	Met Criteria: 5 and 6 Presence of development opportunities on adjoining land	C5A
96	6106036025	1411 W 178TH ST		2.79	Industrial	M2	O4	23	**1**	Back lot for manufacturing building;	0.65	1958	78542	Met Criteria: 2, 3, 5, and 6 Extensive and/or severe physical blighting conditions that may be impairing the value of the existing use	CX
96	6106036805	NA		0.35	Industrial	M2	O4	23	**8**	Back lot for manufacturing building;	0	0	0	Met Criteria: 2, 5, and 7 Presence of development opportunities on adjoining land	
96	6106036023	1401 W 178TH ST		2.09	Industrial	M2	O4	23	**10**	Back lot for manufacturing building;	.0.56	1954	50662	Met Criteria: 2, 3, 5, and 6 Extensive and/or severe physical blighting conditions that may be impairing the value of the existing use	CX
97	6106038025	1440 W 178TH ST		0.39	Industrial	M1	O4	23	**9**	Realty and Investment Group; Old Building	0	0	0	Met Criteria: 7 and 8 Presence of low-intensity or low-value uses, Presence of multiple lots that are already under single or City ownership	
9	6106038021	1446 W 178TH ST		0.39	Industrial	M1	O4	23	**9**	Studio Building; Old Brick Building	0.47	1979	7906	Met Criteria: 3, 5, 6, and 7	C5A

														Extensive and/or severe physical blighting conditions that may be impairing the value of the existing use	
97	6106038023	1406 W 178TH ST		0.39	Industrial	M1	O4	23	**9**	Clothing store warehouse; Old building	0.51	1980	8736	Met Criteria: 3, 5, 6, and 7 Extensive and/or severe physical blighting conditions that may be impairing the value of the existing use	C55A
97	6106038022	1402 W 178TH ST		0.39	Industrial	M1	O4	23	**9**	Food distribution; Old building	0.52	1979	8800	Met Criteria: 3, 5, 6, and 7 Extensive and/or severe physical blighting conditions that may be impairing the value of the existing use	C55A
97	6106038024	1440 W 178TH ST		0.39	Industrial	M1	O4	23	**9**	Realty and Investment Group; Old Building	1.08	1980	18312	Met Criteria: 3, 6, and 8 Extensive and/or severe physical blighting conditions that may be impairing the value of the existing use, Presence of multiple lots that are already under single or City ownership	C65
98	6106038016	1468 W 178TH ST		0.79	Industrial	M1	O4	23	**18**	Logistics Building; Old Brick Building	0.35	1971	12000	Met Criteria: 3, 5, 6, and 7 Extensive and/or severe physical blighting conditions that may be impairing the value of the existing use	C65A
98	6106038017	1480 W 178TH ST		0.73	Industrial	M1	O4	23	**17**	Laboratory; Old Building	0.57	1969	18025	Met Criteria: 3, 5, 6, and 7 Extensive and/or severe physical blighting conditions that may be impairing the value of the existing use	C6A
99	6106037020	1528 W 178TH ST		0.71	Industrial	M1	O3	17	**12**	Manufacturing /office building; Old brick building	0.53	1962	16448	Met Criteria: 3, 5, 6, and 7 Extensive and/or severe physical blighting conditions that may be impairing the value of the existing use	CX
99	6106037025	1524 W 178TH ST		0.22	Industrial	M1	O3	17	**4**	Office building; Old Building	0.46	1969	4424	Met Criteria: 3, 6, 7, and 8 Extensive and/or severe physical blighting conditions that may be impairing the value of the existing use, Presence of multiple lots that are already under single or City ownership	C6A
99	6106037026	1520 W 178TH ST		0.22	Industrial	M1	O3	17	**4**	Manufacturing ; Old Brick Building	0.52	1961	4982	Met Criteria: 5, 6, 7, and 8 Extensive and/or severe physical blighting conditions that may be impairing the value of the existing use, Presence of multiple lots that are already under single or City ownership	C6B
99	6106037029	NA		0.95	Industrial	M1	O3	17	**16**	Building prefab business;	0.26	1996	10800	Met Criteria: 5, 6, 7, and 8 Extensive and/or severe physical blighting conditions that may be impairing the value of the existing use, Presence of multiple lots that are already under single or City ownership	

99	6106037002	17817 EVELYN AVE		0.17	Industrial	M1	O3	17	**3**	Building prefab business; Old building	0.81	1947	6000	Met Criteria: 3, 5, 6, and 8 Extensive and/or severe physical blighting conditions that may be impairing the value of the existing use, Presence of multiple lots that are already under single or City ownership	S1
99	6106037024	17833 EVELYN AVE		0.17	Industrial	M1	O3	17	**3**	Manufacturing building; Old building	0.54	1966	4027	Met Criteria: 3, 5, 6, and 7 Extensive and/or severe physical blighting conditions that may be impairing the value of the existing use	C5B
99	6106037027	1500 W 178TH ST		1.14	Industrial	M1	O3	17	**19**	Manufacturing building; Old Brick Building	0.20	1962	10000	Met Criteria: 5, 6, and 7 Presence of low-intensity or low-value uses	C5A
99	6106037030	17853 EVELYN AVE		2.57	Industrial	M1	O3	17	**44**	Car/vehicle yard; Land with cars/ RVs	0.11	1953	12060	Met Criteria: 2, 5, 6, and 7 Presence of low-intensity or low-value uses	S1
100	6106018050	17805 S DENKER AVE		0.15	Industrial	M1	O3	17	**3**	Auto Services; Old Building	0.13	1966	850	Met Criteria: 5, 6, and 7 Presence of low-intensity or low-value uses	C5
100	6106018042	17809 S DENKER AVE		0.15	Industrial	M1	O3	17	**3**	Auto Services; Old Building	0.18	1959	1176	Met Criteria: 5, 6, and 7 Presence of low-intensity or low-value uses	D4B
101	6106018049	17908 LA SALLE AVE		0.29	Mixed Use	HB	O3	17	**5**	Manufacturing /office building; Old Building	0.63	1966	8004	Met Criteria: 3, 5, and 6 Extensive and/or severe physical blighting conditions that may be impairing the value of the existing use	C55
102	6106017020	17803 LA SALLE AVE		0.23	Industrial	M1	O3	17	**4**	Manufacturing Building; Old building, deteriorating	1.63	1955	16350	Met Criteria: 3, 5, and 6 Extensive and/or severe physical blighting conditions that may be impairing the value of the existing use	C5
103	6106017001	17804 S HARVARD BLVD		0.22	Industrial	M1	O3	17	**4**	Auto Services; Tune Up Shop	1.01	0	9700	Met Criteria: , and 5 Presence of development opportunities on adjoining land	
103	6106017040	17812 S HARVARD BLVD		0.15	Industrial	M1	O3	17	**3**	Auto Services; Tune Up Shop	0.23	1963	1470	Met Criteria: 5, 6, and 7 Presence of low-intensity or low-value uses	C5A
104	6106021018	18011 LA SALLE AVE		0.15	Mixed Use	HB	O3	17	**3**	Gymnastics Studio; Old Building	0.39	1957	2520	Met Criteria: 3, 6, and 7 Extensive and/or severe physical blighting conditions that may be impairing the value of the existing use	DX
105	6106021024	NA		0.07	Mixed Use	HB	O3	17	**1**	Manufacturing Building driveway;	0	0	0	Met Criteria: 2, 3, 5, and 7 Presence of low-intensity or low-value uses	
105	6106021037	18031 LA SALLE AVE		0.15	Mixed Use	HB	O3	17	**3**	Manufacturing Building; Old Building	0.54	1960	3520	Met Criteria: 3, 5, 6, and 7 Extensive and/or severe physical blighting conditions that may be impairing the value of the existing use,	CX

														Presence of development opportunities on adjoining land	
105	6106021047	18105 LA SALLE AVE		0.29	Mixed Use	HB	O3	17	**5**	Security Guard business; Old business	0.55	1979	6900	Met Criteria: 3, 5, 6, and 7 Extensive and/or severe physical blighting conditions that may be impairing the value of the existing use, Presence of development opportunities on adjoining land	C6
106	6106021051	1651 W 182ND ST		0.26	Mixed Use	HB	O5	30	**8**	Auto Services	0.27	1989	3000	Met Criteria: 5, 6, and 7 Presence of low-intensity or low-value uses	C6
107	6106020028	18111 S HARVARD BLVD		0.15	Mixed Use	HB	O3	17	**2**	Auto Services	0.15	1924	960	Met Criteria: 5, 6, and 7 Presence of low-intensity or low-value uses	D4A
107	6106020043	NA		0.15	Mixed Use	HB	O5	30	**4**	Auto Services	0	0	0	Met Criteria: 5 and 7 Presence of low-intensity or low-value uses	
108	6106020018	1700 W 180TH ST		0.29	Mixed Use	HB	O3	17	**5**	Auto Services; Garage	0.34	1972	4340	Met Criteria: 3, 5, 6, and 7 Presence of low-intensity or low-value uses, Extensive and/or severe physical blighting conditions that may be impairing the value of the existing use	C5A
109	6106016017	17803 S HARVARD BLVD		0.45	Industrial	M1	O3	17	**8**	Manufacturing building; Old building	1.11	1955	21801	Met Criteria: 3, 5, and 6 Presence of low-intensity or low-value uses, Extensive and/or severe physical blighting conditions that may be impairing the value of the existing use	C5
110	6106016030	17822 S HOBART BLVD		0.15	Industrial	M1	O3	17	**2**	Metal manufacturing shop; Old brick building	0.54	1973	3500	Met Criteria: 3, 5, 6, and 7 Presence of low-intensity or low-value uses, Extensive and/or severe physical blighting conditions that may be impairing the value of the existing use	C5A
110	6106016033	17812 S HOBART BLVD		0.22	Industrial	M1	O3	17	**4**	Metal manufacturing shop; Old brick building	0.59	1990	5624	Met Criteria: 3, 5, 6, and 7 Presence of low-intensity or low-value uses, Extensive and/or severe physical blighting conditions that may be impairing the value of the existing use	C5
111	6106016032	17832 S HOBART BLVD		0.15	Mixed Use	HB	O3	17	**2**	Auto services; Old building	0.57	1983	3700	Met Criteria: 3, 5, 6, and 7 Presence of low-intensity or low-value uses, Extensive and/or severe physical blighting conditions that may be impairing the value of the existing use	C55

112	6106016031	17924 S HOBART BLVD		0.22	Mixed Use	HB	O3	17	**4**	Molding manufacturer; Old building	0.67	1964	6450	Met Criteria: 3, 5, and 6 Presence of low-intensity or low-value uses, Extensive and/or severe physical blighting conditions that may be impairing the value of the existing use	
113	6106020041	18116 S HOBART BLVD		0.15	Mixed Use	HB	O3	17	**2**	Manufacturing building; Old building	0.61	1985	4000	Met Criteria: 3, 5, and 6 Presence of low-intensity or low-value uses, Extensive and/or severe physical blighting conditions that may be impairing the value of the existing use	C55
114	6106020040	1719 W 182ND ST		0.17	Mixed Use	HB	O5	30	**5**	Small business; Appears vacant building	0.84	1961	6218	Met Criteria: 4 and 6 High or long-term business vacancies	C5
114	6106020038	1725 W 182ND ST		0.1	Mixed Use	HB	O5	30	**3**	Furniture Store; Old Building	0.70	1979	3031	Met Criteria: 3 and 6 Extensive and/or severe physical blighting conditions that may be impairing the value of the existing use	C55
115	6106019065	1745 W 182ND ST		0.15	Industrial	M1	O5	30	**4**	Bicycle store	0.73	1982	4785	Met Criteria: 5 and 6 Presence of development opportunities on adjoining land	C55
116	6106019059	NA		0.07	Industrial	M1	O3	17	**1**	Manufacturing building	1.04	1980	3175	Met Criteria: 5, 6, and 8 Presence of multiple lots that are already under single or City ownership, Presence of development opportunities on adjoining land	DX
116	6106019066	18105 S HOBART BLVD		0.22	Industrial	M1	O3	17	**4**	Manufacturing building	0.76	1980	7275	Met Criteria: 5, 6, and 8 Presence of multiple lots that are already under single or City ownership, Presence of development opportunities on adjoining land	C55
116	6106019067	18101 S HOBART BLVD		0.15	Industrial	M1	O3	17	**2**	Manufacturing building; Old brick building	0.57	1980	3696	Met Criteria: 3, 5, 6, and 7 Extensive and/or severe physical blighting conditions that may be impairing the value of the existing use	C5
116	6106019047	18025 S HOBART BLVD		0.15	Industrial	M1	O3	17	**2**	Manufacturing building; Old brick building	0.56	1976	3660	Met Criteria: 3, 5, 6, and 7 Extensive and/or severe physical blighting conditions that may be impairing the value of the existing use	C55B
117	6106019068	1726 W 180TH ST		0.36	Industrial	M1	O3	17	**6**	Manufacturing building; Old brick building	0.16	1957	2480	Met Criteria: 5, 6, and 7 Presence of low-intensity or low-value uses	SX
118	6106015050	1727 W 180TH ST		0.22	Industrial	M1	O3	17	**4**	Manufacturing business	0.64	1961	6132	Met Criteria: 5 and 6 Presence of development opportunities on adjoining land	C55A

119	6106015044	17913 S HOBART BLVD		0.15	Industrial	M1	O3	17	**2**	Manufacturing building; Old building	0.33	1956	2152	Met Criteria: 3, 5, 6, and 7 Extensive and/or severe physical blighting conditions that may be impairing the value of the existing use, Presence of development opportunities on adjoining land	D5B
120	6106015029	NA		0.07	Industrial	M1	O3	17	**1**	Parking Lot	0	0	0	Met Criteria: 2, 5, 7, and 8 Presence of low-intensity or low-value uses, Presence of multiple lots that are already under single or City ownership	
120	6106015030	NA		0.07	Industrial	M1	O3	17	**1**	Parking Lot	0	0	0	Met Criteria: 2, 5, 7, and 8 Presence of low-intensity or low-value uses, Presence of multiple lots that are already under single or City ownership	
120	6106015048	17903 S HOBART BLVD		0.15	Industrial	M1	O3	17	**3**	Painting business;	0.77	1959	5040	Met Criteria: 5, 6, and 8 Presence of low-intensity or low-value uses, Presence of multiple lots that are already under single or City ownership	C5
120	6106015046	17807 S HOBART BLVD		0.15	Industrial	M1	O3	17	**3**	Manufacturing /Office building; Old building	0.60	1960	3932	Met Criteria: 3, 5, 6, and 7 Extensive and/or severe physical blighting conditions that may be impairing the value of the existing use, Presence of development opportunities on adjoining land	C5
120	6106015045	17831 S HOBART BLVD		0.15	Industrial	M1	O3	17	**3**	Manufacturing Building	0.76	1959	4940	Met Criteria: 5, 6, and 8 Presence of low-intensity or low-value uses, Presence of multiple lots that are already under single or City ownership	C5
120	6106015051	17815 S HOBART BLVD		0.3	Industrial	M1	O3	17	**5**	Manufacturing with parking lot; Old Building with lot	0.08	1968	1008	Met Criteria: 2, 3, 6, and 7 Extensive and/or severe physical blighting conditions that may be impairing the value of the existing use	D5A
121	6106015013	17850 S WESTERN AVE		0.06	Industrial	M1	O5	30	**2**	Nutrients Business; Old	0.77	1963	2000	Met Criteria: 3, 5, and 6 Extensive and/or severe physical blighting conditions that may be impairing the value of the existing use	C5
121	6106015058	17810 S WESTERN AVE		0.13	Industrial	M1	O5	30	**4**	Metal Manufacturing Business;	0.71	1956	4000	Met Criteria: 3, 5, 6, and 8 Extensive and/or severe physical blighting conditions that may be impairing the value of the existing use, Presence of multiple lots that are already under single or City ownership	C5
121	6106015057	NA		0.06	Industrial	M1	O5	30	**2**	Auto Services	0	0	0	Met Criteria: 5, 6, 7, and 8 Presence of low-intensity or low-value uses,	

														Presence of multiple lots that are already under single or City ownership	
121	6106015056	17910 S WESTERN AVE		0.13	Industrial	M1	O5	30	**4**	Auto Services	0.13	1947	720	Met Criteria: 5, 6, 7, and 8 Presence of low-intensity or low-value uses, Presence of multiple lots that are already under single or City ownership	D5A
121	6106015055	17804 S WESTERN AVE		0.19	Industrial	M1	O5	30	**6**	Metal Manufacturing Business	0.87	1946	7226	Met Criteria: 5, 6, and 8 Presence of low-intensity or low-value uses, Presence of multiple lots that are already under single or City ownership	C5
121	6106015060	17840 S WESTERN AVE		0.37	Industrial	M1	O5	30	**11**	Manufacturing ; Old	0.30	1935	4830	Met Criteria: 3, 5, 6, and 7 Extensive and/or severe physical blighting conditions that may be impairing the value of the existing use	DX
121	6106015059	17820 S WESTERN AVE		0.19	Industrial	M1	O5	30	**6**	Manufacturing ; Old	0.29	1956	2420	Met Criteria: 3, 5, 6, 7, and 8 Extensive and/or severe physical blighting conditions that may be impairing the value of the existing use, Presence of multiple lots that are already under single or City ownership	DX
121	6106015019	17920 S WESTERN AVE		0.31	Industrial	M1	O5	30	**9**	Clothing Store; Old	0.39	1953	5277	Met Criteria: 3, 6, and 7 Extensive and/or severe physical blighting conditions that may be impairing the value of the existing use	D5A
122	6106019063	NA		0.06	General Commercial	C3	O5	30	**2**	Nursery	0	1980	0	Met Criteria: 2, 4, 5, 6, 7, and 8 Presence of low-intensity or low-value uses, Presence of multiple lots that are already under single or City ownership	DX
122	6106019048	18016 S WESTERN AVE		0.06	General Commercial	C3	O5	30	**2**	Strip Mall; Old, Vacancies	1.02	1982	2667	Met Criteria: 4, 6, and 8 High or long-term business vacancies, indicating that the value of the existing use is impaired, Presence of multiple lots that are already under single or City ownership	C7C
122	6106019049	NA		0.06	General Commercial	C3	O5	30	**2**	Strip Mall; Old, Vacancies	0.85	1982	2225	Met Criteria: 4, 6, and 8 High or long-term business vacancies, indicating that the value of the existing use is impaired, Presence of multiple lots that are already under single or City ownership	C7C
122	6106019050	NA		0.06	General Commercial	C3	O5	30	**2**	Strip Mall; Old, Vacancies	0.37	1982	954	Met Criteria: 4, 6, 7, and 8 High or long-term business vacancies, indicating that the value of the existing use is impaired, Presence of multiple lots that are already under single or City ownership	C7C

122	6106019055	NA		0.06	General Commercial	C3	O5	30	**2**	Strip Mall; Old, Vacancies	0.44	1982	1148	Met Criteria: 4, 6, 7, and 8 High or long-term business vacancies, indicating that the value of the existing use is impaired, Presence of multiple lots that are already under single or City ownership	C7C
122	6106019062	NA		0.06	General Commercial	C3	O5	30	**2**	Nursery	0	1980	0	Met Criteria: 2, 5, 6, 7, and 8 Presence of low-intensity or low-value uses, Presence of multiple lots that are already under single or City ownership	DX
122	6106019052	NA		0.06	General Commercial	C3	O5	30	**2**	Strip Mall; Old, Vacancies	0.37	1982	954	Met Criteria: 4, 6, 7, and 8 High or long-term business vacancies, indicating that the value of the existing use is impaired, Presence of multiple lots that are already under single or City ownership	C7C
122	6106019064	18110 S WESTERN AVE		0.19	General Commercial	C3	O5	30	**6**	Nursery	0.07	1980	616	Met Criteria: 2, 5, 6, and 7 Presence of low-intensity or low-value uses, Presence of multiple lots that are already under single or City ownership	D5A
122	6106019054	NA		0.12	General Commercial	C3	O5	30	**4**	Strip Mall; Old, Vacancies	0.37	1982	1907	Met Criteria: 4, 6, 7, and 8 High or long-term business vacancies, indicating that the value of the existing use is impaired, Presence of multiple lots that are already under single or City ownership	C7C
122	6106019051	NA		0.12	General Commercial	C3	O5	30	**4**	Strip Mall; Old, Vacancies	0.37	1982	1907	Met Criteria: 4, 6, 7, and 8 High or long-term business vacancies, indicating that the value of the existing use is impaired, Presence of multiple lots that are already under single or City ownership	C7C
122	6106019053	NA		0.06	General Commercial	C3	O5	30	**2**	Strip Mall; Old, Vacancies	0.37	1982	954	Met Criteria: 4, 6, 7, and 8 High or long-term business vacancies, indicating that the value of the existing use is impaired, Presence of multiple lots that are already under single or City ownership	C7C
Total									**6,586**						

Table C-2: Housing Overlay Sites and Income Distribution

Site ID	APN	Address	Acres	Lower Income Units	Moderate Income Units	Above Moderate Income Units	Total Units
O3 Overlay							
8	4059017031	14007 VAN NESS AVE	0.2			3	3
8	4059017027	14115 VAN NESS AVE	0.6			10	10
8	4059017028	14111 VAN NESS AVE	0.2			3	3
8	4059017029	14017 VAN NESS AVE	0.2			3	3
8	4059017030	14015 VAN NESS AVE	0.2			3	3
8	4059017033	13971 VAN NESS AVE	0.2			3	3
8	4059017035	13945 VAN NESS AVE	0.4			7	7
8	4059017034	13961 VAN NESS AVE	0.2			3	3
8	4059017036	13931 VAN NESS AVE	0.2			3	3
8	4059017037	13901 VAN NESS AVE	0.4			7	7
52	4062017042	NA	0.1			2	2
52	4062017038	1819 MARINE AVE	0.1			2	2
52	4062017040	1829 MARINE AVE	0.1			2	2
52	4062017037	1813 MARINE AVE	0.1			2	2
52	4062017039	1823 MARINE AVE	0.1			2	2
52	4062017041	NA	0.1			2	2
53	4062017044	1845 MARINE AVE	0.1			2	2
53	4063005006	1820 MARINE AVE	0.2			3	3
54	4063005005	1816 MARINE AVE	0.2			3	3
62	4063005017	1914 MARINE AVE	0.2			3	3
63	4063005025	1958 MARINE AVE	0.2			3	3
64	4062013018	2003 MARINE AVE	0.3			4	4
65	4062013020	2021 MARINE AVE	0.3			6	6
68	4069003002	2912 MARINE AVE	0.1			3	3
68	4069003001	2918 MARINE AVE	0.2			3	3
95	6111024009	17901 S VERMONT AVE	0.2			4	4
95	6111024010	NA	0.2			4	4
99	6106037020	1528 W 178TH ST	0.7			12	12
99	6106037025	1524 W 178TH ST	0.2			4	4
99	6106037026	1520 W 178TH ST	0.2			4	4
99	6106037029	NA	0.9			16	16
99	6106037002	17817 EVELYN AVE	0.2			3	3
99	6106037024	17833 EVELYN AVE	0.2			3	3
99	6106037027	1500 W 178TH ST	1.1			19	19
99	6106037030	17853 EVELYN AVE	2.6			44	44
100	6106018050	17805 S DENKER AVE	0.2			3	3

Site ID	APN	Address	Acres	Lower Income Units	Moderate Income Units	Above Moderate Income Units	Total Units
100	6106018042	17809 S DENKER AVE	0.1			3	3
101	6106018049	17908 LA SALLE AVE	0.3			5	5
102	6106017020	17803 LA SALLE AVE	0.2			4	4
103	6106017001	17804 S HARVARD BLVD	0.2			4	4
103	6106017040	17812 S HARVARD BLVD	0.1			3	3
104	6106021018	18011 LA SALLE AVE	0.1			3	3
105	6106021024	NA	0.1			1	1
105	6106021037	18031 LA SALLE AVE	0.1			3	3
105	6106021047	18105 LA SALLE AVE	0.3			5	5
107	6106020028	18111 S HARVARD BLVD	0.1			2	2
108	6106020018	1700 W 180TH ST	0.3			5	5
109	6106016017	17803 S HARVARD BLVD	0.5			8	8
110	6106016030	17822 S HOBART BLVD	0.1			2	2
110	6106016033	17812 S HOBART BLVD	0.2			4	4
111	6106016032	17832 S HOBART BLVD	0.1			2	2
112	6106016031	17924 S HOBART BLVD	0.2			4	4
113	6106020041	18116 S HOBART BLVD	0.1			2	2
116	6106019059	NA	0.1			1	1
116	6106019066	18105 S HOBART BLVD	0.2			4	4
116	6106019067	18101 S HOBART BLVD	0.1			2	2
116	6106019047	18025 S HOBART BLVD	0.1			2	2
117	6106019068	1726 W 180TH ST	0.4			6	6
118	6106015050	1727 W 180TH ST	0.2			4	4
119	6106015044	17913 S HOBART BLVD	0.1			2	2
120	6106015029	NA	0.1			1	1
120	6106015030	NA	0.1			1	1
120	6106015048	17903 S HOBART BLVD	0.1			3	3
120	6106015046	17807 S HOBART BLVD	0.1			3	3
120	6106015045	17831 S HOBART BLVD	0.1			3	3
120	6106015051	17815 S HOBART BLVD	0.3			5	5
O3 Total			**17.0**			**300**	**300**
O4 Overlay							
5	4064012009	14516 CRENSHAW BLVD	0.18		4		4
5	4064012011	14504 CRENSHAW BLVD	0.18		4		4
5	4064012027	14600 CRENSHAW BLVD	0.38		8		8
5	4064012029	14520 CRENSHAW BLVD	0.18		4		4
5	4064012028	14526 CRENSHAW BLVD	0.18		4		4
5	4064012025	14614 CRENSHAW BLVD	0.18		4		4

Site ID	APN	Address	Acres	Lower Income Units	Moderate Income Units	Above Moderate Income Units	Total Units
5	4064012010	14510 CRENSHAW BLVD	0.18		4		4
5	4064012024	14626 CRENSHAW BLVD	0.18		4		4
5	4064012026	14604 CRENSHAW BLVD	0.36		7		7
5	4064012030	14426 CRENSHAW BLVD	0.36		7		7
9	4061013001	13151 S WESTERN AVE	2.5		56		56
16	6115001012	12903 S BUDLONG AVE	0.5		12		12
16	6115001011	1200 W EL SEGUNDO BLVD	0.6		14		14
17	6115001031	12923 S BUDLONG AVE	0.9		21		21
18	6115002023	1215 W 132ND ST	2.1		47		47
18	6115002032	13021 S BUDLONG AVE	1.1		26		26
18	6115002031	1220 W 130TH ST	0.9		21		21
19	6115004017	13423 S BUDLONG AVE	0.3		7		7
20	6115004019	13437 S BUDLONG AVE	0.2		4		4
20	6115004032	13441 S BUDLONG AVE	0.2		4		4
20	6115004020	1203 W 135TH ST	0.4		9		9
22	6115020008	1124 W 135TH ST	1.2		28		28
22	6115020012	1144 W 135TH ST	0.7		17		17
22	6115020006	1100 W 135TH ST	0.9		20		20
22	6115020014	1110 W 135TH ST	1		23		23
22	6115020009	13530 S BUDLONG AVE	0.4		10		10
22	6115020013	1156 W 135TH ST	0.3		6		6
23	6102010008	13429 S NORMANDIE AVE	0.2		4		4
23	6102010009	1415 W 135TH ST	0.4		9		9
23	6102010006	1414 W 134TH ST	0.8		18		18
23	6102010017	1435 W 135TH ST	0.8		17		17
23	6102010007	13421 S NORMANDIE AVE	0.5		13		13
23	6102010005	1436 W 134TH ST	0.8		18		18
23	6102010016	1421 W 135TH ST	0.8		17		17
24	6115004031	13428 S NORMANDIE AVE	0.5		11		11
25	6102016013	13615 S NORMANDIE AVE	0.6		13		13
25	6102016020	13609 S NORMANDIE AVE	0.3		7		7
25	6102016023	NA	0.1		2		2
25	6102017030	13725 S NORMANDIE AVE	0.1		3		3
25	6102016025	1580 W 139TH ST	0.1		2		2
25	6102017026	NA	0.1		2		2
25	6102016022	13507 S NORMANDIE AVE	0.4		8		8
25	6102016024	13527 S NORMANDIE AVE	0.4		8		8
25	6102017033	13717 S NORMANDIE AVE	1		24		24

Site ID	APN	Address	Acres	Lower Income Units	Moderate Income Units	Above Moderate Income Units	Total Units
25	6102017044	13705 S NORMANDIE AVE	1		24		24
25	6102017040	1425 W 139TH ST	0.5		10		10
25	6102017045	13807 S NORMANDIE AVE	0.3		6		6
25	6102017027	13815 S NORMANDIE AVE	0.5		12		12
25	6102017039	1433 W 139TH ST	1.9		43		43
26	6115005045	13606 S NORMANDIE AVE	0.1		3		3
26	6115005042	13616 S NORMANDIE AVE	0.5		11		11
26	6115005044	13612 S NORMANDIE AVE	0.2		4		4
26	6115005036	13602 S NORMANDIE AVE	0.2		4		4
26	6115005047	13526 S NORMANDIE AVE	0.2		5		5
26	6115005037	13518 S NORMANDIE AVE	0.4		9		9
26	6115005038	13506 S NORMANDIE AVE	0.3		7		7
27	6115009011	13722 S NORMANDIE AVE	0.3		7		7
27	6115009010	13714 S NORMANDIE AVE	0.3		7		7
27	6115009014	13706 S NORMANDIE AVE	0.3		7		7
27	6115009078	13850 S NORMANDIE AVE	0.8		19		19
69	4069004026	15115 ATKINSON AVE	0.16		5		5
69	4069004027	2938 MARINE AVE	0.09		3		3
70	4069004002	15340 CRENSHAW BLVD	0.16		3		3
70	4069004001	15342 CRENSHAW BLVD	0.16		3		3
71	4069019002	15406 CRENSHAW BLVD	0.2		4		4
71	4069019001	15400 CRENSHAW BLVD	0.2		5		5
72	4069019024	15416 CRENSHAW BLVD	0.4		8		8
73	4069019009	15520 CRENSHAW BLVD	0.5		11		11
74	4069020002	15622 S CRENSHAW	0.1		3		3
75	4069020005	15706 CRENSHAW BLVD	0.1		3		3
75	4069020006	15712 CRENSHAW BLVD	0.1		3		3
75	4069020007	15716 CRENSHAW BLVD	0.1		3		3
75	4069020008	15722 CRENSHAW BLVD	0.2		4		4
91	6106030016	NA	0.3		7		7
91	6106030015	16835 S NORMANDIE AVE	0.5		11		11
91	6106030011	16829 S NORMANDIE AVE	0.6		13		13
92	6106027039	16617 NORMANDIE AVE	1		23		23
93	6106027026	16610 BRIGHTON AVE	0.2		4		4
93	6106027023	16601 S NORMANDIE AVE	0.1		3		3
93	6106027027	16611 S NORMANDIE AVE	0.1		2		2
93	6106027040	1414 W 166TH ST	0.3		6		6
94	6111007016	NA	0.1		2		2

Site ID	APN	Address	Acres	Lower Income Units	Moderate Income Units	Above Moderate Income Units	Total Units
94	6111007017	NA	0.2		5		5
94	6111007032	1345 W 166TH ST	0.5		11		11
96	6106036015	6106036015	1.3		31		31
96	6106036025	1411 W 178TH ST	0		1		1
96	6106036805	NA	0.3		8		8
96	6106036023	1401 W 178TH ST	0.5		10		10
97	6106038025	1440 W 178TH ST	0.4		9		9
97	6106038021	1446 W 178TH ST	0.4		9		9
97	6106038023	1406 W 178TH ST	0.4		9		9
97	6106038022	1402 W 178TH ST	0.4		9		9
97	6106038024	1440 W 178TH ST	0.4		9		9
98	6106038016	1468 W 178TH ST	0.8		18		18
98	6106038017	1480 W 178TH ST	0.7		17		17
O4 Total			**44.2**		**1004**		**1004**
O5 Overlay (Consolidated Parcels)							
6	4060001029	2200 W EL SEGUNDO BLVD	0.7	10	3	7	20
7	4061001029	12816 VAN NESS AVE	0.7	10	3	7	20
	4061001012	2150 W EL SEGUNDO BLVD					
10	6102001021	--	4.2	62	19	44	125
	6102001020	1721 W 130TH ST					
	6102001023	1735 W 130TH ST					
	6102001022	1727 W 130TH ST					
	6102001005	1748 W EL SEGUNDO BLVD					
	6102001024	1751 W 130TH ST					
	6102001025	12918 S WESTERN AVE					
11	6102002022	1613 W 130TH ST	3.6	54	16	38	108
	6102002023	--					
	6102002025	1613 W 130TH ST					
	6102002026	1621 W 130TH ST					
	6102002027	1619 W 130TH ST					
	6102001016	1643 W 130TH ST					
	6102001017	1651 W 130TH ST					
	6102001015	1635 W 130TH ST					
	6102002020	1563 W 130TH ST	0.9	14	4	10	28
	6102002019	1559 W 130TH ST					
13	6102002016	1535 W 130TH ST	0.9	14	4	9	27
15	6102003017	12919 S NORMANDIE AVE	0.6	9	3	7	19
	6102003010	12927 S NORMANDIE AVE					
	6102003026	12901 S NORMANDIE AVE					

Site ID	APN	Address	Acres	Lower Income Units	Moderate Income Units	Above Moderate Income Units	Total Units
16	6115001027	12908 S NORMANDIE AVE	4.3	64	19	45	128
	6115001026	12902 S NORMANDIE AVE					
	6115001028	12912 S NORMANDIE AVE					
	6115001029	1341 W 130TH ST					
	6115001015	1239 W 130TH ST					
	6115001016	1239 W 130TH ST					
	6115001019	1303 W 130TH ST					
	6115001018	1255 W 130TH ST					
	6115001035	1311 W 130TH ST					
	6115001017	1243 W 130TH ST					
28	6102013017	13610 S WESTERN AVE	3.6	55	16	38	109
	6102013011	13618 S WESTERN AVE					
	6102013019	1746 W 135TH ST					
	6102013010	13614 S WESTERN AVE					
	6102013014	13610 S WESTERN AVE					
	6102013020	13528 S WESTERN AVE					
29	4061026005	--	2.1	32	10	22	64
	4061026002	--					
	4061026030	--					
	4061026006	--					
	4061026007	--					
	4061026034	--					
	4061026036	13511 S WESTERN AVE					
30	4061026023	13801 S WESTERN AVE	2.1	31	9	22	62
	4061026022	13727 S WESTERN AVE					
	4061026032	13715 S WESTERN AVE					
39	6114019017	1102 W ROSECRANS AVE	1.4	21	6	15	42
	6114019021	1122 W ROSECRANS AVE					
42	4062005002	14507 S WESTERN AVE	0.8	12	4	9	25
	4062005003	--					
	4062005025	14525 S WESTERN AVE					
	4062005024	14519 S WESTERN AVE					
	4062005004	--					
	4062005001	14501 S WESTERN AVE					
43	4062005067	1817 W 146TH ST	0.2	2	1	2	5
44	4062006033	--	0.6	9	3	6	18
	4062006032	--					
	4062006048	14609 S WESTERN AVE					
45	6103030015	14632 S WESTERN AVE	0.5	8	2	6	16

Site ID	APN	Address	Acres	Lower Income Units	Moderate Income Units	Above Moderate Income Units	Total Units
	6103030014	14690 S WESTERN AVE					
46	4062016037	14807 S WESTERN AVE	0.6	8	2	6	16
	4062016036	14801 S WESTERN AVE					
	4062016038	14817 S WESTERN AVE					
	4062016039	14855 S WESTERN AVE					
47	4062017012	--	0.5	8	2	6	16
	4062017011	14901 S WESTERN AVE					
	4062017013	14921 S WESTERN AVE					
	4062017014	14929 S WESTERN AVE					
48	6103021002	14920 S WESTERN AVE	0.8	12	3	8	23
	6103021026	1744 W 149TH ST					
	6103021025	14914 S WESTERN AVE					
49	6103021033	15020 S WESTERN AVE	0.6	9	3	6	18
	6103021053	15014 S WESTERN AVE					
	6103021054	15014 S WESTERN AVE					
50	6103021031	15032 S WESTERN AVE	0.2	3	1	2	6
51	4062017050	15019 S WESTERN AVE	0.5	8	3	6	17
	4062017047	15019 S WESTERN AVE					
	4062017049	15001 S WESTERN AVE					
55	4063005047	15103 S WESTERN AVE	0.6	9	3	7	19
	4063005050	15109 S WESTERN AVE					
56	4063006002	15225 S WESTERN AVE	0.5	7	2	5	14
	4063006003	15219 S WESTERN AVE					
	4063006004	1808 W 152ND ST					
57	6103018025	15112 S WESTERN AVE	2.9	44	13	31	88
58	4063007004	15325 S WESTERN AVE	0.6	9	3	6	18
	4063007002	15345 S WESTERN AVE					
	4063007003	15325 S WESTERN AVE					
	4063007001	15351 S WESTERN AVE					
	4063007005	15301 S WESTERN AVE					
59	6103015025	15300 S WESTERN AVE	0.7	9	3	7	19
	6103015026	15324 S WESTERN AVE					
	6103015027	15340 S WESTERN AVE					
60	4063008001	15417 S WESTERN AVE	0.4	5	2	3	10
	4063008002	15401 S WESTERN AVE					
61	6105008030	--	4.6	69	21	48	138
	6105008031	--					
	6105008032	1450 REDONDO BEACH BLVD					
66	4064023034	2315 MARINE AVE	1	15	5	11	31

Site ID	APN	Address	Acres	Lower Income Units	Moderate Income Units	Above Moderate Income Units	Total Units
67	4064023019	2421 MARINE AVE	0.9	12	4	9	25
	4064023021	2403 MARINE AVE					
	4064023020	2415 MARINE AVE					
	4064023035	--					
76	4066012033	15915 S WESTERN AVE	0.5	7	2	5	14
77	4066012004	16017 S WESTERN AVE	0.3	4	1	3	8
78	4066012026	16127 S WESTERN AVE	0.7	12	3	8	23
	4066012028	16119 S WESTERN AVE					
79	4066013024	16225 S WESTERN AVE	1.3	19	6	14	39
	4066013025	16303 S WESTERN AVE					
	4066013023	16219 S WESTERN AVE					
	4066013022	16213 S WESTERN AVE					
	4066013014	16229 S WESTERN AVE					
	4066013016	16311 S WESTERN AVE					
	4066013026	16321 S WESTERN AVE					
80	4066025015	16401 S WESTERN AVE	0.68	10	3	7	20
	4066025017	16417 S WESTERN AVE					
	4066025020	16501 S WESTERN AVE					
	4066025016	16411 S WESTERN AVE					
	4066025021	16505 S WESTERN AVE					
81	4066025025	16531 S WESTERN AVE	0.3	4	1	3	8
	4066025024	16523 S WESTERN AVE					
82	6105010018	15820 S WESTERN AVE	2.4	37	11	26	74
	6105010021	15830 S WESTERN AVE					
	6105010024	15926 S WESTERN AVE					
	6105010060	15824 S WESTERN AVE					
	6105010062	15930 S WESTERN AVE					
	6105010026	15934 S WESTERN AVE					
83	6105010043	16102 S WESTERN AVE	3.1	48	14	33	95
	6105010044	16108 S WESTERN AVE					
	6105010045	16116 S WESTERN AVE					
	6105010047	1743 W 162ND ST					
	6105010046	16126 S WESTERN AVE					
	6105010064	16016 S WESTERN AVE					
	6105010048	1735 W 162ND ST					
84	6105004036	16224 S WESTERN AVE	0.8	12	4	9	25
	6105004045	16240 S WESTERN AVE					
85	6105004043	16320 S WESTERN AVE	1	15	5	11	31
	6105004046	1735 W GARDENA BLVD					

Site ID	APN	Address	Acres	Lower Income Units	Moderate Income Units	Above Moderate Income Units	Total Units
86	6105001002	16520 S WESTERN AVE	0.6	8	3	6	17
	6105001003	16516 S WESTERN AVE					
	6105001001	16522 S WESTERN AVE					
	6105001010	1747 W 166TH ST					
	6105001030	16510 S WESTERN AVE					
87	6106003003	16816 S WESTERN AVE	1.3	19	6	14	39
	6106003004	16820 S WESTERN AVE					
	6106003028	16822 S WESTERN AVE					
	6106003030	16826 S WESTERN AVE					
	6106003026	16924 S WESTERN AVE					
	6106003034	16910 S WESTERN AVE					
88	6106009001	17014 S WESTERN AVE	2.9	43	13	30	86
	6106009014	17018 S WESTERN AVE					
	6106009015	17000 S WESTERN AVE					
89	6106009008	17124 S WESTERN AVE	0.8	13	4	9	26
	6106009009	17128 S WESTERN AVE					
106	6106021051	1651 W 182ND ST	0.3	4	1	3	8
107	6106020043	--	0.1	2	1	1	4
114	6106020038	1725 W 182ND ST	0.3	4	1	3	8
	6106020040	1719 W 182ND ST					
115	6106019065	1745 W 182ND ST	0.1	2	1	1	4
121	6106015013	17850 S WESTERN AVE	1.4	22	7	15	44
	6106015057	--					
	6106015058	17810 S WESTERN AVE					
	6106015056	17910 S WESTERN AVE					
	6106015055	17804 S WESTERN AVE					
	6106015059	17820 S WESTERN AVE					
	6106015019	17920 S WESTERN AVE					
	6106015060	17840 S WESTERN AVE					
122	6106019063	--	0.9	15	4	11	30
	6106019048	18016 S WESTERN AVE					
	6106019049	--					
	6106019050	--					
	6106019055	--					
	6106019062	--					
	6106019052	--					
	6106019053	--					
	6106019054	--					
	6106019051	--					

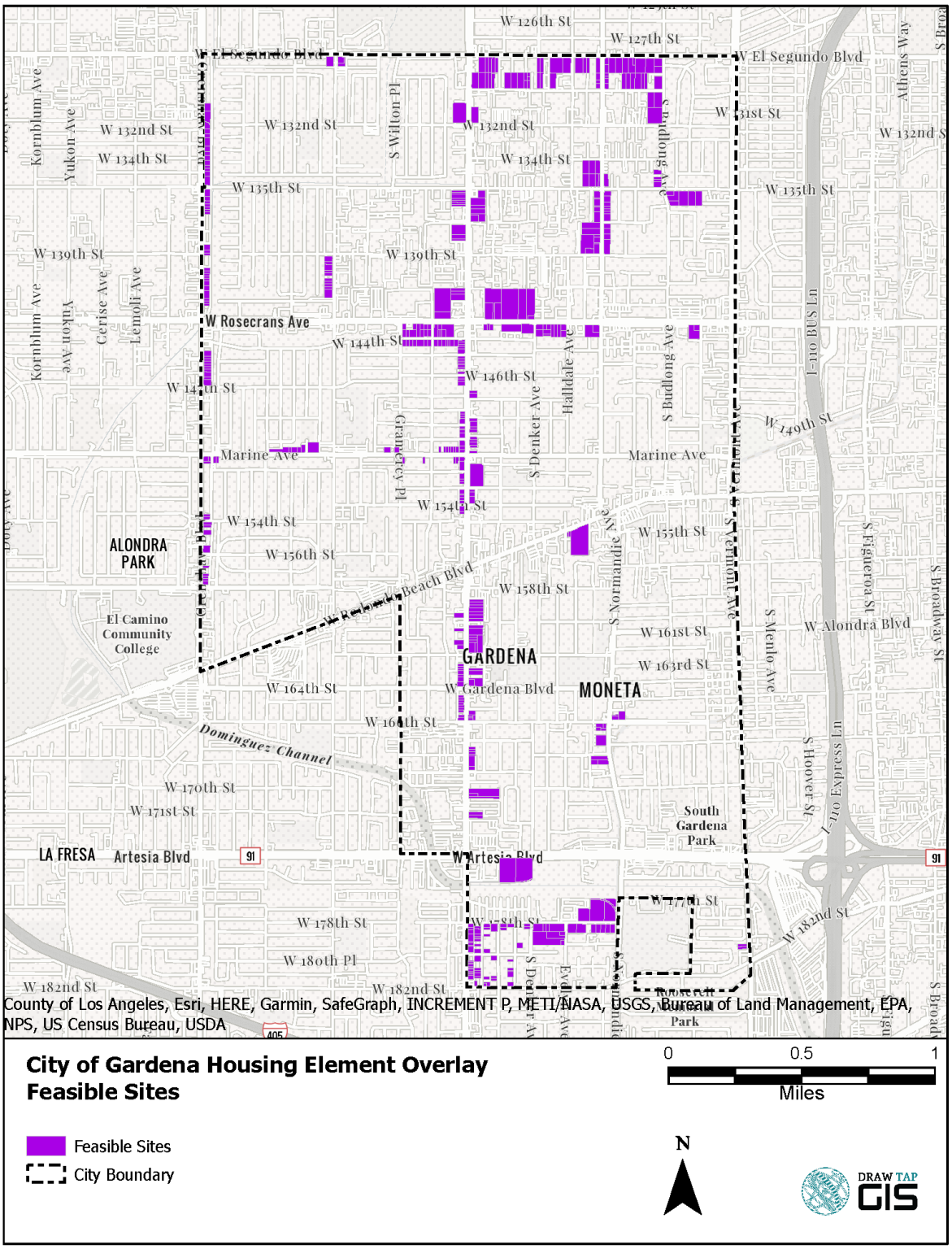
Site ID	APN	Address	Acres	Lower Income Units	Moderate Income Units	Above Moderate Income Units	Total Units
	6106019064	18110 S WESTERN AVE					
O5 Total			**62.3**	**934**	**283**	**660**	**1877**
O6 Overlay							
1	4060004027	13416 CRENSHAW BLVD	4.3	108	32	76	216
	4060004041	--					
	4060004023	13208 CRENSHAW BLVD					
	4060004035	13236 CRENSHAW BLVD					
	4060004038	13400 CRENSHAW BLVD					
	4060004025	13424 CRENSHAW BLVD					
	4060004037	13310 CRENSHAW BLVD					
	4060004010	13204 CRENSHAW BLVD					
	4060004021	13226 CRENSHAW BLVD					
	4060004011	13120 CRENSHAW BLVD					
	4060004022	13214 CRENSHAW BLVD					
	4060004040	13430 CRENSHAW BLVD					
	4060004013	13100 CRENSHAW BLVD					
	4060004012	13112 CRENSHAW BLVD					
2	4059022015	--	1.3	32	9	22	63
	4059022014	13610 CRENSHAW BLVD					
	4059022016	13600 CRENSHAW BLVD					
	4059022018	13514 CRENSHAW BLVD					
	4059022017	13520 CRENSHAW BLVD					
	4059022019	13510 CRENSHAW BLVD					
	4059022024	13500 CRENSHAW BLVD					
3	4059021017	13920 CRENSHAW BLVD	0.5	14	4	9	27
	4059021018	13904 CRENSHAW BLVD					
	4059022026	--					
4	4059021004	14160 CRENSHAW BL.	1.9	46	14	33	93
	4059021005	14150 CRENSHAW BLVD					
	4059021013	14008 CRENSHAW BLVD					
	4059021014	--					
	4059021015	--					
	4059021011	--					
	4059021012	14030 CRENSHAW BLVD					
	4059021003	14160 CRENSHAW BLVD					
	4059021009	14100 CRENSHAW BLVD					
	4059021010	14044 CRENSHAW BLVD					
	4059021021	14124 CRENSHAW BLVD					
10	6102001006	1734 W EL SEGUNDO BLVD	1.8	44	13	31	88

Site ID	APN	Address	Acres	Lower Income Units	Moderate Income Units	Above Moderate Income Units	Total Units
	6102001010	1714 W EL SEGUNDO BLVD					
	6102001007	1726 W EL SEGUNDO BLVD					
	6102001026	1720 W EL SEGUNDO BLVD					
12	6102002005	1564 W EL SEGUNDO BLVD	0.9	22	7	15	44
	6102002006	1556 W EL SEGUNDO BLVD					
13	6102002030	12801 HALLDALE AVE	2.9	72	22	50	144
	6102002028	1530 W EL SEGUNDO BLVD					
14	6102003005	1428 W EL SEGUNDO BLVD	2	49	15	35	99
	6102003004	1434 W EL SEGUNDO BLVD					
	6102003024	1440 W EL SEGUNDO BLVD					
15	6102003007	12829 S NORMANDIE AVE	0.6	15	4	11	30
16	6115001006	1254 W EL SEGUNDO BLVD	6.8	169	51	119	339
	6115001032	1342 W EL SEGUNDO BLVD					
	6115001033	12816 S NORMANDIE AVE					
	6115001005	1254 W EL SEGUNDO BLVD					
	6115001003	1320 W EL SEGUNDO BLVD					
	6115001004	1308 W EL SEGUNDO BLVD					
	6115001002	1332 W EL SEGUNDO BLVD					
	6115001800	1218 W EL SEGUNDO BLVD					
	6115001034	1246 W EL SEGUNDO BLVD					
21	4062004041	14401 S WESTERN AVE	0.1	4	1	2	7
31	4061027004	14101 S WESTERN AVE	6.2	154	46	108	308
	4061027005	14107 S WESTERN AVE					
	4061027006	14119 S WESTERN AVE					
	4061027013	1859 W ROSECRANS AVE					
	4061027014	1835 W ROSECRANS AVE					
32	4062003027	1930 W ROSECRANS AVE	3	75	23	52	150
	4062003024	1954 W ROSECRANS AVE					
	4062003029	1916 W ROSECRANS AVE					
	4062003030	1910 W ROSECRANS AVE					
	4062003031	1900 W ROSECRANS AVE					
	4062003036	1901 W 144TH ST					
	4062003008	1957 W 144TH ST					
	4062003037	1119 W 144TH PL					
	4062003021	1919 W 144TH ST					
	4062003023	--					
	4062003028	1922 W ROSECRANS AVE					
	4062003022	1939 W 144TH ST					
33	4062004032	1847 W 144TH ST	2.4	59	18	41	118

Site ID	APN	Address	Acres	Lower Income Units	Moderate Income Units	Above Moderate Income Units	Total Units
	4062004033	--					
	4062004036	1850 W ROSECRANS AVE					
	4062004008	1839 W 144TH ST					
	4062004082	14314 S ST ANDREWS PL					
	4062004079	1830 W ROSECRANS AVE					
34	6102014039	1601 W ROSECRANS AVE	13.9	348	104	243	695
	6102014048	1701 W ROSECRANS AVE					
	6102014069	1735 W ROSECRANS AVE					
	6102014038	1611 W ROSECRANS AVE					
	6102014040	1617 W ROSECRANS AVE					
	6102014046	1725 W ROSECRANS AVE					
	6102014041	1639 W ROSECRANS AVE					
35	6103002034	--	0.6	14	4	10	28
	6103002035	1718 W ROSECRANS AVE					
	6103002033	1732 W ROSECRANS AVE					
36	6103004021	1600 W ROSECRANS AVE	2.4	60	18	42	120
	6103004037	1650 W ROSECRANS AVE					
37	6103005028	--	3.4	85	26	60	171
	6103005027	--					
	6103005058	1536 W ROSECRANS AVE					
	6103005057	--					
	6103005026	1536 W ROSECRANS AVE					
	6103005029	1510 W ROSECRANS AVE					
	6103005051	1522 W ROSECRANS AVE					
	6103005052	1520 W ROSECRANS AVE					
	6103005054	14315 HALLDALE AVE					
	6103005025	1560 W ROSECRANS AVE					
	6103005053	1518 W ROSECRANS AVE					
	6103005034	1560 W ROSECRANS AVE					
38	6103009057	1408 W ROSECRANS AVE	1.6	41	12	29	82
	6103009063	14315 S NORMANDIE AVE					
40	4062003005	1940 W 144TH ST	1.8	45	13	32	90
	4062003006	1946 W 144TH ST					
	4062003007	14404 GRAMERCY PL					
	4062003002	1910 W 144TH ST					
	4062003004	1934 W 144TH ST					
	4062003001	1900 W 144TH ST					
	4062003003	1920 W 144TH ST					
41	4062004029	1830 W 144TH ST	2.2	56	17	40	113

Site ID	APN	Address	Acres	Lower Income Units	Moderate Income Units	Above Moderate Income Units	Total Units
	4062004081	1834 W 144TH ST					
	4062004022	--					
	4062004021	--					
	4062004023	14415 S WESTERN AVE					
	4062004009	1858 W 144TH ST					
	4062004026	1848 W 144TH ST					
	4062004031	1818 W 144TH ST					
	4062004027	1838 W 144TH ST					
	4062004030	1828 W 144TH ST					
	4062004083	14421 S WESTERN AVE					
90	6106013049	1610 W ARTESIA BLVD	7.6	190	57	133	380
	6106013053	1650 W ARTESIA BLVD					
O6 Total			**68.2**	**1,702**	**510**	**1,193**	**3,405**

Figure C-1: Housing Overlay Sites Inventory



Appendix D: Evaluation of Accomplishments under the 2014-2021 Housing Element

As part of the housing element update, jurisdictions must evaluate the accomplishments made under their adopted housing elements. Wherever possible, these results should be quantified, but may be qualitative where necessary. The purpose of this analysis is to critically evaluate the success of the current programs to aid in the development of an effective five- year strategy for the updated element.

This section reviews the City's progress to date in implementing housing programs set forth in the 2014-2021 Housing Element and the continued appropriateness for inclusion in the 2021-2029 Housing Element. Table D-1, below, summarizes the City's housing program accomplishments.

Effectiveness in Meeting Special Needs

The City of Gardena assists its special needs residents primarily through housing rehabilitation assistance and supportive services. These include its Handyworker Fix Up Residential Rebate, and Mobile Home Rehabilitation programs. The Rent Mediation Board also assisted many of the City's special needs residents. Furthermore, the City expanded its senior housing inventory by facilitating the development of Spring Park Senior Housing. However, with limited CDBG funds and elimination of redevelopment, the City was not able to fully achieve its objectives. For the 2021-2029 Housing Element planning period, the City will proactively pursue funding to expand its housing program capacity.

Table D-1: Evaluation of Housing Program Accomplishments (2014-2021)

	Housing Programs	Program Objectives	Accomplishments
Maintenance and Preservation of the Housing Stock			
1	**Housing Rehabilitation Program** ▪ Handy-Worker Fix Up ▪ Residential Rebate ▪ Multi-Family Rehabilitation and Code Correction ▪ Owner-Occupied Rehabilitation Loan Program (OORP) ▪ Mobile Home Rehabilitation Loan Program	▪ Provide assistance to 179 households annually (approximately 550 households throughout the planning period) through the Handy-Worker Fix Up, Residential Rebate, and Multi-Family Rehabilitation and Code Correction Programs. ▪ Provide 15 deferred loans over two years through OORP and the Mobile Home Rehabilitation Loan Program.	***Progress:*** Overall, between 2014 and 2019 the City provided assistance to a total of 346 residents, including 23 rebates and 20 loans. ▪ Handy-Worker Fix Up – 147 households received assistance during the planning period. In 2019, 21 extremely low income households, 3 very low income households, and 4 low income households were assisted. ▪ Residential Rebate – 42 households received rebates during the planning period. ▪ MF Rehab. and Code Correction – 156 low to extremely low income households received assistance during the planning period. Program funding was not available in 2019. ▪ Owner-Occupied Rehabilitation Loan Program – A total of 21 households received loans under the State HOME and CalHome Programs since 2014. The City applied for new HCD grant to assist low-income families with rehabilitation and received the Standard Agreement (SA) in 2015. One loan payoff was received in 2015 and was used in 2016 to fund an additional rehabilitation loan applicant. No households were assisted through this program in 2018 or 2019. ▪ Mobile Home Rehabilitation Loan Program – The City continues to assist mobile home households throughout the City. ***Effectiveness***: Assistance has been slower than anticipated, but CDBG funds will continue to be available. City met its OORP objective.

Table D-1: Evaluation of Housing Program Accomplishments (2014-2021)

	Housing Programs	Program Objectives	Accomplishments
			Appropriateness: Program implementation remains appropriate for the Housing Element update, but is updated to reflect changes in funding availability.
2	**Section 8 Rental Assistance**	▪ Continue to provide updated information on the Section 8 program through the City's website and making it available at the City's CDC counter.	***Progress:*** LACDA (Los Angeles County Development Authority's predecessor agencies) provided rental assistance to Gardena households with incomes up to 50 percent AMI. Currently, approximately 512 households in Gardena are receiving Section 8 Housing Choice Vouchers. ***Effectiveness***: The HCV program is the key program that benefits extremely low income households and those with special needs. ***Appropriateness:*** This program is included in the 2021-2029 Housing Element.
3	**Preservation of At-Risk Units**	▪ Continue to monitor and gauge at-risk units' activities.	***Progress:*** The following assisted rental housing projects are located in the City: ▪ Gardena Valley Towers – Contract expires in 2038 but is contingent upon the continued renewal of Section 8 funding. The risk of conversion from affordable to market rate is low due to its non-profit status. ▪ South Park Manor – Contract expires in 2026 but is contingent upon the continued renewal of Section 8 funding. The risk of conversion from affordable to market rate is low due to its non-profit status. ▪ Meadowlark Manor – Contract expires in 2031 but is contingent upon the continued renewal of Section 8 funding. The risk of conversion from affordable to market rate is low due to its non-profit status. ▪ Spring Park Senior Villa – Contract expires 2065. Project was funded with HOME funds.

Table D-1: Evaluation of Housing Program Accomplishments (2014-2021)

	Housing Programs	Program Objectives	Accomplishments
			Effectiveness: The City has monitored at-risk activities to maintain an adequate affordable housing inventory. ***Appropriateness:*** Program implementation is appropriate for the Housing Element Update.
Provision of a Variety of Housing Types			
4	**Senior Housing Development**	▪ Support applications for federal and state funding for quality senior developments by providing the information on the City's website and making it available at the City's CDD counter.	***Progress:*** The City provides information about Senior Housing projects and development on their website. Additional information is provided by Community Development and Economic Development staff on an ongoing basis by phone, website, marketing, and at the Community Development counter. Housing staff continues to support applications for federal and state funding for quality senior developments. The Spring Park Senior Housing project, funded by the State HOME project, was completed in 2015 and is now fully occupied. ***Effectiveness***: Program objectives were achieved. The City continues to encourage senior housing developments through the provision of applicable information. ***Appropriateness***: Continue to provide information on the City's website.
5	**Homeownership Programs**	▪ Continue to provide information on financing funds available through ICLFA. ▪ Mail information packages to local financial institutions and facilitate workshops on an annual basis.	***Progress:*** In 2015, the City developed a mailing packet that was sent to local lending entities to encourage the use of ICLFA primary funds. In 2014, the City provided information on ICLFA financing funds on their website. ***Effectiveness***: This program is no longer available. ***Appropriateness:*** The 2021-2029 Housing Element includes other homebuyer assistance resources available to the City.

Table D-1: Evaluation of Housing Program Accomplishments (2014-2021)

	Housing Programs	Program Objectives	Accomplishments
Provision of Adequate Sites			
6	**Specific Plans**	▪ Determine the feasibility of specific plan sites along Rosecrans Avenue.	***Progress:*** The City did not develop any specific plans at the identified locations, but has developed three other specific plans in alternate locations. ***Effectiveness***: The City continues to utilize specific plans as a tool for new residential development. ***Appropriateness:*** The 2021-2029 Housing Element proposes to establish a Housing Overlay to facilitate residential development and will process a specific plan application on the identified sites if submitted. The program is no longer required.
7	**Gardena Boulevard**	▪ Develop 20 new multi-family units along Gardena Boulevard.	***Progress:*** During the last planning period (2008-2014), the City conducted a study to identify mixed uses in the C-R Zone. The City also discussed potential residential mixed use development along Gardena Boulevard with property owners. Since 2013, nine new multi-family units have been developed on Gardena Boulevard. ***Effectiveness***: Development along Gardena Boulevard was slower than anticipated. A total of nine multi-family units have been developed throughout the planning period. ***Appropriateness:*** The 2021-2029 Housing Element proposes to establish a Housing Overlay to facilitate residential development.
8	**Development on Vacant and Underutilized Residential Sites**	▪ Use HOME funds to partner with for-profit and non-profit developers to construction new affordable housing on vacant and underutilized properties within the	***Progress:*** City staff met with Bank of America and prepared a list of profit and non-profit developers in 2014. Community Development staff continues outreach to developers and non-profit agencies to develop strategies and programs for construction of more affordable housing.

Table D-1: Evaluation of Housing Program Accomplishments (2014-2021)

	Housing Programs	Program Objectives	Accomplishments
		City. ▪ Work with CHDOs to facilitate the development of new affordable housing units. ▪ Update the vacant land inventory using the City's GIS system.	In 2016, Spring Park Senior Villa, a 37-unit Senior's complex, was completed in partnership with WASET, Inc. a non-profit organization. City staff continues to seek opportunities to partner with non-profits and non-profit affordable housing developers. The City will update their sites inventory as a part of the 6th cycle Housing Element update. ***Effectiveness***: The Program objectives have been achieved. ***Appropriateness:*** The 2021-2029 Housing Element includes a new inventory of sites and a monitoring procedure to maintain adequate sites for housing.
9	**Brownfield Program**	▪ Market Brownfield opportunity sites with information packets. ▪ Continue Community outreach efforts through the Brownfield Community Relations Committee (BCRC).	***Progress:*** The City of Gardena no longer has an actively funded Brownfields Program; however, the final objectives have been achieved. The City has an active and aggressive marketing program for its Brownfield sites; ongoing marketing of the sites occurs regularly. The BCRC no longer meets on a regular basis. The City provides ongoing outreach to the community through FACT Sheets and postings to Economic Development website. ***Effectiveness***: The City has successfully implemented the Brownfield Program and continues to provide information to the community and the opportunities cleaning up contaminated site for future development. ***Appropriateness:*** Continue to implementation Program Objectives.
10	**Second Unit Ordinance**	▪ Continue to provide an information packet on second-unit developments, as well as other affordable housing information, at	***Progress:*** The City has continually amended the Municipal Code to keep in compliance with State law regarding accessory dwelling units. The City also provided an informational packet on second- unit developments and

Table D-1: Evaluation of Housing Program Accomplishments (2014-2021)

	Housing Programs	Program Objectives	Accomplishments
		the CDD counter and on the City's website.	continues to provide affordable housing information at the CDD counter and on their website. ***Effectiveness***: The Program objectives have been achieved. ***Appropriateness:*** The 2021-2029 Housing Element includes a new Accessory Dwelling Units (ADU) program to facilitate the development of ADUs and second units.
11	**Single Room Occupancy**	▪ Maintain a list of existing hotels that are candidates for conversion. ▪ Review SRO conversion applications on an annual basis.	***Progress:*** The City amended the Municipal Code to permit SROs in the M-1 zone with a CUP in 2014. Ongoing maintenance of list occurred throughout the planning period. No SRO conversion applications were received during the planning period. ***Effectiveness***: The list was maintained throughout the planning period. To date, no SRO conversion application have been received by the City. ***Appropriateness:*** The City will facilitate a variety of housing options in the City, but SRO is not separately identified as a program in the 2021-2029 Housing Element.
12	**Transitional and Supportive Housing in Mixed Use Overly Zone**	▪ Amend the MU zone (Municipal Code Section 18.19) to list transitional housing and supportive housing as permitted uses, in compliance with SB 2.	***Progress:*** The City amended the Municipal Code in 2019 to list transitional housing and supportive housing as permitted uses, in compliance with SB 2. ***Effectiveness***: The Program objectives have been achieved. ***Appropriateness:*** The 2021-2029 Housing Element includes a program to make Zoning Code amendments to comply with recent changes in State law for special needs housing.
13	**Adequate Sites Monitoring**	▪ Continue to maintain an up-to-date inventory of adequate housing sites for each income category.	***Progress:*** The City staff continues to monitor the sites inventory regularly. ***Effectiveness***: This program is ongoing.

Table D-1: Evaluation of Housing Program Accomplishments (2014-2021)

	Housing Programs	Program Objectives	Accomplishments
		▪ Continue to implement a formal ongoing procedure to evaluate identified capacity and identify additional sites as necessary. ▪ Continue to perform an annual evaluation to determine whether sites are being utilized for residential development and monitor the effectiveness of programs and incentives.	***Appropriateness:*** The 2021-2029 Housing Element includes a program to monitor adequate sites pursuant to SB166.
14	**Opportunity Sites Listing and Outreach**	▪ Continue maintaining an updated listing of opportunity sites. ▪ Initiate contact with South Bay Board of Realtors about development opportunities involving lot consolidation.	***Progress:*** All but two of the five previously vacant residential sites have been developed into residential housing. The City will explore development opportunities with other affordable housing developers for possible zoning for other residential sites. Opportunity Sites were identified in 2016 and a process for maintaining their visibility has been in process. The City contacted the South Bay Board of Realtors to discuss lot consolidation in 2014. ***Effectiveness***: The Program objectives have been achieved. The City continues to maintain a list of opportunity sites. ***Appropriateness:*** The City will continue to maintain a list of opportunity sites. This Program will be modified and is included in the Housing Element update.
15	**Non-profit Development Partnership**	▪ Hold one workshop annually.	***Progress:*** A workshop was held in 2014 with Congresswoman Waters and other financial institutions regarding financing for Affordable Housing Projects. A Planning and Development Forum was held on November 15, 2018.

Table D-1: Evaluation of Housing Program Accomplishments (2014-2021)

	Housing Programs	Program Objectives	Accomplishments
			Effectiveness: The City held two workshops during the planning period. ***Appropriateness:*** The City will continue to seek non-profit development partnerships and facilitate workshops. This Program will be modified and is included in the Housing Element update.
Equal Housing Opportunity			
16	**Rent Mediation Board**	▪ Continue providing rent mediation/arbitration assistance to renters in disputes with landlords. ▪ Continue conducting the annual survey of rental housing units.	***Progress:*** The City provided rent mediation and arbitration assistance to renters and landlords and conducted an annual survey of rental units throughout the planning period. The Rent Mediation Board considered 131 cases between 2014 and 2019, 50 of which were settled, 46 were resolved, 34 were closed or cancelled, and 22 were denied. Rental rate reports were conducted monthly by the Rent Mediation Board-members. ***Effectiveness***: The Program objectives have been achieved. ***Appropriateness:*** The City will continue providing rent mediation/arbitration assistance and conducting surveys of rental housing units. This Program will be included in the Housing Element update.
17	**Fair Housing Program**	▪ Continue contracting with the Fair Housing Foundation to assure City residents have equal access to housing.	***Progress:*** The City contracted with the Fair Housing Foundation (FHF), a non-profit housing corporation, throughout the planning period to serve as Fair Housing Administrator for fair housing services. FHF provided educational, training, and enforcement programs to City residents, tenants, housing providers, home seekers and those in the housing industry. Among residents, FHF served predominantly low and very low-income households and

Table D-1: Evaluation of Housing Program Accomplishments (2014-2021)

	Housing Programs	Program Objectives	Accomplishments
			individuals. FHF provided written materials in English, Spanish, Khmer, Korean and Vietnamese and contracted with Certified Languages International for real time interpreting. It also made specific outreach efforts to immigrant populations in low-income neighborhoods to assist in informing and organizing such populations. The City has maintained its website as a means of communicating fair housing services information to community residents, landlords, and lenders. ***Effectiveness***: The Program objectives have been achieved. ***Appropriateness:*** The Fair Housing Program provides a valuable service to residents in Gardena and remains appropriate for inclusion in the Housing Element Update.
18	**Rental Assistance**	▪ Continue to promote diversity through affirmatively marketing of the availability of Section 8 Rental Certificates and the availability of Section 202 units.	***Progress:*** Most rental assistance provided to Gardena residents is administered by the LA County Development Authority (LACDA). The City conducted periodic availability surveys throughout the planning period and found that the average waiting list of applicants was approximately 150. Inquiries regarding availability of affordable and senior housing are referred to the LACDA and to the management at one local senior complex. On an as-needed basis, the Human Services Bureau for the City of Gardena also assists with counseling and rental assistance referrals. All of the City's Housing Programs use affirmative marketing as directed by HUD and the State HCD and does outreach to those ethnic groups that are less likely to seek assistance. Marketing materials are provided in Spanish and English. The City of Gardena provides outreach to homeless residents and local homeless gathering places (e.g.,

Table D-1: Evaluation of Housing Program Accomplishments (2014-2021)

	Housing Programs	Program Objectives	Accomplishments
			community centers and libraries) and through the City of Gardena Social Services Staff. ***Effectiveness***: See the Progress and Effectiveness of Housing Program 2 (Section 8 Rental Assistance) and Housing Program 4 (Senior Housing Development). ***Appropriateness:*** Rental assistance information to be continually updated and the Program remains appropriate for the Housing Element Update.
19	**Accessible Housing**	▪ Provide rehabilitation loans/grants to income- qualified households for access improvements.	***Progress:*** The City of Gardena continues to provide funding for access services through its CDBG Handy worker Fix Up Program. Out of the 108 households assisted from 2015 through 2019, 51 grants provided direct funding for access improvements (See Program 1 under Rehabilitation Assistance). ***Effectiveness***: See the Progress and Effectiveness of Housing Program 1 (Housing Rehabilitation Program). ***Appropriateness:*** The City will continue to provide assistance to income- qualified individuals when funds are available. However, compliance with building codes is not included as a separate program in the Housing Element.
20	**Continuum of Care – Homeless Assistance**	▪ Continue participation in the County's Continuum of Care and allocate CDBG monies to fund the City's Emergency Services Program.	***Progress:*** Staff researched potential funding sources to allow City to continue to provide services, counseling, and referrals to agencies for shelter for the homeless. In addition to these efforts, the City through its Community Development Department participated in the annual update of the Countywide homeless population count program and worked in partnership with Los Angeles County Homeless Services Authority (LAHSA), the South Bay Cities Council of Governments, and local nonprofits and volunteer

Table D-1: Evaluation of Housing Program Accomplishments (2014-2021)

	Housing Programs	Program Objectives	Accomplishments
			organizations to coordinate the provision of temporary housing for the Gardena homeless population and access to information about available affordable housing. The Gardena Police Department provided referrals to the community's homeless population for Mental Health assistance on an as-needed basis. ***Effectiveness***: The City continues to direct efforts towards assisting the homeless. ***Appropriateness:*** This Program remains appropriate for the Housing Element Update.
21	**Outreach for Persons with Developmental Disabilities**	▪ Develop an outreach program providing information on housing options for persons with developmental disabilities through a variety of traditional and electronic media, as well as through face-to-face interaction.	***Progress:*** The City provides information on housing options for a variety of special needs populations including those with developmental disabilities. ***Effectiveness:*** The City continues to outreach to all residents, especially those with special needs. ***Continued Appropriateness:*** The 2021-2029 Housing Element includes enhanced outreach activities.

Appendix E: Affirmatively Furthering Fair Housing (AFFH)

A.Introduction and Overview of AB 686

In 2017, Assembly Bill 686 (AB 686) introduced an obligation to affirmatively further fair housing (AFFH) into California state law. AB 686 defined "affirmatively further fair housing" to mean "taking meaningful actions, in addition to combat discrimination, that overcome patterns of segregation and foster inclusive communities free from barriers that restrict access to opportunity" for persons of color, persons with disabilities, and other protected classes. The Bill added an assessment of fair housing to the Housing Element which includes the following components:

- A summary of fair housing issues and assessment of the jurisdiction's fair housing enforcement and outreach capacity;
- An analysis of segregation patterns, racially/ethnically concentrated areas of poverty, disparities in access to opportunities, and disproportionate housing needs;
- An assessment of contributing factors; and
- An identification of fair housing goals and actions.

The AFFH rule was originally a federal requirement applicable to entitlement jurisdictions, those with populations over 50,000 that can receive HUD Community Planning and Development (CPD) funds directly from HUD. Before the 2016 federal rule was repealed in 2019, entitlement jurisdictions were required to prepare an Assessment of Fair Housing (AFH) or Analysis of Impediments to Fair Housing Choice (AI). AB 686 states that jurisdictions can incorporate findings from either report into the Housing Element.

This analysis of fair housing issues in Gardena relies on the 2016 City of Gardena Analysis of Impediments to Fair Housing Choice (2016 AI), 2018 Analysis of Impediments to Fair Housing Choice (2018 AI) prepared by the Los Angeles Community Development Authority (LACDA), California Department of Housing and Community Development (HCD) AFFH Data Viewer mapping tool, 2015-2019 American Community Survey (ACS), HUD Comprehensive Housing Affordability Strategy (CHAS) data, HUD AFFH data, and additional local sources of information.

B.Fair Housing Issues

Fair Housing Enforcement and Outreach

Federal fair housing laws prohibit discrimination based on: race, color, religion, national origin, sex/gender, handicap/disability, and familial status. Specific federal legislation and court rulings include:

- **The Civil Rights Act of 1866-** covers only race and was the first legislation of its kind
- **The Federal Fair Housing Act 1968-** covers refusal to rent, sell, or finance
- **The Fair Housing Amendment Act of 1988-** added the protected classes of handicap and familial status
- **The Americans with Disabilities Act (ADA)-** covers public accommodations in both businesses and in multi-family housing developments
- **Shelly v. Kramer 1948-** made it unconstitutional to use deed restrictions to exclude individuals from housing
- **Jones v. Mayer 1968-** made restrictive covenants illegal and unenforceable

California state fair housing laws protect the same classes as the federal laws with the addition of marital status, ancestry, source of income, sexual orientation, and arbitrary discrimination. Specific State legislation and regulations include:

- **Unruh Civil Rights Act-** extends to businesses and covers age and arbitrary discrimination
- **California Fair Employment and Housing Act (Rumford Act)-** covers the area of employment and housing, with the exception of single-family houses with no more than one roomer/boarder
- **California Civil Code Section 53-** takes measures against restrictive covenants
- **Department of Real Estate Commissioner's Regulations 2780-2782-** defines disciplinary actions for discrimination, prohibits panic selling and affirms the broker's duty to supervise
- **Business and Professions Code-** covers people who hold licenses, including real estate agents, brokers, and loan officers.

The City has committed to complying with applicable federal and State fair housing laws to ensure that housing is available to all persons without regard to race, color, religion, national origin, disability, familial status, or sex as outlined in the City's 2016 Analysis of Impediments to Fair Housing Choice (2016 AI). Further, the Los Angeles County Development Authority (LACDA) prohibits discrimination in any aspect of housing on the basis of race, color, religion, national origin, disability, familial status, or sex.

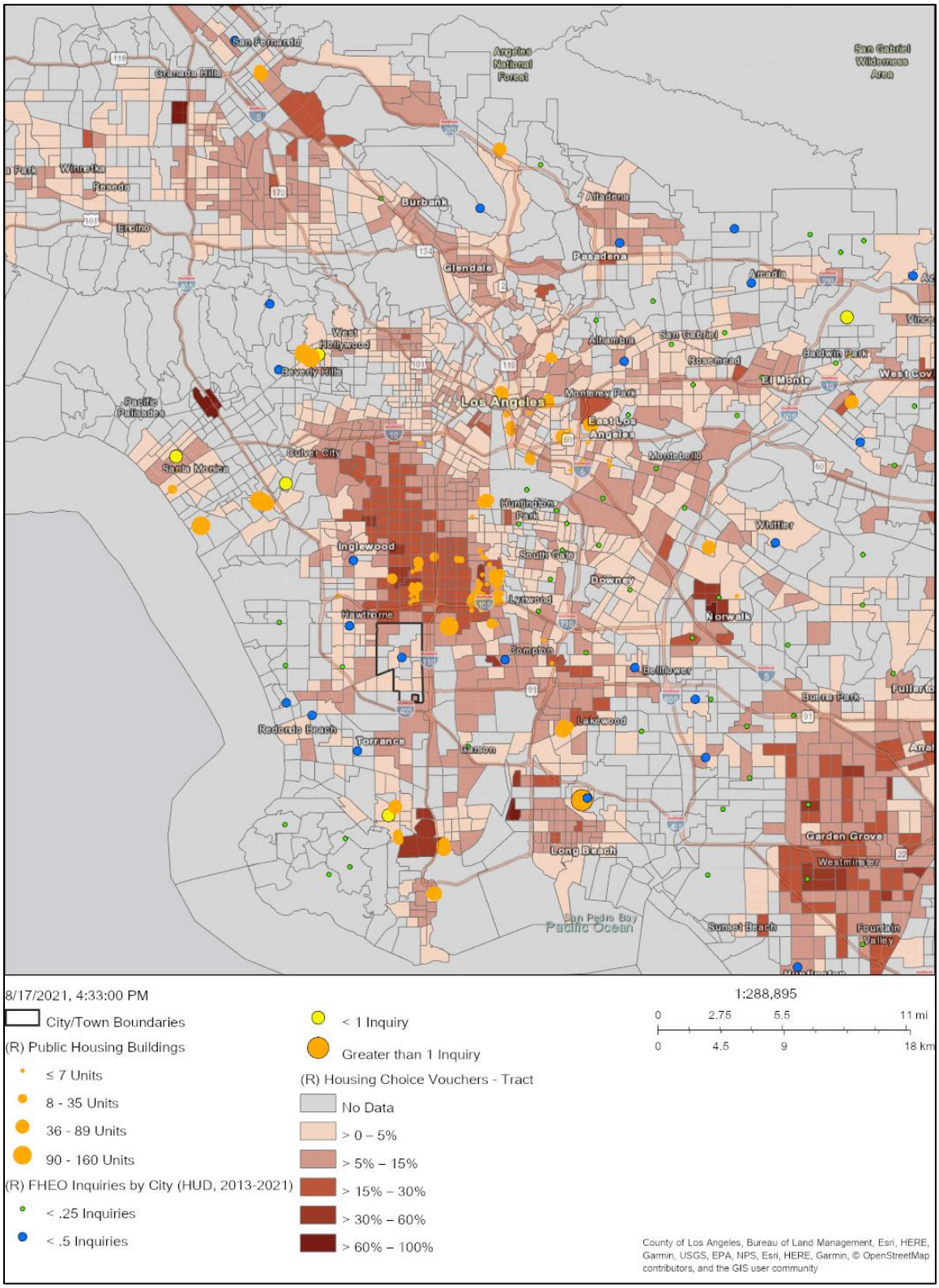
Regional Trend. According to HUD's Office of Fair Housing and Equal Opportunity (FHEO) records, 130 housing discrimination cases were filed in Los Angeles County in 2020, compared to 291 in 2010. In 2020, a majority of cases were related to disability (66%). Another 21 percent of cases were related to racial bias. The percent of cases related to disability has increased significantly since 2010, when only 36 percent of cases reported a disability bias. Public housing buildings, FHEO inquires by City and housing choice voucher (HCV) recipients by tract are shown in Figure E-1. HCVs are most concentrated in the area north of Gardena, near Inglewood, the City of Los Angeles, and in the adjacent unincorporated County areas. Public housing buildings are concentrated in the same area. However, there are many public housing buildings scattered throughout the County.

Local Trend. Under contract with the City, the Fair Housing Foundation (FHF) provides fair housing services to Gardena residents. The FHF provides the following fair housing related services: discrimination complaint intake and investigation; fair housing training, outreach and education, general housing (landlord/tenant) counseling and mediation; enforcement and impact litigation. The FHF also conducts fair housing testing in Gardena and throughout Los Angeles. The following fair housing tests were conducted in Gardena:

- Income (FY 2003-2004): Six tests, all resulting in sustained allegations;
- Familial Status (FY 2004-2005): Six tests, three showed inconclusive evidence, three showed no evidence;
- Disability (relating to companion animals) (FY 2007-2008): Two tests, one showed inconclusive evidence, one showed no evidence;
- Race (FY 2008-2009): Five tests, three showed inconclusive evidence, one showed no evidence, and one showed sustained allegations.

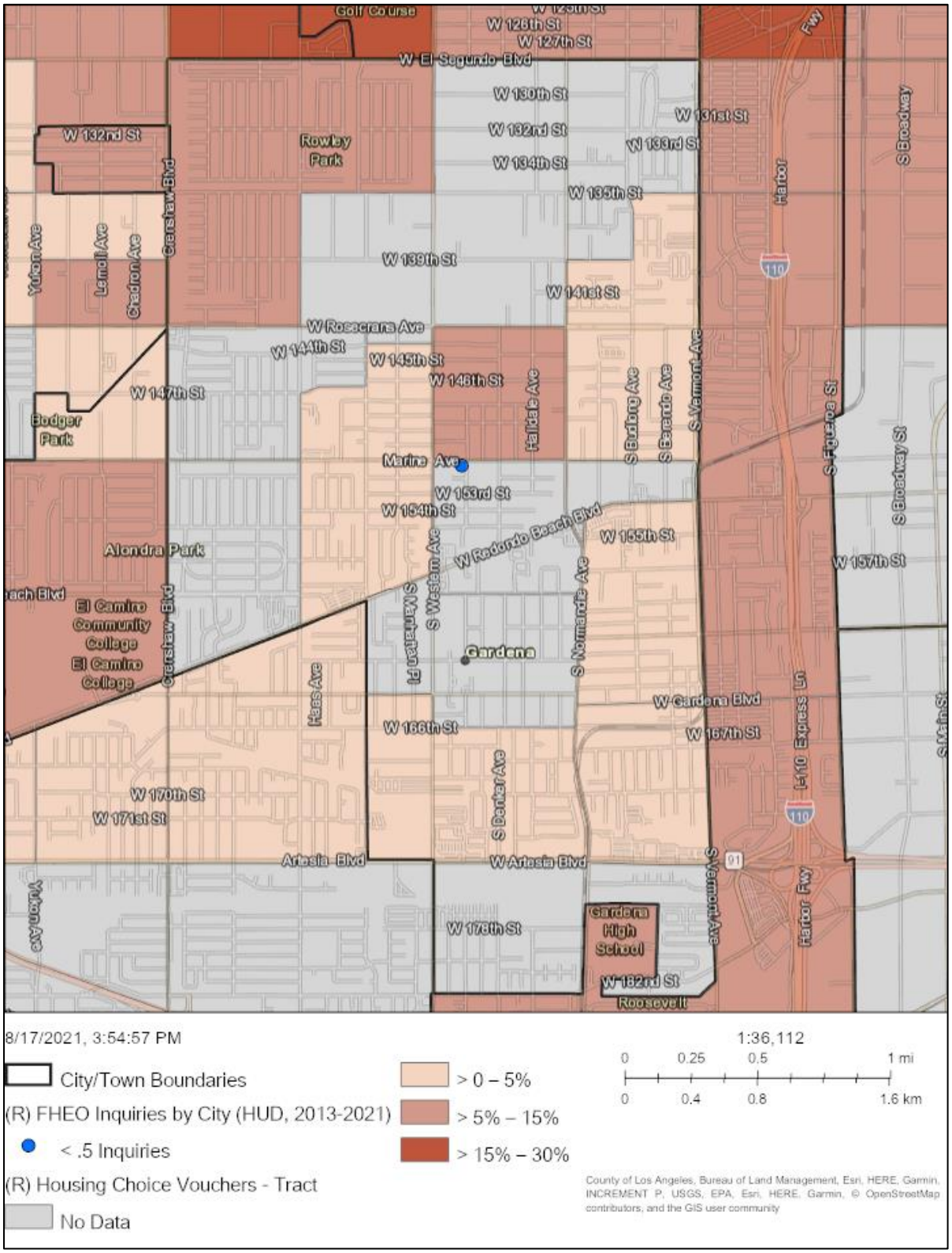
HUD reported that Gardena received a total of 26 FHEO inquiries between January 2013 and March 2021. Of the 26 inquiries, three were related to disability, one race, and one national origin. Total FHEO inquiries in Gardena represent 0.42 inquiries per 1,000 people. The remaining inquiries did not pertain to a specific basis of discrimination. In two tracts, between 5 and 10 percent of all renters receive housing choice vouchers (HCV) and in five tracts, up to 5 percent of renters receive HCVs. To protect the confidentiality of renters receiving HCVs, tracts containing 10 or fewer voucher holders have been omitted from this dataset. Tracts with higher concentrations of renters receiving HCVs are not generally concentrated in one area in the City. FEHO Inquiries and the concentration of HCV recipients by tract are shown in Figure E-2.

Figure E-1: Regional Public Housing Buildings, FHEO Inquiries, and HCVs



Source: HCD Data Viewer, HUD 2013-2021, 2021.

Figure E-2: Public Housing Buildings, FHEO Inquiries, and HCVs



Source: HCD Data Viewer, HUD 2013-2021, 2021.

Integration and Segregation

Race and Ethnicity

Ethnic and racial composition of a region is useful in analyzing housing demand and any related fair housing concerns, as it tends to demonstrate a relationship with other characteristics such as household size, locational preferences and mobility.

Dissimilarity indices can be used to measure the evenness of distribution between two groups in an area. The following shows how HUD views various levels of the index:

- <40: Low Segregation
- 40-54: Moderate Segregation
- >55: High Segregation

The following analysis of racial/ethnic segregation also includes racial/ethnic minority population trends, maps of minority concentrated areas over time, and an analysis of the City's sites inventory as it relates to minority (non-White) concentrated areas.

Regional Trend. As shown in Table E-1, racial/ethnic minority groups make up 73.8 percent of the Los Angeles County population. Nearly half of the Los Angeles County population is Hispanic/Latino (48.5 percent), 26.2 percent of the population is White, 14.4 percent is Asian, and 7.8 percent is Black/African American. Gardena and the adjacent jurisdictions of Carson, Hawthorne, Inglewood, and Lawndale have racial/ethnic minority (non-White) populations exceeding the Countywide average. Of the selected jurisdictions, Carson has the largest racial/ethnic minority population (93 percent), and Torrance has the smallest (62.6 percent).

Table E-1: Racial/Ethnic Composition – L.A. County, Gardena, and Neighboring Cities

	LA County	Gardena	Carson	Hawthorne	Inglewood	Lawndale	Torrance
White	26.2%	9.4%	7.0%	10.3%	4.5%	14.6%	37.4%
Black/ African American	7.8%	22.2%	23.5%	24.1%	39.6%	9.7%	2.6%
American Indian/ Alaska Native	0.2%	0.1%	0.2%	0.2%	0.3%	0.2%	0.4%
Asian	14.4%	24.7%	26.3%	7.5%	2.0%	10.9%	35.6%
Native Hawaiian/ Pacific Islander	0.2%	1.1%	2.6%	0.3%	0.4%	1.0%	0.5%
Some other race	0.3%	0.7%	0.1%	0.5%	0.4%	0.5%	0.3%
Two+ races	2.3%	2.5%	3.0%	2.2%	2.2%	1.6%	4.6%
Hispanic/Latino	48.5%	39.3%	37.3%	54.8%	50.6%	61.5%	18.6%
Source: ACS 2015-2019 (5-Year Estimates).							

As discussed previously, HUD's dissimilarity indices can be used to estimate segregation levels over time. Dissimilarity indices for Los Angeles County are shown in Table E-2. Dissimilarity indices between non-White and White groups indicate that the County has

become increasingly segregated since 1990. Segregation between Black and White communities has decreased, while segregation between Hispanic and Asian/Pacific Islander communities and White communities has increased. According to HUD's thresholds, all White and non-White communities in Los Angeles County are highly segregated.

Table E-2: Racial/Ethnic Dissimilarity Trends – Los Angeles County

	1990	2000	2010	2020
Non-White/White	56.66	56.72	56.55	58.53
Black/White	73.04	67.40	64.99	68.24
Hispanic/White	60.88	63.03	63.35	64.33
Asian or Pacific Islander/White	46.13	48.19	47.62	51.59
Source: U.S. Department of Housing and Urban Development (HUD) Affirmatively Furthering Fair Housing (AFFH) Database, 2020.				

Figure E-3 shows that most areas in Los Angeles County have high concentrations of racial/ethnic minorities. Coastal cities, including Santa Monica and Redondo Beach, and the areas surrounding Beverly Hills, West Hollywood, Burbank, and the Pacific Palisades neighborhood generally have smaller non-White populations. Most block groups in the South Bay, San Gabriel Valley, San Fernando Valley and central Los Angeles areas have majority racial/ethnic minority populations. Gardena's racial/ethnic minority populations are comparable to surrounding jurisdictions. Coastal communities such as Hermosa Beach and Redondo Beach tend to have smaller racial/ethnic minority populations. Communities southeast of Gardena, such as Lakewood, also have fewer racial/ethnic minorities.

Local Trend. According to the 2015-2019 ACS, 90.6 percent of the Gardena population belongs to a racial or ethnic minority group, a slight increase from 90.4 percent during the 2006-2010 ACS. In comparison, only 73.8 percent of Los Angeles County residents belong to a racial or ethnic minority group. The Black/African (22.2 percent), Asian (24.7 percent), and Native Hawaiian/Pacific Islander (1.1 percent) populations make up a larger share of the Gardena population compared to the County. Approximately 39 percent of the population is Hispanic/Latino, less than countywide (see **Table E-1**).

Table E-3 shows the change in racial/ethnic composition in Gardena using the 2006-2010 and 2015-2019 ACS. The racial/ethnic composition in Gardena has remained relatively constant. The White and Asian populations have decreased slightly, while the Hawaiian/Pacific Islander, Hispanic/Latino, and multi-racial populations have grown incrementally.

Table E-3: Change in Racial/Ethnic Composition – Gardena (2010-2019)

Race/Ethnicity	2010		2019	
	Persons	Percent	Persons	Percent
White	5,648	9.6%	5,610	9.4%
Black/African American	13,009	22.2%	13,279	22.2%
American Indian/Alaska Native	74	0.1%	59	0.1%
Asian	16,257	27.7%	14,721	24.7%
Native Hawaiian/Pac. Islander	489	0.8%	664	1.1%
Some other race	318	0.5%	406	0.7%
Two or more races	1,387	2.4%	1,497	2.5%
Hispanic/Latino	21,486	36.6%	23,473	39.3%
Total	58,668	100.0%	59,709	100.0%
Source: 2015-2019 and 2006-2010 ACS (5-Year Estimates).				

Dissimilarity between non-White and White communities in Gardena has worsened since 1990. Dissimilarity between Hispanic/White and Asian or Pacific Islander/White communities has increased, while dissimilarity between Black and White communities has declined. Based on HUD's definition of the various levels of the index, segregation between Hispanic/White and Asian or Pacific Islander/White Gardena residents is low. However, Black/White communities are highly segregated. Compared to the County as a whole, Gardena is less segregated.

Table E-4: Racial/Ethnic Dissimilarity Trends – Gardena

	1990	2000	2010	2020
Non-White/White	22.15	28.95	27.16	30.54
Black/White	59.96	53.30	53.26	54.68
Hispanic/White	20.38	28.94	27.99	33.35
Asian or Pacific Islander/White	22.38	23.68	24.52	27.95
Source: U.S. Department of Housing and Urban Development (HUD) Affirmatively Furthering Fair Housing (AFFH) Database, 2020.				

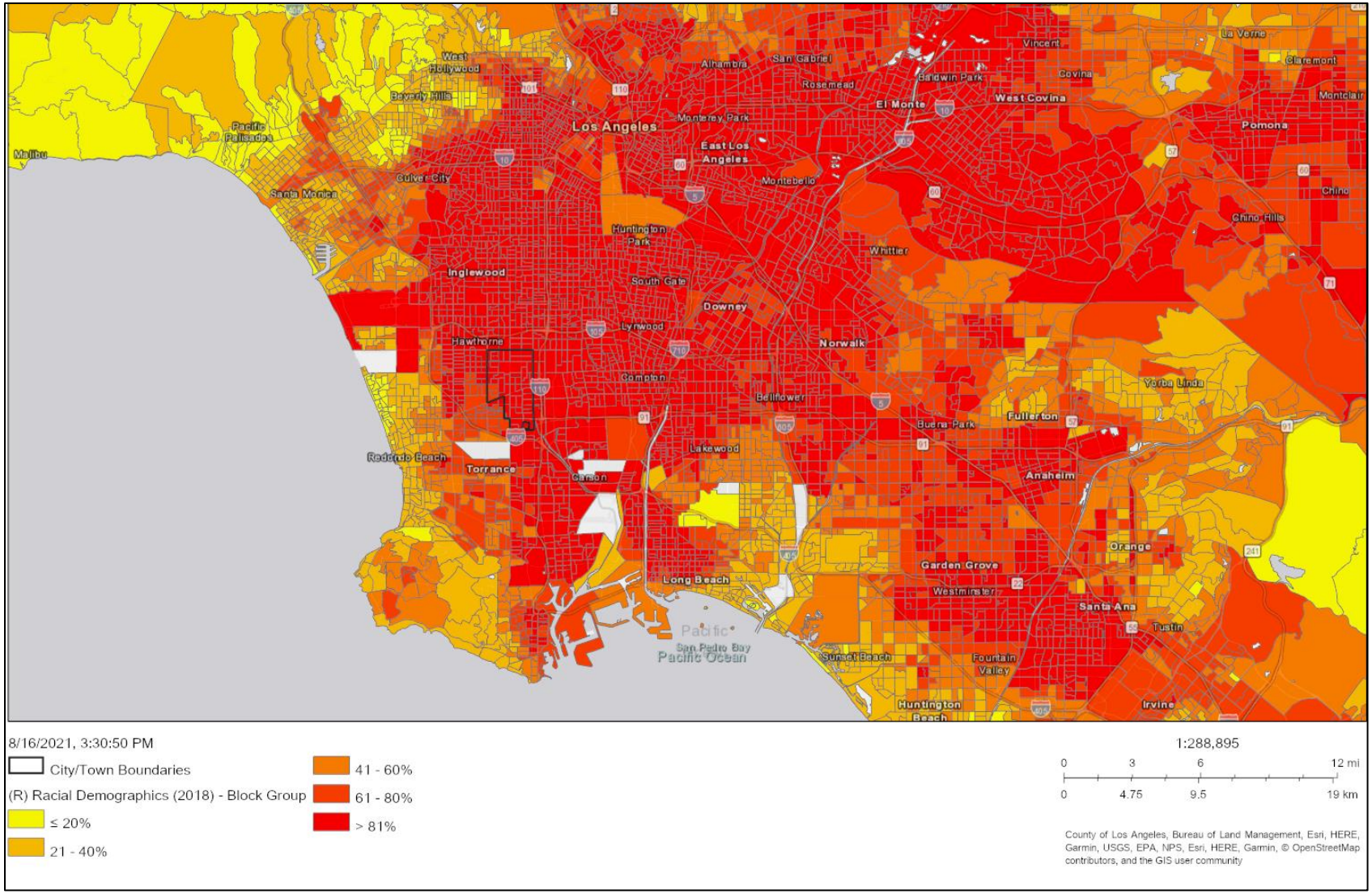
Figure E-4 and Figure E-5 compare racial or ethnic minority concentrations in 2010 and 2018. In nearly all block groups in Gardena, racial/ethnic minorities make up more than 80 percent of the population. Consistent with this trend citywide, there has been an increase in racial/ethnic minority populations in block groups along the northern and western City boundaries since 2010.

Sites Inventory. Figure E-5 also shows the sites inventory used to meet Gardena's 2021-2029 RHNA. The RHNA sites are generally evenly distributed throughout the city. The sites inventory and RHNA is described in depth in Chapter IV, Housing Resources, of this Housing Element. As discussed previously, nearly all Gardena block groups have racial/ethnic minority concentrations exceeding 81 percent. Approximately 98 percent of RHNA units, including 99 percent of lower income units, 96.3 percent of moderate income units, and 98.8 percent of above moderate income units, are in block groups where racial/ethnic minority groups make up more than 81 percent of the population (Table E-5).

Table E-5: Breakdown of RHNA Units by Racial/Ethnic Minority Concentration

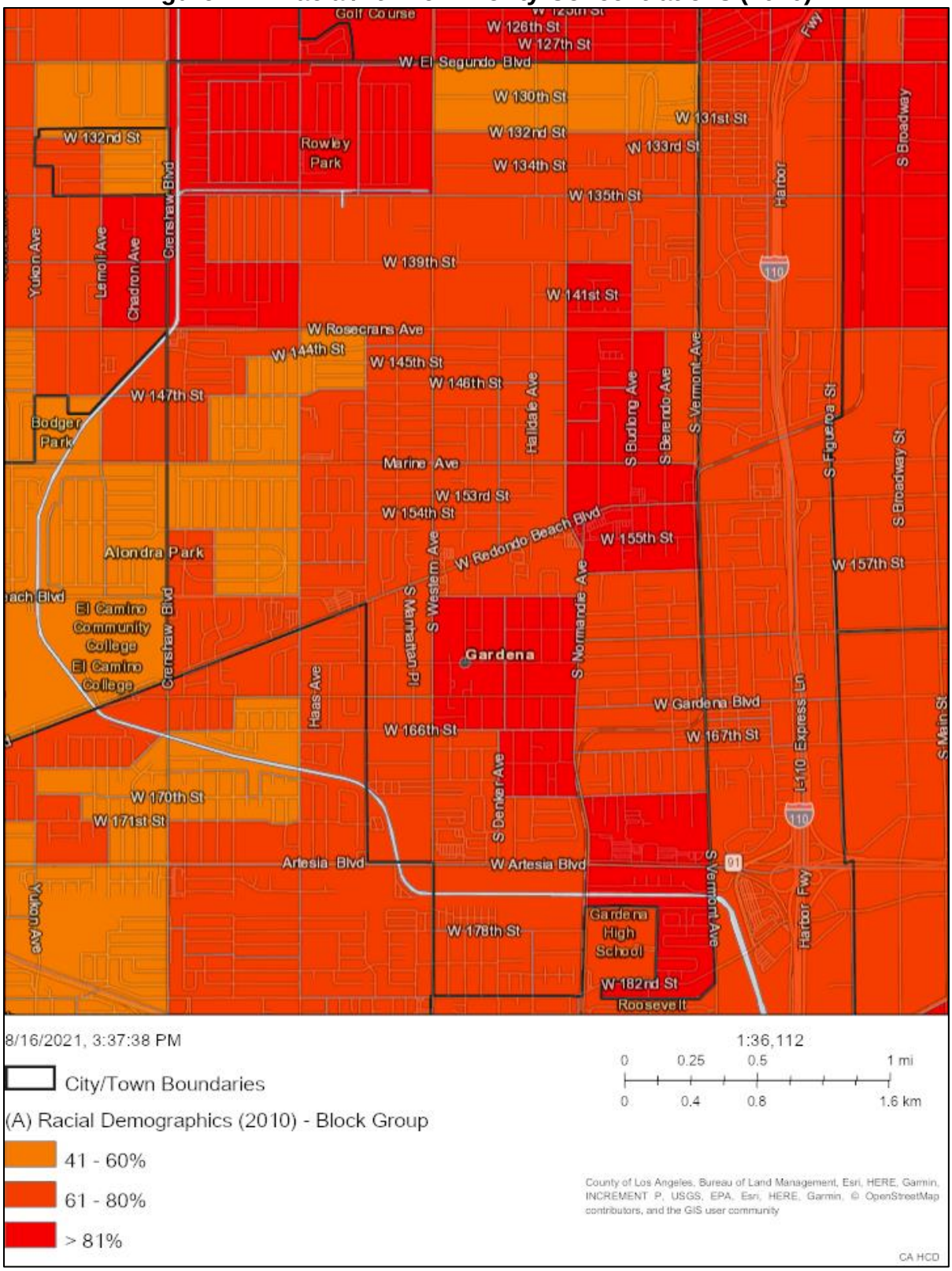
Racial/Ethnic Minority Population (Block Group)	Lower Income Units		Moderate Income Units		Above Moderate Income Units		All RHNA Units	
61-80%	27	1.0%	67	3.7%	26	1.2%	120	1.8%
>81%	2,609	99.0%	1,730	96.3%	2,127	98.8%	6,466	98.2%
Total	2,636	100.0%	1,797	100.0%	2,153	100.0%	6,586	100.0%

Figure E-3: Regional Racial/Ethnic Minority Concentrations (2018)



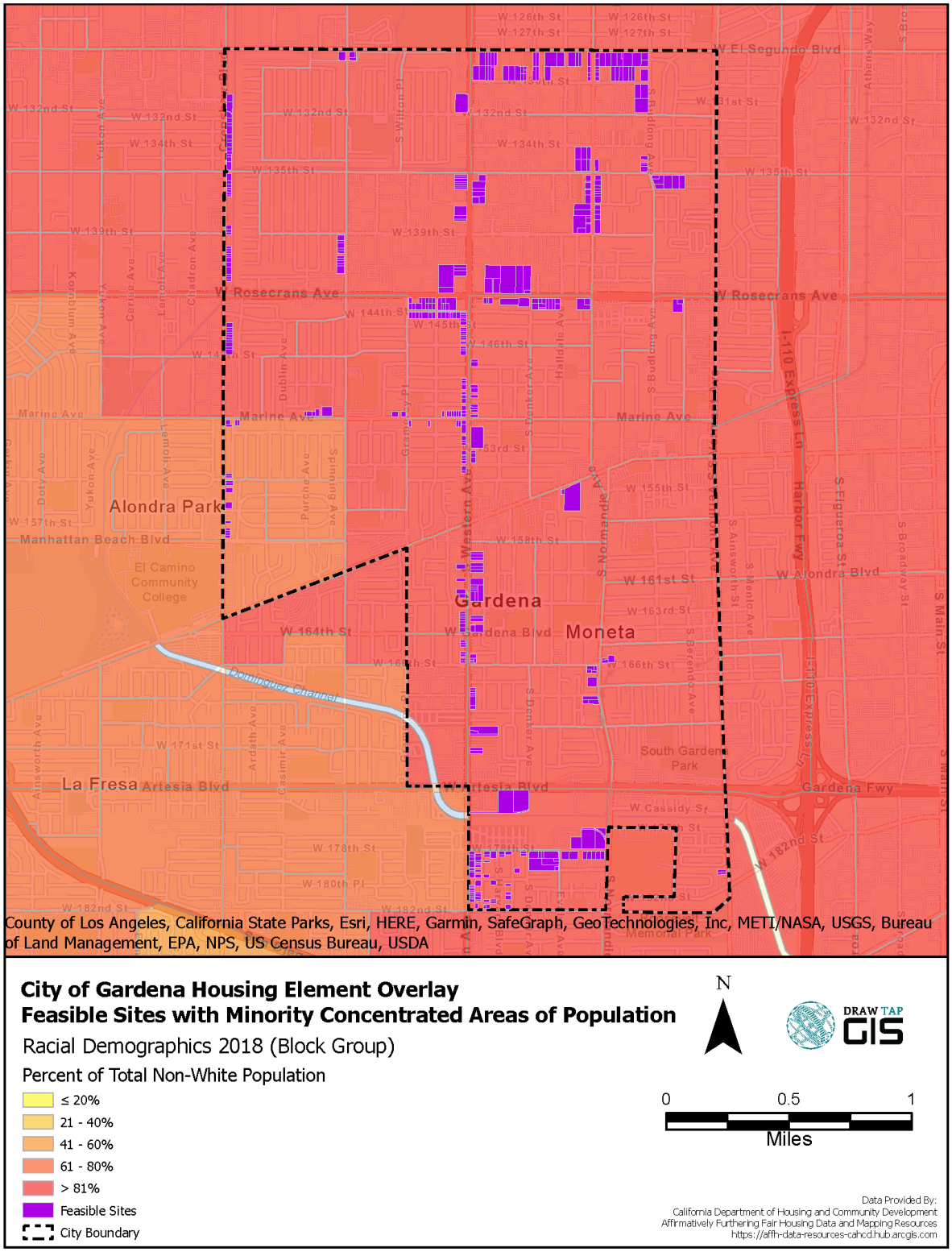
Source: HCD AFFH Data Viewer, 2021.

Figure E-4: Racial/Ethnic Minority Concentrations (2010)



Source: HCD AFFH Data Viewer, 2021

Figure E-5: Minority Concentrations (2018) and RHNA Sites



Source: HCD AFFH Data Viewer, 2021.

Disability

Persons with disabilities have special housing needs because of their fixed income, the lack of accessible and affordable housing, and the higher health costs associated with their disability.

Regional Trend. According to the 2015-2019 ACS, 9.9 percent of Los Angeles County residents experience a disability. Gardena has a larger population of persons with disabilities (12.9 percent) compared to the County, and the neighboring cities of Hawthorne (9.6 percent), Lawndale (9.4 percent), and Torrance (9 percent). Gardena has a similar share of persons with disabilities compared to Carson and Inglewood, where 12.2 percent and 12.5 percent of the population experiences a disability, respectively.

As shown in Figure E-6, less than 20 percent of the population in most tracts in Los Angeles County are persons with disabilities. Tracts with disabled populations exceeding 20 percent are not concentrated in one area of the County. Tracts with larger shares of persons with disabilities closest to Gardena are in Inglewood, Long Beach, and the City of Los Angeles. The concentration of persons with disabilities in Gardena is generally comparable to neighboring jurisdictions. The coastal cities of Manhattan Beach, Hermosa Beach, and Redondo Beach tend to have smaller disabled populations compared to Gardena, Compton, and Inglewood.

Local Trend. Since the 2008-2012 ACS, the disabled population in Gardena increased slightly from 10.2 percent to 12.9 percent during the 2015-2019 ACS. Ambulatory difficulties and independent living difficulties are the most common disability type in Gardena; 7.4 percent of residents experience an ambulatory difficulty and 6.7 percent experience an independent living difficulty. Gardena's population of persons with disabilities exceeds the countywide share due to the City's elderly population. Approximately 17 percent of the Gardena population is age 65 or older compared to only 13 percent countywide. Over half of the population aged 75 and older in Gardena experiences a disability.

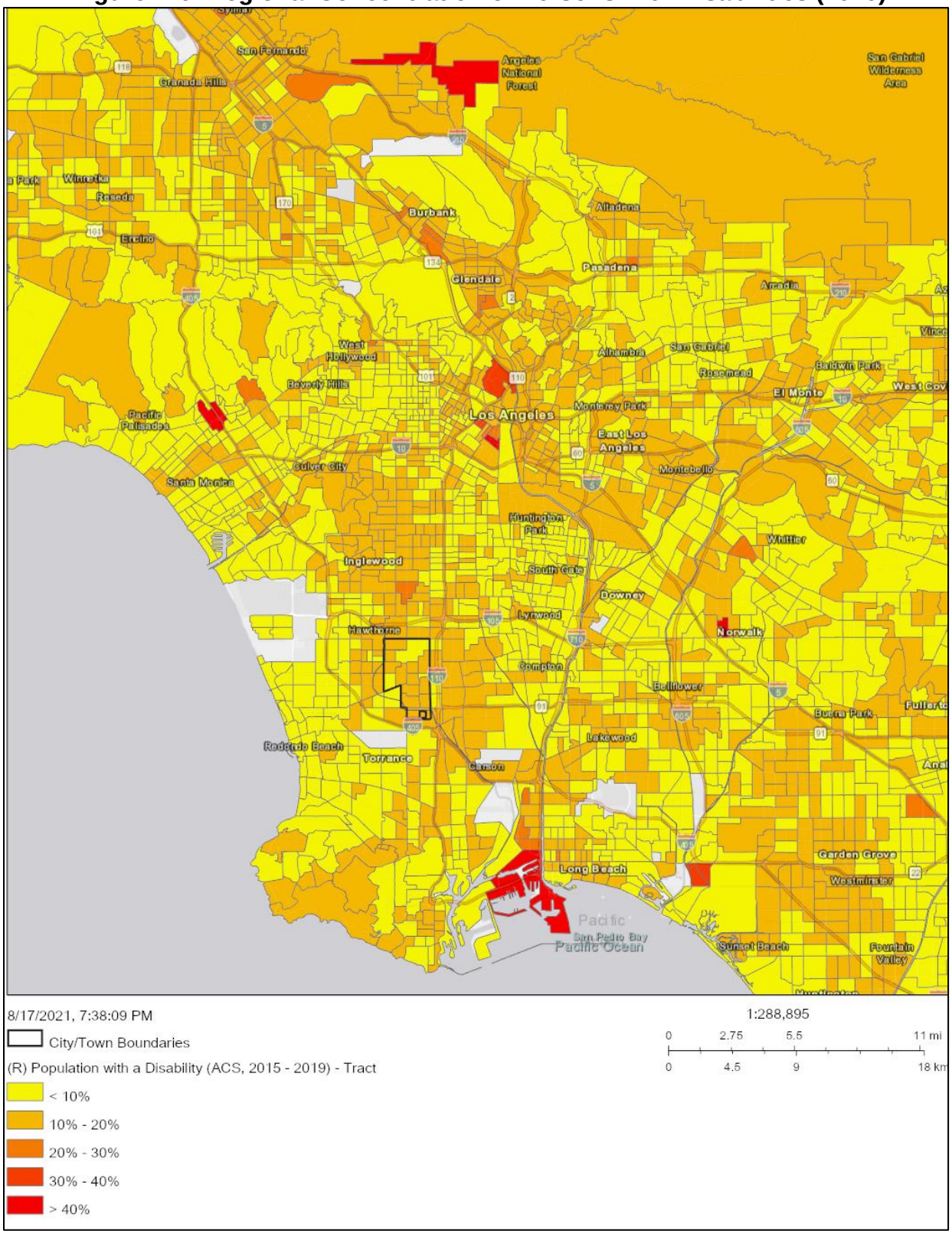
Figure E-7 shows that census tracts with a higher percentage of persons with disabilities are not concentrated in one area in Gardena. Tracts with a disabled population below 10 percent are located in the northeastern section of the City and in one tract along the western boundary. The remaining tracts have a disabled population between 10 and 20 percent.

Sites Inventory. Figure E-7 also includes the sites inventory used to meet Gardena's 2021-2029 RHNA. Table E-6 shows the distribution of RHNA units by population of persons with disabilities. Of all RHNA units, 99 percent are in tracts where 10 to 20 percent of the population experience a disability, including 100 percent of lower income units, 96.8 percent of moderate income units, and 99.7 percent of above moderate income units.

Table E-6: Breakdown of RHNA Units by Population of Persons with Disabilities

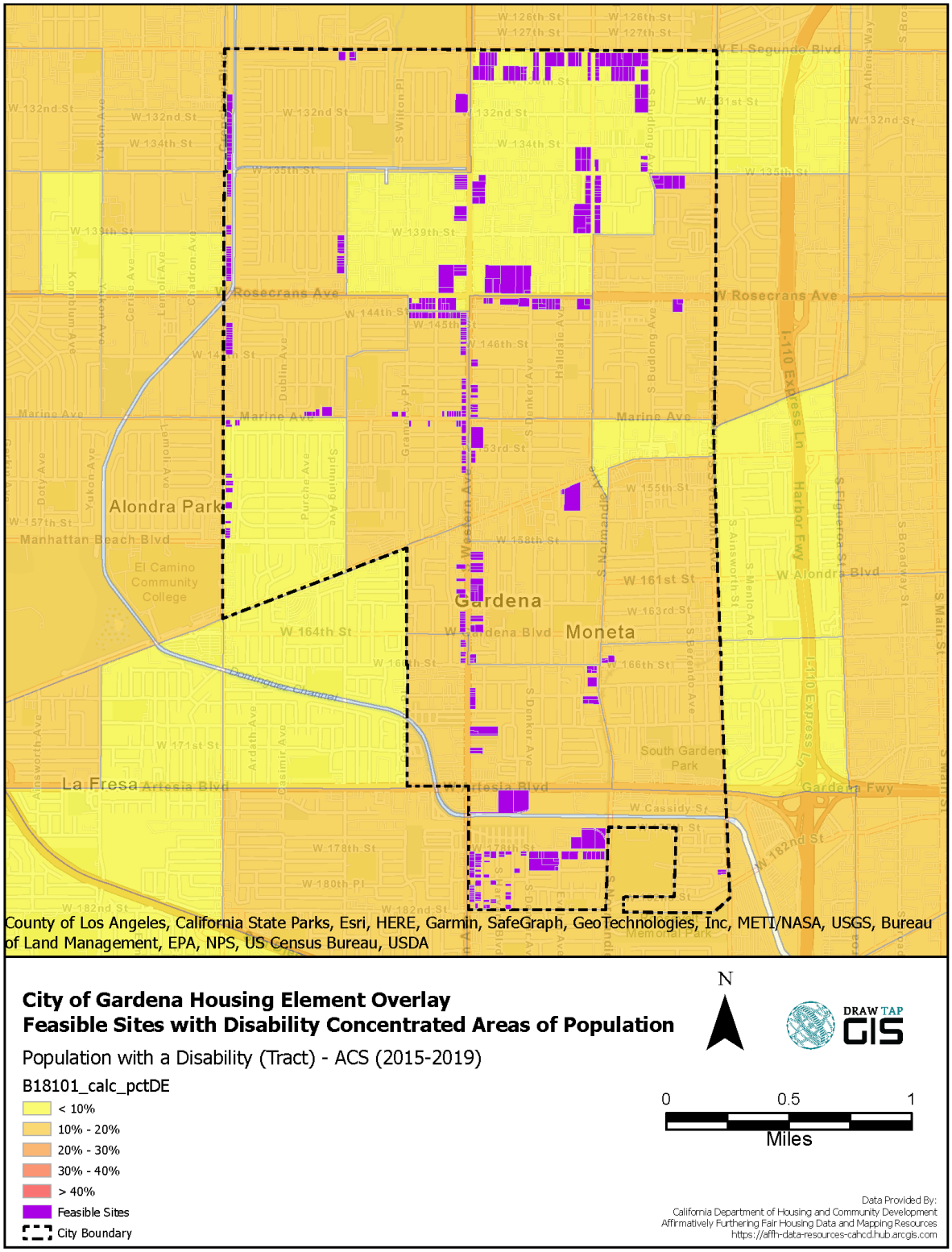
Disabled Population (Tract)	Lower Income Units		Moderate Income Units		Above Moderate Income Units		All RHNA Units	
<10%	0	0.0%	58	3.2%	6	0.3%	64	1.0%
10-20%	2,636	100.0%	1,739	96.8%	2,147	99.7%	6,522	99.0%
Total	2,636	100.0%	1,797	100.0%	2,153	100.0%	6,586	100.0%

Figure E-6: Regional Concentration of Persons with Disabilities (2019)



Source: HCD AFFH Data Viewer, 2015-2019 ACS, 2021.

Figure E-7: Concentration of Persons with Disabilities and Sites Inventory (2019)



Source: HCD AFFH Data Viewer, 2015-2019 ACS, 2021.

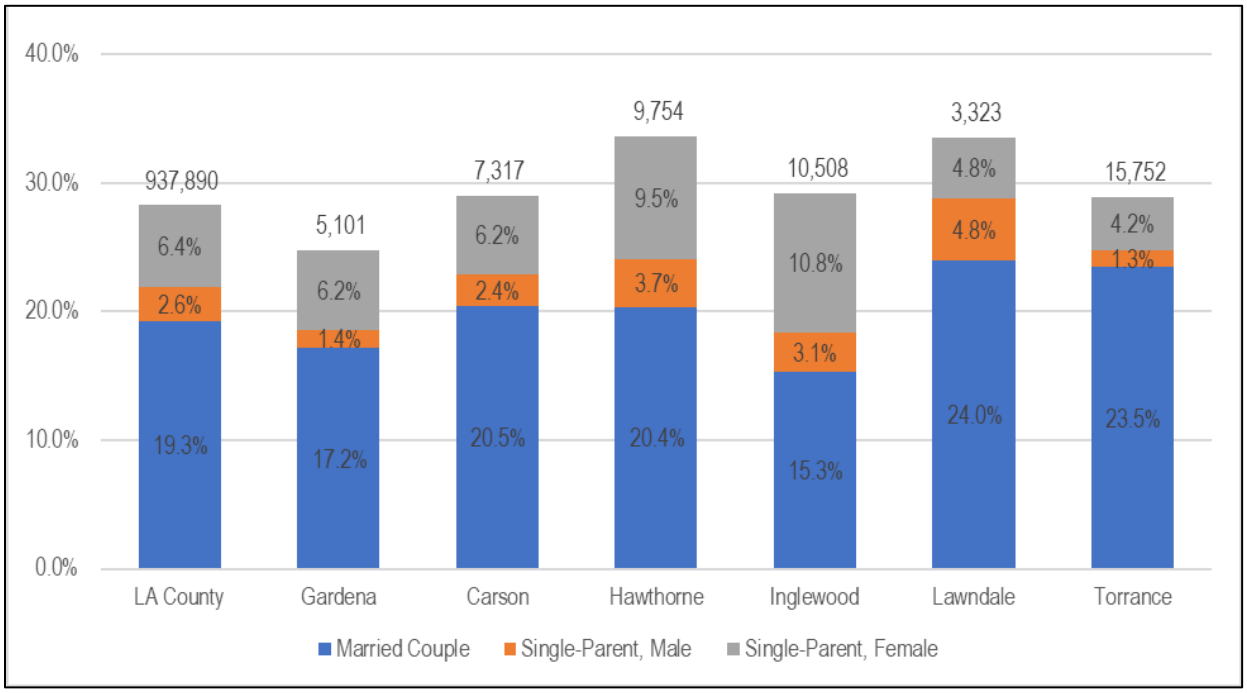
Familial Status

Familial status refers to the presence of children under the age of 18, whether the child is biologically related to the head of household, and the martial status of the head of households. Families with children may face housing discrimination by landlords who fear that children will cause property damage. Some landlords may have cultural biases against children of the opposite sex sharing a bedroom. Differential treatments such as limiting the number of children in a complex or confining children to a specific location are also fair housing concerns. Single parent households are also protected by fair housing law.

Regional Trend. Approximately 25 percent of Gardena households have one or more child under the age of 18. The City's share of households with children is lower than the County, and the neighboring cities of Carson, Hawthorne, Inglewood, Lawndale, and Torrance (Figure E-8). Of the selected jurisdictions, Inglewood has the highest proportion of single-parent households representing 13.9 percent of all households in the City, while only 5.5 percent of households in Torrance are single-parent households.

More than 60 percent of children in most areas around Rolling Hills, Burbank, Redondo Beach, and the Pacific Palisades neighborhood live in married couple households (Figure E-9). Figure E-10 shows percent of children living in single-parent female-headed households by tract. Children in female-headed households are most concentrated in the area north of Gardena, including Inglewood, the City of Los Angeles, and unincorporated Los Angeles County communities, and the areas around Long Beach and Lakewood. In general, there are more children living in female-headed households in the central Los Angeles County areas compared to the South Bay, Westside, Gateway, San Fernando Valley, and San Gabriel Valley cities.

Figure E-8: Housing Type Composition – Households with Children



Source: 2015-2019 ACS (5-Year Estimates).

Local Trend. Gardena has seen a significant decrease in households with children. During the 2006-2010 ACS, there were 6,351 households with children representing 30.2 percent of all City households. The most recent 2015-2019 ACS estimates there is now only 5,101 households with children in Gardena representing 24.7 percent of total households. Approximately 8 percent of households in the City are single-parent households including 6.2 percent female-headed single-parent households. Female-headed households with children require special consideration and assistance because of their greater need for affordable housing and accessible day care, health care, and other supportive services.

As shown in Figure E-11, between 60 percent and 80 percent of children live in married couple households in most Gardena tracts. More than 80 percent of children live in married couple households in one tract along the western City boundary, and only 40 percent to 60 percent of children live in married couple households in two tracts on the central eastern side of the City. Figure E-11 shows that the percent of children in female-headed households is also generally uniform throughout Gardena. There is a slightly larger population of children in female-headed households in the northern half of the City compared to the southern half. In the northern tracts, 20 percent to 40 percent of children live in female-headed households, compared to less than 20 percent of children in the southern areas of the City.

Sites Inventory. Table E-7 and Table E-8 show the breakdown of RHNA units by percent of children living in married couple and female-headed households. Most units, regardless of income category, are in tracts where 60 percent to 80 percent of children live in married

couple households. A slightly higher percentage of lower income units are in tracts where more than 20 percent of children live in female-headed households compared to moderate and above moderate income units.

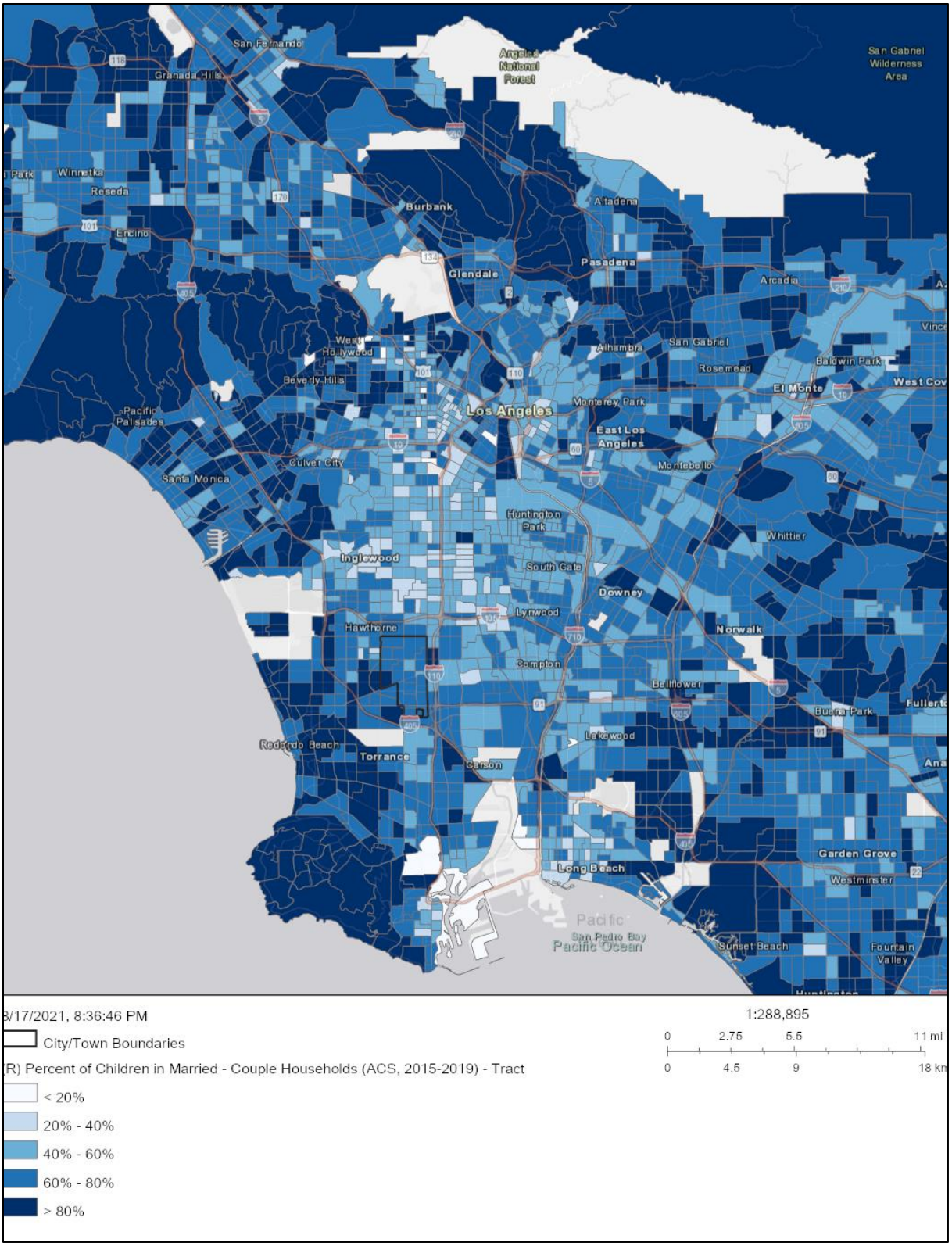
Table E-7: Distribution of RHNA Sites by Children in Married Couple Households

Children in Married Couple Households (Tract)	Lower Income Units		Moderate Income Units		Above Moderate Income Units		All RHNA Units	
40-60%	232	8.8%	69	3.8%	163	7.6%	464	7.0%
60-80%	2,404	91.2%	1,670	92.9%	1,984	92.2%	6,058	92.0%
>80%	0	0.0%	60	3.3%	6	0.3%	66	1.0%
Total	2,636	100.0%	1,797	100.0%	2,153	100.0%	6,586	100.0%

Table E-8: Distribution of RHNA Sites by Children in Female-Headed Households

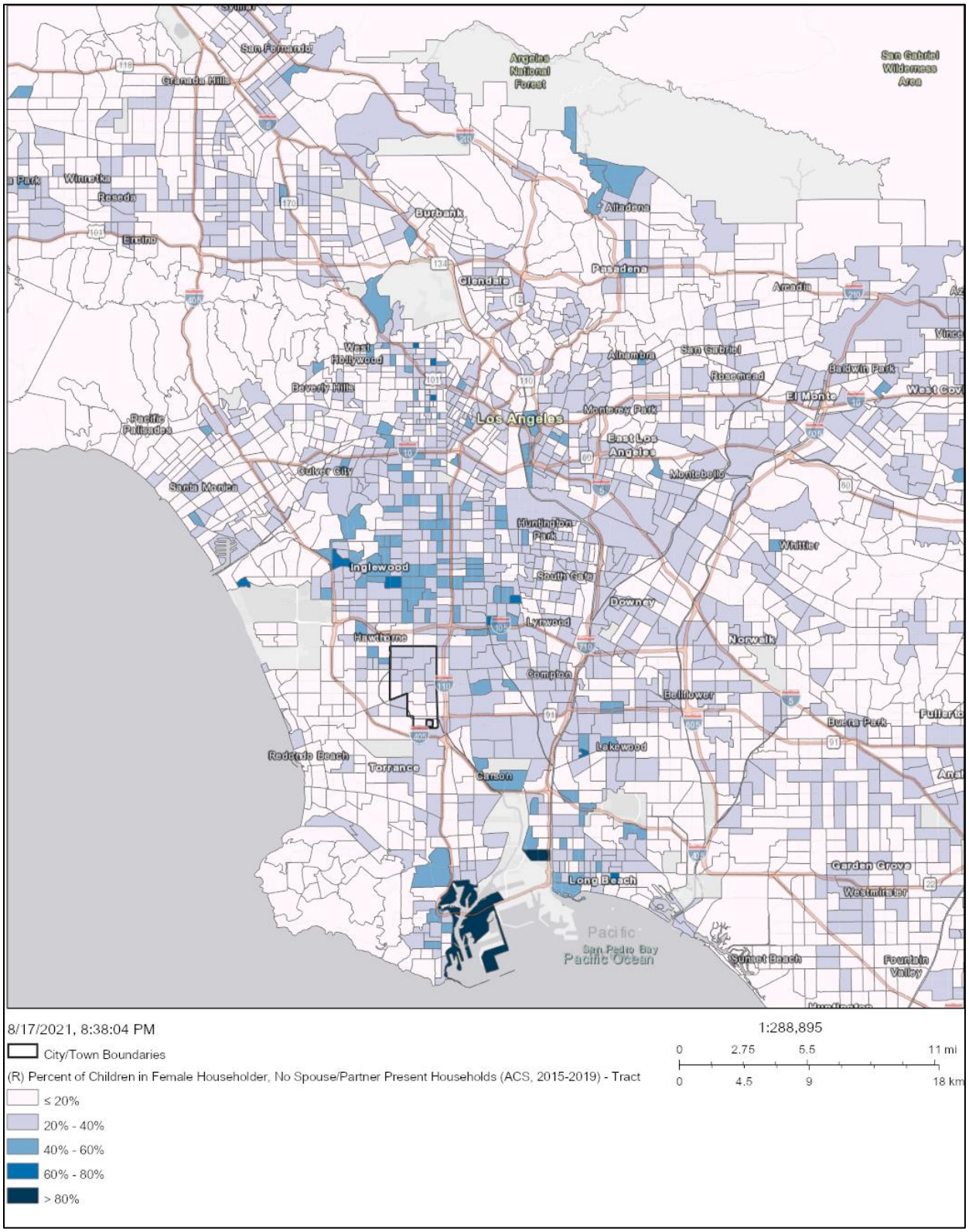
Children in Female-Headed Households (Tract)	Lower Income Units		Moderate Income Units		Above Moderate Income Units		All RHNA Units	
<20%	612	23.2%	460	25.6%	650	30.2%	1,722	26.1%
20-40%	2,024	76.8%	1,337	74.4%	1,503	69.8%	4,864	73.9%
Total	2,636	100.0%	1,797	100.0%	2,153	100.0%	6,586	100.0%

Figure E-9: Regional Percent of Children in Married Couple Households (2019)



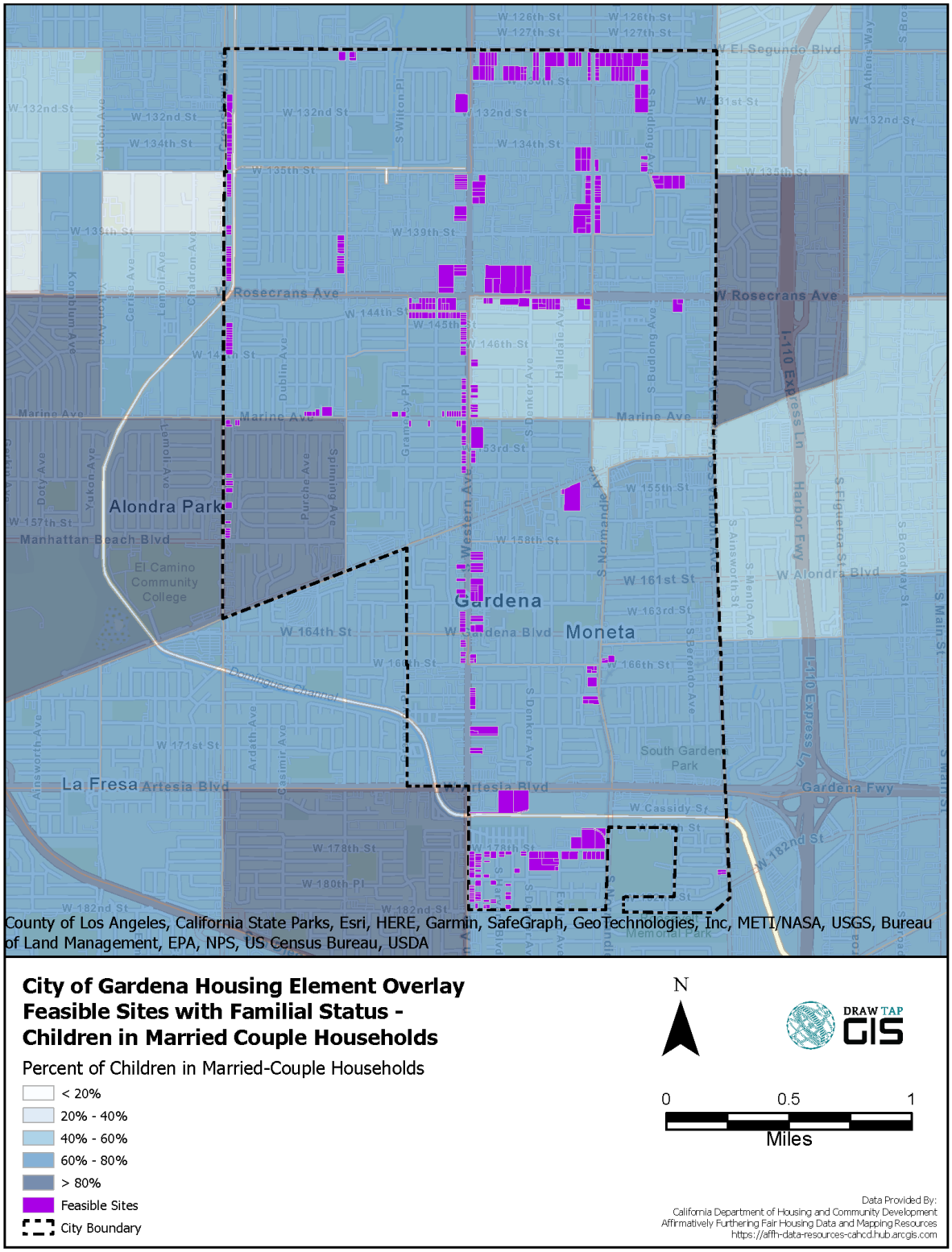
Source: HCD AFFH Data Viewer, 2015-2019 ACS, 2021.

Figure E-10: Regional Percent of Children in Female-Headed Households (2019)



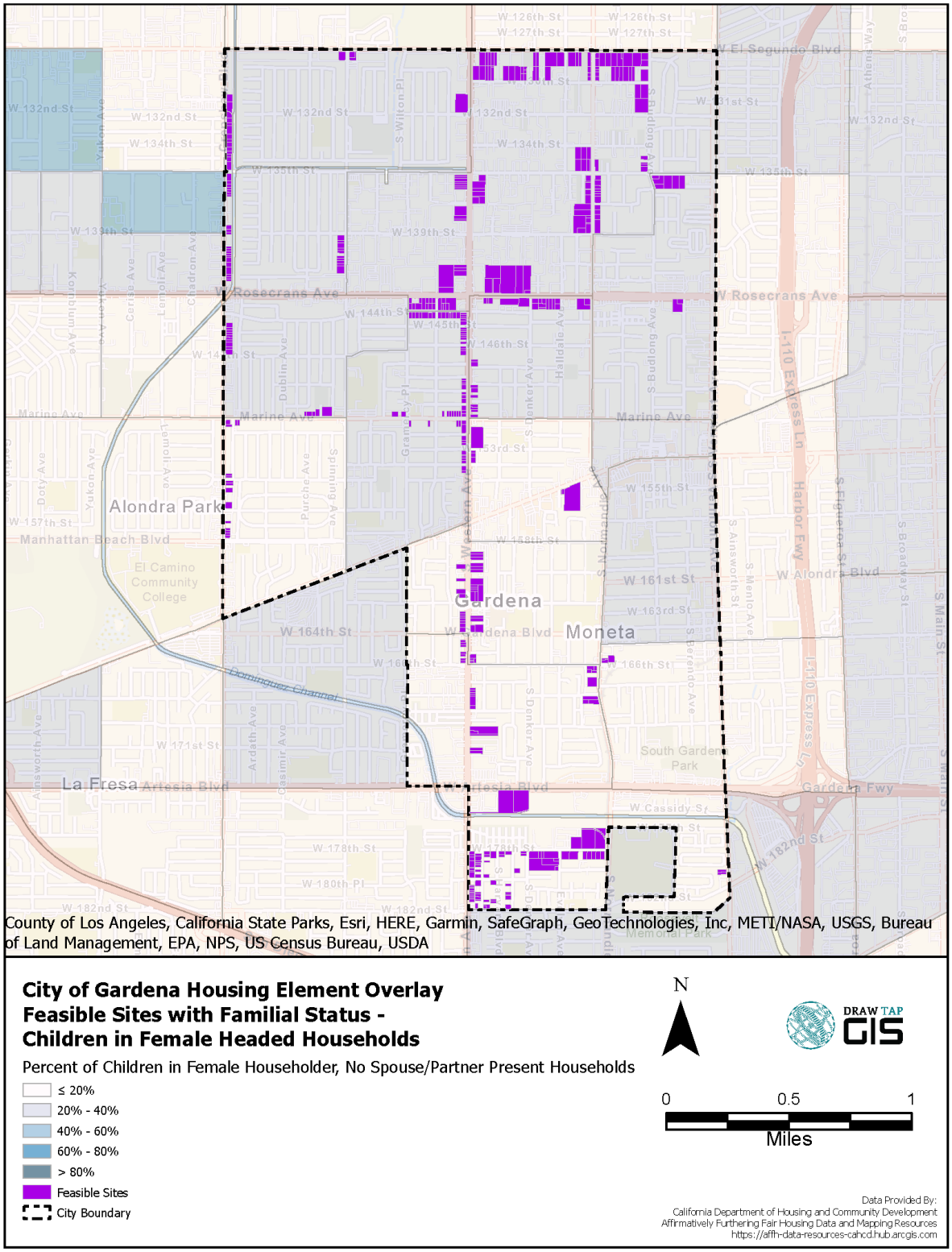
Source: HCD AFFH Data Viewer, 2015-2019 ACS, 2021.

Figure E-11: Children in Married Couple Households and Sites Inventory (2019)



Source: HCD AFFH Data Viewer, 2015-2019 ACS, 2021.

Figure E-12: Children in Female-Headed Households and Sites Inventory (2019)



Source: HCD AFFH Data Viewer, 2015-2019 ACS, 2021.

Income

Identifying low- or moderate-income (LMI) geographies and individuals is important to overcome patterns of segregation. HUD defines a LMI area as a census tract or block group where over 51 percent of the population is LMI (based on HUD's income definition of up to 80 percent of the AMI).

Regional Trend. HUD's CHAS data, presented in Table E-9, shows that 58.5 percent of Gardena residents earn 80 percent or less than the area median family income and are considered lower income, compared to 51.6 percent Countywide. According to the 2015-2019 ACS, the median household income in Gardena is $58,447. The median income in Gardena is lower than the median in the County ($68,044) and the neighboring jurisdictions of Carson, Lawndale, and Torrance, but higher than Hawthorne and Inglewood.

Table E-9: Income Level Distribution

Income Category	Gardena		Los Angeles County	
	Households	Percent	Households	Percent
<30% AMI	4,260	20.6%	641,055	19.5%
31-50% AMI	3,795	18.4%	482,070	14.6%
51-80% HAMFI	4,025	19.5%	578,285	17.5%
81-100% HAMFI	2,265	11.0%	312,595	9.5%
>100% HAMFI	6,305	30.5%	1,281,195	38.9%
Total	20,650	100.0%	3,295,200	100.0%

Source: HUD Comprehensive Housing Affordability Strategy (CHAS) Data (based on 2013-2017 ACS), 2020.

Figure E-13 shows LMI areas regionally. Coastal cities, from Rancho Palos Verdes to El Segundo and the Pacific Palisades neighborhood have low concentrations of LMI households. In most tracts, less than 25 percent of the population is LMI in these areas. LMI households are most concentrated in the central Los Angeles County region around the City of Los Angeles. There are smaller concentrations of LMI households in and around the cities of Glendale, El Monte, San Fernando, and Long Beach. Communities north and east of Gardena have similar LMI concentrations consistent with the City.

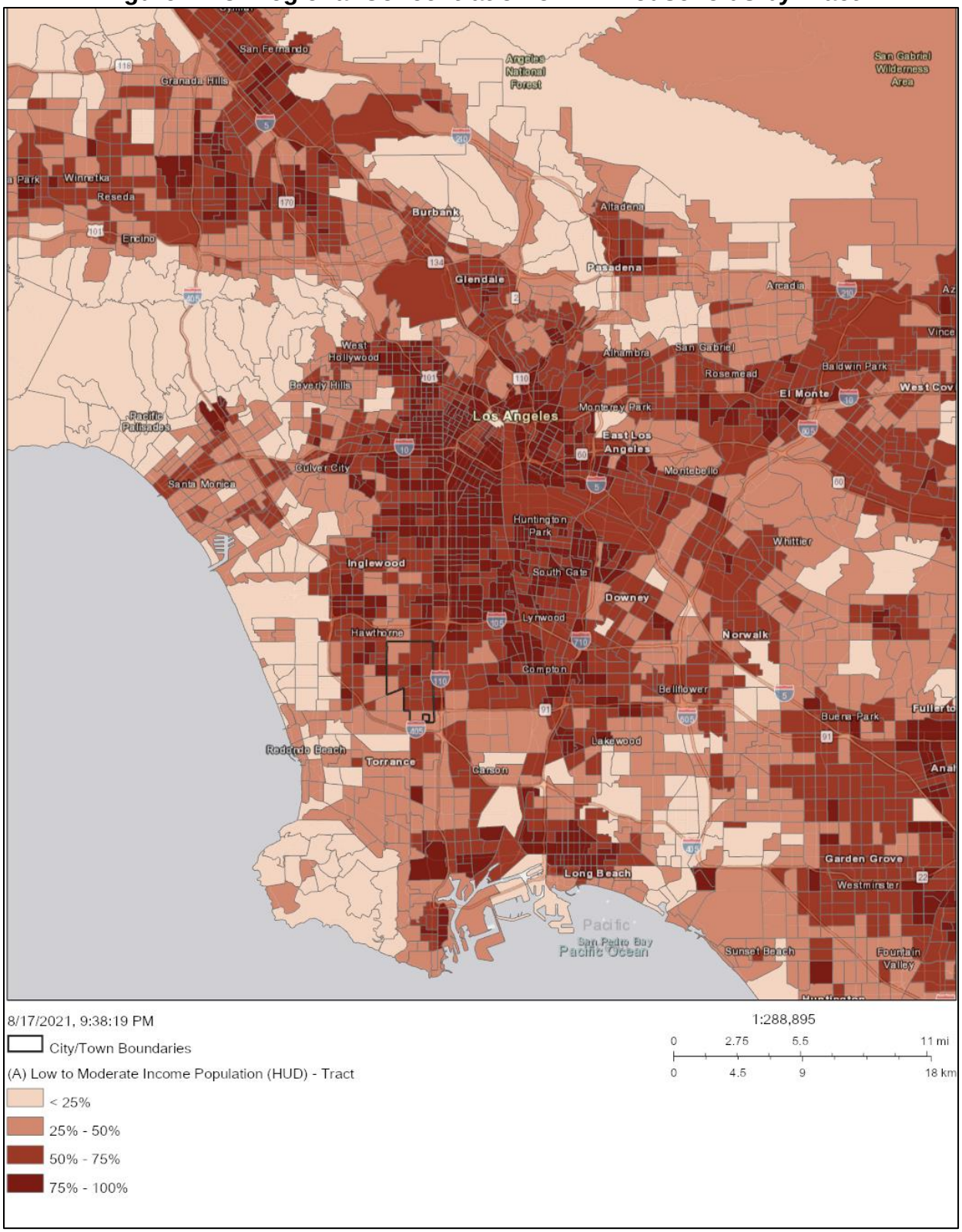
Local Trend. Figure E-14 shows the LMI populations in Gardena block groups. Block groups in Gardena with higher LMI populations are most concentrated in the central and northeastern areas of the City. Most Gardena block groups have LMI populations that make up 50 percent and 75 percent of the block group population. There are six block groups where more than 75 percent of the population is LMI: two in the northeastern corner along W. El Segundo Boulevard, three in the center of the City between W. Rosecrans Avenue and Marine Avenue, and one in the southern area at the intersection of S. Western Avenue and W. 166th street. Less than 50 percent of households are LMI in most block groups along the eastern and southern City boundaries

Sites Inventory. As shown in Figure E-14 and Table E-10, more than half of all units used to meet the City's 2021-2029 RHNA are in block groups where LMI households make up 50 percent to 75 percent of the population. A higher percentage of lower income RHNA units are in block groups where more than 50 percent of the population is LMI (94.7 percent of units), compared to 88.6 percent of moderate income units and 83 percent of above moderate income units.

Table E-10: Distribution of RHNA Units by LMI Household Population

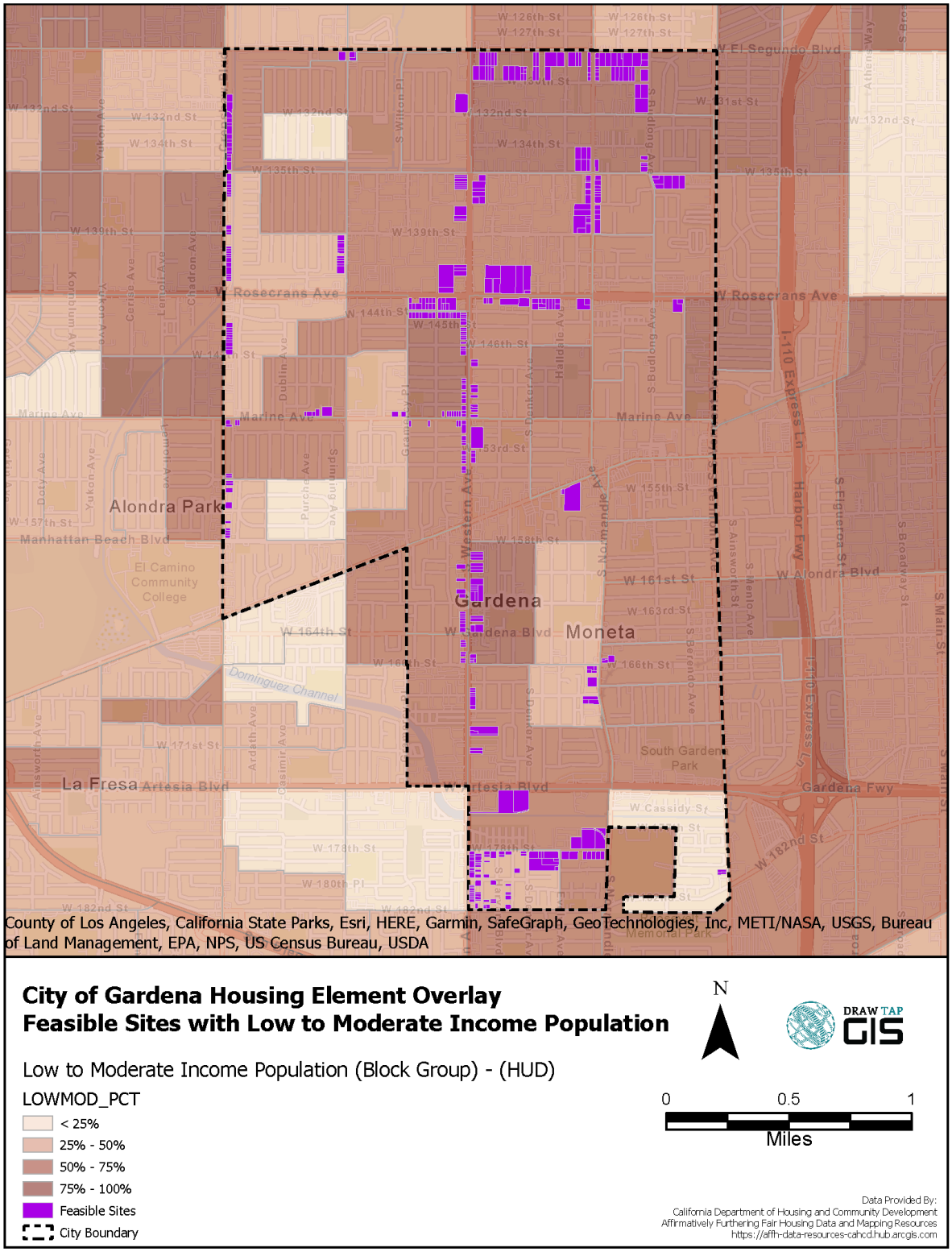
LMI Population (Block Group)	Lower Income Units		Moderate Income Units		Above Moderate Income Units		All RHNA Units	
<25%	0	0.0%	0	0.0%	8	0.4%	8	0.1%
25-50%	141	5.3%	205	11.4%	358	16.6%	704	10.7%
50-75%	1,635	62.0%	1,060	59.0%	1,165	54.1%	3,860	58.6%
75-100%	860	32.6%	532	29.6%	622	28.9%	2,014	30.6%
Total	2,636	100.0%	1,797	100.0%	2,153	100.0%	6,586	100.0%

Figure E-13: Regional Concentration of LMI Households by Tract



Source: HCD AFFH Data Viewer, HUD LMI data (2011-2015 ACS), 2021.

Figure E-14: Concentration of LMI Households and Sites Inventory



Source: HCD AFFH Data Viewer, HUD LMI data (2011-2015 ACS), 2021.

Summary of Fair Housing Issues

Racial/ethnic minorities make up more than 80 percent of the population in nearly all Gardena block groups. Racial/ethnic minority groups are generally the same citywide. A slightly larger proportion of moderate income units are in the block groups where 61-80 percent of the population belongs to a racial/ethnic minority group compared to lower income and above moderate income units.

Gardena has a large population of persons with disabilities and seniors compared to the County. Disabled populations are not concentrated in one area of the City. Almost all units used to meet the lower income RHNA are in tracts where 10 percent to 20 percent of the population is disabled.

Between 60 percent and 80 percent of children live in married couple households in most Gardena tracts. In the tract where more than 80 percent of children live in married couple households (western boundary along W. Redondo Beach Boulevard), racial/ethnic minorities make up between 60 percent and 80 percent of the population, less than the rest of the City (see Figure E-5 and Figure E-11). All northern City tracts have more children living in female-headed households compared to the southern tracts. Most lower income units used to meet the RHNA are in tracts where more than 20 percent of children live in female-headed households.

More than 50 percent of the population is LMI in most Gardena block groups. LMI concentrated block groups in northern Gardena also have more children living in female-headed households (see Figure E-12 and Figure E-14). Up to 15 percent of renters in tracts along the eastern side of Marine Avenue, where more than 75 percent of the population is LMI in some block groups, receive HCVs. There are no HCV recipients in the northeastern and southern block groups, despite the LMI population exceeding 75% (see Figure E-2).[1] A larger proportion of lower income RHNA units are in block groups with high concentrations of LMI households compared to moderate and above moderate income units.

Racially and Ethnically Concentrated Areas of Poverty

Racially and Ethnically Concentrated Areas of Poverty (R/ECAPs)

In an effort to identify racially/ethnically concentrated areas of poverty (R/ECAPs), HUD identified census tracts with a majority non-White population with a poverty rate that exceeds 40 percent or is three times the average tract poverty rate for the metro/micro area, whichever threshold is lower. HCD and the California Tac Credit Allocation Committee (TCAC) convened as the Fair Housing Task Force to create opportunity maps.

[1] To protect the confidentiality of renters receiving HCVs, tracts containing 10 or fewer voucher holders have been omitted from the HCV dataset.

The maps include identifying areas of high segregation and poverty. TCAC Opportunity Maps are discussed in more detail in Section 4 of this fair housing analysis.

Regional Trend. Approximately 15 percent of the County population is below the federal poverty level (Table E-11). Black/African American, American Indian/Alaska Native, persons of a race not listed, and Hispanic/Latino populations all experience poverty at a higher rate than the average countywide. The proportion of non-Hispanic White residents under the poverty level is the lowest compared to other racial/ethnic groups in the County. Over 21 percent of persons with disabilities are also below the poverty level.

Table E-11: Poverty Status by Race/Ethnicity and Disability

	Percent Below Poverty Level	
	Gardena	**LA County**
Black or African American	13.8%	20.8%
American Indian and Alaska Native	5.7%	18.1%
Asian	10.0%	11.1%
Native Hawaiian and Other Pacific Islander	0.0%	11.5%
Some other race	18.6%	19.2%
Two or more races	11.7%	11.7%
Hispanic or Latino (of any race)	16.2%	18.1%
White alone, not Hispanic or Latino	14.3%	9.6%
With a disability	18.3%	21.2%
Population for whom poverty status is determined	13.7%	14.9%
Source: 2015-2019 ACS (5-Year Estimates).		

Figure E-15 shows R/ECAPs, TCAC designated areas of high segregation and poverty, and poverty status in the Los Angeles County region. R/ECAPs and areas of high segregation and poverty are concentrated in the central County areas around the City of Los Angeles. Areas of high segregation and poverty have also been identified in tracts south and north of Gardena in Torrance, Hawthorne, and Inglewood. Tracts with larger populations of persons experiencing poverty are also concentrated in these areas.

Local Trend. As shown in Table E-11 above, 13.7 percent of the Gardena population is below the poverty level, a fewer than the County as a whole. Black/African American, persons of a race not listed, persons of two or more races, non-Hispanic White, and Hispanic/Latino populations all experience poverty at a higher rate than the average citywide. All racial/ethnic minority groups in Gardena have lower poverty rates than the County. Over 18 percent of persons with disabilities are below the poverty level.

According to HCD's 2021 Data Viewer, there are no R/ECAPs or TCAC designated areas of high segregation and poverty in Gardena. Poverty status in Gardena by tract is presented in Figure E-16. Less than 20 percent of the population in most Gardena tracts is under the poverty level. There are two tracts where 20 percent to 30 percent of the

population is under the poverty level: one located in the northeastern corner of the City and one in the southern section north of W. Artesia Boulevard

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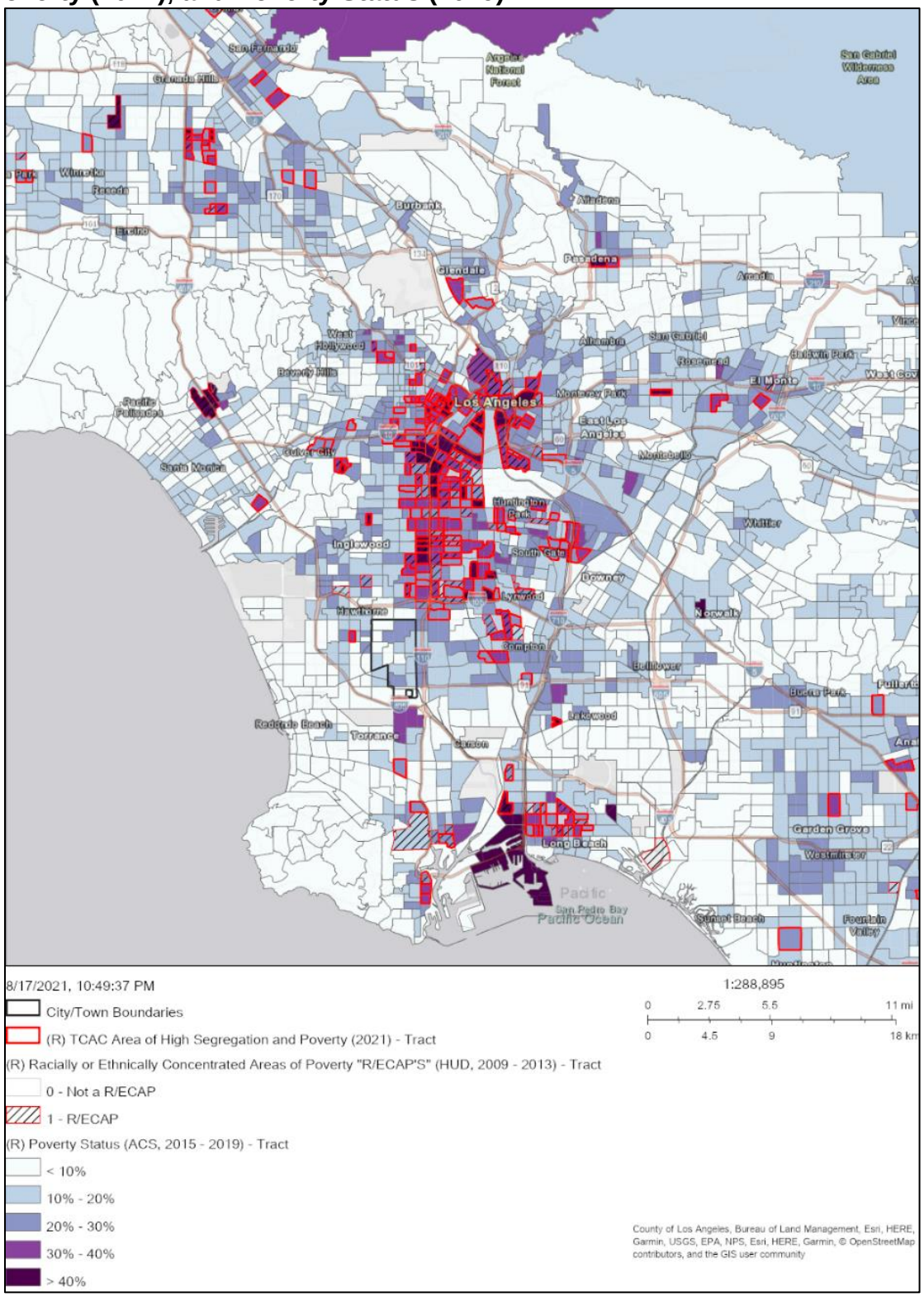
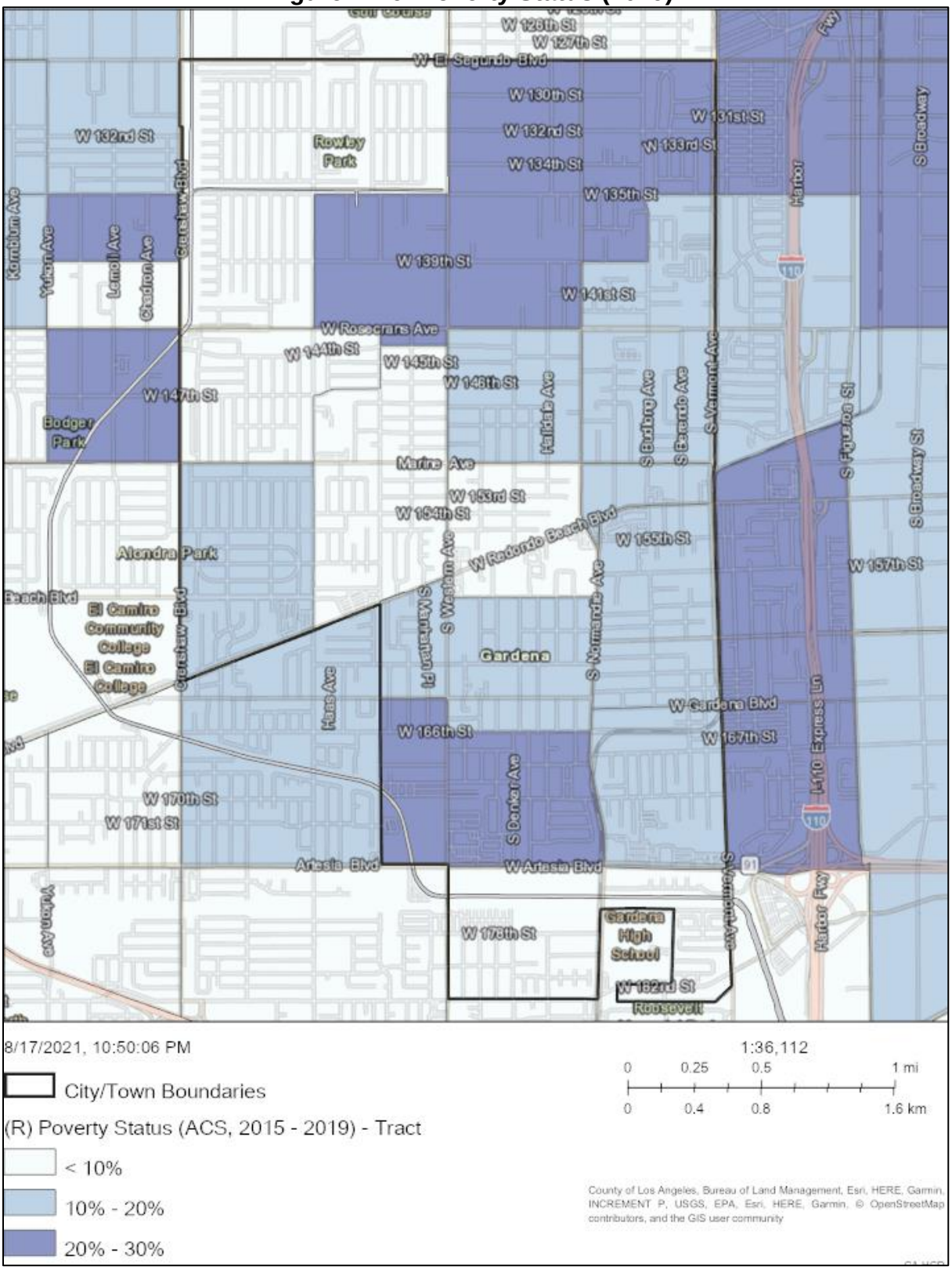
Figure E-15: Regional R/ECAPs (2020), TCAC Areas of High Segregation and Poverty (2021), and Poverty Status (2019)



Source: HCD AFFH Data Viewer, HUD R/ECAP data (2009-2013 ACS) TCAC Opportunity Maps (2021) and 2015-2019 ACS, 2021.

Figure E-16: Poverty Status (2019)



Source: HCD AFFH Data Viewer, 2015-2019 ACS, 2021.

Racially and Ethnically Concentrated Areas of Affluence (RCAAs)

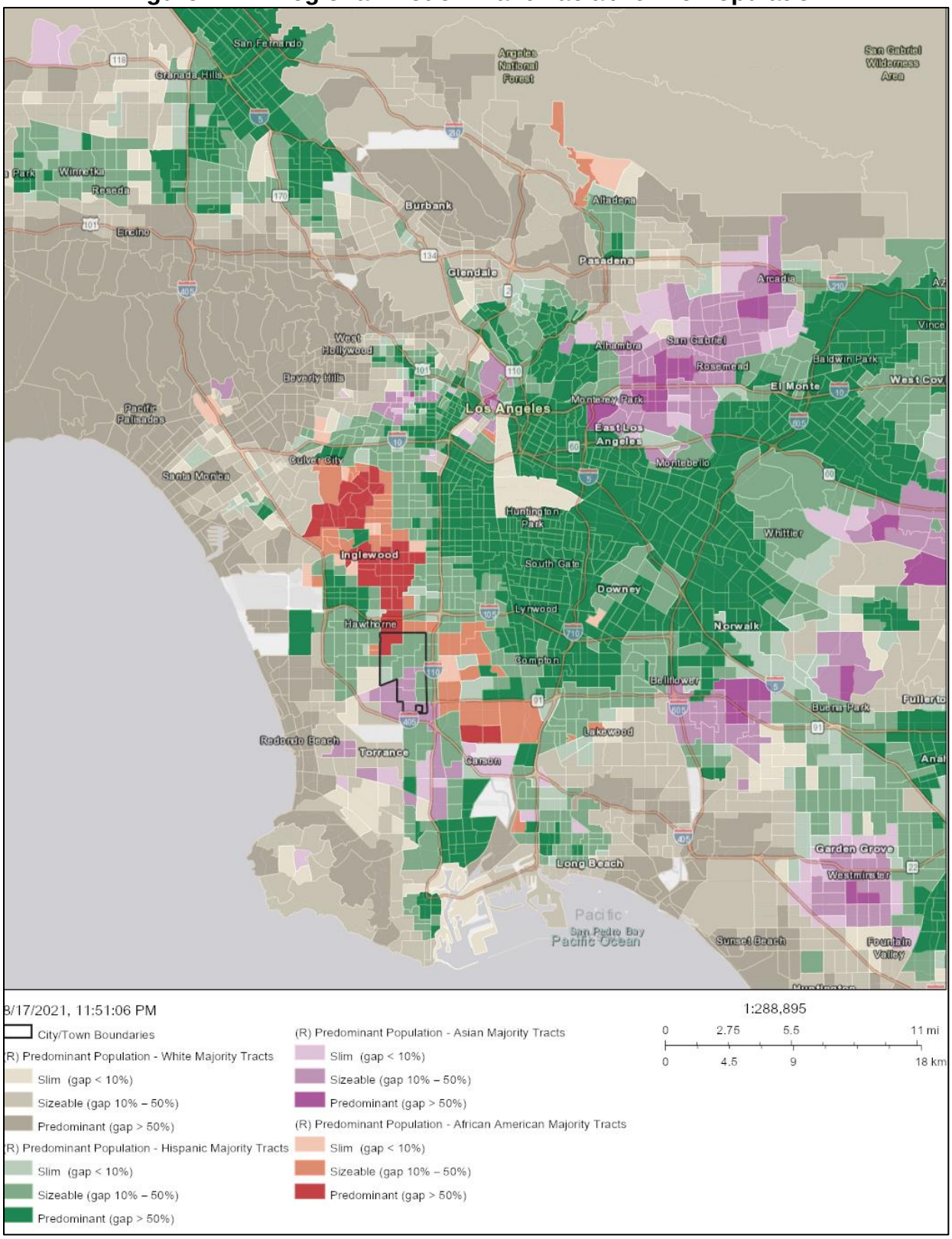
While racially concentrated areas of poverty and segregation (R/ECAPs) have long been the focus of fair housing policies, racially concentrated areas of affluence (RCAAs) must also be analyzed to ensure housing is integrated, a key to fair housing choice. A HUD Policy Paper defines racially concentrated areas of affluence as affluent, White communities.[2] According to this report, Whites are the most racially segregated group in the United States and "in the same way neighborhood disadvantage is associated with concentrated poverty and high concentrations of people of color, conversely, distinct advantages are associated with residence in affluent, White communities." Based on their research, HCD defines RCAAs as census tracts where 1) 80 percent or more of the population is white, and 2) the median household income is $125,000 or greater (slightly more than double the national median household income in 2016).

Regional Trend. Figure E-17 shows the predominant racial/ethnic group by tract and Figure E-18 shows median income by block group in the Los Angeles County region. White predominant populations are generally located outside the central Los Angeles County area. The costal South Bay cities, Westside cities, and parts of the San Fernando Valley are predominantly White. The central Los Angeles, San Gabriel Valley, and Gateway cities have Hispanic, African American, or Asian majority populations. The southern Gardena tracts have Asian majorities, northern and central tracts have Hispanic majorities, and the northwestern tract has an African American majority. The central Los Angeles areas are composed of mostly block groups with median incomes below the 2020 State median of $87,100. Block groups with median incomes exceeding $125,000 are more concentrated in coastal communities and the areas around Santa Monica and Beverly Hills, and Burbank and Pasadena.

Local Trend. As shown in Figure E-19, there are no block groups in Gardena with the racial/ethnic minority populations smaller than 60%. There is only one block group with a median income exceeding $125,000 in the northeastern corner of the City. Most the block groups in Gardena have median incomes lower than the State median of $87,100. There are no areas in Gardena that are considered RCAAs.

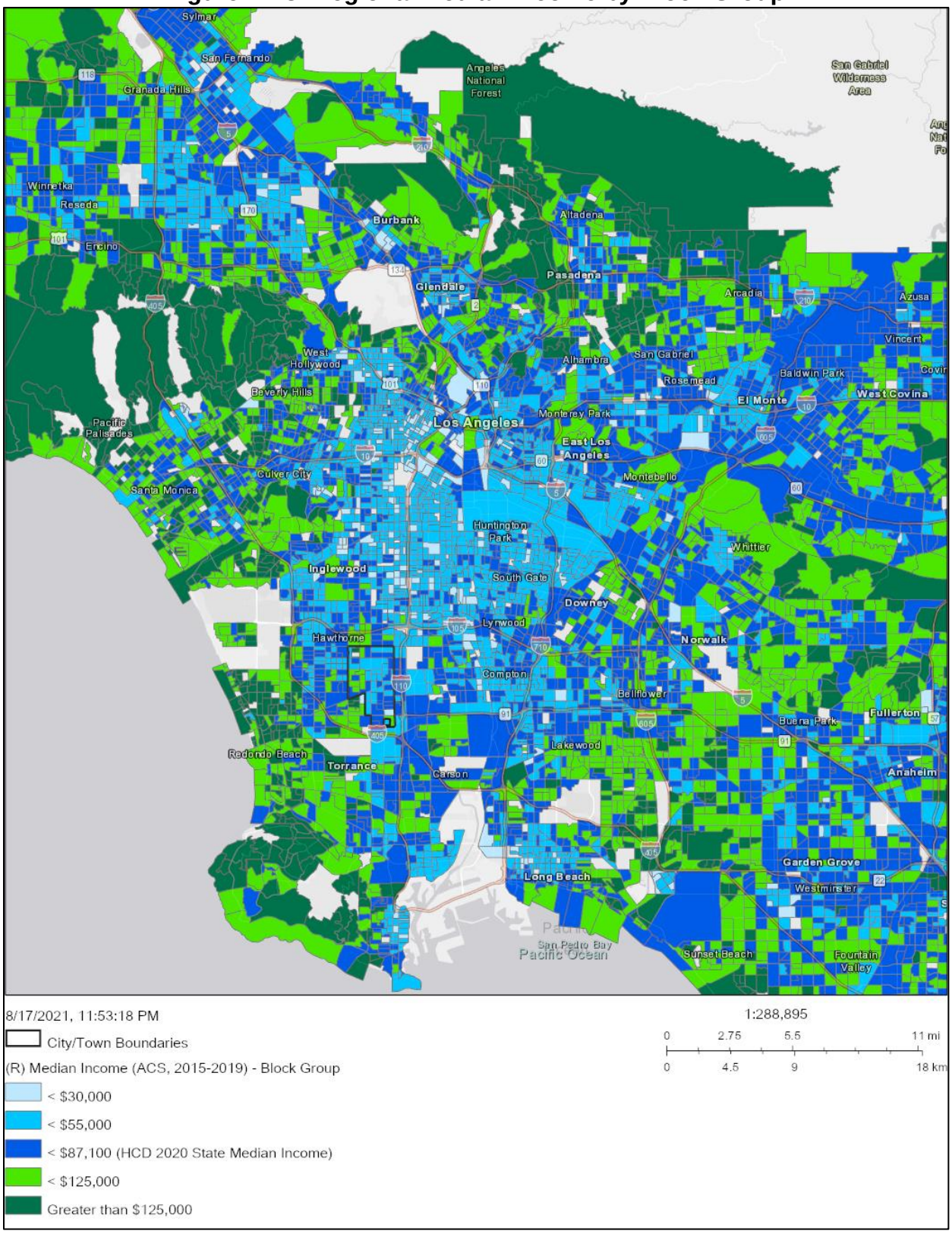
[2] Goetz, Edward G., Damiano, A., & Williams, R. A. (2019) Racially Concentrated Areas of Affluence: A Preliminary Investigation.' Published by the Office of Policy Development and Research (PD&R) of the U.S. Department of Housing and Urban Development in Cityscape: A Journal of Policy Development and Research (21,1, 99-124).

Figure E-17: Regional Predominant Racial/Ethnic Population



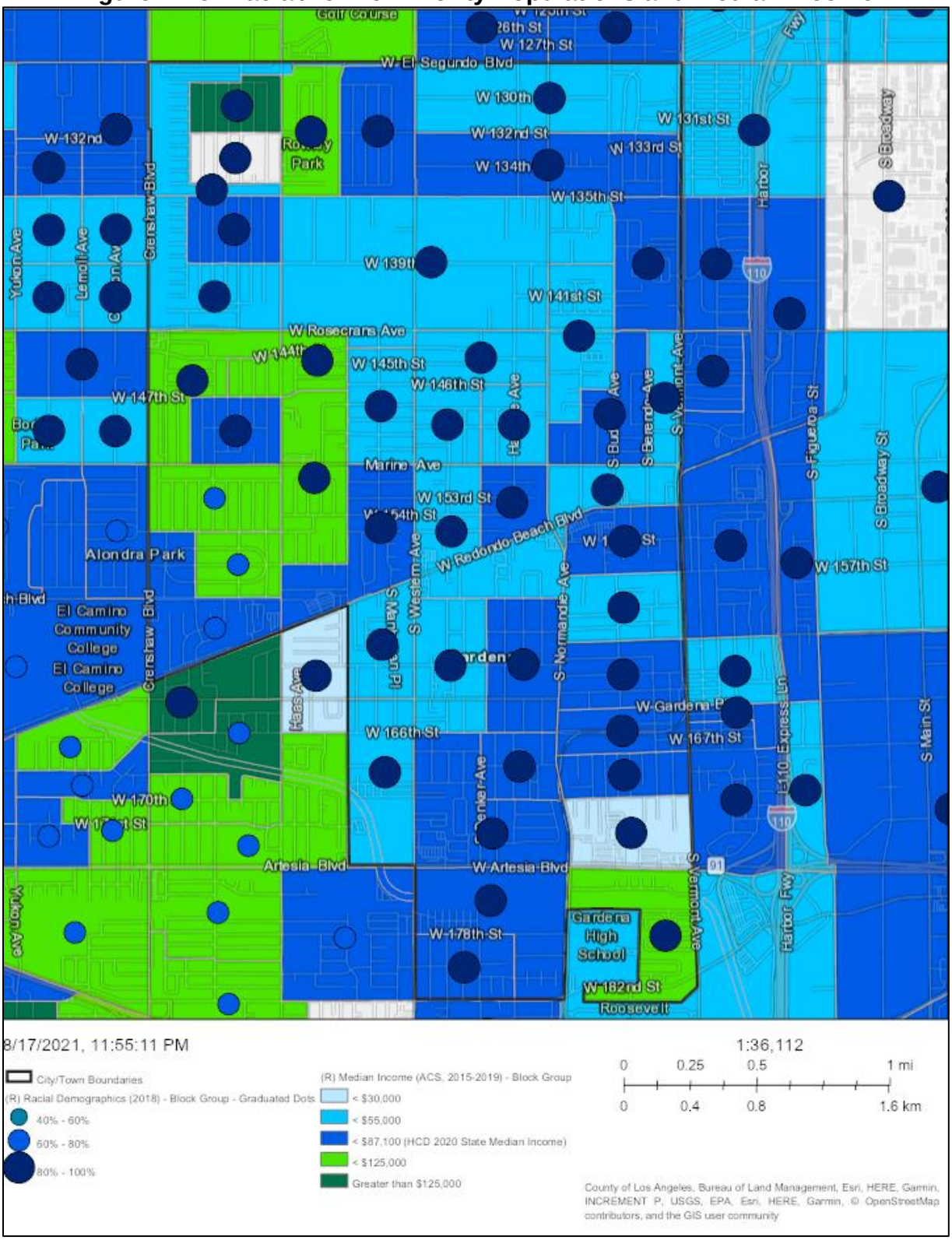
Source: HCD AFFH Data Viewer, 2021.

Figure E-18: Regional Median Income by Block Group



Source: HCD AFFH Data Viewer, 2015-2019 ACS, 2021.

Figure E-19: Racial/Ethnic Minority Populations and Median Income



Source: HCD AFFH Data Viewer, 2021.

Summary of Fair Housing Issues

Nearly 14 percent of the Gardena population is below the poverty level. There are no R/ECAPs or TCAC designated areas of high segregation and poverty in Gardena. Less than 20 percent of the population in most Gardena tracts is under the poverty level. The northeastern tract with a population of 20 percent to 30 percent below the poverty level also has more children living in female-headed households (see Figure E-12). There are no RCAAs in Gardena. All block groups have racial/ethnic minority populations of 60 percent or more and most have median incomes below the State average.

Access to Opportunity

HUD developed an index for assessing fair housing by informing communities about disparities in access to opportunity based on race/ethnicity and poverty status. Index scores are based on the following opportunity indicator indices (values range from 0 to 100):

- **Low Poverty Index:** The higher the score, the less exposure to poverty in a neighborhood.
- **School Proficiency Index:** The higher the score, the higher the school system quality is in a neighborhood.
- **Labor Market Engagement Index:** The higher the score, the higher the labor force participation and human capital in a neighborhood.
- **Transit Trips Index:** The higher the trips transit index, the more likely residents in that neighborhood utilize public transit.
- **Low Transportation Cost Index:** The higher the index, the lower the cost of transportation in that neighborhood.
- **Jobs Proximity Index:** The higher the index value, the better access to employment opportunities for residents in a neighborhood.
- **Environmental Health Index:** The higher the value, the better environmental quality of a neighborhood.

To assist in this analysis, the Department of Housing and Community Development (HCD) and the California Tax Credit Allocation Committee (TCAC) convened in the California Fair Housing Task Force (Task Force) to "provide research, evidence-based policy recommendations, and other strategic recommendations to HCD and other related state agencies/departments to further the fair housing goals (as defined by HCD)." The Task force has created Opportunity Maps to identify resources levels across the state "to accompany new policies aimed at increasing access to high opportunity areas for families with children in housing financed with 9% Low Income Housing Tax Credits (LIHTCs)". These opportunity maps are made from composite scores of three different domains made up of a set of indicators related to economic, environmental and educational opportunities and poverty and racial segregation. Based on these domain scores, tracts

are categorized as Highest Resource, High Resource, Moderate Resource, Moderate Resource (Rapidly Changing), Low Resource, or areas of High Segregation and Poverty. Table E-12 shows the full list of indicators.

Table E-12: Domains and List of Indicators for Opportunity Maps

Domain	Indicator
Economic	Poverty Adult education Employment Job proximity Median home value
Environmental	CalEnviroScreen 3.0 pollution Indicators and values
Education	Math proficiency Reading proficiency High School graduation rates Student poverty rates
Poverty and Racial Segregation	Poverty: tracts with at least 30% of population under federal poverty line Racial Segregation: Tracts with location quotient higher than 1.25 for Blacks, Hispanics, Asians, or all people of color in comparison to the County
Source: California Fair Housing Task Force, Methodology for TCAC/HCD Opportunity Maps, December 2020.	

Regional Trend. HUD Opportunity Indicator scores for Los Angeles County are shown in Table E-13. The White population, including the population below the federal poverty line, received the highest scores in low poverty, school proficiency, labor market participation, jobs proximity, and environmental health. Hispanic communities scored the lowest in low poverty and labor market participation and Black communities scored the lowest in school proficiency, jobs proximity, and environmental health. Black residents were most likely to use public transit and have the lowest transportation costs.

Table E-13: Los Angeles County HUD Opportunity Indicators by Race/Ethnicity

	Low Poverty	School Prof.	Labor Market	Transit	Low Transp. Cost	Jobs Proximity	Env. Health
Total Population							
White, non-Hispanic	62.59	65.09	65.41	82.63	74.09	55.80	18.99
Black, non-Hispanic	34.95	32.37	34.00	87.70	79.18	40.13	11.66
Hispanic	33.91	38.38	33.18	87.19	77.74	41.53	11.91
Asian or Pacific Islander, non-Hispanic	53.57	59.34	55.94	86.52	76.45	51.82	12.16
Native American, non-Hispanic	45.04	46.90	44.50	83.17	75.65	44.24	16.74
Population below federal poverty line							
White, non-Hispanic	50.68	58.06	57.49	86.42	79.48	57.52	16.66
Black, non-Hispanic	23.45	27.16	25.52	88.65	81.18	36.59	11.62
Hispanic	23.66	32.87	27.66	89.45	81.02	42.84	10.30
Asian or Pacific Islander, non-Hispanic	42.97	54.52	50.06	89.62	81.49	54.19	9.84
Native American, non-Hispanic	29.85	35.12	32.02	85.23	78.70	46.35	16.01
Source: HUD AFFH Database – Opportunity Indicators, 2020							

The central Los Angeles County areas around the City of Los Angeles are comprised of mostly low and moderate resource tracts and areas of high segregation and poverty. The El Monte/Baldwin Park area and San Fernando area, including Van Nuys/North Hollywood, also have concentrations of low resource areas and some areas of high segregation and poverty. High and highest resource areas are most concentrated in coastal communities from Rolling Hills/Rancho Palos Verdes to Santa Monica, and areas in and around Beverly Hills, La Cañada Flintridge, and Pasadena/Arcadia.

Local Trend. According to HUD Opportunity Indicators presented in Table E-14, in Gardena, Hispanic residents are mostly likely to be impacted by poverty and have poorer access to employment opportunities. Black Gardena residents are most likely to be exposed to lower school proficiency and labor market participation. White residents were least likely to be exposed to poverty and the most likely to live close to higher quality school systems. Compared to the County, Gardena residents were less likely to be exposed to poverty, more likely to utilize public transit, have lower transportation costs, and be located closer to employment opportunities regardless of race or ethnicity. However, Gardena scored significantly lower in environmental health and school proficiency compared to the County.

Table E-14: Gardena HUD Opportunity Indicators by Race/Ethnicity

	Low Poverty	School Prof.	Labor Market	Transit	Low Transp. Cost	Jobs Proximity	Env. Health
Total Population							
White, non-Hispanic	53.77	31.82	50.89	91.90	82.27	60.52	3.11
Black, non-Hispanic	46.70	12.89	36.95	91.97	82.86	57.88	4.86
Hispanic	42.71	21.98	44.95	91.90	83.75	63.65	3.68
Asian or Pacific Islander, non-Hispanic	48.04	29.74	53.16	92.48	84.46	67.11	2.30
Native American, non-Hispanic	48.71	22.71	44.34	91.19	82.10	59.76	4.07
Population below federal poverty line							
White, non-Hispanic	47.34	32.09	48.26	92.34	83.94	62.21	3.16
Black, non-Hispanic	41.98	10.48	37.63	92.39	83.78	59.19	5.28
Hispanic	35.21	15.51	41.19	91.68	84.91	65.63	4.06
Asian or Pacific Islander, non-Hispanic	46.26	30.04	50.51	92.53	84.68	66.8	1.64
Native American, non-Hispanic	--	--	--	--	--	--	--

-- = data not available.
Source: HUD AFFH Database – Opportunity Indicators, 2020.

Opportunity map scores for Gardena census tracts are presented in Figure E-21 along with the City's sites inventory. Of the tracts in Gardena 21.4 percent (3 tracts) are characterized as High Resource, 35.7 percent Moderate Resource (5 tracts), 7.1 percent Moderate Resource (Rapidly Changing) (1 tract), and 35.7 percent Low Resource (5 tracts). Opportunity map categorization and domain scores for Gardena census tracts are shown in Table E-15. There are no tracts in the City that are classified as areas of high segregation and poverty. The northern section of the City is low resource, while the central and southern sections are moderate and high resource areas.

Table E-15: TCAC Opportunity Map Domain Scores for Gardena Tracts

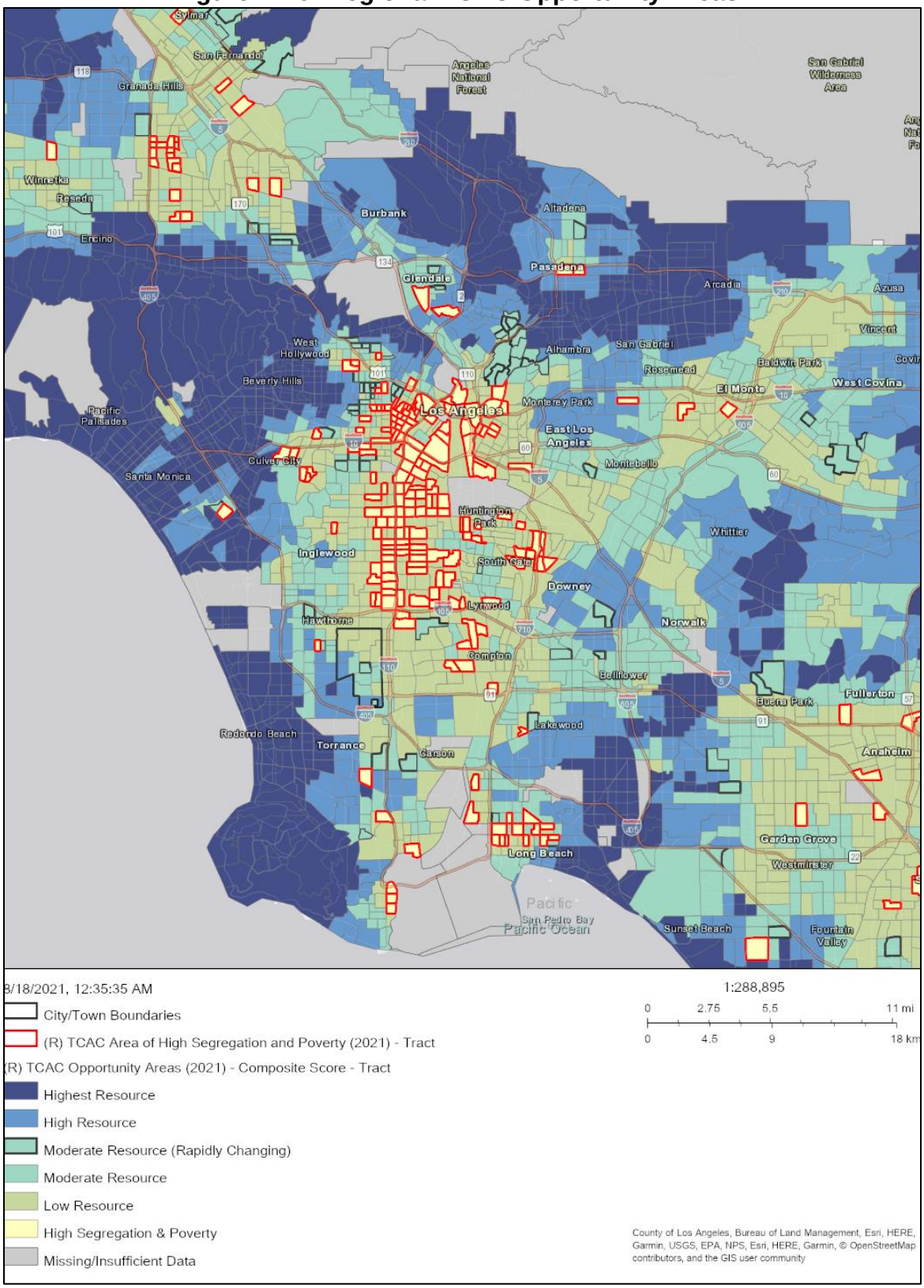
Census Tract	Economic Domain Score	Environmental Domain Score	Education Domain Score	Composite Index Score	Final Category
6037602600	0.4	0.025	0.234	-0.557	Low Resource
6037602900	0.192	0.096	0.037	-0.749	Low Resource
6037603001	0.41	0.593	0.053	-0.459	Low Resource
6037603004	0.586	0.822	0.175	-0.162	Moderate Resource
6037603005	0.251	0.739	0.132	-0.392	Low Resource
6037603006	0.562	0.894	0.431	0.028	Moderate Resource (Rapidly Changing)
6037603101	0.523	0.849	0.352	-0.07	Moderate Resource
6037603102	0.413	0.206	0.29	-0.326	Low Resource
6037603200	0.779	0.074	0.668	0.129	High Resource
6037603301	0.59	0.772	0.503	0.043	Moderate Resource
6037603302	0.423	0.152	0.746	0.043	Moderate Resource
6037603400	0.563	0.683	0.47	-0.014	Moderate Resource
6037603500	0.647	0.667	0.553	0.092	High Resource
6037603600	0.576	0.803	0.799	0.349	High Resource
Source: California Fair Housing Task Force, 2021 TCAC/HCD Opportunity Maps, December 2020.					

Sites Inventory. Most units used to meet Gardena's 2021-2029 RHNA are in low resource tracts (66.4 percent of units) (Table E-16). Of the 2,636 lower income RHNA units, 10.1 percent are in high resource tracts, 21.1 percent are in moderate resource tracts, including rapidly changing, and 68.9 percent are in low resource tracts. In comparison, 69 percent of moderate income units and 61.2 percent of above moderate income units are in low resource tracts. A larger proportion of moderate income units (17.8 percent) and above moderate income units (18.9 percent) are in high resource tracts compared to lower income units.

Table E-16: Distribution of RHNA Units by TCAC Opportunity Map Category

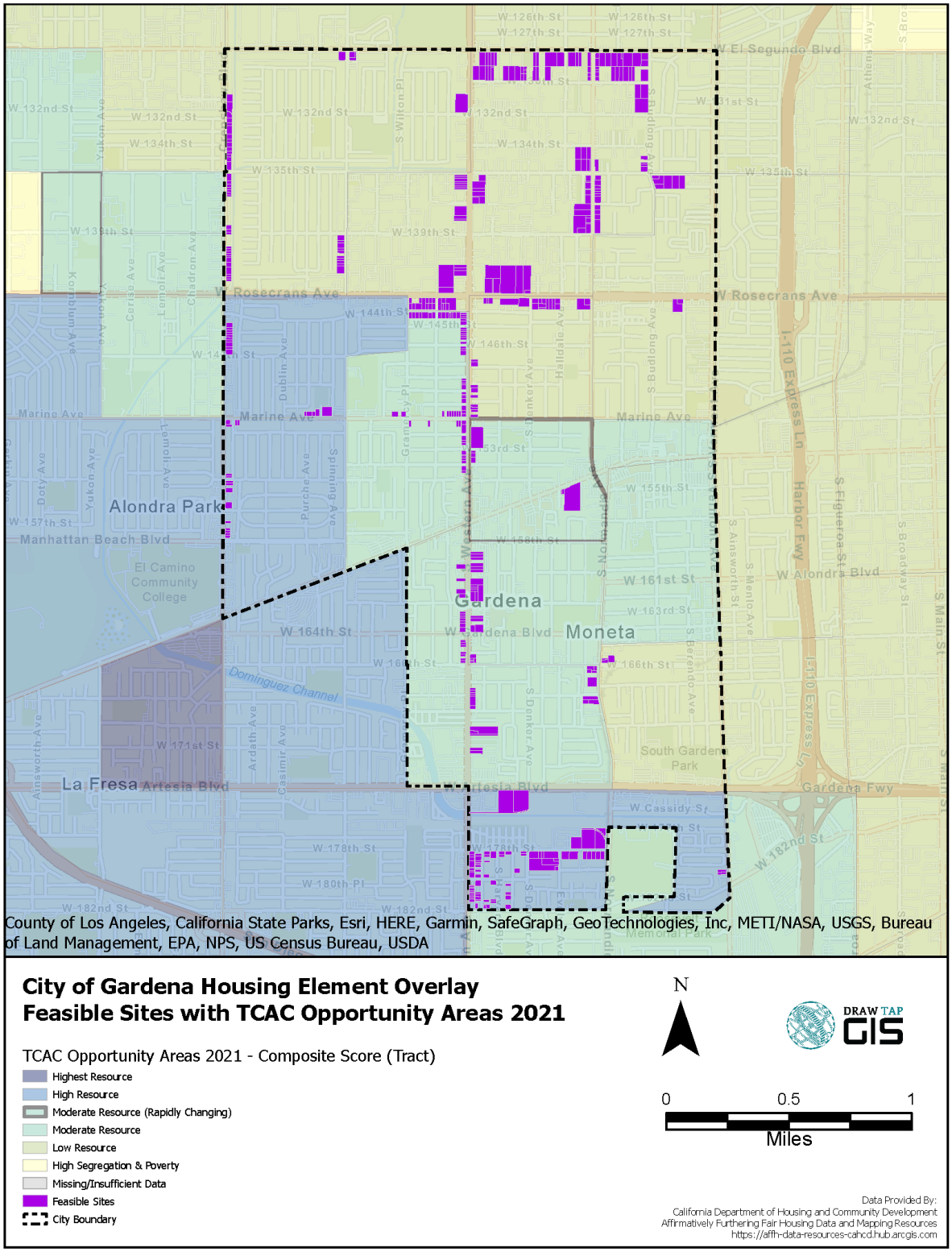
TCAC Opportunity Map Category (Tract)	Lower Income Units		Moderate Income Units		Above Moderate Income Units		All RHNA Units	
High Resource	266	10.1%	319	17.8%	406	18.9%	991	15.0%
Moderate Resource	433	16.4%	201	11.2%	344	16.0%	978	14.8%
Moderate Resource (Rapidly Changing)	122	4.6%	37	2.1%	86	4.0%	245	3.7%
Low Resource	1,815	68.9%	1,240	69.0%	1,317	61.2%	4,372	66.4%
Total	2,636	100.0%	1,797	100.0%	2,153	100.0%	6,586	100.0%

Figure E-20: Regional TCAC Opportunity Areas



Source: HCD AFFH Data Viewer, TCAC Opportunity Maps, 2021.

Figure E-21: TCAC Opportunity Areas by Tract and Sites Inventory



Source: HCD AFFH Data Viewer, TCAC Opportunity Maps, 2021.

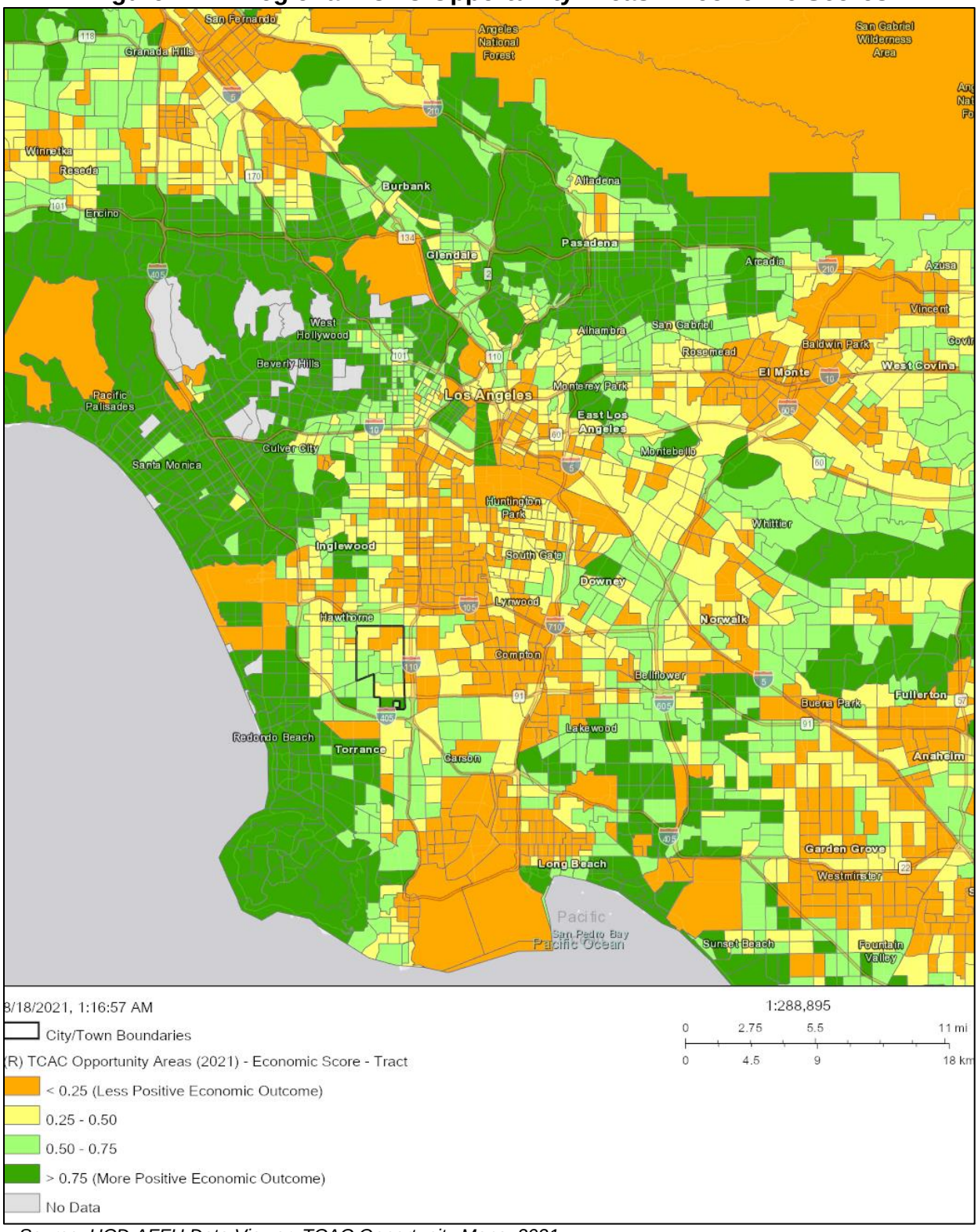
Economic

As described previously, the Fair Housing Task Force calculates economic scores based on poverty, adult education, employment, job proximity, and median home values. See Table E-12 for the complete list of TCAC Opportunity Map domains and indicators.

Regional Trend. Figure E-22 shows TCAC Opportunity Map economic scores in the Los Angeles region by tract. Consistent with final TCAC categories, tracts with the highest economic scores are in concentrated in coastal communities, from the Rancho Palos Verdes to Santa Monica, and areas around Beverly Hills, Burbank, Pasadena, and Arcadia. Tracts with economic scores in the lowest quartile are concentrated in the central Los Angeles County areas, San Gabriel Valley cities around El Monte, and around the cities of Long Beach and Carson.

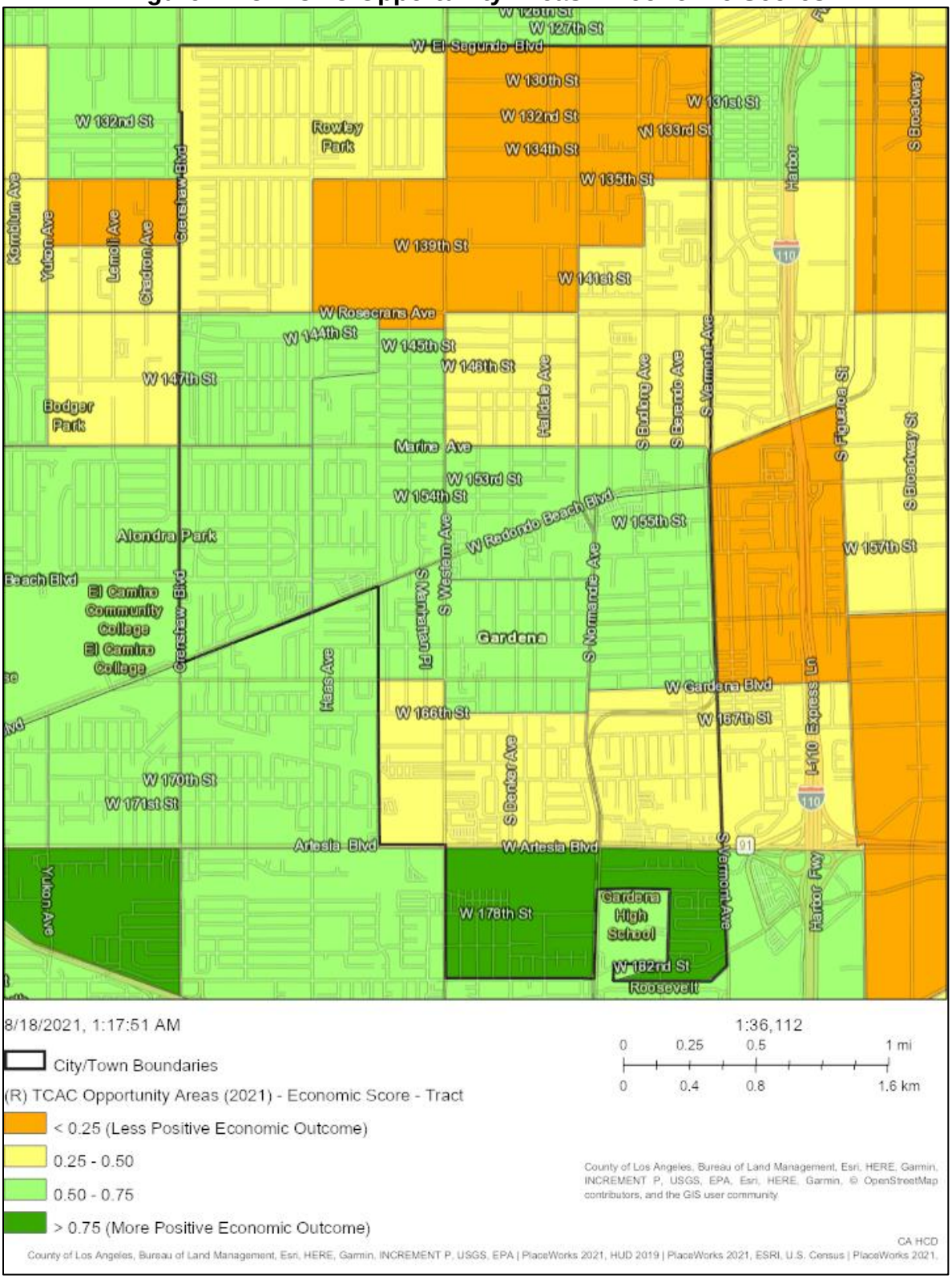
Local Trend. According to the 2021 Opportunity Map presented in Figure E-23, there is one tract in the City with an especially low economic score located in the northeastern section of the City. This tract is categorized as a low resource area and has concentrations of racial/ethnic minorities, children in female-headed households, and LMI households (see Figure E-5, Figure E-12, and Figure E-14). The tract located along the southern border received the highest economic score. The rest of Gardena received an economic score between 0.25 and 0.75.

Figure E-22: Regional TCAC Opportunity Areas – Economic Scores



Source: HCD AFFH Data Viewer, TCAC Opportunity Maps, 2021.

Figure E-23: TCAC Opportunity Areas – Economic Scores



Source: HCD AFFH Data Viewer, TCAC Opportunity Maps, 2021.

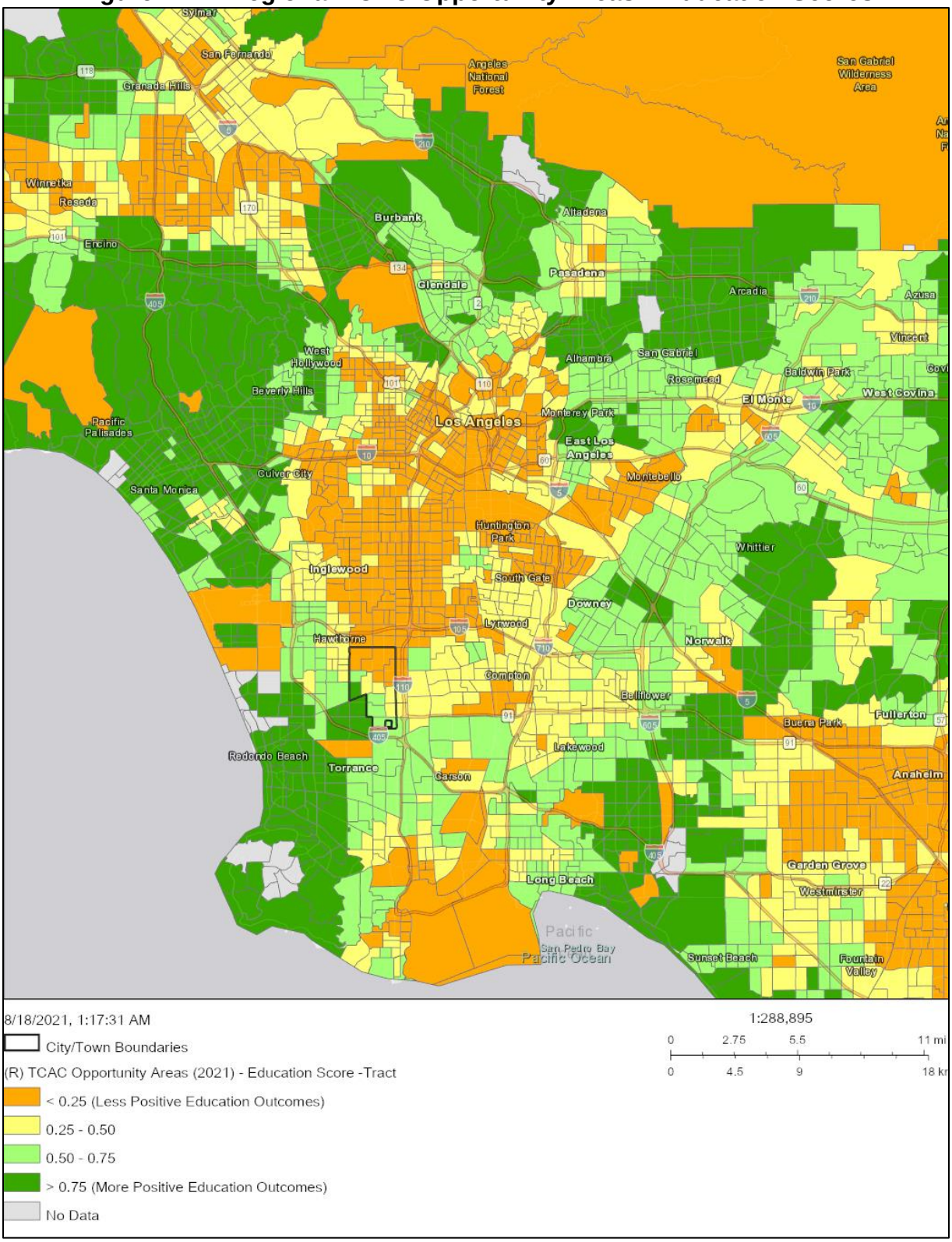
Education

As described above, the Fair Housing Task Force determines education scores based on math and reading proficiency, high school graduation rates, and student poverty rates. See Table E-12 for the complete list of TCAC Opportunity Map domains and indicators.

Regional Trend. TCAC Opportunity Map education scores for the region are shown in Figure E-24. The central County areas have the highest concentration of tracts with education scores in the lowest percentile. There is also a concentration of tracts with low education scores in San Fernando Valley cities east of Burbank. Areas around coastal communities, Burbank/La Cañada Flintridge, Arcadia, and Whittier have the highest education scores.

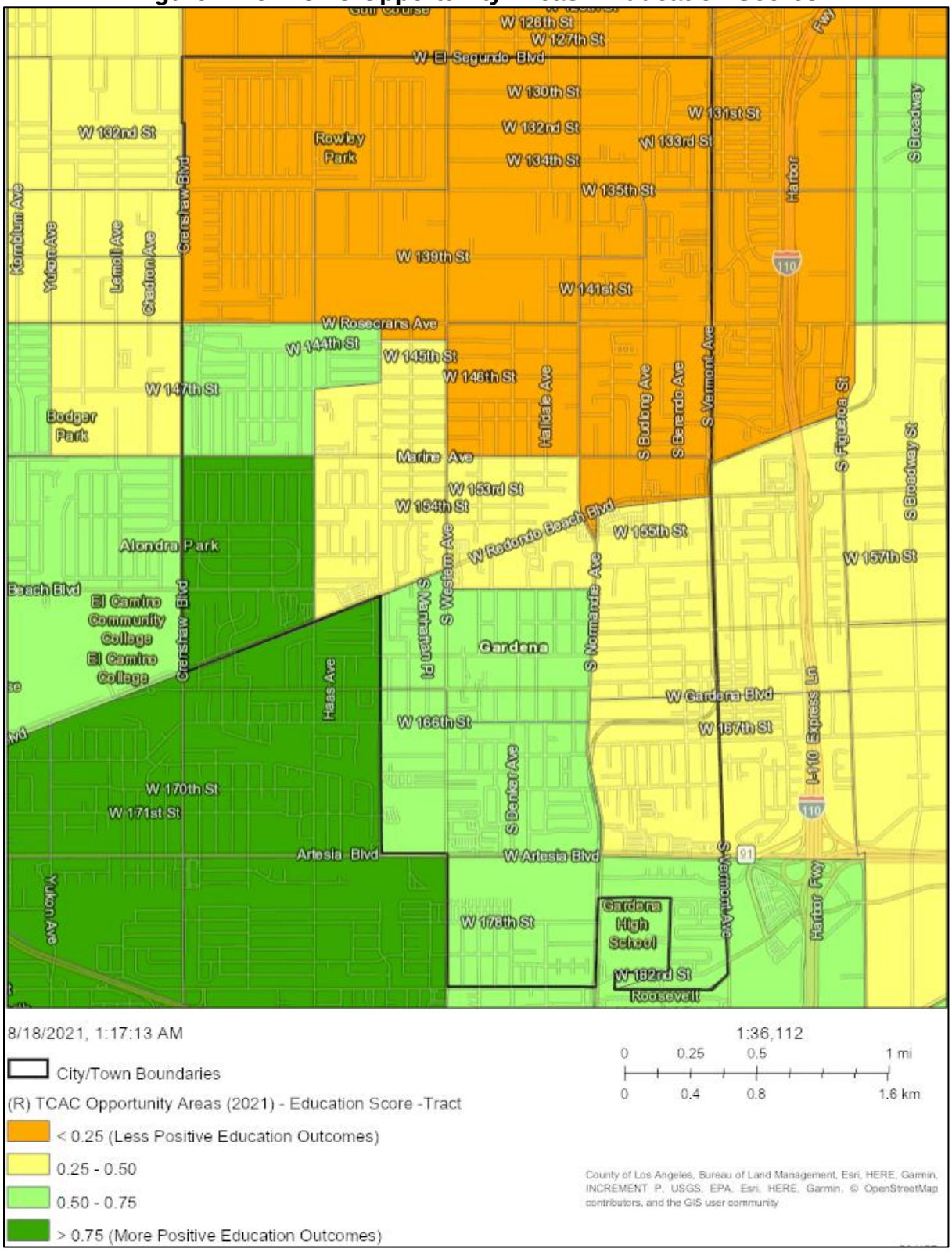
Local Trend. Areas with lower education scores, shown in Figure E-25, are concentrated in the northern section of the City. The southern end of the City tends to have higher education scores and one tract along the western border received an education score in the highest percentile. The areas with lower education scores also received lower economic scores and are categorized as low resource (see Figure E-21 and Figure E-23).

Figure E-24: Regional TCAC Opportunity Areas – Education Scores



Source: HCD AFFH Data Viewer, TCAC Opportunity Maps, 2021.

Figure E-25: TCAC Opportunity Areas – Education Scores



Source: HCD AFFH Data Viewer, TCAC Opportunity Maps, 2021.

Environmental

Environmental health scores are determined by the Fair Housing Task Force based on CalEnviroScreen 3.0 pollution indicators and values. The California Office of Environmental Health Hazard Assessment (OEHHA) compiles these scores to help identify California communities disproportionately burdened by multiple sources of pollution. In addition to considering (1) environmental factors such as pollutant exposure, groundwater threats, toxic sites, and hazardous materials exposure and (2) sensitive receptors, including seniors, children, persons with asthma, and low birth weight infants, CalEnviroScreen also takes into consideration socioeconomic factors. These factors include educational attainment, linguistic isolation, poverty, and unemployment. See Table E-12 for the complete list of TCAC Opportunity Map domains and indicators.

Regional Trend. A larger proportion of Los Angeles County has environmental scores in the lowest percentile compared to economic and education scores (Figure E-26). The central Los Angeles County, San Gabriel Valley, South Bay, and San Fernando Valley areas near Burbank all have concentrations of tracts with environmental scores in the lowest percentile. Tracts with the highest environmental scores are in western South Bay areas (i.e., Rolling Hills and Redondo Beach), and areas around Inglewood, Altadena, Whittier, and Lakewood.

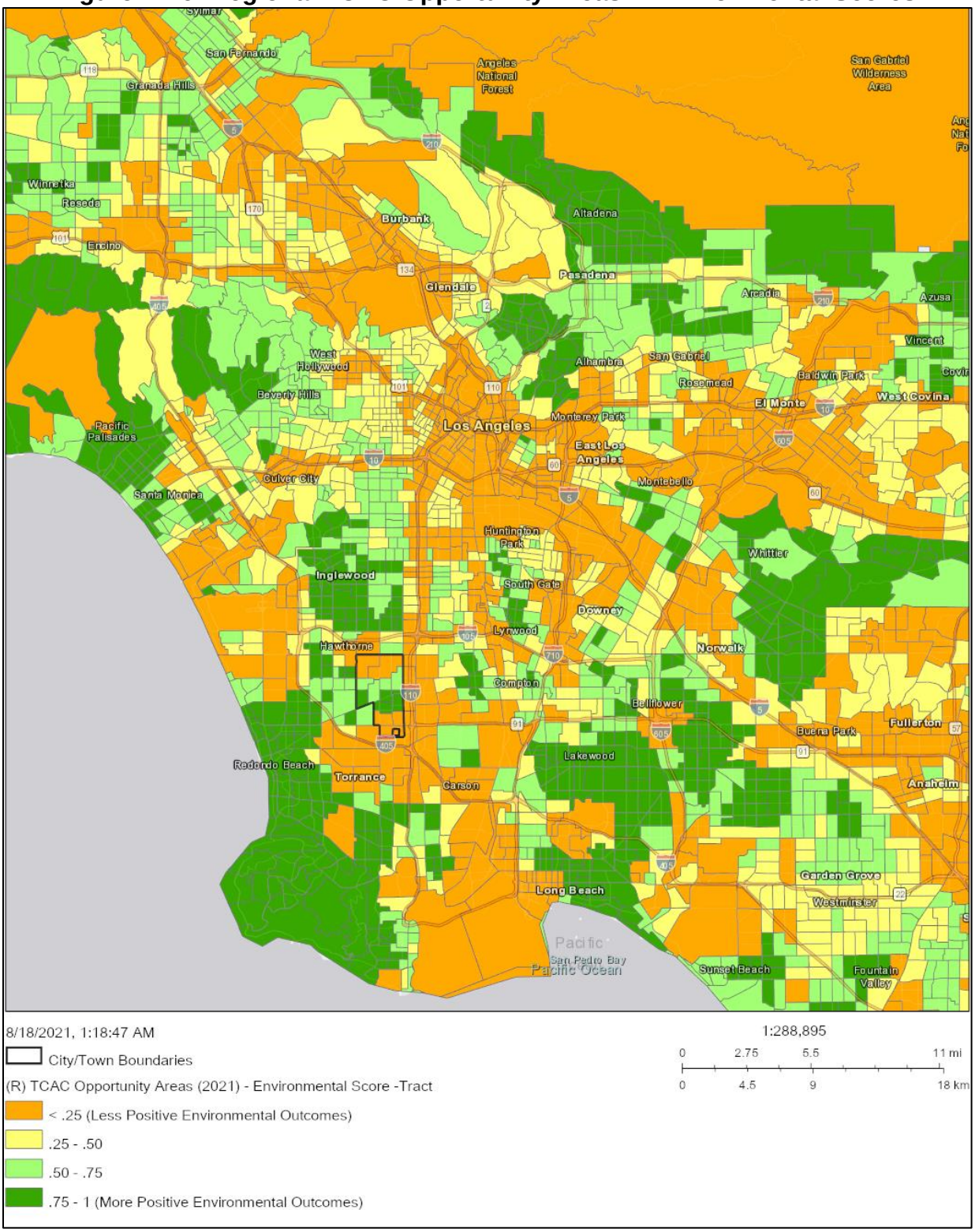
Local Trend. Figure E-27 shows that the northern and southern areas of the City have the lowest environmental scores. The central area of the City received higher environmental scores of 0.50 and above. As discussed previously, the northern area of the City received low economic and education scores and is categorized as a low resource area (see Figure E-21, Figure E-23, and Figure E-25).

Sites Inventory. The February 2021 update to the CalEnviroScreen (CalEnviroScreen 4.0) and the City's sites inventory is shown in Figure E-28. A census tract's overall CalEnviroScreen percentile equals the percentage of all ordered CalEnviroScreen scores that fall below the score for that area. The areas with the highest (worst) scores are in the central and southern areas of the City. The central part of the City scored slightly better than the northern and southern ends of the City, but all Gardena tracts scored in the 50th percentile or above relative to other census tracts. The distribution of RHNA units by CalEnviroScreen 4.0 score is presented in Table E-17. Over half of all RHNA units are in tracts that fall within the highest (worst) percentile score, including 55.1 percent of lower income units, 62.8 percent of moderate income units, and 47.3 percent of above moderate income units.

Table E-17: Distribution of RHNA Units by CalEnviroScreen 4.0 Percentile

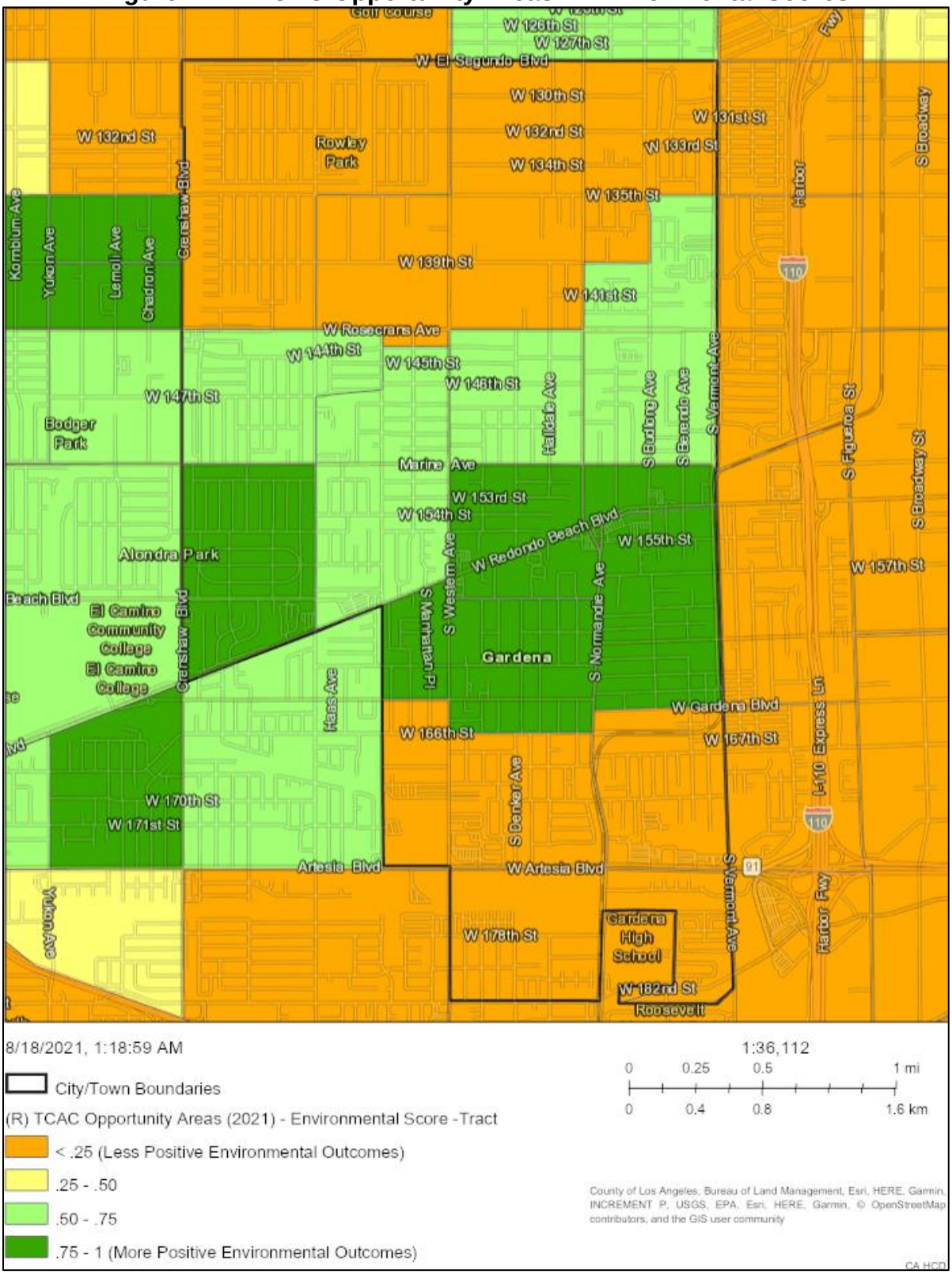
CalEnviroScreen 4.0 Percentile Score (Tract)	Lower Income Units		Moderate Income Units		Above Moderate Income Units		All RHNA Units	
	Units	Percent	Units	Percent	Units	Percent	Units	Percent
61-70%	122	4.6%	95	5.3%	92	4.3%	309	4.7%
71-80%	344	13.1%	105	5.8%	281	13.1%	730	11.1%
81-90%	718	27.2%	469	26.1%	762	35.4%	1,949	29.6%
91-100%	1,452	55.1%	1,128	62.8%	1,018	47.3%	3,598	54.6%
Total	2,636	100.0%	1,797	100.0%	2,153	100.0%	6,586	100.0%

Figure E-26: Regional TCAC Opportunity Areas – Environmental Scores



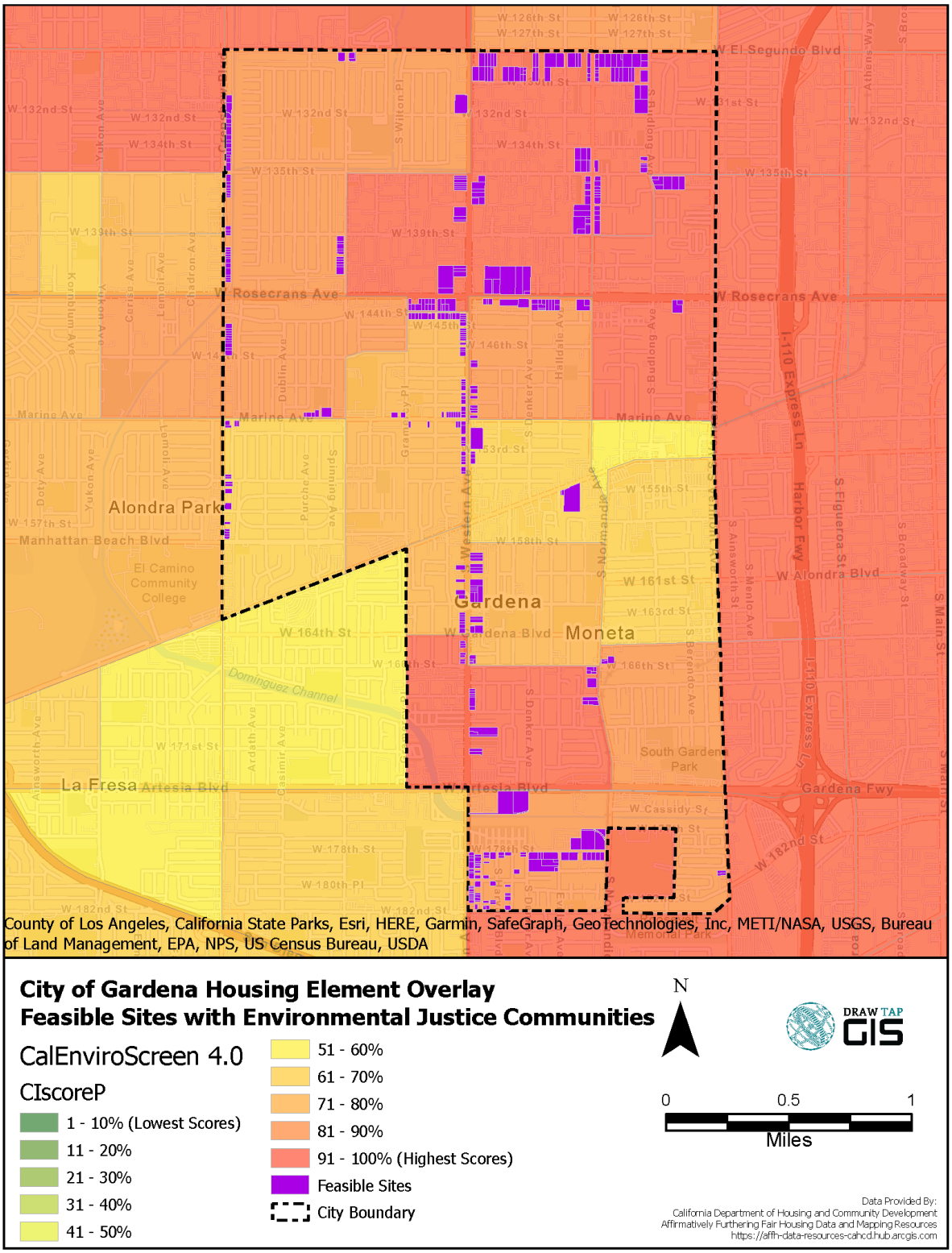
Source: HCD AFFH Data Viewer, TCAC Opportunity Maps, 2021.

Figure E-27: TCAC Opportunity Areas – Environmental Scores



Source: HCD AFFH Data Viewer, TCAC Opportunity Maps, 2021.

Figure E-28: CalEnvrioScreen 4.0 Scores and Sites Inventory



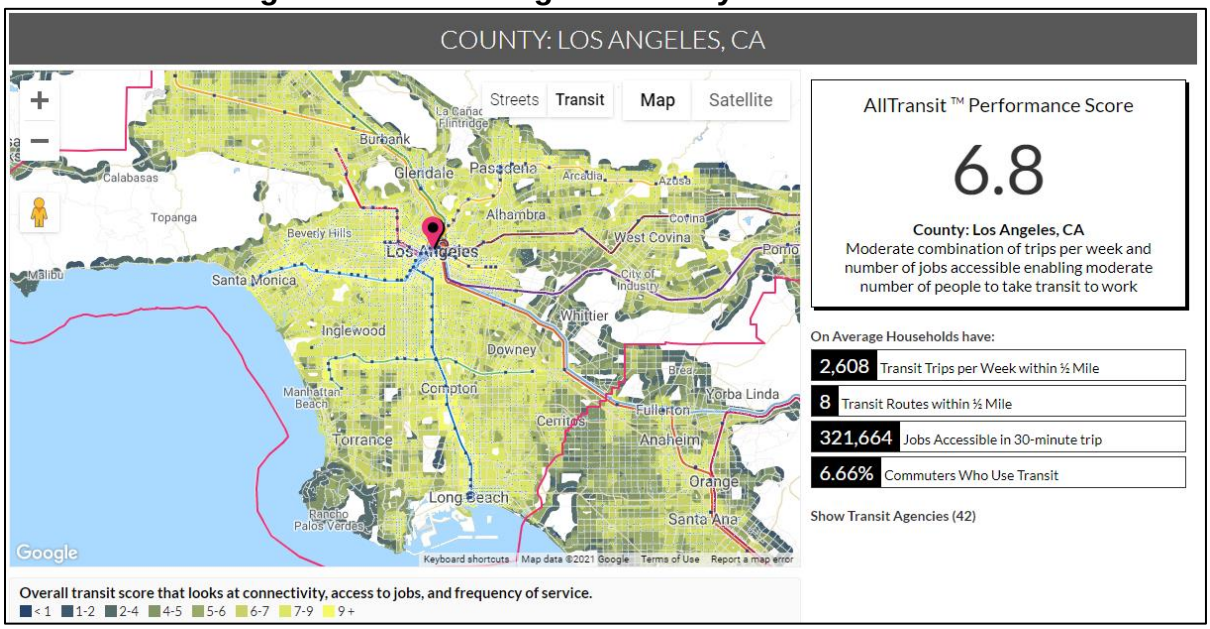
Source: HCD AFFH Data Viewer, TCAC Opportunity Maps, 2021.

Transportation

HUD's Job Proximity Index, shown in Table E-13 and Table E-14 above, can be used to show transportation need geographically. Block groups with lower jobs proximity indices are located further from employment opportunities and have a higher need for transportation. Availability of efficient, affordable transportation can be used to measure fair housing and access to opportunities. SCAG developed a mapping tool for High Quality Transit Areas (HQTA) as part of the Connect SoCal 2020-2045 Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS). SCAG defines HQTAs as areas within one-half mile from a major transit stop and a high-quality transit corridor. This section also utilizes All Transit metrics to identify transportation opportunities in Los Angeles County and Gardena.

Regional Trend. All Transit explores metrics that reveal the social and economic impact of transit, specifically looking at connectivity, access to jobs, and frequency of service.[3] Gardena's All Transit Performance score of 4.7 is lower than the surrounding jurisdictions of Carson (6.0), Hawthorne (7.3), Inglewood (7.7), Lawndale (7.8), Torrance (6.1), and the County (6.8). Los Angeles County All Transit metrics are shown in Figure E-29. The County's All Transit score of 6.8 indicates a moderate combination of trips per week and number of accessible jobs enabling a moderate number of people to take transit to work. All Transit estimates 93.9 percent of jobs and 90.1 percent of workers are located within ½ a mile from transit.

Figure E-29: Los Angeles County All Transit Metrics



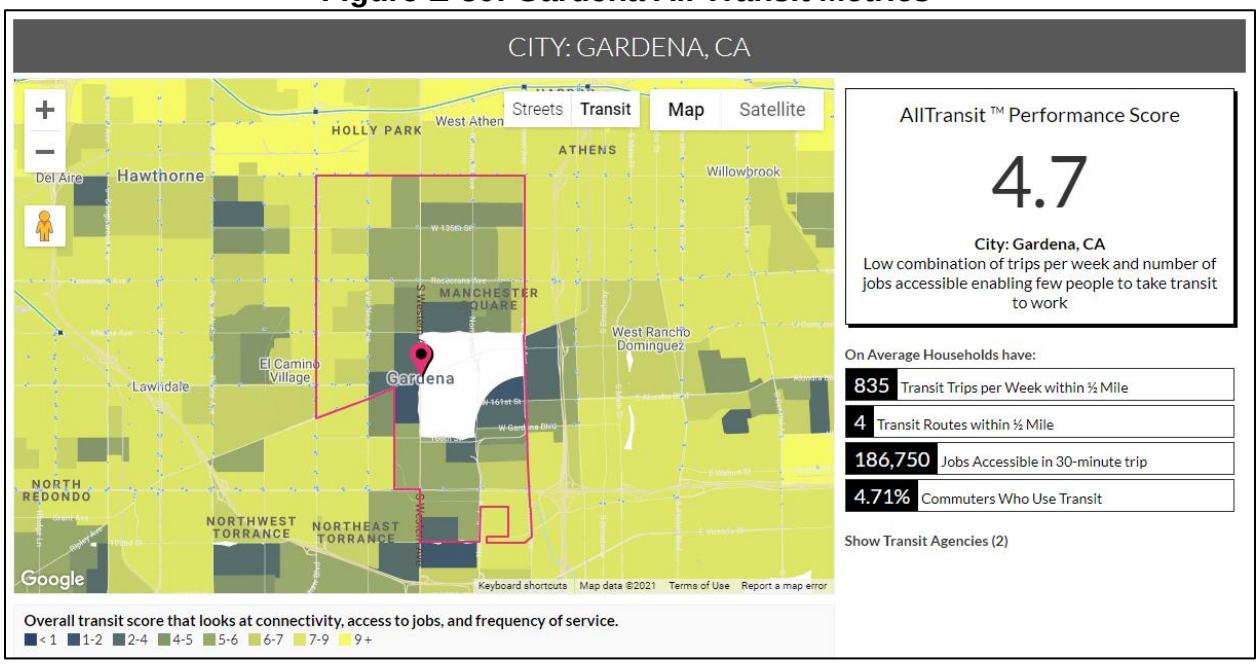
Source: All Transit Metrics: All Transit Performance Score – Los Angeles County, 2019.

[3] AllTransit. 2019 Metrics: AllTransit Performance Score. https://alltransit.cnt.org/. Accessed August 2021.

As shown in Figure E-31, block groups around Santa Monica/Beverly Hills, Glendale/Burbank, Torrance, downtown Los Angeles, and coastal areas around El Segundo have the highest jobs proximity index scores indicating employment opportunities are most accessible in these areas. Central County areas, from Inglewood to Bellflower, southern South Bay cities, and parts of San Fernando Valley have the lowest jobs proximity index scores. Most of the central County areas and San Fernando Valley are considered HQTAs (Figure E-33).

Local Trend. All Transit metrics for Gardena are shown in Figure E-30. Gardena received an All Transit Performance Score of only 4.7, indicating a low combination of trips per week and number of jobs accessible by transit. All Transit estimates that 77.9 percent of jobs and 85.4 percent of workers in Gardena live within ½ a mile from transit.

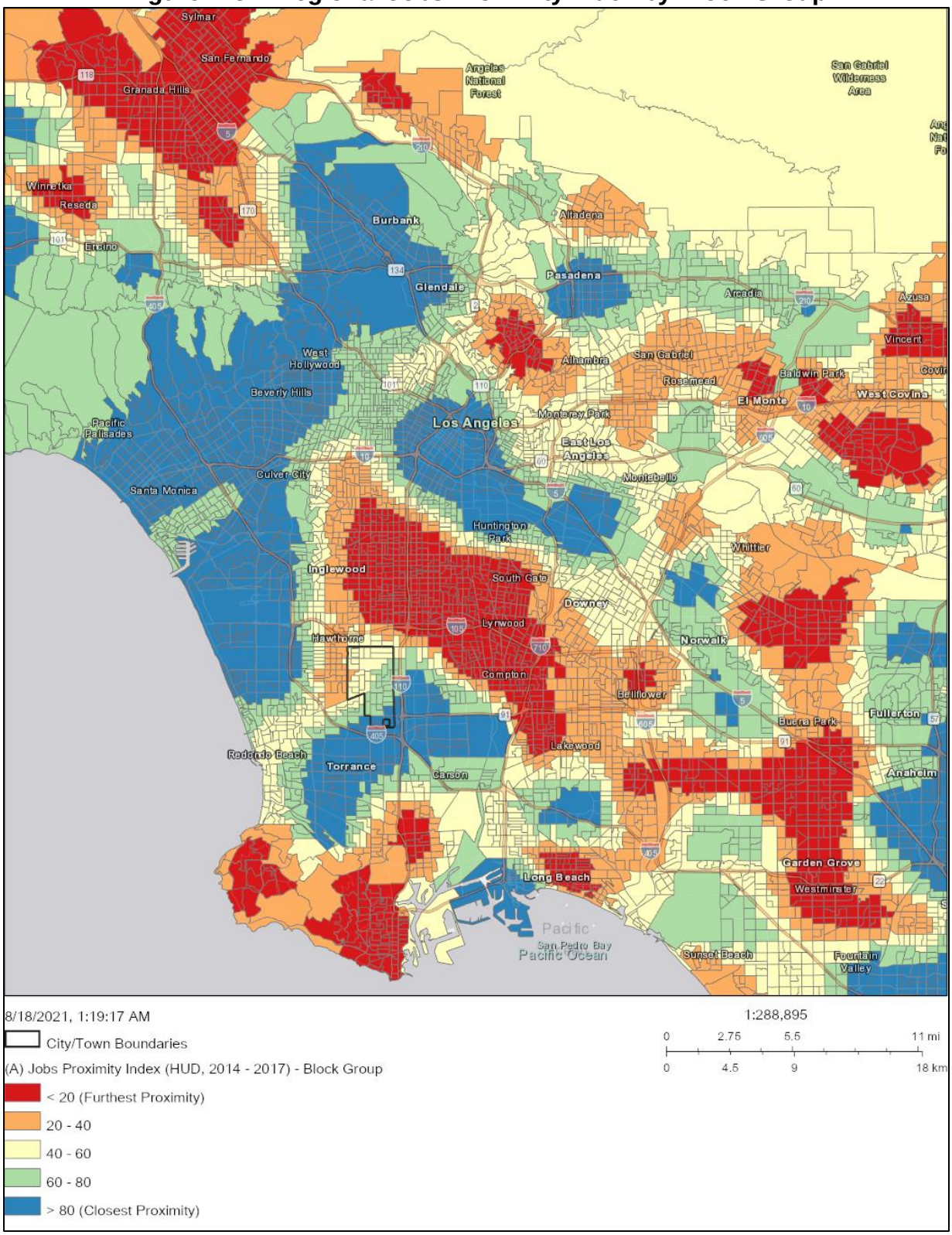
Figure E-30: Gardena All Transit Metrics



Source: All Transit Metrics: All Transit Performance Score – Los Angeles County, 2019.

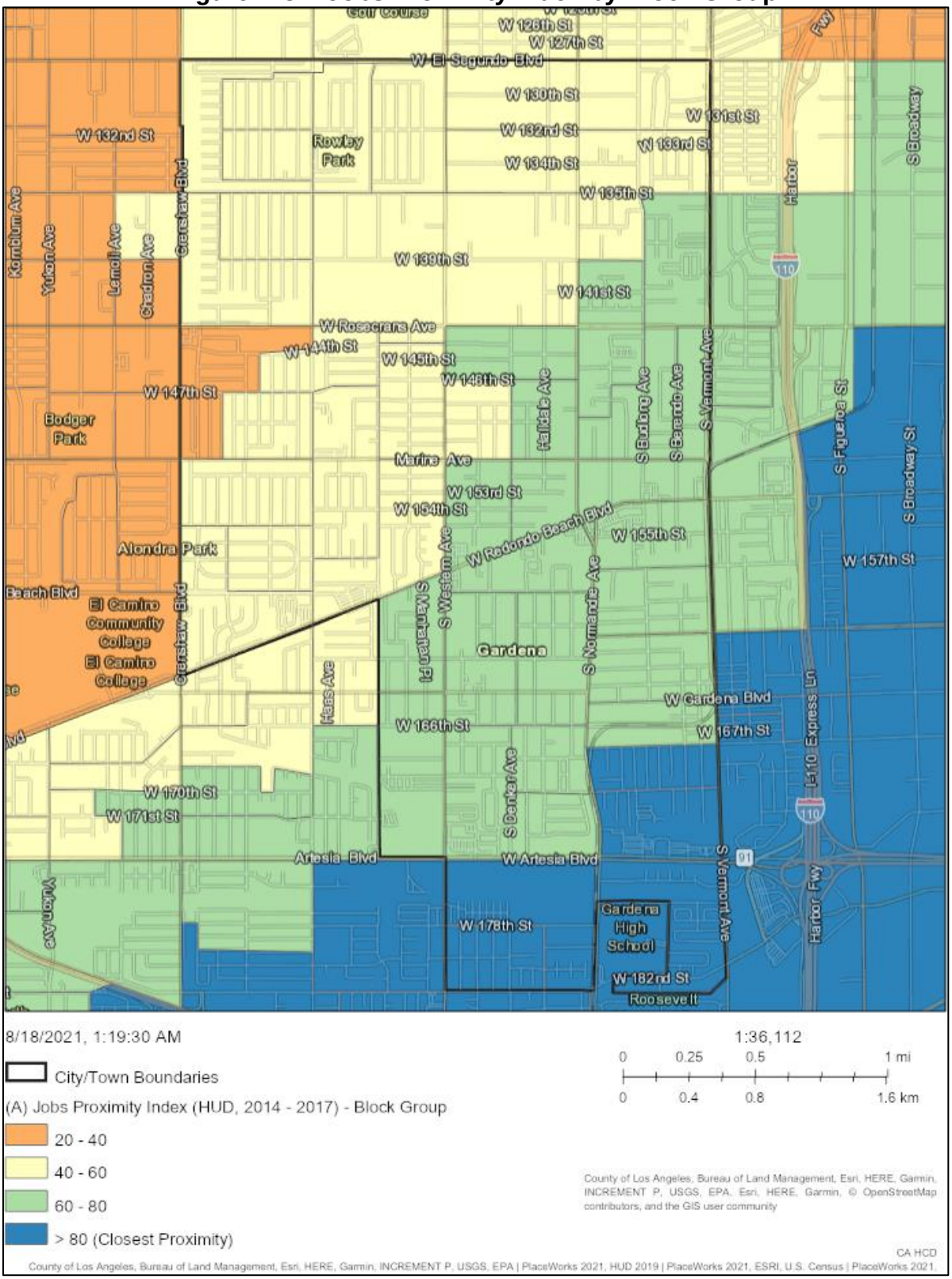
Based on HUD Opportunity Indicators shown in Table E-14, Gardena residents, regardless of race, have better access to employment opportunities compared to residents Countywide. As shown in Figure E-32, census block groups in the southeastern areas of the City have the greatest access to employment opportunities. Employment opportunities are less accessible to residents in the northwestern areas of Gardena. One block group along the western City border received a jobs proximity score of 39, the lowest in the City. Figure E-33 shows that most of Gardena is considered an HQTA. As discussed previously, Gardena also scored higher than the County average in access to transit and low transportation cost (see Table E-14).

Figure E-31: Regional Jobs Proximity Index by Block Group



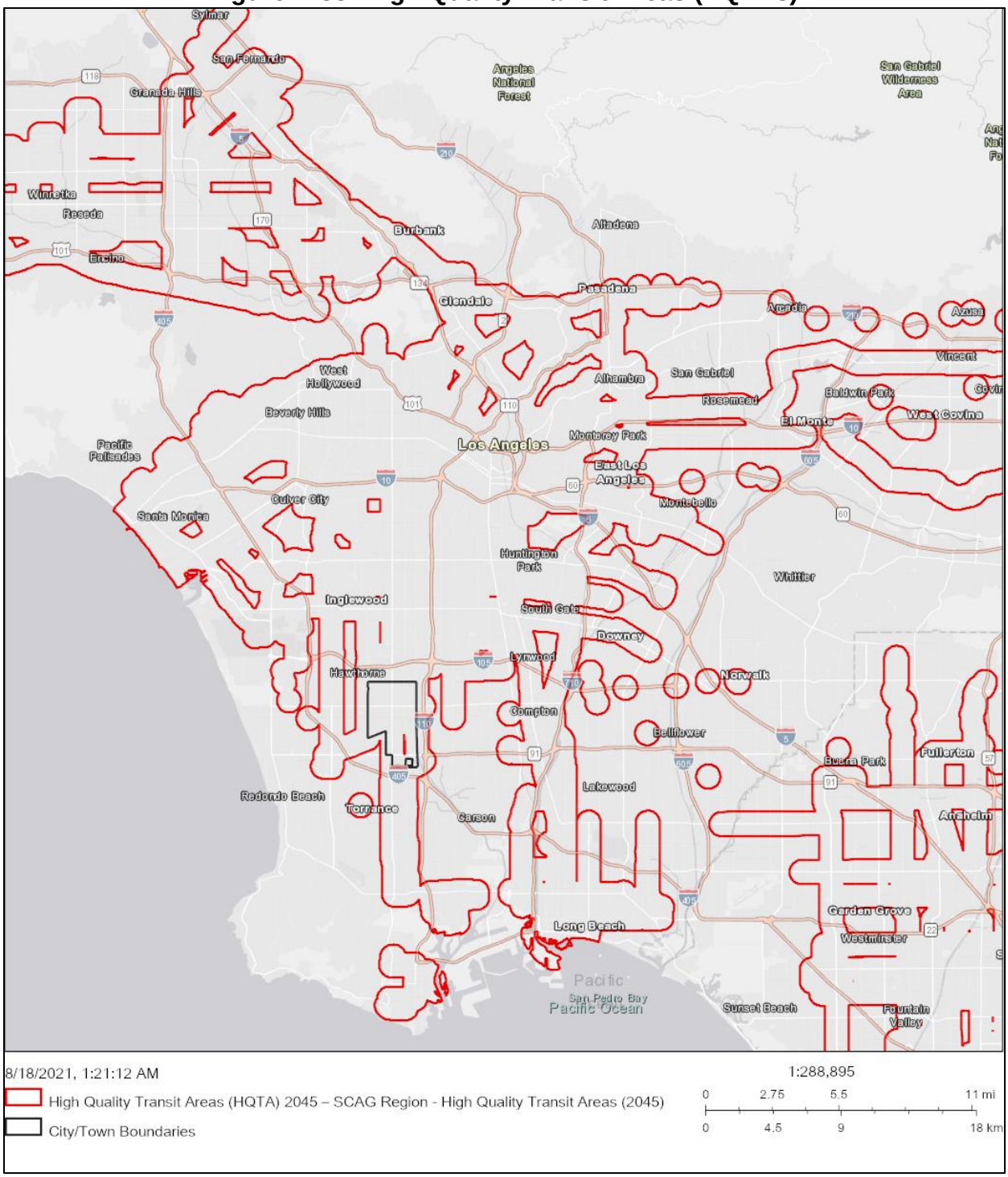
Source: HCD AFFH Data Viewer, HUD Opportunity Indicators, 2021.

Figure E-32: Jobs Proximity Index by Block Group



Source: HCD AFFH Data Viewer, HUD Opportunity Indicators, 2021.

Figure E-33: High Quality Transit Areas (HQTAs)



Source: SCAG HQTA database, 2021.

Summary of Fair Housing Issues

As discussed previously, the entire City has high concentrations of racial/ethnic minorities (see Figure E-5). The low resource areas in the northern half of the City also have larger proportions of LMI households and children in female-headed households (see Figure E-12 and Figure E-14). Northern Gardena also has lower economic scores, education scores, and jobs proximity index scores compared to the southern section of the City.

Disproportionate Housing Needs

Housing problems for Gardena were calculated using HUD's 2020 Comprehensive Housing Affordability Strategy (CHAS) data based on the 2013-2017 ACS. Table E-18 breaks down households by race and ethnicity and presence of housing problems for Gardena and Los Angeles County households. The following conditions are considered housing problems:

- Substandard Housing (measured by incomplete plumbing or kitchen facilities)
- Overcrowding (more than 1 person per room)
- Cost burden (housing costs greater than 30 percent)

In Gardena, 41.2 percent of owner-occupied households and 59.3 percent of renter-occupied households have one or more housing problems. The city has a larger proportion of households with a housing problem compared to the County, where 38.9 percent of owner-occupied households and 62.3 percent of renter-occupied households experience a housing problem. In Gardena, Pacific Islander renter-households experience housing problems at the highest rate (97.8 percent). Black and Hispanic households, owners and renters, also experience housing problems at a higher rate than the city average.

Table E-18: Housing Problems by Race/Ethnicity

Race/Ethnicity	Gardena		Los Angeles County	
	Owner	Renter	Owner	Renter
White	32.6%	43.0%	32.1%	52.6%
Black	52.6%	64.1%	41.5%	63.7%
Asian	33.3%	55.5%	38.3%	56.3%
American Indian	8.9%	--	39.7%	56.4%
Pacific Islander	42.9%	97.8%	39.7%	55.5%
Hispanic	46.4%	63.7%	48.2%	71.1%
Other	46.2%	45.3%	36.5%	55.7%
All	41.2%	59.3%	38.9%	62.3%

Source: HUD CHAS Data (based on 2013-2017 ACS), 2020.

Cost Burden

Households are considered cost burdened if housing costs exceed 30 percent of their gross income for housing, and severely cost burdened if housing costs exceed 50 percent of their gross income. Cost burden in Gardena and Los Angeles County is assessed using 2020 HUD CHAS data (based on 2013-2017 ACS estimates) and the HCD Data Viewer (based on 2010-2014 and 2015-2019 ACS estimates).

Regional Trend. Cost burden by tenure and race/ethnicity for Los Angeles County is shown in Table E-19. Approximately 45 percent of Los Angeles County households are cost burdened, including 35 percent of owner-occupied households and 54.2 percent of renter-occupied households. Non-Hispanic Black and Hispanic renter households have the highest rate of cost burden of 59.6 percent and 58.3 percent, respectively. Non-Hispanic White and non-Hispanic Pacific Islander owner households have the lowest rate of cost burden of 31.1 percent and 33.3 percent, respectively. Cost burden is more common amongst renter households than owner households regardless of race or ethnicity.

Table E-19: Cost Burden by Race/Ethnicity – Los Angeles County

Race/Ethnicity	Cost Burdened (>30%)	Severely Cost Burdened (>50%)	Total Households
Owner-Occupied			
White, non-Hispanic	31.1%	14.8%	648,620
Black, non-Hispanic	40.0%	19.6%	104,895
Asian, non-Hispanic	34.4%	15.8%	255,890
American Indian, non-Hispanic	36.9%	16.3%	3,215
Pacific Islander, non-Hispanic	33.3%	14.8%	2,165
Hispanic	39.5%	17.8%	470,670
Other	34.9%	17.2%	26,905
Renter-Occupied			
White, non-Hispanic	49.4%	27.5%	541,545
Black, non-Hispanic	59.6%	34.8%	206,950
Asian, non-Hispanic	47.6%	25.5%	226,765
American Indian, non-Hispanic	48.8%	26.8%	4,420
Pacific Islander, non-Hispanic	47.9%	22.5%	4,355
Hispanic	58.3%	30.5%	755,590
Other	50.9%	27.5%	43,210
Source: HUD CHAS Data (based on 2013-2017 ACS), 2020.			

Local Trend. Cost burden by tenure based on HUD CHAS data is shown in Table E-20. Pacific Islander and Black renter-occupied households have the highest rate of cost burden in the city (88.9 and 66.4 percent, respectively). American Indian and White owner-occupied households have the lowest instance of cost burden (8.9 and 28.9

percent, respectively). For all racial and ethnic groups besides members of a group not listed ("other"), cost burden is more prevalent amongst renter-occupied households. Overall, 45.5 percent of Gardena households are cost burdened, and 22.9 percent are severally cost burdened. Over half (54.6 percent) of renters in Gardena pay more than 30 percent of their income in housing, compared to 36.2 percent of owners. A larger proportion of households in Gardena are cost burdened compared to the County.

Table E-20: Cost Burden by Race/Ethnicity – Gardena

Race/Ethnicity	Cost Burdened (>30%)	Severely Cost Burdened (>50%)	Total Households
Owner-Occupied			
White, non-Hispanic	28.9%	13.3%	1,765
Black, non-Hispanic	52.6%	26.8%	2,425
Asian, non-Hispanic	29.5%	16.1%	3,290
American Indian, non-Hispanic	8.9%	0.0%	45
Pacific Islander, non-Hispanic	42.9%	21.4%	70
Hispanic	33.3%	15.1%	2,445
Other	48.9%	37.8%	225
Total	**36.2%**	**18.4%**	**10,265**
Renter-Occupied			
White, non-Hispanic	39.5%	23.0%	1,000
Black, non-Hispanic	63.4%	30.7%	2,935
Asian, non-Hispanic	50.4%	30.5%	2,740
Pacific Islander, non-Hispanic	88.9%	0.0%	45
Hispanic	55.3%	23.2%	3,400
Other	45.3%	30.2%	265
Total	**54.6%**	**27.3%**	**10,385**
Source: HUD CHAS Data (based on 2013-2017 ACS), 2020.			

Figure E-34 and Figure E-35 compare overpayment by tenure over time using the 2010-2014 and 2015-2019 ACS. The proportion of overpaying homeowners has decreased in most tracts. Between 20-40 percent of homeowners in most Gardena tracts are cost burdened; 40-60 percent of homeowners in the remaining tracts are cost burdened. Tracts with more cost burdened owner-occupied households are not concentrated in on area in the city.

Concentrations of overpaying renters have generally remained the same since 2014. The proportion of cost burdened renters has decreased in one tract along the northwestern City boundary and the southernmost tract and increased in one tract in the southwestern corner. Between 40 percent and 80 percent of renters are cost burdened in most Gardena tracts. In general, more renters in the northern City areas are cost burdened compared to the southern tracts. Northern Gardena is considered a low resource area and has high concentrations of racial and ethnic minorities and LMI households (see Figure E-5, Figure

E-14, and Figure E-21). The northern half of the city also has higher concentrations of children in female-headed households compared to the rest of the city (see Figure E-12). As discussed previously, cost burden is generally more common amongst renters than owners in Gardena.

Sites Inventory. Figure E-34 and Figure E-35 also include the sites inventory used to meet the City's 2021-2029 RHNA. As presented in Table E-21, most RHNA units are located in tracts where 20 percent to 40 percent of households are cost burdened. Conversely, 67.7 percent of RHNA units are in tracts where 60 percent to 80 percent of renters are cost burdened. Over 70 percent of lower income units are in tracts where more than 60 percent of renter households overpay for housing. A slightly larger proportion of lower income units are in tracts where 60 percent to 80 percent of renters are cost burdened compared to moderate (67.2 percent) and above moderate (63.4 percent) income units.

Table E-21: Distribution of RHNA Units by Percent of Cost Burdened Owners

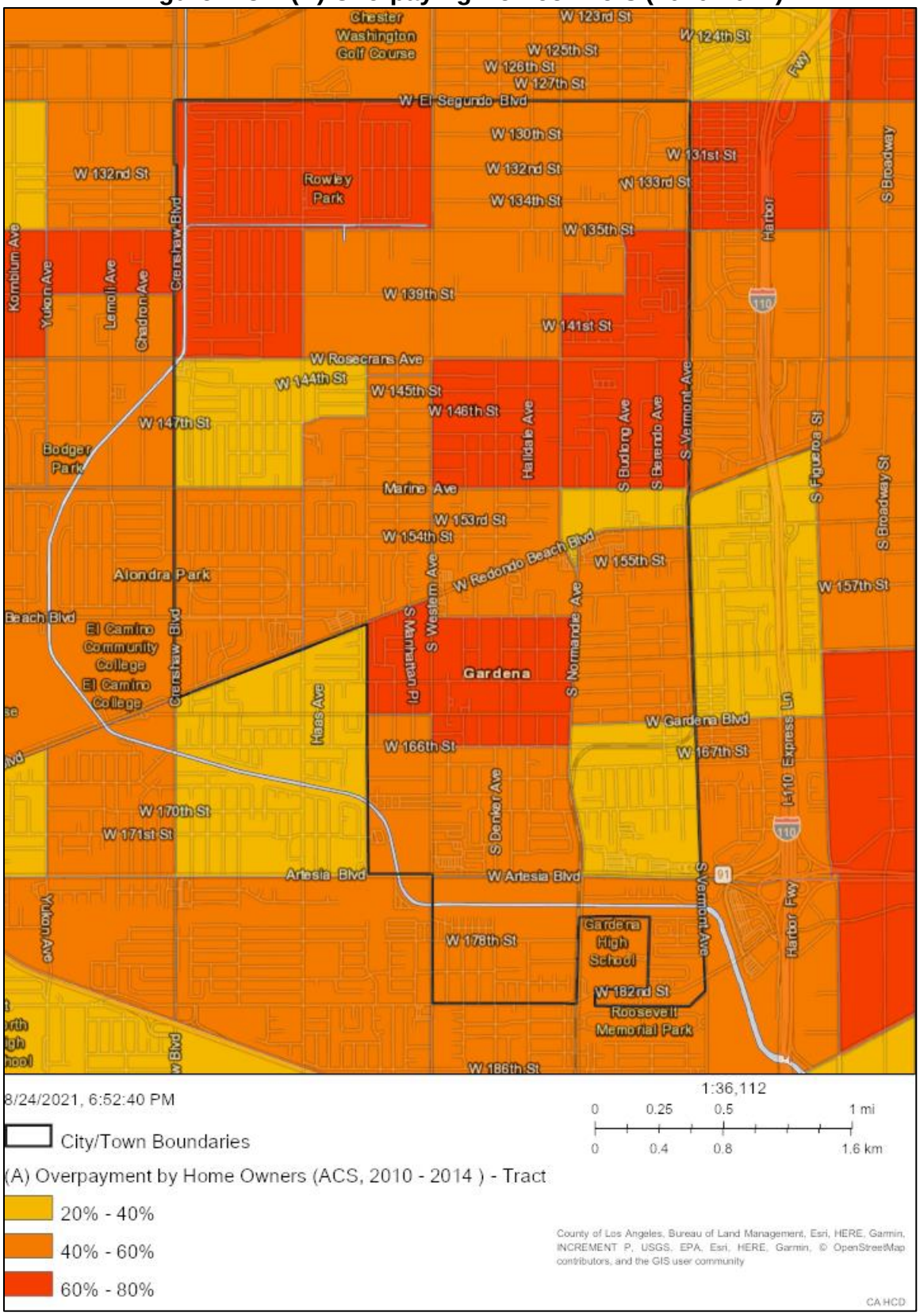
Cost Burdened Owners (Tract)	Lower Income Units		Moderate Income Units		Above Moderate Income Units		All RHNA Units	
	Units	Percent	Units	Percent	Units	Percent	Units	Percent
20-40%	1,912	72.5%	1,294	72.0%	1,592	73.9%	4,798	72.8%
40-60%	724	27.5%	503	28.0%	561	26.1%	1,788	27.1%
Total	2,636	100.0%	1,797	100.0%	2,153	100.0%	6,586	100.0%

Table E-22: Distribution of RHNA Units by Percent of Cost Burdened Renters

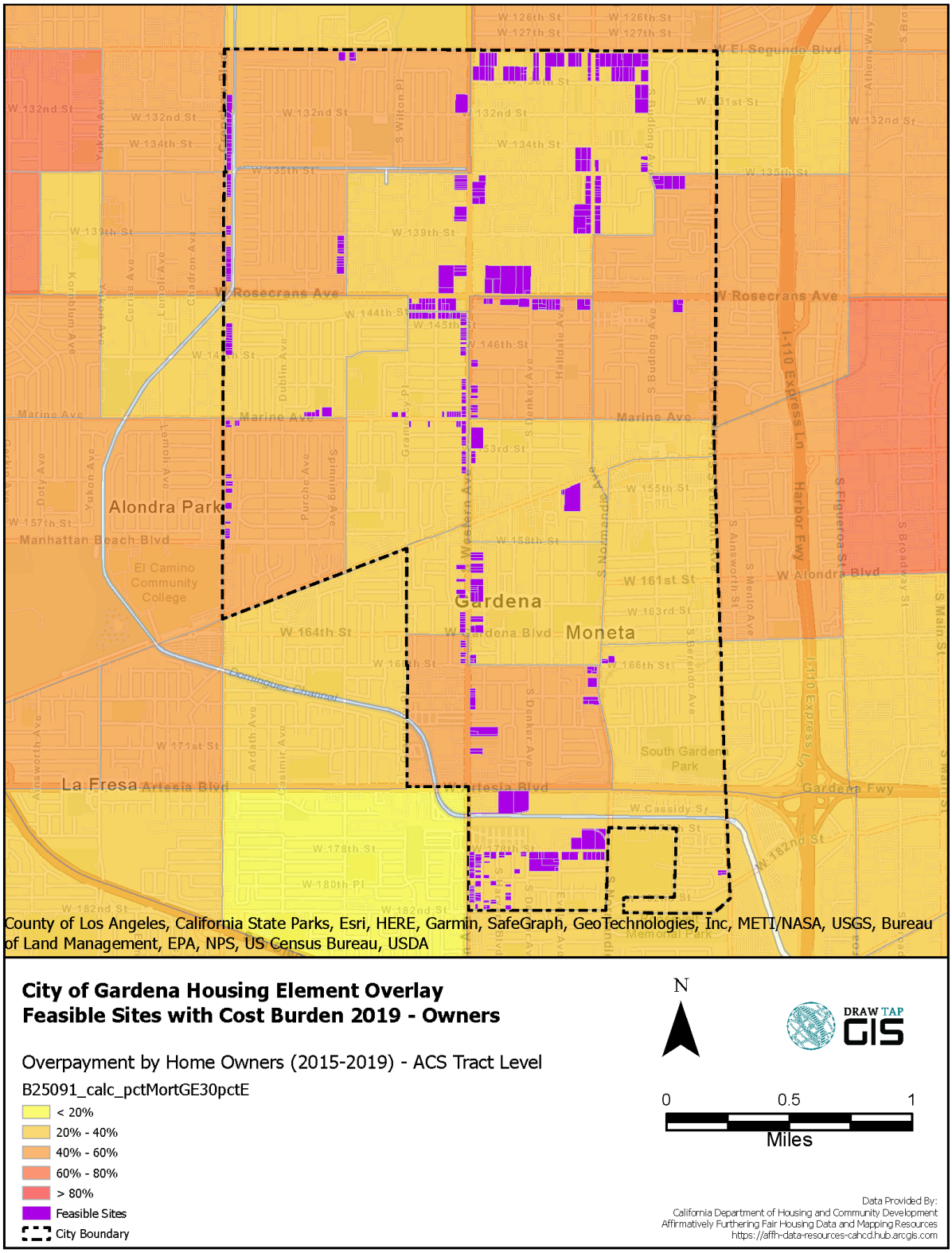
Cost Burdened Renters (Tract)	Lower Income Units		Moderate Income Units		Above Moderate Income Units		All RHNA Units	
	Units	Percent	Units	Percent	Units	Percent	Units	Percent
40-60%	753	28.6%	589	32.8%	788	36.6%	2,130	32.3%
60-80%	1,883	71.4%	1,208	67.2%	1,365	63.4%	4,456	67.7%
Total	2,636	100.0%	1,797	100.0%	2,153	100.0%	6,586	100.0%

.

Figure E-34: (A) Overpaying Homeowners (2010-2014)

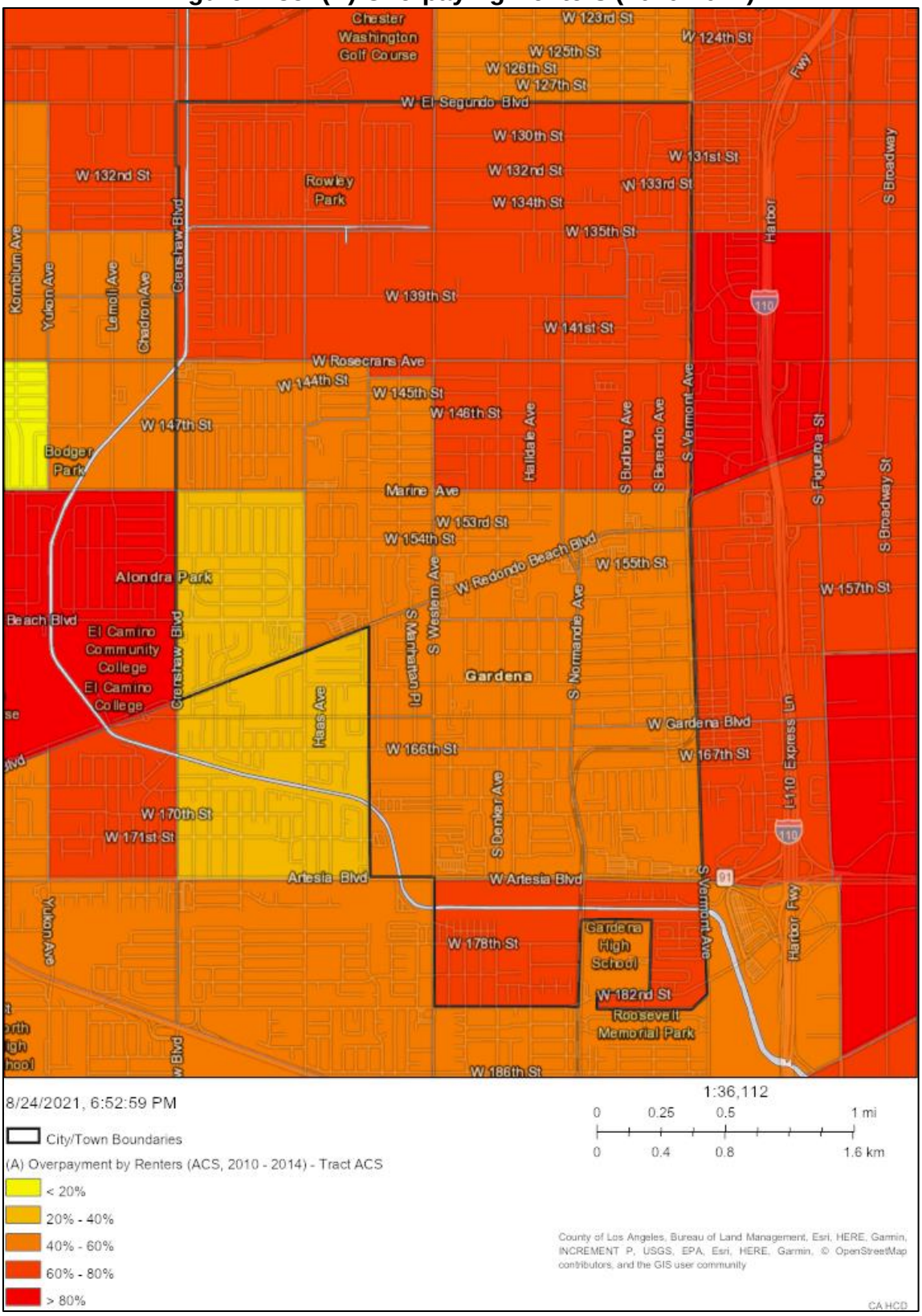


(B) Overpaying Homeowners (2015-2019) and Sites Inventory

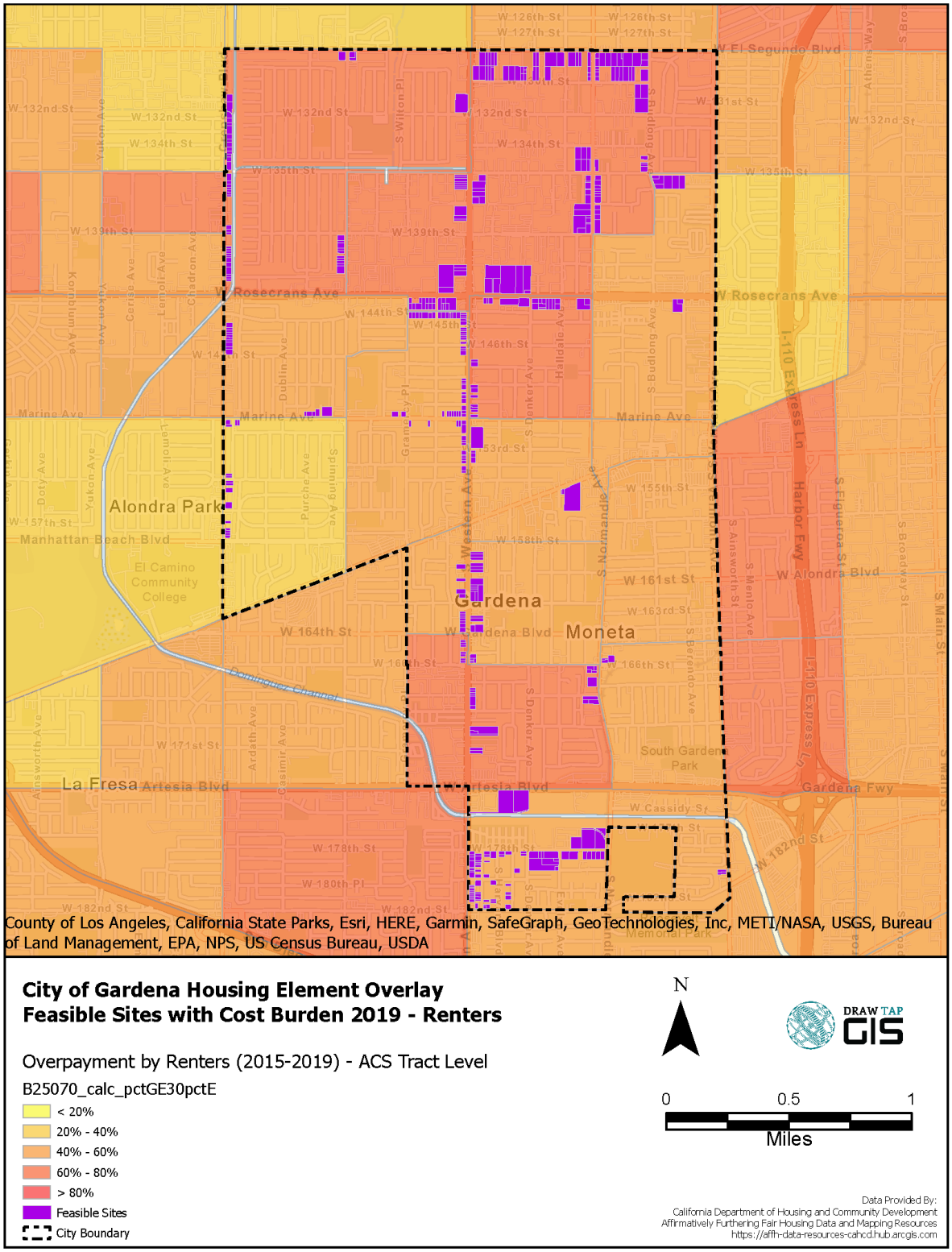


Source: HCD AFFH Data Viewer, 2010-2014 & 2015-2019 ACS, 2021.

Figure E-35: (A) Overpaying Renters (2010-2014)



(B) Overpaying Renters (2015-2019) and Sites Inventory



Source: HCD AFFH Data Viewer, 2010-2014 & 2015-2019 ACS, 2021.

Overcrowding

A household is considered overcrowded if there is more than one person per room and severely overcrowded is there is more than 1.5 persons per room. HUD CHAS data based on the 2013-2017 ACS and the HCD AFFH Data Viewer (2015-2019 ACS) is used to show overcrowding in Gardena and Los Angeles County.

Regional Trend. As shown in Table E-23, 5.7 percent of owner-occupied households and 16.7 percent of renter-occupied households throughout the County are overcrowded. Severe overcrowding is also an issue in the County, especially amongst renter households. Over one percent of owner households and 7.6 percent of renter households are severely overcrowded.

Figure E-36 shows concentrations of overcrowded households by tract regionally. Overcrowded households are most concentrated in the central County areas, including the City of Los Angeles, South Gate, and Compton, and in parts of the San Fernando Valley.

Local Trend. Table E-23, below, shows that 6.2 percent of owner-occupied households and 12.5 percent of renter-occupied households in Gardena are overcrowded. Countywide, only 5.7 percent of owner-occupied households are overcrowded, but 16.7 percent of renter-occupied households are overcrowded.

Figure E-37 shows the concentration of overcrowded households in Gardena by census tract. There is a concentration of overcrowded households in the northeast corner of the city, where more than 20 percent of households in those tracts are overcrowded. Less than 8.2 percent of households in tracts along the western and southern city boundaries are overcrowded. Census tracts with severely overcrowded households are shown in Figure E-24. Approximately 14 percent of households in one tract in the northeastern section of the city are severely overcrowded. Less than 5 percent of households are severely overcrowded in the remainder of the city. The tracts with larger proportions of overcrowded and severely overcrowded households are categorized as low resource areas and have concentrations of racial and ethnic minorities, LMI households, and children in female-headed households (see Figure E-5, Figure E-12, Figure E-14, and Figure E-21). Cost burdened renters are also more prominent in this area (see Figure E-35).

Table E-23: Overcrowding by Tenure

	Overcrowded (>1 person per room)		Severely Overcrowded (>1.5 persons per room)		Total Households
	Households	Percent	Households	Percent	
Gardena					
Owner-Occupied	640	6.2%	205	2.0%	10,265
Renter-Occupied	1,300	12.5%	630	6.1%	10,385
Los Angeles County					
Owner-Occupied	85,870	5.7%	23,025	1.5%	1,512,365

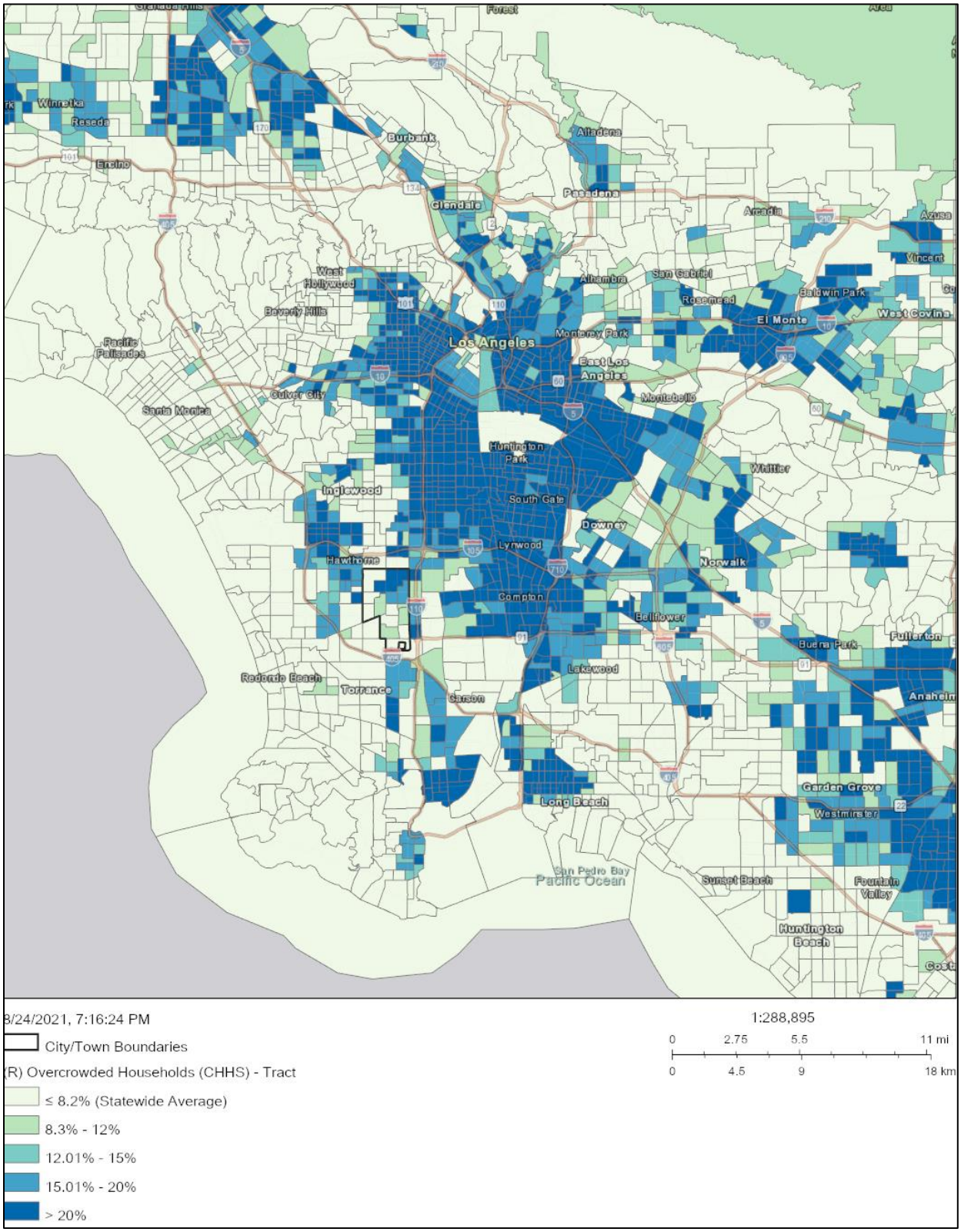
Renter-Occupied	298,460	16.7%	134,745	7.6%	1,782,835
Source: HUD CHAS Data (based on 2013-2017 ACS), 2020.					

Sites Inventory. As presented in Table E-24, nearly half of the units selected to meet the 2021-2029 RHNA are in tracts where more than 20 percent of households are overcrowded. A smaller share of lower income RHNA units are in tracts where less than 8.2 percent of households are overcrowded compared to moderate and above moderate income units.

Table E-24: Distribution of RHNA Units by Percent of Overcrowded Households

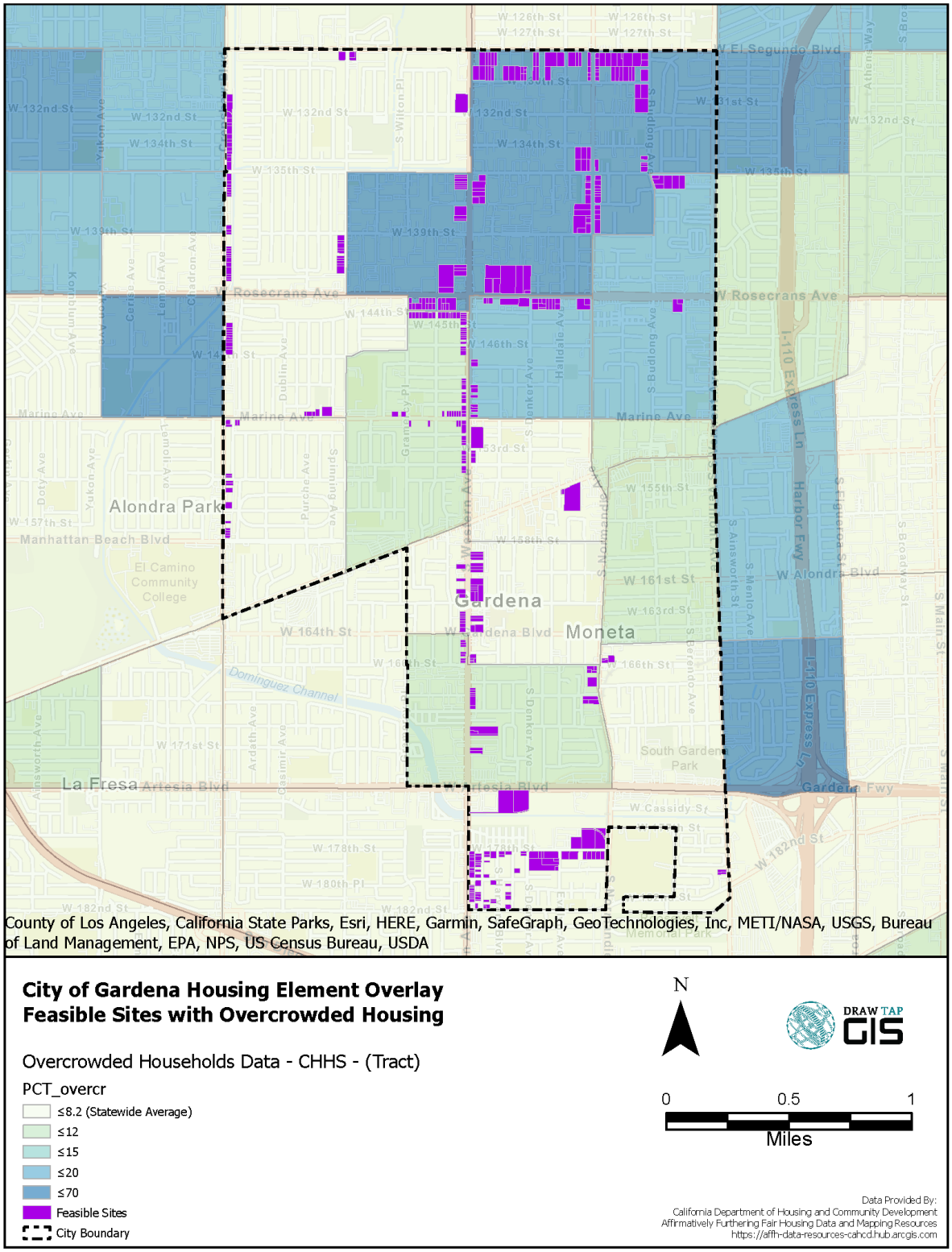
Overcrowded Households (Tract)	Lower Income Units		Moderate Income Units		Above Moderate Income Units		All RHNA Units	
<8.2%	770	29.2%	544	30.3%	806	37.4%	2,120	32.2%
<12%	271	10.3%	152	8.5%	229	10.6%	652	9.9%
<15%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
<20%	253	9.6%	179	10.0%	178	8.3%	610	9.3%
>20%	1,342	50.9%	922	51.3%	940	43.7%	3,204	48.6%
Total	2,636	100.0%	1,797	100.0%	2,153	100.0%	6,586	100.0%

Figure E-36: Regional Overcrowded Households by Tract



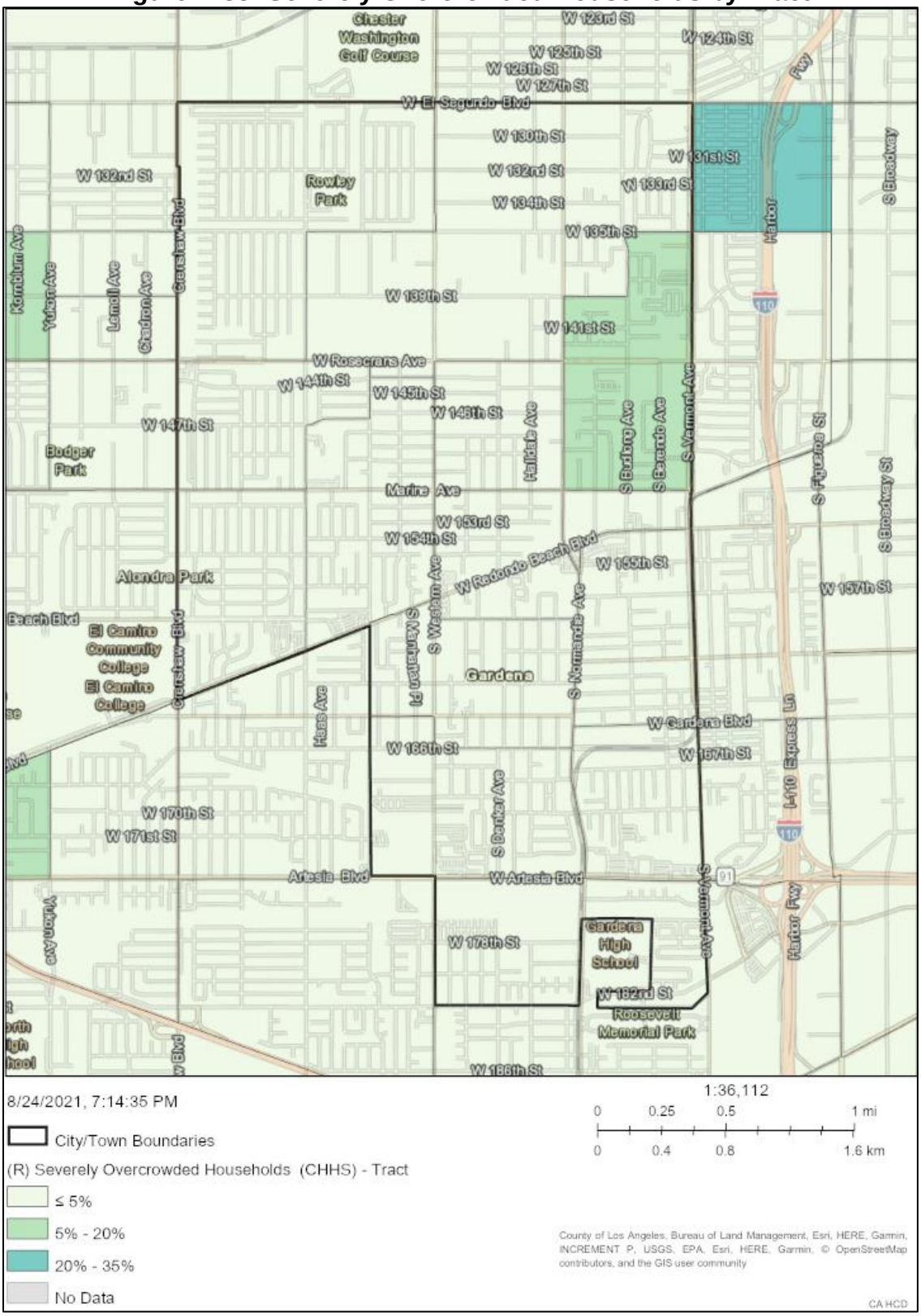
Source: HCD AFFH Data Viewer, HUD CHAS data, 2021.

Figure E-37: Overcrowded Households by Tract and Sites Inventory



Source: HCD AFFH Data Viewer, HUD CHAS data, 2021.

Figure E-38: Severely Overcrowded Households by Tract



Source: HCD AFFH Data Viewer, HUD CHAS data, 2021.

Substandard Housing

Incomplete plumbing or kitchen facilities can be used to measure substandard housing conditions. Incomplete facilities are estimated using 2020 HUD CHAS data, and housing age is based on the 2015-2019 ACS. In general, residential structures over 30 years of age require minor repairs and modernization improvements, while units over 50 years of age are likely to require major rehabilitation such as roofing, plumbing, and electrical system repairs.

Regional Trend. Less than one percent of owner-occupied households and 2.8 percent of renter-occupied households in Los Angeles County lack complete plumbing or kitchen facilities (Table E-25). Overall, only 1.7 percent of households in the County lack complete facilities.

Housing age can also be used as an indicator for substandard housing and rehabilitation needs. In general, residential structures over 30 years of age require minor repairs and modernization improvements, while units over 50 years of age are likely to require major rehabilitation such as roofing, plumbing, and electrical system repairs. In the County, 86 percent of the housing stock was built prior to 1990, including 60.5% built prior to 1970 (Table E-26).

Local Trend. In Gardena, 1.4 percent of owner-occupied households and 3.8 percent of renter-occupied households lack complete plumbing or kitchen facilities (Table E-25). Substandard housing conditions are more common in Gardena than Los Angeles County, where only 0.5 percent of owner-occupied households and 2.8 percent of renter-occupied households lack complete plumbing or kitchen facilities. As of December 2021, City's Code Enforcement agency estimates 250-300 housing units, or 1.4 percent of the housing stock, are in substandard condition.

Table E-25: Substandard Housing Conditions

	Lacking Complete Kitchen or Plumbing Facilities		Total Households
	Households	Percent	
Gardena			
Owner-Occupied	140	1.4%	10,265
Renter-Occupied	390	3.8%	10,385
Los Angeles County			
Owner-Occupied	6,850	0.5%	1,512,365
Renter-Occupied	50,030	2.8%	1,782,835
Source: HUD CHAS Data (based on 2013-2017 ACS), 2020.			

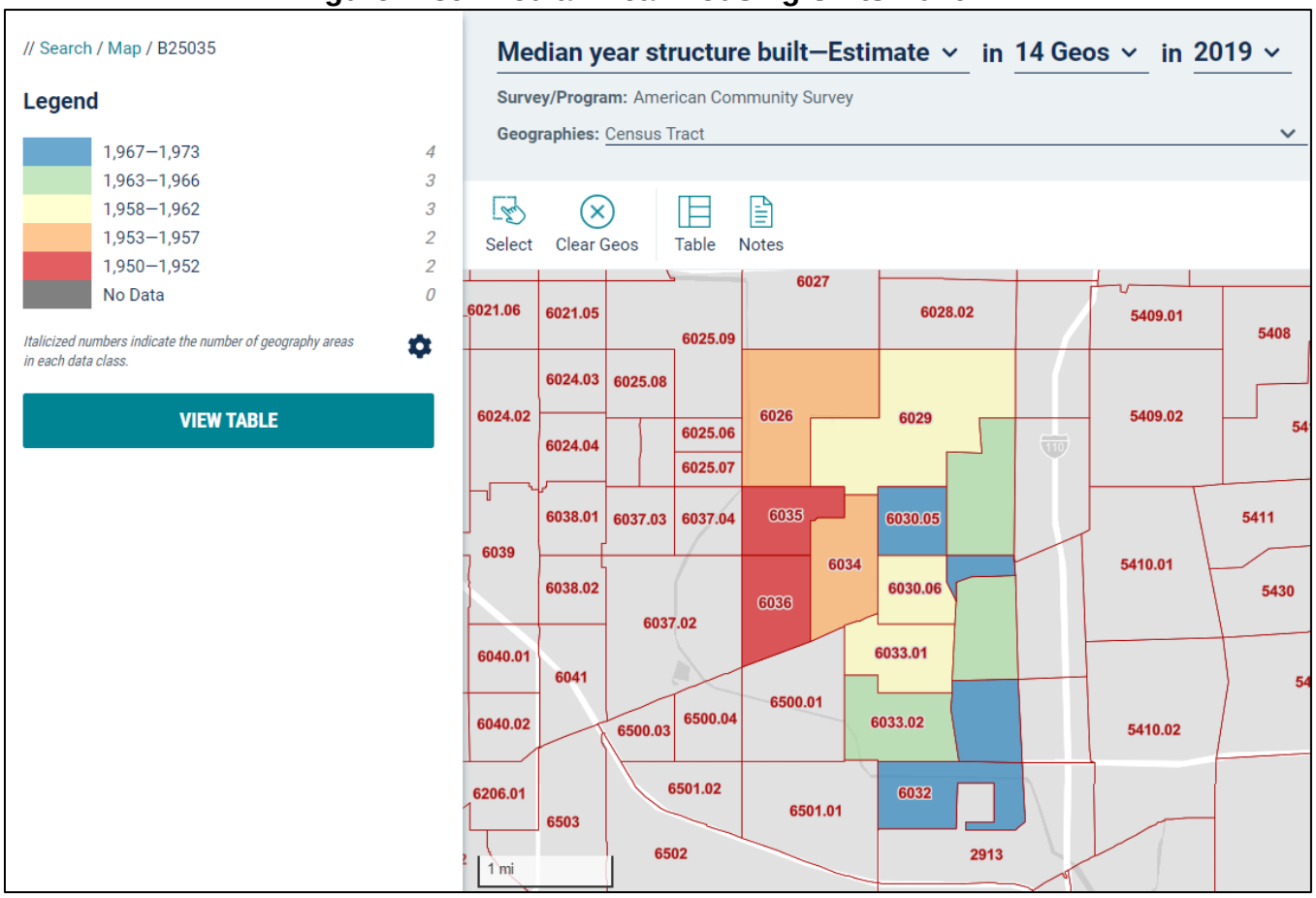
Housing age can also be used as an indicator for substandard housing and rehabilitation needs. According to the 2015-2019 ACS, 88.5 percent of the housing stock in Gardena was built prior to 1990 and may be susceptible to deterioration, including 66.8 percent built before 1970 which may require major repairs. In comparison, 85.9 percent of housing units Countywide were built in 1989 or earlier (Table E-26). Tracts 6035, 6034, and 6026

have the highest proportion of housing units aged 50 or older. Figure E-39 shows the median year built for housing units by census tract. Tracts with older housing units are most concentrated in the northwest section of the city. Tracts 6032 and 6031.02, located in southern Gardena, have the largest proportion of new housing built in 1990 or later.

Table E-26: Housing Unit Age

Tract/Jurisdiction	1969 or Earlier (50+ Years)	1970-1989 (30-50 Years)	1990 or Later (<30 Years)	Total Housing Units
6026	85.2%	10.4%	4.3%	2,881
6029	68.4%	23.1%	8.5%	1,329
6030.01	61.8%	25.9%	12.4%	2,453
6030.04	54.2%	37.1%	8.6%	649
6030.05	45.9%	42.6%	11.5%	1,939
6030.06	76.8%	17.6%	5.6%	837
6031.01	62.6%	25.9%	11.5%	1,585
6031.02	43.8%	30.1%	26.0%	1,478
6032	53.7%	13.2%	33.1%	1,230
6033.01	64.1%	21.9%	14.0%	1,573
6033.02	60.5%	28.6%	10.9%	1,679
6034	86.1%	12.7%	1.1%	1,492
6035	94.4%	4.4%	1.2%	922
6036	76.7%	9.6%	13.6%	1,410
Gardena	**66.8%**	**21.8%**	**11.5%**	**21,457**
Los Angeles County	60.5%	25.4%	14.1%	3,542,800
Source: 2015-2019 American Community Survey (ACS) (5-Year Estimates).				

Figure E-39: Median Year Housing Units Built



Note: The numbers in the legend represent years (1,967 = 1967).
Source: 2015-2019 ACS (5-Year Estimates).

Displacement Risk

HCD defines sensitive communities as "communities [that] currently have populations vulnerable to displacement in the event of increased development or drastic shifts in housing cost." The following characteristics define a vulnerable community:

- The share of very low-income residents is above 20 percent; and
- The tract meets two of the following criteria:
  - Share of renters is above 40 percent,
  - Share of people of color is above 50 percent,
  - Share of very low-income households that are severely rent burdened households is above the county median,

- The area or areas in close proximity have recently experienced displacement pressures (percent change in rent above County median for rent increases), or

- Difference between tract median rent and median rent for surrounding tracts above median for all tracts in county (rent gap).

Regional Trend. Figure E-40 shows sensitive communities at risk of displacement in the region. Vulnerable communities are most concentrated in the central County areas around the City of Los Angeles, Inglewood, South Gate, and Compton, East Los Angeles, and parts of the San Gabriel Valley and San Fernando Valley. There are fewer vulnerable communities in coastal areas and between Calabasas, Malibu, and Beverly Hills.

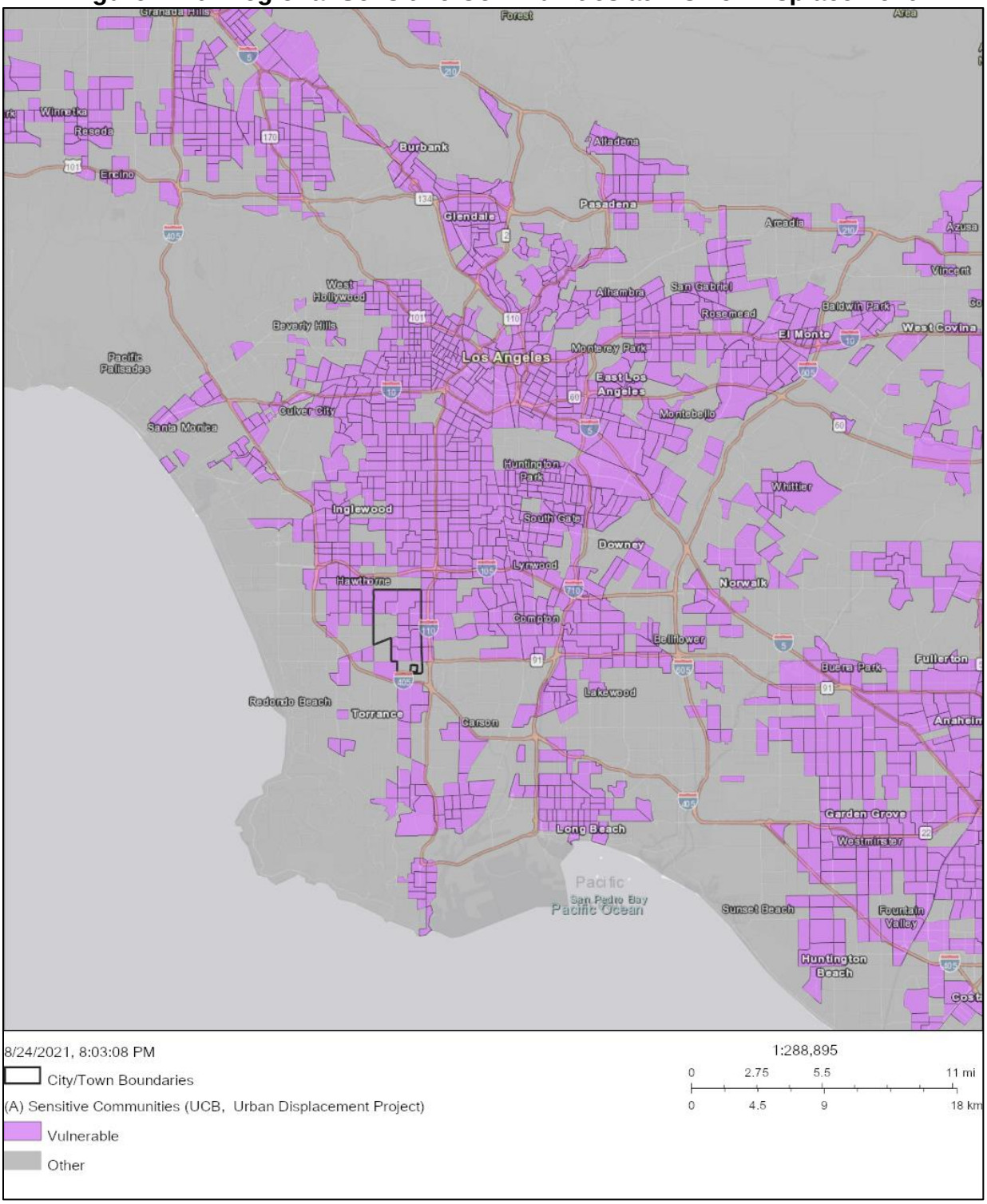
Local Trend. As shown in Figure E-41, the majority of tracts in Gardena are considered sensitive communities where the population is vulnerable to displacement in the event of increased redevelopment or shifts in housing cost. Three tracts in the central western section of the city and the southernmost tract are not considered vulnerable communities. The tracts in the northern section of the city and on tract along the eastern boundary are categorized as low resource areas (see Figure E-21). As discussed previously, racial and ethnic minority populations make up over 80 percent of the population in all but two Gardena block groups (see Figure E-5). Some of the sensitive communities identified also have larger shares of children in female-headed households, LMI households, overcrowded households, and cost burdened owners and renters (see Figure E-12, Figure E-14, Figure E-34, Figure E-35, and Figure E-37).

Sites Inventory. The distribution of RHNA units in sensitive communities at risk of displacement is shown in Table E-27. Because a majority of Gardena tracts are considered sensitive communities, 78.8 percent of RHNA units are located in these areas. There are more low and moderate income units located in sensitive communities compared to above moderate units. Despite the concentration of units in sensitive communities, sites selected to meet the RHNA are generally evenly distributed throughout the City. The high concentration of units in communities at risk of displacement is a reflection of the high rate of these communities citywide.

Table E-27: Distribution of RHNA Units by Communities At Risk of Displacement

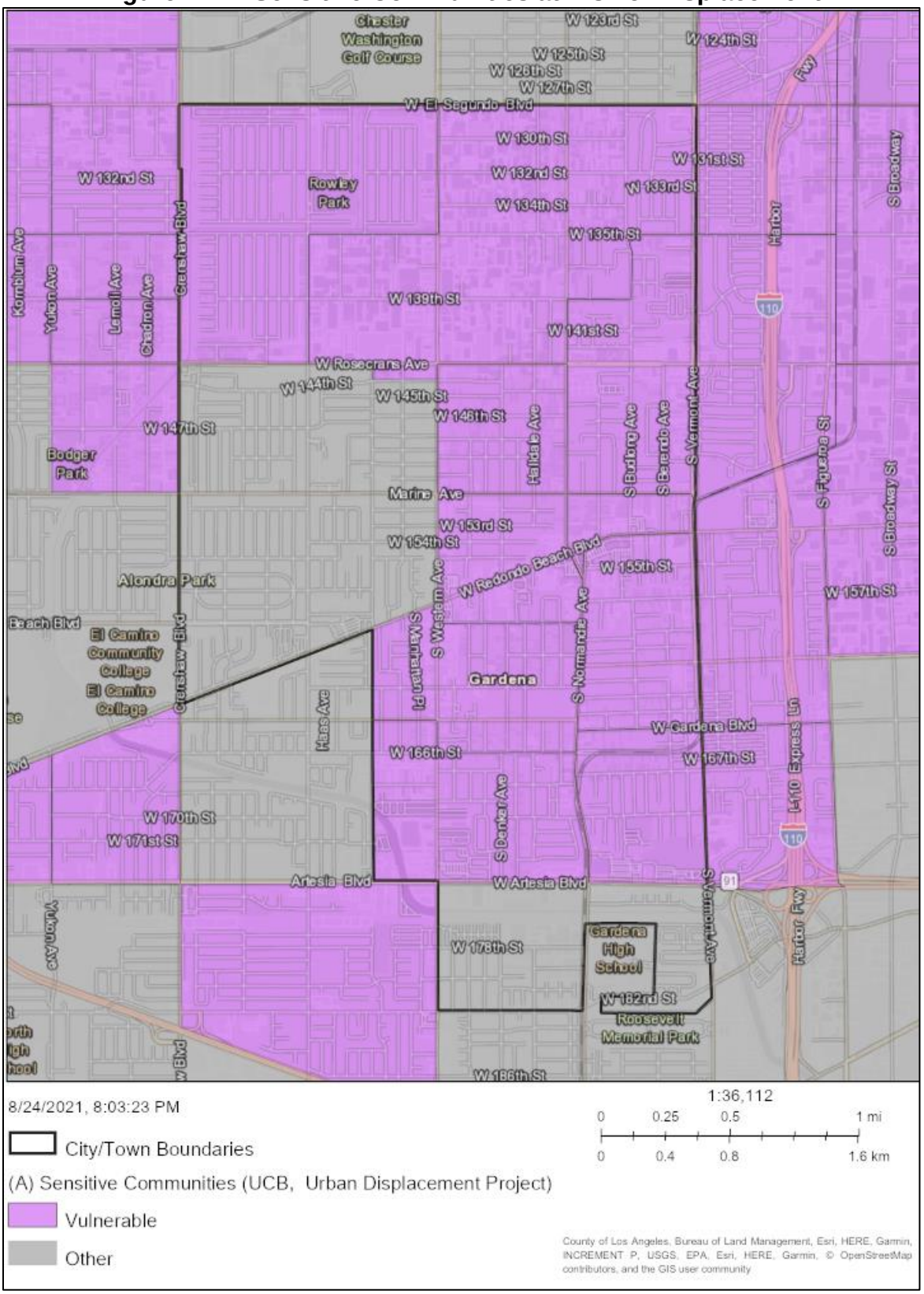
Sensitive Community (Tract)	Lower Income Units		Moderate Income Units		Above Moderate Income Units		All RHNA Units	
Not a Sensitive Community	448	17.0%	375	20.9%	572	26.6%	1,395	21.2%
Sensitive Community	2,188	83.0%	1,422	79.1%	1,581	73.4%	5,191	78.8%
Total	2,636	100.0%	1,797	100.0%	2,153	100.0%	6,586	100.0%

Figure E-40: Regional Sensitive Communities at Risk of Displacement



Source: HCD AFFH Data Viewer, Urban Displacement Project, 2021.

Figure E-41: Sensitive Communities at Risk of Displacement

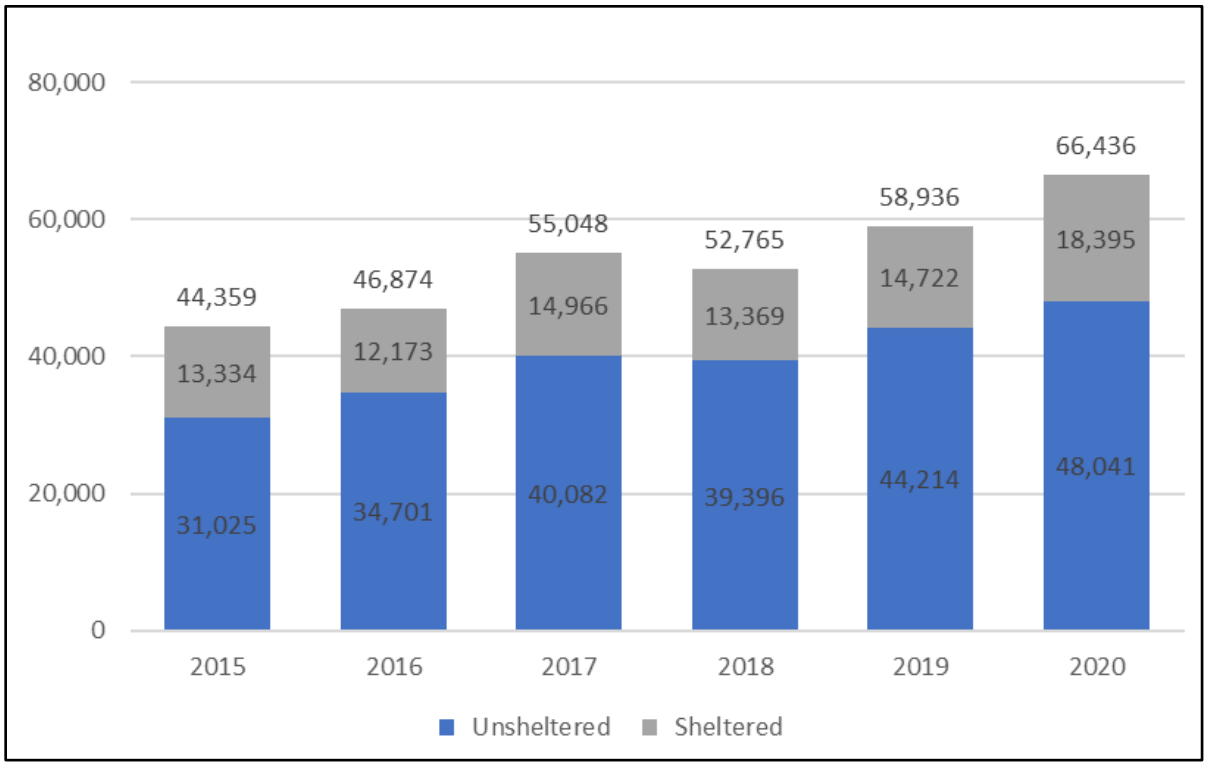


Source: HCD AFFH Data Viewer, Urban Displacement Project, 2021.

Homelessness

Regional Trend. The Los Angeles Homeless Services Authority (LAHSA) estimates there were 66,436 persons experiencing homelessness in the Los Angeles County, based on the 2020 Greater Los Angeles Homeless Point-in-Time (PIT) Count. Figure E-42 shows the Los Angeles County homeless populations from 2015 to 2020. Approximately 72 percent of the homeless population is unsheltered and 28 percent is sheltered. The homeless population has increased by nearly 50 percent since 2015, and 12.7 percent since 2019. According to Department of Finance (DOF) estimates, the entire Los Angeles County population grew by only 0.5 percent between 2015 and 2020.

Figure E-42: Los Angeles County Homeless Population Trend (2015-2020)



Source: Los Angeles Homeless Services Authority (LAHSA), 2015-2020 LA County/LA Continuum of Care (CoC) Homeless Counts.

Table E-28 shows the homeless populations in 2019 and 2020 by population type, gender, and health/disability. Approximately 19 percent of the homeless population belongs to a family with one or more child, 38.4 percent are chronically homeless, and 22.3 percent have a serious mental illness. Since 2019, the population of homeless family members (+45.7 percent), persons experiencing chronic homelessness (+54.2 percent), persons fleeing domestic violence (+40 percent), non-binary/gender non-conforming persons (+325.5 percent), and persons with a substance use disorder (+104 percent) have increased the most drastically. The population of transgender persons and persons with HIV/AIDS experiencing homelessness have decreased by 81.4 percent and 4.7 percent, respectively.

Table E-28: Los Angeles County Homeless Population Demographics (2019-2020)

	2019		2020		Percent Change
	Persons	Percent	Persons	Percent	
Total	**58,936**	**100.0%**	**66,436**	**100.0%**	**12.7%**
Individuals	50,071	85.0%	53,619	80.7%	7.1%
Transitional Aged Youth (18-24)	3,635	6.2%	4,278	6.4%	17.7%
Unaccompanied Minors (under 18)	66	0.1%	74	0.1%	12.1%
Family Members*	8,799	14.9%	12,817	19.3%	45.7%
Veterans	3,878	6.6%	3,902	5.9%	0.6%
People Experiencing Chronic Homelessness	16,528	28.0%	25,490	38.4%	54.2%
Fleeing Domestic/Intimate Partner Violence	3,111	5.3%	4,356	6.6%	40.0%
Gender					
Male	39,348	66.8%	44,259	66.6%	12.5%
Female	18,331	31.1%	21,129	31.8%	15.3%
Non-Binary/Gender Non-Conforming	200	0.3%	851	1.3%	325.5%
Transgender	1,057	1.8%	197	0.3%	-81.4%
Health and Disability**					
Substance Use Disorder	7,836	13.3%	15,983	24.1%	104.0%
HIV/AIDS	1,306	2.2%	1,245	1.9%	-4.7%
Serious Mental Illness	13,670	23.2%	14,790	22.3%	8.2%
Percent of Total County Population	**--**	**0.6%**	**--**	**0.7%**	**--**

*Members of families with at least one child under 18.
** Indicators are not mutually exclusive.
Source: Los Angeles Homeless Services Authority (LAHSA), 2019-2020 LA County/LA Continuum of Care (CoC) Homeless Counts.

The following data refers to the Los Angeles Continuum of Care (CoC) region, covering all Los Angeles County jurisdictions except for the cities of Long Beach, Pasadena, and Glendale. Special needs groups are considered elderly or disabled (including developmental disabilities), female-headed households, large families, farmworkers, and people experiencing homelessness.

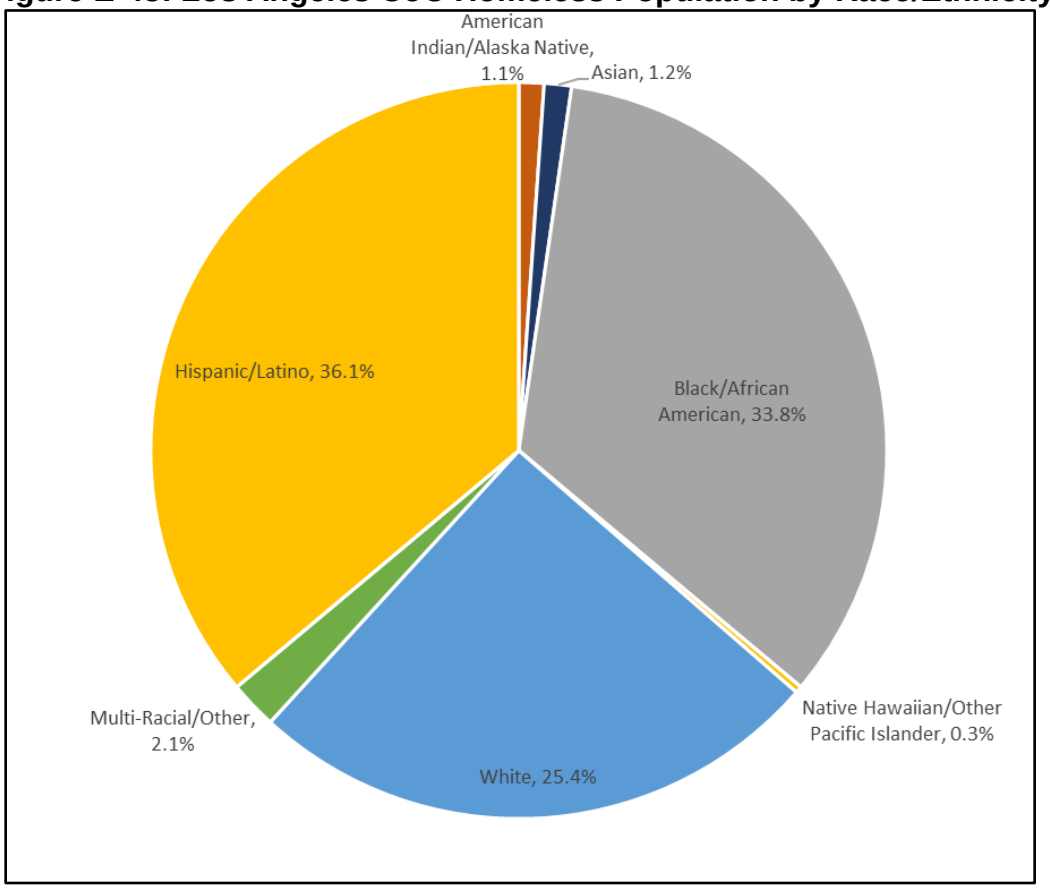
Nearly 20 percent of the homeless population are members of families with one or more child under the age of 18, 9.9 percent are elderly persons aged 62 and older, 17 percent have a physical disability, and 8.3 percent have a developmental disability. Only 32 percent of homeless persons with a developmental disability, 17.3 percent with a physical disability, and 21.5 percent of homeless seniors are sheltered. However, most families (76.3 percent) are sheltered (Table E-29).

Table E-29: Homeless Populations and Special Needs Groups

Special Needs Group	Sheltered	Unsheltered	Total
Developmental Disability	32.1%	67.9%	5,292
Physical Disability	17.3%	82.7%	10,833
Family Members	76.3%	23.7%	12,416
62+	21.5%	78.5%	6,290
Source: LAHSA, 2020 LA CoC Homeless Counts; 2015-2019 ACS (5-Year Estimates			

Figure E-43 shows the Los Angeles CoC homeless population by race and ethnicity. The Hispanic/Latino, Black/African American, and White populations make up the largest proportions of the homeless population. The Black/African American population is the most overrepresented in the Los Angeles CoC region. Nearly 34 percent% of homeless persons are Black or African American, compared to only 7.8 percent of the population countywide. The American Indian and Alaska Native population is also overrepresented, making up only 0.2 percent of the County population, but 1.1 percent of the homeless population.

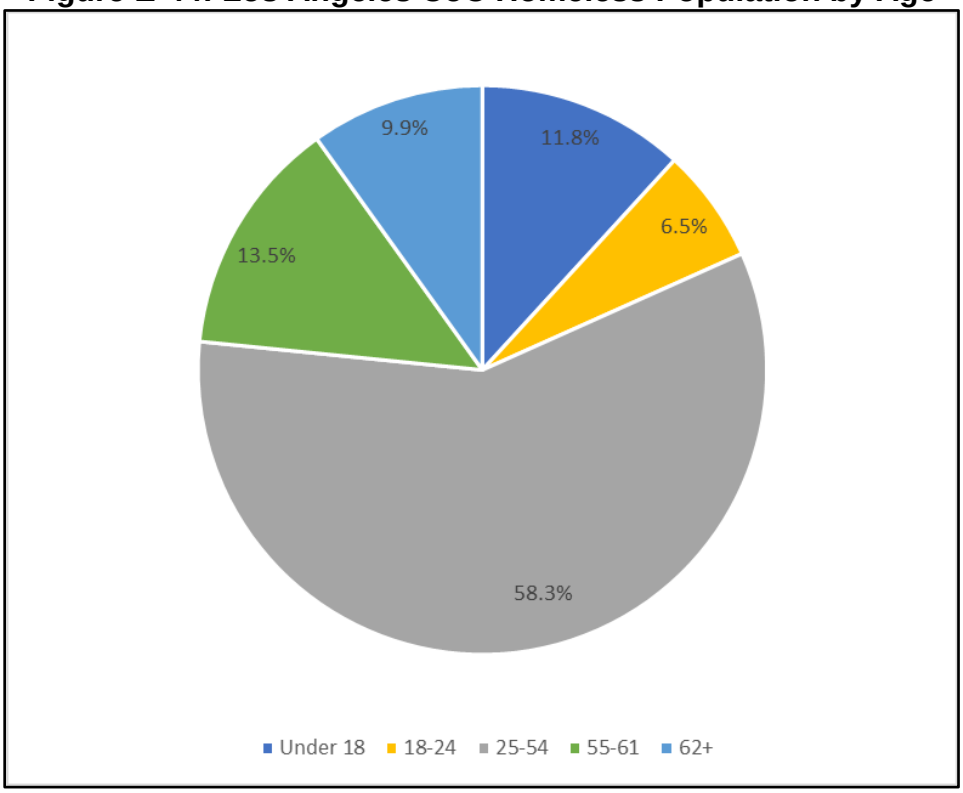
Figure E-43: Los Angeles CoC Homeless Population by Race/Ethnicity



Race/Ethnicity	Homeless Population		% LA County Population
	Persons	Percent	
American Indian/Alaska Native	686	1.1%	0.2%
Asian	774	1.2%	14.4%
Black/African American	21,509	33.8%	7.8%
Hispanic/Latino	23,005	36.1%	48.5%
Native Hawaiian/Other Pacific Islander	205	0.3%	0.2%
White	16,208	25.4%	26.2%
Multi-Racial/Other	1,319	2.1%	2.6%
Source: LAHSA, 2020 LA CoC Homeless Counts; 2015-2019 ACS (5-Year Estimates)			

Figure E-44 shows the distribution of homeless persons in the Los Angeles CoC region by age. Adults aged 25 to 54 make up most of the homeless population, followed by adults aged 55 to 61, and children under 18. Children account for 11.8 percent of the homeless population and seniors (age 62+) account for 9.9 percent of the population; 6.6 percent of the homeless population is transitional aged youths between the ages of 18 and 24.

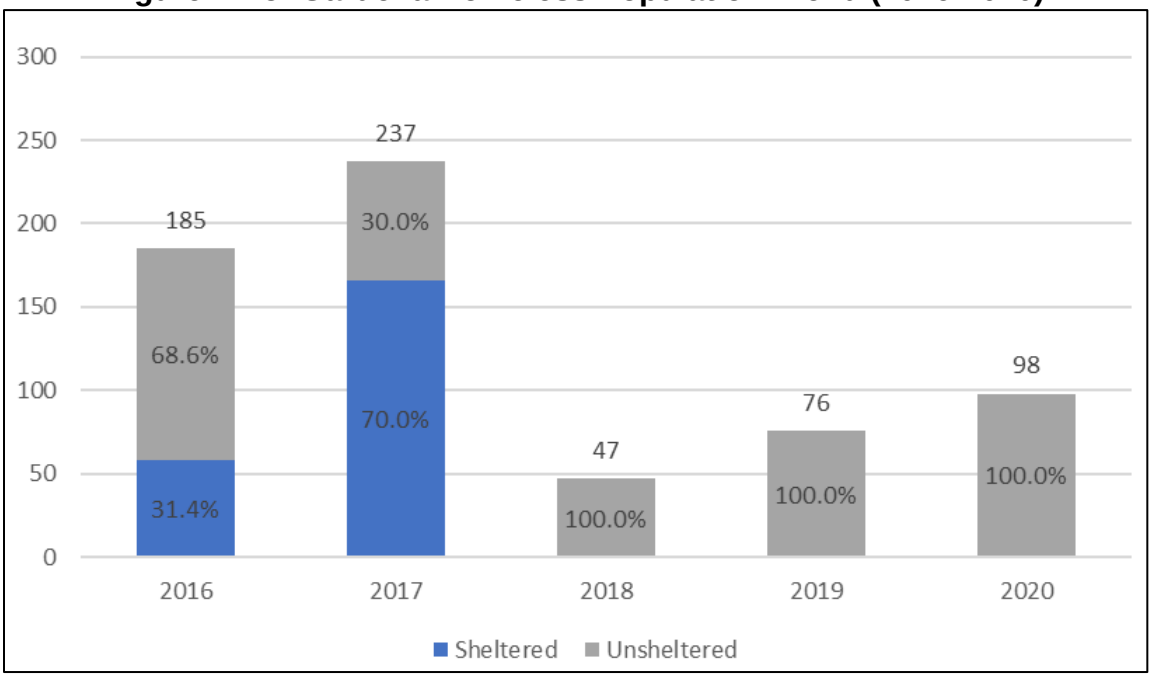
Figure E-44: Los Angeles CoC Homeless Population by Age



Age	Homeless Population		% LA County Population
	Persons	Percent	
Under 18	7,491	11.8%	22.0%
18-24	4,181	6.6%	9.7%
25-54	37,138	58.3%	43.2%
55-61	8,606	13.5%	8.7%
62+	6,290	9.9%	16.4%
Source: LAHSA, 2020 LA CoC Homeless Counts; 2015-2019 ACS (5-Year Estimates).			

Local Trend. Figure E-45 shows the homeless population trend in Gardena from 2016 to 2020. As of 2020, there are 98 persons experiencing homelessness in Gardena, all of which are unsheltered. Of the homeless persons in Gardena, 47.9 percent were on the street, 28.6 percent were in cars, 12.2 percent were in RVs/campers, 8.2 percent were in vans, and 3.1 percent were in makeshift shelters. The population of persons experiencing homelessness in Gardena has decreased by 47 percent since 2016 but increased 28.9 percent since 2019.

Figure E-45: Gardena Homeless Population Trend (2016-2020)



Source: LAHSA, 2020 Greater Los Angeles City/Community Homelessness Reports Service Planning Area 5.

A summary of the homeless population in Gardena, provided by LAHSA, is shown in Figure E-46. As discussed previously, there are no sheltered persons experiencing homelessness in Gardena. The homeless population summary includes homeless populations by census tract, homeless population trend, and dwelling type of unsheltered persons. Tract 6031.01, along the western City boundary, has the largest homeless population based on the 2020 PIT Count, followed by tract 6029 in the central-northern area of the City. Homeless counts by tract are shown in Table E-30.

Figure E-46: Gardena Homeless Population Summary

Note: Because of the interactive nature of the [LAHSA homeless count] dashboard and exclusion of some categories, LAHSA does not recommend citing this dashboard as the official count. Estimates shown in Figure E-41 are from the 2020 Greater Los Angeles City/Community Homelessness Reports rather than the dashboard.

Source: LAHSA 2020 Homeless Count by Community/City.

Table E-30: Homeless Data by Tract

Tract	Persons	Percent of Total
6037602600	5	5.2%
6037602900	17	17.5%
6037603001	0	0.0%
6037603004	2	2.1%
6037603005	4	4.1%
6037603006	8	8.2%
6037603101	25	25.8%
6037603102	8	8.2%
6037603200	4	4.1%
6037603301	9	9.3%
6037603302	9	9.3%
6037603400	1	1.0%
6037603500	2	2.1%
6037603600	3	3.1%

Note: LAHSA does not recommend aggregating census tract-level data to calculate numbers for other geographic levels. Due to rounding, census tract-level data may not add up to the total for Los Angeles City Council District, Supervisorial District, Service Planning Area, or the Los Angeles CoC.

Source: LAHSA 2020 Homeless Count Data by Census Tract.

The Los Angeles County Coordinated Entry System (LA County CES) assesses individuals to match them with available housing resources and programs. From July to December 2020, 275 individuals in Culver City were assessed through CES, including 14 youths, 55 families, 39 veterans, and 49 persons aged 62 or older. Culver City is a part of Service Planning Area (SPA) 5, serving West Los Angeles communities including Beverly Hills, Brentwood, Culver City, Malibu, Pacific Palisades, Playa del Rey, Santa Monica, and Venice. Culver City and SPA 5 CES assessments and services are presented in Table E-26.

Table E-31: Cumulative CES Statistics (July 2020 – December 2020)

	Gardena	SPA 8	City Share of SPA 8
CES Assessment			
Total Persons	201	3,651	6%
Individuals	80	2,398	3%
Youth	15	213	7%
Families	106	1,083	10%
Veterans	7	250	3%
Persons Aged 62+	17	418	4%
Types of Services Provided to Those Assisted			
Interim Housing	95	1,470	6%
Rapid Re-Housing	80	1,211	7%
Street Outreach (Contacts)	47	1,201	4%
Street Outreach (Engagements)	27	500	5%
Other (Non-Permanent)	57	1,084	5%
Placed into Permanent Housing*	47	684	7%

* Includes persons that have moved into permanent housing during the reporting period (through either rapid re-housing, permanent supportive housing, or other permanent destinations).
Note: For households with more than one person (including families), the assessment of the head of household is applied to all members.
Source: LAHSA Homelessness Statistics by City (July 1, 2020 – December 31, 2020), March 2021.

Summary of Fair Housing Issues

Approximately 41% of owner households and 59% of renter households in Gardena experience a housing problem. In general, more renters in the northern City areas are cost burdened compared to the southern tracts. Northern Gardena is considered a low resource area and has high concentrations of racial and ethnic minorities and LMI households (see Figure E-5, Figure E-14, and Figure E-21). The northern half of the city also has higher concentrations of children in female-headed households compared to the rest of the city (see Figure E-12). Many of these tracts also have higher concentrations of overcrowded households. There is a concentration of homeless persons in some Gardena tracts, one in the central northern area of the City and one along the southeastern City boundary.

Other Relevant Factors

Lending Practices

Home loan applications in Gardena by race and income are shown in Table E-32. Black and Hawaiian/Pacific Islander applicants were denied loans at the highest rates (22.9 percent and 25 percent, respectively), while Hispanic or Latino and White applicants were denied at the lowest rates (13.4 percent and 14.1 percent, respectively). There were eight American Indian/Alaska Native and eight applicants of two or more minority races; 12.5 percent of American Indian/Alaska Native applicants were denied and no applicants of two or more minority races were denied. Applicants belonging to lower income categories had higher denial rates; approximately 38 percent of loan applications submitted by low income residents were denied compared to only 15 percent of applications submitted by upper income residents.

Table E-32: Home Loan Approval and Denial Rates – Gardena (2020)

Loan Type/Applicant Demographics	Approved/ Originated	Denied	Total Applications
Loan Purpose and Type			
Purchase – Conventional	71.9%	11.0%	566
Purchase – Government	63.9%	13.4%	119
Home Improvement	53.7%	27.9%	147
Refinancing	53.8%	19.9%	1,124
Applicant Race/Ethnicity			
American Indian/Alaska Native	75.0%	12.5%	8
Asian	65.8%	15.2%	453
Black or African American	53.8%	22.9%	424
Hawaiian / Pacific Islander	43.8%	25.0%	32
White	63.9%	14.1%	609
2 or More Minority Races	87.5%	0.0%	8
Joint Race (White/Minority)	71.4%	19.0%	42
Race Not Available	51.3%	19.5%	380
Hispanic or Latino	61.5%	13.4%	366
Not Hispanic or Latino	60.8%	17.7%	1,195
Applicant Income			
Low (0-49% of Median)	32.4%	38.2%	68
Moderate (50-79% of Median)	47.3%	25.7%	148
Middle (80-119% of Median)	53.3%	20.6%	413
Upper (>=120% of Median)	64.1%	14.9%	1,218
Income Not Available	67.9%	11.9%	109

Note: This dataset excludes withdrawn/incomplete applications. Sum of percentages may not total 100%.
Source: Home Mortgage Disclosure Act (HMDA) Data – City of Gardena, 2020.

Table E-33 compares the racial/ethnic composition of loan applicants and the City. White applicants are significantly overrepresented in the loan application pool, representing 31.1 percent of loan applicants but only 9.4 percent of the citywide population. Conversely, Hispanic/Latino residents represent only 18.7 percent of the applicant pool, but 39 percent of the total population.

Table E-33: Race/Ethnicity of Loan Applicants vs. Total Population

Race/Ethnicity	Percent of Gardena Population	Percent of Total Loan Applicants
White	9.4%	31.1%
Black/African American	22.2%	21.7%
American Indian/Alaska Native	0.1%	0.4%
Asian	24.7%	23.2%
Native Hawaiian/Pacific Islander	1.1%	1.6%
Hispanic/Latino	39.3%	18.7%
Source: HMDA data, 2020; 2015-2019 ACS (5-Year Estimates).		

Historical Trends

The City of Gardena was incorporated on September 11, 1930. It combined the rural communities of Gardena, Moneta, and Strawberry Park into a Municipal Corporation, Sixth Class City. At that time Gardena was a small farming community of about 20,000 people.

During the early years of and prior to Gardena's establishment, Japanese immigrants played a crucial role in the City's farm community. The Japanese Association founded the Moneta Japanese Institute in 1911, funding a schoolhouse and teacher living quarters. In 1916, the Gardena Japanese school was established. During World War II, the City's large Japanese population was relocated to states in the middle of the Country.[4] Prior to the 1942 Executive Order and subsequent removal and incarceration of Japanese and Japanese Americans, Los Angeles County was home to approximately 36,000 Japanese Americans. In 1945, those incarcerated were granted the opportunity to return to California; however, by the end of the year, only an estimated 3,000 Japanese Americans had returned to Los Angeles County.[5] According to the 2011-2015 ACS, Gardena has a population of 5,091 residents with Japanese ancestry representing 8.5 percent of the total population.

The 1896 Supreme Court ruling of Plessy v. Ferguson upheld the constitutionality of "separate but equal," ushering in the Jim Crow Era of racial segregation and disenfranchisement. This sentiment spread beyond the South, where African Americans and other minority groups were expelled from predominantly White communities, through

[4] Los Angeles County Library. (2021). Gardena – Community History, https://lacountylibrary.org/gardena-local-history/.

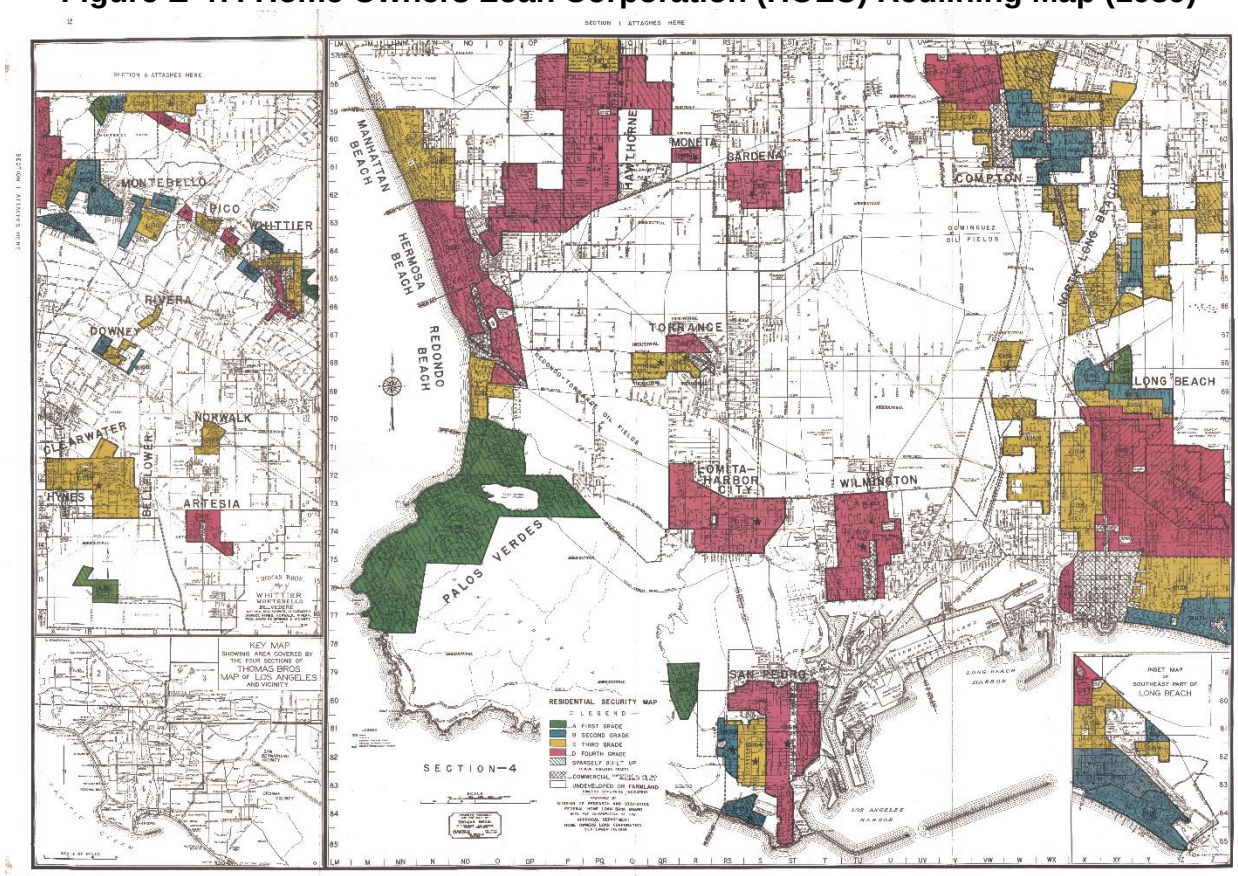
[5] The National World War II Museum. (2021). The Return of Japanese Americans to the West Coast in 1945. https://www.nationalww2museum.org/war/articles/return-japanese-americans-west-coast-1945.

the adoption of policies forbidding them from residing or even being within town borders after dark, known as 'sundown towns.'[6] Contrary to the widespread misconception that these existed only in the deep south, sundown towns were prominent throughout the Country, including more than 100 California towns. Several California sundown towns were located in Los Angeles County.[7]

The Home Owners' Loan Corporation (HOLC), formed in 1933 under the New Deal Program, established the County's first red-lining maps. Gardena received a D-rating, indicating the community was "least desirable" and a higher loan risk. Redlined, or D-rated communities, were typically comprised of large minority communities. Segregation achieved through red-lining was further exacerbated through the establishment of the Federal Housing Administration in 1934. The FHA insured bank mortgages that covered 80% of purchase prices and had terms of 20 years and were fully amortized. However, the FHA also conducted its own appraisals; mortgages were granted only to Whites. Mixed-race neighborhoods and White neighborhoods in the vicinity of Black neighborhoods were deemed "too risky" to invest in.[6] Figure E-47 shows the 1939 redlining for the South Bay. An updated redlining map from the HCD AFFH Data Viewer of Gardena and the surrounding areas is presented in Figure E-48.

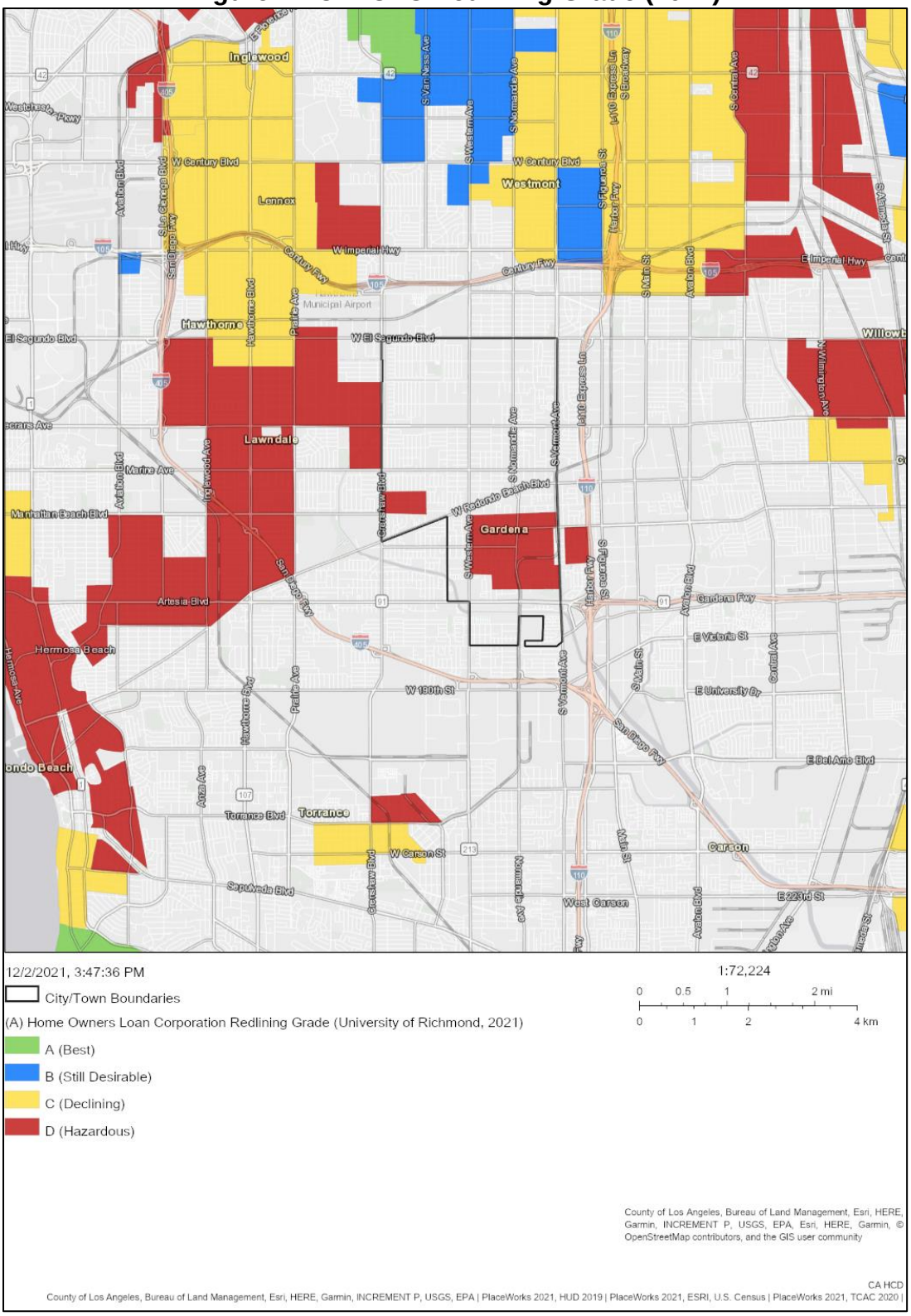
[6] Rothstein, Richard. (2017). The Color of Law: A Forgotten History of How Our Government Segregated America. Liveright Publishing Corporation.
[7] History and Social Justice. (2021). https://justice.tougaloo.edu,

Figure E-47: Home Owners Loan Corporation (HOLC) Redlining Map (1939)



Source: Robert K. Nelson, LaDale Winling, Richard Marciano, Nathan Connolly, et al., "Mapping Inequality," American Panorama, ed. Robert K. Nelson and Edward L. Ayers, accessed December 1, 2021, https://dsl.richmond.edu/panorama/redlining.

Figure E-48: HOLC Redlining Grade (2021)

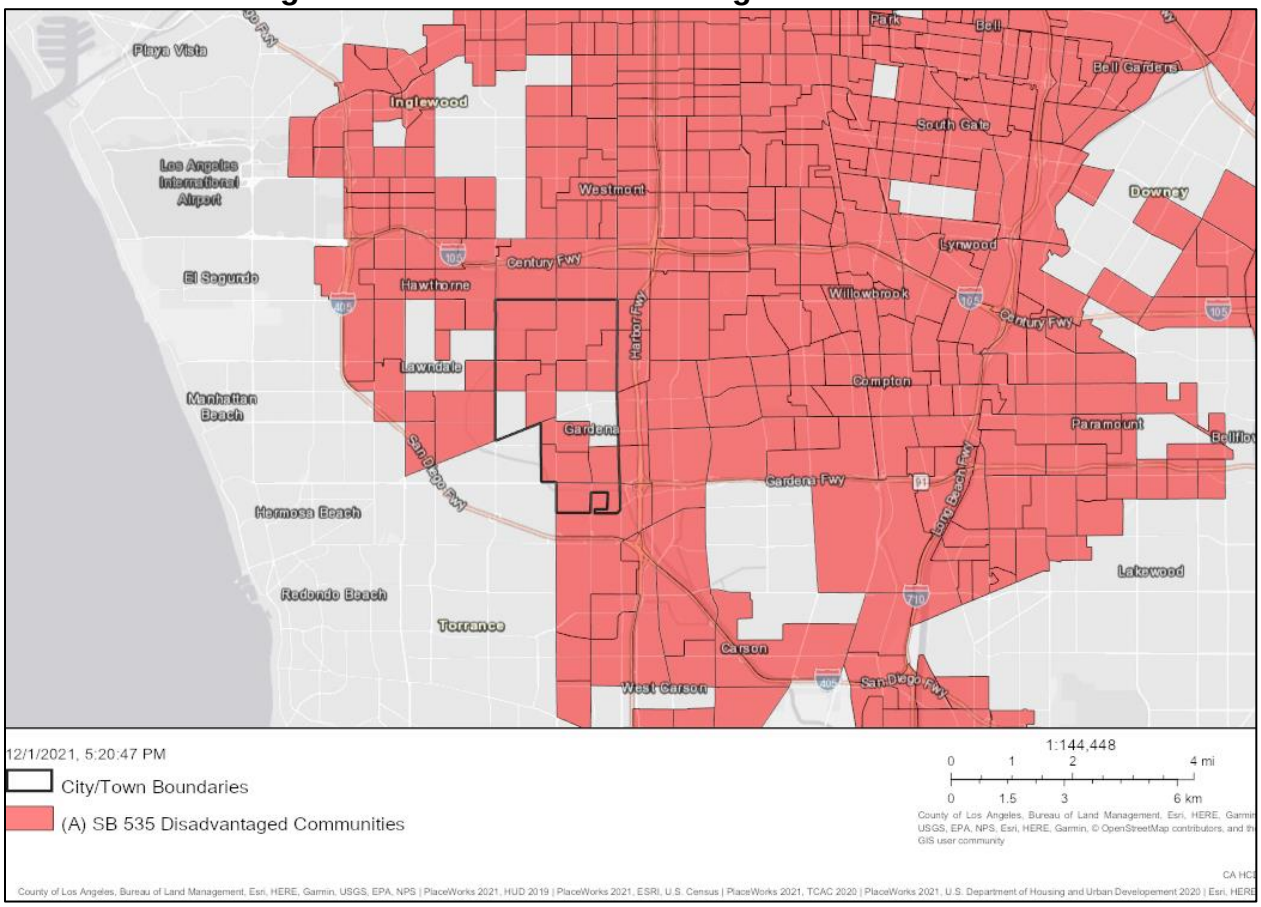


Source: HCD AFFH Data Viewer, University of Richmond (2021), 2021.

SB 535 Disadvantaged Communities

Disadvantaged communities in California are specifically targeted for investment of proceeds from the State's cap-and-trade program. Known as California Climate Investments (CCI), these funds are aimed at improving public health, quality of life and economic opportunity in California's most burdened communities at the same time they're reducing pollution that causes climate change. As identified using the HCD AFFH tool, a majority of tracts in Gardena and the surrounding jurisdictions north, east, and south are considered "disadvantaged communities" (Figure E-49).

Figure E-49: SB 535 Disadvantaged Communities



Source: HCD AFFH Data Viewer, Office of Environmental Health Hazard Assessment (OEHHA), 2021.

Concentration of Fair Housing Issues

While there are concentrations of certain special needs groups and/or fair housing issues throughout the City, the northern section of Gardena, specifically tracts 6026, 6029, 6030.01, and 6030.05, have several overlapping fair housing issues. The following fair housing issues, described previously, are present in northern Gardena tracts:

- Concentrations of racial/ethnic minority populations exceeding 80 percent;

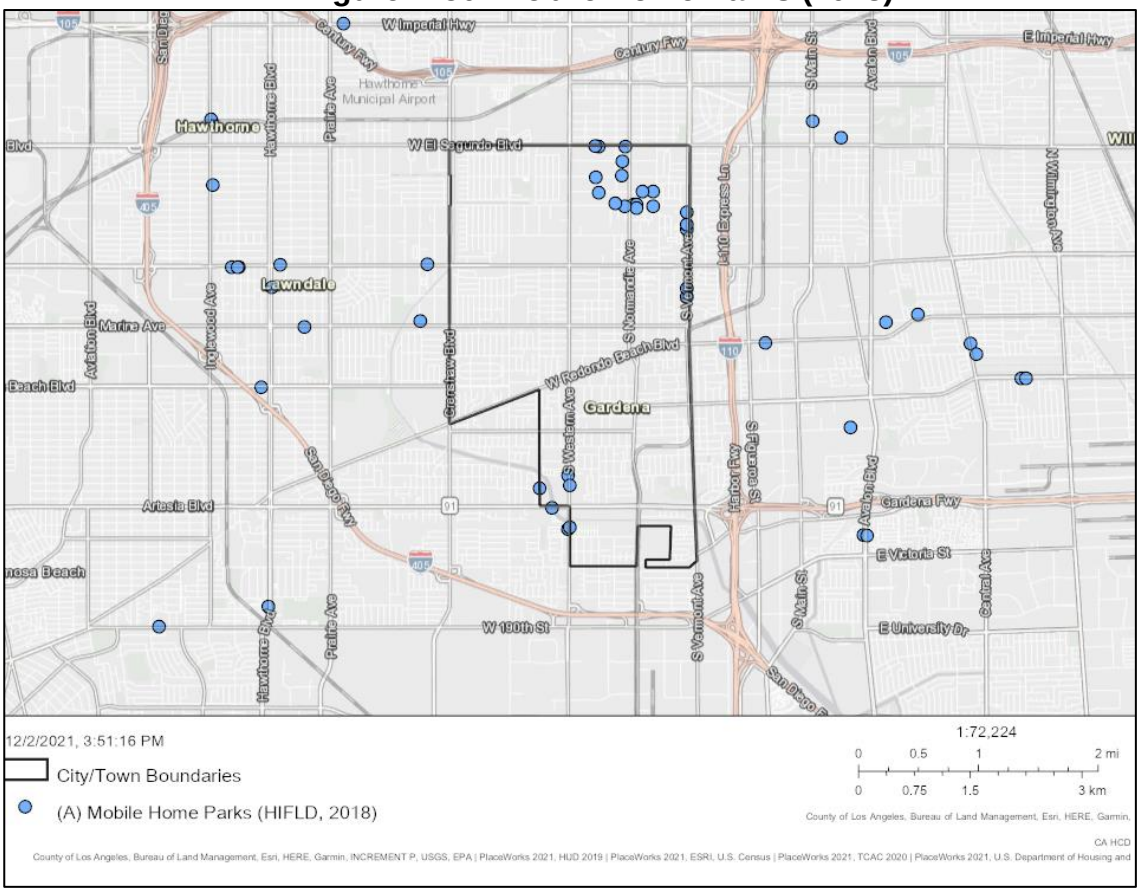
- Concentrations of children living in single-parent female-headed households exceeding 20 percent;
- Concentrations of LMI areas where more than 50 percent of households are low or moderate income;
- Low resource area designations;
- Lower jobs proximity indices;
- Higher rates of cost burdened renters exceeding 60 percent;
- Higher rates of overcrowded households exceeding the Statewide average of 8.2 percent.

Northern Gardena is zoned largely for industrial uses (M-1 and M-2 zones) surrounded by residential zones ranging from single-family (R-1) to high density residential (R-4). The City's Zoning Map is shown in Figure E-51. As presented in Figure E-50, the northeastern corner of the City also has a high concentration of mobile home parks, typically occupied by lower income households. The northeastern corner of the City also has the highest concentrations of overcrowded households (see Figure E-37).

Though all of Gardena has high concentrations of non-White populations, the northern City tracts have African American and Hispanic majority populations, while the southern City tracts have Asian majority populations. The northeastern tract (6029), where mobile home parks and industrial zoning is most concentrated, is the only mostly Black and Latino populated tract while the remainder of the City has a mix of three or more racial/ethnic populations. Racial or ethnic majority populations by tract are shown in Figure E-52 and neighborhood segregation patterns by tract are shown in Figure E-53.

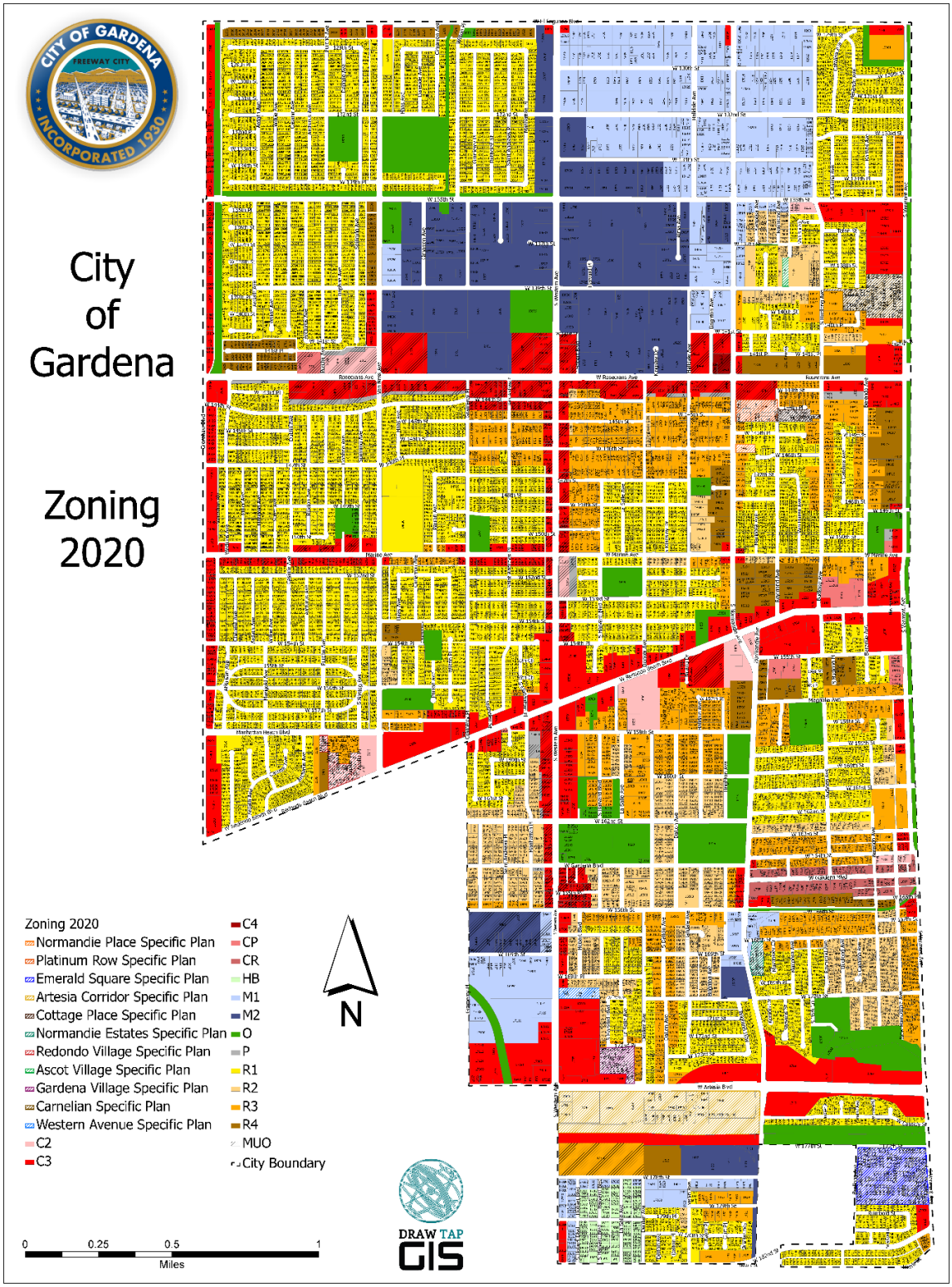
There are also five subsidized housing projects located in the City: Gardena Senior Housing (73 affordable units), Gardena South Park Sr. Citizens (126 affordable units), Gardena Marine Av Sr Housing (79 affordable units), Casimir House (three affordable units), and Spring Park (36 affordable units). Spring Park is an affordable senior housing project located in tract 6026 and may contribute to the concentration of LMI households and persons with disabilities in this tract.

Figure E-50: Mobile Home Parks (2018)



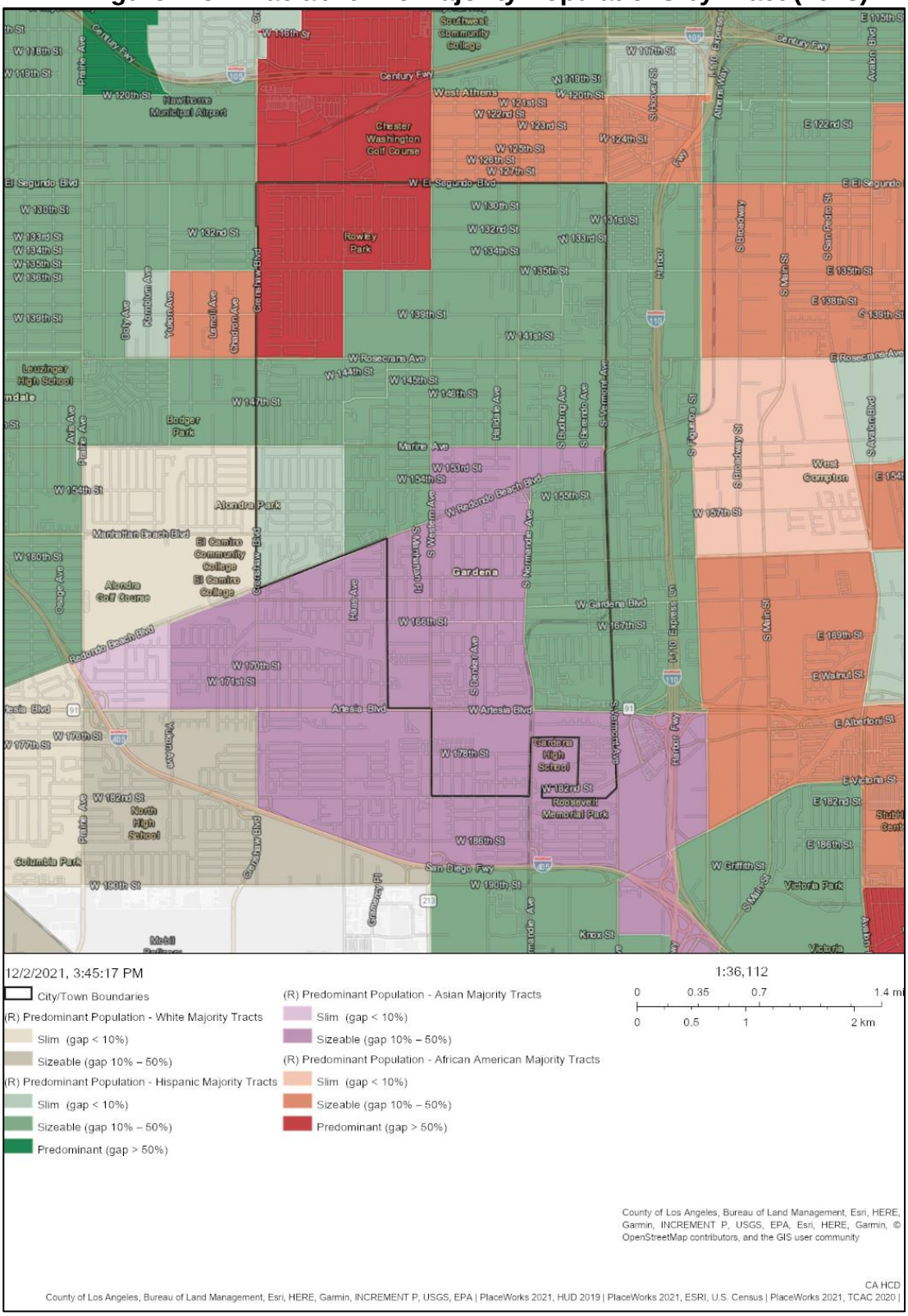
Source: HCD AFFH Data Viewer, Homeland Infrastructure Foundation Level Data (HIFLD) (2018), 2021.

Figure E-51: Gardena Zoning Map (2020)



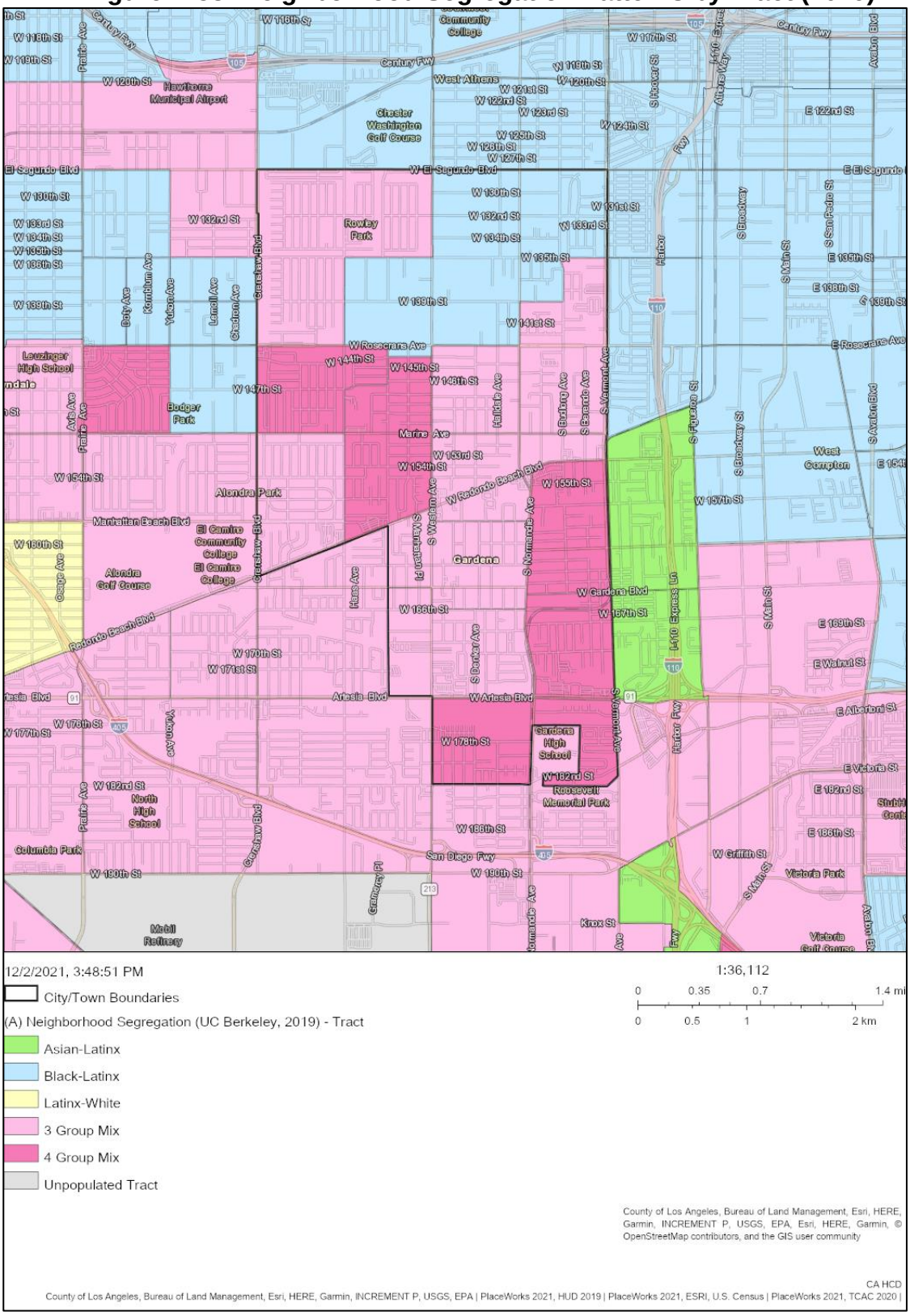
Source: City of Gardena, 2020.

Figure E-52: Racial/Ethnic Majority Populations by Tract (2018)



Source: HCD AFFH Data Viewer, 2021.

Figure E-53: Neighborhood Segregation Patterns by Tract (2019)



Source: HCD AFFH Data Viewer, UC Berkeley (2019), 2021.

Local Knowledge

In April 2016, the City published an Analysis of Impediments to Fair Housing Choice which included a fair housing community survey and workshop. The Fair Housing Survey was conducted from November 2015 to February 2016 and received 44 responses, 42 of which had not experienced housing discrimination in the City. The survey was distributed at the Nakaoka Senior Center, Civic Center, Parks and Recreation center, City Council meetings, and on the City's website. Table E-34 shows the race or ethnicity and income group of the respondents. One respondent indicated they had experienced discrimination and one respondent was unsure. Neither reported the incident. The respondent that reported experiencing discrimination was African American. The City did not receive any comments during the fair housing workshop or during the 2016 Draft AI public review period.

Table E-34: Survey Respondent Demographics (2016)

	Percent of Respondents
Race/Ethnicity	
White	20%
African American	20%
Asian	20%
Hispanic	14%
Not reported	11%
Non-resident	14%
Income	
<$10,000/year	5%
$10,000-$20,000/year	25%
$20,000-$30,000/year	9%
$30,000-$40,000/year	7%
$40,000-$50,000/year	11%
$50,000+/year	7%
Not reported	36%
Source: City of Gardena, 2016.	

C. Sites Inventory

The City has been allocated a very substantial RHNA that placing large number of units in existing residential and creating new residential/mixed use neighborhoods are necessary and unavoidable strategies to comply with State law. The City's sites inventory used to meet the RHNA is shown in Table E-35 by tract and AFFH variable. The sites inventory is divided into the following sections of the City. Zoning designations are also included for context. Commercial zoning is generally located throughout the City along major roads.

- **Northern Gardena** (tracts 6026, 6029, and 6030.01): Northern Gardena is generally north of W Rosecrans Avenue. A small section of tract 6029 is south of Rosecrans Avenue, bound by Gramercy Place, W 144th Street, and S Western Avenue and tract 6030.01 extents to Marine Avenue.
    - Predominantly R1 (Single-Family Residential), M1 (Industrial), and M2 (General Industrial)
    - Smaller areas zoned R2 (Low-Density Multiple-Family Residential), R3 (Medium Density Multiple-Family Residential), R4 (High Density Multiple-Family Residential), MUO (Mixed Use Overlay), and C-R (Commercial-Residential)
- **Central Gardena** (tracts 6030.05, 6030.06, 6034, 6035, and 6036): Central Gardena is generally bound by Rosecrans Avenue to the north and W Redondo Beach Boulevard to the south. A section of tract 6030.06 is located south of Redondo Beach Boulevard.
    - Predominantly R1 and R3
    - Some R2, R4, MUO, and C-R zones present
- Southeastern Gardena (tracts 6031.02, 6032, 6033.01, and 6033.02): Southeastern Gardena is generally bound by W Redondo Beach Boulevard to the north.
    - Mix of R1, R2, and R3
    - Small pockets of M1 and M2
    - MUO, C-R

Northern Gardena

All tracts in Northern Gardena are low resource areas. As discussed in this analysis of fair housing issues, this area of the City tends to have higher concentrations of non-White populations, overcrowded households, and cost burdened renters. All tracts in this section of the City are also communities at risk of displacement.

Of the 3,890 units identified in Northern Gardena, 1,583 are lower income (40.7 percent), 1,153 are moderate income (29.6 percent), and 1,154 are above moderate income (29.7 percent). While the City does place a larger proportion of lower income units in this area, additional housing units in these tracts would increase housing opportunities in the area. Additional lower income units, in conjunction with policies included in this Housing Element, specifically anti-displacement measures, would benefit the existing residents in these neighborhoods.

It is important to note that this area of the City has the highest potential for new housing projects, hence the concentration of units in Northern Gardena. Another 563 lower income units are allocated in Central Gardena and another 490 lower income units are allocated in Southeastern Gardena. While Northern Gardena has the highest concentration of overlapping fair housing issues, the City's RHNA strategy provides a variety of housing types to existing and future residents. Further, the RHNA strategy places lower income units throughout the City, ensuring existing fair housing issues are not exacerbated.

Central Gardena

Of the Central Gardena tracts containing RHNA units, two are high resource areas, two are moderate resource areas, and one is a low resource area. Tracts 6030.05 and 6030.06, bound by W Rosecrans Avenue, S Normandie Avenue, W 158th Street, and S Western Avenue are also considered communities at risk of displacement. Central Gardena has variable non-White populations, ranging from 77.6 to 96.7 percent, and LMI household populations, ranging from 31.6 to 82 percent.

The City has identified sites with a capacity for 1,283 units in Central Gardena, including 563 lower income units (43.9 percent), 279 moderate income units (21.7 percent), and 441 above moderate income units (34.4 percent). Of the 464 units in the low resource tract (tract 6030.05), 50 percent are allocated towards the moderate and above income RHNA. Tract 6030.05 also has larger proportions of overcrowded households and cost burdened households. However, 50 percent of the units in this tract are for lower income units, providing opportunity for affordable housing and ease existing overcrowding conditions. Another 331 lower income units are also allocated in Central Gardena in moderate and high resource tracts. The City's RHNA strategy generally distributes RHNA units of all income levels throughout the City, including Central Gardena. It is also important to note that 40 percent of all units selected are allocated towards the lower income RHNA.

The City's sites strategy encourages mixed income communities and does not disproportionately expose RHNA units to adverse fair housing conditions in excess of the Citywide trend.

Southeastern Gardena

Three of the four tracts containing RHNA units in Southeastern Gardena are sensitive communities at risk of displacement. TCAC opportunity categorizations for Southeastern Gardena tracts include: one low resource, two moderate resource, and one high resource. This area of the City tends to have smaller populations of LMI households and low to moderate rates of overcrowding and cost burden compared to the remainder of the City.

Of the 1,413 units identified in Southeastern Gardena, 490 are allocated towards the lower income RHNA, 365 to the moderate income RHNA, and 558 to the above moderate income RHNA. A concentration of smaller sites was identified in tract 6032, the southernmost tract. Smaller sites may not be suitable for higher density low income units, hence the higher concentration of above moderate income units in this section of the City. Furthermore, only a limited number of units are located in the Low Resource tract. The largest number of units are located in the High Resource tract.

Fair housing issues tend to be less prominent in Southeastern Gardena. The City's RHNA strategy includes a variety of sites suitable for an array of housing types. The RHNA strategy does not exacerbate existing conditions related to fair housing in this area of the City.

Table E-35: Residential Sites Inventory by Area and AFFH Variable

Area/Tract	# of HHs	Total Units	Income Distribution			TCAC Opp. Category	% Non-White	% LMI Pop.	% Over-crowded	Renter Cost Burden	Owner Cost Burden	At Risk of Displace-ment?
			Lower	Moderate	Above Moderate							
Northern Gardena												
6026	2,881	540	220	121	199	Low	96.5%-97.7%	39.0%-64.6%	5.6%	66.7%	45.0%	Yes
6029	1,316	3,204	1,342	922	940	Low	92.0%-95.3%	52.3%-80.0%	22.1%	66.6%	39.5%	Yes
6030.01	2,421	146	21	110	15	Low	94.1%-95.1%	63.7%-65.0%	18.6%	49.0%	57.1%	Yes
Central Gardena												
6030.05	1,872	464	232	69	163	Low	95.3%-96.7%	63.2%-65.9%	16.6%	67.1%	53.8%	Yes
6030.06	810	245	122	37	86	Moderate (Rap. Changing)	92.2%	57.0%	6.1%	46.4%	22.8%	Yes
6034	1,421	404	182	56	166	Moderate	82.9%-94.1%	31.6%-82.0%	9.2%	59.5%	39.2%	No
6035	883	106	27	59	20	High	80.3%-86.1%	40.1%-56.8%	7.0%	49.3%	39.9%	No
6036	1,364	64	0	58	6	High	77.6%-79.4%	45.9%-50.6%	4.3%	40.0%	50.3%	No
Southeastern Gardena												
6031.02	1,318	18	0	18	0	Low	94.7%	71.0%	7.6%	45.0%	28.1%	Yes
6032	1,163	821	239	202	380	High	83.2%-91.5%	16.1%-62.9%	4.4%	49.8%	36.1%	No
6033.01	1,418	326	162	49	115	Moderate	86.1%-95.7%	54.6%-77.9%	7.4%	52.9%	40.0%	Yes
6033.02	1,630	248	89	96	63	Moderate	85.8%-95.2%	46.9%-74.4%	9.6%	60.7%	43.1%	Yes

No sites are allocated in tracts 6030.04 or 6031.01 along the eastern City boundary (Marin Avenue to the north, Gardena Boulevard to the south, Vermont Avenue to the east, and Normandie Avenue to the west).

D. Identification and Prioritization of Contributing Factors

Fair Housing Enforcement and Outreach

There has been a lack of fair housing testing in Gardena in recent years. In 2020, 130 discrimination cases were opened in Los Angeles County, mostly on the basis of disability (66%) and race (21%). HUD reported 26 fair housing inquires in Gardena between 2013 and 2021. Further, concentrations of Housing Choice Voucher (HCV) recipients do not always correspond with the populations of cost burdened renters. In the northeastern area of the City specifically, there are very few HCV recipients while 66.6 of renters are cost burdened. The northeastern area of the City also has a high concentration of overcrowded households and a moderate proportion of elderly housing units that may be in need of rehabilitation. This may indicate that households are not aware of resources related to fair housing that may be available, including HCVs.

Contributing Factors:

- Lack of monitoring
- Lack of outreach towards special needs groups

Concentration of Special Needs Groups

The City has overlapping concentrations of LMI households, disabled persons, and children in female-headed households in the northern area of the City. Many of these tracts were also identified as low resource areas or as sensitive communities at risk of displacement. The northern section of the City also has a concentration of households with disproportionate housing needs including overpaying renters, overcrowded households, and aging housing units that may need rehabilitation. The concentration of mobile home parks may contribute to the clustering of fair housing issues in this area.

Contributing Factors

- Lack of private investment
- Location and type of affordable housing

Substandard Housing Conditions

1.4% of owner-occupied households and 3.8% percent of renter-occupied households lack complete plumbing or kitchen facilities and 88.5% of the City's housing stock was built prior to 1990 and may be susceptible to deterioration. Tracts with older housing units are most concentrated in the northern and western areas of the City. The northern section of Gardena has a higher concentration of overlapping

fair housing issues including LMI households, cost burdened renters, and overcrowded households.

Contributing Factors

- Age of housing stock
- Cost of repairs of rehabilitation

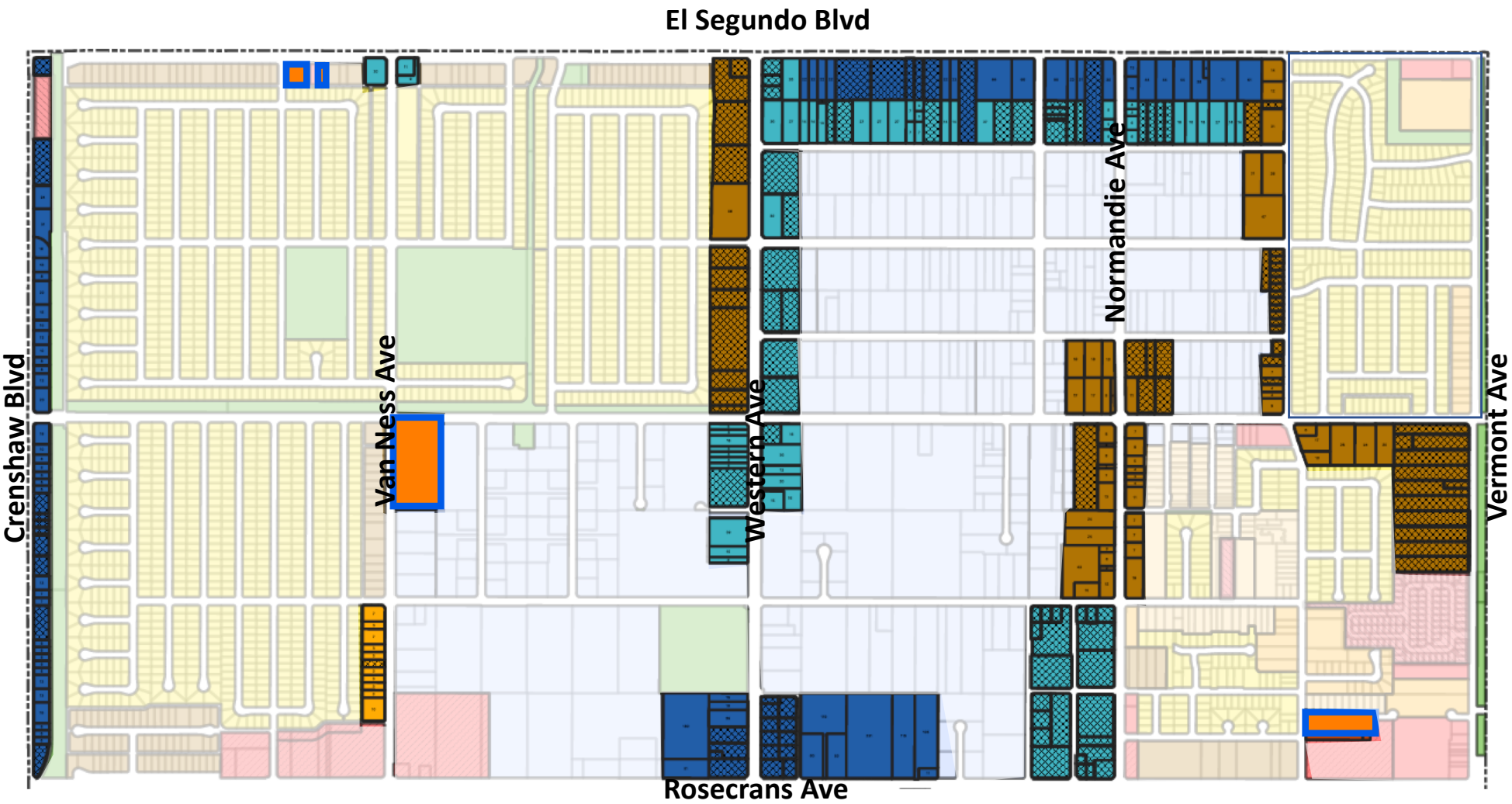
Displacement Risk of Low Income Residents Due to Economic Pressures

Most of the City is considered a sensitive community at-risk of displacement. Approximately 60-80% of renter-occupied households in the northern half of Gardena are cost burdened, while only 40-60% of renter-occupied households in the southern section are cost burdened. Many of these tracts also have higher concentrations of LMI households, disabled persons, and children in female-headed households.

Contributing Factors

- Unaffordable rents
- Concentration of poverty in some tracts
- Availability of affordable housing

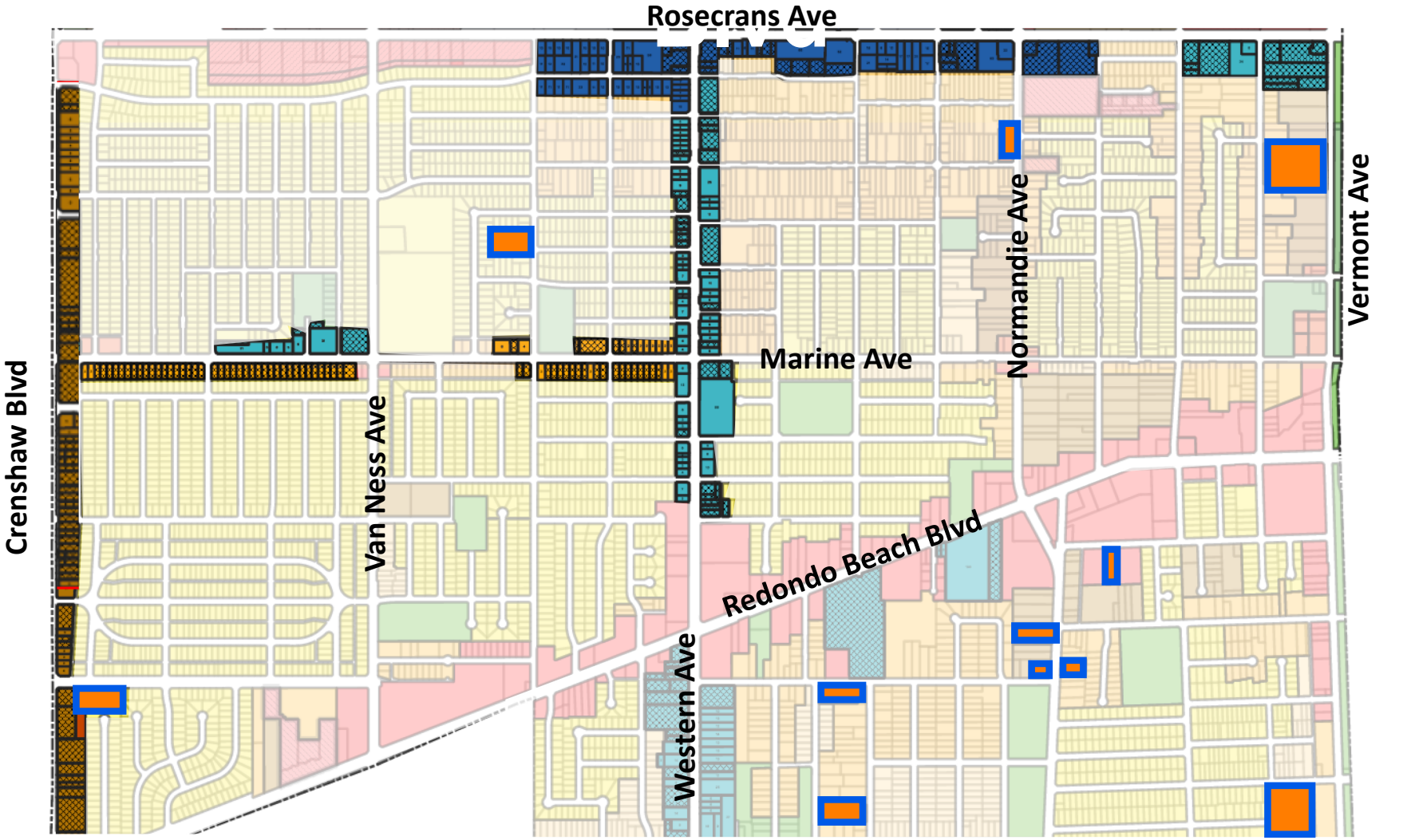
El Segundo Blvd to Rosecrans Ave



O3 (12 - 20 du/acre)
O4 (21 - 30 du/acre)
O5 (31 - 50 du/acre)
O6 (51 - 70 du/acre)

Not Included in Inventory
Religious Institution Overlay

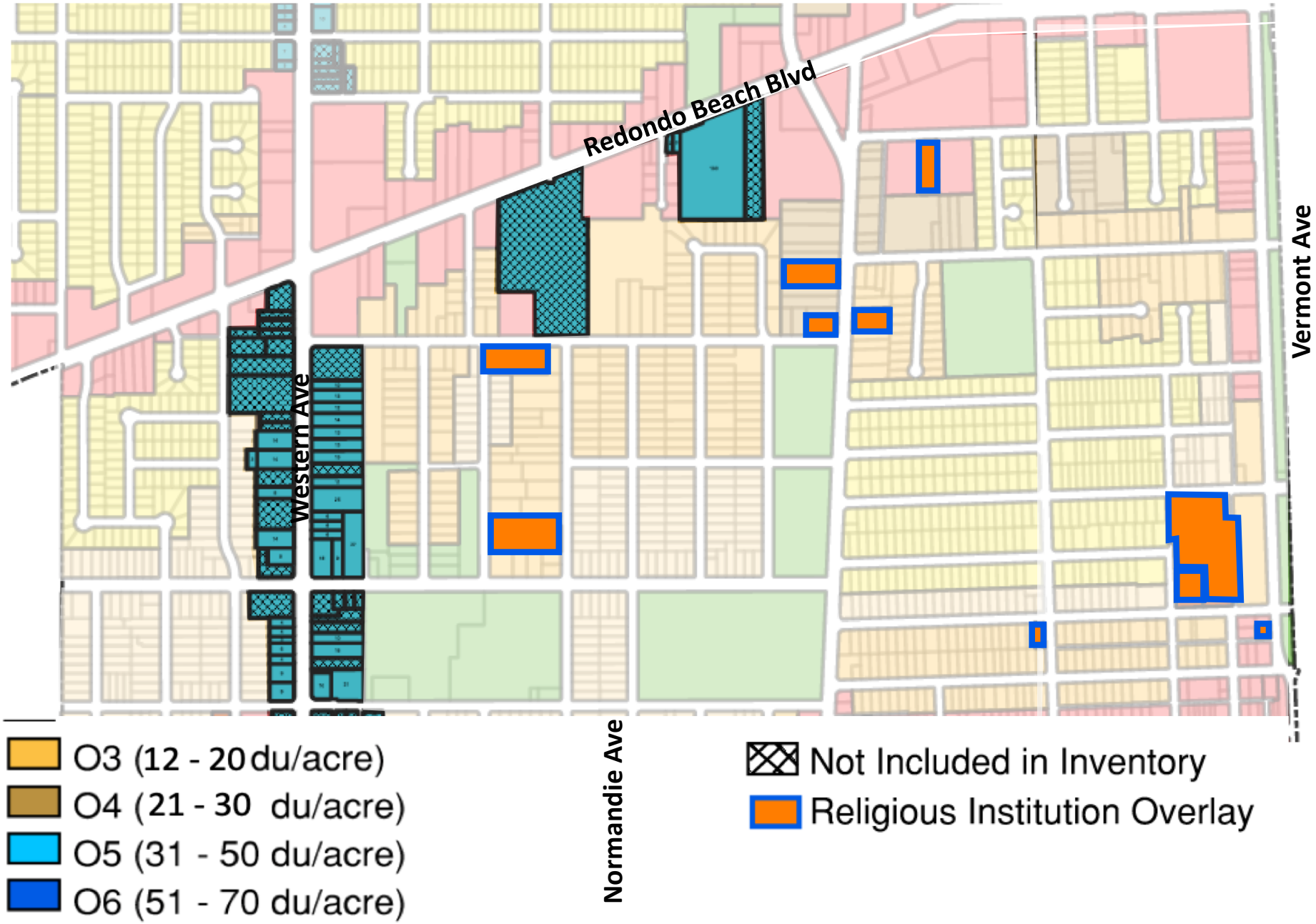
Rosecrans Ave to Redondo Beach



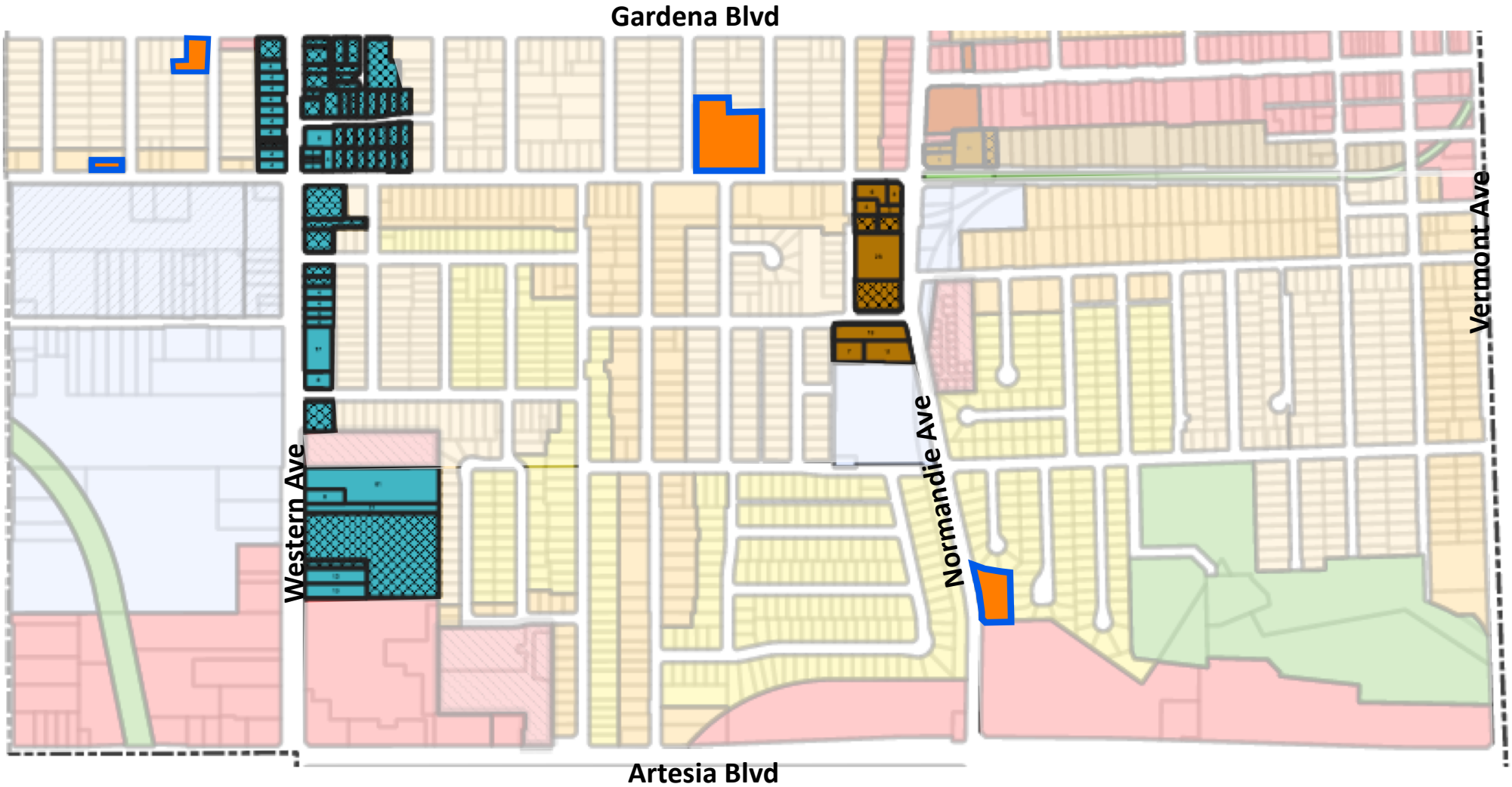
O3 (12 - 20 du/acre)
O4 (21 - 30 du/acre)
O5 (31 - 50 du/acre)
O6 (51 - 70 du/acre)

Not Included in Inventory
Religious Institution Overlay

Redondo Beach Blvd to Gardena Blvd



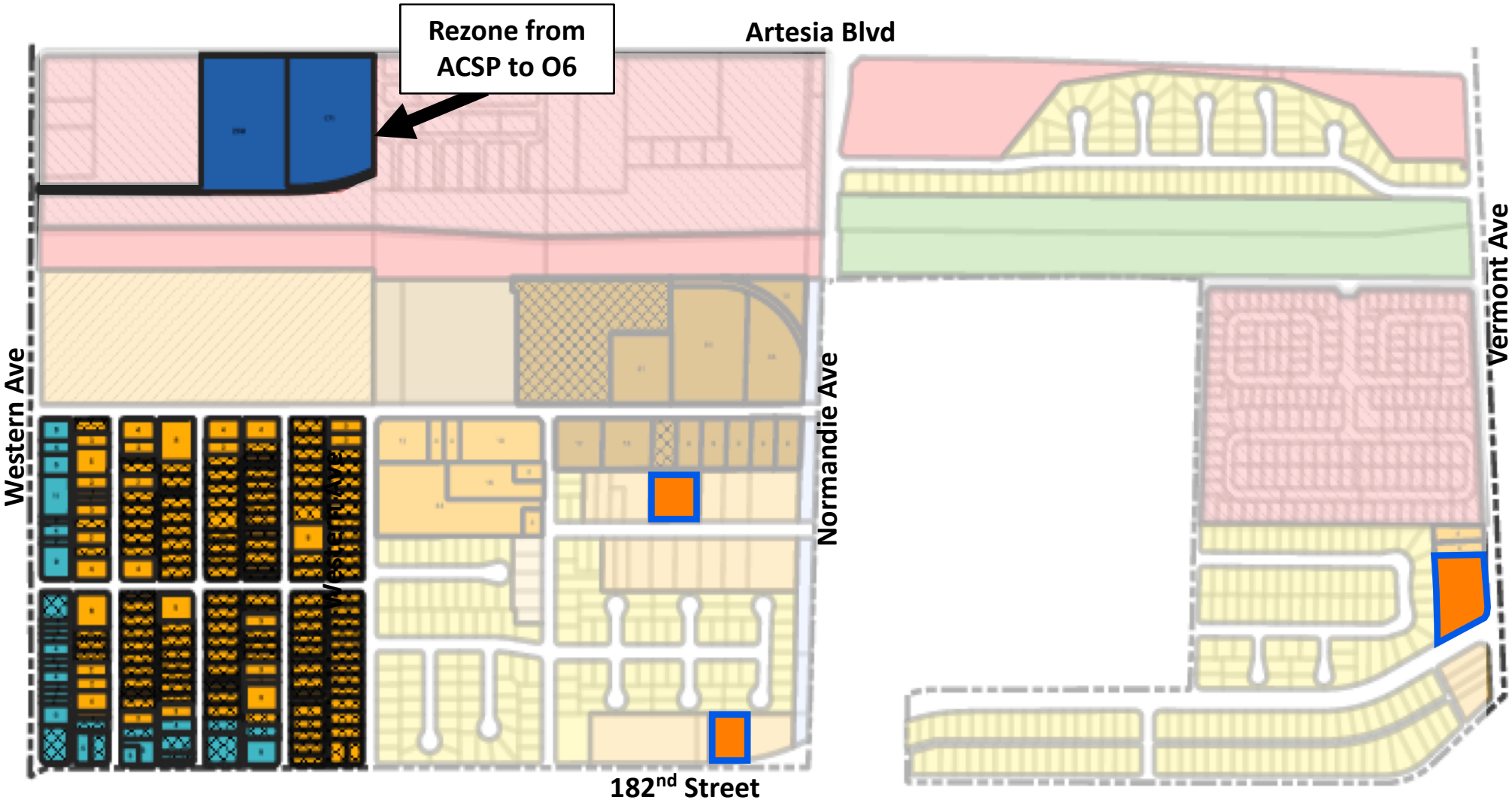
Gardena Blvd to Artesia Blvd



- O3 (12 - 20 du/acre)
- O4 (21 - 30 du/acre)
- O5 (31 - 50 du/acre)
- O6 (51 - 70 du/acre)

- Not Included in Inventory
- Religious Institution Overlay

South of Artesia



- O3 (12 - 20 du/acre)
- O4 (21 - 30 du/acre)
- O5 (31 - 50 du/acre)
- O6 (51 - 70 du/acre)
- Not Included in Inventory
- Religious Institution Overlay

Cities that failed to meet California's housing deadline seek rezoning extension

Almost every city and county in Southern California faces penalties for failing to adopt new housing plans on time.

A state lawmaker is working on a Southern California exception to his 2021 bill giving local jurisdictions that failed to update their housing plans on time just one year to complete state-mandated rezoning instead of three. The penalty applies to 97% of the region's local jurisdictions, officials say. (Photo by Mindy Schauer, Orange County Register/SCNG)

By **JEFF COLLINS** | JeffCollins@scng.com | Orange County Register
PUBLISHED: May 4, 2022 at 7:09 p.m. | UPDATED: May 5, 2022 at 9:03 a.m.

Local and state officials are working on a deal to soften penalties affecting almost every Southern California city and county for failing to adopt state-approved housing plans by a February deadline.

Under a new law adopted just last fall, those cities now are required to rezone land needed to meet state housing goals by Oct. 15, instead of the usual three-year timeline.

If they fail to meet the rezoning deadline, the state can find them out of compliance with state housing laws, exposing them to lawsuits, stiff fines, a cutoff of housing grants and a loss of local control over planning decisions.

“Everyone was late, and so it’s been very hard because at the same time … (state housing officials) were sending letters saying, ‘You’re out of compliance, you could like lose your funding.’ And that is sending all the cities into, you know, crazy mode,” said Guy Strahl, chief of staff for bill author Richard Bloom, D-Santa Monica. “It’s driving all the cities crazy.”

Just five cities and one county in the six-county Southern California Association of Governments region — Duarte, San Gabriel, Victorville, Westlake Village, Wildomar and the county of Ventura — met the Feb. 11 deadline to adopt a state-certified plan, or “housing element.”

The remaining 191 jurisdictions in the SCAG region now have only until Oct. 15 to rezone land needed to accommodate huge increases in state-mandated homebuilding goals — a time-consuming task many cities said is impossible to accomplish by the fall.

Kome Ajise, SCAG’s executive director, said his agency had been seeking more time for rezoning since last year because the new measure, Assembly Bill 1398, “changed the rules of the game” just as the region’s localities were in the process of revising their housing plans.

“We knew immediately when 1398 passed it was going to be a problem,” Ajise said. “Given the number of cities that we had just beginning to get their housing elements done, it was going to be impossible to meet the deadline.”

A proposed compromise seeks to create a Southern California exception to AB 1398.

Meeting an Oct. 15 rezoning deadline “is going to be very difficult,” said Manhattan Beach Planning Manager Tylyn Mirzakhanian.

“It is a very difficult task to demonstrate capacity for 774 new units in a small city that is completely built out,” Mirzakhanian said. ” … We don’t have a single vacant site to rely on. And so, we were hit with very stringent requirements because of that.”

Long Beach Planning Manager Alison Spindler-Ruiz said her city can’t complete the rezoning of about 800 parcels until sometime next year, even though the city got a head start after recently updating its land-use plan.
“The rezoning process takes a whole host of extensive community engagements,” Spindler-Ruiz said. “(They include the) noticing of public hearings, mailings and (the holding of) public hearings by both the planning commission and the city council.”

The city of Los Angeles needs to rezone enough land to accommodate about 255,000 additional housing units, the city said in a statement. Officials identified about 243,000 "candidate sites" on the list for possible rezoning. Even three years may not be enough time to accomplish that task, the statement indicated.
"Rezoning efforts typically take several years from community engagement and initiation to adoption," it said. "A one-year timeline appears to be infeasible … and even a three-year timeline is significantly expedited."

In Redondo Beach, rezoning will require voter approval, said Community Development Director Brandy Forbes. The soonest the city would be able to get such a measure on the ballot would be March 2023.

"We can do it within a three-year timeframe," Forbes said. "We just can't do it in one year."

Stiff sanctions

Under AB 1398, cities that fail to meet the October rezoning deadline would be ruled out of compliance with the state's housing element law, setting in motion a wide array of potential consequences.

Non-compliant jurisdictions face the loss of numerous state and federal grants, including competitive grants for fixing roads, adding bike lanes, improving transit or building affordable housing.

They also cannot deny affordable housing projects for being inconsistent with zoning or the general plan and face possible lawsuits with fines ranging from $10,000 to $100,000 a month. Fines can be multiplied by six for jurisdictions that continue to be out of compliance.

Bloom said in a press release when AB 1398 was signed into law that the measure was designed to incentivize cities to adopt their updated housing elements on time.

"Unfortunately, there have been instances where cities deliberately adopt faulty housing elements to avoid building their fair share of housing," Bloom said. "As the housing crisis grows in California, it is critical that every local government adopt a plan that meets the requirements of state law (and) that they do it on time."

State officials say 185 Southern California cities and five of the region's six counties failed to update their housing plans by a Feb. 11 deadline, exposing them to a host of sanctions if they don't complete needed rezoning by next Oct. 15. A proposed deal now in the works would give those cities more time to rezone.

SCAG chief Ajise said tougher planning and fair housing requirements, coupled with COVID-19 lockdowns and delays in determining local housing allocations, put the

region's cities and counties about six months behind in adopting their new housing elements.

Most cities had a draft housing element done by last October, but the back-and-forth process of getting housing department reviews and making revisions pushed most jurisdictions past the Feb. 11 deadline to get state approval.

"The process is not that easy," Ajise said. " … We didn't expect that law would change the rules of the game while we were in process. So, (AB 1398) didn't come as a surprise to us, but we were also not expecting that it would apply to us."

Housing advocates expressed conditional support for a rezoning extension, saying they want to spare cities the consequence of losing affordable housing grants, but don't want to let them off the hook for not getting their housing plans done on time.

"While we want there to be consequences, we don't want to make the situation worse by (cities) losing affordable housing money," said Leonora Camner, executive director of Abundant Housing LA.

"SCAG got caught in kind of the middle of this," added Kennedy Commission Executive Director Cesar Covarrubias, an affordable housing advocate. "We understand there are cities like L.A. that have thousands of sites. It's a bigger challenge for them. … But we need to hold cities accountable."

City of Gardena

Gardena City Council Meeting
AGENDA REPORT SUMMARY

Agenda Item No. 14.A
Section: DEPARTMENTAL ITEMS - POLICE
Meeting Date: July 26, 2022

TO: THE HONORABLE MAYOR AND MEMBERS OF THE GARDENA CITY COUNCIL

AGENDA TITLE: Authorization to Purchase Five (5) Patrol Vehicles from National Auto Fleet Group in the amount of $210,825.21 and expend Build-Out Costs in the amount of $95,876.30

COUNCIL ACTION REQUIRED:
Staff Recommendation: Authorize Purchase

RECOMMENDATION AND STAFF SUMMARY:
Staff respectfully recommends that the City Council authorize the Police Department to purchase five (5) new/unused 2022 Ford Utility Police Interceptor AWD vehicles from National Auto Fleet Group at a total cost of $210,825.21, including a 10.25% state sales tax and an $8.75 tire tax per vehicle. Staff also requests City Council authorization to expend the vehicle buildouts in the amount of $95,876.30.

The ongoing replacement of capital equipment is necessary to maintain a fleet inventory that is safe, efficient, and reliable. This purchase of five new patrol vehicles will replace the older vehicles that have reached the end of their useful service life due to age, mileage, and general wear and tear.

National Auto Fleet Group will sell and deliver the new vehicles available under the Sourcewell Master Vehicle Contract #091521-NAF at a discounted price of $37,187.00 each, for a total cost of $42,165.04 per unit, including sales tax and tire tax. The total expenditure for all five vehicles is $210,925.21. The vehicles will be assigned to Patrol and will be purchased using previously budgeted funds from the City's Equipment Revolving Fund.

South Bay Regional Public Communications Authority (SBRPCA) is our local vendor for vehicle buildouts. Using serviceable equipment from five decommissioned Ford Police Interceptors will result in a significant savings in build-out costs. SBRPCA has quoted a cost of $19,175.96 per vehicle, for a total cost of $95,876.30.

FINANCIAL IMPACT/COST:
The vehicle and build-out costs will be covered under the City's Equipment Revolving Fund.

ATTACHMENTS:
Agenda Staff Report -7-26-22.pdf
SBRPCA Build-out Quote.pdf

APPROVED:

_____

Clint Osorio, City Manager

City of Gardena
City Council Meeting

AGENDA STAFF REPORT

AGENDA TITLE:

AUTHORIZATION TO PURCHASE FIVE (5) PATROL VEHICLES FROM NATIONAL AUTO FLEET GROUP IN THE AMOUNT OF $210,825.21 AND EXPEND BUILD-OUT COSTS IN THE AMOUNT OF $95,876.30

RECOMMENDATION:

Staff respectfully recommends that the City Council authorize the Police Department to purchase five (5) new/unused 2022 Ford Utility Police Interceptor AWD vehicles from National Auto Fleet Group at a total cost of $210,825.21, including a 10.25% state sales tax and an $8.75 tire tax per vehicle. Staff also requests City Council authorization to expend the vehicle buildouts in the total amount of $95,876.30.

BACKGROUND:

The ongoing replacement of capital equipment is necessary to maintain a fleet inventory that is safe, efficient, and reliable. This purchase of five new patrol vehicles will replace the older vehicles that have reached the end of their useful service life due to age, mileage, and general wear and tear. Currently, the Police Department has thirty-one (31) black-and-white patrol vehicles in the fleet, with a plan to replace five units per year through the Vehicle Replacement Fund.

Police Department staff obtained a quote via National Auto Fleet Group for five (5) new Ford Police Interceptors. The total cost of each vehicle, including state sales tax and tire tax, is $42,165.04 for each patrol unit. These vehicles are available under the Sourcewell Master Vehicle Contract #091521-NAF, formerly known as the National Joint Powers Alliance (NJPA) contract. The five new Ford Police Interceptors will replace five older Police Interceptors that are currently in service or have been damaged beyond repair.

The City can take advantage of the Sourcewell Master Vehicle Contact and will purchase the Ford Police Interceptors at a discount. MSRP for the Police Interceptors is $45,040.00 each, or a total cost of $225,200.00 for five (5) vehicles. Using the Sourcewell Master Vehicle Contract, each of the police units will cost $37,187.00 for a total of $185,935.00, which is a savings of $39,265.00 or 17.44%

South Bay Regional Public Communications Authority (SBRPCA) is our local vendor for vehicle buildouts. Over the years, SBRPCA staff has worked to find the most reasonable prices on equipment that we purchase through them. However, with the significant outlay for the purchase and outfitting of these vehicles with all new equipment, staff sought options to reduce expenses by having SBRPCA recycle most of the serviceable equipment from the five decommissioned Ford Police Interceptors. This option will result in a cost reduction in vehicle setups.

Pursuant to staff's request, SBRPCA conducted an inventory of useable vehicle parts and quoted the following build-out costs for each unit:

P-24	$19,175.26
P-10	$19,175.26
P-11	$19,175.26
P-07	$19,175.26
P-12	$19,175.26
Total:	**$95,876.30**

Ordinarily, the cost to build five (5) new police patrol units is approximately $118,465.00. Because we can recycle viable equipment from the older police units at a cost of $95,876.30, we estimate a savings of approximately $22,588.70 overall.

The five Ford Police Interceptor vehicles that are being replaced will have their police-related equipment removed and then sent to auction. Some of the recycled equipment is not reusable for the new patrol vehicle vehicles, as they have become incompatible with the length and width of the new police models.

Therefore, with a savings of $39,265.00 in vehicle purchases and $22,588.70 in build-out costs, the City will realize a total savings of $61,853,70.

IN CONCLUSION, Staff respectfully recommends that the City Council approve the purchase and build-out costs for five new 2022 Ford Utility Police Interceptor AWD vehicles.

Submitted by: _____ Date: July 20, 2022

Michael Saffell, Chief of Police

SBRPCA
4440 WEST BROADWAY HAWTHORNE CA,90250
310-973-1802 FAX: 310-978-0892

QUOTE

DATE	QUOTE #	CUST #
6/20/2022	0000002547	0000011

CUSTOMER

City Of Gardena
Attn: Accounts Payable
1700 W. 162nd Street
Gardena CA 90247

SHIP TO:

Gardena Police Dept
Attn: Gina Ayers
1718 W. 162nd Street
Gardena CA 90247

P.O. NUMBER	TERMS	JOB OR UNIT #
	NET 30	

QUAN		DESCRIPTION	PRICE EACH	AMOUNT
1.00	MBFX11JJ	Ford Explorer, 2011-2014 and Police Interceptor Utility, 2013-2014, Two Split Red/Blue Lightheads	237.00	237.00
4.00	I3JC	ION TRIO ION R/B W/ WHT OVERRIDE	127.20	508.80
2.00	PE 215	STROBE PRE-EMPTION SUPPLY (OPTICOM)	305.40	610.80
2.00	416900-BW	Corner LED Dual Color Corner LED with in-line flasher, Blue/White	51.00	102.00
1.00	PF200R	Federal Signal Pathfinder Remote Head Siren / Light Controller, 100/200 watt, OBD integration capability, integrated Rumbler capability, and integrated dual-tone capability	765.00	765.00
1.00	EXP-MOD-1	Exp-mod-1	344.50	344.50
1.00	689000-00	RUMBLER SIREN SYSTEM	307.56	307.56
1.00	RB-FPIU20	2020 RUMBLER BKTS INTCEPTOR UTILITY	26.50	26.50
2.00	ESB-U	UNIVERSAL SIREN BKT FOR ES100C	19.00	38.00
2.00	ES100C	SIREN SPEAKER	151.00	302.00
12.00	MPS 620U-BR	6-LED Surface mount lighthead, BLUE/Red	82.00	984.00
14.00	MPSM6-LB	MPS 600 SERIES L BRACKET	10.07	140.98
2.00	MPS 620U-RW	6-LED Surface mount lighthead, Red/White	82.00	164.00
2.00	MPS1200U-RB	MicroPulse Ultra Red/Blue	98.00	196.00
2.00	MPS1220U-BA	12-LED light head, (12) Blue / (12) Amber	98.00	196.00
1.00	FHL-TAIL	TAIL LIGHT FLASHER INTERCEPTOR UTILTY	41.00	41.00
2.00	20.1850 CLEAR	LINEAR STROBE CLEAR LENS	105.37	210.74
2.00	PE 215	STROBE PRE-EMPTION SUPPLY (OPTICOM)	305.40	610.80
1.00	14.0553	CIG OUTLET X 3	18.57	18.57
1.00	390-0042-0	KUSSMAUL POWER CENTER DISTRIBUTION	318.00	318.00
1.00	C-VS-1012-INUT	2020 Ford Interceptor Utility Specific Angled Consolewith 22 inches of total internal mounting space; 10 inches front angled, 12 inches rear horizontal	329.64	329.64
1.00	C-DMM-3015	Swing Up Device Mount for Ford 2020 Interceptor Utility Vehicle	327.60	327.60
1.00	CUP2-1001	Self-Adjusting Double Cup Holder	41.01	41.01
1.00	C-AP-0325	3 INCH INTERNAL POCKET HAVIS CONSOLE	32.13	32.13
1.00	C-TTP-INUT-1201	2020 FORD IU RAISED FOLD-UP CARGO PLATE FOR EQUIPMENT UNDERNEATH	558.70	558.70
1.00	C-MD-202	Tilt Swivel Motion Device	53.08	53.08
1.00	C-EB30-FSR-1P	1-Piece Equipment Mounting Bracket, 3" Mounting Space, Fits Federal Signal Pathfinder PF200R switch panel remote		
1.00	C-EB25-XPR-1P	1-Piece REMOTE HEAD Equipment Mounting Bracket, 2.5" Mounting Space, Fits Motorola XPR4550, XPR4380, XPR4580 & XPR4350 radio	17.64	17.64
1.00	C-FP-4	FILLER PLATE 4 INCH	8.59	8.59

SBRPCA
4440 WEST BROADWAY HAWTHORNE CA,90250
310-973-1802 FAX: 310-978-0892

QUOTE

DATE	QUOTE #	CUST #
6/20/2022	0000002547	0000011

CUSTOMER

City Of Gardena
Attn: Accounts Payable
1700 W. 162nd Street
Gardena CA 90247

SHIP TO:

Gardena Police Dept
Attn: Gina Ayers
1718 W. 162nd Street
Gardena CA 90247

P.O. NUMBER	TERMS	JOB OR UNIT #
	NET 30	

QUAN		DESCRIPTION	PRICE EACH	AMOUNT
1.00	C-FP-1.0	Filler plate 1inch	7.27	7.27
1.00	C-FP-.5	1/2 inch faceplate	7.95	7.95
1.00	PK1126ITU20TM	#10XL C Coated Polycarbonate With Expanded Metal Window Security Screen,Tall man	671.30	671.30
1.00	QK0566ITU20	Full Replacement Transport Seat TPO Plastic, with Center Pull Seat Belts & #12 Coated Polycarbonate Cargo Partition	979.30	979.30
1.00	MB05-19005GB-	Cradlepoint R1900-5GB - wireless router - WWAN - LTE, 802.11a/b/g/n/ac/ax,	2,795.00	2,795.00
1.00	AP-NEXT-C4W4G	CENTURION 5G 9-in-1 High Performance External IP67 Antenna includes support for LTE Band 14 for FirstNet™, Band 71 for T-Mobile,	525.00	525.00
1.00	IK-TR-911	Full Travel Keyboard with Attachment Versatility	395.00	395.00
1.00	DEFAULT 4030	Sbrpca wire harnes	387.65	387.65
1.00	MISC PARTS	WIRE, LOOM, HARDWARE	600.00	600.00
1.00		SHIPPING COSTS	600.00	600.00
1.00	36-2125	WESTIN 2020 FORD IU PUSH BUMPER	307.50	307.50
1.00	36-2125PB	WESTIN 2020 FORD IU PIT BAR	321.48	321.48
1.00	36-6005W2	WESTIN 2020 FORD IU WHELEN 2 LIGHT CHANEL	28.59	28.59
1.00	35-14045	2020-2021 DEFENDER PRISONER SEAT WITH READY BUCKLE SEAT BELT SYSTEM	805.61	805.61
1.00	35-20045	WESTIN 2020 FORD IU FRONT PARTITION	903.45	903.45
1.00	35-220452	WESTIN 2020 FORD IU REAR PARTITION	422.50	422.50
1.00	C-TTP-INUT-4	2020 FORD IU PREMIUM FOLD-UPEQUIPMENT TRAY.	200.05	200.05

SUBTOTAL	**$17,448.29**
TAX	**$1,726.97**
TOTAL	**$19,175.26**

City of Gardena

Gardena City Council Meeting
AGENDA REPORT SUMMARY

Agenda Item No. 15.A
Section: DEPARTMENTAL ITEMS - PUBLIC WORKS
Meeting Date: July 26, 2022

TO: THE HONORABLE MAYOR AND MEMBERS OF THE GARDENA CITY COUNCIL

AGENDA TITLE: Approve the Proposed Master Plan to proceed with the Design and Construction Document Phase of the Mas Fukai Park Improvements, JN 820.

COUNCIL ACTION REQUIRED:
Staff Recommendation: Approve the Proposed Master Plan

RECOMMENDATION AND STAFF SUMMARY:
In April 2020, the City hired BGB Design Group of Landscape Architecture firm to develop a Master Plan for the Mas Fukai Park Improvements, summarize existing conditions and make recommendations. The study was suspended during the COVID-19 pandemic period and was reinstated in fall 2021. The plan is now completed to present to the City Council.

Mas Fukai Park is a 4.53-acre neighborhood park located at 15800 South Brighton Avenue. The park is adjacent to Peary Middle School and nearby Denker Avenue Elementary School, City Hall, City's Human Services (all within a 0.40-mile radius) and provides recreation facilities for Gardena residents. The park fronts Brighton Avenue on the west and Normandie Avenue on the east side and is south of 158th Street. Surrounding the park is mostly a residential neighborhood with single-family (R-1) through multi-family (R4), low-density multiple-family (R-2) residential zone.

The major components of the park are a 59-year-old community center equipped with three recreation rooms, a kitchen, two freestanding restroom buildings, three baseball diamonds, two basketball courts, tot play area, and recently renovated picnic shelter and BBQ area. Due to the age of the park facilities, many of the existing features are reaching the end of their life cycle. The master plan is developed to focus on some of these features as well as addressing current programming needs, ADA compliance, water quality management program, safety on the play field, drainage, programming of desired uses through community workshop participation and energy consumption.

Under recently adopted two-year city budget, $1 million in FY 2022-2023 and $3.5 million in FY 2023-2024 has been allocated to fund the design and construction document phases and partially for the construction phase. The master plan's total estimated project cost is approximately $7 million, and the key components are as follows:

• New Community Center	$3 M
• Electrical Lighting	$275K
• Irrigation System Renovation	$260K
• Concrete Permeable Pavers	$110K
• Pickleball & Basketball Courts	$180K
• Resilient Surfacing at Tot Lots	$124K
• Site Furnishings	$194K
• Landscape Improvements	$82K
• New and Renovating Decomposed Granite	$110K
• Misc. Items (SWPPP, Utility, Demo, Concrete, Etc.)	$670K
TOTAL	$5,669K (5.7M)
• Development of Design & Construction Documents (12%)	$680K
• Construction Management & Sinspection Services (12%)	$680K
TOTAL	$1,354K (1.3M)
GRAND TOTAL	**$7,029K (Approx. $7M)**

Staff intends to pursue different grant opportunities to supplement or replace the existing City budget. Further development of the design and construction document phase should increase the City's chances of obtaining competitive grant(s).

Staff respectfully recommends that the City Council approves the proposed Master Plan to proceed with the Design and Construction Document Phase of the Mas Fukai Park Improvements, JN 820.

FINANCIAL IMPACT/COST:

Project Budget: $4.5 million ($1 million in FY 2022-2023 and $3.5 million in FY 2023-2024)
Funding Source: Park in-lieu

ATTACHMENTS:

Mas Fukai Park Master Plan_June 2022.pdf

APPROVED:

_____

Clint Osorio, City Manager

BGB | DESIGN GROUP
Landscape Architecture Planning Urban Design

June 06, 2022

City of Gardena Dept. of General Services
Public Works
1717 West 162 Street
Gardena, CA 90247-3778
ATTN: Kevin Kwak

MAS FUKAI PARK
SUMMARY OF EXISTING CONDITIONS AND RECOMMENDATIONS

PARK CONTEXT

Mas Fukai Park is a 4.53-acre neighborhood park located at 15800 South Brighton Avenue. The park is adjacent to Peary Middle School and nearby Denker Avenue Elementary School, City Hall, City's Human Services (all within a 0.40-mile radius) and provides recreation facilities for Gardena residents. The park fronts Brighton Avenue on the west and Normandie Avenue on east side just south of 158th Street. Surrounding the park is mostly a residential neighborhood with single-family (R-1) through multi- family (R4) low-density multiple-family (R-2) residential zone.

The park was purchased from the County and dedicated as a City park in 1960. In June 2000, the Gardena City Council rededicated Recreation Park as Mas Fukai Park. Masani "Mas" Fukai was elected to Council in 1974 and served until his retirement in 1998. Mas, as his friends and associates call him, also served for five years as the Chief Deputy to then Los Angeles County Supervisor Kenneth Hahn.

The major components of the park are a 59-year old community center equipped with three recreation rooms, kitchen, two freestanding restroom buildings, three baseball diamonds, two basketball courts, tot play area, and recently renovated picnic shelter and bbq area.

SITE INVENTORY ASSESSMENT

Due to the age of the park facilities, many of the existing features are reaching their life cycle end. The master plan being developed will focus on some of these features as well as addressing current programming needs such as ADA compliance, water quality management program (WQMP), safety on the play fields, drainage, programming of desired uses through community workshop participation and energy consumption.

COMMUNITY OUTREACH

In November 2021, a community outreach session was help in addition to a subsequent online community questioniare. City staff meetings further engaged the master plan process taht queried park patrons as to their opinions for future park needs and deficiencies within the current facilities. The major outcomes of the outreach as follows:

- New Community Building
- Resilient surfacing for Tot Lot
- Added Pickleball Courts without reducing the number of Basketball Courts
- An Interior Walking Track
- New Restroom Facilities for the Main Ballfield

- New ADA Compliant Bleachers and Access
- Exercise Equipment
- Foot Reflexology Labyrinth
- Efficient Field Lighting
- Improved Field Conditions

The Landscape Master Plan reflects the incorporation of staff concerns with degraded facilities and community input from in-person meetings and on-line notifications. A teen space shall be considered which is not currently reflected in the master plan.

BALL FIELDS

The two existing baseball diamonds are continuously used by the Little League and adult softball leagues. The brick dust infields are well groomed through a city maintenance program. However, over the years uneven playing surfaces have developed causing puddling during rain events. Utility / pull box(s) are located in the field of play, potentially a cause for injury. Soil settlement over time have created depressions within the turf play area. Although the overall turf appearance is relatively uniform, it may be beneficial to conduct an irrigation water audit to determine the irrigation system efficiency.

Recommendations

- Scour existing brick dust infield and import additional stabilized brick dust and laser re-grade to meet recreational field standards.
- Determine viability of relocating any/all utility boxes located within the field of play.
- Conduct water audit for irrigation coverage. Traditional “catch can” testing or GPS mapping of systems with uniformity distribution software can objectively determine efficiency of systems. Recommendation for head / nozzle replacements to meet current industry standards can then be determined.
- Conduct agronomy testing of existing turf soil conditions to determine any deficiencies. Close mow turfgrass and aerate the soil. Provide 50/50 sand / soil mix and prepare uniform grades throughout Address any “lips” at edges of play / brick dust surface. Overseed with appropriate turfgrass mix.

TOT LOT

The existing tot lot equipment configuration provides a variety of play experiences for different age levels given the allotted space. Poured -in-place resilient surfacing provides access to each of the play experience points of entry and exit (i.e. slides, swings and climbing points). The remaining area comprises compacted sand. The resilient surfacing is starting to delaminate and due for replacement.

Recommendations

- Remove all the existing resilient surfacing and sand. Replace with resilient tiles throughout. Tiles can be replaced if damaged in the future, whereas poured-in-place surfacing repairs are difficult and noticeable.
- Allow the existing play equipment to reach its eventual life cycle end before replacement. Tiles may allow this replacement to occur in a more economic fashion, given the surfacing and equipment would be on different life cycles.

PARKING

Mas Fukai Park is a local park, served only with on-street parking. The master plan proposes (1) Van and (1) Standard ADA stall to be constructed near the entry to the community center. This would provide accessibility to the various park experiences.

HARDCOURT PLAY

Currently, the park has (2) basketball courts. A new sail shade structure for picnicking along with BBQ stations was constructed in 2021. The basketball courts are in relatively good condition with a Sportsmaster™ or equal surface treatment. Cracks in the concrete are evidenced which may be filled / repaired if the city determines the need to bring all the surfacing to the same level. The post / backboards /hoops are in relatively good condition.

Recommendations

During the public outreach / comment phase, a strong demand for pickleball courts was expressed without reducing basketball play area. Hardcourt play to be reconfigured to meet the expanding recreational programming needs.

MULTI-USE AREAS

An existing raised former horseshoe pit area adjacent to the community center will required repurposing and is master planned as open area for yoga, Tai Chi, Zumba or other programmed activities. Alternatively, this area could be converted to exercise stations. The city will seek public input to determine eventual use. Additionally, this area could receive a similar shade structure to compliment the new group picnic structure. An adjacent open turf area outside of the ball field play, may also be explored for potential active use.

WQMP REQUIREMENTS

Pending the outcome of the final master plan document, a Non-Priority Determination study will address the impact of additional impervious vs pervious pavement replacement or additions. This will likely require removals and replacement surfacing around the main ball diamond / bleacher area to be constructed with pervious pavers or concrete. Additionally, a significant portion of the arrival court and ballfield viewing area adjacent to the recreational building be converted to pervious surfacing to remain under the 5,000 s.f. non-priority threshold. Other BMP's being explored will be to provide a rain garden on the south side of the recreation building fed from downspouts and adjacent hardscape to retain stormwater run-off.

ELECTRICAL SYSTEM

- Main Electrical Service: The existing service is fed overhead from Normandie Ave. and drops down into a 277/480V 600A Electrical service. The service itself is aged but appears to be in good working condition and has 10-15 years of useful life left. From this service, there are (2) distribution sections that serve the park. One is located adjacent to the basketball courts and one is located on the west side of baseball diamond off of Brighton Ave. Both of these distributions appear to be original to the park and are well past their useful life. Both are in need of replacement. Being that they are outdoors, typical anticipated life cycle is approx. 25 years. The following is description of what each distribution feeds.

- Basketball Court Distribution – Distribution consists of a 225A 480V Panel, 75kVA transformer and 225A 120/208V Panel. Distribution also provides power to Baseball Distribution Panel. This distribution feeds the park area lighting around the basketball courts, RR Building and Community Building.

- Baseball Distribution – Distribution consists of a 75kVA transformer and 225A 120/208V Panel. This switchgear feeds the lighting associated with the baseball fields.

- Building: The building is currently fed by a single panel located in the maintenance space between the two exterior restroom spaces. The panel is original to the building and was sized to accommodate the anticipated electrical load, which was minimal when it was installed. The building has no HVAC, only gas fired wall heaters and minimal outlets and lights. The panel is currently being fed from a 208V distribution panel located adjacent to the existing basketball courts. Panel should be replaced as it is passed its useful life cycle.

- Park Lighting: Overall the park lighting needs to be improved. Most of the fixtures are aged or damaged. There are some newer LED fixtures that have been installed in some locations but there is no consistency to the fixtures. The general lighting/security lighting should be designed to meet current park design as it has changed from original concept.

- Sports Field Lighting: The existing fixtures are 1000W metal halide with several burned out fixtures. It is understood that replacement only occurs after several fixtures are scheduled for replacement due to significant costs for the rental of a boom truck personnel required for singular replacements The City should consider an LED option not only for energy savings but also reduced cost of maintenance. The existing fixtures typically have a 12,000 - 15,000 lamp hour rating where LED fixtures are anywhere from 70,000 – 100,000 hours. Although the existing poles look to be in reusable condition, it may be more practical to replace the entire pole and luminaire assembly. A photometric study is recommended to determine benefits or constraints with reuse of poles versus replacement with new fixture arrays. We would highly recommend that the City look at a sports lighting

manufacturer like Musco, Sportslite or GE to do the design with an LED option. The City's energy consumption would drop over 45% if the lights are replaced with an LED option and a cloud-based lighting controller to help with scheduling. Additionally, a subscription-based system offers immediate replacement of bulbs.

- The existing message board and park identification sign installed approximately (8) years ago and currently non-operational. Additionally, it is understood the software programming interface is antiquated. Staff would prefer an alternate messaging solution, including the relocation of a new monument / messaging board to the area adjacent to the main ball diamond. Existing street trees may need to be replaced to not obscure the messaging.

RECREATION BUILDING

The following on-site observations were made by Crane Architects for the existing one-story 4,750 s.f. recreation building built in 1960.

- Existing wood structural members have extensive wood rot. This can be seen in the existing exposed beams, fascias, and exposed roof sheathing. Additional wood rot most likely exists in other areas that are covered by other building materials/finishes and the extent of the wood rot cannot be known unless these areas are exposed.

- Mechanical System: The interior of the existing building is hot during the summer and cold during the winter. The existing mechanical system is old and out of service. The existing system was heating only which was typical for this time period. Due to the building construction, there is no insulation in the walls, ceiling or below the roof. Windows are low efficient single pane, which do not comply to current code. Due to all these existing conditions, making the existing building comply with current code will be very challenging and not cost effective. Being that walls are CMU block, they would need to be furred out in order to add insulation. Since there is very little ceiling, this would make insulating the roof very difficult. Since the existing mechanical system was heating only, each room has an individual unit. If the building is to be cooled, there is little to no space to run ductwork. This makes the options to use different types of units out of the equation. Since there might only be one or two options available, the cost cannot be easily controlled.

- Plumbing System: The existing plumbing systems in the public restrooms are non-functional and are currently closed off to public use because they do not work. Existing plumbing fixtures throughout, including toilets, urinals, lavatory, and kitchen sink faucets are old and are not the low water consumption fixtures required by the current building code. If the building is remodeled, state law requires all plumbing fixtures to be replaced with new water efficient fixtures. The plumbing systems in the existing kitchen do not comply with current Plumbing Code or Health Department requires for indirect waste, prep and three-compartment sinks, floor sinks, and other required features. In addition, the existing domestic water and sewer systems are old and outdated and would require extensive repair or full replacement. The current building is not ADA accessible. The entrances to the public restrooms do not comply with required path-of-travel widths and slopes. Toilet stalls, urinals, and lavatories do not comply with minimum ADA or Building Code requirements. Existing door thresholds and door hardware are not accessible and level landings are required at each entrance/exit door. Counter heights, light switch heights, and electrical outlet heights are additional building features that are non-compliant.

- The building is not energy efficient. Inefficient building features include the following:

    - Lighting systems (refer to Item #7 for deficiencies)

    - Window & Door systems: Existing window system are single pane windows with glazing that has minimal efficiency related to U-value and shading coefficient. This has a large impact on the efficiency of lighting and HVAC systems. All windows will need to be replaced with new windows utilizing low 'E' 1" insulated

dual glazed units with a U- value and shading coefficient complying with current Building Code maximums. Existing exterior doors are older hollow core doors with a standard honeycomb core. The current Building Code requires exterior doors to be insulated, usually with rigid foam insulating core.

- Roofing Materials: The existing roofing materials are outdated and contributes significantly to the heat load of the building. New roofing systems are required to be a cool roof system, which reduces the solar heat gain to the building and contributes to efficient HVAC usage. Also refer to comments in Item #6.

- Roof & Wall Insulation (Non-existent): The existing roof structure and exterior walls do not appear to have any insulation. The current code requires conditioned spaces (heated and/or cooled) to have insulated roof and wall systems with a minimum R-value rating as dictated by the current code. Refer to Item #2 for some of the difficulties with insulating the existing roof and wall systems.

- The existing roofing materials are deteriorated, and water is leaking into the structure. This has resulted in the wood rot problems mentioned in Item #1. Remodel work, including the installation of new electrical, mechanical, and plumbing systems, will result in the need for new penetrations in the roof. The existing roof should not be patched or repaired as this will only be a temporary fix. In addition, existing roof sheathing and structural members will be rotted and need to be replaced. A new roof system, complying with the current Building Code as a cool roof (see Item #5c), would need to be installed.

- Electrical Systems: The existing electrical system is original to the building and needs to be replaced. Also, it does not meet current electrical code on disconnecting means requirements for the building. The existing lighting is very old and poor, there are no lighting controls and due to the construction type all outlets are surface mounted which aesthetically are not pleasant. Although lighting is space by space, controls are typically building wide and work together to make the building as energy efficient as possible. Due to the construction of the building this makes adding controls challenging.

Recommendations:

- A renovation of the existing building would require the existing structure as well as electrical, mechanical, and plumbing systems to comply with current 2019 California Building Codes requirements. Upgrading, repairing, or replacing these systems will be challenging when trying to work around an existing structure. In addition, there will also be hidden problems with the existing building that will only come to light once construction starts, which could result in costly change orders to repair or replace these hidden issues.
- Construction of a new building will give the City the opportunity to provide a better functioning building that will better serve the end user. Also, this means the new building will be required to comply with the current 2019 California Building Codes. This would result in a more modern, safer structural system as well as more energy efficient HVAC and electrical systems, and water conserving plumbing systems.
- Walls and roof assemblies, as well as, door and window systems, will also be more energy efficient. Finishes will be environmentally friendly (low VOC) as well. The benefit of all of these items will result in a new building that will cost less to build and operate.
- Based on the information above, remodeling the existing building would not be cost effective. It is our recommendation to replace the existing building with a new structure. It is our opinion that constructing a new building would be the most cost-effective solution.
- Note that whether the City decides to remodel the existing building, or demolish the existing building and replace it with new construction, a demolition permit will be required. As part of that permit, the City will be required to obtain an Asbestos and Lead Survey Report and will be required to remediate/remove all lead-based paint and all materials containing asbestos.
- The current floor plan design development was a multiple iteration process which began with the following requirements generally contained within the existing community center footprint:

- Lobby
- Kitchen
- Large Meeting Room
- (2) Classrooms
- Park Manager Office
- Interior Restrooms serving the both the Community Center and Park Visitors
- Storage
- Changing Room

Iterations involved having the office face the street or into the park, kitchen in the front or towards the rear of the building, classrooms separated by walls or partitioned for flex space, central corridor linking the various functions or maximizing usable meeting space. Community outreach supported adding mirrors, barre rails and resilient flooring for dance programs. The master plan footprint reflects the initial design consensus meeting the programming needs of the community and city staff. However, recent council / community input has focused on providing expanded city-wide teen programs. Consideration to increase the existing building footprint to include the teen space during the final programming phase of the preliminary design.

ROOFING

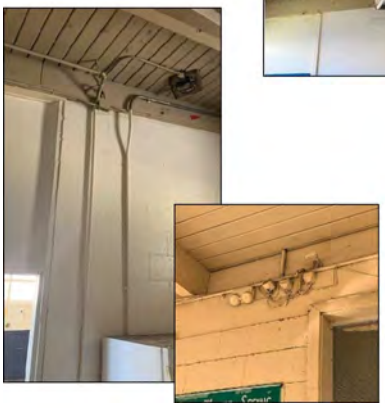
WOOD ROT

WINDOWS

HEATER (ONLY) SYSTEM

LIGHTING SYSTEM

RESTROOMS AT N.E. CORNER



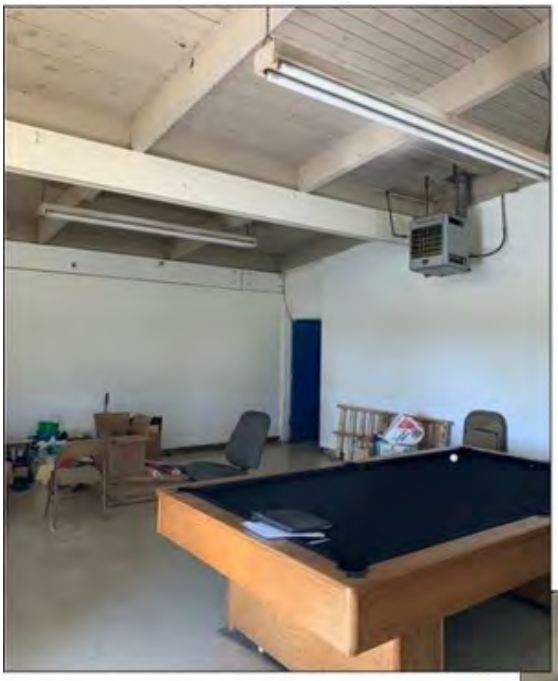
ELECTRICAL SYSTEM

OFFICE AT S.E. CORNER

S.W. CORNER OF BUILDING

S.W. CORNER - BRIGHTON AVENUE

S.W. CORNER - 158TH STREET



GAME ROOM

MEETING ROOM

MULTIPURPOSE ROOM

OFFICE

RESTROOMS

KITCHEN

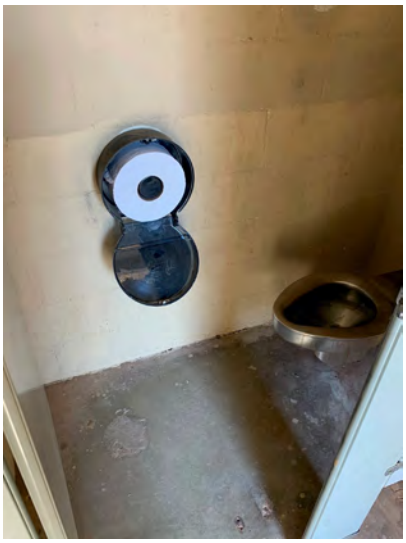
REMOTE RESTROOMS

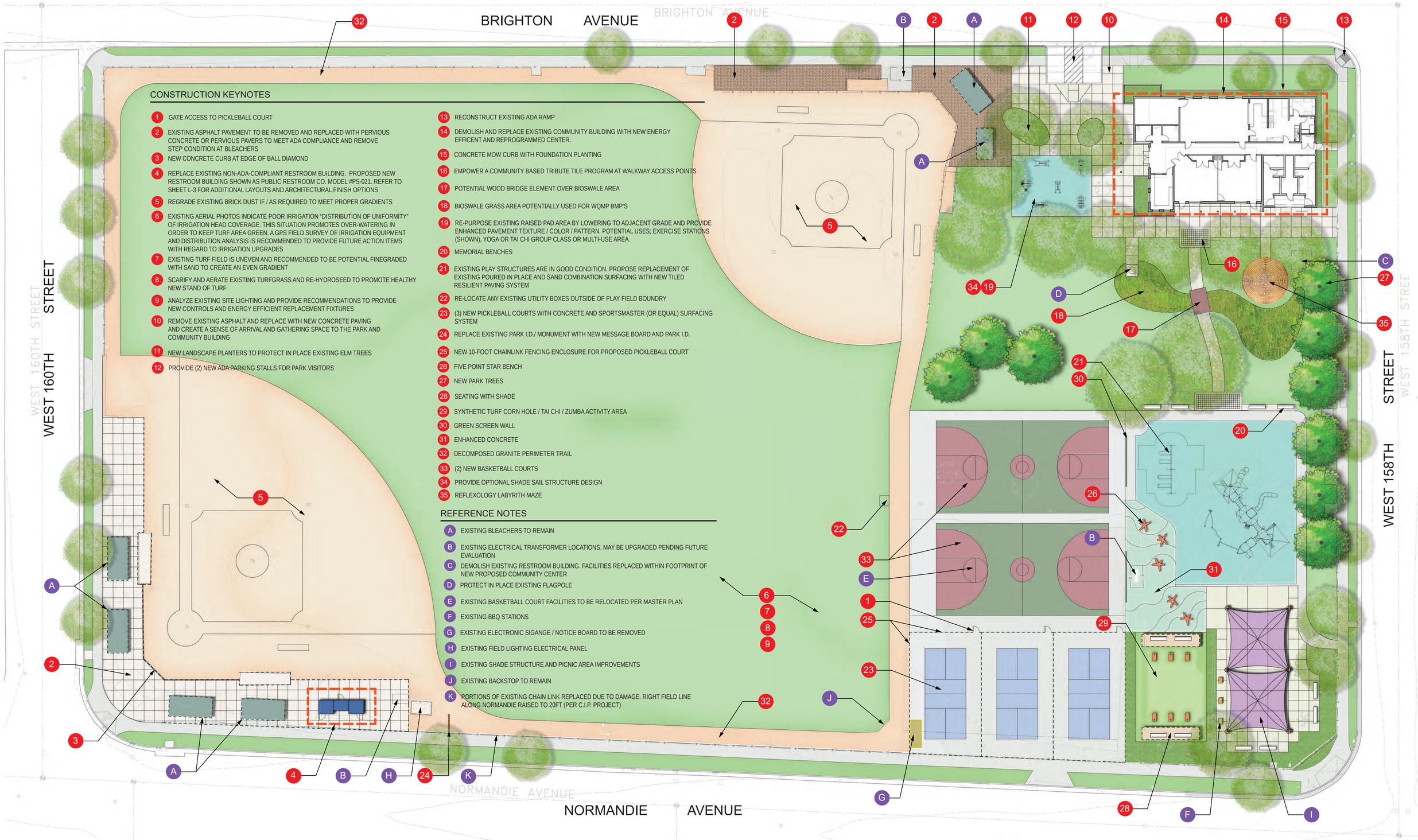
Two existing remote restrooms exist on the site. While there are exterior accessed restrooms available within the existing recreation building, a single-use restroom is available near the tot lot for off-hour visitors. The building restrooms may be locked outside of daytime park manager hours. These restrooms are currently not ADA compliant.

Additionally, a restroom with male/female stalls located next to the main ballfield diamond provides storage use for ballfield equipment. It was built in the 1960's and has reached the end of it's building cycle. The restrooms are not ADA compliant.

Recommendations

- The proposed recreation building would have new outdoor accessible restrooms for park visitors. The single-use restroom would be removed.
- The remote restroom at the main ballfield would be replaced with a prefabricated building with (2) single-use stalls and equipment storage space.





CONSTRUCTION KEYNOTES

1. GATE ACCESS TO PICKLEBALL COURT
2. EXISTING ASPHALT PAVEMENT TO BE REMOVED AND REPLACED WITH PERVIOUS CONCRETE OR PERVIOUS PAVERS TO MEET ADA COMPLIANCE AND REMOVE STEP CONDITION AT BLEACHERS
3. NEW CONCRETE CURB AT EDGE OF BALL DIAMOND
4. REPLACE EXISTING NON-ADA-COMPLIANT RESTROOM BUILDING. PROPOSED NEW RESTROOM BUILDING SHOWN AS PUBLIC RESTROOM CO. MODEL #PS-021. REFER TO SHEET L-3 FOR ADDITIONAL LAYOUTS AND ARCHITECTURAL FINISH OPTIONS
5. REGRADE EXISTING BRICK DUST IF / AS REQUIRED TO MEET PROPER GRADIENTS
6. EXISTING AERIAL PHOTOS INDICATE POOR IRRIGATION "DISTRIBUTION OF UNIFORMITY" OF IRRIGATION HEAD COVERAGE. THIS SITUATION PROMOTES OVER-WATERING IN ORDER TO KEEP TURF AREA GREEN. A GPS FIELD SURVEY OF IRRIGATION EQUIPMENT AND DISTRIBUTION ANALYSIS IS RECOMMENDED TO PROVIDE FUTURE ACTION ITEMS WITH REGARD TO IRRIGATION UPGRADES
7. EXISTING TURF FIELD IS UNEVEN AND RECOMMENDED TO BE POTENTIAL FINEGRADED WITH SAND TO CREATE AN EVEN GRADIENT
8. SCARIFY AND AERATE EXISTING TURFGRASS AND RE-HYDROSEED TO PROMOTE HEALTHY NEW STAND OF TURF
9. ANALYZE EXISTING SITE LIGHTING AND PROVIDE RECOMMENDATIONS TO PROVIDE NEW CONTROLS AND ENERGY EFFICIENT REPLACEMENT FIXTURES
10. REMOVE EXISTING ASPHALT AND REPLACE WITH NEW CONCRETE PAVING AND CREATE A SENSE OF ARRIVAL AND GATHERING SPACE TO THE PARK AND COMMUNITY BUILDING
11. NEW LANDSCAPE PLANTERS TO PROTECT IN PLACE EXISTING ELM TREES
12. PROVIDE (2) NEW ADA PARKING STALLS FOR PARK VISITORS
13. RECONSTRUCT EXISTING ADA RAMP
14. DEMOLISH AND REPLACE EXISTING COMMUNITY BUILDING WITH NEW ENERGY EFFICENT AND REPROGRAMMED CENTER.
15. CONCRETE MOW CURB WITH FOUNDATION PLANTING
16. EMPOWER A COMMUNITY BASED TRIBUTE TILE PROGRAM AT WALKWAY ACCESS POINTS
17. POTENTIAL WOOD BRIDGE ELEMENT OVER BIOSWALE AREA
18. BIOSWALE GRASS AREA POTENTIALLY USED FOR WQMP BMP'S
19. RE-PURPOSE EXISTING RAISED PAD AREA BY LOWERING TO ADJACENT GRADE AND PROVIDE ENHANCED PAVEMENT TEXTURE / COLOR / PATTERN. POTENTIAL USES; EXERCISE STATIONS (SHOWN), YOGA OR TAI CHI GROUP CLASS OR MULTI-USE AREA.
20. MEMORIAL BENCHES
21. EXISTING PLAY STRUCTURES ARE IN GOOD CONDITION. PROPOSE REPLACEMENT OF EXISTING POURED IN PLACE AND SAND COMBINATION SURFACING WITH NEW TILED RESILIENT PAVING SYSTEM
22. RE-LOCATE ANY EXISTING UTILITY BOXES OUTSIDE OF PLAY FIELD BOUNDRY
23. (3) NEW PICKLEBALL COURTS WITH CONCRETE AND SPORTSMASTER (OR EQUAL) SURFACING SYSTEM
24. REPLACE EXISTING PARK I.D./ MONUMENT WITH NEW MESSAGE BOARD AND PARK I.D.
25. NEW 10-FOOT CHAINLINK FENCING ENCLOSURE FOR PROPOSED PICKLEBALL COURT
26. FIVE POINT STAR BENCH
27. NEW PARK TREES
28. SEATING WITH SHADE
29. SYNTHETIC TURF CORN HOLE / TAI CHI / ZUMBA ACTIVITY AREA
30. GREEN SCREEN WALL
31. ENHANCED CONCRETE
32. DECOMPOSED GRANITE PERIMETER TRAIL
33. (2) NEW BASKETBALL COURTS
34. PROVIDE OPTIONAL SHADE SAIL STRUCTURE DESIGN
35. REFLEXOLOGY LABYRITH MAZE

REFERENCE NOTES

- A EXISTING BLEACHERS TO REMAIN
- B EXISTING ELECTRICAL TRANSFORMER LOCATIONS. MAY BE UPGRADED PENDING FUTURE EVALUATION
- C DEMOLISH EXISTING RESTROOM BUILDING. FACILITIES REPLACED WITHIN FOOTPRINT OF NEW PROPOSED COMMUNITY CENTER
- D PROTECT IN PLACE EXISTING FLAGPOLE
- E EXISTING BASKETBALL COURT FACILITIES TO BE RELOCATED PER MASTER PLAN
- F EXISTING BBQ STATIONS
- G EXISTING ELECTRONIC SIGANGE / NOTICE BOARD TO BE REMOVED
- H EXISTING FIELD LIGHTING ELECTRICAL PANEL
- I EXISTING SHADE STRUCTURE AND PICNIC AREA IMPROVEMENTS
- J EXISTING BACKSTOP TO REMAIN
- K PORTIONS OF EXISTING CHAIN LINK REPLACED DUE TO DAMAGE. RIGHT FIELD LINE ALONG NORMANDIE RAISED TO 20FT (PER C.I.P. PROJECT)

CONCEPTUAL LANDSCAPE PLAN

MAS FUKAI PARK RENOVATION MASTER PLAN

CITY OF GARDENA

0 20 40 60 80 feet

SCALE: 1" = 20'

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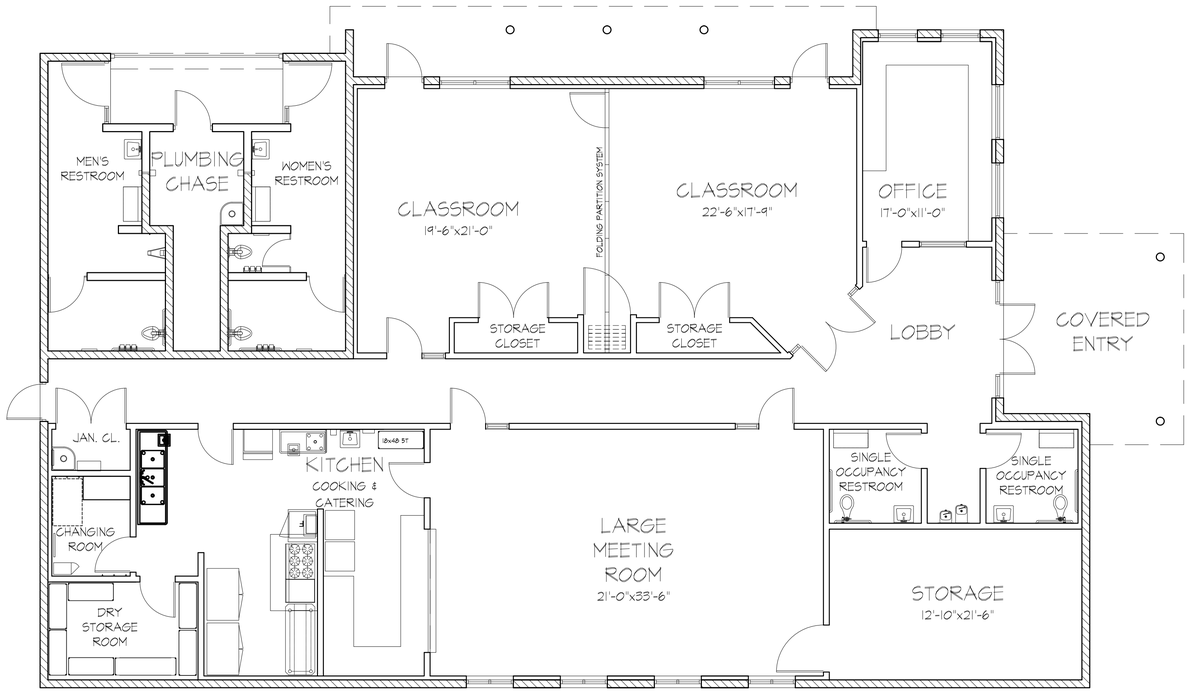
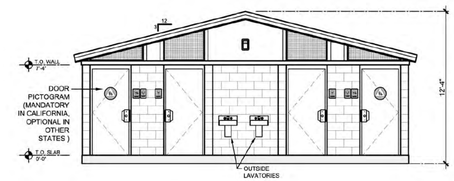
L-1

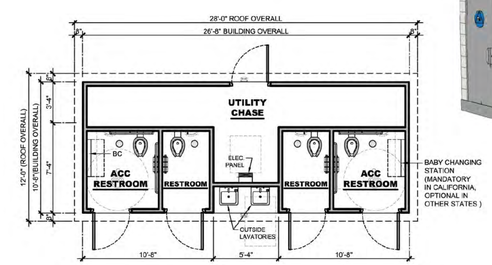
05/27/2022





ELEVATION

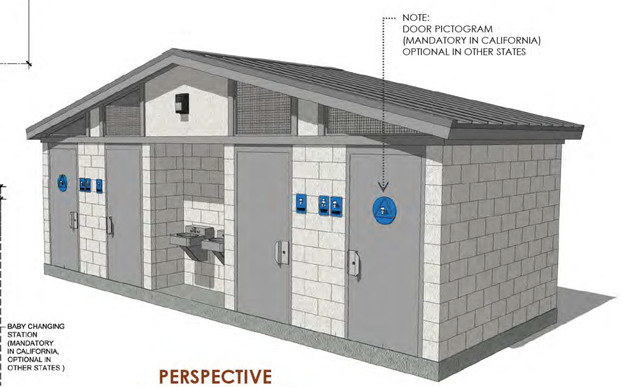
SCALE: 1/8"=1'0"



FLOOR PLAN

SCALE: 1/8"=1'0"

NOTE: STAINLESS FIXTURES



PERSPECTIVE

(FINISHES SUBJECT TO CHANGE)

PLAN FOUR

- LARGE MEETING ROOM AND STORAGE IN FRONT OF BUILDING
- KITCHEN / CATERING IN REAR OF BUILDING
- NO HALLWAY CONNECTING ALL FACILITIES WHICH ALLOWS AN INCREASE OF APPROX. 177 S/F FOR LARGE MEETING ROOM OVER HALLWAY OPTIONS
- PARTITIONED CLASSROOMS WITH SEPARATE STORAGE SPACES. NO DIRECT INTERIOR ACCESS TO REAR CLASSROOM WITHOUT PASSING THROUGH MEETING ROOM
- (2) COMBINED SINGLE OCCUPANCY RESTROOMS OFF FRONT LOBBY

MODEL PS-021

COMMUNITY BUILDING FLOOR PLAN

MAS FUKAI PARK RENOVATION MASTER PLAN

CITY OF GARDENA

0 4 8 12 80 feet

SCALE: 1/4" = 1'-0"

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L-2

03/28/2022

TRIBUTE TILE PROGRAM AT WALKWAY ACCESS

PICKLEBALL COURT WITH CONCRETE AND SPORTSMASTER

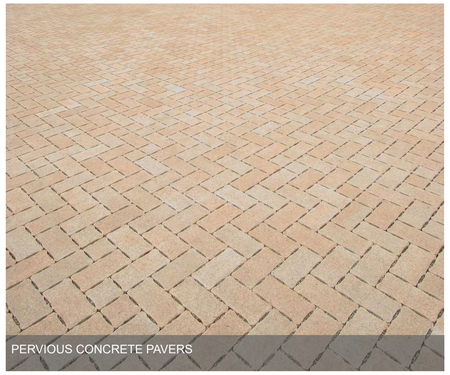
TILED RESILIENT PAVING SYSTEM

WOOD BRIDGE ELEMENT OVER BIOSWALE AREA

FIVE POINT STAR BENCH

EXERCISE STATIONS

EXERCISE STATIONS


PERVIOUS CONCRETE PAVERS

ENHANCED CONCRETE

REFLEXOLOGY LABYRITH MAZE

PRECEDENT IMAGES

MAS FUKAI PARK RENOVATION MASTER PLAN

CITY OF GARDENA

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L-3

03/28/2022

SITE CONSTRUCTION BUDGET ESTIMATE

MAS FUKAI PARK RENOVATION MASTER PLAN

Presented To: CITY OF GARDENA | **Presented By:**

Date: JUNE 6, 2022 | **BGB I DESIGN GROUP**

	Scope Description	Qty	Unit	Unit Costs	Totals - rounded
GENERAL CONDITIONS (SITE AMENTIES)					
1	General Contractor Conditions (5%) & Construction Contingency (7.5%) - includes project management, superintendent, subcontractor supervision, jobsite facilities, survey, testing, construction fencing, vehicular/pedestrian traffic control, trash removal, temporary office, material storage yard, install/remove erosion control systems and security.	1	LS	$ 273,293.75	$ 273,293.75
2	Storm Water Prevention Plan (SWPPP), Best Management Practices (BMPs), QC Monitoring & Removals	1	LS	$ 25,000.00	$ 25,000.00
3	Utility Relocation Tie-Ins To Site Locations (for sewer, water & storm drain)	3	EA	$ 15,000.00	$ 45,000.00
	Subtotal Cost of The Above:				**$ 343,293.75**
DEMOLITION					
4	Grubbing, Clearing and Rough Grading Select Site Areas	1	LS	$ 39,535.00	$ 39,535.00
5	Weed Abatement and Fine Grading	1	LS	$ 11,860.50	$ 11,860.50
6	Demolish Existing Concrete Paving, Asphalt Hardscape & Step Condition - includes haul-off, permits & dump fees (15,814 s.f.)	1	LS	$ 31,628.00	$ 31,628.00
7	Demolish Existing (350 s.f.) Restroom Building - includes haul-off, permits & dump fees	1	LS	$ 12,250.00	$ 12,250.00
8	Demolish Existing Marquee Sign - size of this sign is indeterminable (assumed size 15' l. x 8' h.) includes haul-off, permits & dump fees	1	LS	$ 3,600.00	$ 3,600.00
9	Demolish Existing Field Lighting System - magnitude of this system is immeasureable and the cost is a place holder at best. Assumption of this system includes light pole standards, concrete footings, conduit/witing and control systems. Includes haul-off, permits & dump fees	1	LS	$ 40,000.00	$ 40,000.00
10	Demolish Existing Bleachers - the magnitude of this system is immeasureable, as such, the cost is a place holder	1	LS	$ 4,500.00	$ 4,500.00
	Subtotal Cost of The Above:				**$ 143,373.50**
SITE WORK					
11	Construct Concrete Permeable Pavers with sand subbase	8,291	SF	$ 13.25	$ 109,855.75
12	Construct Enhanced Reinforced Concrete Paving at Recreational Activity Zone - assumed to include 4" thk. with rebar, integral color and exposed aggregate finish	1,780	SF	$ 17.00	$ 30,260.00

	Scope Description	Qty	Unit	Unit Costs	Totals - rounded
13	Construct Reinforced Pervious Concrete Pavement at Exercise Area with no rebar	1,192	SF	$ 12.75	$ 15,198.00
14	Construct Asphalt Paving at ADA Parking Stalls	468	SF	$ 15.00	$ 7,020.00
15	Construct Concrete Curbs & Gutters	100	LF	$ 32.00	$ 3,200.00
16	Construct Reinforced Concrete ADA Ramp at Brighton & 158th St.	1	EA	$ 1,200.00	$ 1,200.00
17	Construct Reinforced Concrete Pickleball & Basketball Courts - 4" thk. with rebar	17,794	SF	$ 9.90	$ 176,160.60
18	Sportscourt Surfacing at concrete slab noted above	17,794	SF	$ 2.50	$ 44,485.00
19	Construct 10' High Vinyl Coated Chainlink Fence & Gates with Concrete Footings	454	LF	$ 78.00	$ 35,412.00
20	Construct 10' High Laser Cut Fencing & Electrical Enclosure with Concrete Footings	40	LF	$ 200.00	$ 8,000.00
21	Construct Resilient Surfacing at Tot Lots	5,616	SF	$ 22.00	$ 123,552.00
22	Construct Synthetic Turf at Multi-Use Areas	1,843	SF	$ 16.10	$ 29,672.30
23	Construct Memorial Tile Area with Reinforced Concrete Subslab	426	SF	$ 24.00	$ 10,224.00
24	Construct Decomposed Granite Perimeter Path with Edge Constriants	7,744	SF	$ 7.25	$ 56,144.00
25	Construct Decomposed Granite Memorial Path with Edge Constriants	354	SF	$ 7.25	$ 2,566.50
26	Renovate Existing Decomposed Granite Infields - the extent of renovation is a guess	31,746	SF	$ 1.50	$ 47,619.00
27	Construct Sail Shade Structure for Exersize Area - Posts & Concrete Footings. Assumed size to be 1,200 s.f. (Optional)	1	LS	$ 36,000.00	$ 36,000.00
28	Construct Prefabricated Bridge @ Bioswale - includes concrete support walls & footings. The estimated dimensions are: 8' wide x 30' long	1	LS	$ 10,000.00	$ 10,000.00
29	Construct Pergola Structure for Activity Area such as Corn-Hole. Estimated dimension is: 30' x 30'	2	EA	$ 15,000.00	$ 30,000.00
30	Construct Reflexology Labryrinth Maze	1	Allow	$ 60,000.00	$ 60,000.00
	Subtotal Cost of The Above:				**$ 836,569.15**
ELECTRICAL					
31	New Sportsfield Lighting System (1 sportsfield)	1	LS	$ 400,000.00	$ 400,000.00
32	Restroom Building Power Supply	1	LS	$ 8,000.00	$ 8,000.00
33	Security/Surveillance System Conduits & Pull Boxes	1	LS	$ 7,500.00	$ 7,500.00
34	Distribution Power Sections	1	LS	$ 125,000.00	$ 125,000.00
35	Lighting Controls	1	LS	$ 8,000.00	$ 8,000.00
36	Site Lighting	1	LS	$ 100,000.00	$ 100,000.00
37	New Marquee Sign @ Normandie & West 158th St.	1	LS	$ 15,000.00	$ 15,000.00
	Subtotal Cost of The Above:				**$ 663,500.00**

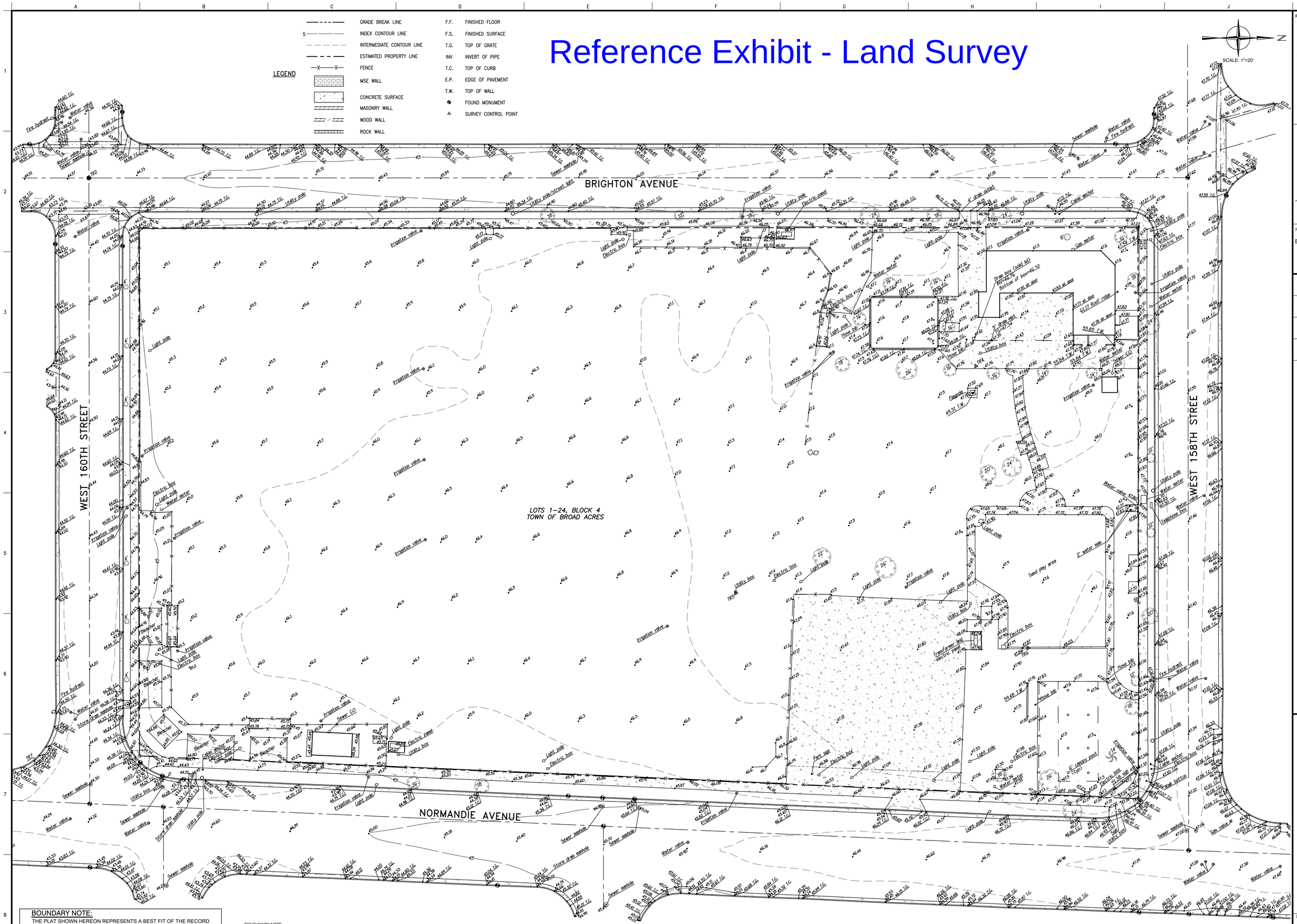
	Scope Description	Qty	Unit	Unit Costs	Totals - rounded
SITE FURNISHINGS					
38	Large Bleachers @ Normandie & West 160th St.	2	EA	$ 15,000.00	$ 30,000.00
39	Small Bleachers @ Brighton Ave.	10	EA	$ 7,000.00	$ 70,000.00
40	Exercise Equipment (Furnish & Install)	6	EA	$ 7,000.00	$ 42,000.00
41	Corn Hole Stations (Sets)	3	EA	$ 500.00	$ 1,500.00
42	Traditional Benches (assume metal) - includes concrete footings	4	EA	$ 1,900.00	$ 7,600.00
43	Memorial Benches (assumes to include brass medalions) - includes concrete footings	4	EA	$ 2,600.00	$ 10,400.00
44	Five Point Star Benches - includes concrete footings	5	EA	$ 3,200.00	$ 16,000.00
45	Trash Receptacles	5	EA	$ 2,150.00	$ 10,750.00
46	Park use Signage - (Posted on fence)	7	EA	$ 750.00	$ 5,250.00
	Subtotal Cost of The Above:				**$ 193,500.00**
IRRIGATION SYSTEMS					
47	Irrigation System Renovation - assumed to include new controller, control valves and gate valves.	103,106	SF	$ 2.50	$ 257,765.00
	Subtotal Cost of The Above:				**$ 257,765.00**
LANDSCAPE					
		103,106	SF		
48	Bioswale Planting - assumed to include hydroseeded planting	1,600	SF	$ 6.00	$ 9,600.00
49	New turf - assumed to be sod	1,564	SF	$ 2.50	$ 3,910.00
50	Miscellaneous landscape - assumed to include 1 gal plants spaced at 12" o.c., 1,268 s.f.	1,268	EA	$ 9.00	$ 11,412.00
51	36" Box Trees	9	EA	$ 900.00	$ 8,100.00
52	Mulch at non-turf planting areas	1,268	SF	$ 0.75	$ 951.00
53	Miscellaneous - protection of existing adjacent materials/finishes, daily cleanup, testing planting area soils for horticultural suitability & amendments, secured tree & shrub storage area, as-built irrigation plans, traffic control during material deliveries, landscape maintenance manuals & implementation of BV's jobsite safety practices	1	LS	$ 15,000.00	$ 15,000.00
	Subtotal Cost of The Above:				**$ 48,973.00**
MAINTENANCE					
54	90 Day Post-Installatiomn Landscape Maintenance (Entire 5 Acre Park)	217,800	SF	$ 0.15	$ 32,670.00
	Subtotal Cost of The Above:				**$ 32,670.00**

Scope Description	Qty	Unit	Unit Costs	Totals - rounded
MISCELLANEOUS				
General Conditions, Profit & Overhead (included above)				
Construction Contingency (included above)				
Design Fees (12%) - Staff Administration, Civil Engineer, Architecture, Landscape Architecture, (NIC)				**$ 296,000.00**
Construction Management & Inspections Fees (12%)				**$ 296,000.00**
Subtotal Cost of The Above:				**$ 592,000.00**
COST OF ALL THE ABOVE (SITE AMENITIES):				**$ 3,111,644.40**

ARCHITECTURAL SITE AMENITIES				
Construct New Community Building *Cost provided by Estimate by Robert Crane (A.I.A.) Architect.* Includes General Conditions, Demolition of Existing, Site Construction (overexcavation & recompaction, and preparation of building pad), bldg. electrical systems (does not include the new main electrical service, meter, transformer, pads and any site electrical demands in the park)	1	LS	$ 2,279,582.00	$ 2,279,582.00
New Community Building *- Contractor Overhead/Profit (8%)*	1	LS	$ 182,330.00	$ 182,330.00
New Community Building - *Includes contingency (20%), Architectural/Engineering Fees, Plan Check Permit Fees, Furnishings (furniture, fixtures & equipment), Construction Management Fees & Inspection Fees*	1	LS	$ 1,186,970.00	$ 1,186,970.00
Construct New Prefab Restroom Building #SP-042 by Public Restroom Company *- Sports Park Series with four single-occupant flush toilets & two exterior sinks. This unisex restroom design includes two ADA code compliant stalls with built-in vandal resistant components.*	1	LS	$ 275,000.00	$ 275,000.00
COST OF ALL THE ABOVE (ARCHITECTURAL SITE AMENITIES) :				**$ 3,923,882.00**

TOTAL PROJECT COST:	**$ 7,035,526**

Reference Exhibit - Land Survey



BOUNDARY NOTE:

THE PLAT SHOWN HEREON REPRESENTS A BEST FIT OF THE RECORD BOUNDARY TO THE FOUND MONUMENTS AND LINES OF OCCUPATION. IT SHALL NOT BE CONSIDERED THE FINAL BOUNDARY, AND A BOUNDARY SURVEY IS RECOMMENDED PRIOR TO DESIGN OR CONSTRUCTION OF IMPROVEMENTS.
CENTERLINE AND PROPERTY LINES SHOWN HEREON ARE PER A MAP OF CENTER STREET, LA COUNTY SURVEYOR'S MAP NO. B-672

BENCHMARK NOTE:
THE BENCHMARK FOR THIS TOPOGRAPHIC SURVEY IS PER A DEMOLITION PLAN PROVIDED TO TOAL BY DMS CONSULTANTS.

EASEMENT NOTE:
THE PLAT FOR THIS SURVEY WAS PREPARED WITHOUT A TITLE REPORT. UNPLOTTED EASEMENTS MAY EXIST ON THE SUBJECT PROPERTY.

PLANS PREPARED BY:
TOAL ENGINEERING, INC.
CIVIL ENGINEERING
LAND SURVEYING
STORMWATER QUALITY
139 Avenida Navarro
San Clemente, CA 92672
949.492.8586
www.toalengineering.com

LICENSED LAND SURVEYOR
VIKTOR P. MEUM
No. 8682
STATE OF CALIFORNIA

VIKTOR P. MEUM
P.L.S. 8682
DATE:

PREPARED FOR:
BGB DESIGN GROUP

REVISIONS	BY	DATE	APVD.	DATE

TOPOGRAPHIC SURVEY

LOTS 1-24, BLOCK 4, TOWN OF BROAD ACRES, APN 6105-014-900
15800 BRIGHTON AVENUE, GARDENA, CALIFORNIA

DATE: 4-16-20	H. SCALE: 1"=20'
SURVEY DATE: 3-24-20	V. SCALE: -
DRN.: MSF	DWG. NO.
CHD.: -	TP-01
APPD.: VM	
JOB NO. 20049	SHEET 1 OF 1

4/16/2020 9:02:28 AM N:\20dwn\20049\Drawings\Survey\Topo\20049-tp-01.dwg

Reference Exhibit - Outreach Survey

SURVEY RESULTS FROM COMMUNITY WORKSHOP HELD AT MAS FUKAI PARK November 20, 2021	Softball/Baseball	Picnicking	Basketball`	Tot Lot	Jogging / Walking Trail	Comm. Bldg Activities	Pickleball	Group Activities	Excercize Stations	Walk	Bike	Drive	Bus Or Facilitated Transport	One Block	A couple of Blocks	1/4 Mile	1/2 Mile	I like to Drive	Tot Lot Safety	Basketball Equipment	Area Lighting	Field Lighting	Grass Field Quality	Infield Quality	Bathrooms	Community Building	Lack of Facilities	Accessibility
Do you actively use Mas Fukai Park for any activities?	1	3	3	4	5	3	1																						
What activities not currently available would you like to see?								5	5																				
How did you get to the park?										6	2	5						2											
How far do you live from the park?														3	1		4												
What most concerns you about the park?																			4		3	1	1		7	4	1	2

Other Comments:

No Sand (2)
More Playground
Splash Pad (2)
Flower Garden
Tennis
More shade (3)
Fence between basketball & tot lot
Monthly family cleanup day
Board Games
Solar for bldg
Badmitton overlay for Pickleball (2)
Security (2)
Church Picnics / Activities
Senior Activities
Inside Bldg: Cheerlead/Salsa/Ballet / Children Dance /Resilient flooring / Mirror (2)
Kitchen

MAS FUKAI MASTER PLAN

PUBLIC INPUT QUESTIONS

1. **DO YOU ACTIVELY USE MAS FUKAI PARK FOR ANY ACTIVITIES? YES OR NO. IF YES, CHECK WHICH ONES.**
   A. SOFTBALL / BASEBALL
   B. PICNICKING
   C. BASKETBALL
   D. TOT LOT
   E. JOGGING
   F. COMMUNITY BUILDING ACTIVITIES
2. **WHAT ACTIVITIES NOT CURRENTLY AVAILABLE AT THE PARK WOULD YOU LIKE TO SEE?**
   A. PICKLEBALL
   B. GROUP AREA DESIGNATED FOR YOGA / TAI CHI / ZUMBA / ETC.
   C. EXERCISE STATIONS
   D. OTHER _____
3. **HOW DO YOU GET TO THE PARK?**
   A. WALK
   B. BIKE
   C. CAR
   D. BUS OR FACILITATED TRANSPORTATION
4. **HOW FAR DO YOU LIVE FROM THE PARK?**
   A. ONE BLOCK
   B. A COUPLE OF BLOCKS
   C. ¼ MILE
   D. ½ MILE
   E. I LIKE THE DRIVE
5. **WHAT MOST CONCERNS YOU ABOUT THE CURRENT PARK? 1=HIGHEST…10=LOWEST**
   A. TOT LOT SAFETY
   B. BASKETBALL EQUIPMENT
   C. AREA LIGHTING
   D. FIELD LIGHTING
   E. GRASS FIELD QUALITY
   F. INFIELD QUALITY
   G. BATHROOM(S)
   H. COMMUNITY BUILDING
   I. LACK OF ACTIVITIES
   J. ACCESSIBILITY

MAS FUKAI MASTER PLAN

PUBLIC INPUT QUESTIONS

1. **DO YOU ACTIVELY USE MAS FUKAI PARK FOR ANY ACTIVITIES? YES OR NO. IF YES, CHECK WHICH ONES.**
   A. SOFTBALL / BASEBALL
   B. PICNICKING
   C. BASKETBALL
   D. TOT LOT
   E. JOGGING
   F. COMMUNITY BUILDING ACTIVITIES
2. **WHAT ACTIVITIES NOT CURRENTLY AVAILABLE AT THE PARK WOULD YOU LIKE TO SEE?**
   A. PICKLEBALL
   B. GROUP AREA DESIGNATED FOR YOGA / TAI CHI / ZUMBA / ETC.
   C. EXERCISE STATIONS
   D. OTHER _____
3. **HOW DO YOU GET TO THE PARK?**
   A. WALK
   B. BIKE
   C. CAR
   D. BUS OR FACILITATED TRANSPORTATION
4. **HOW FAR DO YOU LIVE FROM THE PARK?**
   A. ONE BLOCK
   B. A COUPLE OF BLOCKS
   C. ¼ MILE
   D. ½ MILE
   E. I LIKE THE DRIVE
5. **WHAT MOST CONCERNS YOU ABOUT THE CURRENT PARK? 1=HIGHEST…10=LOWEST**
   A. TOT LOT SAFETY
   B. BASKETBALL EQUIPMENT
   C. AREA LIGHTING
   D. FIELD LIGHTING
   E. GRASS FIELD QUALITY
   F. INFIELD QUALITY
   G. BATHROOM(S)
   H. COMMUNITY BUILDING
   I. LACK OF ACTIVITIES
   J. ACCESSIBILITY

No Sand

MAS FUKAI MASTER PLAN

PUBLIC INPUT QUESTIONS

1. **DO YOU ACTIVELY USE MAS FUKAI PARK FOR ANY ACTIVITIES? YES OR NO. IF YES, CHECK WHICH ONES.**
   - A. SOFTBALL / BASEBALL
   - (B.) PICNICKING
   - (C.) BASKETBALL
   - (D) TOT LOT
   - (E) JOGGING
   - F. COMMUNITY BUILDING ACTIVITIES
2. **WHAT ACTIVITIES NOT CURRENTLY AVAILABLE AT THE PARK WOULD YOU LIKE TO SEE?**
   - A. PICKLEBALL
   - (B) GROUP AREA DESIGNATED FOR YOGA / TAI CHI / ZUMBA / ETC.
   - C. EXERCISE STATIONS
   - D. OTHER Tennis, ~~4~~, more playground, splash patch, flower garden
3. **HOW DO YOU GET TO THE PARK?**
   - (A) WALK
   - (B.) BIKE
   - C. CAR
   - D. BUS OR FACILITATED TRANSPORTATION
4. **HOW FAR DO YOU LIVE FROM THE PARK?**
   - (A.) ONE BLOCK
   - B. A COUPLE OF BLOCKS
   - C. ¼ MILE
   - D. ½ MILE
   - E. I LIKE THE DRIVE
5. **WHAT MOST CONCERNS YOU ABOUT THE CURRENT PARK? 1=HIGHEST…10=LOWEST**
   - A. TOT LOT SAFETY } Need fences between basketball court and playground
   - B. BASKETBALL EQUIPMENT
   - C. AREA LIGHTING
   - D. FIELD LIGHTING
   - E. GRASS FIELD QUALITY
   - F. INFIELD QUALITY
   - G. BATHROOM(S)
   - H. COMMUNITY BUILDING
   - I. LACK OF ACTIVITIES – parents and kids would love to ~~do~~ join monthly clean up event or something for playground.
   - J. ACCESSIBILITY –

· No sand would be better
· more shades would be better

We come here maybe 2-4 times a week.
We love this park and Gardena City.
We would love to keep this place clean and fun!
Let's do it!

MAS FUKAI MASTER PLAN

PUBLIC INPUT QUESTIONS

1. **DO YOU ACTIVELY USE MAS FUKAI PARK FOR ANY ACTIVITIES? YES OR NO. IF YES, CHECK WHICH ONES.**
   A. SOFTBALL / BASEBALL
   B. PICNICKING
   C. BASKETBALL
   D. TOT LOT
   E. JOGGING / walking around the park.
   F. COMMUNITY BUILDING ACTIVITIES
2. **WHAT ACTIVITIES NOT CURRENTLY AVAILABLE AT THE PARK WOULD YOU LIKE TO SEE?**
   A. PICKLEBALL
   B. GROUP AREA DESIGNATED FOR YOGA / TAI CHI / ZUMBA / ETC. / Qigong
   C. EXERCISE STATIONS for stretching
   D. OTHER Chess + other board games.
3. **HOW DO YOU GET TO THE PARK?**
   A. WALK
   B. BIKE
   C. CAR
   D. BUS OR FACILITATED TRANSPORTATION
4. **HOW FAR DO YOU LIVE FROM THE PARK?**
   A. ONE BLOCK
   B. A COUPLE OF BLOCKS
   C. ¼ MILE
   D. ½ MILE
   E. I LIKE THE DRIVE
5. **WHAT MOST CONCERNS YOU ABOUT THE CURRENT PARK? 1=HIGHEST…10=LOWEST**
   A. TOT LOT SAFETY
   B. BASKETBALL EQUIPMENT
   C. AREA LIGHTING
   D. FIELD LIGHTING
   E. GRASS FIELD QUALITY
   F. INFIELD QUALITY
   G. BATHROOM(S) - availability & access
   H. COMMUNITY BUILDING
   I. LACK OF ACTIVITIES
   J. ACCESSIBILITY

6. Would the building be solar powered?
7. Is there a website to follow the progress of the project?

(cont next page)

MAS FUKAI MASTER PLAN

PUBLIC INPUT QUESTIONS

1. **DO YOU ACTIVELY USE MAS FUKAI PARK FOR ANY ACTIVITIES? YES OR NO. IF YES, CHECK WHICH ONES.**
   A. SOFTBALL / BASEBALL
   B. PICNICKING
   C. BASKETBALL
   D. TOT LOT
   E. JOGGING
   F. COMMUNITY BUILDING ACTIVITIES
2. **WHAT ACTIVITIES NOT CURRENTLY AVAILABLE AT THE PARK WOULD YOU LIKE TO SEE?**
   A. PICKLEBALL ? NEVER HEARD
   B. GROUP AREA DESIGNATED FOR YOGA / TAI CHI / ZUMBA / ETC. ✓
   C. EXERCISE STATIONS
   D. OTHER BADMINTON, WALK/JOG PATH
3. **HOW DO YOU GET TO THE PARK?**
   A. WALK
   B. BIKE
   C. CAR
   D. BUS OR FACILITATED TRANSPORTATION
4. **HOW FAR DO YOU LIVE FROM THE PARK?**
   A. ONE BLOCK
   B. A COUPLE OF BLOCKS
   C. ¼ MILE
   D. ½ MILE
   E. I LIKE THE DRIVE
5. **WHAT MOST CONCERNS YOU ABOUT THE CURRENT PARK? 1=HIGHEST…10=LOWEST**
   A. TOT LOT SAFETY (1) - PLEASE ENSURE SECURITY IN WINDOW IN BUILDING
   B. BASKETBALL EQUIPMENT
   C. AREA LIGHTING (1) - NIGHT TIME FEELS UNSAFE
   D. FIELD LIGHTING
   E. GRASS FIELD QUALITY
   F. INFIELD QUALITY
   G. BATHROOM(S) (1) - FAMILY BATHROOM WOULD BE NICE
   H. COMMUNITY BUILDING (1) - CHURCH PICNICS/ACTIVITIES
   I. LACK OF ACTIVITIES
   J. ACCESSIBILITY
   K. BETTER SHADING FOR PARENTS WATCHING THEIR KIDS

MAS FUKAI MASTER PLAN

PUBLIC INPUT QUESTIONS

1. **DO YOU ACTIVELY USE MAS FUKAI PARK FOR ANY ACTIVITIES? YES OR NO. IF YES, CHECK WHICH ONES.**
   A. SOFTBALL / BASEBALL
   B. PICNICKING
   C. BASKETBALL
   D. TOT LOT
   E. JOGGING
   F. COMMUNITY BUILDING ACTIVITIES
2. **WHAT ACTIVITIES NOT CURRENTLY AVAILABLE AT THE PARK WOULD YOU LIKE TO SEE?**
   A. PICKLEBALL
   B. GROUP AREA DESIGNATED FOR YOGA / TAI CHI / ZUMBA / ETC.
   C. EXERCISE STATIONS
   D. OTHER walking trail
3. **HOW DO YOU GET TO THE PARK?**
   A. WALK
   B. BIKE
   C. CAR
   D. BUS OR FACILITATED TRANSPORTATION
4. **HOW FAR DO YOU LIVE FROM THE PARK?**
   A. ONE BLOCK
   B. A COUPLE OF BLOCKS
   C. ¼ MILE
   D. ½ MILE
   E. I LIKE THE DRIVE
5. **WHAT MOST CONCERNS YOU ABOUT THE CURRENT PARK? 1=HIGHEST…10=LOWEST**
   A. TOT LOT SAFETY
   B. BASKETBALL EQUIPMENT
   C. AREA LIGHTING 3
   D. FIELD LIGHTING
   E. GRASS FIELD QUALITY
   F. INFIELD QUALITY
   G. BATHROOM(S) 4
   H. COMMUNITY BUILDING 2
   I. LACK OF ACTIVITIES 1
   J. ACCESSIBILITY

We could use more. Senior activities

MAS FUKAI MASTER PLAN

PUBLIC INPUT QUESTIONS

1. **DO YOU ACTIVELY USE MAS FUKAI PARK FOR ANY ACTIVITIES? YES OR NO. IF YES, CHECK WHICH ONES.**
   A. SOFTBALL / BASEBALL
   B. PICNICKING
   C. BASKETBALL
   D. TOT LOT
   E. JOGGING
   F. COMMUNITY BUILDING ACTIVITIES

   NONE WALK

2. **WHAT ACTIVITIES NOT CURRENTLY AVAILABLE AT THE PARK WOULD YOU LIKE TO SEE?**
   A. PICKLEBALL
   B. GROUP AREA DESIGNATED FOR YOGA / TAI CHI / ZUMBA / ETC.
   C. EXERCISE STATIONS
   D. OTHER _____

3. **HOW DO YOU GET TO THE PARK?**
   A. WALK
   B. BIKE
   C. CAR
   D. BUS OR FACILITATED TRANSPORTATION

4. **HOW FAR DO YOU LIVE FROM THE PARK?**
   A. ONE BLOCK
   B. A COUPLE OF BLOCKS
   C. ¼ MILE
   D. ½ MILE
   E. I LIKE THE DRIVE

5. **WHAT MOST CONCERNS YOU ABOUT THE CURRENT PARK? 1=HIGHEST…10=LOWEST**
   A. TOT LOT SAFETY
   B. BASKETBALL EQUIPMENT
   C. AREA LIGHTING
   D. FIELD LIGHTING
   E. GRASS FIELD QUALITY
   F. INFIELD QUALITY
   G. BATHROOM(S)
   H. COMMUNITY BUILDING
   I. LACK OF ACTIVITIES
   J. ACCESSIBILITY

   - wheelchair (mobility) ACCESS VERY imp + inclusive

   - security system - cams

MAS FUKAI MASTER PLAN

PUBLIC INPUT QUESTIONS

1. **DO YOU ACTIVELY USE MAS FUKAI PARK FOR ANY ACTIVITIES? YES OR NO. IF YES, CHECK WHICH ONES.**
   - A. SOFTBALL / BASEBALL Most Popular
   - B. PICNICKING Most Popular
   - C. BASKETBALL – Most Popular
   - D. TOT LOT – Most Popular
   - E. JOGGING – YES
   - F. COMMUNITY BUILDING ACTIVITIES very Popular
2. **WHAT ACTIVITIES NOT CURRENTLY AVAILABLE AT THE PARK WOULD YOU LIKE TO SEE?**
   - A. PICKLEBALL
   - B. GROUP AREA DESIGNATED FOR YOGA / TAI CHI / ZUMBA / ETC. Cheerleading (tumbling)
   - C. EXERCISE STATIONS
   - D. OTHER _____
   - · Salsa Dance
3. **HOW DO YOU GET TO THE PARK?**
   - A. WALK
   - B. BIKE
   - C. CAR
   - D. BUS OR FACILITATED TRANSPORTATION

   Note: · Dance - We can bring in portable bars for ballet
4. **HOW FAR DO YOU LIVE FROM THE PARK?**
   - A. ONE BLOCK
   - B. A COUPLE OF BLOCKS
   - C. ¼ MILE
   - D. ½ MILE
   - E. I LIKE THE DRIVE
5. **WHAT MOST CONCERNS YOU ABOUT THE CURRENT PARK? 1=HIGHEST…10=LOWEST**
   - A. TOT LOT SAFETY
   - B. BASKETBALL EQUIPMENT
   - C. AREA LIGHTING
   - D. FIELD LIGHTING
   - ✓ E. GRASS FIELD QUALITY
   - F. INFIELD QUALITY
   - G. BATHROOM(S)
   - ✓ H. COMMUNITY BUILDING
   - I. LACK OF ACTIVITIES
   - J. ACCESSIBILITY
   - ✓ K. Bathrooms
   - ✓ L. kitchen

   children's Dance Classes

Hello I am Ms Tammy Kemp. I use the park regularly for dance, cheer and modeling.
- Adult
- Children's

Interested in the community building for dance classes. A floating floor to protect the dancers knees and feet. A mirror would be ideal for instruction. We support your efforts to renovate Mas Fukai Park.

Tel: 877 DAN-NCE1
Email: onyourtoesstudios@gmail.com
Ms Tammy Kemp
Dance Director

MAS FUKAI MASTER PLAN

PUBLIC INPUT QUESTIONS

1. **DO YOU ACTIVELY USE MAS FUKAI PARK FOR ANY ACTIVITIES? YES OR NO. IF YES, CHECK WHICH ONES.**
   A. SOFTBALL / BASEBALL
   B. PICNICKING
   C. BASKETBALL
   D. TOT LOT
   E. JOGGING
   F. COMMUNITY BUILDING ACTIVITIES
2. **WHAT ACTIVITIES NOT CURRENTLY AVAILABLE AT THE PARK WOULD YOU LIKE TO SEE?**
   A. PICKLEBALL
   B. GROUP AREA DESIGNATED FOR YOGA / TAI CHI / ZUMBA / ETC.
   C. EXERCISE STATIONS
   D. OTHER _____
3. **HOW DO YOU GET TO THE PARK?**
   A. WALK
   B. BIKE
   C. CAR
   D. BUS OR FACILITATED TRANSPORTATION
4. **HOW FAR DO YOU LIVE FROM THE PARK?**
   A. ONE BLOCK
   B. A COUPLE OF BLOCKS
   C. ¼ MILE
   D. ½ MILE
   E. I LIKE THE DRIVE
5. **WHAT MOST CONCERNS YOU ABOUT THE CURRENT PARK? 1=HIGHEST…10=LOWEST**
   A. TOT LOT SAFETY
   B. BASKETBALL EQUIPMENT
   C. AREA LIGHTING
   D. FIELD LIGHTING
   E. GRASS FIELD QUALITY
   F. INFIELD QUALITY
   G. BATHROOM(S)
   H. COMMUNITY BUILDING
   I. LACK OF ACTIVITIES
   J. ACCESSIBILITY

Ballet class needs mirrows on the wall bars to hold on while they learn ballet moves & a nice children love that class can't wait to come back

MAS FUKAI MASTER PLAN

PUBLIC INPUT QUESTIONS

1. **DO YOU ACTIVELY USE MAS FUKAI PARK FOR ANY ACTIVITIES? YES OR NO. IF YES, CHECK WHICH ONES.**
   A. SOFTBALL / BASEBALL
   B. PICNICKING
   C. BASKETBALL
   D. TOT LOT
   E. JOGGING
   F. COMMUNITY BUILDING ACTIVITIES
2. **WHAT ACTIVITIES NOT CURRENTLY AVAILABLE AT THE PARK WOULD YOU LIKE TO SEE?**
   A. PICKLEBALL
   B. GROUP AREA DESIGNATED FOR YOGA / TAI CHI / ZUMBA / ETC.
   C. EXERCISE STATIONS
   D. OTHER _____
3. **HOW DO YOU GET TO THE PARK?**
   A. WALK
   B. BIKE
   C. CAR
   D. BUS OR FACILITATED TRANSPORTATION
4. **HOW FAR DO YOU LIVE FROM THE PARK?**
   A. ONE BLOCK
   B. A COUPLE OF BLOCKS
   C. ¼ MILE
   D. ½ MILE
   E. I LIKE THE DRIVE
5. **WHAT MOST CONCERNS YOU ABOUT THE CURRENT PARK? 1=HIGHEST…10=LOWEST**
   A. TOT LOT SAFETY
   B. BASKETBALL EQUIPMENT
   C. AREA LIGHTING
   D. FIELD LIGHTING
   E. GRASS FIELD QUALITY
   F. INFIELD QUALITY
   G. BATHROOM(S)
   H. COMMUNITY BUILDING
   I. LACK OF ACTIVITIES
   J. ACCESSIBILITY

- We need some shade in play area.
- Clean toilet for adult and kids.
- Small splash.

MAS FUKAI MASTER PLAN

PUBLIC INPUT QUESTIONS

1. **DO YOU ACTIVELY USE MAS FUKAI PARK FOR ANY ACTIVITIES? YES OR NO. IF YES, CHECK WHICH ONES.**
   A. SOFTBALL / BASEBALL
   B. PICNICKING
   C. BASKETBALL
   D. TOT LOT
   E. JOGGING
   F. COMMUNITY BUILDING ACTIVITIES
2. **WHAT ACTIVITIES NOT CURRENTLY AVAILABLE AT THE PARK WOULD YOU LIKE TO SEE?**
   A. PICKLEBALL
   B. GROUP AREA DESIGNATED FOR YOGA / TAI CHI / ZUMBA / ETC.
   C. EXERCISE STATIONS
   D. OTHER _____
3. **HOW DO YOU GET TO THE PARK?**
   A. WALK
   B. BIKE
   C. CAR
   D. BUS OR FACILITATED TRANSPORTATION
4. **HOW FAR DO YOU LIVE FROM THE PARK?**
   A. ONE BLOCK
   B. A COUPLE OF BLOCKS
   C. ¼ MILE
   D. ½ MILE
   E. I LIKE THE DRIVE
5. **WHAT MOST CONCERNS YOU ABOUT THE CURRENT PARK? 1=HIGHEST…10=LOWEST**
   A. TOT LOT SAFETY
   B. BASKETBALL EQUIPMENT
   C. AREA LIGHTING
   D. FIELD LIGHTING
   E. GRASS FIELD QUALITY
   F. INFIELD QUALITY
   G. BATHROOM(S)
   H. COMMUNITY BUILDING
   I. LACK OF ACTIVITIES
   J. ACCESSIBILITY

BADMITTON OVERLAY

MOVE (3) PICKLEBALL COURTS TOWARDS BALL DIAMOND. REMOVE (2) TREES & KEEP (2) B-BALL COURTS

8. Is it possible to widen the pavements around the park? I walk around the park dailyevery morning for years and noticed there are many walkers doing the same thing. As such wider pavements would enhanced the experience of walking around the park.

9. Can the proposed prickle ball court be doubled as a badminton court. Badminton is very popular @ Lee Arthur Johnson park.

#1

COMPLETE

Collector:	Web Link 1 (Web Link)
Started:	Monday, November 22, 2021 7:11:48 PM
Last Modified:	Monday, November 22, 2021 7:13:07 PM
Time Spent:	00:01:18
IP Address:	64.201.101.66

Page 1

Q1

Do you actively use Mas Fukai Park for any activities? If Yes, check which ones.

Jogging/Exercise

Q2

What activities not currently available at the park would you like to see?

Other (please specify):

Walking trail

Q3

How do you get to the park?

Walk

Q4

How far do you live from the park?

1/4 Mile

Q5

What most concerns you about the park in its current conditions?

Tot Lot Safety	**4**
Basketball Equipment	**3**
Area Lighting	**6**
Field Lighting	**7**
Grass/Field Quality	**8**
Infield Quality	**9**
Public Restrooms	**5**
Community Building	**1**
Lack of Activities	**N/A**
Accessibility	**2**

Q6

Is there any additional information that you would like us to know about suggested improvements to Mas Fukai Park?

Respondent skipped this question

Q7

Please provide contact information for updates about the project.

Respondent skipped this question

#2

COMPLETE

Collector:	Web Link 1 (Web Link)
Started:	Monday, November 22, 2021 7:24:35 PM
Last Modified:	Monday, November 22, 2021 7:27:18 PM
Time Spent:	00:02:42
IP Address:	23.243.155.215

Page 1

Q1

Do you actively use Mas Fukai Park for any activities? If Yes, check which ones.

Community Building Activities

Q2

What activities not currently available at the park would you like to see?

Pickleball

Q3

How do you get to the park?

Walk,

Bike

Q4

How far do you live from the park?

1/2 Mile

Q5

What most concerns you about the park in its current conditions?

Tot Lot Safety	**N/A**
Basketball Equipment	**N/A**
Area Lighting	**N/A**
Field Lighting	**N/A**
Grass/Field Quality	**N/A**
Infield Quality	**N/A**
Public Restrooms	**N/A**
Community Building	**N/A**
Lack of Activities	**1**
Accessibility	**N/A**

Q6

Is there any additional information that you would like us to know about suggested improvements to Mas Fukai Park?

Pickleball is the fastest growing sport in America. It will bring a lot of people to Gardena to spend $$ at restaurants etc.

Q7

Please provide contact information for updates about the project.

Name	**Tish McCauley**
ZIP/Postal Code	**90247**
Email Address	**tishmccauley@gmail.com**
Phone Number	**3107101797**

#3

COMPLETE

Collector:	Web Link 1 (Web Link)
Started:	Monday, November 22, 2021 7:44:17 PM
Last Modified:	Monday, November 22, 2021 7:48:02 PM
Time Spent:	00:03:44
IP Address:	23.243.155.113

Page 1

Q1

Do you actively use Mas Fukai Park for any activities? If Yes, check which ones.

Picnicking ,

Tot Lot ,

Jogging/Exercise,

Other (please specify):

Ballet and dance classes

Q2

What activities not currently available at the park would you like to see?

Other (please specify):

Dance classes for kids

Q3

How do you get to the park?

Walk,

Car

Q4

How far do you live from the park?

Live in Gardena

Q5

What most concerns you about the park in its current conditions?

Tot Lot Safety	**2**
Basketball Equipment	**10**
Area Lighting	**4**
Field Lighting	**5**
Grass/Field Quality	**6**
Infield Quality	**7**
Public Restrooms	**3**
Community Building	**8**
Lack of Activities	**1**
Accessibility	**9**

Q6

Is there any additional information that you would like us to know about suggested improvements to Mas Fukai Park?

Please return back ballet and dance classes

Q7

Please provide contact information for updates about the project.

Name	**Carla**
ZIP/Postal Code	**90247**
Email Address	**karla16aa@yahoo.com**
Phone Number	**3238967485**

#4

COMPLETE

Collector:	Web Link 1 (Web Link)
Started:	Monday, November 22, 2021 9:00:07 PM
Last Modified:	Monday, November 22, 2021 9:08:42 PM
Time Spent:	00:08:35
IP Address:	172.58.25.24

Page 1

Q1

Do you actively use Mas Fukai Park for any activities? If Yes, check which ones.

Jogging/Exercise

Q2

What activities not currently available at the park would you like to see?

Exercise Stations

Q3

How do you get to the park?

Walk

Q4

How far do you live from the park?

1/2 Mile

Q5

What most concerns you about the park in its current conditions?

Basketball Equipment	**N/A**
Area Lighting	**5**
Infield Quality	**N/A**
Public Restrooms	**2**
Community Building	**7**
Lack of Activities	**6**
Accessibility	**8**

Q6

Is there any additional information that you would like us to know about suggested improvements to Mas Fukai Park?

No

Q7

Please provide contact information for updates about the project.

Name	**CLAUDIA SANCHEZ**
ZIP/Postal Code	**90247**
Email Address	**marpatnat.13@gmail.com**
Phone Number	**4247026255**

#5

COMPLETE

Collector:	Web Link 1 (Web Link)
Started:	Monday, November 22, 2021 10:27:56 PM
Last Modified:	Monday, November 22, 2021 10:29:35 PM
Time Spent:	00:01:38
IP Address:	172.58.24.14

Page 1

Q1

Do you actively use Mas Fukai Park for any activities? If Yes, check which ones.

Softball/Baseball ,

Picnicking ,

Jogging/Exercise,

Community Building Activities

Q2

What activities not currently available at the park would you like to see?

Group exercise area for yoga/ tai chi/Zumba,

Exercise Stations,

Other (please specify):

Teen camps for middle / high school kids

Q3

How do you get to the park?

Walk,

Car

Q4

How far do you live from the park?

Live in Gardena

Q5

What most concerns you about the park in its current conditions?

Tot Lot Safety	**6**
Basketball Equipment	**8**
Area Lighting	**1**
Field Lighting	**4**
Grass/Field Quality	**7**
Infield Quality	**9**
Public Restrooms	**2**
Community Building	**5**
Lack of Activities	**10**
Accessibility	**3**

Q6

Is there any additional information that you would like us to know about suggested improvements to Mas Fukai Park?

Respondent skipped this question

Q7

Please provide contact information for updates about the project.

Respondent skipped this question

#6

COMPLETE

Collector: Web Link 1 (Web Link)
Started: Monday, November 22, 2021 10:46:54 PM
Last Modified: Monday, November 22, 2021 10:49:34 PM
Time Spent: 00:02:39
IP Address: 104.11.141.250

Page 1

Q1

Do you actively use Mas Fukai Park for any activities? If Yes, check which ones.

Tot Lot ,

Jogging/Exercise

Q2

What activities not currently available at the park would you like to see?

Group exercise area for yoga/ tai chi/Zumba,

Exercise Stations

Q3

How do you get to the park?

Walk,

Bike,

Car

Q4

How far do you live from the park?

A couple of blocks

Q5

What most concerns you about the park in its current conditions?

Tot Lot Safety	**2**
Basketball Equipment	**1**
Area Lighting	**5**
Field Lighting	**3**
Grass/Field Quality	**7**
Infield Quality	**4**
Public Restrooms	**8**
Community Building	**9**
Lack of Activities	**6**
Accessibility	**10**

Q6

Is there any additional information that you would like us to know about suggested improvements to Mas Fukai Park?

Please contact a exterminator. I went twice in a week and got bit up amid did my daughter playing in the jungle gym

Q7

Please provide contact information for updates about the project.

Name	**Brenda**
ZIP/Postal Code	**90247**
Email Address	**bd33135@gmail.com**
Phone Number	**3237168353**

#7

COMPLETE

Collector:	Web Link 1 (Web Link)
Started:	Monday, November 22, 2021 11:48:47 PM
Last Modified:	Monday, November 22, 2021 11:52:52 PM
Time Spent:	00:04:05
IP Address:	76.89.93.182

Page 1

Q1

Do you actively use Mas Fukai Park for any activities? If Yes, check which ones.

Tot Lot

Q2

What activities not currently available at the park would you like to see?

Exercise Stations,

Other (please specify):

Walking track

Q3

How do you get to the park?

Car

Q4

How far do you live from the park?

1/2 Mile

Q5

What most concerns you about the park in its current conditions?

Tot Lot Safety	**8**
Area Lighting	**6**
Field Lighting	**7**
Infield Quality	**1**
Public Restrooms	**3**
Lack of Activities	**10**
Accessibility	**2**

Q6

Is there any additional information that you would like us to know about suggested improvements to Mas Fukai Park?

Respondent skipped this question

Q7

Please provide contact information for updates about the project.

Name	**Sherelle Diggs**
ZIP/Postal Code	**90247**
Email Address	**sjnbumpass@gmail.com**
Phone Number	**3107227557**

#8

COMPLETE

Collector:	Web Link 1 (Web Link)
Started:	Tuesday, November 23, 2021 6:46:37 AM
Last Modified:	Tuesday, November 23, 2021 6:48:56 AM
Time Spent:	00:02:18
IP Address:	162.233.102.95

Page 1

Q1

Do you actively use Mas Fukai Park for any activities? If Yes, check which ones.

Softball/Baseball

Q2

What activities not currently available at the park would you like to see?

Pickleball

Q3

How do you get to the park?

Walk

Q4

How far do you live from the park?

A couple of blocks

Q5

What most concerns you about the park in its current conditions?

Tot Lot Safety	**1**
Basketball Equipment	**3**
Area Lighting	**6**
Field Lighting	**7**
Grass/Field Quality	**10**
Infield Quality	**9**
Public Restrooms	**8**
Community Building	**5**
Lack of Activities	**4**
Accessibility	**2**

Q6

Is there any additional information that you would like us to know about suggested improvements to Mas Fukai Park?

Respondent skipped this question

Q7

Please provide contact information for updates about the project.

Respondent skipped this question

#9

COMPLETE

Collector: Web Link 1 (Web Link)
Started: Tuesday, November 23, 2021 7:03:05 AM
Last Modified: Tuesday, November 23, 2021 7:06:31 AM
Time Spent: 00:03:25
IP Address: 23.243.147.111

Page 1

Q1

Do you actively use Mas Fukai Park for any activities? If Yes, check which ones.

Other (please specify):

Playground

Q2

What activities not currently available at the park would you like to see?

Respondent skipped this question

Q3

How do you get to the park?

Walk,

Car

Q4

How far do you live from the park?

Live in Gardena

Q5

What most concerns you about the park in its current conditions?

Tot Lot Safety	**2**
Basketball Equipment	**N/A**
Area Lighting	**N/A**
Field Lighting	**N/A**
Grass/Field Quality	**3**
Infield Quality	**N/A**
Public Restrooms	**4**
Community Building	**1**
Lack of Activities	**N/A**
Accessibility	**N/A**

Q6

Is there any additional information that you would like us to know about suggested improvements to Mas Fukai Park?

An enclosure around the playground area would be nice. Little kids are quite tempted by the basketball court.

Q7

Please provide contact information for updates about the project.

Respondent skipped this question

#10

COMPLETE

Collector:	Web Link 1 (Web Link)
Started:	Tuesday, November 23, 2021 11:57:53 AM
Last Modified:	Tuesday, November 23, 2021 12:00:05 PM
Time Spent:	00:02:11
IP Address:	174.193.133.178

Page 1

Q1

Do you actively use Mas Fukai Park for any activities? If Yes, check which ones.

Jogging/Exercise

Q2

What activities not currently available at the park would you like to see?

Group exercise area for yoga/ tai chi/Zumba,

Exercise Stations

Q3

How do you get to the park?

Walk

Q4

How far do you live from the park?

A couple of blocks

Q5

What most concerns you about the park in its current conditions?

Public Restrooms	**1**
Lack of Activities	**2**

Q6

Is there any additional information that you would like us to know about suggested improvements to Mas Fukai Park?

Respondent skipped this question

Q7

Please provide contact information for updates about the project.

Name	**Eric Hayashi**
ZIP/Postal Code	**90247**
Email Address	**scubadivere@gmail.com**
Phone Number	**2134539395**

#11

COMPLETE

Collector:	Web Link 1 (Web Link)
Started:	Tuesday, November 23, 2021 12:26:48 PM
Last Modified:	Tuesday, November 23, 2021 12:30:37 PM
Time Spent:	00:03:49
IP Address:	108.206.65.29

Page 1

Q1

Do you actively use Mas Fukai Park for any activities? If Yes, check which ones.

Other (please specify):

I grew up @ this park. Flag football, YMCA Indian Guide Pow Wows, Basketball, Softball, Carom boards and attending the carnivals there.

Q2

What activities not currently available at the park would you like to see?

Group exercise area for yoga/ tai chi/Zumba,

Exercise Stations

Q3

How do you get to the park?

Walk,

Bike,

Car

Q4

How far do you live from the park?

Live in Gardena

Q5

What most concerns you about the park in its current conditions?

Respondent skipped this question

Q6

Is there any additional information that you would like us to know about suggested improvements to Mas Fukai Park?

Respondent skipped this question

Q7

Please provide contact information for updates about the project.

Name	**Randy Tanaka**
ZIP/Postal Code	**90247**
Email Address	**blackssab@aol.com**
Phone Number	**3104938393**

#12

COMPLETE

Collector: Web Link 1 (Web Link)
Started: Tuesday, November 23, 2021 12:45:55 PM
Last Modified: Tuesday, November 23, 2021 12:47:32 PM
Time Spent: 00:01:37
IP Address: 47.181.159.134

Page 1

Q1

Do you actively use Mas Fukai Park for any activities? If Yes, check which ones.

Picnicking ,

Tot Lot ,

Jogging/Exercise

Q2

What activities not currently available at the park would you like to see?

Exercise Stations,

Other (please specify):

Jogging track

Q3

How do you get to the park?

Walk

Q4

How far do you live from the park?

Within One Block

Q5

What most concerns you about the park in its current conditions?

Tot Lot Safety	**2**
Basketball Equipment	**6**
Area Lighting	**1**
Field Lighting	**5**
Grass/Field Quality	**8**
Infield Quality	**9**
Public Restrooms	**3**
Community Building	**10**
Lack of Activities	**7**
Accessibility	**4**

Q6

Is there any additional information that you would like us to know about suggested improvements to Mas Fukai Park?

Respondent skipped this question

Q7

Please provide contact information for updates about the project.

Respondent skipped this question

#13

COMPLETE

Collector:	Web Link 1 (Web Link)
Started:	Tuesday, November 23, 2021 5:01:29 PM
Last Modified:	Tuesday, November 23, 2021 5:06:24 PM
Time Spent:	00:04:54
IP Address:	76.170.183.134

Page 1

Q1

Do you actively use Mas Fukai Park for any activities? If Yes, check which ones.

Picnicking ,

Basketball,

Tot Lot ,

Jogging/Exercise

Q2

What activities not currently available at the park would you like to see?

Exercise Stations,

Other (please specify):

Splash pad

Q3

How do you get to the park?

Walk

Q4

How far do you live from the park?

Within One Block

Q5

What most concerns you about the park in its current conditions?

Tot Lot Safety	**N/A**
Basketball Equipment	**N/A**
Area Lighting	**N/A**
Field Lighting	**N/A**
Grass/Field Quality	**N/A**
Infield Quality	**N/A**
Public Restrooms	**N/A**
Community Building	**N/A**
Lack of Activities	**N/A**
Accessibility	**N/A**

Q6

Is there any additional information that you would like us to know about suggested improvements to Mas Fukai Park?

During the day the restrooms should be open for the kids..Park staff should check the play area to make sure it’s clean..My kid picked up a used condom,thinking it was a balloon.

Q7

Please provide contact information for updates about the project.

Name	**Taniecsha Waller**
ZIP/Postal Code	**90247**
Email Address	**Taniecshawaller@yahoo.com**
Phone Number	**3104843730**

#14

COMPLETE

Collector:	Web Link 1 (Web Link)
Started:	Tuesday, November 23, 2021 5:34:57 PM
Last Modified:	Tuesday, November 23, 2021 5:37:22 PM
Time Spent:	00:02:25
IP Address:	76.170.180.15

Page 1

Q1

Do you actively use Mas Fukai Park for any activities? If Yes, check which ones.

Picnicking ,

Jogging/Exercise

Q2

What activities not currently available at the park would you like to see?

Group exercise area for yoga/ tai chi/Zumba,

Exercise Stations

Q3

How do you get to the park?

Car

Q4

How far do you live from the park?

Live in Gardena

Q5

What most concerns you about the park in its current conditions?

Lack of Activities	**10**

Q6

Is there any additional information that you would like us to know about suggested improvements to Mas Fukai Park?

Respondent skipped this question

Q7

Please provide contact information for updates about the project.

Name	**Peggy Morgan**
ZIP/Postal Code	**90248**
Email Address	**pj.morgan63@gmail.com**
Phone Number	**310-515-4745**

#15

COMPLETE

Collector:	Web Link 1 (Web Link)
Started:	Tuesday, November 23, 2021 6:15:36 PM
Last Modified:	Tuesday, November 23, 2021 6:21:05 PM
Time Spent:	00:05:28
IP Address:	76.93.62.180

Page 1

Q1

Do you actively use Mas Fukai Park for any activities? If Yes, check which ones.

Tot Lot

Q2

What activities not currently available at the park would you like to see?

Group exercise area for yoga/ tai chi/Zumba

Q3

How do you get to the park?

Walk

Q4

How far do you live from the park?

A couple of blocks

Q5

What most concerns you about the park in its current conditions?

Tot Lot Safety	**10**

Q6

Is there any additional information that you would like us to know about suggested improvements to Mas Fukai Park?

Gating the playground. Having a door or gate on the entrance on the corner of Normandy Ave.

Q7

Please provide contact information for updates about the project.

Name	**Lily**
ZIP/Postal Code	**90247**
Email Address	**lizeth8a.yahoo.com**
Phone Number	**3104693077**

#16

COMPLETE

Collector:	Web Link 1 (Web Link)
Started:	Thursday, November 25, 2021 12:03:27 AM
Last Modified:	Thursday, November 25, 2021 12:12:03 AM
Time Spent:	00:08:35
IP Address:	172.58.22.237

Page 1

Q1

Do you actively use Mas Fukai Park for any activities? If Yes, check which ones.

Jogging/Exercise

Q2

What activities not currently available at the park would you like to see?

Group exercise area for yoga/ tai chi/Zumba,

Exercise Stations,

Other (please specify):

badminton court

Q3

How do you get to the park?

Walk

Q4

How far do you live from the park?

1/2 Mile

Q5

What most concerns you about the park in its current conditions?

Community Building	**10**

Q6

Is there any additional information that you would like us to know about suggested improvements to Mas Fukai Park?

a) Building powered by solar panels. Savings apply to park programs.
b) Wider pavements around the park.
c) Exercise station that facilitates stretching.
d) Reflexology pebble stone foot walking path.

Q7

Please provide contact information for updates about the project.

Name	**Tuck Lye**
ZIP/Postal Code	**90247**
Email Address	**TuckHLye@gmail.com**
Phone Number	**18575749868**

#17

COMPLETE

Collector: Web Link 1 (Web Link)
Started: Friday, November 26, 2021 3:53:22 PM
Last Modified: Friday, November 26, 2021 3:56:16 PM
Time Spent: 00:02:53
IP Address: 99.165.116.254

Page 1

Q1

Do you actively use Mas Fukai Park for any activities? If Yes, check which ones.

Other (please specify):

I use other parks

Q2

What activities not currently available at the park would you like to see?

Group exercise area for yoga/ tai chi/Zumba

Q3

How do you get to the park?

Walk

Q4

How far do you live from the park?

A couple of blocks

Q5

What most concerns you about the park in its current conditions?

Tot Lot Safety	**1**
Basketball Equipment	**2**
Area Lighting	**4**
Field Lighting	**3**
Grass/Field Quality	**8**
Infield Quality	**5**
Public Restrooms	**7**
Community Building	**6**
Lack of Activities	**10**
Accessibility	**9**

Q6

Is there any additional information that you would like us to know about suggested improvements to Mas Fukai Park?

Respondent skipped this question

Q7

Please provide contact information for updates about the project.

Respondent skipped this question

#18

COMPLETE

Collector:	Web Link 1 (Web Link)
Started:	Saturday, November 27, 2021 11:34:43 AM
Last Modified:	Saturday, November 27, 2021 11:37:57 AM
Time Spent:	00:03:13
IP Address:	98.148.64.161

Page 1

Q1

Do you actively use Mas Fukai Park for any activities? If Yes, check which ones.

Other (please specify):

No

Q2

What activities not currently available at the park would you like to see?

Other (please specify):

N/a

Q3

How do you get to the park?

Car

Q4

How far do you live from the park?

Live in Gardena

Q5

What most concerns you about the park in its current conditions?

Area Lighting	**2**
Field Lighting	**1**
Grass/Field Quality	**5**
Lack of Activities	**3**

Q6

Is there any additional information that you would like us to know about suggested improvements to Mas Fukai Park?

Respondent skipped this question

Q7

Please provide contact information for updates about the project.

Name	**Betty hill**
ZIP/Postal Code	**90249**
Email Address	**jeanehill@aol.com**
Phone Number	**3105325748**

#19

COMPLETE

Collector:	Web Link 1 (Web Link)
Started:	Tuesday, November 30, 2021 4:55:40 PM
Last Modified:	Tuesday, November 30, 2021 5:01:56 PM
Time Spent:	00:06:16
IP Address:	76.170.162.94

Page 1

Q1

Do you actively use Mas Fukai Park for any activities? If Yes, check which ones.

Softball/Baseball ,

Picnicking ,

Jogging/Exercise

Q2

What activities not currently available at the park would you like to see?

Pickleball ,

Other (please specify):

Would love to take my dog legally

Q3

How do you get to the park?

Walk

Q4

How far do you live from the park?

Within One Block

Q5

What most concerns you about the park in its current conditions?

Tot Lot Safety	**9**
Basketball Equipment	**N/A**
Area Lighting	**6**
Field Lighting	**3**
Grass/Field Quality	**4**
Infield Quality	**2**
Public Restrooms	**5**
Community Building	**1**
Lack of Activities	**8**
Accessibility	**7**

Q6

Is there any additional information that you would like us to know about suggested improvements to Mas Fukai Park?

If I were to build a new fence today and I used chain link, I'd be fined by the city. It looks terrible, feels unwelcoming and doesn't contribute towards the community that Gardena is. I am at a loss how this beautiful park is surrounded by chain link.

Q7

Please provide contact information for updates about the project.

Name	**Richard Magana**
ZIP/Postal Code	**91247**
Email Address	**rick.m.magana@gmail.com**
Phone Number	**8185316634**

City of Gardena

Gardena City Council Meeting
AGENDA REPORT SUMMARY

Agenda Item No. 15.B
Section: DEPARTMENTAL ITEMS - PUBLIC WORKS
Meeting Date: July 26, 2022

TO: THE HONORABLE MAYOR AND MEMBERS OF THE GARDENA CITY COUNCIL

AGENDA TITLE: Approve purchase of the 2023 TYMCO Model 600 Regenerative Air Sweeper from TYMCO in the amount of $443,177.44 for Public Works Street Sweeper Equipment Purchase, JN 515

COUNCIL ACTION REQUIRED:
Staff Recommendation: Approve Purchase

RECOMMENDATION AND STAFF SUMMARY:
Staff respectfully recommends that the City Council approve the purchase of the 2023 TYMCO Model 600 Regenerative Air Sweeper from TYMCO in the amount of $443,177.44 including sales tax and freight.

The Public Works Department currently has four Street Sweepers. The age of the Street Sweepers range from 14 years, 12 years, 10 years to 3-years-old. The life expectancy of a Street Sweeper is 10 years per industry standard. Typically, the oldest Street Sweeper in the fleet is retired first. However, the oldest Street Sweeper has a 2018 engine and is fully operational. The 12-year-old Street Sweeper has exceeded its life expectancy and is non-operable. With the purchase of the TYMCO Model 600 Regenerative Air Sweeper, the purchase will retire the 12-year-old Street Sweeper and reduce the maintenance and constant upkeep that it required throughout the years. Ultimately, the purchase will allow staff to operate more efficiently and effectively to ensure clean right-of-way and always have two back up Street Sweepers in case either or both of the Street Sweepers being used malfunction.
Per Gardena Municipal Code Ordinance No. 1780 pertaining to open market purchase procedures and Purchasing Policy APP-2018-003, Section 4(B) pertaining to cooperative purchases, the Department will piggy-back off HGAVBuy Contract #SW04-20. HGAVBuy negotiates contract pricing for goods and services frequently used by government agencies. These state contracts result in significant cost savings to the City and allow vendors an opportunity to compete with their lowest bids and enables municipalities to obtain the overall best price for their procurement.

FINANCIAL IMPACT/COST:
Approved Budget Amount Fiscal Year 2022-2023: $500,000 ($400,000 Sewer Fund & $100,000 Gas Tax Fund)

Amount Requested for Approval: $443,177.44 ($363,177.44 Sewer Fund & $80,000 Gas Tax Fund) - There will be no General Fund funds will be expended for this purchase.

ATTACHMENTS:

TYMCO 600 Street Sweeper Quote.pdf

APPROVED:

_____

Clint Osorio, City Manager

HGACBuy	CONTRACT PRICING WORKSHEET For MOTOR VEHICLES Only	Contract No.:	SW04-20	Date Prepared:	7/8/2022

This Worksheet is prepared by Contractor and given to End User. If a PO is issued, both documents MUST be faxed to H-GAC @ 713-993-4548. Therefore please type or print legibly.

Buying Agency:	City of Gardena, CA	Contractor:	TYMCO, Inc. (ISSUE P.O. TO TYMCO, Inc.-email below)
Contact Person:	Kevin Thomas	Prepared By:	Kaye Morgan
Phone:	310.217.9500	Phone:	254-799-5546
Fax:		Fax:	254-799-2722
Email:		Email:	kaye.morgan@tymco.com

Product Code:	B53	Description:	TYMCO Model 600 Regenerative Air Sweeper

A. Product Item Base Unit Price Per Contractor's H-GAC Contract: $ 138,000.00

B. Published Options - Itemize below - Attach additional sheet(s) if necessary - Include Option Code in description if

Description	Cost	Description	Cost
Alternative Fuel - Sweeper CNG 600838	$ 14,750.00	Auxiliary Hydraulic System 600053	$ 1,130.00
Variable Speed Gutter Brooms 600070	$ 775.00	Gutter Broom Tilt Adjuster - Left/Right 600022	$ 1,700.00
Abrasion Protection Package 600036	$ 1,275.00	Hopper Deluge 600043	$ 750.00
Stainless Hopper/High Capacity Dust Separator 600091	$ 17,775.00	Auto Sweep Interrupt w/Overspeed Interrupt 600079	$ 1,025.00
2020 Freightliner M2-112 CNG Chassis 600721	$ 155,000.00	Traffic Directing Light - LED 600823	$ 1,200.00
Pick-Up Head Curtain Lifter 600087	$ 1,605.00	AWTI Camera/Monitor System - 1 camera 600008-A	$ 1,530.00
		QUOTE GOOD FOR 30 DAYS	
		Subtotal From Additional Sheet(s):	
		Subtotal B:	$ 198,515.00

C. Unpublished Options - Itemize below / attach additional sheet(s) if necessary.

Description	Cost	Description	Cost
Hydraulic Oil Level Shutdown System	$ 400.00	(4) LED Floodlights - 2-GB; 2-Rear	$ 400.00
Hydrant Wrench	$ 50.00	LED Lights - Stop/Turn/Tail/Clearance markers	$ 500.00
Dump Switch in Cab	$ 200.00	Low Emission Package	$ 2,000.00
3" Gutter Broom Arm Extension - right	$ 400.00	Stainless Blower Housing	$ 1,500.00
Fire Extinguisher	$ 100.00	Stainless Steel Screen - Split (exchange)	$ 800.00
Hazard Reflectors	$ 100.00	Slow Moving Vehicle Sign	$ 100.00
2023 Freightliner M2-112 CNG Chassis UPGRADE	$ 11,500.00	Truck Manuals - Parts/Service	$ 1,000.00
		Subtotal From Additional Sheet(s):	
		Subtotal C:	$ 19,050.00

Check: Total cost of Unpublished Options (C) cannot exceed 25% of the total of the Base Unit Price plus Published Options (A+B).	**For this transaction the percentage is:**	6%

D. Total Cost Before Any Applicable Trade-In / Other Allowances / Discounts (A+B+C) $ 355,565.00

Quantity Ordered:	1	X Subtotal of A + B + C:	$ 355,565.00	=	Subtotal D:	$ 355,565.00

F. Trade-Ins / Other Allowances / Special Discounts / Freight / Installation

Description	Cost	Description	Cost
Freight/PDI/Inservice	$ 11,000.00	Surcharge - CNG Aux. Engine	$ 3,160.00
Surcharge - Base Sweeper Unit	$ 27,700.00	CA Sales Tax (10.25%)	$ 41,202.44
Surcharge - Stainless Hopper	$ 4,550.00	**Subtotal F:**	$ 87,612.44

Delivery Date:	**210-270 Days**	**G. Total Purchase Price (D+E+F):**	$ 443,177.44

City of Gardena

Gardena City Council Meeting
AGENDA REPORT SUMMARY

Agenda Item No. 17.A
Section: DEPARTMENTAL ITEMS - TRANSPORTATION
Meeting Date: July 26, 2022

TO: THE HONORABLE MAYOR AND MEMBERS OF THE GARDENA CITY COUNCIL

AGENDA TITLE: Approve Purchase of Seven (7), 40-foot Compressed Natural Gas (CNG) Buses for $6,130,421 and Authorize Program Total of $6,743,463

COUNCIL ACTION REQUIRED:
Staff Recommendation: Approve Purchase and Program Total

RECOMMENDATION AND STAFF SUMMARY:
Between FY2017-2023, GTrans will be replacing its entire fleet of 40-foot gasoline electric hybrid buses that have reached the end of their useful lives. In order to guide the timely replacement of aging buses, Staff developed a FY2017-2023 Fleet Replacement Plan approved by Council in February 2017. The plan dictated that GTrans would immediately pursue a combination of both CNG and zero emission buses for the near-term replacement of its fleet, with an eventual conversion of the entire fleet to zero emission by 2034. In accordance with the plan, GTrans deployed its first order of 18 CNG buses in 2021. As you recall, Council approved the purchase of seven zero emission buses in March, and 14 CNG buses in April. Now that required federal funding is available, GTrans is ready to secure its final order of CNG buses to replace aging gasoline/hybrid buses in our fleet.

GTrans is able to purchase CNG buses under an assignment clause through an existing contract by Los Angeles County Metropolitan Transportation Authority (Metro). Under the assignment clause GTrans has reserved up to 46 CNG buses under Metro's 2017 Contract No. OP28367-000 – Part A for up to 46, forty-foot (40') CNG buses from El Dorado National (California), Inc. CNG technology has a long-standing, proven history throughout the transit industry as having the reliability, range and lower greenhouse gas emission benefits necessary to operate in a variety of transit service environments. There will also be anticipated safety improvements for operating these new CNG buses in GTrans' bus fleet. These buses will incorporate the latest safety features and designs, including improved American with Disabilities Act (ADA) amenities and boarding ramps. New buses will provide a safer, cleaner operating environment for GTrans passengers and employees, improve fleet reliability and allow GTrans to remain in compliance with California Air Resources Board (CARB) and South Coast Air Quality Management District (SCAQMD) regulations.

Therefore staff respectfully recommends that Council authorize the purchase of seven (7) CNG buses from El Dorado National (California), Inc. for a total price of $6,130,421, which

includes sales tax and delivery fees. And authorize a 10 percent contingency of $613,042 to account for any unforeseen changes, only to be approved in advance by GTrans staff. The total recommended authorization will not to exceed a project total of $6,743,463.

FINANCIAL IMPACT/COST:

GTrans has existing federal, state, and local funding available for its bus replacement program, to purchase seven CNG buses. There is no impact to the General Fund.

ATTACHMENTS:

Assignment Agreement_Gardena_Executed.pdf
Gardena Option Quote - (7) Buses 7-6-22.pdf
ENC Bus Breakdown_7 CNG Buses.pdf
Contract OP28367_Volume I_Group A_ENC_Final_Signed.pdf
Complete Amendments to OPS28367-000 (#1 to #20).pdf

APPROVED:

_____

Clint Osorio, City Manager

ATTACHMENT C – ASSIGNMENT AGREEMENT

ASSIGNMENT TO PURCHASE AGREEMENT

Los Angeles County Metropolitan Transportation Authority of Los Angeles, California, "Assignor", hereby assigns to GTrans of the City of Gardena, California, "Assignee", to purchase from El Dorado National (California), Inc. (ENC), "Seller", forty six (46) units of 40' low floor CNG transit Vehicles at a price and under the terms and conditions contained in Assignor's Contract No OP28367-000, dated August 15, 2017 with Seller ("Contract").

Contract OP28367-000 commenced, per terms of Contract, on September 1, 2017, and any unused buses may be assigned at any time on or before September 1, 2022.

With respect to Vehicles assigned hereunder and this Assignment, Assignee agrees to perform all covenants, conditions and obligations required of Assignor under said Contract and agrees to defend, indemnify and hold Assignor harmless from any liability or obligation under said Contract. Assignee further agrees to hold Assignor harmless from any deficiency or defect in the legality or enforcement of the terms of said Contract or option to purchase thereunder. Assignee agrees and understands that Assignor is not acting as a broker or agent in this transaction and is not representing Seller or Assignee, but rather is acting as a principle in assigning its interest in the above-referenced option to purchase the Vehicles under the Contract to Assignee.

Assignee hereby unconditionally releases and covenants not to sue Assignor upon any claims, liabilities, damages, obligations or judgments whatsoever, in law or in equity, whether known or unknown, or claimed, which they or either of them have or claim to have or which they or either of them may have or claim to have in the future against Assignor, with respect to the Vehicles or any rights whatsoever assigned hereunder.

Dated this 17th day of ~~March~~ April, 2018

Los Angeles County Metropolitan Transportation Authority

Phillip A. Washington
Chief Executive Officer

BY:_____
Assignor

GTrans
City of Gardena

Ernie Crespo
Director of Transportation

BY:_____
Assignee

I hereby accept and approve the terms of this agreement and agree to hold Assignor harmless from any further liability or obligation under our agreement.

El Dorado National (California), Inc. (ENC)

BY:_____
Seller

QUOTATION
PREPARED FOR: City of Gardena

DATE: 7/6/2022

ITEM	DESCRIPTION	PRICE
1.0	Base bus price of previous (18) unit order without freight	$ 640,369.82
2.0	Delete ferry riser	$ (365.00)
3.0	Delete driver's protection system on last bus (price was divided over 18 buses)	$ (169.84)
4.0	Delete GFI farebox for (6) buses divided over 18 buses	$ (5,512.95)
5.0	Delete GFI farebox expedited delivery charge	$ (166.67)
6.0	Delete CUBIC-DCU for (6) buses divided over (18) buses	$ (2,146.64)
	Subtotal	$ 632,008.72
	NEW BUS CHARGES	
7.0	PPI calculation August 2017 to August 2021(P) per attached; 11.87% PPI on revised subtotal	$ 75,019.44
9.0	Change from safefleet mirrors to ENC demo style mirror: low mounted streetside & use same head on both sides; use spacer on streetside mirror	$ -
10.0	Change from Byk-Rak 3 position stl stl bike to black stainless steel	$ 70.00
11.0	Changes to Luminator/Apollo system - updated antenna; add camera	$ 774.00
12.0	Optional Luminator/Apollo equipment per attached Luminator quote; total is divided over 7 buses	$ 604.00
13.0	Supply & install complete Clever Devices AVL & APC System	$ 25,268.00
14.0	Use Hanover internal amps to separate front & rear speakers	$ 101.00
15.0	Hanover WDM software, 1 year annual hosting server solution, Tycon switch and charge guard; costs divided over 7 buses	$ 1,572.00
16.0	Driver's protection system - Arowguard with extra extended glass	$ 6,063.00
17.0	GFI Farebox pre-wire only	$ 108.00
18.0	Add ring collar to overhead grab straps	$ 266.00
19.0	Rear passenger door Obstruction Detection System (sonic sensor)	$ 1,527.00
20.0	Brake pedal E10 valve	$ 158.00
21.0	Hinged door for emergency door release housing at both doors	$ 34.00
	COMMODITY SURCHARGE 3.04%	$ 22,612.98
	BASE SUBTOTAL PER BUS	$ 766,186.14
	FREIGHT (NON-TAXABLE)	$ 275.00
	SUBTOTAL	$ 766,461.14
	TAX 10.25%	$ 76,510.73
	BASE TOTAL PER BUS	**$ 842,971.87**
	QTY	**7**
	TOTAL FOR 7 BUSES	**$ 5,900,803.09**

BUS TAX		
BUS AMOUNT	$	766,186.14
NON-TAXABLE ADA	$	(19,740.00)
TAXABLE AMOUNT	$	746,446.14
TAX 10.25%	$	76,510.73

	ADDITIONAL DELIVERABLES (NOT IN BUS PRICE)		
ITEM	**DESCRIPTION**	**PRICE**	
1.0	Spare parts package - per attached listing	$ 201,605.02	*
2.0	(1) A/C interface software and cable @ $673	$ 673.00	*
3.0	(2) Accessory Power System (APS) software & adapter interface @ $2996	$ 5,992.00	*

* TAXABLE

PREPARED BY: Holly Piper, Sales Administration Manager

This quote is valid until 07/31/22

ENC Purchase of 7 Buses

Item	Quantity	Unit Price	Unit	Description	Total
1-6	7	$ 612,268.72	Each	40 Ft.CNG Base Bus ($632,008.72-ADA $19,740)	$ 4,285,881
7	7	$ 75,019.44	Each	11.87% PPI on Base Bus	$ 525,136
9-21	7	$ 36,545.00	Each	Additional Onboard Equipment	$ 255,815
	7	$ 22,612.98	Each	Commodity Charge (3.04%)	$ 158,291
	7	$ 19,740.00	Each	ADA Equipment (tax exempt)	$ 138,180
	7	$ 766,186.14		Total Bus	
	7	$ 76,510.73	Each	10.25% California Sales Tax Buses	$ 535,575
	7	$ 275.00	Each	Delivery	$ 1,925
					$ 5,900,803

Additional

4	1	$ 201,605	DL	Spare Parts Package	$ 201,605
6	1	$ 673	DL	(1) A/C interface software and cable @ $673	$ 673
11	2	$ 2,996	DL	Accessory Power System (APS) software & adapter interface	$ 5,992
5			DL	10.25% Calif. Sales tax, Other (line 4)	$ 21,348

$ 6,130,421 Total

July 13, 2022

Los Angeles County
Metropolitan Transportation Authority

FORTY-FOOT (40') LOW FLOOR CNG TRANSIT BUSES

Contract No.: OP28367-000 ISSUED: 08.10.17

ELDORADO NATIONAL (CALIFORNIA), INC.

Photo By: Chang Kim

Metro

GROUP A – 40’ CNG

TABLE OF CONTENTS

FIRM FIXED PRICE CONTRACT 1
ARTICLE I: CONTRACT DOCUMENTS ORDER OF PRECEDENCE 2
ARTICLE II: DEFINITIONS 3
ARTICLE III: WORK TO BE PERFORMED 3
ARTICLE IV: COMPENSATION 3
ARTICLE V: CONTRACT TERM AND PERIOD OF PERFORMANCE 4
ARTICLE VI: TAX CREDITS 4
ARTICLE VII:INVOICES 4
ARTICLE VIII:LIMITATION OF FUNDS 5
ARTICLE IX: ENTIRE AGREEMENT 6
EXHIBIT A – INSURANCE REQUIREMENTS 7

REGULATORY REQUIREMENTS 8
RR-01 ADMINISTRATIVE CODE * 8
RR-02 DISCRIMINATION * 9
RR-03 WHISTLEBLOWER REQUIREMENTS * 9
RR-04 PUBLIC RECORDS ACT * 10
RR-05 ACCESS TO RECORDS 10
RR-06 FEDERAL FUNDING, INCORPORATION OF FEDERAL TRANSIT ADMINISTRATION (FTA) TERMS, AND FEDERAL CHANGES* 11
RR-07 ENERGY CONSERVATION REQUIREMENTS 12
RR-08 CIVIL RIGHTS REQUIREMENTS * 12
RR-09 NO GOVERNMENT OBLIGATION TO THIRD PARTIES * 13
RR-10 PROGRAM FRAUD AND FALSE OR FRAUDULENT STATEMENTS OR RELATED ACTS * 14
RR-11 SUSPENSION AND DEBARMENT* 14
RR-12 RECYCLED PRODUCTS 15
RR-13 CLEAN WATER AND CLEAN AIR REQUIREMENTS* 15
RR-14 COMPLIANCE WITH FEDERAL LOBBYING POLICY * 16
RR-15 BUY AMERICA * 16
RR-16 CARGO PREFERENCE* 16
RR-17 FLY AMERICA 17
RR-18 CONTRACT WORK HOURS AND SAFETY STANDARDS ACT * 18
RR-19 SEISMIC SAFETY 19
RR-20 ADA ACCESS 19
RR-21 ALCOHOL AND DRUG-FREE WORKPLACE PROGRAM * 21
RR-22 TRANSIT EMPLOYEE PROTECTIVE ARRANGEMENTS * 22
RR-23 CHARTER SERVICE OPERATIONS 23
RR-24 SCHOOL BUS REQUIREMENTS 23
RR-25 FEDERAL PATENT AND DATA RIGHTS* 23
RR-26 PUBLIC WORKS CONTRACT REGISTRATION LAW 26
RR-27 COMPLIANCE WITH CALIFORNIA HEALTH AND SAFETY CODE (HSC) §25250.51 27

SPECIAL PROVISIONS 28
SP-01 DEFINITIONS 28
SP-02 DBE PARTICIPATION 31
SP-03 ORGANIZATIONAL CONFLICTS OF INTEREST* 31
SP-04 NOTICES AND SERVICE THEREOF* 32
SP-05 APPROVED SUBCONTRACTORS 33
SP-06 PILOT VEHICLE 33
SP-07 CONFIGURATION AND PERFORMANCE APPROVAL 34
SP-08 FIRST ARTICLE/PRE-DELIVERY TESTS AND INSPECTION 35

SP-09 VEHICLE DELIVERY SCHEDULE 36
SP-10 LIQUIDATED DAMAGES 36
SP-11 ISSUANCE OF THE NOTICE TO PROCEED 36
SP-12 DELIVERY PROCEDURE 37
SP-13 PERFORMANCE BOND/GUARANTEE 37
SP-14 MOTOR VEHICLE POLLUTION REQUIREMENTS 37
SP-15 ENGINE EMISSIONS CERTIFICATE 38
SP-16 DESIGN AND MANUFACTURING RESPONSIBILITY 38
SP-17 INTERCHANGEABILITY 39
SP-18 MATERIALS AND WORKMANSHIP RESPONSIBILITY 39
SP-19 SPARE AND REPLACEMENT PARTS 39
SP-20 PRE-PRODUCTION MEETINGS 40
SP-21 CONTRACT STATUS REPORTS 41
SP-22 PRODUCTION CONTINUITY 41
SP-23 ASSUMPTION OF RISK OF LOSS 42
SP-24 CONDITIONAL ACCEPTANCE AND ACCEPTANCE OF PRODUCTION VEHICLES 42
SP-25 ACCEPTANCE OF PRODUCTION VEHICLE 42
SP-26 NON-ACCEPTANCE OF PRODUCTION VEHICLE 43
SP-27 REPAIRS BY LACMTA 43
SP-28 OPTIONS 44
SP-29 ASSIGNMENT OF OPTIONS 46
SP-30 TITLE 46
SP-31 INSURANCE REQUIREMENTS 46
SP-32 THE CONTRACTOR'S INTERACTION WITH THE MEDIA AND THE PUBLIC 52
SP-33 ANTI-DUMPING PROHIBITIONS 52
SP-34 NONRESTRICTIVE CLAUSES 52
SP-35 APPROVALS 53
SP-36 DOCUMENT APPROVAL AND REVIEW 53
SP-37 OTHER CONTRACT DELIVERABLES (NON-TECHNICAL) 54
SP-38 LOCAL EMPLOYMENT PROGRAM 57
SP-39 RELEASE OF INFORMATION* 59
SP-40 CONTRACTOR WARRANTY 60
SP-41 CONTRACTOR'S IN-PLANT QUALITY ASSURANCE REQUIREMENTS 70
SP-42 PAYMENT OF PREVAILING AND LIVING WAGES / REPORTING (NOT APPLICABLE) 79
SP-43 SERVICE CONTRACT WORKER RETENTION POLICY (NOT APPLICABLE) 80
SP-44 BUY AMERICA CERTIFICATION 80

ATTACHMENT A: NEW BUS MANUFACTURING INSPECTION GUIDELINES 83

ATTACHMENT B – FAITHFUL PERFORMANCE BOND 86

ATTACHMENT C – ASSIGNMENT AGREEMENT 88

GENERAL CONDITIONS (SERVICES) 89
GC-01 GLOSSARY OF TERMS* 89
GC-02 INTERPRETATION* 94
GC-03 PRECEDENCE OF CONTRACT DOCUMENTS 94
GC-04 CONTRACT DOCUMENTS 95
GC-05 AUTHORITY OF THE CONTRACTING OFFICER 96
GC-06 METRO'S TECHNICAL REPRESENTATIVE (PROJECT MANAGER) 96
GC-07 INDEPENDENT CONTRACTOR 96
GC-08 ORGANIZATIONAL AND KEY PERSONNEL 96
GC-09 SUBCONTRACTORS AND SUPPLIERS* 97
GC-10 PERMITS 99
GC-11 GOODS* 100
GC-12 STANDARDS OF PERFORMANCE* 100
GC-13 UNAUTHORIZED ACTIONS* 101

GC-14 PERIOD OF PERFORMANCE 101
GC-15 INSPECTION OF WORK (ACCEPTANCE)* 102
GC-16 FINAL ACCEPTANCE* 102
GC-17 SAFETY* 104
GC-18 WARRANTY* 104
GC-19 RIGHTS IN PROPERTY* 104
GC-20 EXTENTION OF TIME 105
GC-21 CHANGES 107
GC-22 AUDIT SOFTWARE 109
GC-23 NOTICE OF INTENT TO CLAIM AND CLAIMS 109
GC-24 RESOLUTION OF DISPUTES 110
GC-25 SUSPENSION* 110
GC-26 TERMINATION FOR CONVENIENCE OF METRO* 111
GC-27 TERMINATION FOR DEFAULT* 114
GC-28 ASSIGNMENT* 116
GC-29 ENVIRONMENTAL COMPLIANCE 117
GC-30 HISTORICAL, ARCHAEOLOGICAL, PALEONTOLOGICAL, AND SCIENTIFIC DISCOVERIES* 118
GC-31 THE CONTRACTOR'S INTERACTION WITH THE MEDIA AND THE PUBLIC* 118
GC-32 WHISTLEBLOWER REQUIREMENTS* 119
GC-33 COMPLIANCE WITH THE AMERICANS WITH DISABILITIES ACT* 119
GC-34 SEVERABILITY* 119
GC-35 GOVERNING LAW* 120
GC-36 PUBLIC RECORDS ACT* 120
GC-37 LIABILITY AND INDEMNIFICATION* 120
GC-38 RIGHTS IN TECHNICAL DATA, PATENTS AND COPYRIGHTS* 124
GC-39 SOFTWARE LICENSING AGREEMENT AND PROVISIONS FOR USE* 125
GC-40 AGENT TO ACCEPT SERVICE 126
GC-41 CONFLICT OF INTEREST* 126
GC-42 COVENANT AGAINST CONTINGENT FEES* 127
GC-43 NO WAIVER 127
GC-44 CONFIDENTIALITY* 128
GC-45 SAFETY AND LOSS PREVENTION * 128
GC-46 ENGLISH REQUIREMENTS * 129

COMPENSATION & PAYMENT PROVISIONS (FIRM FIXED PRICE) 130
CP-01 BASIS OF COMPENSATION * 131
CP-02 MILESTONE PAYMENTS 131
CP-03 PAYMENT TO SUBCONTRACTORS * 136
CP-04 PAYMENT OF TAXES * 137
CP-05 FINAL PAYMENT * 137
CP-06 AUDIT REQUIREMENTS * 139
CP-07 LIQUIDATED DAMAGES 141
EXHIBIT 1 - PAYMENT CERTIFICATION 143

EXHIBIT B - STATEMENT OF WORK 144

* All Articles, Subarticles, or portions of the Contract noted by an asterisk (*) shall be included in (flow-down to) all Subcontracts of any tier.

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LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY

CONTRACT NO.: OP28367-000

FORTY-FOOT (40') LOW FLOOR CNG TRANSIT BUSES

FIRM FIXED PRICE CONTRACT

BETWEEN

LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY

AND

ELDORADO NATIONAL (CALIFORNIA), INC.

AUGUST 15, 2017

EFFECTIVE DATE

LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY
FIRM FIXED PRICE CONTRACT

CONTRACT NO.: OP28367-000

Between

LOS ANGELES COUNTY
METROPOLITAN TRANSPORTATION AUTHORITY
ONE GATEWAY PLAZA
LOS ANGELES, CA 90012-2952

and

ELDORADO NATIONAL (CALIFORNIA), INC.
9670 Galena Street
Riverside, CA 92509

FORTY-FOOT (40') LOW FLOOR CNG TRANSIT BUSES

This Contract is entered into by and between the Los Angeles County Metropolitan Transportation Authority (LACMTA/Metro), and **ELDORADO NATIONAL (CALIFORNIA), INC.** (Contractor).

In consideration of the mutual covenants of the parties as set forth below, the parties hereby agree as follows:

ARTICLE I: CONTRACT DOCUMENTS ORDER OF PRECEDENCE

A. This Contract includes this Form of Contract and the other following Contract Documents and Attachments, which are incorporated herein and made a part of this Contract.

B. Except as otherwise specified herein, in the event of any conflict, the precedence of the Contract Documents shall be as follows:

1. Form of Contract, (Pro Form 18, Dated 08/08/14)
2. Regulatory Requirements, (Pro Form 039, Dated 02/03/16)
3. Special Provisions, (Pro Form 089, Dated 01/11/16)
4. General Conditions, (Pro Form 038, Dated 01/11/16)
5. Compensation and Payment Provisions, Firm Fixed Price, (Pro Form 040, Dated 08/23/13)
6. Technical Specifications, (Dated 08/10/17)

C. An Amendment or Change to this Contract shall take its precedence from the term it amends. All other documents and terms and conditions shall remain unchanged.

ARTICLE II: DEFINITIONS

Capitalized terms, abbreviations and symbols used in this Contract are defined in the Article in the General Conditions entitled GLOSSARY OF TERMS. Additional terms may be defined in the Special Provisions or the Statement of Work.

ARTICLE III: WORK TO BE PERFORMED

Contractor shall furnish all necessary labor, materials, supplies, and transportation necessary to manufacture 295 Forty-Foot (40') Low Floor CNG Transit Buses, up to 305 Option vehicles, spare parts, special tools, diagnostic equipment, training, training aids and manuals as is more fully described in the Special Provisions and Technical Specifications.

ARTICLE IV: COMPENSATION

A. Contract Price

In consideration of the Contractor's full performance of the Work, and in accordance with the terms of the Contract, Metro will pay the Contractor the Contract Price of $199,067,748, inclusive of tax and delivery as provided in this Article and in the Contract Document entitled Compensation and Payment Provisions.

Contract Options may be exercised unilaterally by LACMTA in accordance with Special Provisions Article SP-28, Options.

B. Payment Schedule

The Contract Price shall be paid to the Contractor based upon the Milestone Payment Schedule, Form PF1-Contract Price Summary, and the Compensation and Payment Provisions.

All Applications for Milestone Payments shall be submitted in writing in accordance with the Contract Documents entitled COMPENSATION AND PAYMENT AND THE SPECIAL PROVISIONS, as applicable, and delivered or mailed to LACMTA as follows:

Los Angeles County Metropolitan Transportation Authority
Accounts Payable
P.O. Box 512296
Los Angeles, CA 90051-0296
Contract No.: OP28367-000

C. Final Payment

The Application for Final Payment shall be marked **FINAL** and a copy sent to Metro's Authorized Representative. LACMTA shall remit payment to the Contractor at the following address:

ELDORADO NATIONAL (CALIFORNIA), INC.
9670 Galena Street
Riverside, CA 92509

D. Effective January 1, 2009, Metro started payment of invoices via Electronic Funds Transfer (EFT) which guarantees faster payments and is a more secure and efficient way to make payments. If you have not already done so, you will be required to sign up for EFT, unless you request a waiver in writing. Please call (213) 922-6811, then press option # 7 for EFT forms.

ARTICLE V: CONTRACT TERM AND PERIOD OF PERFORMANCE

The Effective Date of this Contract is **August 15, 2017**. The Period of Performance of this Contract shall begin on September 1, 2017 (hereinafter "Commencement Date"). Contractor shall complete delivery of the Base quantity of 295 vehicles no later than November 29, 2019, 117 weeks (819 calendar days) after the Commencement Date, unless this Contract is terminated earlier or extended by LACMTA, in writing, as provided in the Contract. Said complete delivery date of November 29, 2019 for Group A buses shall be automatically extended on a day-for-day basis if the Contract for the Base Buy is not executed by LACMTA on or before September 1, 2017.

The Base quantity for Group A is 295 Vehicles. The Base quantity delivery schedule is for a minimum of five (5) and a maximum of ten (10) vehicles per week. Any Group A vehicles delivered beyond that November 29, 2019 date may be subject to Liquidated Damages in accordance with Special Provisions SP – 10. If any Option for Group A vehicles is exercised, the Group A Option Vehicles shall be delivered in accordance with the schedule contained in the Modification to exercise the Option.

ARTICLE VI: TAX CREDITS

In the event Contractor is entitled to Federal or State tax credits or refunds conditioned on the sale of CNG/ZEB buses to a public agency, the Contractor agrees to rebate an amount equal to ninety (90) percent of the per bus credit or refund to LACMTA when the Contractor takes the credit and/or realizes the refund. The provision of such credits shall not affect any other responsibilities contained in the Contract

ARTICLE VII: INVOICES

Contractor shall submit invoices for all Vehicles including Option Vehicles, Spare Parts, equipment and other items purchased under this Contract to LACMTA 30 calendar days prior to each delivery. Payment shall be within 30 days after Acceptance of the item. Pro forma invoices will be acceptable. Contractor shall pay all Sales/Use Taxes, including spare parts, training, training aids, special tools, manuals or diagnostic equipment ordered under the Contract. LACMTA shall require the Contractor to remit all Sales/Use Taxes directly to State and

Federal Tax agencies, and to provide annual reports to LACMTA of such remittances.

A separate invoice shall be submitted for each Vehicle, including Option Vehicles. Each invoice shall include:

- Contract number
- Model and serial number of Vehicles invoiced
- Unit or total prices by line item number
- Total invoice amount.

A separate invoice shall be submitted for spare parts, special tools, training, training aids, and diagnostic equipment. Each invoice shall include:

- Contract number
- Description of the item
- Unit or total prices by line item number
- Total invoice amount.

ARTICLE VIII:LIMITATION OF FUNDS

Funding for this Contract is based upon the availability of funds determined by LACMTA's fiscal budget, which runs from July 1 through June 30 of each fiscal year. If funding is not approved for any subsequent fiscal year during which this Contract is in effect, LACMTA will issue a stop work notice.

ARTICLE IX: ENTIRE AGREEMENT

This Contract includes this Form of Contract, all other Contract Documents incorporated pursuant to Article I herein, and all Attachments and other documents incorporated herein by inclusion or by reference, and constitutes the complete and entire agreement between Metro and Contractor and supersedes any prior representations, understandings, communications, agreements or proposals, oral or written.

ELDORADO NATIONAL (CALIFORNIA), INC.
9670 Galena Street
Riverside, CA 92509
tony.wayne@eldorado-ca.com EMAIL ADDRESS
(909) 591-9557 PHONE NUMBER

SIGNATURE OF AUTHORIZED OFFICIAL

BY: **Tony Wayne**
(PRINT OR TYPE NAME)

Vice President and General Manager
TITLE

August 14, 2017
DATE

TAX ID NO.: **33-0485436**

LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY

PHILLIP A. WASHINGTON
CHIEF EXECUTIVE OFFICER

BY:

8/21/17
DATE

APPROVED AS TO FORM
MARY C. WICKHAM
COUNTY COUNSEL

BY: DEPUTY

EXHIBIT A – INSURANCE REQUIREMENTS

(Reference Special Provisions SP-31)

REGULATORY REQUIREMENTS

RR-01 ADMINISTRATIVE CODE *

A. Applicability

This Article applies to all contracts.

B. Metro Administrative Code

Contractor warrants and represents that it has read and understands Title 4, Procurement, and Title 5, Ethics, of the **Metro Administrative Code** (hereinafter "Administrative Code" - available at **www.metro.net/images/MTA Administrative Code Enactment.pdf**), and will comply with each and every one of those requirements in accordance with their terms to the extent that they are applicable to contractors doing business with Metro. All definitions used in the Administrative Code are hereby incorporated herein as though fully set forth.

Without reducing or affecting its obligation to comply with any and all provision of the Administrative Code, as applicable, Contractor specifically warrants, represents and covenants that it will:

1. Comply with:

   a. Chapter 5-20, Contractor Code of Conduct;

   b. Chapter 5-25, Lobbying the Metro; and

   c. Chapter 5-35, Metro Conflict of Interest Code, and

2. Not induce, attempt to induce, or solicit:

   a. Board members to violate Chapter 5-10;

   b. Metro employees to violate Chapter 5-15;

   c. Metro Financial employees to violate Chapter 5-30: or

   d. Either Board members, Metro employees or Metro Financial employees to violate any other provision of the Administrative Code.

C. Compliance with §§1090 et. seq. and §§87100 et. seq. of the California Government Code

Contractor shall comply with all applicable provisions of §§1090 et. seq. and §§87100 et. seq. of the California Government Code. Without reducing or affecting its obligation to comply with any and all of said provisions, Contractor specifically covenants:

1. Contractor shall not cause or permit any member, officer, or employee of Metro to have any financial interest in the Contract;

2. Contractor shall not enter into any Subcontract involving services or property with a person or business prohibited from transacting such business with Metro;

3. Contractor warrants and represents that to its knowledge no Board member, officer, or employee of Metro has any interest, whether contractual, non-contractual, financial or otherwise, in this Contract, or in the business or any other contract or transaction of the Contractor or any Subcontractor and that if any such interest comes to Contractor's knowledge at any time, Contractor shall make a full and complete disclosure of all such information in writing to Metro.

D. Campaign Contributions

Neither Contractor nor its Agents shall give or offer to give any campaign contribution to any member of Metro's Board of Directors in violation of California Public Utilities Code §130051.20, California Government Code §§84300 et seq., or the Administrative Code.

E. Environmental Management System (EMS) Policy

Contractor represents that during the performance of the Contract it will assist Metro in achieving the principles of Metro's EMS Policy, available at **Environmental Management System (EMS) Policy** and Contractor further commits that it shall adhere to the applicable EMS Policy principles in its choice of means and methods in the performance of the Work.

RR-02 DISCRIMINATION *

A. Applicability

This Article applies to all contracts.

B. In connection with the performance of Work provided for under this Contract, Contractor agrees that it will not, on the grounds of race, religious creed, color, national origin, ancestry, physical disability, medical condition, marital status, sex, sexual orientation, or age, discriminate or permit discrimination against any person or group of persons in any manner prohibited by Federal, State or local laws.

RR-03 WHISTLEBLOWER REQUIREMENTS *

A. Applicability

This Article applies to all contracts.

B. Contractor shall not adopt any rule, regulation or policy preventing an employee from disclosing information to a government or law enforcement agency, where the employee believes the information discloses violation or noncompliance with a state or Federal regulation; nor shall Contractor retaliate against an employee for taking such actions as set forth in the California Labor Code §1101 et. seq.

RR-04 PUBLIC RECORDS ACT *

A. Applicability

This Article applies to all contracts.

B. Except as otherwise provided herein, all records, documents, drawings, plans, specifications, and all other information relating to the conduct of Metro's business, including all information and documents submitted by Contractor ("**Records**"), shall become the exclusive property of Metro and shall be deemed public records. Said Records are subject to the provisions of the California Public Records Act (Government Code §6250 et. seq.). Metro's use and disclosure of its records are governed by this Act. Metro will use its best efforts to inform the Contractor of any request for any financial records or documents marked "Trade Secret", "Confidential" or "Proprietary" provided by Contractor to Metro. Metro will not advise as to the nature or content of documents entitled to protection from disclosure under the California Public Records Act.

C. In the event of litigation concerning the disclosure of any Records, Metro's sole involvement will be as a stakeholder, retaining the Records until otherwise ordered by a court. The submitting party, at its sole expense and risk, shall be fully responsible for any and all fees for prosecuting or defending any action concerning the Records and shall indemnify and hold Metro harmless from all costs and expenses including attorney's fees in connection with any such action.

RR-05 ACCESS TO RECORDS

A. Applicability

This Article applies to all federally funded contracts.

B. Contractor agrees to provide Metro, the FTA Administrator, the Comptroller General of the United States or any of their authorized representatives access to any books, documents, papers and records of the Contractor which are directly pertinent to this Contract for the purposes of making audits, examinations, excerpts and transcriptions. Contractor also agrees, pursuant to 49 C. F. R. 633.17 to provide the FTA Administrator or the FTA's authorized representatives, including any FTA Project Management Oversight Contractor, access to Contractor's records and construction sites pertaining to a major capital project, defined at 49 U.S.C. 5302(a)1, which is

receiving federal financial assistance through the programs described at 49 U.S.C. 5307, 5309 or 5311.

C. If this Contract is for a capital project or improvement (defined at 49 U.S.C. 5302(a)1) and was entered in to through other than competitive bidding, the Contractor shall make records related to this Contract available to Metro, the Secretary of Transportation and the Comptroller General or any authorized officer or employee of any of them for the purposes of conducting an audit and inspection.

D. Contractor shall permit any of the foregoing parties to reproduce without any cost by any means whatsoever or to copy excerpts and transcriptions as reasonably needed.

E. Contractor shall maintain all books, records, accounts and reports required under this Contract for a period of not less than three years after the date of termination or expiration of this Contract, except in the event of litigation or settlement of claims arising from the performance of this Contract, in which case Contractor agrees to maintain same until Metro, the FTA Administrator, the Comptroller General, or any of their duly authorized representatives, have disposed of all such litigation, appeals, claims or exceptions related thereto.

RR-06 FEDERAL FUNDING, INCORPORATION OF FEDERAL TRANSIT ADMINISTRATION (FTA) TERMS, AND FEDERAL CHANGES*

A. Applicability

This Article applies to all federally funded contracts.

B. This Contract includes, in part, certain Standard Terms and Conditions required by DOT, whether or not expressly set forth in the Contract provisions. All contractual provisions required by DOT, as set forth in FTA Circular 4220.1F, dated November 1, 2008 (including any changes, revisions or successor circulars) is automatically hereby incorporated by reference. Anything to the contrary herein notwithstanding, all FTA mandated terms shall be deemed to control in the event of a conflict with other provisions contained in this Contract. Contractor shall not perform any act, fail to perform any act, or refuse to comply with any Metro requests which would cause Metro to be in violation of the FTA terms and conditions.

This Contract is subject to a financial assistance agreement between Metro and the Federal Transit Administration of the US Department of Transportation and all laws, regulations, guidelines, and provisions of the financial assistance agreement apply to this Contract and are incorporated by reference as if fully set forth herein.

C. Contractor shall at all times comply with all applicable federal laws and regulations, including without limitation FTA regulations, policies, procedures and directives, including those listed directly or by reference in Applicable Grant Agreements between Metro and FTA, as they may be amended or

promulgated from time to time during the term of this Contract collectively "Federal Requirements". These Federal Requirements may change and the changed Federal Requirements will apply to this Contract as required unless the Federal Government determines otherwise. Contractor's failure to so comply with the Federal Requirements shall constitute a material breach of this Contract.

RR-07 ENERGY CONSERVATION REQUIREMENTS

A. Applicability

This Article applies to all federally funded contracts.

B. Contractor shall comply with mandatory standards and policies relating to energy efficiency which are contained in the state energy conservation plan issued in compliance with the Energy Policy and Conservation Act 42 USC §6321 et seq.

RR-08 CIVIL RIGHTS REQUIREMENTS *

A. Applicability

This Article applies to all federally funded contracts.

B. Nondiscrimination - In accordance with Title VI of the Civil Rights Act, as amended, 42 U.S.C. § 2000d, section 303 of the Age Discrimination Act of 1975, as amended, 42 U.S.C. § 6102, section 202 of the Americans with Disabilities Act of 1990, 42 U.S.C. § 12132, and Federal transit law at 49 U.S.C. § 5332, Contractor shall not discriminate against any employee or applicant for employment because of race, color, creed, national origin, sex, age, or disability. In addition, Contractor shall comply with applicable Federal implementing regulations and other implementing requirements FTA may issue.

In addition to any other remedies under this Contract, in the event of the Contractor's noncompliance with the nondiscrimination provisions of this agreement, the California Department of Transportation shall impose such sanctions as it or the FHWA may determine to be appropriate, including but not limited to:

1. Withholding of payments to Contractor under the Contract within a reasonable period of time, not to exceed 90 days; and/or

2. Cancellation, termination or suspension of the Contract, in whole or in part.

C. Equal Employment Opportunity

(a) Race, Color, Creed, National Origin, Sex - In accordance with Title VII of the Civil Rights Act, as amended, 42 U.S.C. § 2000e, and Federal transit

laws at 49 U.S.C. § 5332, Contractor shall comply with all applicable equal employment opportunity requirements of U.S. Department of Labor (U.S. DOL) regulations, "Office of Federal Contract Compliance Programs, Equal Employment Opportunity, Department of Labor," 41 C.F.R. Parts 60 et seq. , (which implement Executive Order No. 11246, "Equal Employment Opportunity," as amended by Executive Order No. 11375, "Amending Executive Order 11246 Relating to Equal Employment Opportunity," 42 U.S.C. § 2000e note), and with any applicable Federal statutes, executive orders, regulations, and Federal policies that may in the future affect activities undertaken in the course of the Contract. Contractor shall take affirmative action to ensure that applicants are employed, and that employees are treated during employment, without regard to their race, color, creed, national origin, sex, or age. Such action shall include, but not be limited to, the following: employment, upgrading, demotion or transfer, recruitment or recruitment advertising, layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. In addition, Contractor shall comply with any implementing requirements FTA may issue.

(b) Age - In accordance with section 4 of the Age Discrimination in Employment Act of 1967, as amended, 29 U.S.C. § 623 and Federal transit law at 49 U.S.C. § 5332, Contractor shall refrain from discrimination against present and prospective employees for reason of age. In addition, Contractor shall comply with any implementing requirements FTA may issue.

(c) Disabilities - In accordance with section 102 of the Americans with Disabilities Act, as amended, 42 U.S.C. § 12112, Contractor shall comply with the requirements of U.S. Equal Employment Opportunity Commission, "Regulations to Implement the Equal Employment Provisions of the Americans with Disabilities Act," 29 C.F.R. Part 1630, pertaining to employment of persons with disabilities. In addition, Contractor shall comply with any implementing requirements FTA may issue.

RR-09 NO GOVERNMENT OBLIGATION TO THIRD PARTIES *

A. Applicability

This Article applies to all federally funded contracts.

B. Notwithstanding any concurrence by the Federal Government in or approval of the solicitation or award this Contract, absent the express written consent by the Federal Government, the Federal Government is not a party to this Contract and shall not be subject to any obligations or liabilities to Metro, Contractor, or any other party (whether or not a party to that Contract) pertaining to any matter resulting from this Contract.

Contractor shall include this Article in each Subcontract and shall not modify the Article, except to identify the Subcontractor who will be subject to its provisions.

RR-10 PROGRAM FRAUD AND FALSE OR FRAUDULENT STATEMENTS OR RELATED ACTS *

A. Applicability

This Article applies to all federally funded contracts.

B. The provisions of the Program Fraud Civil Remedies Act of 1986, as amended, 31 U.S.C. § 3801 et seq. and U.S. DOT regulations, "Program Fraud Civil Remedies," 49 C.F.R. Part 31, shall apply to actions pertaining to this Contract. Upon execution of this Contract, Contractor certifies or affirms the truthfulness and accuracy of any statement it has made, it makes, it may make, or causes to be made, pertaining this Contract or the FTA assisted project for which this Contract work is being performed. In addition to other penalties that may be applicable, Contractor further acknowledges that if it makes, or causes to be made, a false, fictitious, or fraudulent claim, statement, submission, or certification, the Federal Government reserves the right to impose the penalties of the Program Fraud Civil Remedies Act of 1986 on Contractor to the extent the Federal Government deems appropriate.

C. Contractor also acknowledges that this Contract is connected with a project that is financed in whole or in part with Federal assistance originally awarded by FTA under the authority of 49 U.S.C. § 5307 and if it makes, or causes to be made, a false, fictitious, or fraudulent claim, statement, submission, or certification to the Federal Government, the Government reserves the right to impose the penalties of 18 U.S.C. § 1001 and 49 U.S.C. § 5307(n)(1) on Contractor, to the extent the Federal Government deems appropriate.

D. Contractor shall include this Article in each subcontract financed in whole or in part with Federal assistance provided by FTA. Contractor shall not modify the Article, except to identify the Subcontractor who will be subject to the provisions.

RR-11 SUSPENSION AND DEBARMENT*

A. Applicability

This article applies to federally funded contracts and subcontracts at any level expected to equal or exceed $25,000 as well as any contract or subcontract (at any level) for Federally required auditing services.

B. This Contract is a covered transaction for purposes of 49 CFR Part 29. As such, Contractor shall verify that none of the Contractor, its principals, as defined at 49 CFR 29.995, or affiliates, as defined at 49 CFR 29.905, are excluded or disqualified as defined at 49 CFR 29.940 and 29.945.

Contractor shall comply with 49 CFR 29, Subpart C and shall include the requirement to comply with 49 CFR 29, Subpart C in any lower tier covered transaction it enters into.

C. By entering into this Contract, Contractor certifies that it shall comply with the requirements of 49 CFR 29, Subpart C throughout the period of this Contract.

This certification is a material representation of fact relied upon by Metro. If it is later determined that Contractor knowingly rendered an erroneous certification, in addition to remedies available to Metro, the Federal Government may pursue available remedies, including but not limited to suspension and/or debarment .

RR-12 RECYCLED PRODUCTS

A. Applicability

This Article applies to federally funded operations/management, construction, or materials & supplies contracts for items designated by the Environmental Protection Agency, when procuring $10,000 or more per year.

B. To the extent practicable and economically feasible, a competitive preference shall be given for products and services that conserve natural resources and protect the environment and are energy efficient.

RR-13 CLEAN WATER AND CLEAN AIR REQUIREMENTS*

A. Applicability

This Article applies to all federally funded contracts over $100,000.

B. CLEAN WATER REQUIREMENTS

Contractor shall comply with all applicable standards, orders or regulations issued pursuant to the Federal Water Pollution Control Act, as amended, 33 U.S.C. 1251 et seq., and all applicable clean water standards of the State of California and any state or local agency having jurisdiction. Contractor shall report each violation to Metro. Metro will, in turn, report each violation as required to FTA and the appropriate EPA Regional Office, and all other agencies having jurisdiction.

C. CLEAN AIR

Contractor shall comply with all applicable standards, orders or regulations issued pursuant to the Clean Air Act, as amended, 42 U.S.C. §§ 7401 et seq. and all applicable Clean Air Standards of the State of California or any state or local agency having jurisdiction. Contractor shall report each violation to Metro. Metro will, in turn, report each violation as required to FTA, the appropriate EPA Regional Office and all other agencies having jurisdiction.

RR-14 COMPLIANCE WITH FEDERAL LOBBYING POLICY *

A. Applicability

The following Article applies to federally funded contracts over $100,000.

B. The Byrd Anti-Lobbying Amendment, 31 U.S.C. 1352, requires that Contractors who apply or bid for an award of $100,000 or more shall file the certification required by 49 CFR Part 20, attached hereto as the certification entitled, "Certification of Compliance with Federal Lobbying Requirements." As set forth in the certifications, each tier of subcontractors shall certify to the tier above that it will not and has not used Federal appropriated funds to pay any person or organization for influencing or attempting to influence an officer or employee of any agency, a member of Congress in connection with obtaining any Federal contract, grant or any other award covered by 31 U.S.C. 1352. Each tier shall also disclose the name of any registrant under the Lobbying Disclosure Act of 1995 who has made lobbying contacts on its behalf with non-Federal funds with respect to that Federal contract, grant or award covered by 31 U.S.C. 1352. Such disclosures shall be forwarded from tier to tier up to Metro.

RR-15 BUY AMERICA *

A. Applicability

The following Article applies to federally funded rolling stock purchase and construction contracts over $100,000 and to contracts over $100,000 for materials & supplies for steel, iron, or manufactured products.

B. Contractor shall comply with 49 U.S.C. 5323(j) and 49 CFR Part 661, which provide that Federal funds may not be obligated unless steel, iron, and manufactured products used in FTA-funded projects are produced in the United States, unless a waiver has been granted by FTA or the product is subject to a general waiver.

Metro may investigate Contractor's, any Subcontractor's, and any Supplier's compliance with this Article. If an investigation is initiated, Contractor, Subcontractor, or Supplier shall document its compliance, in accordance with 49 CFR 661.15, and cooperate with the investigation. Contractor shall incorporate the Buy America conditions set forth in this Article in every subcontract or purchase order and shall enforce such conditions.

RR-16 CARGO PREFERENCE*

A. Applicability

The following Article applies to federally funded contracts involving equipment, materials, or commodities which may be transported by ocean vessels

B. USE OF UNITED STATES FLAG VESSELS

Contractor shall use privately owned United States-Flag commercial vessels to ship at least 50 percent of the gross tonnage (computed separately for dry bulk carriers, dry cargo liners, and tankers) involved, whenever shipping any equipment, material, or commodities pursuant to this Contract to the extent such vessels are available at fair and reasonable rates for United States-Flag commercial vessels

Contractor shall furnish within 20 working days following the date of loading for shipments originating within the United States or within 30 working days following the date of leading for shipments originating outside the United States, a legible copy of a rated, "on-board" commercial ocean bill-of -lading in English for each shipment of cargo described in the preceding paragraph to the Division of National Cargo, Office of Market Development, Maritime Administration, Washington, DC 20590 and to the Metro (through Contractor in the case of a subcontractor's bill-of-lading.)

Contractor shall include these requirements in all subcontracts issued pursuant to this Contract when the subcontract may involve the transport of equipment, material, or commodities by ocean vessel.

RR-17 FLY AMERICA

A. Applicability

This Article applies to federally funded contracts if the contract or subcontracts may involve the international transportation of goods, equipment, or personnel by air.

B. Contractor agrees to comply with 49 U.S.C. 40118 (the “Fly America” Act) in accordance with the General Services Administration’s regulations at 41 CFR Part 301-10, which provide that recipients and subrecipients of Federal funds and their contractors are required to use U.S. Flag air carriers for U.S Government-financed international air travel and transportation of their personal effects or property, to the extent such service is available, unless travel by foreign air carrier is a matter of necessity, as defined by the Fly America Act. Contractor shall submit, if a foreign air carrier was used, an appropriate certification or memorandum adequately explaining why service by a U.S. flag air carrier was not available or why it was necessary to use a foreign air carrier and shall, in any event, provide a certificate of compliance with the Fly America requirements. Contractor agrees to include the requirements of this section in all subcontracts that may involve international air transportation.

RR-18 CONTRACT WORK HOURS AND SAFETY STANDARDS ACT *

A. Applicability

This Article applies to federally funded construction contracts over $100,000 (including ferry vessels), rolling stock purchases over $100,000 and to operations/management contracts over $100,000 (except transportation services)

B. Pursuant to the Labor Standards Provisions Applicable to Non-construction Contracts subject to the Federal Contract Work Hours and Safety Standards Act, 40 U.S.C.A. § 327 through 332 as implemented by U.S. Department of Labor regulations, 29 CFR 5.5 (b) and (c) Contractor and Subcontractor's contracting for any part of the Contract work shall comply with the following:

1. **Overtime requirements** – Neither Contractor nor any Subcontractor contracting for any part of the Contract work that requires or involves the employment of laborers or mechanics shall require or permit any such laborer or mechanic in any workweek in which he or she is employed on such work to work in excess of forty hours in such workweek unless such laborer or mechanic receives compensation at a rate not less than one and one-half times the basic rate of pay for all hours worked in excess of forty hours in such workweek.

2. **Violation; liability for unpaid wages; liquidated damages** – In the event of any violation of the Article set forth in paragraph 1 of this Section Contractor and any Subcontractor responsible therefore shall be liable for the unpaid wages. In addition, Contractor and Subcontractor shall be liable to the United States for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer or mechanic, including watchmen and guards, employed in violation of the Article set forth in paragraph 1 of this Section, in the sum of ten dollars ($10) for each calendar day on which such individual was required or permitted to work in excess of the standard workweek of forty hours without payment of the overtime wages required by the Article set forth in paragraph 1 of this Section.

3. **Withholding for unpaid wages and liquidated damages** – Metro shall upon its own action or upon written request of an authorized representative of the Department of Labor withhold or cause to be withheld, from any monies payable on account of work performed by Contractor or Subcontractor under the Contract or any other Federal contract with Contractor, or any other federally-assisted contract subject to the Contract Work Hours and Safety Standards Act, which is held by Contractor, such sums as may be determined to be necessary to satisfy any liabilities of Contractor or Subcontractor for unpaid wages and liquidated damages as provided in the Article set forth in paragraph 2 of this Section.

4. **Subcontracts** – Contractor or Subcontractor shall insert in any Subcontracts the Articles set forth in this Section and also a Article requiring the Subcontractors to include these Articles in any lower tier Subcontracts. Contractor shall be responsible for compliance by any Subcontractor or lower tier Subcontractor with the Articles set forth in this Section.

5. **Payrolls and basic records** – The records to be maintained hereinabove shall be made available by Contractor or Subcontractor for inspection, copying, or transcription by Metro and U.S. Dept. of Labor. Contractor and Subcontractor shall maintain payrolls and basic records during the course of the work and shall preserve them for a period of three (3) years from the completion of the Contract for all laborers and mechanics, including guards and watchmen, working on the Contract. Such records shall contain the name and address of each such employee, social security number, correct classifications, hourly rates of wages paid, daily and weekly number of hours worked, deductions made and actual wages paid.

RR-19 SEISMIC SAFETY

A. Applicability

This Article applies to federally funded Architect & Engineer contracts for the design of new buildings or additions to existing buildings and to contracts for the construction of new buildings or additions to existing buildings.

B. Any new building or addition to an existing building shall be designed and constructed in accordance with the standards for Seismic Safety required in Department of Transportation Seismic Safety Regulations 49 CFR Part 41 and Contractor shall certify to compliance to the extent required by the regulation. Contractor shall ensure that all work performed under this Contract, including work performed by a Subcontractor, is in compliance with the standards required by the Seismic Safety Regulations and the certification of compliance issued on the project.

RR-20 ADA ACCESS

A. Applicability

This Article applies to federally funded Architect & Engineer, Operations/Management, Rolling Stock Purchase, and Construction contracts

B. Access Requirements for Persons with Disabilities

Contractor shall comply with:

1. The requirements of 49 U.S.C. § 5301(d), which states the Federal policy that elderly persons and persons with disabilities have the same right as other persons to use mass transportation service and facilities, and that

special efforts shall be made in planning and designing those services and facilities to implement that policy;

2. All applicable requirements of section 504 of the Rehabilitation Act of 1973, as amended, 29 U.S.C. § 794, which prohibits discrimination on the basis of handicaps;

3. The Americans with Disabilities Act of 1990 (ADA), as amended, 42 U.S.C. § 12101 *et seq*., which requires that accessible facilities and services be made available to persons with disabilities, including any subsequent amendments to that Act;

4. The Architectural Barriers Act of 1968, as amended, 42 U.S.C. §§ 4151 *et seq*., which requires that buildings and public accommodations be accessible to persons with disabilities, including any subsequent amendments to that Act; and

5. All applicable requirements of the following regulations and any subsequent amendments thereto:

   (1) U.S. DOT regulations, "Transportation Services for Individuals with Disabilities (ADA)," 49 C.F.R. Part 37;

   (2) U.S. DOT regulations, "Nondiscrimination on the Basis of Handicap in Programs and Activities Receiving or Benefiting from Federal Financial Assistance," 49 C.F.R. Part 27;

   (3) Joint U.S. Architectural and Transportation Barriers Compliance Board (U.S. ATBCB)/U.S. DOT regulations, "Americans With Disabilities (ADA) Accessibility Specifications for Transportation Vehicles," 36 C.F.R. Part 1192 and 49 C.F.R. Part 38;

   (4) U.S. DOJ regulations, "Nondiscrimination on the Basis of Disability in State and Local Government Services," 28 C.F.R. Part 35;

   (5) U.S. DOJ regulations, "Nondiscrimination on the Basis of Disability by Public Accommodations and in Commercial Facilities," 28 C.F.R. Part 36;

   (6) U.S. General Services Administration (U.S. GSA) regulations, "Accommodations for the Physically Handicapped," 41 C.F.R. Subpart 101-19;

   (7) U.S. Equal Employment Opportunity Commission, "Regulations to Implement the Equal Employment Provisions of the Americans with Disabilities Act," 29 C.F.R. Part 1630;

   (8) U.S. Federal Communications Commission regulations, "Telecommunications Relay Services and Related Customer Premises Equipment for the Hearing and Speech Disabled," 47 C.F.R. Part 64, Subpart F; and

(9) U.S. ATBCB regulations, "Electronic and Information Technology Accessibility Standards," 36 C.F.R. Part 1194; and

(10) FTA regulations, "Transportation for Elderly and Handicapped Persons," 49 C.F.R. Part 609;

(11) Any implementing requirements FTA may issue.

RR-21 ALCOHOL AND DRUG-FREE WORKPLACE PROGRAM *

A. Applicability

This Article applies to federally funded contracts for transit operations.

B. FTA Prevention of Alcohol Misuse and Prohibited Drug Use in Transit Operations Regulations

Contractor and its Subcontractors shall comply with the FTA anti-drug and alcohol misuse regulations (49 CFR Part 655) and the U.S. Department of Transportation (DOT) Procedures for Transportation Workplace Drug and Alcohol Testing Programs (49 CFR Part 40) to the full extent that they are, by their terms, applicable to Contractor and its Subcontractors. The regulations apply to all “contractors” that have “covered employees” that perform “safety sensitive functions” as those terms are defined in the regulations.

C. Certificate of Compliance

The CERTIFICATE OF COMPLIANCE WITH 49 CFR PARTS 655, PREVENTION OF ALCOHOL MISUSE AND PROHIBITED DRUG USE IN TRANSIT, submitted by Contractor prior to award, is incorporated as part of the Contract Documents.

D. Drug and Alcohol Testing Program

In the event that any part of the Work under this Contract falls within the scope of 49 CFR Part 655, Contractor, and its Subcontractors (as applicable), shall implement all programs required under the regulations, including without limitation, a Drug and Alcohol Testing Program and an anti-drug use and alcohol misuse program, in full compliance with the regulations.

E. Alcohol and Drug Free Workplace Program

In addition to the above, for Work performed on Metro property, Contractor shall provide an Alcohol and Drug-free Workplace Program in accordance with FTA requirements found at **http://transit-safety.volpe.dot.gov/Safety/DATesting.asp**.

RR-22 TRANSIT EMPLOYEE PROTECTIVE ARRANGEMENTS *

A. Applicability

Subject to the limitations in Sections B, C and D, this Article applies if this Contract involves transit operations to be performed by employees of a Contractor recognized by FTA to be a transit operator, and if FTA has determined that it is financed in whole or in part with Federal assistance.

B. General Transit Employee Protective Requirements

If FTA has determined that this Contract involves transit operations financed in whole or in part with Federal assistance (other than Federal assistance authorized by 49 U.S.C. § 5310(a)(2) or 49 U.S.C. § 5311), and if the U.S. Secretary of Transportation has determined that the employee protective requirements of 49 U.S.C. § 5333(b) are necessary or appropriate for Metro under this Contract, then Contractor shall perform the transit operations work under the Contract in compliance with terms and conditions, (a) determined by the U.S. Secretary of Labor to meet the employee protective requirements of 49 U.S.C. A 5333(b), and U.S. Department of Labor ("U. S. DOL") guidelines at 29 C.F.R. Part 215, and any amendments thereto, and (b) stated in a U. S. DOL letter of certification to FTA, the date of which is set forth in the applicable Grant Agreement or Cooperative Agreement with Metro, and which is incorporated in the Form of Contract as a Contract Document entitled "U. S. DOL Certification".

C. Transit Employee Protective Requirements for Projects Authorized by 49 U.S.C. § 5310(a)(2) for Elderly Individuals and Individuals with Disabilities

If FTA has determined that this Contract involves transit operations financed in whole or in part with Federal assistance authorized by 49 U.S.C. § 5310(a)(2), and if the U.S. Secretary of Transportation has determined or determines in the future that the employee protective requirements of 49 U.S.C. § 5333(b) are necessary or appropriate for Metro under the Contract, Contractor shall perform the Work in compliance with the terms and conditions determined, (a) by the U.S. Secretary of Labor to meet the requirements of 49 U.S.C. § 5333(b), U.S. DOL guidelines at 29 C.F.R. Part 215, and any amendments thereto, and (b) stated in the U.S. DOL's letter of certification to FTA, the date of which is set forth in the applicable Grant Agreement or Cooperative Agreement with Metro, and which is incorporated in the Form of Contract as a Contract Document entitled "U. S. DOL Certification".

D. Transit Employee Protective Requirements for Projects Authorized by 49 U.S.C. § 5311 in Nonurbanized Areas

If FTA has determined that this Contract involves transit operations financed in whole or in part with Federal assistance authorized by 49 U.S.C. § 5311, Contractor shall comply with the terms and conditions of the Special Warranty for the Nonurbanized Area Program agreed to by the U.S. Secretaries of

Transportation and Labor, dated May 31, 1979, and the procedures implemented by U.S. DOL or any revision thereto.

E. Indemnity

Contractor shall defend, indemnify and hold harmless Metro, and its Board Members, employees and agents from and against all liability, claims, demands actions, costs, judgments, penalties, damages, losses and expenses arising out of or in connection with Contractor's failure to comply with or failure to carry out its responsibilities under all applicable provisions of Sections B, C and D of this Article.

RR-23 CHARTER SERVICE OPERATIONS

A. Applicability

This Article applies to federally funded Operational Service Contracts.

B. Contractor shall comply with 49 U.S.C. 5323(d) and 49 CFR Part 604, which provides that recipients and subrecipients of FTA assistance are prohibited from providing charter service using federally funded equipment or facilities if there is at least one private charter operator willing and able to provide the service, except under one of the exceptions at 49 CFR 604.9. Any charter service provided under one of the exceptions must be "incidental," i.e., it must not interfere with or detract from the provision of mass transportation.

RR-24 SCHOOL BUS REQUIREMENTS

A. Applicability

This Article applies to federally funded Operational Service Contracts

B. Pursuant to 69 U.S.C. 5323(f) and 49 CFR Part 605, recipients and subrecipients of FTA assistance may not engage in school bus operations exclusively for the transportation of students and school personnel in competition with private school bus operators unless qualified under specified exemptions. When operating exclusive school bus service under an allowable exemption, recipients and subrecipients may not use federally funded equipment, vehicles, or facilities.

RR-25 FEDERAL PATENT AND DATA RIGHTS*

A. Applicability

This Article applies to each contract involving experimental, developmental or research work and for which the purpose of the FTA grant is to finance the development of a product or information.

B. Subject Data

The term "Subject Data" used in this Article means recorded information, whether or not copyrighted, that is delivered or specified to be delivered under the Contract. The term includes graphic or pictorial delineation in media such as drawings or photographs; text in specifications or related performance or design-type documents; machine forms such as punched cards, magnetic tape, or computer memory printouts; and information retained in computer memory. Examples include, but are not limited to: computer software, engineering drawings and associated lists, specifications, standards, process sheets, manuals, technical reports, catalog item identifications, and related information. The term "Subject Data" does not include financial reports, cost analyses, and similar information incidental to contract administration.

C. Restrictions on Subject Data

The following restrictions apply to all Subject Data first produced in the performance of the Contract:

1. Except for its own internal use, metro or Contractor may not publish or reproduce Subject Data in whole or in part, or in any manner or form, nor may metro or Contractor authorize others to do so, without the written consent of the Federal Government, until such time as the Federal Government may have either released or approved the release of such data to the public; this restriction on publication, however, does not apply to any contract with an academic institution.

2. In accordance with 49 C.F.R. § 18.34 and 49 C.F.R. § 19.36, the Federal Government reserves a royalty-free, non-exclusive and irrevocable license to reproduce, publish, or otherwise use, and to authorize others to use, for "Federal Government purposes," any Subject Data or copyright described in subparagraphs C.2(a) and C.2(b) of this Paragraph C.2. As used in the previous sentence, "for Federal Government purposes," means use only for the direct purposes of the Federal Government. Without the copyright owner's consent, the Federal Government may not extend its Federal license to any other party.

   (a) Any Subject Data developed under the Contract, whether or not a copyright has been obtained; and

   (b) Any rights of copyright purchased by metro or Contractor using Federal assistance in whole or in part provided by FTA.

3. When FTA awards Federal assistance for experimental, developmental, or research work, it is FTA's general intention to increase transportation knowledge available to the public, rather than to restrict the benefits resulting from the work to participants in that work. Therefore, unless FTA determines otherwise, Metro and Contractor performing experimental, developmental, or research work required by the Contract shall permit FTA to make available to the public, either FTA's license in the copyright

to any Subject Data developed in the course of the Contract, or a copy of the Subject Data first produced under the Contract for which a copyright has not been obtained. If the experimental, developmental, or research work, which is the subject of the Contract, is not completed for any reason whatsoever, all data developed under the Contract shall become Subject Data and shall be delivered as the Federal Government may direct. This Paragraph C.3 shall not apply to adaptations of automatic data processing equipment or programs for Metro's or Contractor's use whose costs are financed in whole or in part with Federal assistance provided by FTA for transportation capital projects.

4. Unless prohibited by state law, upon request by the Federal Government, Metro and Contractor shall indemnify, save, and hold harmless the Federal Government, its officers, agents, and employees acting within the scope of their official duties against any liability, including costs and expenses, resulting from any willful or intentional violation by Metro or Contractor of proprietary rights, copyrights, or right of privacy, arising out of the publication, translation, reproduction, delivery, use, or disposition of any data furnished under the Contract. Neither Metro nor Contractor shall be required to indemnify the Federal Government for any such liability arising out of the wrongful act of any employee, official, or agent of the Federal Government

5. Nothing contained in this Article shall imply a license to the Federal Government under any patent or be construed as affecting the scope of any license or other right otherwise granted to the Federal Government under any patent.

6. Data developed by Metro or Contractor and financed entirely without using Federal assistance provided by the Federal Government that has been incorporated into work required by the Contract is exempt from the requirements of Paragraphs 2, 3, and 4 of this Article, provided that Metro or Contractor identifies that data in writing at the time of delivery of the Contract Work.

D. Patent Rights

If any invention, improvement, or discovery is conceived or first actually reduced to practice in the course of or under the Contract, and that invention, improvement, or discovery is patentable under the laws of the United States of America or any foreign country, Metro and Contractor shall take actions necessary to provide immediate notice and a detailed report to the party at a higher tier until FTA is ultimately notified.

E. Provision of Rights in Invention to Federal Government

Unless the Federal Government later makes a contrary determination in writing, irrespective of Contractor's status (a large business, small business, state government or state instrumentality, local government, nonprofit organization, institution of higher education, individual), Metro and Contractor shall take the necessary actions to provide, through FTA, those rights in that

invention due the Federal Government as described in U.S. Department of Commerce regulations, "Rights to Inventions Made by Nonprofit Organizations and Small Business Firms Under Government Grants, Contracts and Cooperative Agreements," 37 C.F.R. Part 401.

RR-26 PUBLIC WORKS CONTRACT REGISTRATION LAW

This Contract is subject to the provision of California Law regarding Public Works, including, but not limited to California Labor Code. Among other things, the Legislature has established a public works contractor registration program to replace prior Compliance Monitoring Unit (CMU) and Labor Compliance Program (LCP) requirements for bond-funded and other specified public works projects.

Contractors seeking to perform work on Metro's state/local and federally funded public works contracts are now subject to registration requirements in order to bid or perform work on state and local public works projects (as defined under the Labor Code).

Contractors must meet a set of minimum qualifications to be registered as eligible to bid and work on state and local public works projects. Those qualifications are currently:

- Must have workers' compensation coverage for any employees and only use subcontractors who are registered public works contractors.
- Must have Contractors State License Board license if applicable to trade.
- Must have no delinquent unpaid wage or penalty assessments owed to any employee or enforcement agency.
- Must not be under federal or state debarment.
- Must not be in prior violation of this registration requirement once it becomes effective. However, for the first violation in a 12 month period, a contractor may still qualify for registration by paying an additional penalty (See L.C. Section 1725.5 for current requirements).

Metro shall not accept any bid nor award any contract without proof of the contractor's and subcontractor's current registration.

The California Department of Industrial Relations (DIR) will post a list of registered contractors and subcontractors on its website so that awarding bodies and contractors will be able to comply with requirements to only use registered contractors and subcontractors.

This Contract is subject to compliance monitoring and enforcement by the DIR.

Contractors and subcontractors on *all* public works projects will be required to submit electronic certified payroll records (CPRs) to the Labor Commissioner

unless excused from this requirement. Contractor and subcontractors are still required to submit CPRs directly to Metro, as well.

Prime contractors will be required to ensure that their subcontractors subject to this requirement are properly registered with the DIR.

RR-27 COMPLIANCE WITH CALIFORNIA HEALTH AND SAFETY CODE (HSC) §25250.51

a. Applicability

This article applies to all contracts containing motor vehicle brake friction materials as listed in the sections in this regulatory requirement.

b. Contractor shall comply with California SB 346 adding §25250.51 to the California Health & Safety Code as follows:

1. On or after January 1, 2014, any motor vehicle brake friction materials containing any of the following constituents in an amount that exceeds the following concentrations shall not be sold in this state:

   i. Cadmium and its compounds: 0.01% by weight;
   ii. Chromium (VI)- salts: 0.1% by weight;
   iii. Lead and its compounds: 0.1% by weight;
   iv. Mercury and its compounds: 0.1% by weight; and
   v. Asbestiform fibers: 0.1% by weight

2. The brake constituents shall not contain any Lead or Asbestos.

END OF REGULATORY REQUIREMENTS

SPECIAL PROVISIONS

All Articles, Subarticles, or portions of the Contract noted by a asterisk (*) shall be included in all Subcontracts of any tier.

SP-01 DEFINITIONS

The following are definitions of special terms used in this Contract.

Auxiliary Power System	Provides single or three phase power for functions other than propulsion.
Bus or Buses	The entire Vehicle and all Units and parts thereof and shall include Base Order Vehicles and Option Vehicles. Also referred to as Equipment in the General Conditions.
Bus Fleet	Buses delivered and accepted of a like type, size and configuration are considered to be a Bus Fleet. For purposes of fleet defect and warranty claims a bus fleet consists of those buses that have been accepted and entered into service at the time of fleet defect or warranty claim notification and does not include incomplete or unfinished buses.
Business days	Monday through Friday excluding LACMTA holidays. As of 1/1/10, LACMTA holidays are New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving and Christmas Day.
Charging/Fueling System	Any charging or fueling system or sub-system required to fuel or recharge the vehicle batteries whether installed or onboard the vehicle or installed at MTA facility.
CNG	Compressed natural gas. Mixtures of hydrocarbon gases and vapors consisting principality of methane in gaseous form that has been compressed for use as a vehicle fuel.
Configuration and Performance Approval	A determination by LACMTA, as described in the Section entitled CONFIGURATION AND PERFORMANCE APPROVAL, that the Pilot Vehicle Delivered and tendered for Acceptance conform to the Specification and has been Accepted by LACMTA.
Defect	Patent or latent flaw, in the design, material or workmanship of the Vehicle, or any Unit or part thereof, which causes a malfunction or failure, or Contractor's failure to meet the specifications and/or General Technical Requirements of this Contract that causes a Vehicle, or any Unit or part thereof to cease operating or causes it to operate in a degraded mode. The term Defect also refers to the failure that is caused by the Defect, and is sometimes also referred to as a Failure. See also Deficiency in the General Conditions.
Delivery, Delivering, or Delivered	Presentation of a Vehicle to LACMTA at the LACMTA Support Service Center for the purposes of inspection
First Article Inspection or "FAI"	Inspection by LACMTA of a Vehicle, Unit, system, subsystem, component to ascertain Contractor's

	engineering and manufacturing compliance with the Technical Specifications and drawings, or part.
First Article Vehicle (FAV)	Designation for one of the first ten (10) Vehicles produced on the production line. The First Article may be used as a reference point for resolving contractual issues between the Manufacturer and LACMTA.
Labor Rate	LACMTA's current straight time wage scale for a Warrant Equipment Mechanic (WEM) or an A Mechanic including fringe benefits and overhead calculated at 80% of the hourly rate. As of July 2016, the rate for an A Mechanic is $60.77 per hr. Labor Rate adjusts each six months and the Contractor will pay the adjusted Labor Rate.
Liens	Any and every lien of any kind whatsoever against the Work, any monies due or to become due from LACMTA to Contractor, and/or any other property of LACMTA, for or on account of the Work, including any Public Lien.
Low Voltage Generation and Distribution	Provides 12 or 24 volt DC to properly charge and maintain the charge on low voltage batteries as well as provide power for a variety of bus systems including; lighting, multiplex and other control modules.
Major Systems	The engine, transmission, steering and axles, brakes, HVAC equipment, door systems including wheelchair ramp, lighting, electrical, Vehicle body, destination sign and air system.
Notice of Acceptance	Notice given by LACMTA to the Contractor that a Vehicle, including a Pilot Base or Option Vehicle, has passed all required tests and is being accepted by LACMTA into revenue service.
Notice of Exercise of Options	The Notice to the Contractor from LACMTA that LACMTA is exercising its option to purchase additional Vehicles under the provisions defined in the Section entitled Option Vehicles.
Operational Life	The intended engineered/design lifespan of equipment.
Original Equipment Manufacturer (OEM)	The manufacturer of the original equipment on a Vehicle or in any Unit or Part thereof. An OEM Standard is a standard, requirement, or recommendation of the OEM which shall apply to all similar equipment not manufactured by the OEM.
Pilot Vehicle	Vehicle manufactured following issuance of the Notice to Proceed, which after acceptance by LACMTA pursuant to the Section entitled, "PILOT VEHICLE" becomes the standard for production Vehicles that follow.

Propulsion Power Assembly (PPA) - CNG	The Propulsion Power Assembly shall include but not be limited to the following: a) Engine cradle (if applicable) b) Engine c) Transmission d) Turbocharger e) Electric Cooling System f) Power Generator (for HVAC and Electric Accessories g) Starter h) Heat Exchanger (transmission and engine) i) Oil filters (bypass filter if used) j) Muffler / Catalyst unit k) Any other component not mentioned above but required for the satisfactory and legal operation of the engine.
Primary Propulsion Unit (PPU) - ZEB	The Primary Power Unit shall include but not be limited to the following: a) Traction Motor b) Transmission/Gearbox c) Radiator d) Electric System Controller e) A/C Compressor f) Charging Systems (Low/High Voltage) g) Cooling Systems h) Oil filter (bypass filter if used) i) Air Compressor j) Auxiliary Inverter Any other component not mentioned above but required for the satisfactory and legal operation of the Bus.
Preventive Maintenance Program	Preventive maintenance program as referenced throughout this specification with the abbreviation “PMP”.
Project Manager	LACMTA’s Authorized Representative designated to manage the project (except LACMTA’s Authorized Representative for Contract administration), and includes the Project Manager’s duly authorized representative and any successor or successors duly appointed or any deputy or substitute who shall be appointed as an Authorized Representative by LACMTA, provided Contractor shall have received Notice of such designation or appointment.
Related Defect	Damage inflicted on a Vehicle or any Unit, part, component or subsystem as a direct result of a Defect.
Subcontractor	An individual or organization that enters into a Contract to furnish materials, labor and services or any combination thereof in connection with the Work directly for or in behalf of the Contractor and whether or not in privity of Contract with the Contractor or another Subcontractor of any tier.
Supplier	Any manufacturer, company, or agency, providing Units, components, subassemblies or parts for inclusion in the

	Vehicle (supplier items shall require qualifications by type and acceptance tests in accordance with requirements defined in the Quality Assurance Section).
Traction Motor(s)	Any motor drive system(s) whether axle or chassis mounted.
Unit	A term sometimes used to either individually or collectively to refer to a system, subsystem, component, assembly, subassembly or part of a Vehicle. Where applicable, the specific terms Vehicle, system, subsystem, and part may be used to describe specific Units of the Vehicle. See also Lowest Level Replaceable Unit defined in Warranty Requirements.
Vehicle	Another term for the entire Bus and all Units and parts thereof and shall include Base Order Vehicles and Option Vehicles. Also referred to as Equipment in the General Conditions.
Working Drawings or Drawings	All drawings necessary or required for the prosecution of the Work
Work Program	A Work Program includes specific repair procedures and/or work instructions, and a schedule for completion of such repairs (e.g. Fleet Defects).

SP-02 DBE PARTICIPATION

The Contractor must have at all times an approved or not disapproved, Disadvantaged Business Enterprise (DBE) program on file as a Transit Vehicle Manufacturer (TVM) with U.S. Department of Transportation, Federal Transit Administration (FTA).

Prior to award of any Contract, the Contractor will be required to furnish and complete the certification of compliance with the provisions of 49 CFR Part 26 (Exhibit “C” DBE CERTIFICATION).

SP-03 ORGANIZATIONAL CONFLICTS OF INTEREST*

This Contract is subject to the restrictions against organizational conflicts of interest promulgated by the Federal Transit Administration in FTA Circular 4220.1F dated November 1, 2008 or successor circulars. Contractor and its Subcontractors shall at all times comply with such restriction in connection with the Services it provides to and on behalf of LACMTA. Without limiting the generality of the foregoing, Contractor shall not provide Services to LACMTA, under this Contract, which would constitute or create an organizational conflict of interest, including but not limited to any of the following that could result in a lack of impartiality or impaired objectivity, unequal access to information, and biased ground rules, for this Contract or any other contract for LACMTA:

A. Influenced Specifications or Statement of Work

The Contractor's prior work product, whether it is performed on behalf of LACMTA or another public or private entity, has been relied upon in

establishing, or significantly influenced, the specifications or Statement of Services under this Contract.

B. Opportunity to Create Contracting Opportunities
The Contractor's prior work product, whether it is performed on behalf of LACMTA or another public or private entity, afforded an opportunity for the Contractor to make or influence findings with respect to this Contract.

C. Evaluation of Prior Work Product
The Contractor would be in position to evaluate its own prior work product as part of this Contract, whether the prior work product is performed on behalf of LACMTA or another public or private entity; or as part of this Contract the Contractor would be in a position to assess its prior work product whether or not it was performed on behalf of LACMTA or another public or private entity.

D. Access to Information
The Contractor received confidential or other information as part of the services performed for LACMTA or another public or private entity which provides the Contractor with an unfair competitive advantage to obtain this Contract or another contract with LACMTA.

SP-04 NOTICES AND SERVICE THEREOF*

A. Any Notice legally required to be given by one party to another under the Contract, including but not limited to those regarding interpretation of the Contract or changes thereto, shall be in writing and dated. The Notice shall be signed by the party giving such Notice or by a duly authorized representative of such party.

B. Notices shall not be effective for any purpose whatever unless enclosed in a sealed envelope and transmitted by registered mail or any certifiable delivery service addressed to:

Los Angeles County Metropolitan Transportation Authority
One Gateway Plaza
Los Angeles, CA 90012-2952
Attention: Hernandez, Elizabeth
Contract No.: OP28367-000

C. All Notices to the Contractor will be enclosed in a sealed envelope and transmitted by personal delivery to the Contractor or its authorized representative or by registered mail or any certifiable delivery service addressed as follows:

ELDORADO NATIONAL (CALIFORNIA), INC.
9670 Galena Street
Riverside, CA 92509
Attention: Richard Himes, Contract Administration Manager

D. Any Notice of changes of address shall be given according to the provisions of this Special Provision.

SP-05 APPROVED SUBCONTRACTORS

Subcontractor	Services Performed	DBE/ MBE/ WBE
Six Robblees, Inc.	Alcoa Wheels	
Agility Fuel Systems	CNG Fuel Storage System	
Akzo Nobel Coatings, Inc.	Sikkens Exterior Paint	
Amerex	Methane Gas Detection System	
BAE Systems	High Voltage Belt-Driven Generator	
Berendsen Fluid Power, Inc.	Electric Power Steering	
Cummins, Inc.	CNG Engine	
Dura Automotive Systems	Side Windows	
Engineered Machine Products (EMP)	Electric Cooling Fan	
Firestone Industrial Products	Air Springs	
Freedman	Passenger Seats	
Hanover Displays	Destination Signs and Interior Information Signs	
Harris Battery	Odyssey Batteries	
I/O Controls	Multiplex, Event Data Logger, LED Interior Lighting, LED low beam headlights	
Lift-U, Divison of Hogan Mfg, Inc.	Wheelchair Ramp	
Lucerix International Corp	Exterior Mirrors	
Meritor	Axles	
Mobile Climate Control	Electric HVAC	
PowerEx	Electric Air Compressor	
SafeFleet/Specialty Manufacturing, Inc.	Bumpers	
Sportworks Northwest, Inc.	Bike Rack	
UTC Fire & Security Americas Corporation, Inc - A subsidary of United Technologies Corp (UTX)	MobileView Camera System	
Valley Power Systems, Inc.	Allison Transmission	
Vanner	Equalizer	
Ventura Systems	Electric Passenger Doors	

SP-06 PILOT VEHICLE

The Contractor shall produce **one Pilot Vehicle**. This Vehicle shall be one of the ultimate quantity of the Vehicle order. The Pilot Vehicle shall demonstrate that the Vehicles fully meet all requirements of the Contract. The Pilot Vehicle shall be produced and delivered to LACMTA for a minimum of ninety (90) days prior to the initiation of any production activities for the remaining vehicles unless otherwise authorized in writing by LACMTA. In

the event that non-compliance is identified, LACMTA shall to the extent practicable notify the Contractor of said non-compliance. No later than the end of the ninety-day period, LACMTA shall issue a written report to the Contractor that advises the Contractor of any non-compliance issues and/or any proposed Modifications or changes required on the remaining Vehicles. Contractor shall perform the necessary corrective actions to address the non-compliance issues prior to acceptance of the Pilot Vehicle. Upon LACMTA's acceptance of the Pilot Vehicle, a Notice to Proceed shall be issued for Contractor to proceed with the manufacturing of the production vehicles.

In the event that the Pilot Vehicle does not initially comply with all performance criteria contained in the Technical Specifications, LACMTA shall have the right to retain a portion of any Milestone Payment that may have been established for the Pilot Vehicle. The amount to be withheld shall be based on the lack of compliance and may equal up to the entire Milestone Payment amount for the Pilot Vehicle. This amount shall be withheld until compliance is demonstrated. In the event that the compliance is subsequently determined to be impossible to achieve, LACMTA may require all or a portion of the Milestone Payment for the Pilot Vehicle to be forfeited as a penalty for the non-compliance. The amount of the penalty shall be negotiated by the parties.

SP-07 CONFIGURATION AND PERFORMANCE APPROVAL

In order to assess the Contractor's compliance with the Technical Specifications, LACMTA and the Contractor shall jointly conduct a Configuration and Performance review of the Pilot Vehicle. In addition to the items listed below, the Pilot Vehicle review shall include any items identified for review during the Pre-Production Meeting (see SP-20 Pre-Production Meetings)

LACMTA, as a part of the Configuration and Performance Approval process, may permit certifications to be submitted in lieu of performance based on physical testing (see the Technical Contract Deliverables, in the Technical Specification TS 88.3).

At a minimum, the following dimensional/performance tests shall be included in the Configuration and Performance Approval:

a. Complete electrical system audit.
b. Dimensional requirements audit
c. Seating capacity
d. Water Test
e. Water runoff test
f. Function test of systems/subsystems and components
g. Sound / noise level tests
h. Vehicle top speed
i. Acceleration tests
j. Brake stop tests
k. Airflow tests

l. PA function tests
m. Air/brake system audit
n. Individual axle weight
o. Standee capacity
p. Body deflection tests
q. Silent alarm function test
r. Interior lighting
s. Exterior lighting
t. Gradability test
u. Kneeling system function
v. HVAC pull down/heat
w. Speedometer
x. Outside air infiltration (smoke)
y. Wheelchair Ramps

Engine performance qualification – this test shall be jointly conducted by Contractor and engine manufacturer (including but not limited to: charge air cooler performance, air to boil test, loss of coolant, fuel system electrical inputs, engine protection system).

Transmission performance qualifications- this test shall be jointly conducted by Contractor and transmission manufacturer (including, but not limited to: retarder operation, heat exchanger, interface with ABS, electrical inputs).

SP-08 FIRST ARTICLE/PRE-DELIVERY TESTS AND INSPECTION

The purpose of a first article inspection is to confirm that any components, systems, subsystems, major assemblies, subassemblies, products, parts, apparatuses, articles and other materials comply with the Technical Specifications and other Contract documents.

LACMTA reserves the right to conduct a First Article Inspection (FAI) on one of the first ten (10) Vehicles (or LACMTA'S first order of vehicles) at the Contractor's plant to verify that the Vehicle complies with the terms of this Contract including any changes agreed to during the Pilot Bus acceptance. Vehicles will not be released for delivery to LACMTA pending LACMTA's completion and approval of the First Article Vehicle. At LACMTA's sole option, LACMTA may conduct an FAI on each lot of the base order and on any subsequent Option order. If an FAI is required for an Option order, the selected Vehicle may be required to successfully pass all performance tests as required in the Technical Specification.

The Contractor's pre-delivery tests and inspections of all Vehicles shall be performed at or near the Contractor's plant; they shall be performed in accordance with the procedures defined in Quality Assurance Provisions, and they may be witnessed by the Resident Inspector and/or LACMTA Project Staff (as designated by the Contracting Officer). When the Vehicle passes the pre-delivery tests and inspections, the Resident Inspector shall authorize the Contractor to Deliver the Vehicles to LACMTA's designated point of delivery.

If the Contractor is delayed in Delivering Vehicles as a result of failure to pass the FAI, the delay shall be the responsibility of the Contractor and shall not be an excusable delay.

SP-09 VEHICLE DELIVERY SCHEDULE

The Vehicles shall be delivered at a rate not to exceed 10 Vehicles per week, Monday through Friday. Hours of delivery shall be 6:00 a.m. through 2:00 p.m. LACMTA will consider allowing deliveries outside of normal business hours with prior approval and on a case-by-case basis.

During the Pre-Award Site Visit, the Contractor shall provide its production schedule and/or other material to LACMTA for the purpose of verifying available production capacity to comply with the above stated schedule.

SP-10 LIQUIDATED DAMAGES

It is mutually understood and agreed by and between the parties to the Contract that time is of the essence with respect to the completion of the Work and that in case of any failure on the part of the Contractor to deliver the buses within the time specified in SP-09 Vehicle Delivery Schedule, except for any excusable delays as provided in “Excusable Delays/Force Majeure” or any extension thereof, the LACMTA will be damaged thereby.

If Contractor does not deliver all of the Vehicles ordered by LACMTA under this Contract in a condition to be accepted by LACMTA within the time limit set forth in the Contract, damages will be sustained by LACMTA. It is, and will be, impracticable to determine the actual damages which LACMTA will sustain in the event of and by the reason of such delays. Therefore, pursuant to Government Code Section 53069.85 the Contractor shall pay LACMTA the sum of $300.00 per Vehicle per day for each calendar day that each Vehicle is delayed beyond the scheduled delivery date set forth in the Contract. Liquidated damages for each Vehicle shall continue until that Vehicle is delivered, subject to extensions granted under the Changes section of this Contract, including changes for Unavoidable Delays. In case liquidated damages are not paid, LACMTA may deduct the amount thereof from any money due or to become due the Contractor under the Contract.

SP-11 ISSUANCE OF THE NOTICE TO PROCEED

LACMTA may issue multiple Notices to Proceed. A Limited Notice to Proceed may be issued following Contract execution to initiate the Pre-Production process and manufacture of the Pilot Vehicle.

All production work performed by Contractor prior to Acceptance of the Pilot Vehicle by LACMTA shall be subject to rework and correction at Contractor’s cost, to correct any Defects discovered during the Pilot Vehicle Acceptance process.

SP-12 DELIVERY PROCEDURE

Delivery of a Vehicle or Unit shall be complete upon Acceptance in writing by LACMTA's Project Manager or his designee pursuant to the Section entitled, SP-25 ACCEPTANCE OF VEHICLE. Upon Contractor's tender of Delivery to a designated point, LACMTA will take possession of the Vehicle or Unit for the purpose of inspection and testing.

Delivery of the Vehicles and Units shall be F.O.B. destination, at the designated point of delivery listed herein. The designated point of delivery shall be LACMTA's Service Support Center located at: 900 Lyon Street, Los Angeles, CA 90012, or other location designated as such in writing by LACMTA.

SP-13 PERFORMANCE BOND/GUARANTEE

The Contractor shall furnish, at its own expense, a performance guarantee in the form of a cashier's check, a letter of credit in a form approved by LACMTA before Proposal submission, or a performance bond from a surety duly licensed to do business in the state of California having a financial rating from A.M. Best Company of "A VIII" or better, in the amount of **15% of the Contract Price** and shall remain in force until said obligations have been fulfilled. A separate Performance Bond shall be required for any Option Vehicles ordered under this Contract.

The bond amount may be reduced as follows for the Base Order and for any Option Orders:

1. To sixty-five (65) percent of the original Bond value when fifty (50) percent of the required number of buses are delivered and accepted;
2. To thirty (30) percent of the original Bond value when seventy-five (75) percent of the required number of buses are delivered and accepted; and
3. To zero (0) percent of the original Bond value when one hundred (100) percent of the required number of buses are delivered and accepted.

In the case that a surety becomes insolvent, its license is revoked or suspended, or in the case of a surety approved on the basis that it is listed as an approved federal surety and such federal approval is revoked or suspended, the Contractor, shall immediately notify LACMTA, and within five (5) days after notice, shall replace with an acceptable and sufficient surety or sureties. LACMTA may suspend payments on the Contract until a properly rated replacement performance bond is delivered by Contractor to LACMTA. The Contractor shall pay all costs of compliance with this Section. If the Contractor fails to do so, such failure shall be an event of default.

SP-14 MOTOR VEHICLE POLLUTION REQUIREMENTS

The Contractor shall furnish to LACMTA a certification in writing with each Vehicle delivered that:

- Vehicles will meet Federal and California pollution requirements.
- The horsepower of the Vehicle is adequate for the speed, range, and terrain in which it will be required to operate and meet the demands of all auxiliary power equipment.

SP-15 ENGINE EMISSIONS CERTIFICATE

The engine manufacturer shall certify to the lowest NOx level available for the engine being provided. Following the Notice of Intent to Award and prior to the completion of the Pilot Vehicle. the Contractor shall submit to LACMTA a signed copy of an Executive Order from the California Air Resources Board (CARB) which states the level to which the engine emissions are certified. This letter shall be in sufficient detail to be used by LACMTA to participate in the NOx trading program if said program is still in effect.

Maximum Emission Levels for Transit Fleets following Alternate Fuel Path

Year	Oxides of Nitrogen (NOx) Grams per brake horsepower-hour	Particulate Matter (PM) grams per brake horsepower-hour
2010	0.2	0.01
2013	0.2	0.01
2016	0.02	0.01

SP-16 DESIGN AND MANUFACTURING RESPONSIBILITY

The Contractor shall be responsible for the design and manufacture of the Vehicles. Any omission from or error in description in this contract, including without limitation the Technical Specifications, or LACMTA's approval of any Unit, or element of design or construction, of any Vehicle shall not in any way relieve the Contractor of responsibility for the adequacy of the design, manufacture or performance of a Vehicle. The Vehicle shall be fit for its intended purpose and use. The provision of any drawings, Technical Specifications, or other data by LACMTA shall be solely for the purpose of describing the product which is the subject matter of this Contract, and LACMTA does not thereby assume any responsibility whatsoever for the design or manufacture of any completed Vehicle or any Unit or portion thereof.

Notwithstanding any omission or misdescription from any specification:

A. The Vehicle and any Unit thereof, and its associated equipment, must be of the best engineered design for the service intended and shall include an adequate margin of safety and durability into the design of Vehicle.

B. The Contractor shall design and construct the Vehicles, and select the materials and equipment to obtain the strength and reliability required to achieve the maximum Operational Life for the Vehicles.

C. The Contractor shall furnish adequate labor, tools and materials, parts and equipment necessary for manufacturing a complete Vehicle in accordance with the Contract.

D. The Contractor shall have full responsibility for supplying all design, manufacturing, materials, parts and equipment required to make the Vehicle complete and ready for service. Unless required by the Technical Specification, fareboxes, radios, and other items that are installed by LACMTA shall not be the responsibility of the Contractor.

SP-17 INTERCHANGEABILITY

All Units delivered under this Contract, whether provided by a Subcontractor or Supplier, or manufactured by the Contractor, shall be duplicates in design, manufacture, and installed to assure Interchangeability among Vehicles in this Contract. This Interchangeability shall extend to the individual Units, components and parts as well as to their locations in the Vehicles. The requirement for interchangeability shall apply to the entire Contract.

For Option Vehicles, LACMTA will consider changes such as product improvements on a case-by-case basis. LACMTA's basic expectation for any such change is that the new product will perform at least as well if not better than the original. To that end, the Contractor shall be required to obtain and provide an extended warranty at no cost for any proposed change in components. The Contractor shall not be required to retrofit product improvements authorized for an Option Vehicle order to the Base Order. All such changes shall be processed pursuant to the Section entitled, CHANGES. The Contractor shall not modify any Unit approved on the Pilot Vehicles, including any of the listed Units contained on the Technical Submittal that was submitted with the Proposal, except by written Modification.

SP-18 MATERIALS AND WORKMANSHIP RESPONSIBILITY

The Contractor shall be responsible for all materials and workmanship in the manufacture of the Vehicles, any Unit and Parts thereof, whether the same are manufactured by the Contractor or Subcontractor or purchased from a Supplier. This provision excludes LACMTA furnished equipment such as fare boxes and radios if applicable, and/or tires leased or supplied by LACMTA, except to the extent that such equipment is damaged by the failure of any Unit for which the Contractor is responsible, and except to the extent that the damage to such equipment is caused by the Contractor during the manufacture, testing or repair of the Vehicles.

SP-19 SPARE AND REPLACEMENT PARTS

The Contractor guarantees the availability of spare and replacement parts for these Vehicles for a 15-year period (or the operational design life of the vehicle if greater than 15 years) after the date of the Acceptance of the final bus. Spare parts shall be of the latest configuration, interchangeable with the

original components and shall be manufactured in accordance with industry standards and the quality assurance provisions of this Contract. Contractor and its Subcontractors and Suppliers agree to provide LACMTA with all documents necessary to make or manufacture spare parts after the 15 year period.

Contractor shall provide LACMTA Contract Administrator with a detailed list of spare and replacement parts on an excel spreadsheet. Any parts referred to as “sets” or “kits” are unacceptable and must be broken down to the component level on the spreadsheet. LACMTA requires the following information for each spare or replacement part:

1. Item by Item Listing
2. Affected System (i.e. PPA)
3. Quantity Provided
4. Product Name/Description (starting with the appropriate key word, followed by key word modifiers)
5. Major Classifications: Illustrated Parts Catalog Section (IPS) Name
6. Manufacturer’s Name, Address and Telephone Number
7. Manufacturer’s Part Number and Model Number
8. Unit of Measure (each, feet, etc.)
9. Unit Cost
10. Local Distributor (Name, Address, federal ID & Phone Number)
11. Distributor’s Part Number
12. Authorized OEM Rebuild Facility (Name, Address and Phone Number)
13. Confirmation of whether the part is hazardous or not. Include MSDS sheet if hazardous
14. Recommended stocking quantities
15. Alternate Vendor Sources

<u>Contractor Shipment:</u>

LACMTA will assign an internal purchase order number, item code and delivery location for the Contractor to use when creating packing slips for components on the Spare Part Package. The Contractor will provide copies of each packing slip before scheduling a spare parts delivery to LACMTA. Each pallet or crate, within a shipment, shall have a packing slip that identifies the material inside each pallet or crate. All sequentially numbered packing slips will include:

- LACMTA’s assigned purchase order
- LACMTA’s assigned item code
- Manufacturer’s number
- Illustrated Parts Catalog description
- Quantity delivered and back ordered

SP-20 PRE-PRODUCTION MEETINGS

In order to assess the Contractor’s compliance with the Technical Specifications, LACMTA and the Contractor shall conduct at least one formal

pre-production meeting. At the Pre-Production Meeting(s), Contractor and LACMTA shall jointly develop a configuration and performance review document for review of the Pilot Vehicle (also refer to SP-7 Configuration and Performance Approval). This document shall include appropriate performance standards for each test that is being required and the document shall become part of the official record of the pre-production meeting.

Unless otherwise agreed, one meeting shall be held at LACMTA's facility. At the first meeting, the Contractor shall make a formal presentation on their Quality Assurance Program for LACMTA'S review and comments. Contractor shall provide a formal production schedule at this meeting. The parties shall make best efforts to resolve all the issues/questions discussed at the pre-production meeting(s), to the satisfaction of LACMTA's Project Manager (or designee), within six (6) weeks after the date of the last Pre-Production meeting.

The Contractor shall prepare and issue formal minutes for each meeting no later than two (2) weeks following the meeting. The minutes shall be approved in writing by the representatives of the Contractor and LACMTA. Discrepancies noted in the minutes are to be reviewed further and every effort is to be made to resolve issues. The Project Manager will issue a written confirmation that all major open issues have been satisfactorily resolved.

SP-21 CONTRACT STATUS REPORTS

Contractor shall provide written, weekly status reports following the initial Pre-Production Meeting (report format to be determined by LACMTA during the Pre-Production Meeting). In addition to weekly status reports, the Contractor is also required to participate in weekly status meetings via teleconference beginning on the date of the Notice to Proceed through the end of the warranty period. LACMTA and Contractor shall attempt to mutually agree on who is to attend all meetings. If agreement cannot be reached, LACMTA may designate the attendees and time of meetings.

SP-22 PRODUCTION CONTINUITY

Contractor production gaps, if necessary, may occur during the production run. Production gaps shall be scheduled and approved in advance with LACMTA on a mutually acceptable schedule. Regardless of the production schedule, LACMTA Vehicle Series numbers, the Vehicle number located on the roof and other areas of the Vehicle, shall be sequential.

At LACMTA's sole option, LACMTA may conduct a FAI on each lot of the vehicle order or following any production gaps. If an FAI is required for any production gap, the selected Vehicles may be required to successfully pass all performance tests as required in the Technical Specification.

SP-23 ASSUMPTION OF RISK OF LOSS

LACMTA shall assume risk of loss of the Vehicle upon taking Delivery of the Vehicle for inspection and testing, as described in SP-10, DELIVERY PROCEDURE. Except for the period when LACMTA takes possession of the Vehicle for inspection and testing, the Contractor shall have risk of loss of the Vehicle, including any damages sustained during the delivery operation until the Vehicle is delivered to the LACMTA Support Service Center. If a Vehicle is driven to the location of Delivery, drivers shall keep a maintenance log of the Vehicle in route and it shall be delivered to LACMTA with the Vehicle. If the Vehicle is rejected pursuant to SP-23, NON-ACCEPTANCE OF VEHICLES, and the Vehicle is tendered back to Contractor for any reason, Contractor has the risk of loss upon such tender.

SP-24 CONDITIONAL ACCEPTANCE AND ACCEPTANCE OF PRODUCTION VEHICLES

Acceptance Testing of the Production Vehicles shall occur in accordance with all testing requirements set forth in SP-07 Configuration and Performance Approval of the Contract, including all submittals, corrective actions and retrofits. LACMTA will notify Contractor in writing of acceptance or rejection of each Bus, and in the case of rejection, the reasons therefore.

If, during Acceptance Testing, LACMTA determines that one or more Buses is suitable for operation in revenue service, but that it is not totally responsive to the Contract requirements, due to only readily correctable minor, non-safety critical discrepancies or open items, LACMTA may, at its discretion, issue a "Notice of Conditional Acceptance". The Notice of Conditional Acceptance shall define the corrective actions necessary to achieve Acceptance Test approval. Such conditionally accepted vehicles shall then be available to LACMTA for temporary use in revenue service to meet LACMTA's needs. Upon receipt of a Notice of Conditional Acceptance, Contractor shall immediately initiate and execute the necessary corrective action(s) for acceptance of such vehicle(s). Corrective actions shall not exceed 90 days for any Bus that has received a Notice of Conditional Acceptance. Failure to complete the corrective actions defined by the Notice of Conditional Acceptance shall result in LACMTA's issuance of Notice of Non-Acceptance pursuant to SP-26 Non-Acceptance of Production Vehicle. If a Notice of Non-Acceptance is issued to any Bus that was once Conditionally Accepted, the Bus shall be subject to Liquidated Damages defined in article SP-10.

Vehicles that receive a Notice of Conditional Acceptance shall be eligible for milestone payment, and warranty.

SP-25 ACCEPTANCE OF PRODUCTION VEHICLE

Upon Contractor's Delivery of the Production Vehicle at a point of delivery, LACMTA shall take possession of the Vehicle and shall perform the inspections and tests described in the Quality Assurance Requirements. If the

Vehicle passes the Acceptance Testing, LACMTA will accept the Vehicle and issue a Notice of Acceptance no later than the fifteenth day after Contractor delivers the Vehicle to the LACMTA Support Service Center. If LACMTA has not issued a Notice of Acceptance or Notice of Conditional Acceptance or Notice of Non-Acceptance, within the 16th day from Delivery, LACMTA will be deemed to have accepted the Vehicle on the date it places the Vehicle into revenue service.

SP-26 NON-ACCEPTANCE OF PRODUCTION VEHICLE

If the Contractor fails to complete the corrective actions defined by the Notice of Conditional Acceptance or if a Vehicle fails any inspection or test during Acceptance Testing, LACMTA shall provide Contractor with Notice of Non-Acceptance, which shall be effective until Contractor makes the repair or corrects the deficiency at its own cost and LACMTA accepts the Vehicle after retest and inspection.

If a Vehicle is not accepted or is conditionally accepted, the Contractor, or its designated representative shall be responsible for the correction of all deficiencies. The Contractor may request LACMTA to perform limited work related to correction of deficiencies. Such work shall be subject to full reimbursement of LACMTA's costs by the Contractor. If LACMTA agrees to perform such limited work, it shall remain the sole obligation of the Contractor to correct the deficiencies. LACMTA's responsibility will be strictly limited to competently performing the limited work designated by the Contractor in accordance with the contractor's instructions. The Contractor shall warrant all such LACMTA work in the same manner as it warrants its own work.

If a Vehicle is delivered but not accepted because of a deficiency, or the Contractor fails to correct and complete a conditionally accepted Vehicle, the Contractor shall have ten (10) days after LACMTA's Notice of Non-Acceptance to correct the deficiency. Liquidated Damages shall thereafter be assessed in accordance with Contract Article CP-08, until all deficiencies have been corrected and LACMTA has provided a Notice of Acceptance.

SP-27 REPAIRS BY LACMTA

If a Vehicle is delivered but not accepted by LACMTA, the Contractor may request LACMTA to correct deficiencies or perform repairs. LACMTA will only perform limited work or replace defective parts as instructed by Contractor. It is at LACMTA's sole discretion whether to agree to make any such corrective action or repairs. If LACMTA elects to perform the repairs the following conditions apply:

1) Parts Used. LACMTA shall make the repairs designated by the Contractor using Contractor specified parts available from LACMTA stock or those supplied by the Contractor specifically for this repair. LACMTA will provide reports of all repairs covered by this procedure to the Contractor for reimbursement or replacement of parts.

2) Contractor Supplied Parts. If the Contractor supplies parts for repairs being performed by LACMTA, these parts shall be shipped prepaid to LACMTA from any source selected by the Contractor within fourteen (14) days after receipt of the request for said parts.

3) Return of Defective Parts. The Contractor may request that parts covered by this provision be returned to the manufacturing plant. The total cost for this action shall be paid by the Contractor.

4) Reimbursement for Labor. Contractor shall reimburse LACMTA for labor in accordance with Warranty Requirements SP-38.11.5.

5) Reimbursement for Parts. Contractor shall reimburse LACMTA within 30 days after LACMTA submits a claim to Contractor for LACMTA owned parts that LACMTA used to effect repairs. The Contractor shall reimburse LACMTA using the parts costs provided in the Contractor's parts catalogue effective at the date of the repair and shall include taxes and a 25% markup for handling costs.

SP-28 OPTIONS

A. Option Vehicles

Contractor hereby grants LACMTA and any permissible assignee pursuant to Subsection B hereof, options ("Options") to purchase up to 305 additional Vehicles ("Option Vehicles"). The Options shall be valid for a period of five (5) years from the effective date of the Contract. Options that are exercised shall have a minimum quantity of 150 for CNG and 10 for ZEB Vehicles. There shall be no minimum order quantity for any permissible assignee pursuant to SP-29 ASSIGNMENT OF OPTIONS. Subject to LACMTA's right to order Modifications pursuant to the Article entitled Modifications in the General Conditions of this Contract, the Option Vehicles shall have the same specifications of the Vehicles purchased under this Contract. Metro may exercise the Options by written Notice to the Contractor ("Notice of Exercise of Option") at any time on or before five years following the Effective Date of Contract ("Option Date").

The Price of the Option Vehicles shall be the Unit Price of the base order Vehicles, ("Base Order Price") adjusted by multiplying the Base Order Price by the following fraction:

$$\frac{\text{Preliminary Index Number on Month Prior to Notice of Exercise of Option}}{\text{Index Number on Effective Date of the Contract}}$$

The Index shall be the Producer Price Index for Truck and Bus Bodies, Series No. 1413 published by the United States Department of Labor or if such Index is no longer in use, then such replacement which is most comparable to the Index as may be designated by the Bureau of Labor Statistics, or as agreed by the parties. However in no case shall the

annual increase in the cost of a Vehicle created by the application of the above referenced Index exceed four percent (4%) unless the Contractor provides written evidence, such as Invoices from its Suppliers that its cost of any Major Subsystem has increased at a rate exceeding four percent (4%) per annum. In that event, in addition to paying an increase in the cost of Vehicle up to a four percent (4%) per annum, LACMTA will pay one half of that portion of the increase in the cost of the Major Subsystem that exceeds four percent (4%) per annum. In the event that the decision to exercise an Option occurs mid year, the maximum allowable increase of four percent shall be prorated.

The calculated increase shall be established by the above formula and shall not increase unless LACMTA does not issue the Notice to Proceed for the Option Vehicles within 60 days of the LACMTA Board's formal approval to purchase the Option Vehicles. In such instance, the PPI increase may continue to accrue subject to the limitation stated. At the time LACMTA chooses to execute the required Contract Modification, the PPI shall be recalculated and incorporated into the Contract Modification.

Within thirty (30) days after delivery of LACMTA's Notice of Exercise of Option to Contractor, Contractor shall submit a proposed delivery schedule. Along with the proposed delivery schedule, Contractor will provide LACMTA with access to its production schedule for the purpose of the parties verifying available production capacity. The production schedule shall include a reasonable time for mobilization and for coordinating with other Vehicle orders, and shall be based upon a production rate at least equal to the production rate actually realized with respect to the Base Order Vehicles. If the parties are unable to agree on a production schedule, the maximum term for the production of the Option Vehicles shall not exceed a total of 36 months after the date of Notice to Proceed with Option Vehicle production. LACMTA or any permissible assignee pursuant to Subsection B hereof may issue a Notice to Proceed at any time after the Contractor submits its proposed delivery schedule. Contractor shall not commence production of the Option Vehicles prior to issuance of the Notice to Proceed by LACMTA or any permissible assignee of LACMTA for the Option Vehicles incorporating the agreed production delivery schedule or the 36 month maximum term.

Except as otherwise specially provided in this Contract, all other terms of the Contract shall apply to the Option Vehicles.

B. Options for Items such as Special Equipment, Training Aids, Diagnostic Equipment

Contractor hereby grants LACMTA Options to purchase other equipment listed as Options on the Proposal Forms. Pricing for each Option shall be valid for two years after the Effective Contract Date.

SP-29 ASSIGNMENT OF OPTIONS

LACMTA specifically reserves the right to assign part or all of its Options and Option Vehicles to any other public transportation agency or governmental entity under inter-governmental contracting procedures; pursuant to a form of assignment agreement attached hereto as Attachment C. LACMTA may assign any quantity of Options and Option Vehicles under an assignment. Any such assigned Options and Option Vehicles shall be produced in accordance with the terms of the Contract. The assignment shall be in writing, signed between LACMTA and the assignee, and acknowledged by the Contractor. Any assignment must be entered into within the effective period as defined in SP-28.

SP-30 TITLE

Contractor shall provide to LACMTA adequate documents for securing title to the Vehicles in LACMTA's jurisdiction at least 10 calendar days before Contractor releases each Vehicle for delivery to LACMTA. The required documents shall be printed with one of the following security features:

1. sensitive security paper without added optical brighteners that will not fluoresce under ultraviolet light.
2. engraved border and prismatic-rainbow printing with Copy Void Pantograph (the work "void" appears when the document is copied.
3. 2 complex colors (colors developed by using a mixture of two or more primary colors and back if required) and 2 security threads, with or without watermark, and/or intaglio print, with or without latent image, and/or security laminate.

The Contractor warrants that the title shall pass to LACMTA free and clear of all liens, mortgages and encumbrances, financing statements, security agreements, claims, and demands of any character following LACMTA's Acceptance of each Vehicle. The document to secure title shall clearly state the following: "This vehicle meets California Emissions Standards."

SP-31 INSURANCE REQUIREMENTS

Contractor shall procure and maintain insurance against claims for injuries to persons, or damages in property which may arise from or in connection with the performance of the work hereunder by the Contractor, their agents, representatives, employees or Subcontractors for the duration of the contract. The insurance provided hereunder shall be available for the benefit of LACMTA and Contractor with respect to covered claims, but shall not be interpreted to relieve Contractor of any obligations hereunder. Contractor shall require all Subcontractors to be covered by Insurance on the same terms as the Contractor itself. The LACMTA (and their respective directors, officers, employees and agents) and other Indemnified Parties (if any) will be an additional insured on all policies excepting workers' compensation. All of

the policies shall explicitly waive subrogation rights against indemnified parties and shall include “pay on behalf of” coverage for indemnified parties.

All insurance required hereunder shall be procured from insurance or indemnity companies with an A.M. Best and Company rating level of A- or better, Class VII or better or as otherwise approved by LACMTA and authorized or approved to do business in the State. All limits of liability set forth below are in U.S. dollars.

A. Commercial General Liability Insurance

The Contractor shall provide a policy or policies of commercial general liability insurance for bodily injury, property damage, personal injury and advertising injury and contractual liability that shall be as broad as Insurance Services Office Commercial General Liability coverage (occurrence form CG0001 or its equivalent). The coverage shall contain no special limitations on the scope of protection afforded to LACMTA et al. and is required to respond fully to all claims brought due to Contractor activities. Contractor and each of the Indemnified Parties (if any) shall be included, by endorsement, with a non-owned and hired automobile liability endorsement to the general liability policy.

The commercial general liability insurance coverage shall have a minimum limit of $1 million combined single limit of liability for bodily injury, property damage and personal injury per occurrence, $2 million general annual aggregate and $2 million products/completed operations aggregate. Contractor shall maintain such insurance for the duration of the contract. LACMTA shall be an additional insured prior to the commencement of any work as to any insured loss or liability arising out of or in any way related to the Project.

B. Workers’ Compensation and Employer’s Liability Insurance

The Contractor shall provide a workers’ compensation statutory limits policy in conformance with the laws of the State, and employer’s liability insurance (for bodily injury or disease) with minimum limits of $1 million per accident for bodily injury by accident, $1 million per employee for bodily injury by disease, and $1 million policy limit for bodily injury by disease.

C. Automobile Liability Insurance

The Contractor shall provide commercial automobile liability insurance covering the ownership, maintenance or use of all owned/leased, non-owned and hired vehicles used in the performance of the Work, with limits of not less than $1 million, combined single limit for bodily injury and property damage liability. Coverage shall be provided on Insurance Services Office form number CA 0001 (Ed. 7/97) or equivalent.

D. Excess Liability Insurance

The Contractor shall provide umbrella or excess liability insurance with limits not less than $20,000,000 which shall provide bodily injury, personal injury and property damage liability coverage at least as broad as the primary

coverages set forth above, including Employer's Liability, Commercial General Liability and Commercial Automobile Liability insurance, in excess of the amounts set forth herein above.

E. Subcontractor Insurance Requirements

Contractor shall include all Subcontractors as insured under its policies or shall ensure that each Subcontractor maintains separate coverage to provide appropriate coverage to LACMTA in the event of loss. Contractor is required to monitor and maintain records of such coverage and provide proof of compliance to LACMTA upon request. If requested by LACMTA, the Contractor shall submit copies of all required insurance policies, including endorsements affecting the coverage required by these specifications.

F. Other Insurance Provisions

1. Premiums, Deductibles and Self-Insured Retentions

The Contractor shall be responsible for payment of premiums for all insurance required under this Section. LACMTA shall have no obligation to pay any premium. The Contractor further agrees that for each claim, suit or action made against insurance provided hereunder, with respect to all matters for which the Contractor is responsible hereunder, the Contractor shall be solely responsible for all deductibles, self-insured retentions and amounts in excess of the coverage provided. Any deductibles or self-insured retentions over $200,000 must be declared and approved by LACMTA.

2. Verification of Coverage

Concurrently with the Contractor's execution hereof or on such later date on which coverage is required to be provided hereunder, the Contractor shall deliver to LACMTA a certificate of insurance with respect to each policy required to be provided by the Contractor under this Section. LACMTA shall have no duty to pay or perform under the Contract until such certificate(s), in compliance with all requirements of this Section, have been provided. Upon request by LACMTA, copies of each of the insurance policies (including renewal policies) required under this Section shall be provided for review.

The Contractor shall promptly deliver to LACMTA a certificate of insurance with respect to each renewal policy, as necessary to demonstrate the maintenance of the required insurance coverages for the terms specified herein. Such certificate shall be delivered to LACMTA not less than 30 days prior to the expiration date or as soon as possible at the renewal period. If requested by certified duplicate copies of the renewal policy shall also be provided.

3. Endorsements and Waivers

All insurance policies required to be provided by the Contractor hereunder shall contain or be endorsed to comply with the following provisions, provided that, for the workers' compensation policy, only the following provisions (d) and (f) shall be applicable:

(a) For claims covered by the insurance specified herein, said insurance coverage shall be primary insurance with respect to the insureds, additional insureds, and their respective directors, officers, employees, agents and consultants. Any insurance or self-insurance beyond that specified in the Contract that is maintained by an insured, additional insured, or their directors, officers, employees, agents and consultants shall be excess of such insurance and shall not contribute with it.

(b) Any failure on the part of the Contractor to comply with reporting provisions or other conditions of the policies, any breach of warranty, any action or inaction of a named insured or others shall not affect coverage provided to the other insureds or additional insureds (and their respective members, directors, officers, employees, agents and consultants).

(c) The insurance shall apply separately to each insured and additional insured against whom a claim is made or suit is brought, except with respect to the limits of the insurer's liability.

(d) Each policy shall be endorsed to state that coverage shall not be suspended, voided, canceled, modified or reduced in coverage or in limits except after 30 days prior written notice has been provided to LACMTA. Such endorsement shall not include any limitation of liability of the insurer for failure to provide such notice.

(e) The commercial general liability insurance policy shall be endorsed to state that coverage for Subcontractor employees shall not be excluded.

(f) Each policy shall provide coverage on an "occurrence" basis and not a "claims made" basis and no policy issued on an occurrence basis shall have any sunset clause requiring reporting within a specified period of time.

4. Waivers of Subrogation

Contractor waives all rights of subrogation against LACMTA and each of their agents, employees, directors, officers and consultants for any claims to the extent covered by insurance obtained pursuant to this Section, except such rights as they may have to the proceeds of such insurance. The Contractor shall require all Subcontractors to provide similar waivers in writing each in favor of LACMTA et' al.. Each policy, including workers' compensation, shall include a waiver of any right of subrogation against

all insureds (and their respective members, directors, officers, employees, agents and consultants).

5. Changes in Insurance Requirements

LACMTA shall notify the Contractor in writing of any changes in the requirements applicable to insurance required to be provided by the Contractor. Any additional cost from such change shall be paid by LACMTA upon demonstrated evidence such as insurance carrier provided invoice or similar acceptable instrument that authenticates such cost.

6. No Recourse

There shall be no recourse against LACMTA for payment of premiums or other amounts with respect to the insurance required to be provided by the Contractor hereunder, except for deductibles payable by LACMTA as specified herein.

7. Support of Indemnifications

The insurance coverage provided hereunder by the Contractor shall support but is not intended to limit the Contractor's indemnification obligations, nor do the indemnity obligations limit the rights of the insured parties to the coverage afforded by their insured status.

8. Prosecution of Claim

Unless otherwise directed by LACMTA in writing, the Contractor shall be responsible for reporting and processing all potential claims by LACMTA or the Contractor against the insurance required to be provided under this Section. The Contractor agrees to report timely to the insurer(s) any and all matters which may give rise to an insurance claim and to promptly and diligently pursue any and all insurance claims on behalf of LACMTA, whether for defense or indemnity or both. LACMTA agrees to promptly notify the Contractor of LACMTA's incidents, potential claims, and matters which may give rise to an insurance claim by LACMTA, to tender its defense or the claim to the Contractor, and to cooperate with the Contractor as necessary for the Contractor to fulfill its duties hereunder.

9. Commencement of Work

The Contractor shall not commence work under the Contract until it has obtained the insurance required under this Section, has furnished original certificates of insurance evidencing the required coverage as required under this Section and such insurance has been approved by LACMTA, nor shall the Contractor allow any Subcontractor to commence work under its Subcontract until the Subcontractor has obtained insurance as required under this Section.

10. Contractors Failure to Comply

If the Contractor or any Subcontractor fails to provide and maintain insurance as required herein, then LACMTA shall have the right but not the obligation, to purchase such insurance or to suspend the Contractor's right to proceed until proper evidence of insurance is provided. Any amounts paid by LACMTA shall, at LACMTA's sole option, be deducted from amounts payable to the Contractor or reimbursed by the Contractor upon demand, plus interest thereon from the date of payment by LACMTA to the reimbursement date, at the lesser of (a) 10% per annum or (b) the maximum rate allowable under applicable Governmental Rules.

If on account of the Contractor's failure to comply with the provisions of this Section, LACMTA is adjudged to be a co-insurer or otherwise held responsible for all or any portion of a judgment, loss or settlement (through admission or stipulation by the Contractor or court decision) that would have been covered by insurance but for non-compliance with this Section, then any loss or damage it shall sustain by reason thereof shall be borne by the Contractor, and the Contractor shall immediately pay the same to LACMTA, upon receipt of written demand therefore and evidence of such loss or damage.

11. Disclaimer

The Contractor and each Subcontractor shall have the responsibility to make sure that their insurance programs fit their particular needs, and it is their responsibility to arrange for and secure any insurance coverage which they deem advisable, whether or not specified herein.

LACMTA makes no representation or warranty that the coverage, limits of liability or other terms specified for the Insurance Policies to be carried pursuant to this Section are adequate to protect the Contractor against its undertakings under the Contract Documents or its liability to any third party or preclude LACMTA from taking any actions as are available to it under the Contract or otherwise at law. LACMTA shall not be limited to the amount of the insurance premium not paid in the proof of any damages it may claim against the Contractor arising out of or by reason of failure of the Contractor to provide and keep in force the insurance policies required by and on the terms of this Section, but LACMTA shall instead be entitled to recover the full amount of damages available.

12. Due Care Required

Nothing contained in this Section shall relieve the Contractor or any Subcontractors of its obligation to exercise due care in the performance of the Work and to complete the Work in strict compliance with the Contract.

SP-32 THE CONTRACTOR'S INTERACTION WITH THE MEDIA AND THE PUBLIC

A. LACMTA shall review and approve all LACMTA-related copy proposed to be used by the Contractor for advertising or public relations purposes prior to publication. The Contractor shall not allow LACMTA-related copy to be published in its advertisements and public relations programs prior to receiving such approval. The Contractor shall ensure that all published information is factual and that it does not in any way imply that LACMTA endorses the Contractor's firm, service, and/or product.

B. The Contractor shall refer all inquiries from the news media to LACMTA, and shall comply with the procedures of LACMTA's Public Affairs staff regarding statements to the media relating to this Contract or the Services.

C. If the Contractor receives a complaint from a citizen or the community, the Contractor shall inform LACMTA about what action was taken to alleviate the situation.

SP-33 ANTI-DUMPING PROHIBITIONS

The Contractor represents and warrants that its prices do not violate the anti-dumping or countervailing duty laws of the United States, including but not limited to 19 U.S.C. 1671 et. seq., as amended, and shall pay any duties or other penalties assessed under such laws. The Contractor shall indemnify and hold harmless LACMTA from any loss or expense, including but not limited to reasonable attorneys' fees that LACMTA may incur from any claim, demand, or investigation of alleged violation of said laws.

SP-34 NONRESTRICTIVE CLAUSES

Wherever brand, manufacturer or product names are indicated in these specifications, they are included for the purpose of establishing identification and a general description of the Unit. Wherever such names appear, the term "OR APPROVED EQUAL" is deemed to follow. The decision whether a proposed unit is an approved equal will be rendered by LACMTA.

Specifying a brand name of any Unit in this Contract shall not relieve the Contractor, or any Subcontractor or Supplier from its responsibility to design and produce the Unit to fully meet the performance specifications, the warranty and other contractual requirements. The Contractor shall provide written notice to LACMTA of any incorrect or inappropriate brand name or Unit that is listed or referred to in the specifications, and shall propose a suitable substitute for LACMTA's consideration and approval.

SP-35 APPROVALS

No review, acceptance, approval or failure to object or comment (collectively "Approval") shall impose any liability on LACMTA or release or relieve Contractor of its sole responsibility to Deliver a Vehicle and Units thereof meeting all of the requirements of this Contract, nor shall such Approval waive affect in any way any of the Contractor's obligations, or duties, obligations or liabilities imposed on it by this Contract.

No act by LACMTA, including without limitation any certification by a LACMTA Authorized Representative, payment of money, payment for or Acceptance of any Vehicle or Unit, or any extension of time, or the taking of possession or use shall be a waiver by LACMTA of any provision of this Contract or of any power herein reserved to LACMTA or of any right to damages herein provided. Any waiver by LACMTA of any breach of this Contract shall not constitute a waiver of any other or subsequent breach.

SP-36 DOCUMENT APPROVAL AND REVIEW

A. Document Approval

Unless otherwise noted, documents requiring LACMTA "Approval" will be approved, conditionally approved or disapproved in writing within thirty (30) calendar days after receipt of the documents. Documents that are disapproved must be corrected and resubmitted within fifteen (15) calendar days after notice of disapproval. Conditionally approved documents must be corrected and resubmitted as directed in the notice of conditional approval. If no response is received by the Contractor within the thirty-day period, approval of the document is granted unless LACMTA extends the review period in writing for the document prior to the expiration of the thirty (30) day period. Neither approval nor waiver of such approval shall relieve the Contractor of the obligation to meet the requirements of the Contract. Corrections or revisions to the original submittals will be subject to the provisions of the Contract. Corrections or revisions to original submittals will be subject to the same approval cycle in writing for the document prior to the expiration of the thirty (30) day period.

B. Document Review

All documents not requiring LACMTA approval but delivered and specified for LACMTA review shall be for information purposes only and the Contractor may proceed to work without delay.

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SP-37 OTHER CONTRACT DELIVERABLES (NON-TECHNICAL)

In addition to the Contract Deliverables found in the Technical Specification TS-88.3, the following items represent Contract Data Deliverables and/or documents/test results that must be provided by the Contractor as required in the listed Contract Documents. While intended to be a comprehensive list, the Contactor and LACMTA acknowledge that the specification may contain implicit or implied additional requirements not contained in this list. The Contractor shall comply with such implicit or implied requirements. Compliance Methods include: Test - Tested by Contractor, Demo - Demonstrated by Contractor, Certificate - Applicable Certification less than two years old, Inspection – Inspection by LACMTA, LACMTA representatives or other governmental agencies, Deliverable – deliverable from Contractor, or Documentation – Analysis, Documentation or Meeting minutes as required or implied by the specification. All tests and demonstrations are to be documented in writing with the results provided to LACMTA. Unless otherwise noted, the Contractor shall provide a quantity of one (1) of each listed item.

SECTION	DUE	REQUIREMENT	COMPLIANCE METHOD	DISPOSITION
		GENERAL CONDITIONS		
GC-08	Prior to starting work.	An organization chart showing the proposed organization established by the contractor for the performance of the work, including: Lines of authority, responsibility, and communication; Office organizations, if any; and Names, titles, and functions of all supervisory and other key personnel.	Documentation	
GC-09	Within 14 days of Contract Execution	Copy of all executed subcontracts	Documentation	
GC-38	Upon completion of work or termination of the Contract	All documents and materials pertaining to technical data, patents and copyrights found in gc-36	Documentation	
		REGULATORY REQUIREMENTS		
RR-16B	20 days of	Bills of lading for each shell (if	Documentation	

SECTION	DUE	REQUIREMENT	COMPLIANCE METHOD	DISPOSITION
	shipping	applicable)		
		SPECIAL PROVISIONS		
SP-07	Post pilot	Configuration and performance review of the pilot vehicle	Documentation	
SP-08	1st 10 vehicles	First article inspection	Documentation	
SP-13/SI-1	Within 10 days of Contract Execution	Performance bond	Documentation	
SP-14	With each vehicle	Motor vehicle pollution requirements	Certificate	
SP-15	Pre-Pilot vehicle	Engine emission certificate	Certificate	
SP-20	Pre-Pilot vehicle	Pre-production meetings including QA presentation, formal production schedule and minutes no later than two weeks following each meeting.	Documentation	
SP-21	Weekly	Contract status reports	Documentation	
SP-23	Each vehicle	Driver's log and incident report	Delivery of each Vehicle if Driveaway Service is used.	
SP-30	Each vehicle	Title Documentation	Documentation	
SP-31	At contract execution	Certificate of Insurance	Documentation	
		WARRANTY PROVISIONS		
SP-40.3	Delivery of each Vehicle	Electronic list of serial numbers for units installed on each Vehicle	Documentation	
SP-40.7	Pre- Pilot Vehicle	Additions to warranty offered by component suppliers	Documentation	
		QUALITY ASSURANCE		
SP-41.1.1	Pre-prod	ISO 9001 Certificate	Certificate	
SP-41.2.2	Pre-prod	Evidence of calibration of tools and	Certificate	

SECTION	DUE	REQUIREMENT	COMPLIANCE METHOD	DISPOSITION
		equipment		
SP-41.2.2	Delivery	The quality assurance organization shall document and certify in writing that each transit Vehicle is manufactured in accordance with these controlled drawings and documentation.	Certificate	
SP-41.2.3	Pre-prod	Copies of certification from major suppliers acknowledging receipt of specifications	Certificate	
SP-41.2.5	Production	Vehicle inspection record with each Vehicle	Documentation	
SP-41.4.4	Production	Office for Inspectors as specified		
SP- 41.5.1	Pre-delivery	Acceptance Tests and Completed Vehicle inspection with each Vehicle	Documentation	
SP-41.5.3	Pre-delivery	Initial lubrication certification	Certificate	
SP-41.5.7	Pre-delivery	Complete Vehicle Documentation Package for each Vehicle	Documentation	
		SUPPLEMENTAL INSTRUCTIONS TO PROPOSERS		
SI-3	Prior to	Copy of the final Altoona Vehicle Test Report for the Vehicle being provided.	Documentation	

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SP-38 LOCAL EMPLOYMENT PROGRAM

A. OBLIGATIONS OF CONTRACTOR

The Contractor shall implement the Local Employment Plan and Local Facility Capital Investments as approved by LACMTA and set forth in Exhibit C of the Contract. The Contractor's Local Employment Plan Commitment Value for Local Workers' Wages and Benefits is $2,506,164. The Contractor's Local Employment Plan Commitment Value for Local Facility Capital Investments is $ 3,470,000. The Contractor's Total Local Employment Plan Commitment Value is $5,976,164.

B. STATE OF CALIFORNIA NEW FULL TIME EQUIVALENT (FTE) POSITIONS & LOCAL FACILITY CAPITAL INVESTMENTS

The State of California Resident FTE Positions included under the Contractor's Local Employment Plan shall:

1. Include only Contractor and Subcontractor/Supplier with State of California Resident employees who provide work hours directly allocable to the OP28367-000 program in the State of California. Local Employees that also work on other projects may only be counted to the extent they perform work allocable to the OP28367-000 Contract. A Local Employee may be expressed as a percentage of one FTE. To be considered eligible for California resident status, workers must maintain a physical presence in California, show intent to make California his or her permanent home, and be a U.S. Citizen or be granted and maintain an allowable immigration status prior to the Contract award date.

   Evidence of intent to make California one's permanent home prior to Contract award may include, but is not limited to:

   - California voter registration and voting in California elections
   - California driver's license
   - California automobile registration
   - California State income tax obligation on total income
   - Ownership of residential property or continuous occupancy or renting of an apartment on a lease basis where your personal belongings are kept
   - Active savings and/or checking accounts in a California bank
   - Immigration status with legal capacity to establish California residency
   - Maintaining a permanent military address and home of record in California
   - Military leave and earning statements showing California as legal residence.

2. Not include 1) current employees; 2) former, furloughed, and/or laid off employees who are separated from employment with the Contractor or Subcontractor/Supplier (if applicable) on or after the

date of LACMTA's Notice of Intent to Award Letter; 3) employees who will not be working on the project; 4) employees hired by the Contractor or Subcontractor to work on other projects to fill in or replace current employees reassigned to OP28367-000, 5) hours and costs that cannot be segregated and audited pursuant to internal Cost Accounting Systems of the Contractor or Subcontractors;6) Work conducted outside of the State of California; 7) Work performed by Non-State of California residents.

The Local Facility Capital Investments included under the Contractor's Local Employment Plan shall:

1. Include only facility improvements, additions, upgrades, modifications, or major improvements (not ordinary repairs and maintenance) to existing facilities, leased facilities, or newly purchased facilities within the State of California. capital equipment investments may be included only if the equipment has an estimated useful life of at least two (2) years and is valued at $5,000 or more for any individual item. Proposers may include lease costs in their local facility capital investments only if ownership is shifted from the lessor to the lessee by the end of the lease period.
2. Not include: lease costs without a lease to own agreement, utility costs, minor repair costs, capital equipment investments less than $5,000 for any individual item, short term (less than 2 years) capital equipment investments or operating costs.

C. REPORTS

The Contractor shall submit quarterly progress reports to LACMTA detailing its adherence to the commitments made in the Local Employment Plan. The quarterly report shall summarize the major actions taken during the prior quarter in implementation of the Employment, and shall:

1. Specify the total number of Local Employee Full Time Equivalent (FTE) work performed in that quarter by type (trade or craft), duration, and location, and disadvantaged worker status, and the annual value of those jobs (expressed in direct OP28367-000 hours expended and people hired);

2. Describe the workforce development and training programs carried out during that quarter and the amount expended by the Contractor for such programs;

3. Describe the quarterly outreach and recruitments coordinated through workforce development and community groups that led to new local hires and;

4. Describe the extent to which the Local Employment Plans producing long-term employment in skilled or trade labor;

5. Describe the value of construction performed toward the Facility Investment Commitment; include copies of design and construction contracts.

If any such report indicates that the Contractor has failed to achieve the Total Local Employment Plan Commitment Value for local employee wages and benefits, Disadvantaged Worker wages and benefits or Facility Investments set forth in its Local Employment Plan for the time period involved, the report shall include a corrective action plan designed to achieve the Total Local Employment Plan Commitment Value, including a time frame within which such corrective actions will be achieved.

D. RELATION TO MILESTONE PAYMENTS

LACMTA reserves the right to review and audit the Contractor's records, books and financial ledgers and cost accounting system at any time during the Contract term for purposes of determining the Contractor's compliance with Total Local Employment Commitment Value. In the event LACMTA determines that there has been a material failure of the Contractor or its Subcontractors/Suppliers to comply with any requirement of its Local Employment Plan, LACMTA shall notify the Contractor in writing and shall provide the Contractor with thirty (30) days to correct such non-compliance. If such non-compliance is not corrected to the satisfaction of LACMTA within such 30-day period (or such longer period as LACMTA may in its discretion allow), LACMTA may withhold a portion of the next Milestone Payment due to the Contractor under CP-02, in an amount that LACMTA determines in its discretion to be reasonable and appropriate based on the nature and extent of the Contractor's non-compliance. Any amounts withheld by LACMTA under this subsection shall be repaid to the Contractor, as part of the next Milestone Payment due, when the Contractor demonstrates to the satisfaction of LACMTA that it has corrected the non-compliance. Any withholding under this subsection shall not affect the right of LACMTA to exercise other remedies available under this Contract for the Contractor's non-compliance with its Local Employment Plan, including the right to terminate for default in the event of repeated instances of such non-compliance.

SP-39 RELEASE OF INFORMATION*

The Contractor shall not publish information or technical data acquired or generated by the Contractor in performing the Contract until such time as such information or technical data is released in published reports by the Los Angeles County Metropolitan Transportation Authority (Metro).

SP-40 CONTRACTOR WARRANTY

Except where longer warranty periods are specified by the Contractor, the Contractor warrants all Buses furnished under this Contract, including all equipment and materials, and all labor performance, shall be in full accordance with the Contract requirements, and shall be fit for their intended purpose, and shall be free of all Defects in the design, materials, and workmanship for the time periods and mileage set forth below. In addition, the Contractor expressly warrants to LACMTA each complete Bus, Unit and Part as follows. All warranties hereunder are deemed and acknowledged to explicitly extend to the future performance of the Unit warranted. The warranty shall apply regardless of whether the equipment, materials or labor were furnished or performed by the Contractor or by any of its Subcontractors or Suppliers of any tier.

SP-40.1 COMPLETE BUS

The complete bus, propulsion system, components, major subsystems and body and chassis structure are warranted to be free from Defects and Related Defects for two years or 100,000 miles, whichever comes first, beginning on the date of revenue service but not longer than 15 days after acceptance under “Inspection, Testing and Acceptance.” The warranty is based on regular operation of the bus under the operating conditions prevailing in LACMTA’s locale.

SP-40.1.1 BODY AND CHASSIS STRUCTURE

Body, body structure, structural elements of the suspension and engine cradle are warranted to be free from Defects and Related Defects for three years or 150,000 miles, whichever comes first.

Primary load-carrying members of the bus structure, including structural elements of the suspension such as articulation joint and air ride beams, are warranted against corrosion failure and/or Fatigue Failure sufficient to cause a Class 1 or Class 2 Failure for a period of 12 years or 500,000 miles, whichever comes first.

SP-40.1.2 PROPULSION SYSTEM

40.1.2.1 CNG Propulsion System

Propulsion system components, specifically the engine, transmission and drive and non-drive axles shall be warranted to be free from Defects and Related Defects for five years or 300,000 miles, whichever comes first. The propulsion system manufacturers’ standard warranties, delineating items excluded from the Warranty, submitted in accordance with the Request for Pre-Offer Change or Approved Equal or with the Form for Proposal Deviation.

40.1.2.2 Zero Emission Propulsion System

Propulsion system components, specifically the traction system, controllers/inverters, and gear box shall be warranted to be free from Defects and Related Defects for twelve years or 600,000 miles, whichever comes first.

Conventional drive train components, such as transmissions, and drive and non-drive axles, shall be warranted to be free from Defects and Related Defects for five years or 300,000 miles, whichever comes first. The propulsion system manufacturers' standard warranties, delineating items excluded from the Warranty, submitted in accordance with the Request for Pre-Offer Change or Approved Equal or with the Form for Proposal Deviation.

40.1.2.3 Zero Emission Energy Storage

Energy storage system components shall be warranted to be free from Defects and Related Defects for twelve years or 600,000 miles, whichever comes first. The energy storage system manufacturers' standard warranties, delineating items excluded from the Warranty, submitted in accordance with the Request for Pre-Offer Change or Approved Equal or with the Form for Proposal Deviation.

SP-40.1.3 MAJOR SUBSYSTEMS

Contractor warrants major subsystems to be free from Defects and Related Defects, for three years or 150,000 miles, whichever comes first. Documents delineating items the warranty coverage shall be submitted with the Proposal. Items included as Major Subsystems, as applicable, are listed below:

SUBSYSTEMS	YEAR(S)	MILEAGE
Brake system: Foundation brake components, including advancing mechanisms, as supplied with the axles, excluding friction surfaces.	3	150,000
Destination signs: All destination sign equipment for the front, side and rear signs, power modules and operator control.	3	150,000
HVAC System: Roof and/or rear main unit only, excluding floor heaters and front defroster. AC unit and compressor: Roof and/or rear main unit only, excluding floor heaters and front defroster.	3	150,000
Door systems: Door operating actuators and linkages.	3	150,000
Air compressor and dryer	3	150,000
Wheelchair ramp system: Ramp parts and mechanical only.	3	150,000
Starter	3	150,000
Alternator - Alternator only. Does not include drive	3	150,000

system.		
Fire Suppression system: Includes tank and extinguishing agent dispensing system.	3	150,000
Hydraulic Systems: Including power steering as applicable.	3	150,000
Cooling Systems: Radiator including core, tanks and related framework, including surge tank.	3	150,000
Multiplex system	3	150,000
Video Security System: including cameras and video recorder. Router.	3	150,000
Steering box	3	150,000
Auxiliary Power System	3	150,000
Low Voltage Generation and Distribution	3	150,000
On Route/Shop Charging Equipment	12	n/a
All on-Board charging equipment	5	300,000

SP-40.1.4 EMISSION CONTROL SYSTEM

Contractor warrants the Emission Control System (ECS) for five (5) years or 100,000 miles whichever comes first. The ECS shall include but is not limited to the following components:

- Complete exhaust system including Catalytic Converter, if required and/or diesel exhaust after treatment device
- Charge Air Cooler

SP-40.2 EXTENSION OF WARRANTY

If, during the warranty period, repairs or modifications on any Bus, made necessary by any Defect in design, materials or workmanship are not completed due to lack of material or inability to provide the proper repair for 30 (thirty) calendar days, the applicable warranty period shall be extended by the number of days equal to the delay period.

SP-40.3 SERIAL NUMBERS

Upon delivery of each bus, the Contractor shall provide a complete electronic list of serialized units installed on each bus to facilitate warranty tracking. The list shall include, but is not limited to:

a. engine
b. transmission
c. alternator
d. starter
e. A/C compressor and condenser/evaporator unit
f. drive axle
g. power steering unit
h. fuel cylinders (if applicable)
i. air compressor
j. wheelchair ramp (if applicable)
k. DVR
l. Router

The Contractor shall provide updated serial numbers resulting from warranty campaigns. The format of the list shall be approved by LACMTA prior to delivery of the first production bus.

SP-40.4 VOIDING OF WARRANTY

The warranty shall not apply to the failure of any part or component of the bus that directly results from misuse, negligence, accident or repairs not conducted in accordance with the Contractor-provided maintenance manuals and with workmanship performed by adequately trained personnel in accordance with recognized standards of the industry. The warranty also shall be void if LACMTA fails to conduct normal inspections and scheduled preventive maintenance procedures as recommended in the Contractor's maintenance manuals and if that omission caused the part or component failure. The LACMTA shall maintain documentation, auditable by the Contractor, verifying service activities in conformance with the Contractor's maintenance manuals.

SP-40.5 EXCEPTIONS AND ADDITIONS TO WARRANTY

The warranty shall not apply to the following items:

a. scheduled maintenance items
b. normal wear-out items
c. items furnished by LACMTA

SP-40.6 PASS-THROUGH WARRANTY

Should the Contractor elect to not administer warranty claims on certain components and wish to transfer this responsibility to the sub-Suppliers, or to others, the Contractor shall request this waiver.

Contractor shall state in writing that the LACMTA's warranty reimbursements will not be impacted. The Contractor also shall state in writing any exceptions and reimbursement including all costs incurred in transport of vehicles and/or components. At any time during the warranty period, the Contractor may request approval from the LACMTA to assign its warranty obligations to others, but only on a case-by-case basis approved in writing by the LACMTA. Otherwise, the Contractor shall be solely responsible for the administration of the warranty as specified. Warranty administration by others does not eliminate the warranty liability and responsibility of the Contractor.

SP-40.7 SUPERIOR/SPECIAL WARRANTY

The Contractor shall pass on to the LACMTA any "Superior" or "Special" warranty offered by a component Supplier that is superior to that required herein. The Contractor shall provide a list to the LACMTA noting the conditions and limitations of the Superior Warranty not later than the start of production. The Superior Warranty shall not be administered by the Contractor.

SP-40.8 FLEET DEFECTS OCCURRENCE AND REMEDY

A Fleet Defect is defined as cumulative failures of twenty (20) percent of the same components (part number) within the Bus Fleet (see Special Provisions definition of Bus Fleet) where such items are covered by warranty. A Fleet Defect shall apply only to the base warranty period in sections entitled "Complete Bus," "Propulsion System" and "Major Subsystems." When a Fleet Defect is declared, the remaining warranty on that item/component stops. The warranty period does not restart until the Fleet Defect is corrected. In cases where there are multiple components/systems on each bus (e.g. passenger seats), a single failure found on 20% of the buses may be considered a fleet defect.

For the purposes of Fleet Defects, each Option Order shall be treated as a separate Bus Fleet. Should there be a change in a major Unit within either the Base Order or an Option Order, the Buses containing that new major Unit shall become a separate Bus Fleet for the purposes of Fleet Defect.

The Contractor shall correct a Fleet Defect under the warranty provisions defined in "Repair Procedures." After a Fleet Defect is declared, LACMTA and the Contractor shall mutually agree to and the Contractor shall promptly undertake and complete a work program reasonably designed to prevent the occurrence of the same Defect in all other buses and spare parts purchased under this Contract. Where the specific Defect can be solely attributed to particular identifiable part(s), the work program shall include redesign and/or replacement of only the defectively designed and/or manufactured part(s). In all other cases, the work program shall include inspection and/or correction of all of the buses in the fleet via a mutually agreed-to arrangement. The Contractor shall update, as necessary, technical support information (parts, service and operator's manuals) due to changes resulting from warranty repairs. LACMTA may immediately declare a Defect in design resulting in a safety hazard to be a Fleet Defect. The Contractor shall be responsible to furnish, install and replace all defective units.

SP-40.9 EXCEPTIONS TO FLEET DEFECT PROVISIONS

The Fleet Defect warranty provisions shall not apply to LACMTA-supplied items such as fareboxes, radio and fare collection equipment, communication systems, and tires.

The Fleet Defect provisions shall not apply to Fleet Defects caused by LACMTA's non-compliance with the Contractor's minimum recommended normal preventative maintenance practices and procedures as contained in then current maintenance manuals supplied by the Contractor to LACMTA; provided, however, the Contractor, in the denial of Fleet Defect status must demonstrate by adequate proof that LACMTA did not comply, and if adequate proof is not provided, the Fleet Defect provisions shall apply.

SP-40.10 REPAIR PERFORMANCE

The Contractor is responsible for all warranty-covered repair Work. To the extent practicable, LACMTA will allow the Contractor or its designated representative to perform such Work. At its discretion, LACMTA may perform such Work if it determines it needs to do so based on transit service or other requirements. Such Work shall be reimbursed by the Contractor. Repairs made by LACMTA will be to the Lowest Line Replacement Unit (LLRU). LLRU is defined as the minimum unit which must be remnoved from a bus to affect a repair.

SP-40.11 REPAIRS BY THE CONTRACTOR

SP-40.11.1 VENDOR FAILURE NOTIFICATION (VFN)

LACMTA may issue a VFN to the Contractor's designated local service representative via email to request a Contractor's response to a potential warrantable defect. Within two (2) working days after receipt of a Notice of Defect (VFN), LACMTA and the Contractor shall attempt to resolve the status of warranty coverage on the Unit. When a VFN is determined to be warrantable, the Contractor's shall initiate repairs within three (3) working days after receipt of VFN.

SP-40-11.2 REPAIR WORK BY CONTRACTOR

The Contractor shall provide at its own expense all spare parts, tools and space required to complete repairs. At LACMTA's option, the Contractor may be required to remove the bus from LACMTA's property while repairs are being affected. If the bus is removed from LACMTA's property, repair procedures must be diligently pursued by the Contractor's representative.

At the sole discretion of LACMTA, as determined on a case-by-case basis, parts used from its own stock, shall be replaced by the Contractor. The Contractor must replace each part used from LACMTA stock with a new part within thirty (30) calendar days from issuing a warranty claim to a LACMTA designated

location. All costs associated with replacing spare parts shall be borne by the Contractor.

SP-40-12 REPAIRS BY LACMTA

SP-40.12.1 PARTS USED

If LACMTA performs the warranty-covered repairs, it shall correct or repair the Defect and any Related Defects utilizing parts supplied by the Contractor specifically for this repair. At its discretion, LACMTA may use Contractor-specified parts available from its own stock if deemed in its best interests. Contractor is expected to maintain locally, a reasonable inventory of commonly used replacement parts when making warranty repairs.

SP-40.12.2 Contractor-Supplied Parts

LACMTA may require that the Contractor supply parts for warranty-covered repairs being performed by LACMTA. Those parts may be remanufactured but shall have the same form, fit and function, and warranty. The parts shall be shipped prepaid to LACMTA from any source selected by the Contractor within fourteen (14) days of receipt of the request for said parts and shall not be subject to an Agency handling and restocking charge.

SP-40.12.3 Defective Component Return

The Contractor may request that parts covered by the warranty be returned to the manufacturing plant. The total cost for this action shall be paid by the Contractor. Materials should be returned in accordance with the procedures outlined in “Warranty Processing Procedures.”

SP-40.12.4 Failure Analysis

The Contractor shall, upon specific request by LACMTA, provide a failure analysis of Fleet Defect or safety-related parts, or major components, removed, including any rejected components from buses under the terms of the warranty that could affect fleet operation. Such reports shall be delivered within 60 days of the receipt of failed parts. All rejected claims shall have failure analysis.

SP-40.12.5 Reimbursement for Labor And Other Related Costs

The LACMTA shall be reimbursed by the Contractor for labor. The amount shall be determined by LACMTA for a qualified “A Mechanic” at their standard wage rate per hour, plus 80 percent for fringe benefits and overhead. Should a Contractor request LACMTA to transport vehicles to a vendor/subcontractor for repairs, the Contractor shall reimburse LACMTA for all expenses incurred.

If required, Contractor shall reimburse LACMTA for costs associated with towing or moving a bus if such action was necessary and if the bus was in the normal service area. Also, the Contractor shall assume all liability for damage from the time the vehicle is released from LACMTA’s custody until it is returned.

SP-40.12.6 In Service Bus Delay, Change Or Bus Cancellation (ROADCALLS)

Any warranty defect requiring an in-service change or delay or a bus cancellation will be charged at $250.00 per event plus towing costs assessed under this Contract other than for the cost of the in-service bus change. The LACMTA shall maintain documentation, auditable by the Contractor, verifying service activities related to in-service bus delays or cancellations.

SP-40.12.7 Reimbursement for Parts

LACMTA shall be reimbursed by the Contractor for defective parts and for parts that must be replaced to correct the Defect. The reimbursement shall be at the current price of the Contractor's parts catalogue effective at the time of repair and shall include taxes where applicable, plus twenty-five (25) percent handling costs. Handling costs shall not be paid if part is supplied by Contractor and returned to LACMTA storeroom it was taken from within 72 hours. If the Contractor does not provide a parts catalogue, the LACMTA's last purchase price shall prevail.

SP-40.12.8 Reimbursement Requirements

The Contractor shall respond to the warranty claim with an accept/reject decision including necessary failure analysis no later than sixty (60) days after LACMTA submits the claim and defective part(s), when requested. Reimbursement for all accepted claims shall occur no later than sixty (60) days from the date of acceptance of a valid claim. If approved warranty claims are not paid within 60 days, LACMTA reserves the right to charge interest on any such claims that exceed 60 days. LACMTA may dispute rejected claims or claims for which the Contractor did not reimburse the full amount. The parties agree to review disputed warranty claims during the following quarter to reach an equitable decision to permit the disputed claim to be resolved and closed. The parties also agree to review all claims at least once per quarter throughout the entire warranty period to ensure that open claims are being tracked and properly dispositioned.

SP-40.13 WARRANTY AFTER REPLACEMENT/REPAIRS

If any component, unit or subsystem is repaired, rebuilt or replaced by the Contractor or by LACMTA with the concurrence of the Contractor, the component, unit or subsystem shall have the unexpired warranty period of the original. Repairs shall not be warranted if the Contractor-provided or authorized parts are not used for the repair, unless the Contractor has failed to respond within five days, in accordance with "Repairs by the Contractor."

The warranty on items determined to be Fleet Defects shall be suspended at the time that a fleet defect status is established. Warranty on fleet defect units shall be as follows: if the unit is repaired by the Contractor, or by LACMTA with the concurrence of the Contractor, the Unit shall have the remaining warranty as required by this contract; if the unit is replaced by the Contractor, or by LACMTA

with the concurrence of the Contractor, the unit shall have the remaining warranty as required by this Contract or the OEM's standard warranty, which ever is greater. This suspended warranty shall again become effective on the repair/replacement date for corrected items on each Bus.

SP-40.13.1 Warranty Processing Procedures

The following list represents requirements by the Contractor to LACMTA for processing warranty claims. One failure per bus per claim is allowed.

a. bus number and VIN
b. total vehicle life mileage at time of repair
c. date of failure/repair
d. acceptance/in-service date
e. Contractor part number and description
f. component serial number
g. description of failure
h. all costs associated with each failure/repair (invoices may be required for third-party costs):
   - towing
   - road calls
   - labor
   - materials
   - parts
   - handling
   - troubleshooting time

SP-40.14 FORMS

LACMTA's forms will be accepted by the Contractor if all of the above information is included. Electronic submittal may be used if available between the Contractor and Agency.

SP-40.15 RETURN OF PARTS

When returning defective parts to the Contractor, LACMTA shall tag each part with the following:

a. bus number and VIN
b. claim number
c. part number
d. serial number (if available)

SP-40.16 TIMEFRAME

Each claim must be submitted no more than forty five (45) days from the date of failure and/or repair, whichever is later. All defective parts must be returned to the Contractor, when requested, no more than sixty (60) days from date of repair. Labor only claims (no parts were used and bus manufacturer is solely responsible for the failure) can be submitted up to 60 days from failure.

SP-40.17 REIMBURSEMENTS

The Contractor shall reimburse LACMTA for all costs associated with performing warranty work. Reimbursement checks shall be sent to:

Los Angeles County Metropolitan Transportation Authority
Cash Operations
One Gateway Plaza
Mail Stop 99-21
Los Angeles, Ca 90012

A copy of the reimbursement check including the listing of warranty claims covered by the check shall simultaneously be sent to:

Los Angeles County Metropolitan Transportation Authority
Warranty Processing Center
900 Lyon Street
Mail Stop 30-2-1
Los Angeles, Ca 90012

SP-40.18 LOCAL SERVICE SUPPORT

The Contractor shall provide local service support resources to perform “off-site” warranty repairs and bus acceptance work (make-ready) in accordance with SP-25 Acceptance of Vehicle. The Contractor shall have the ability to perform all bus acceptance and warranty repairs locally, including, but not limited to, complete repairs of any Unit. Warranty repair and bus acceptance work shall occur within 50 miles of LACMTA’s Service Support Center located at 900 Lyon St., Los Angeles CA 90012. LACMTA may visit Contractor's repair and acceptance site to monitor and review repairs on LACMTA vehicles. The Contractor is responsible for towing costs and/or labor associated with bringing a bus to either the service center or a subcontractor facility. Weekly progress reports are to be provided for all repair work.

SP-40.19 SERVICE REPRESENTATIVE(S)

The Contractor shall submit with the Submittal a list containing the name, address, and telephone number of the representatives responsible for assisting LACMTA, as well as the location for off-site repair and maintenance of the buses to be supplied. The Contractor shall, at its own expense, provide a full-time dedicated LACMTA service representative to respond to technical support and warranty issues.

Unless previous arrangements are made with LACMTA, the individual must be available to respond to LACMTA technical or warranty issues via email or phone within a maximum of 8 hours on a 24-hour a day basis. This individual’s principal point of contact at LACMTA shall be LACMTA's designated Project Manager or designee.

SP-40.20 LIQUIDATED DAMAGES (WARRANTY)

LACMTA reserves the right to assess liquidated damages when warranty repairs are not completed by the end of the initial 30 (thirty) calendar days. Warranty repairs that go beyond the 30 calendar day period will be assessed liquidated damages of $300 per day, per bus.

SP-41 CONTRACTOR'S IN-PLANT QUALITY ASSURANCE REQUIREMENTS

SP-41.1 Quality Assurance Organization

SP-41.1.1 Organization Establishment

The Contractor shall establish and maintain an effective in-plant quality assurance organization. It shall be a specifically defined organization and should be directly responsible to the Contractor's top management. The organization shall be organized and function according to the procedures contained in the Contractor's ISO 9001 Certification. A copy of the certification shall be provided upon issuance of a Notice of Intent to Award Contract.

SP-41.1.2 Control

The quality assurance organization shall exercise quality control over all phases of production, from initiation of design through manufacture and preparation for delivery. The organization shall also control the quality of supplied articles.

SP-41.1.3 Authority and Responsibility

The quality assurance organization shall have the authority and responsibility for reliability, quality control, inspection planning, establishment of the quality control system, and acceptance/rejection of materials and manufactured articles in the production of the transit buses.

SP-41.2 QUALITY ASSURANCE ORGANIZATION FUNCTIONS

SP-41.2.1 Minimum Functions

The quality assurance organization shall include the following minimum functions:

a. **Work instructions:** The quality assurance organization shall verify inspection operation instructions to ascertain that the manufactured product meets all prescribed requirements.

b. **Records maintenance:** The quality assurance organization shall maintain and use records and data essential to the effective operation of its program. These records and data shall be available for review by the resident inspectors. Inspection and test records for this

procurement shall be available for a minimum of five (5) years after inspections and tests are completed.

c. **Corrective actions:** The quality assurance organization shall detect and report to LACMTA significant quality issues, and promptly ensure correction of any conditions that may result in the production of defective transit buses. These conditions may occur in designs, purchases, manufacture, tests or operations that culminate in defective supplies, services, facilities, technical data or standards.

SP-41.2.2 Basic Standards And Facilities

The following standards and facilities shall be basic in the quality assurance process:

a. **Configuration control**: The Contractor shall maintain drawings, assembly procedures, and other documentation that completely describe a qualified bus that meets all of the options and special requirements of this procurement. The quality assurance organization shall verify that each transit bus is manufactured in accordance with these controlled drawings, procedures, and documentation.

b. **Measuring and testing facilities:** The Contractor shall provide and maintain the necessary gauges and other measuring and testing devices for use by the quality assurance organization to verify that the buses conform to all specification requirements. These devices shall be calibrated at established periods against certified measurement standards that have known, valid relationships to national standards. Contractor shall provide evidence of calibration of tools and equipment at the Pre-Production meeting.

c. **Production tooling as media of inspection:** When production jigs, fixtures, tooling masters, templates, patterns, and other devices are used as media of inspection, they shall be proved for accuracy at formally established intervals and adjusted, replaced, or repaired as required to maintain quality. At a minimum, production tooling needs to be checked at least every 50 buses.

d. **Equipment use by resident inspectors:** The Contractor's gauges and other measuring and testing devices shall be made available for use by the resident inspectors to verify that the buses conform to all specification requirements. If necessary, the Contractor's personnel shall be made available to operate the devices and to verify their condition and accuracy.

SP-41.2.3 Maintenance of Control

The Contractor shall maintain quality control of purchases:

a. **Supplier control:** The Contractor shall require that each Supplier maintains a quality control program for the services and supplies that it provides. The Contractor's quality assurance organization shall inspect and test materials provided by Suppliers for conformance to specification requirements. Materials that have been inspected, tested, and approved shall be identified as acceptable to the point of use in the manufacturing or assembly processes. Controls shall be established to prevent inadvertent use of nonconforming materials.

b. **Purchasing data:** The Contractor shall verify that all applicable specification requirements are properly included or referenced in purchase orders of articles to be used on transit buses.

c. **Vender Certifications:** Contractor shall provide LACMTA with copies of certifications from all major suppliers acknowledging receipt of the applicable Contract Specifications. Said certificates shall be presented within 30 days following the final Pre-Production meeting.

SP-41.2.4 Manufacturing Control

a. **Controlled conditions:** The Contractor shall ensure that all basic production operations, as well as all other processing and fabricating, are performed under controlled conditions. Establishment of these controlled conditions shall be based on the documented Work instructions, adequate production equipment and special working environments if necessary.

b. **Completed items:** A system for final inspection and test of completed transit buses shall be provided by the quality assurance organization. It shall measure the overall quality of each completed bus.

c. **Nonconforming materials:** The quality assurance organization shall monitor the Contractor's system for controlling nonconforming materials. The system shall include procedures for identification, segregation and disposition of non-conforming materials.

d. **Statistical techniques**: Statistical analysis, tests and other quality control procedures may be used when appropriate in the quality assurance processes.

e. **Inspection status:** A system shall be maintained by the quality assurance organization for identifying the inspection status of components and completed transit buses. Identification may include cards, tags or other normal quality control devices.

SP-41.2.5 Inspection System

The quality assurance organization shall establish, maintain and periodically audit a fully documented inspection system. The system shall prescribe inspection and test of materials, Work in process and completed articles. As a minimum, it shall include the following controls:

a. **Inspection personnel:** Sufficient trained inspectors shall be used to ensure that all materials, components and assemblies are inspected for conformance with the qualified bus design.

b. **Inspection records:** Acceptance, rework or rejection identification shall be attached to inspected articles. Articles that have been accepted as a result of approved materials review actions shall be identified. Articles that have been reworked to specified drawing configurations shall not require special identification. Articles rejected as unsuitable or scrap shall be plainly marked and controlled to prevent installation on the bus. Articles that become obsolete as a result of engineering changes or other actions shall be controlled to prevent unauthorized assembly or installation. Unusable articles shall be isolated and then scrapped. Discrepancies noted by the Contractor or resident inspectors during assembly shall be entered by the inspection personnel on a record that accompanies the major component, subassembly, assembly, or bus from start of assembly through final inspection. Actions shall be taken to correct discrepancies or deficiencies in the manufacturing processes, procedures or other conditions that cause articles to be in nonconformity with the requirements of the Contract specifications. The inspection personnel shall verify the corrective actions and mark the discrepancy record. If discrepancies cannot be corrected by replacing the nonconforming materials, then LACMTA shall approve the modification, repair or method of correction to the extent that the Contract specifications are affected.

c. **Quality assurance audits:** The quality assurance organization shall establish and maintain a quality control audit program. Records of this program shall be subject to review by LACMTA.

SP-41.3 INSPECTION

SP-41.3.1 INSPECTION STATIONS

Inspection stations shall be at the best locations to provide for the Work content and characteristics to be inspected. Stations shall provide the facilities and equipment to inspect structural, electrical, hydraulic and other components and assemblies for compliance with the design requirements.

Stations shall also be at the best locations to inspect or test characteristics before they are concealed by subsequent fabrication or assembly operations. These locations shall minimally include underbody structure completion, body

framing completion, body prior to paint preparation, water test, engine installation completion, underbody dress-up and completion, bus prior to final paint touchup, bus prior to road test and bus final road test completion.

SP-41.4 RESIDENT INSPECTORS

SP-41.4.1 Resident Inspector's Role

LACMTA shall be represented at the Contractor's plant by resident inspectors, as required by FTA. Resident inspectors may be Agency employees or outside contractors. LACMTA shall provide the identity of each inspector and shall also identify their level of authority in writing. They shall monitor, in the Contractor's plant, the manufacture of transit buses built under the procurement. The presence of these resident inspectors in the plant shall not relieve the Contractor of its responsibility to meet all of the requirements of this procurement. LACMTA shall designate a primary resident inspector, whose duties and responsibilities are delineated in "Pre-Production Meetings," "Authority" and "Pre-Delivery Tests," below. Contractor and resident inspector relations shall be governed by the guidelines included as Attachment A to this Section.

SP-41.4.1.1 Inspection Memorandum

LACMTA's Resident Inspectors will express concerns pertaining to manufacturing issues or contract compliance using Inspection memoranda contained in a Master Resolution List (MRL). There shall be a separate MRL for the Pilot Bus and for the remaining production Buses. It is expected that the MRL shall be electronic and shall be regularly updated by both parties. The configuration of this document shall be agreed upon during the Pre-Production Meetings. The Contractor shall reply to all urgent matters in writing within 24 hours. It is expected that an electronic matrix of all production issues, speed memos and other correspondence will be developed and transmitted via email to expedite this process.

SP-41.4.2 Pre-Production Meetings

The primary resident inspector may participate in design review and pre-production meetings with LACMTA. At these meetings, the configuration of the buses and the manufacturing processes shall be finalized, and all Contract documentation provided to the inspector.

No less than thirty (30) days prior to the beginning of bus manufacture, the primary resident inspector may meet with the Contractor's quality assurance manager and may conduct a pre-production audit meeting. They shall review the inspection procedures and finalize inspection checklists. The resident inspectors may begin monitoring bus construction activities two weeks prior to the start of bus fabrication.

SP-41.4.3 Authority

Records and data maintained by the quality assurance organization shall be available for review by the resident inspectors. Inspection and test records for this procurement shall be available for a minimum of one year after inspections and tests are completed.

The Contractor's gauges and other measuring and testing devices shall be made available for use by the resident inspectors to verify that the buses conform to all specification requirements. If necessary, the Contractor's personnel shall be made available to operate the devices and to verify their condition and accuracy.

Discrepancies noted by the resident inspector during assembly shall be entered by the Contractor's inspection personnel on a record that accompanies the major component, subassembly, assembly or bus from start of assembly through final inspection. Actions shall be taken to correct discrepancies or deficiencies in the manufacturing processes, procedures or other conditions that cause articles to be in nonconformity with the requirements of the Contract specifications. The inspection personnel shall verify the corrective actions and mark the discrepancy record. If discrepancies cannot be corrected by replacing the nonconforming materials, LACMTA shall approve the modification, repair or method of correction to the extent that the Contract specifications are affected.

The primary resident inspector shall remain in the Contractor's plant for the duration of bus assembly Work under this Contract. Only the primary resident inspector or designee shall be authorized to release the buses for delivery. The resident inspectors shall be authorized to approve the pre-delivery acceptance tests. Upon request to the quality assurance supervisors, the resident inspectors shall have access to the Contractor's quality assurance files related to this procurement. These files shall include drawings, assembly procedures, material standards, parts lists, inspection processing and reports, and records of Defects.

SP-41.4.4 Support Provisions

The Contractor shall provide office space for the resident inspectors in close proximity to the final assembly area. This office space shall be equipped with desks, outside and interplant telephones, Internet access, file cabinet and chairs. As an alternative, Contractor may supply a combination plain paper fax, copier and printer. In addition, two (2) large erasable white board with markers, one bulletin board and one printing calculator shall be provided.

The Contractor shall provide access to the Contractor's LAN server to both send and receive email. The required email address shall be "TBD@METRO.net"

SP-41.4.5 Compliance with Safety Requirements

At the time of the Pre-Production meeting, the Contractor shall provide all safety and other operational restrictions that govern the Contractor's facilities. These issues will be discussed and the parties will agree which rules/restrictions will

govern LACMTA's inspector(s) and any other Agency representatives during the course of the Contract.

SP-41.5 ACCEPTANCE TESTS

SP-41.5.1 RESPONSIBILITY

Fully documented tests shall be conducted on each production bus following manufacture to determine its acceptance to LACMTA. These acceptance tests shall include pre-delivery inspections and testing by the Contractor and inspections and testing by LACMTA after the buses have been delivered. Acceptance Tests and Completed Vehicle inspection documentation shall be presented to LACMTA upon delivery of each Bus.

SP-41.5.2 INITIAL ENGINE START-UP

The fuel system shall be filled and pressure tested after installation of the engine in the Bus and before it is initially started. The pressure test shall ensure that the fuel system is free of leaks. This requirement shall be verified with the fuel system and lines at working pressure. Starting aids, such as ether, shall not be used to start engines.

SP-41.5.3 INITIAL LUBRICATION

All assemblies shall be lubricated in accordance with manufacturer recommendations before the Bus is operated on the road. This shall include, but not limited to proper engine oil, transmission fluid, hydraulic system oil levels, and grease applied to all zerk fittings. Initial lubrication certification shall be presented to LACMTA upon delivery of each Bus.

SP-41.5.4 PRE-DELIVERY TESTS

The Contractor shall conduct acceptance tests at its plant on each Bus following manufacture completion and before submittal to LACMTA for "Completed Bus" inspection. Contractor pre-delivery tests shall include visual and measured inspections, as well as testing the total Bus operation. The underfloor equipment shall be made available for inspection by the Resident Inspectors using a pit or Bus hoist provided by the Contractor. A hoist, scaffold, or elevated platform shall be provided by the Contractor to easily and safely inspect Bus roofs. The Contractor shall provide a driver for road test, water booths for water test, and personnel equipment and facilities for any other tests LACMTA requests.

Delivery of each Bus shall require written authorization of the Senior Resident Inspector or his designee. An executed copy of the authorization shall accompany the delivery of each Bus.

The Resident Inspector has the right to witness inspections and testing for all Buses prior to delivery including any additional tests conducted by or on behalf of the Contractor. The Contractor's pre-delivery test shall be scheduled and conducted with sufficient notice so that they may be witnessed by the Resident

Inspectors, who may accept or reject the results of the test. The tests shall be conducted and documented in accordance with written test plans which are to be provided to LACMTA. Additional tests may be conducted at the Contractor's discretion to ensure that the completed Buses have attained the desired quality and have met the requirements of the technical specifications. This additional testing shall be recorded on appropriate test forms provided by the Contractor.

SP-41.5.5 VISUAL AND MEASUREMENT INSPECTIONS

Visual and measurement inspections shall be conducted with the Bus in a static condition. The purpose of the inspection testing is to verify:

a) Overall dimension and weight requirements
b) Required components are included and ready for operation
c) Components and subsystems functionally operate with the Bus as designed in a static condition.

SP-41.5.6 OVERALL BUS OPERATION

Overall Bus operation shall be evaluated during road tests. The purpose of the road test is to observe and verify the operation of the Bus as a system and to verify the functional operation of the sub-systems which can be operated only while the Bus is in motion.

Each Bus shall be driven for a minimum 35 miles during the road test. If requested, computerized diagnostic printouts showing the performance of each Bus shall be produced and provided to LACMTA. Observed defects shall be recorded on the test forms. The Bus shall be re-tested when defects are corrected and adjustments made. This process shall continue until defects are no longer detected. Results shall be pass/fail for these Bus operation tests.

SP-41.5.7 PRE-DELIVERY BUS DOCUMENTATION PACKAGE (BDP)

Prior to presenting each Bus for inspection, the Contractor’s quality assurance organization shall be responsible for preparing a documentation package for each Bus. When completed following LACMTA inspection, the BDP shall be inserted into a manila envelope which shall be labeled with the LACMTA Bus number on the front of the envelope. This envelope shall be placed into the Bus and shall be presented to LACMTA upon delivery of the Bus in Los Angeles.

At a minimum, each BDP shall contain the following items:

1. BDP Check-off Sheet listing the following:
2. QA Certificate of Completion (signed by Contractor QC representative).
3. CNG pressure test certification.
4. Water test Certification.
5. Alignment and Steering Stop Adjustment Certification.
6. Smoke Opacity Test (Exhaust Emissions). Not applicable to CNG or Zero Emission buses; applicable only to diesel powered buses.
7. LACMTA “Completed Bus” Inspection document.

8. Copy of defects noted during LACMTA Completed Bus inspection.
9. List of “Open Items” .
10. VIN number (copy of bus data plate)
11. Certificate of Origin
12. Weight slip (curb weight)
13. Certificate of compliance for high voltage/energy storage protective devices, if applicable.
14. Component Serial Number List - List of serialized components installed on each Bus to include, but not limited to:
    - Engine
    - Transmission
    - Alternator
    - Starter
    - A/C Compressor
    - Drive Axle
    - Power Steering Unit
    - Air Compressor
    - CNG Fuel Cylinders with installation location diagram.
    - Other serialized components for which the Contractor will require serial numbers for the processing of warranty claims.

Open items may be considered and approved by LACMTA on a case-by-case basis only prior to bus shipment. They may include material which is missing, damaged, or non-compliant.

The BDP shall be well organized and be contained in a suitable binder clearly showing the LACMTA bus number on the outside. Item number 1 (above) shall be clearly visible and prominent when the BDP is opened.

SP-41.5.8 POST-DELIVERY TESTS

LACMTA may conduct acceptance tests on each delivered Bus. These tests shall be completed within 15 days after Bus delivery. The purpose of these tests is to identify defects that have become apparent between the time of Bus release and delivery to LACMTA. The post-delivery tests shall include visual inspection and Bus operations.

Buses which fail to pass the post-delivery tests are subject to non-acceptance. LACMTA shall record details of all defects on the appropriate test forms and shall notify the Contractor of the non-acceptance of each Bus within 5 days after completion of tests. The defects during these tests shall be repaired according to the procedures defined in this Contract. A Contractor's representative shall be present during post-delivery test days.

SP-41.6 POST DELIVERY INSPECTION

The post-delivery inspection is similar to the inspection at the Contractor's plant and shall be conducted with the Bus in a static condition. Any visual damage shall be identified and recorded during the post delivery inspection of each Bus.

SP-41.6.1 BUS OPERATION

The road tests for total Bus operation are similar to those conducted at the Contractor's plant. Operational deficiencies of each Bus shall be identified and recorded and shall be resolved as provided in this Contract.

SP-41.6.2 OIL DRAIN

If required by the OEM manufacturer, Buses that are driven from the Manufacturing site to LACMTA shall have engine and transmission oils and all filters, including fuel filters, changed by Contractor prior to acceptance by LACMTA.

SP-41.6.3 BOLT TORQUE

Upon a buses arrival in Los Angeles – Contractor shall be required to re-torque and mark any structural bolts and fasteners as recommended in the Contractors Maintenance Manual.

SP-42 PAYMENT OF PREVAILING AND LIVING WAGES / REPORTING (NOT APPLICABLE)

This Contract is subject to the provisions of California law regarding Public Works, including, but not limited to California Labor Code Sections 227, 1021, and 1720 through and including 1861, together with all applicable regulations (e.g. Title 8 California Code of Regulations, Section 16001 et. seq.). In addition to the requirements for payment of prevailing wages set forth in the Labor Compliance Manual, this Contract, if federally funded, is also subject to payment of prevailing wages under federal law by the Davis Bacon Act, as determined by the US Department of Labor. All pertinent federal and state statutes and regulations, including but not limited to those referred to above are hereby incorporated by reference into this document as though set forth in their entirety.

This Contract is also subject to the payment of a living wage, as set forth in the Living Wage Policy (LWP). Contractors under contract for the furnishing of service to or for Metro and that involve expenditures in excess of $25,000 and a contract term of at least three (3) months, shall comply with the provisions in the LW P.

In the event of a conflict between LACMTA's living wage, the prevailing wage under state law as determined by California authorities and the prevailing wage under federal law as determined by the U.S Department of Labor, the Contractor shall pay at minimum the highest of the three (3) wages.

Prevailing Wage Reporting System — LACMTA may require, at time of award, the Contractor to utilize LACMTA's online "Prevailing Wage Reporting System," in lieu of hard copy manual submittals, for the following documents:

- Certified Payroll and other related documents if applicable
- Project Labor Agreement related documents (if applicable)
- Construction Careers Policy monthly reports and related documents (if applicable)

SP-43 SERVICE CONTRACT WORKER RETENTION POLICY (NOT APPLICABLE)

This Contract may be subject to the Service Contract Worker Retention Policy ("SCWRP") which is incorporated herein by this reference. If applicable, Contractor must also comply with the SCWRP which requires that, unless specific exemptions apply, all employers under contracts that are primarily for the furnishing of services to or for the Los Angeles County Metropolitan Transportation Authority (Metro) and that involve an expenditure or receipt in excess of Twenty-Five Thousand Dollars ($25,000) and a contract term of at least three (3) months, shall provide retention by a successor contractor for a ninety-day (90-day) transition period of the employees who have been employed for the preceding twelve (12) months or more by the terminated contractor or subcontractor, if any, as provided for in the SCWRP. Metro has the authority, under appropriate circumstances, to terminate this Contract and otherwise pursue legal remedies that may be available if Metro determines that the subject contractor violated the provisions of the SCWRP.

SP-44 BUY AMERICA CERTIFICATION

A. Buy America Certification

1. As described in Regulatory Requirements Section RR-15 of this RFP, this Contract is subject to the "Buy America" statutory requirements of 49 USC §5323U) and regulatory requirements of 49 CFR Part 661, as may be amended from time to time. Proposer's attention is directed to 49 CFR §661.11, Rolling Stock Procurements. Proposer has the responsibility to comply with the above cited provisions and any other governing statutes and regulations, including official interpretations.

2. Proposers shall execute the appropriate "Buy America" certification in the Proposal Documents. Failure to do so will make the Proposal non-responsive. The two signature blocks on the "Buy America" Certificate are mutually exclusive. Proposer shall sign only one signature block on the Certificate. Signing both signature blocks will make the Proposal non-responsive. Knowingly and willfully making a false certification is a criminal act under 18 USC §1001.

   2.1 The Proposer who has submitted an incomplete "Buy America" certificate or incorrect certificate of non-compliance through inadvertent or clerical error (but not including failure to sign the certificate, submission of certificates of both compliance and

non-compliance, or failure to submit any certification), may submit to the FTA Chief Counsel within ten (10) Days of Proposal opening a written explanation of the circumstances surrounding the submission of the incomplete or incorrect certification in accordance with 28 USC §1746, sworn under penalty of perjury, stating that the submission resulted from inadvertent or clerical error. The Proposer will also submit evidence of intent, such as information about the origin of the product, invoices, or other working documents. The Proposer will simultaneously send a copy of this information to LACMTA.

2.2 The FTA Chief Counsel may request additional information from the Proposer, if necessary. LACMTA may not make Contract Award until the FTA Chief Counsel issues his/her determination, except as provided in 49 CFR Part 661.15(m).

2.3 Certification based on ignorance of proper application of the "Buy America" requirements is not an inadvertent or clerical error.

3. Any party may petition FTA to investigate a successful Proposer's compliance with the "Buy America" certification. The procedures are set out in 49 CFR Part 661.15. If FTA determines the evidence indicates noncompliance, FTA will require LACMTA to initiate an investigation. The successful Proposer has the burden of proof to establish compliance with its certification. If the successful Proposer fails to so demonstrate compliance, the successful Proposer will be required to substitute sufficient domestic materials without revision of the original Contract terms or increase in the Contract Price. A willful failure to comply with a certification will be a breach of the Contract and may lead to the initiation of debarment or suspension proceedings under 49 CFR Part 29.

B. Buy America Pre-Award and Post-Delivery Audit Requirements.

a. Proposer/Supplier agrees to provide the information requested by LACMTA in order for LACMTA to meet the pre-Award and post-Delivery audit requirements of 49 USC. §5323(m) and 49 CFR Part 663.

2. Pre-Award Audit Requirements: If Proposer certifies compliance with Buy America as set forth in these Special Provisions, Proposer shall submit documentation which lists 1) component and subcomponent parts of the Vehicle, as defined by 49 CFR Part 661, to be purchased, identified by manufacturer of the part, its country of origin and cost; 2) the location of the final assembly point for the Vehicle; and 3) a description of the activities that will take place at the final assembly point and the cost of final assembly, in order to allow LACMTA to complete the pre-award audit. Proposer shall provide enough detail to

allow for the determination that all final assembly activities will be performed in the Contractor's final assembly facility in the U.S. In addition, the Pre-Award Audit must include the Purchaser's Requirements Certification required under 49 CFR 663.27.

3. Post-Delivery Audit Requirements: If Proposer certifies compliance with Buy America as set forth in these Special Provisions, Proposer shall submit documentation which lists 1) component and subcomponent parts of the Vehicle purchased, as defined by 49 CFR Part 661, identified by manufacturer of the part, its country of origin and cost; 2) the actual location of the final assembly point for the Vehicle; and 3) a description of the activities that took place at the final assembly point and the cost of final assembly, in order to allow LACMTA to complete the post-Delivery audit. Proposer shall provide accurate records of all vehicle construction activities; and address how the construction and operation of the vehicles fulfills the contract specifications in enough detail to allow for the determination that all final assembly activities were performed in the Contractor's final assembly facility in the U.S.

C. Buy America Compliance Reporting

The Contractor shall promptly report and provide enough details to LACMTA of any substitution / addition / deletion of supplier(s) that may impact Buy America domestic content proposed at the time of the Pre-Award audit.

Additionally, the Contractor shall report Buy America compliance status each month in the monthly progress report in a format approved by LACMTA.

ATTACHMENT A: NEW BUS MANUFACTURING INSPECTION GUIDELINES

This attachment was developed by the APTA Bus Equipment and Maintenance Committee and is intended as a guideline for use by transit systems (Agencies) and vehicle manufacturers (Contractors). Two lists are included to reflect the expectations of both the transit system and the vehicle manufacturer.

Pre-Building Phase

Bus Manufacturer's Expectations	Transit System's Expectations
1. Contract/transit system inspectors must be given all Contract documentation before beginning the inspection process. 2. The bus manufacturer's inspection process should be reviewed at pre-production audit meeting. Inspectors should be present and understand the difference among various manufacturing processes. At least one key customer and manufacturer representative who will follow the entire procurement from start to finish should be present. 3. When change orders are required, they need to be made as early in the process as possible. If change orders have an impact on the delivery schedule, consideration should be given to a delivery schedule revision. 4. Transit system inspection forms should be provided to manufacturers prior to the build so that the manufacturers will know what items the customer believes are critical. The inspection forms should be provided to the manufacturer after completion so that the Defects to be corrected can be identified. 5. If the transit system requires sole-source components, it should obtain assistance for the first installation of new components. 6. The transit system should have a decision maker at the pre-production audit meeting. 7. The transit system should make every effort to inform manufacturers of what they want. Hidden agenda items buried in the Contract to not promote the cooperative environment desired. 8. The parties should agree on what necessitates a line shutdown before the build begins.	1. Manufacturers should have a formal, approved quality assurance (QA) program and must adhere to the program. Any changes in the approved program must be resubmitted to the transit system for approval. 2. At the pre-production audit meeting with the transit system: • Representatives from contracts, engineering, quality and production should be represented. • Manufacturers should ensure good communication among their departments regarding Contract requirements. • A formal sales release must be ready for review at the meeting, and a final sales release must be ready before production. • Manufacturers should not use the meeting to sell parts. • Manufacturers should supply test information and other documents required to meet expectations. 3. Manufacturers should have application and installation approvals from Suppliers whenever possible. On installations of new major components, the sub-Supplier must be present at initial production. 4. Manufacturers should read and understand the specification prior to bid. Specification clarifications should be made during the approved equals process. Ask the appropriate questions at pre-bid meetings. 5. The manufacturer's service representative should be involved with the pre-production audit meeting and initial production, and/or at final acceptance. 6. Prior to build, the manufacturer should be able to provide the transit system a complete Bill of Materials for the buses to be built.

Process During Building Phase

Bus Manufacturer's Expectations	Transit System's Expectations
1. One person should be the primary inspector from start to finish. The primary inspector should be included in the design review process and pre-production meetings. The rotation of personnel with different expectations and standards causes difficulties. The first or second bus should stay at the manufacturer's location as a quality standard and be delivered last. 2. An adequate number of experienced inspectors should be available to prevent production line movement delays. 3. Inspectors should be available to support the manufacturing effort Monday through Friday, consistent with the manufacturer's production personnel hours. 4. Inspection should be conducted in a cooperative, professional manner. The inspector must *want* to solve problems. 5. Only one person should be able to make stop ship calls, and the reason for the stop ship *must* be immediately available. The stop ship should be in writing. 6. Problems identified should be brought to the attention of the manufacturer at the stage when they occur rather than at a future stage or when the vehicle is complete.	1. The resident inspector should have access to a complete set of engineering drawings and documents for the bus being built. Engineering or manufacturing changes must be formally documented and included in documents provided to transit systems. 2. Manufacturers should maintain the build schedule if possible. Changes in the build schedule and requests for overtime and weekend Work must be communicated as early as possible. 3. Buses that are not ready or complete should not be presented for final inspection. 4. Manufacturers should have a formal internal/external communications process and feedback for inspection problems and resolutions. Manufacturers should provide early resolution of problems identified by inspectors. QA procedures must be revised to reflect problem corrections. 5. The attitude of manufacturers and QA personnel is important; remember who the customer is. However, there must be mutual respect. 6. The transit system is not responsible for redesigning the bus, correcting problems or providing manufacturing quality. It audits only. Manufacturers should not need a learning period to determine acceptable quality standards. 7. Buses should be identical and interchangeable within an order unless provided by the transit system. 8. Inspection Work should be spread evenly during the workday to the extent possible.

Post-Building Phase

Bus Manufacturer's Expectations	Transit System's Expectations
1. To ensure prompt payment, the transit system should increase the rate of the final acceptance process. 2. The on-property final acceptance inspection should be primarily for shipping damage and Defects that occur during shipment. It should not be a complete vehicle inspection with criteria different from those used at the plant.	1. Defects noted at the property final inspection should be repaired in a timely and acceptable manner.

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ATTACHMENT B – FAITHFUL PERFORMANCE BOND

LOS ANGELES COUNTY
METROPOLITAN TRANSPORTATION AUTHORITY

CONTRACT NO. OP28367-000

FORTY-FOOT (40') LOW FLOOR CNG TRANSIT VEHICLES

PERFORMANCE BOND

WHEREAS the Los Angeles County Metropolitan Transportation Authority ("LACMTA") has awarded to ELDORADO NATIONAL (CALIFORNIA), INC. ("Principal"), Contract No. OP28367-000, for Forty-Foot (40') Low Floor CNG Transit Vehicles. And

WHEREAS Principal is required under the terms of the Contract to furnish a Bond for the faithful performance of the Contract;

NOW, THEREFORE, we ELDORADO NATIONAL (CALIFORNIA), INC., as Principal, and ("Surety"), as Surety, are held and firmly bound unto LACMTA in the sum of fifteen percent (15%) of the Not to Exceed (NTE) Contract value, in lawful money of the United States of America, for payment of which sum well and truly to be made, we bind ourselves, our heirs, executors, administrators, successors, and assigns, jointly and severably, firmly by these presents. In case suit is brought upon this Bond, Surety shall pay reasonable attorneys' fees to LACMTA in an amount to be fixed by the court. In no event shall the surety be liable under this Bond for an amount greater than the aggregate penal sum designated in this paragraph.

The condition of this obligation is such that, if the hereby-bonded Principal or its heirs, executors, administrators, successors, assigns, or Subcontractors shall in all things stand to and abide by and well and truly keep and perform all the undertakings, terms, covenants, conditions, and agreements in the Contract and any alteration thereof, made as therein provided, all within the time and in the manner therein-designated and in all respects according to their true intent and meaning, then this obligation shall become null and void; otherwise, it shall be and remain in full force and effect.

Further, Surety, for value received, hereby stipulates and agrees that no change, extension of time, alteration, or modification of the Contract, or of the Goods to be furnished thereunder, shall in any way affect its obligations under this Bond, and it does hereby waive notice of any such change, extension of time, alteration, or modification of the Contract or of the Goods and Technical Services to be performed thereunder.

IN WITNESS WHEREOF, three identical counterparts of this instrument, each of which shall for all purposes be deemed an original hereof, have been duly executed by Principal and Surety named herein, on the _____ day of _____ 20__, the name and corporate seal of each corporate party being hereto affixed and these presents duly signed by its undersigned representative pursuant to authority of its governing body.

By: _____
(Principal)

_____

By: _____
(Surety)

_____

By: _____

ATTACHMENT C – ASSIGNMENT AGREEMENT

ASSIGNMENT TO PURCHASE AGREEMENT

Los Angeles County Metropolitan Transportation Authority of Los Angeles, California, "Assignor", hereby assigns to _____ of _____, "Assignee", to purchase from _____ of, "Seller", _____ floor transit Vehicles at a price and under the terms and conditions contained in Assignor's Contract No OP28367-000, dated _____ with Seller ("Contract").

Contract OP28367-000 commenced, per terms of Contract, on _____, and any unused buses may be assigned at any time on or before _____.

With respect to Vehicles assigned hereunder and this Assignment, Assignee agrees to perform all covenants, conditions and obligations required of Assignor under said Contract and agrees to defend, indemnify and hold Assignor harmless from any liability or obligation under said Contract. Assignee further agrees to hold Assignor harmless from any deficiency or defect in the legality or enforcement of the terms of said Contract or option to purchase thereunder. Assignee agrees and understands that Assignor is not acting as a broker or agent in this transaction and is not representing Seller or Assignee, but rather is acting as a principle in assigning its interest in the above-referenced option to purchase the Vehicles under the Contract to Assignee.

Assignee hereby unconditionally releases and covenants not to sue Assignor upon any claims, liabilities, damages, obligations or judgments whatsoever, in law or in equity, whether known or unknown, or claimed, which they or either of them have or claim to have or which they or either of them may have or claim to have in the future against Assignor, with respect to the Vehicles or any rights whatsoever assigned hereunder.

Dated this _____ day of _____, 201_

_____ _____

Assignor Assignee

I hereby accept and approve the terms of this agreement and agree to hold Assignor harmless from any further liability or obligation under our agreement.

_____

Seller

END OF SPECIAL PROVISIONS

GENERAL CONDITIONS (SERVICES)

Note: * = **Flow-down requirement as defined in the Article entitled SUBCONTRACTORS AND SUPPLIERS herein**

GC-01 GLOSSARY OF TERMS*

GC-01-A Abbreviations And Symbols

ADR	Alternative Disputes Resolution
Cal-OSHA	California Occupational Safety and Health Administration
CEO	Chief Executive Officer
CFR	Code of Federal Regulations
DVBE	Disabled Veteran Business Enterprise
EPA	United States Environmental Protection Agency
FAR	Federal Acquisition Regulations
FTA	Federal Transit Administration
GEC	General Engineering Consultant
Metro	Los Angeles County Metropolitan Transportation Authority
NTE	Not-to-Exceed
OSHA	United States Department of Labor, Occupational Safety and Health Administration, and Occupational Safety and Health Act
PUC	Public Utilities Code, State of California
RFC	Request for Change
SBE	Small Business Enterprise
USC	United States Code

GC-01-B Definitions

Acceptance	Documentation prepared by Metro or its Authorized Representative attesting to the completion of all of the Services or Work under the Contract or a CWO or a specified portion thereof.
Alternative Disputes Resolution:	Means for settling a disputed claim which may include arbitration, mediation or other recognized means for settling a dispute.
Amendment:	A document mutually agreed to by the Parties modifying the Contract.
Approve:	To confirm documents presented by and/or actions of the Contractor related to the Work under the Contract or CWO.
Assessment:	A cost imposed on the Contractor for non-compliance with certain contractual requirements.
Authorized Representative:	Person or firm empowered to act for or in the place of the named business or governmental entity.

Chief Executive Officer:	The Chief Executive Officer (CEO) of Metro.
Claim:	A written demand by one of the Contracting Parties for: 1. Time extension; and/or 2. Payment of money.
Consultant	One that provides Services or Work to Metro, also defined as the Contractor.
Consultant Change Notice (CCN):	A document issued by Metro to the Contractor detailing a proposed change to the Contract or CWO.
Contract:	Written agreement executed by Metro and the Contractor which sets forth the rights and obligations of the parties in connection with the Services and Work, and which includes the Contract Documents.
Contract Work Order (CWO):	The document issued by Metro for each separate assignment detailing the Scope of Work, price and completion time.
CWO Period of Performance:	The total time period allowed for completion of the Work, including all authorized time extensions, as specified in each CWO.
CWO Price:	The not-to-exceed amount agreed to by the Parties to perform the Scope of Work.
Contracting Officer:	The CEO or a designated representative who is authorized and empowered to execute contracts, contract amendments, CWOs, CWO Revisions, WACNs, and agreements on behalf of Metro.
Contractor:	The individual, firm, partnership, corporation, joint venture or combination thereof, referred to throughout the Contract in the singular and by the neuter term "it", that has entered into the Contract with Metro.
Cure Notice:	Written notice from Metro to the Contractor to correct Work performed not in conformance with the Contract or CWO.
Days:	Unless otherwise stated, "days" shall mean calendar days. When a required submittal falls on a non-business day, submittal shall be on the next

	business day.
Design Professional (DP):	A person licensed as an architect, registered as a professional engineer, licensed as a land surveyor or otherwise licensed or registered in a professional discipline pursuant to the laws of the State of California.
DVBE:	Disabled Veteran Business Enterprise (DVBE): A business enterprise certified by the State of California's Department of General Services (DGS) and is 51% owned by one or more disabled veterans, whose daily business operations are managed and controlled by one or more disabled veterans.
Goods:	Equipment, material and/or products required to perform the Services. Goods may be furnished by Metro or required to be furnished by the Contractor.
Government Entity	Any federal, state, or local government and any political subdivision or any governmental, quasi-governmental, judicial, public or statutory instrumentality, administrative agency, authority, body or entity other than Metro.
Home Office:	The home office(s) of the Contractor's firm.
Invoice:	A request for payment for Work performed.
Milestone:	An established event or occurrence that is associated with the Schedule as defined in the Contract or CWO.
Modification	Any written addition, deletion, adjustment or alteration to the Contract, whether arising out of the unilateral exercise by the MAT of any right under the Contract, or by mutual agreement/action executed by the Parties. A Modification may be unilateral or bilateral, and includes Change Orders, adjustments in quantities, extensions of time, administrative changes and adjustments, and all other actions and events that result in an alteration, correction or adjustment of the Total Contract Price or Time, any Contract term or process, or any other obligation of either Party.
Metro or MTA	The Los Angeles County Metropolitan Transportation Metro (Metro) or its successor, or

	any successor in interest, or its Authorized Representative.
Notice of Termination:	Written notice from Metro to the Contractor terminating the Contract or/CWO, or a portion thereof, either for convenience of Metro or for default due to the Contractor's failure to perform its contractual obligations.
Payment Application:	A request for payment for Work performed.
Parties:	Metro and the person(s), governmental entities, or business entities entering into the Contract.
Period of Performance:	The total time period allowed for completion of all Services or Work under the Contract or CWO, as specified in the Form of Contract or CWO.
Prime Design Professional (PDP):	A design professional with a written Contract directly with Metro.
Program:	Existing and planned rail transit system that is and will be operated by Metro.
Project:	A portion of Metro Transit System as defined in the Form of Contract
Provide:	In reference to Work to be performed by the Contractor, "provide" means to perform Work in accordance with the Scope of Services and the Scope of Work.
Request for Change (RFC):	A document issued by the Contractor to Metro detailing a proposed change to the Contract or CWO.
Request for Substitution:	Goods, service(s), or system(s) that the Contractor requests to use in lieu of that specified in the Contract.
Revision:	A document issued by Metro to the Contractor or mutually agreed to by the Parties modifying the Contract or CWO.
SBE:	Small Business Enterprise (SBE): A small business that is 55 percent owned and controlled by one or more economically disadvantaged individuals; and whose management and daily business operations are controlled by one or more economically disadvantaged individual who owns it.

Schedule:	A time phased Project execution plan that identifies all activities necessary to implement a given Project in a logical time phased manner. The Contract or CWO Schedule provides the start and completion date of each activity and its Milestones. The Project Schedule shall include the Milestones for the entire Project.
Scope of Services (Services):	Description of the sum total of productive and operative efforts used to generate the results specified, indicated, or implied in the Contract, including all technical and professional services, and Goods used during all related activities whether originally or subsequently Scheduled.
Scope of Work:	Description of the Work to be provided by the Contractor under the Contract or CWO.
Special Provisions:	Requirements applicable to the Contract that invoke, modify, and/or supplement the General Conditions
State:	The State of California.
Sub-consultant Design Professional (SDP):	Design professional hired by a prime design professional.
Subcontractor:	Any individual, firm, partnership, corporation, joint venture or combination thereof, other than employees of the Contractor, that enters into a legal agreement with the Contractor to furnish Work, labor or Goods as a portion of the Work. Unless otherwise specified, Subcontractors includes Subcontractors of any tier.
Supplier:	Any individual, firm, partnership, corporation, joint venture, or combination thereof, other than employees of the Contractor, or Subcontractor that enters into a legal agreement with the Contractor and that manufacturers, distributes or furnishes tangible Goods as a portion of the Work, with Work usually limited to delivery and/or required testing.
Technical Review:	A technical quality and progress audit including, but not limited to, a check of budget versus expenses to date, technical progress, quality of work, Schedule assessment and a measurement of design hours per drawing, review of adherence to policies and procedures and safety requirements.

Total Contract Price (TCP):	The total compensation approved by Metro's governing board to be paid to the Contractor in accordance with the terms of the Contract (and Amendments thereto).
Transit System:	The entire fixed guideway rail transportation system, including right-of-way, pavement, tracks, structures, equipment appurtenances, and all other related property of Metro.
Work:	The sum of all activities, Services and Deliverables, to be accomplished under the Contract or CWO.
Worksite:	The location where the Contractor's Work will be performed as defined in the Contract or CWO(s). The term may include the location of work performed by others (i.e., the construction site of a Project).

GC-02 INTERPRETATION*

GC-02-A Information

1. Furnished By Metro:

   Upon request by the Contractor, Metro shall furnish the Contractor any general information and data readily available to Metro or those under contract to Metro, which the Contractor determines, may be of use to the Contractor in the performance of the Work. Metro shall rely upon the Contractor to determine which of the general information and data readily available to Metro the Contractor requires for the performance of the Work hereunder. Metro makes no representations with respect to the reliability, accuracy, or completeness of any information or data it may furnish hereunder. The Contractor is entitled to rely on the information or data to the extent a professional engineer believes it is appropriate to do so. The Contractor is expected to apply its professional judgment and seek any clarification it deems necessary.

2. Furnished by Others:

   The Contractor is to obtain, utilizing its own personnel, any required information that has been developed by other public or private agencies or companies that are not under contract to Metro. The Contractor is to apply its professional judgment as to the reliability of the information or data for the purpose for which the Contractor intends on utilizing such information or data.

GC-03 PRECEDENCE OF CONTRACT DOCUMENTS

See Form of Contract Article 1

GC-04 CONTRACT DOCUMENTS

GC-04-A Explanations

Should it appear that the Work to be performed or any relative matters are not sufficiently detailed or explained in the Contract, the Contractor shall request in writing from Metro a written explanation as may be necessary and shall conform to the explanation given.

GC-04-B Omissions And Misdescriptions

1. The Contractor shall carefully study the Contract; shall verify all figures in the Contract Documents before performing the Work; shall promptly notify Metro of all errors, inconsistencies, and/or omissions that it discovers; and, in instances where such non-conformities are discovered, shall obtain specific instructions in writing from Metro before Contractor's proceeding with the Work. Any Work affected that is performed prior to Metro's decision shall be at the Contractor's risk. The Contractor shall not take advantage of any apparent non-conformity that may be found in the Contract. Metro shall be entitled to make such corrections therein and interpretations thereof as it may deem necessary for the fulfillment of the intent of the Contract. Omissions or misdescription of any Work that are manifestly necessary to carry out the intent of the Contract, or that are customarily performed, shall not relieve the Contractor from performing such Work at no additional expense and/or delay, and such Work shall be performed as if fully and correctly set forth in the Contract.

2. Terms

   Where the terms "as indicated" and "as detailed," or words of similar import are used by themselves, it shall be understood that reference is made to the Technical Specifications or other technical documents provided by Metro, or Contract drawings unless otherwise expressly stated. "Directed," "required," "permitted," "ordered," "designated," "selected," "approve," "accept," "satisfactory," "equal,", "necessary," or words of like import shall be understood to require an identifiable action by Metro unless otherwise expressly stated.

3. References within the Contract

   References to Articles and Subarticles herein are made by citing the Title of the Articles only, e.g., a reference to this particular paragraph would be phased "in the Article entitled 'INTERPRETATION,' which would necessarily be inclusive of all other paragraphs in this Article. However, where a reference is made to other paragraphs within the same Article, the reference is made as in the preceding sentence, i.e., "in this Article." References to other Sections of the Contract are made by citing the title of the Section.

GC-05 AUTHORITY OF THE CONTRACTING OFFICER

Metro has the final approval in all matters relating to or affecting the Work. Except as expressly specified in the Contract, the Contracting Officer may exercise any powers, rights, and/or privileges that have been lawfully delegated by Metro. Metro shall inform Contractor in writing of delegations given by it to the Contracting Officer. Nothing in the Contract shall be construed to bind Metro for acts of its employees and Authorized Representatives that exceed the delegation of Metro specified herein.

GC-06 METRO'S TECHNICAL REPRESENTATIVE (PROJECT MANAGER)

Metro shall provide a Project Manager and/or a technical representative for all technical aspects related to the performance of the Contract. The Contractor shall make such oral or written reports to Metro's technical representative with an information copy to Metro's Contract Administrator as may be requested by Metro or as specifically required by the Contract. ALL CONTRACTUAL MATTERS SHALL BE ADDRESSED TO THE DESIGNATED CONTRACT ADMINISTRATOR.

GC-07 INDEPENDENT CONTRACTOR

The Contractor represents that it is fully experienced and properly qualified to perform the class of Work required for the Contract and that it is properly licensed, equipped, organized, and financed to perform the Work. The Contractor shall be an independent contractor. The Contractor is not an agent of Metro in the performance of the Contract, and shall maintain complete control over its employees and its Subcontractors and Suppliers of any tier. Nothing contained in the Contract or any Subcontract awarded by the Contractor shall create any contractual relationship between any Subcontractor and Metro. The Contractor shall perform the Work in accordance with its own methods, in compliance with the terms of the Contract.

Metro reserves the right of prior approval of all subcontractors and retains the right to request Contractor to terminate any subcontractor, for any reason deemed appropriate by Metro, by so notifying Contractor in writing. Should said notification be submitted to Contractor, it shall terminate said subcontractor immediately.

GC-08 ORGANIZATIONAL AND KEY PERSONNEL

A. Before starting any Work, the Contractor shall submit for Metro review and acceptance, an organization chart showing the proposed organization established by the Contractor for the performance of the Work, including:

   1. Lines of authority, responsibility, and communication;

   2. Office organizations, if any; and

   3. Names, titles, and functions of all supervisory and other key personnel.

B. The Contractor's Project Manager shall supervise and direct the Work, and have overall responsibility for the Work in accordance with the Contract. The Contractor shall be solely responsible for implementation of all Work, means, methods, techniques, sequences, and procedures and for coordination of all portions of the Work under the Contract.

C. The Contractor shall not reassign such key personnel to other projects without Metro's prior written approval and until a satisfactory replacement has been approved by Metro. The Contractor shall secure the prior written approval of Metro for any change or reassignment of the key personnel, submitting written documentation of the new individuals' qualifications.

D. If Metro provides office space to the Contractor, or requires Contractor to locate its office space in a specific location, then at all times during the performance of Work hereunder, only related Work shall be performed in such office space and Contractor shall not use such office space to perform non-Contract related work.

GC-09 SUBCONTRACTORS AND SUPPLIERS*

GC-09-A Documentation And Acceptance

The Contractor shall submit a copy of all executed subcontracts at any time within fourteen (14) days of execution regardless of value to Metro for fulfillment of the (DBE), (SBE/DVBE) commitments, and a copy of insurance certificates in accordance with the Exhibit to the Form of Contract entitled INSURANCE REQUIREMENTS. Failure to submit subcontracts and certificates within the required time period will result in the Subcontractor’s not being permitted to perform Work on the Project.

GC-09-B Performance Of Work

The Contractor shall:

1. Be responsible to Metro for all acts and omissions of its own personnel, and of Subcontractors, Suppliers and their employees; and

2. Be responsible for coordinating the Work performed by Subcontractors and Suppliers.

Should a portion of the subcontracted Work not be performed in accordance with the terms of the Contract, or if a Subcontractor commits or omits any act that would constitute a breach of the Contract, the Subcontractor shall be replaced and shall not again be employed on the Program.

GC-09-C Acceptance Of Substitution Of Subcontractor

1. The Contractor shall notify Metro in writing of any proposal to substitute a Subcontractor in place of a Subcontractor listed in the Contractor's Qualification/Proposal. Prior to such substitution the Contractor shall secure

the acceptance of Metro. The Contractor shall submit the following information in a form similar to that contained in the Contractor's original Qualification/Proposal.

a. Name of Subcontractor

b. Location and Phone Number of Place of Business

c. Contact Person

d. Subcontractor's License(s) number and expiration date (if applicable)

e. Current Metro Contract Compliance Certification Status (if applicable)

f. The portion of the Services that will be performed by each Subcontractor.

Metro will promptly initiate a review of the information submitted on each Subcontractor and transmit written notification to the Contractor concerning its decision.

2. Metro shall not be responsible for delays incurred by the Contractor because of a timely disapproval by Metro of a Subcontractor proposed by the Contractor, or for the late submittal for acceptance of a Subcontractor to Metro, or because of a Subcontractor's removal from the performance of the Work.

3. The Contractor shall not do any of the following without the prior written consent of Metro:

   a. replace any previously accepted Subcontractor;

   b. permit any previously accepted Subcontract to be assigned or transferred; and/or

4. However, the Contractor may perform the Work itself with qualified personnel, provided written permission is obtained from Metro prior to performance of the Work.

GC-09-D Flow-Down Requirements

1. The Contractor shall incorporate the following into each Subcontract and require insertion of same into all lower-tier Subcontracts:

2. All Articles, Subarticles or portions of the Contract noted by a star (*) shall be included in all Subcontracts of any tier.

3. All provisions required by law, regulation, rule, or the Contract shall apply to subcontracts and shall apply to all subcontracts of any tier.

4. By virtue of signing the subcontract, the following apply:

a. The Subcontractor acknowledges and agrees that all Work being performed by it under the subcontract shall be performed in accordance with the Contractor's Contract with Metro.

b. The Subcontractor agrees that it shall have the same duties and obligations to the Contractor with respect to its performance of its own Work as the Contractor has to Metro under its Contract.

c. The Contractor and the Subcontractor agree that Metro is the third party beneficiary of the Subcontract and shall have the right to enforce all of the terms of the Subcontract for its own benefit. All guarantees and warranties, express or implied, shall inure to the benefit of both Metro and the Contractor during the performance of the Work; upon final completion of the Work, such guarantees and warranties shall inure to the benefit of Metro.

The Contractor and the Subcontractor agree that nothing contained in the Subcontract shall be deemed to create any privity of the Contract between Metro and the Subcontractor, nor does it create any duties, obligations, or liabilities on the part of Metro to the Subcontractor except those allowed under California Law. In the event of any claim or dispute arising under the subcontract and/or the Contractor's Contract with Metro, the Subcontractor shall look only to the Contractor for any payment, redress, relief, or other satisfaction. The Subcontractor hereby waives any claim or cause of action against Metro arising out of the subcontract.

GC-09-E This Article does not and shall not operate to relieve the Contractor of any duty or liability under the Contract nor does it create any duty or liability on the part of Metro. The Contractor shall have sole responsibility for promptly settling any disputes between its Subcontractors and between the Subcontractors and any of their Subcontractors.

GC-09-F No Subcontractor shall be permitted to perform the Work under the Contract until it, or the Contractor, has supplied satisfactory evidence of required insurance to Metro, in compliance with the Exhibit to the Form of Contract entitled INSURANCE REQUIREMENTS.

GC-10 PERMITS

Except for any permits furnished by Metro, the Contractor shall be fully responsible for identifying and obtaining, at its own expense, all necessary licenses and permits required for the timely prosecution of the Work.

The Contractor acknowledges that prior to entering into the Contract or any CWO it familiarized itself with the requirements of all applicable federal, state, county, and municipal laws, codes, rules, and regulations, as well as the conditions of any required licenses and permits, in effect at time of execution of the Contract or issuance of any CWO. The Contractor shall be responsible for complying with all of the foregoing, at its sole expense and without any increase in the TCP or CWO Price or Contract or CWO Period of Performance set forth in the Form of Contract or CWO on account of such compliance, regardless of whether such

compliance would require additional labor, equipment, or Goods not expressly stated in the Contract or CWO.

GC-11 GOODS*

GC-11-A The Contractor shall furnish all Goods required to complete the Work, except those designated to be furnished by Metro. Unless otherwise indicated in the Contract or CWO, Goods incorporated into the Work shall be new, of good quality, and of the grade specified for the purpose intended. Unless otherwise specifically stated, reference to Goods or patented processes by trade name, make, or catalog number shall be regarded only as a means of establishing a standard of quality; such references shall not be construed as limiting competition. The Contractor may, at its option, use any Goods or process that is equivalent to that named subject to the prior written acceptance by Metro. Metro shall be the sole judge of the quality and suitability of proposed alternative Goods or processes subject to the right of Metro to accept or reject such alternative.

GC-11-B Any Goods that may be purchased under the Contract shall be transported, handled, and stored by the Contractor in a manner that shall ensure the preservation of their quality, appearance, and fitness for the Work. All Goods shall also be stored in a manner that facilitates inspection.

GC-12 STANDARDS OF PERFORMANCE*

GC-12-A The Contractor shall perform and require its Subcontractors to perform the Work in accordance with the requirements of the Contract and in accordance with professional standards of skill, care, and diligence adhered to by firms recognized for their expertise, experience and knowledge in performing Work of a similar nature. The Contractor shall be responsible for the professional quality, technical accuracy, completeness, and coordination of the Work, it being understood that Metro will be relying upon such professional quality, accuracy, completeness, and coordination in utilizing the Work. The foregoing obligations and standards shall constitute the "Standard of Performance" for purposes of the Contract.

GC-12-B Contractor hereby represents that it has made the necessary commitment, that it possesses the necessary professional capabilities, qualifications, licenses, skilled personnel, experience, expertise, and financial resources, and it has available or will make the necessary equipment, materials, tools, and facilities to perform the Work in an efficient, professional, and timely manner in accordance with the terms and conditions of the Contract.

GC-12-C All personnel shall have sufficient skill and experience to perform the work assigned to them. Contractor shall ensure that any individual performing work under the Contract requiring a California license shall possess the appropriate license required by the State of California. All personnel shall have sufficient skill and experience to perform the Work assigned to them.

GC-12-D If any Work provided by the Contractor is deficient because of the Contractor's or a Subcontractor's failure to perform the Work in accordance with the above

standards, Metro shall report such deficiencies in writing to the Contractor. Metro thereafter may:

1. Have the Contractor re-perform such Work at the Contractor's own expense; or

2. Have such Work performed in accordance with the Article entitled TERMINATION FOR DEFAULT herein, by others and the costs thereof charged to and collected from the Contractor.

GC-12-E Corrected or re-performed Work shall be subject to the above standards of performance.

GC-12-F The Contractor shall provide such specific standards of performance as may be set forth in individual CWOs as agreed to by the parties. If parties cannot agree Metro shall unilaterally establish them.

GC-12-G Metro shall have the right, in its absolute discretion, to require the removal of Contractor's personnel at any level assigned to the performance of the Services or Work, if Metro considers such removal necessary in the best interests of the Program and requests such removal in writing. Such personnel shall be promptly removed from the Project by the Contractor at no cost or expense to Metro. Further, an employee who is removed from the Project for any reason shall not be re-employed on the Program.

GC-13 UNAUTHORIZED ACTIONS*

Any action taken by the Contractor or its Subcontractors not in conformance with the terms and conditions of the Contract will be considered as unauthorized and at the sole expense of the Contractor. Contractor or its Subcontractors will not be compensated for any actions deemed by Metro to be unauthorized. No extensions of time will be granted under the Contract or CWO due to unauthorized actions.

No Metro employee or officer, except the Contracting Officer, may authorize any Amendments to the Contract, issue a CWO or make Revisions to CWOs.

GC-14 PERIOD OF PERFORMANCE

A. Neither party hereto shall be considered in default in the performance of its obligations with respect to schedule, to the extent that the performance of any such obligation is prevented or delayed by an excusable delay. Should Contractor's Work be delayed by an excusable cause, Contractor's schedule for completion of tasks affected by such delay may be extended. Excusable delays may include, but are not limited to, Acts of God or acts or failures to act of government agencies or Metro in either their sovereign or contractual capacities; fires, floods, earthquakes, epidemics, quarantine restrictions, strikes, civil disturbance; but, in every case, the failure to perform must be reasonably beyond the control, and without the fault or negligence of the Contractor.

B. Within 30 days after the last day of delay, the Contractor shall furnish Metro with detailed information concerning the circumstances of the delay, the number of days actually delayed, the appropriate Contract references, and the measures taken to prevent or minimize the delay. Failure to submit such information shall be sufficient cause for denying the delay claim.

GC-15 INSPECTION OF WORK (ACCEPTANCE)*

GC-15-A Metro reserves the right to inspect all and every part of the Work at any time during the performance and after completion, at its discretion.

GC-15-B If the Work or any parts thereof have not been performed in accordance with the Contract, the Contractor will be notified in writing that such Work is rejected. Thereupon, the Contractor shall take the necessary corrective action. Metro shall not be obligated to make any inspections, however, and neither the inspection of the Work, nor the lack thereof, shall relieve the Contractor of its responsibility for performing and providing the Work in accordance with the terms of the Contract.

GC-15-C Metro shall not be deemed to have accepted the Contractor's performance of the Work unless Metro or its designated representative has given written notice of final acceptance of the Work to the Contractor. No payment in whole or in part shall be construed to be an acceptance of the Work.

GC-15-D Metro shall have access, at all reasonable times, to the Contractor's calculations, supporting materials, data, and information concerning the Work, including computer programs and printouts, which Metro determines are required to review the Work properly and expeditiously. The Contractor shall furnish sufficient and convenient facilities for such inspection and review, and shall grant Metro's designated representatives free access at all reasonable times to all locations where the Work is performed.

GC-15-E Prior to the release of Work or issuance of a CWO, Metro and the Contractor shall determine which required reports will be submitted to Metro in draft form before final submission of the report.

GC-16 FINAL ACCEPTANCE*

GC-16-A Final Acceptance Of Work

When the Contractor determines that all Work as authorized in the Contract or CWO is fully completed including all required submissions and deliveries to Metro specified in the Contract or CWO, the Contractor shall give Metro a written Request for final Contract or CWO Acceptance within ten (10) working days thereafter, specifying that the Work is completed and the date on which it was completed. Within ten (10) days after the receipt of the Request for Final Contract or CWO Acceptance, Metro will commence a final review of the Work and, within 60 days will either:

1. Give the Contractor a final Contract/CWO Acceptance; or

2. Advise the Contractor in writing of any outstanding item or items which must be furnished, completed or corrected at the Contractor's cost.

Upon submittal of the request for final Contract/CWO Acceptance, the Contractor shall make no additional charges for Work under the Contract/ CWO. Metro shall not pay for any additional charges or be liable for any costs incurred after the date of receipt of the request for final Contract/CWO Acceptance of Contract/CWO Work.

This procedure shall comply with Metro's procedure entitled Services Contract Close-out in effect at the time of the request for Final Acceptance and shall be repeated until such time as Metro is satisfied that GC-17-B Final Acceptance of CONTRACT

GC-16-B Final Acceptance Of Contract

When Metro determines that all Work authorized under the Contract has been completed and Metro requires no further work from Contractor, or the Contract is otherwise terminated or expires in accordance with the terms of the Contract, Metro shall give the Contractor written notice that the Contract will be closed out. Contractor shall submit all outstanding Billings, Work submittals, Deliverables, reports or similarly related documents as required under the Contract and any CWO, within ninety (90) days of receipt of notice of Contract close-out. Upon Metro's receipt of Contractor's submittals under this Article, Metro shall commence a closeout audit of the Contract within one hundred twenty (120) days after final submission of the last Contractor's or Subcontractor's overhead rates and will either:

1. Give the Contractor final Contract acceptance; or

2. Advise the Contractor in writing of any outstanding item or items which must be furnished, completed or corrected at the Contractor's cost.

This procedure shall comply with Metro's procedure entitled Services Contract Close-out.Notwithstanding the final Contract/CWO Acceptance the Contractor will not be relieved of its obligations hereunder, nor will the Contractor be relieved of its obligations to complete any portions of the Work, the non-completion of which were not disclosed to Metro (regardless of whether such nondisclosures were fraudulent, negligent, or otherwise); and the Contractor shall remain obligated under all those provisions of the Contract which expressly or by their nature extend beyond and survive final Contract and/or CWO Acceptance.

GC-16-C Any failure by Metro to reject the Work or to reject the Contractor's Request for final Contract or CWO Acceptance as set forth above, shall not be deemed to be Acceptance of the Work by Metro for any purpose nor imply Acceptance of, or agreement with, the Contractor's Request for final Contract and/or CWO Acceptance.

GC-17 SAFETY*

GC-17-A The Contractor shall at all times conduct its operations in such a manner as to avoid risk of bodily harm to persons or damage to property. The Contractor shall promptly take all reasonable precautions to safeguard against such risks and shall make regular safety inspections of its operations. The Contractor shall be solely responsible for the discovery, determination and correction of any unsafe conditions caused by the Contractor‘s performance of the Work.

GC-17-B In addition, the Contractor shall comply with all applicable safety laws, standards, codes, rules, and regulations, including any safety program established by Metro. The Contractor shall cooperate and coordinate with Metro and with other Metro Contractors on safety matters and shall promptly comply with any specific safety instructions or directions given to the Contractor by Metro. Notwithstanding, the construction contractor shall remain responsible for the construction site safety.

GC-17-C The Contractor shall inform its personnel of Metro safety practices and the requirements of Metro's safety program. If any of the Contractor's personnel are required to visit any Worksites, the Contractor shall furnish suitable safety equipment and enforce the use of such equipment by those personnel.

GC-18 WARRANTY*

The Contractor warrants that all Work shall be in accordance with the Contract and shall comply with the Standard of Performance for a period of one year from final acceptance of the Work. In the event of breach of this warranty, the Contractor shall take the necessary actions to correct the breach and the consequences thereof, at the Contractor's sole expense, in the most expeditious manner as permitted by existing circumstances. If the Contractor does not promptly take steps to correct the breach upon notification thereof by Metro, Metro without waiving any other rights or remedies it may have at law or otherwise, may do so or cause others to do so, and the Contractor shall promptly reimburse Metro for all expenses and costs incurred in connection therewith.

GC-19 RIGHTS IN PROPERTY*

GC-19-A Title

1. All property purchased by the Contractor for Metro, shall be hereinafter referred to as Metro Property. Title to Metro Property shall pass to and vest in Metro upon the vendor's delivery and acceptance of such property by the Contractor.

2. Title to Metro Property shall not be affected by its incorporation into or attachment to any property not owned by Metro, nor shall Metro Property become a fixture or lose its identity as personal property by being attached to any real property.

3. The title transferred as described above shall in each case be good, and free and clear from any and all security interests, liens, and/or other

encumbrances. The Contractor shall not pledge or otherwise encumber the items in any manner that would result in any lien, security interest, charge, and/or claim upon or against said items.

4. The Contractor shall promptly execute, acknowledge, and deliver to Metro proper bills of sale or other written instruments of title in a form as required by Metro; said instruments shall convey to Metro title to material free and clear of debts, claims, liens, mortgages, taxes, and/or encumbrances.

GC-19-B Metro Property shall be used only for performing Work on the Contract or CWO, unless otherwise provided in the Contract or approved by Metro's Contract Administrator.

GC-19-C PROPERTY ADMINISTRATION

1. The Contractor shall be responsible and accountable for all Metro Property provided under the Contract and shall submit an inventory list, or revised list, in a form acceptable to Metro's Contract Administrator within thirty (30) days of acquisition of Metro Property.

2. The Contractor shall establish and maintain a program for the use, maintenance, repair, protection, and preservation of Metro Property in accordance with sound business practice.

3. If damage occurs to Metro Property, the Contractor shall replace the items not otherwise covered by any warranties, or the Contractor shall make the necessary repairs at Metro's direction, all at no additional charge to Metro.

GC-19-D Metro and all its designees shall have access at all reasonable times to the premises in which any Metro Property is located for the purpose of inspecting Metro Property.

GC-19-E Upon completing the Contract or CWO or at such earlier dates as may be fixed by Metro: (1) the Contractor shall prepare and submit a final inventory list of all Metro property which includes the property's description, location and condition, and; (2) the Contractor shall prepare for shipment, and deliver F.O.B. destination, Metro property as may be directed or authorized by Metro.

GC-20 EXTENTION OF TIME

GC-20-A The Contractor will be granted an extension of time for any portion of a delay in completion of the Work caused by acts of a public enemy, wars, civil disturbances, fires, floods, earthquakes, epidemics, quarantine restrictions, freight embargoes, strikes, weather more severe than normal, any other cause not in the reasonable control of the Contractor or acts of God, providing that the:

1. Aforesaid causes were not foreseeable and did not result from the fault or negligence of the Contractor;

2. Contractor has taken reasonable precautions to prevent further delays owing to such causes; and

3. Contractor notifies Metro in writing of the cause(s) for the delay within five (5) days from the beginning of any such delay.

GC-20-B Claims for additional compensation shall be limited to the costs incurred during a Metro approved extension of time measured at end of period of performance not at time of delay.

GC-20-C An extension of time will not be granted for a delay described above caused by a shortage of Goods, except Metro-furnished Goods, unless the Contractor supplies Metro with documented proof that it made every effort to obtain such Goods from every known source within reasonable distance of the Work. The Contractor shall also submit proof, that the inability to obtain such Goods when originally planned, did in fact cause a delay in final completion of the Work that could not be compensated for by revising the sequence of its operations. Only the physical shortage of Goods will be considered as a basis for an extension of time. No consideration will be given to any claim that Goods could not be obtained at a reasonable, practical, or economical cost, unless it is shown to the satisfaction of Metro that:

1. Such Goods could have been obtained only at exorbitant prices or;

2. The prices were entirely inconsistent with current rates, taking into account the quantities involved and the usual practices employed in obtaining such quantities; and

3. Such facts could not have been known or anticipated at the time the Contract or CWO was executed.

GC-20-D In case the Contractor is actually and necessarily delayed by any act or omission on the part of Metro, or others under contract with Metro and providing that the Contractor notifies Metro in writing within five (5) days from the beginning of any such delay, specifying the act or omission causing such delay, the time for completion of the Work shall be extended accordingly, and an adjustment shall be made to the TCP or CWO Price for any increase in the cost of performance of the Services or Work (excluding profit) necessarily caused by such delay. If the delay in the performance of the portion of Work described in the Contractor's five (5) day notice has been similarly delayed by Contractor-induced causes, including but not limited to the fault or negligence of the Contractor or any of its Subcontractors, the time for completion of the Work will be extended for the period of any such concurrent delay with no adjustment to the TCP or CWO Price.

GC-20-E Within thirty (30) days after the last day of a delay, the Contractor shall supply Metro with detailed information concerning the circumstances of the delay, the number of days actually delayed, the appropriate Contract and CWO references, and the measures taken to prevent or minimize the delay. Failure to submit such information shall be sufficient cause for denying the delay claim. Metro will ascertain the facts and the extent of the delay; its findings thereon will be final

and conclusive unless the Contractor disputes the decision. All time extensions must be approved by Metro prior to Contract or CWO Final Acceptance.

GC-20-F No extension of time will be granted under this Article for any delay in which remedies are included or excluded by any other provision of the Contract. Only the actual delay necessarily resulting from the causes specified in this Article shall be grounds for extension of time. In case the Contractor is delayed at any time or for any period by two or more of the causes specified in this Article, the Contractor shall not be entitled to a separate extension for each one of the causes; only one extension will be granted for the entire delay.

The Work shall continue and be carried on in accordance with all the provisions of the Contract. The Contract shall remain in full force and effect during the continuance and until the completion and Final Acceptance of the Services or Work covered by the Contract or CWO, unless formally suspended or terminated in accordance with the terms of the Contract. Permitting the Contractor to finish the Work, or any part thereof, after the time fixed for completion or after the date to which the time for completion may have been extended and/or making payments to the Contractor after any such periods shall not constitute a waiver on the part of Metro of any rights under the Contract.

GC-20-G Neither the granting of an extension of time beyond the date fixed for the completion of any part of the Work nor the performance and Acceptance of any part of the Work after the time specified for the completion of the Work shall be deemed to be a waiver by the authority of Metro's right to terminate the Contract or CWO for abandonment or failure to complete within the total time specified or to impose and deduct damages as may be specified.

GC-20-H In all cases that the Contractor either claims or intends to claim a delay, the Contractor shall submit to Metro at the earliest possible date and supplement thereafter as information becomes available:

1. An analysis of the impact of the claimed delay event upon the Contractor's then current Schedule, identifying the affected activities and the actual impacts; and

2. Proposals to minimize the effects of the claimed delay.

GC-21 CHANGES

GC-21-A The term "Change(s)," as used herein, means substitutions, additions, or deletions which result in revisions to the Contract or CWO. Change does not mean work performed by the Contractor to correct defective Work caused by the Contractor's negligent acts, errors or omissions.

GC-21-B Metro may at any time, and from time to time without invalidating the Contract or CWO, make Changes in the Scope of Work. Metro and Contractor will endeavor to reach mutual agreement regarding costs and Schedule associated with the Change; however, Metro reserves the right to direct the Contractor to perform the Changed Work. Such Changes, including any increase or decrease in the amount of the Contractor's compensation and/or the period of performance, shall

be incorporated into the Contract or CWO through the issuance of a Contract Amendment or CWO Revision. All of the provisions of the Contract shall apply to Changes. Upon receipt of a Contract Amendment or CWO Revision, approved by Metro, the Contractor shall continue performance of the Scope of Work as modified by the Amendment.

GC-21-C If a Fixed Fee as defined in the Compensation and Payment section is a part of the compensation for the Contract or CWO, it is the agreed intent of the parties that the Fixed Fee is an amount fixed at the inception of a CWO with respect to the Work planned and Scheduled as set forth in the Scope of Work and is not intended to vary with actual costs for the Work. A Contract Amendment or CWO Revision issued hereunder may, but will not automatically; result in a Change to the Fixed Fee.

GC-21-D Contractor's Cost and Schedule Proposal: The Contractor shall submit a Contractor's Cost and Schedule Proposal (utilizing the Form 60 provided in Compensation and Payments Provisions) to Metro within ten (10) days after receipt of a change request. The proposal shall detail price and scheduling information showing all of the cost and time ramifications of the Changes shown in the request. If any prices or other aspects are conditional, such as orders being made by a certain date or the occurrence of a particular event at a specified time, the Contractor shall identify these conditions in its proposal. The components to be used by the Contractor in preparing the proposal shall be those set forth in the Compensation and Payment Provisions and shall be presented in such a manner that all elements of the proposal can be easily identified and certified upon request. The submittal shall include certified current cost or pricing data as described in the Article entitled AUDITS herein.

GC-21-E **Contract Amendment Or CWO Revision:**

A Contract Amendment shall be agreed to by the Parties to reflect changes in the Contract terms and/or Scope of Services.

When the Contractor's compensation for a Change and the required adjustments, if any, to the Total Contract Price or CWO Price and/or Schedule have been determined, a Contract Amendment or CWO Revision will be issued containing the following items:

1. The total Contract/CWO adjustments to be made.

2. A statement that it is Metro's intention to treat the items described therein as Changes in the Work.

3. Scheduling requirements, time extensions, prices, and all costs of any nature arising out of each Change and a Certificate of Current Cost or Pricing Data.

4. A statement that the adjustment to the Total Contract Price or CWO Price, if any, includes all amounts to which the Contractor is entitled as a result of the events giving rise to the CWO Revision.

The execution of a Contract Amendment or CWO Revision by both parties shall be deemed to be an agreement to all Changes in Contract terms and/or Scope of Services and costs and time of performance related to each Change. There will be no reservation of rights by either party on a bi-lateral Contract Amendment or CWO Revision.

For all Contract Amendments or CWO Revisions greater than or equal to one-hundred-thousand dollars ($100,000), an Ethics Declaration must be submitted by the Contractor.

GC-21-F Except as expressly provided herein, no order, statement, or conduct of any person shall be treated as a Change under the Contract or a CWO or entitle the Contractor to any adjustment under the Contract or a CWO.

GC-22 AUDIT SOFTWARE

At the request of Metro, the Contractor, Subcontractors and Suppliers shall allow installation of computer assisted audit techniques (CAAT) software supplied by Metro on its computer systems during the audit of Metro's contract. In lieu of installation of CAAT software on the Contractor's, Subcontractor's or Supplier's Home Office computers, a verified backup copy of its computer systems' database(s) can be supplied. Upon reasonable advance notice, the Authorized Auditors shall have access at all reasonable times to this software, database or verified copy for the purpose of auditing and verifying the Contractor's costs claimed to be due and payable hereunder. Prior to the start of an audit, the CAAT software will be supplied to the Contractor, its Subcontractors and Suppliers to allow for testing and review on its computer system. Once the audit is complete, the software will be removed from the Contractor's, its Subcontractors' and its Suppliers' computer system. The software will be installed permanently at the Program Office in order to assist the Authorized Auditors in the review of the Program Office costs.

GC-23 NOTICE OF INTENT TO CLAIM AND CLAIMS

A. The Contractor shall give to Metro a written notice of potential claim within five (5) days of any act or event for which it intends to seek adjustment in the Contract/CWO price, terms, or schedule. The written notice shall set forth the basis of the claim and an estimate of any costs involved. The claim shall be filed within 30 days of the act or event and shall be in sufficient detail to allow Metro to evaluate the claim. The Contractor shall also furnish any additional information relating to the claim as Metro may request. Failure of the Contractor to comply with these requirements shall be sufficient cause for denying the Contractor's claim.

B. Metro shall, within 30 days of the receipt of the claim, render a decision or provide an estimate of when a decision will be made. If no decision is made within 30 days of the filing of the claim, or within any extended period mutually agreed to in writing by the parties, the claim shall be deemed rejected by Metro. The Contractor shall proceed diligently with performance

of the Contract/CWO, pending resolution of any claim or appeal or action ensuing under the Contract/CWO.

GC-24 RESOLUTION OF DISPUTES

The Parties shall use their best efforts to resolve disputes under the Contract by submission of the dispute to Metro's Contract Administrator and the Contractor's Contract Administrator. If a dispute cannot be resolved at this administrative level, the Parties may mutually agree to utilize an alternative dispute resolution (ADR) process such as arbitration, mediation, or other recognized ADR process for settling a dispute.

GC-25 SUSPENSION*

GC-25-A The requirements of this Article are in addition to other audit, inspection, and record keeping requirements specified elsewhere in the Contract.

GC-25-B If Metro notifies Contractor that work on a particular portion of the Project will be suspended for a period to exceed one hundred eighty (180) days, Contractor shall immediately notify Metro that key personnel working on that portion of the work can either:

(1) Be moved to support another portion of the Program, as approved by Metro, or

(2) Be released because there is no need for the services of the specific key personnel on the Program

If suspension is less than one hundred eighty (180) days, Contractor and Metro shall agree upon the short-term duties of all affected personnel.

GC-25-C The Contractor shall comply immediately with any written order it receives from Metro suspending the Work and take all reasonable steps to minimize costs allocable to the Work covered by the suspension during the period of suspended Work. The Contractor shall resume performance of the suspended Work upon expiration of the notice of suspension, or upon direction of Metro.

GC-25-D The Contractor shall be allowed an equitable adjustment in the TCP and CWO Price (not to include profit) and/or an extension of the Contract or CWO Time, directly attributable to any suspension and/or to recover reasonable costs incurred during suspension, provided that the Contractor makes a Claim as provided in the Article entitled NOTICE OF INTENT TO CLAIM AND CLAIMS herein. However, no adjustment shall be made under this Article for any suspension, delay or interruption to the extent that Contractor's performance would have been so suspended, delayed or interrupted by any other cause, including the fault or negligence of the Contractor, or for which an equitable adjustment or an extension of time is provided for or excluded under any other term or condition of the Contract.

GC-25-E Submittal of an RFC by the Contractor for an equitable adjustment of the TCP or CWO Price or the Contract or CWO Time extension shall be filed in compliance with the Article entitled CHANGES herein; and within twenty (20) days after the end of the Work suspension. The provisions of this Article shall only apply if a written order of suspension is issued by Metro.

GC-25-F Metro will make partial payments against costs authorized by Metro and incurred by the Contractor in connection with the suspended portion of the Contract or CWO, so long as the aggregate of such payments does not exceed the authorized value of the Contract or CWO.

GC-26 TERMINATION FOR CONVENIENCE OF Metro*

GC-26-A The performance of the Services or Work under the Contract or a CWO may be terminated at any time, in whole or in part, as determined by Metro in its sole discretion. Such termination will be accomplished by delivery of a Notice of Termination to the Contractor, specifying the extent to which performance of the Services or Work under the Contract or CWO shall be terminated and the date upon which such termination shall become effective.

GC-26-B After receipt of a Notice of Termination, except as otherwise directed by the AUTHORITY, the Contractor shall:

1. Stop Work under the Contract or a CWO on the date and to the extent specified in the Notice of Termination.

2. Place no further orders or Subcontracts for Goods or Work, except as may be necessary for completion of such portions of the Services or Work expressly excluded from the Notice of Termination.

3. Communicate any Notice of Termination to the affected Subcontractors and Suppliers, and any other parties, at any tier.

4. Terminate all orders and Subcontracts that relate to the performance of the Work terminated by the Notice of Termination.

5. Settle outstanding liabilities and Claims arising out of such termination of orders and Subcontracts, with the acceptance of Metro if required (which acceptance shall be final for the purposes of this Article).

6. Assign to Metro in the manner, at the times, and to the extent directed by Metro all of the rights, titles, and interests of the Contractor under the orders and Subcontracts so terminated; in which case Metro will have the right, at its sole discretion, to settle or pay any or all Claims arising out of the termination of such orders and Subcontracts.

7. Transfer title and deliver to Metro in the manner, at the times, and to the extent directed by it:

a. Work in process, completed Work, and other Goods procured as a part of, or acquired in connection with, the performance of the Work terminated; and

b. The completed or partially completed plans, drawings, information, and other items that would have been required (per the Scope of Services and Scope of Work) to be furnished to Metro if the Contract or a CWO had been completed.

8. Use its best efforts to sell the Goods of the types referred to above in the manner, at the times, to the extent, and at the price(s) directed or authorized by Metro, providing that the:

   a. Contractor is not required to extend credit to any purchaser;

   b. Contractor may acquire any such Goods under the prescribed conditions; and/or

   c. Proceeds of any such transfer or disposition are applied or otherwise cred`ited to reduce payments made by Metro to the Contractor under the Contract or CWO.

9. Take any action that may be necessary, or that Metro may direct, for the protection and preservation of the property related to the Contract that is in the possession of the Contractor and in which Metro has or may acquire an interest.

10. Comply with all other requirements of Metro as may be specified in the Notice of Termination.

11. Complete performance of that portion of the Work that has not been terminated by the Notice of Termination, as applicable and in accordance with the Contract.

GC-26-C If the termination is for the convenience of Metro, Contractor shall submit a final invoice within 60 days of termination and upon approval by Metro, Metro shall pay Contractor a percentage of the total Contract price based on the percentage of the Work completed prior to the effective date of termination and other costs reasonably incurred by the Contractor to implement the termination.

GC-26-D Upon failure of the Contractor to submit its termination claim within the time specified, Metro will determine the amount due the Contractor, if any, on the basis of information available, and will pay the Contractor the amount so determined. Such payment shall constitute payment in full for the Work performed under the Contract or CWO. Any allowable costs incurred prior to the date of termination shall be handled in accordance with the Compensation and Payment Provisions.

GC-26-E Subject to the provisions of the above Subarticle, the Contractor and Metro may agree upon the total or partial amount to be paid to the Contractor by reason of the total or partial termination of the Work pursuant to this Article. The Contract

or CWO will be amended or revised accordingly and the Contractor will be paid the agreed-upon amount. Nothing in the following Subarticle, which deals with the failure to reach agreement on the total amount to be paid to the Contractor, shall be deemed to limit, restrict, or otherwise determine or affect the amount that may be agreed upon pursuant to this Subarticle.

GC-26-F In the event of failure of the Contractor and Metro to agree on the total amount to be paid the Contractor by reason of the termination of Work pursuant to this Article, Metro will pay the Contractor the amounts determined by Metro as follows, exclusive of any amounts agreed upon in accordance with the preceding Subarticle:

1. The Contract or CWO Price allocable to the portion of the Work properly performed by the Contractor as of the date of termination, including overhead, and Fixed Fee or profit, as determined in accordance with the Compensation and Payment Provisions, reduced by any sums previously paid to the Contractor.

2. The cost of settling and paying Claims arising out of the termination of the Work under Subcontracts or orders as specified above, exclusive of the amounts paid or payable on account of Goods delivered or Work furnished by Subcontractors prior to the effective date of the Notice of Termination of Work under the Contract or CWO, which amounts are included in subarticle E of this Article.

3. Profit on the cost of Work performed is included in the amount determined in subarticle E of this Article. However, if the Contractor would have sustained a loss on the entire Contract or CWO had it been completed, the Contractor shall not be entitled to a profit and the settlement will be reduced to reflect the indicated rate of loss.

4. The reasonable cost of preserving and protecting property will also be paid, as well as any other reasonable costs incidental to the termination of the Work under the Contract or a CWO, including those reasonable expenses incurred to determine the amounts due.

GC-26-G Except to the extent that Metro will have otherwise expressly assumed the risk of loss, the fair value (as determined by Metro) of property that is destroyed, lost, stolen, or damaged (so as to become undeliverable to Metro or other buyer as described above) shall be excluded from the amounts paid to the Contractor.

GC-26-H In arriving at the amount due the Contractor under this Article, retention shall be made for the following:

1. The amount of the Claim that Metro may have against the Contractor in connection with the Contract or a CWO; and

2. The agreed upon price for and/or proceeds from the sale of Goods or other items acquired or sold by the Contractor that have not been otherwise recovered by or credited to Metro.

GC-26-I Under such terms and conditions as it may prescribe and at its sole discretion, Metro may make partial payments against costs incurred by the Contractor in connection with the terminated portion of the Contract or a CWO whenever Metro decides that the aggregate of such payments is within the amount to which the Contractor is entitled hereunder. If the total of such payments is in excess of the amount finally agreed-upon or determined to be due under this Article, such excess shall be payable by the Contractor to Metro upon demand, together with interest at a rate equal to that set forth in California Code of Civil Procedure Section 685.010.

GC-26-J The Contractor shall not be entitled to anticipatory or consequential damages as a result of any termination under this Article. Payment to the Contractor in accordance with this Article shall constitute the Contractor's exclusive remedy for any termination hereunder. The rights and remedies of Metro provided in this Article are in addition to any other rights and remedies provided by law or under the Contract.

GC-26-K Anything contained in the Contract or a CWO to the contrary notwithstanding, a termination under this Article shall not waive any right or claim to damages that Metro may have; Metro may pursue any cause of action that it may have by law or under the Contract.

GC-27 TERMINATION FOR DEFAULT*

GC-27-A Metro may terminate the Contractor's Work, in whole or in part, for default under any of the following circumstances:

1) Failure or refusal of the Contractor to perform any obligation required under the Contract or a CWO, or violation of any duty required of the Contractor under the Contract or a CWO.

2) Bad faith by the Contractor.

3) Violation by the Contractor of an order or requirement of Metro authorized by or within the scope of the Contract or a CWO.

4) Abandonment of the Contract or a CWO by the Contractor.

5) A filing by or against the Contractor of a petition in bankruptcy, reorganization, insolvency, conservatorship, or similar proceeding.

6) Failure of the Contractor to pay any amounts owing to any persons performing any portion of the Work, or the failure of the Contractor to pay its debts incurred on the Contract as they become due, providing that such failure continues for a period of ten (10) working days after written notice to the Contractor by Metro.

7) The attachment, levy, execution, or other judicial seizure of any portion of the Contractor's property, or any substantial portion of the other assets of the Contractor, which is not released, expunged, or discharged within a period of ten (10) working days.

8) Material failure to comply with any law, ordinance, rule, regulation, or order of a legal authority applicable to the Contractor, the Services, the Work, the Contract, a CWO, the Program or the Project.

9) Failure to indemnify any party that the Contractor is obligated to indemnify under the Article entitled LIABILITY AND INDEMNIFICATION herein or elsewhere under the Contract.

10) Failure to promptly correct or re-perform rejected Work.

11) Conviction of the Contractor or any of its officers, partners, principals, or employees for a violation of any federal, state or local safety law or regulation, or for a crime arising out of, or in connection with, the Work to be done or payment to be made under the Contract.

GC-27-B If Metro determines the Contractor is in default of the Contract or CWO, Metro will so notify the Contractor by issuing a Cure Notice describing the default. If the Contractor fails to cure the default within five (5) days after receipt of such Cure Notice, or if the default cannot be cured within five (5) days, and the Contractor fails to commence to cure within five (5) days and diligently proceed to cure within the time Metro determines to be necessary, Metro may, by written notice, terminate the Contractor's right to proceed under all or such part of the Contract or CWO as Metro at its sole discretion deems to be in its best interest. Whether or not the Contract or a CWO or any part thereof is terminated, the Contractor shall be liable for any damage to Metro resulting from the Contractor's default.

GC-27-C Upon receipt of a Notice of Termination for default from Metro, the Contractor shall:

1) Stop all Work under the Contract or a CWO on the date and to the extent specified in the Notice of Termination.

2) Place no further orders or Subcontracts for Goods or Work, except as may be necessary for completion of such portions of the Services or Work expressly excluded from the Notice of Termination.

3) Communicate any Notice of Termination to the affected Subcontractors and Suppliers, and any other parties, at any tier.

4) Terminate all orders and Subcontracts that relate to the performance of Work terminated by the Notice of Termination.

5) Comply with all other requirements of Metro as may be specified in the Notice of Termination.

GC-27-D Upon Metro's termination of the Contract or CWO because of the Contractor's default under the Contract or a CWO, Metro shall have the right to complete the Work by whatever means and methods it deems advisable. Metro will not be required to obtain the lowest prices for completing the Work, but shall make such expenditures that, in Metro’s sole judgment, best accomplish such completion.

GC-27-E If the termination is due to the failure of the Contractor to fulfill its contractual obligations, Metro may take over the Work, and complete the Work by contract or otherwise. In such case, the Contractor shall be liable to Metro for any reasonable costs or damages occasioned to Metro thereby. The expense of completing the Work, or any other costs or damages otherwise resulting from failure of the Contractor to fulfill its obligations, will be charged to the Contractor and will be deducted by Metro out of such payments as may be due or may at any time thereafter become due to Metro. If such costs and expenses are in excess of the sum which otherwise would have been payable to the Contractor, then the Contractor shall promptly pay the amount of such excess to Metro upon notice of the excess so due.

GC-27-F If the Contract or CWO is terminated as specified in this Article, Metro may require that the Contractor transfer title to and deliver the following items to Metro as directed: any Goods, fixtures, plans, drawings, information, reports, estimates, Contract or CWO rights and other items that the Contractor has specifically produced or acquired for the terminated portion of the Contract or a CWO and would have been required to be furnished to Metro if the Contract or a CWO had been completed. The Contractor also shall, at its sole expense, protect and preserve property in its possession in which Metro has an interest.

GC-27-G If, after the notice of termination for failure to fulfill Contract obligations, it is determined that the Contractor has not so failed, the termination shall be deemed to have been effected for the convenience of Metro. In such event, adjustment shall be made as provided in Article entitled TERMINATION FOR CONVENIENCE herein.

The Contractor shall not be entitled to anticipatory or consequential damages as a result of any termination under this Article. Payment to the Contractor in accordance with this Article shall constitute the Contractor's exclusive remedy for any termination hereunder. The rights and remedies of Metro provided in this Article are in addition to any other rights and remedies provided by law or under the Contract.

GC-28 ASSIGNMENT*

GC-28-A The Contractor shall not assign, transfer, convey, or otherwise dispose of the Contract or a CWO (or the right, title, or interest in it or any part of it) without the prior written consent and endorsement of Metro, which consent shall not be unreasonably withheld.

GC-28-B No right under the Contract shall be asserted against Metro, in law or in equity, by reason of any assignment of the Contract, or any part thereof, unless authorized by Metro as specified in this Article.

GC-28-C Any assignment of proceeds of the Contract shall be subject to all proper setoffs and withholdings in favor of Metro and to all deductions specified in the Contract or CWO. All monies withheld, whether assigned or not, shall be subject to being used by Metro for completion of the Work, pursuant to the terms of the Contract. In the event that Metro consents to such assignment of monies, written notice

thereof shall be given by the Contractor to Metro at least ten (10) days before payment is due.

GC-29 ENVIRONMENTAL COMPLIANCE

GC-29-A The Contractor shall include the requirements of the following Subarticles in every Subcontract that is more than one hundred thousand dollars ($100,000) and shall take such action as Metro directs to enforce these requirements.

GC-29-B The Contractor shall comply with all air, water, and noise pollution provisions set forth in the Scope of Services or Scope of Work.

GC-29-C Air Quality Control

1. The Contractor shall comply with all applicable standards, orders, and requirements issued under the Clean Air Act (42 USC § 7401); all applicable standards of the State of California; and all clarifications, mitigation measures, and any other requirements approved by Metro in accordance with state and federal laws.

2. The Contractor shall comply with all rules, regulations, and ordinances of the South Coast Air Quality Management District (SCAQMD) and statutes of the State that apply to any Work performed pursuant to the Contract or CWO, including any air quality control rules, regulations, ordinances, and statutes specified in Section 11017 of the California Government Code. Contractor, Subcontractors, and Suppliers shall submit evidence to Metro that the governing air quality control criteria are being met; such evidence will be retained by Metro.

3. In the absence of applicable air quality control rules, regulations, ordinances, or statutes governing solvents, including but not limited to the solvent portions of paints, thinners, curing compounds, and liquid asphalt used on the Contract or CWO, the Contractor shall comply with the applicable material requirements of the SCAQMD. Containers of paints, thinner, curing compound, or liquid asphalt shall be labeled to indicate that the contents fully comply with said requirements.

4. The Contractor shall comply with California state law regarding pollution controls in purchasing new motor vehicles with Project funds.

5. Material to be disposed of shall not be burned.

GC-29-D Water Quality:

The Contractor shall comply with all applicable standards, orders, and requirements issued under the Clean Water Act (33 USC § 1251); all applicable water standards of the State of California; and all clarifications, mitigation measures, and any other requirements approved by Metro in accordance with state and federal laws.

GC-29-E Environmental Protection Agency Regulations

1. The Contractor shall comply with all applicable regulations (40 CFR Part 15) of the Environmental Protection Agency (EPA).

2. The Contractor shall not use any facility in the performance of the Contract or CWO that is listed on the EPA List of Violating Facilities, unless and until the EPA eliminates said name of such facility from said listing. The Contractor shall promptly notify Metro of the receipt of any communication from the Director, Office of Federal Activities, EPA (or any successor agency), indicating that a facility to be used by the Contractor is under consideration for listing on the EPA List of Violating Facilities. The Contractor shall also report violations to Metro, to the FTA, and to the EPA Assistant Administrator for Enforcement.

GC-29-F Energy Conservation:

The Contractor shall comply with all mandatory standards and policies relating to energy efficiency that are contained in the State energy conservation plan issued in compliance with the Energy Policy and Conservation Act (42 USC 6321). Refer to the Scope of Services or the Scope of Work for energy conservation measures.

GC-30 HISTORICAL, ARCHAEOLOGICAL, PALEONTOLOGICAL, AND SCIENTIFIC DISCOVERIES*

All things of historical, archaeological, paleontological, or scientific interest encountered by the Contractor during performance of the Work shall be reported immediately to Metro. Work in the vicinity of the discovery shall be halted in order to preserve and protect it until its significance can be determined by Metro. Metro will issue instructions to the Contractor with respect to the disposition of the discovery.

GC-31 THE CONTRACTOR'S INTERACTION WITH THE MEDIA AND THE PUBLIC*

1. Metro shall review and approve all Metro related copy proposed to be used by the Contractor for advertising or public relations purposes prior to publication. The Contractor shall not allow Metro related copy to be published in its advertisements and public relations programs prior to receiving such approval. The Contractor shall ensure that all published information is factual and that it does not in any way imply that Metro endorses the Contractor's firm, service, and/or product.

2. The Contractor shall refer all inquiries from the news media to Metro, and shall comply with the procedures of Metro's Public Affairs staff regarding statements to the media relating to the Contract or the Work.

3. If the Contractor receives a complaint from a citizen or the community, the Contractor shall inform Metro about what action was taken to alleviate the situation.

4. The Contractor shall not publish information or technical data acquired or generated by the Contractor in performing the Contract until such time as such information or technical data is released in published reports by Metro or otherwise authorized by Metro.

GC-32 WHISTLEBLOWER REQUIREMENTS*

GC-32-A The Contractor shall not adopt any rule, regulation or policy preventing an employee from disclosing information to a government or law enforcement agency, where the employee believes the information discloses violation or noncompliance with a state or federal regulation; nor shall an employer retaliate against an employee for taking such actions as set forth in the California Labor Code Sections 1101 et. seq.

GC-32-B The Contractor shall post and maintain all Metro Phone Hotline literature provided by Metro ("Hotline Literature") at place(s) of performance during the term of the Contract. All Hotline Literature is to be posted in prominent locations that are highly visible and accessible to Contractor's employees. Contractor shall not hinder or coerce its employees from using Metro Phone Hotline to voice ideas, suggestions, or concerns relative to the performance of any Metro contract. The Contractor shall provide access to Metro representatives for the purpose of verifying Contractor's adherence to this section. In the event Metro inspection finds the Contractor has failed to comply herewith, the Contractor shall correct such failures including, but not limited to, replacing Hotline Literature and sponsoring training sessions, with Metro representatives, on the use of Metro Phone Hotline.

GC-33 COMPLIANCE WITH THE AMERICANS WITH DISABILITIES ACT*

The Contractor shall comply with all applicable provisions of the Americans with Disabilities Act in performing the Work under the Contract.

GC-34 SEVERABILITY*

In the event any Article, section, Subarticle, paragraph, sentence, clause, or phrase contained in the Contract or CWO shall be determined, declared, or adjudged invalid, illegal, unconstitutional, or otherwise unenforceable, such determination, declaration, or adjudication shall in no manner affect the other Articles, sections, Subarticles, paragraphs, sentences, clauses, or phrases of the Contract or CWO, which shall remain in full force and effect as if the Article, section, Subarticle, paragraph, sentence, clause, or phrase declared, determined, or adjudged invalid, illegal, unconstitutional, or otherwise unenforceable, was not originally contained in the Contract or CWO.

GC-35 GOVERNING LAW*

The Contract has been negotiated between Metro and the Contractor and shall be subject to the laws of the State of California.

By entering into the Contract, the Contractor consents and submits to the jurisdiction of the Courts of the State of California, County of Los Angeles, over any action at law, suit in equity, and/or other proceeding that may arise out of the Contract.

GC-36 PUBLIC RECORDS ACT*

GC-36-A All records, documents, drawings, plans, specifications and other information relating to conduct of Metro's business, including information submitted by the Contractor shall become the exclusive property of Metro and shall be deemed public records. Said materials are subject to the provisions of the California Public Records Act (Government Code sections 6250 et. seq.). Metro's use and disclosure of its records are governed by this Act. Metro will not advise as to the nature or content of documents entitled to protection from disclosure under the California Public Records Act.

GC-36-B In the event of litigation concerning the disclosure of any information submitted by the submitting parties, Metro's sole involvement will be as a stakeholder, retaining the information until otherwise ordered by a court. The submitting party, at its sole expense and risk, shall be responsible for any and all fees for prosecuting or defending any action concerning the information, and shall indemnify and hold Metro harmless from all costs and expenses including attorneys' fees, in connection with any such action.

GC-37 LIABILITY AND INDEMNIFICATION*

GC-37-A Indemnification

To the fullest extent permitted by law, the Contractor shall defend, indemnify and hold harmless Metro, its subsidiaries, and any of their respective members, directors, officers, employees and agents, from and against any and all Claims, actions, demands, costs, judgments, liens, penalties, liabilities, damages, losses, and expenses, including but not limited to workers compensation suits, breaches of contract and any fees of accountants, attorneys or other professionals arising out of, or resulting from any act, omission, fault or negligence of the Contractor or any of its officers, Authorized Representative, employees, Subcontractors or Suppliers, or any person or organization directly or indirectly employed by any of them, in connection with or relating to, or claimed to be in connection with or relating to, the Services, the Work, the Contract, or the Program, including but not limited to any costs or liability on account of:

1. Personal injury to or death of any person (including employees of the parties to be indemnified) or for damage to or loss of use of property (including property of Metro); and

2. Metro's reasonable reliance upon the use of data or other information provided or delivered by the Contractor pursuant to the Contract or CWO.

The indemnification specified in this Article shall apply even in the event of the act, omission, fault or negligence whether active or passive, of the party or parties to be indemnified, but shall not apply to Claims, actions, demands, costs, judgments, liens, penalties, liabilities, damages, losses, and expenses arising from the willful misconduct of, or defects in design furnished by, the party or parties to be indemnified. Metro shall not be responsible for any negligence, willful misconduct or defects in design caused and/or furnished by the Contractor.

The indemnification specified in this Article shall survive termination or closeout of the Contract, CWO or Final Payment thereunder and is in addition to any other rights or remedies that Metro may have under the law or under the Contract. In the event of any Claim or demand made against any party that is entitled to be indemnified hereunder, Metro may at its sole discretion reserve, retain, and/or apply any monies due the Contractor under the Contract or CWO, for the purpose of resolving such Claims; provided, however, that Metro may release such funds if the Contractor gives Metro reasonable assurance that theMetro's interests will be protected. Metro shall, at its sole discretion, determine whether such assurance is reasonable.

Claims against the indemnified parties by any employee of the Contractor, its Subcontractors, Suppliers, anyone directly or indirectly employed by any of them, and/or anyone for whose acts any of them may be liable shall not in any way limit the Contractor's indemnification obligation as set forth above, including the amount and/or type of damages, compensation, and/or benefits payable by or for the Contractor or its Subcontractors under workers' compensation acts, disability benefit acts, and/or other employee benefit acts and/or insurances.

GC-37-B Third Party Liability

Nothing contained in the Contract or CWO is intended to or shall have the effect of creating any rights in any third party against Metro. The inclusion of the Contract or any part thereof in any other document shall not be deemed to be creating or incorporating any obligation, duty, or liability on the part of Metro. The Contractor shall indemnify the AUTHORITY in accordance with the provisions of this Article against any claim made by any third party claiming rights under the Contract.

GC-37-C Joint Severable Liability

If the Contractor is a joint venture or partnership, each venturer or partner shall be jointly and severally liable for any and all of the duties and obligations of the Contractor that are assumed under or arise out of the Contract. Each of such venturers or partners waives notice of the breach or non-performance of any undertaking or obligation of the Contractor contained in, resulting from or assumed under the Contract, and the failure to give any such notice shall not affect or impair such venturer's or partner's joint and several liability hereunder.

GC-37-D Professional Liability

The Contractor shall be responsible for the professional quality, technical accuracy, completeness and coordination of all Work furnished by the Contractor (including the Work performed by Subcontractors on the basis provided herein) under the Contract or CWO. In addition to any other remedies provided Metro under the Contract, CWO or at law, the Contractor or Subcontractor shall correct or revise at no additional cost or fee to Metro any defective Work caused by the Contractor's or Subcontractor's negligent acts, errors or omissions in the performance of the Work hereunder. Neither Metro's inspection of, nor failure to inspect, review, accept, make payment for, any of the Work required under the Contract shall be construed to relieve the Contractor or Subcontractor of its obligations and responsibilities under the Contract or CWO for any negligent acts, errors and omissions in its performance of Work hereunder, nor operate as a waiver of any of Metro's rights under the Contract or of any cause of action arising out of the performance of the Contract. The Contractor or Subcontractor shall be and remain liable to Metro in accordance with applicable law for all damages to Metro caused by any failure of the Contractor or Subcontractor to comply with the terms and conditions of the Contract or CWO, or by the Contractor's or Subcontractor's negligent acts or errors or omissions in the performance of the Contract or CWO. With respect to the performance of Work by Subcontractors, the Contractor shall use its professional judgment, care and prudence in approving and accepting such Work but shall also take all action necessary to ensure correctness/accuracy of Subcontractors work. The Contractor warrants that the Work performed hereunder is of high professional quality and has been performed in full conformity with all codes, rules, regulations and statutory requirements.

In the event that the Contractor fails to perform its obligations under this Article (or under any other warranty or guarantee under the Contract) within the specified time and to the reasonable satisfaction of Metro, Metro shall have the right to correct and/or cause to be re-performed any defective or non-conforming Work and any Work of third parties damaged by such defective or non-conforming Work or the correction or re-performance thereof. The Contractor shall be obligated to fully reimburse Metro upon demand for any expenses incurred hereunder.

GC-37-E Investigation Of Potential Negligence

Contractor shall pay for all costs associated with its investigation of any negligence alleged against it under the terms and conditions of the Contract, unless there is a finding that the Contractor was not negligent; in which case Metro shall only pay for the reasonable cost of the Contractor's staff time to investigate the alleged negligence. Where it has been determined Contractor was in fact negligent, Contractor shall be responsible for and charged with Metro's staff time to investigate or review any alleged negligence by the Contractor, or any construction change order request, request for information, or claim related thereto, which shall not include third party costs.

The Contractor shall be a participant in the review of any construction change order request, request for information, or claim which alleges or involves potential

Contractor negligence, and shall not be responsible for or charged with any claims for delay by the Construction Manager or any construction Contractor unless the Contractor has been given a reasonable opportunity to participate in the review.

GC-37-F The Contractor acknowledges that the rights and remedies of the AUTHORITY specified in this Article are in addition to and do not limit any rights or remedies of Metro, afforded by the Contract or by law.

GC-37-G Warranty

Contractor Warranties: Contractor warrants that: it is aware of and understands the hazards which are presented to persons, property and the environment in the performing of transportation, storage, remediation and disposal Work as described within the Scope of Work of the Contract or CWO. It will transport, store, remediate and dispose of such materials in full compliance with all applicable governmental laws, regulations and orders. If the Scope of Work requires off-site storage or disposal, the selected storage and disposal facilities described in the work plan are now appropriately licensed and permitted to store and dispose of the waste, materials or hazardous substances detailed within the work plan. In the event the storage or disposal facility loses its permitted status hereafter during the terms of the Contract or CWO, Contractor will promptly notify Metro of such loss.

GC-37-H Indemnification - Environmental Impairment Losses

Environmental Impairment Losses (in addition to the indemnification provisions of the Contract). It is agreed that the Contractor, at the Contractor's sole cost and expense, shall indemnify and hold harmless Metro from and against the full amount of any and all present and future Environmental Impairment Losses that may arise out of the negligent performance of the activities or Work provided by the Contractor under the Contract or CWO. The term "Environmental Impairment Losses" shall mean any and all loss, liability, expense or damage (including, without limitation, all attorneys' fees and costs and all other professional or contractors' fees and costs), incurred by Metro under federal, state or local environmental law as a result of the activities conducted by the Contractor under the Contract or CWO.

GC-37-I Environmental Indemnity

In addition to any other indemnification provisions of the Contract, Contractor shall indemnify, defend and hold harmless Metro, its subsidiaries, and all of their officials, officers, agents, employees, and contractors, from and against any and all present and future liability, loss, cost, damage, and expense of every kind and nature, including, but not limited to, clean up costs, releases or substances resulting from acts of Contractor, failure to recognize or report the existence, quantity, or location of substances, remedial work required under any federal, state, or local law, regulation, or ordinance, contractors' fees, and attorneys' fees, resulting, directly or indirectly, from any negligent act or omission of Contractor, or any employee, Subcontractor, or Supplier of t Contractor, in the performance

or failure to perform any work carried out, wholly or in part, pursuant to the Contract or CWO.

GC-38 RIGHTS IN TECHNICAL DATA, PATENTS AND COPYRIGHTS*

GC-38-A All documents and materials prepared or developed by the Contractor and its subcontractors pursuant to the Contract shall become the property of Metro without restriction or limitation on their use and shall be made available upon request, to Metro at any time. Original copies of such shall be delivered to Metro upon completion of the Work or termination of the Work. The Contractor shall be permitted to retain copies of such items for the furtherance of its technical proficiency; however, publication of this material is subject to the written approval of Metro.

GC-38-B Metro shall have the right to use, duplicate, modify or disclose the technical data and the information conveyed therein, in whole or in part, in any manner whatsoever, and to have or permit others to do so except as limited by the Article entitled PUBLIC RECORDS ACT herein.

GC-38-C The Contractor shall agree to grant to Metro and to its officers, agents, and employees acting within the scope of their official duties, a royalty-free license to publish, translate, reproduce, deliver, and use as they deem fit all technical data covered by copyright supplied for the Contract. No such copyrighted matter shall be included in technical data furnished hereunder without the written permission of the copyright owner for Metro to use such in the manner herein described.

GC-38-D The Contractor warrants that the Work and Goods used in providing the Work shall be delivered free of any rightful claim of any third party for infringement of any United States patent or copyright. If a suit or proceeding based on a claimed infringement of a patent or copyright is brought against Metro, the Contractor shall, at its own expense, defend or settle any such suit or proceeding if authorized to do so in writing by Metro, and indemnify and hold harmless Metro, its subsidiaries, agents and employees from all liability, damages, costs, and expenses associated therewith, including, but not limited to, defense costs and attorneys' fees.

When use of these Goods and/or processes is judged to be an infringement and such use is banned, the Contractor, at its own expense, shall, with the concurrence of Metro, do one of the following:

1. Secure for Metro the right to continue using said Goods and/or processes, by suspension of the injunction or by procuring a license(s);

2. Replace said Goods and/or processes, with non-infringing Goods and/or processes;

3. Modify said Goods and/or processes, so that they become non-infringing; or

4. Remove said Goods and/or processes, and refund the sum paid therefor without prejudice to any other rights of Metro.

The preceding subarticles shall not apply to Goods and/or processes furnished to the Contractor by Metro.

For Metro provided software, Metro, at its own cost, shall obtain any required license agreement(s). Metro shall indemnify, hold harmless and defend the Contractor from and against any and all Liability, damages, costs, and expenses, including but not limited to, defense costs and attorneys' fees, for or by any reason of any actual or alleged infringement of any United States patent or copyright, or any actual or alleged trade secret disclosure, arising from or related to the operation and utilization of Metro provided software, except for the unauthorized use of Metro provided software by the Contractor, its Director, Officers, employees, agents or representatives.

GC-39 SOFTWARE LICENSING AGREEMENT AND PROVISIONS FOR USE*

GC-39-A The Terms Used In This Article Are Defined As Follows:

1. Software: The computer programs and products required to be developed and delivered by the Contractor to Metro under the Contract, in object code (but excludes commercial software developed at private expense and not in the public domain).

2. Source Code Materials: A human-readable copy of the Software and related materials and documentation generated in preparing the Software, including programmer notes, flow charts, logic diagrams, and listings.

3. Documentation: Systems and user manuals sufficient to enable a person skilled in the applicable art to operate, maintain, and support the Software for its intended purposes.

GC-39-B The Contractor shall deliver to Metro the Software, Source Code Materials, and Documentation, in such tape, disk, or hardcopy format as Metro may designate.

GC-39-C The Contractor shall retain ownership of the Software, Source Code Materials, and Documentation with the right to exploit the same, subject to Metro's rights as herein provided. Metro shall place such copyright notices affirming the Contractor's ownership rights as the Contractor may reasonably require on all materials licensed hereunder which are reproduced by Metro.

GC-39-D The Contractor hereby grants to Metro a royalty-free, paid-up, non-exclusive license, in perpetuity, to use duplicate, and disclose the Software, Source Code Materials, and Documentation, and to make modifications of and enhancements to the Software, and permit others (who sign standard nondisclosure agreements) to do the same, but only for governmental purposes and not for any commercial purposes.

GC-39-E Metro shall hold the Software, Source Code Materials, and Documentation in confidence, shall use and disclose them only as expressly authorized herein or as required by law and only to its employees, agents or sublicensees to whom disclosure is necessary or appropriate for the performance and exercise of its

rights hereunder, and shall take reasonable steps to ensure that unauthorized persons will have no access to them.

GC-39-F The Contractor warrants that the Software will perform according to the specifications set forth in the Contract, that it is owner of the Software, Source Code Materials, and Documentation that it has the right to convey and grant the license herein granted to Metro, and that Metro's use thereof as herein contemplated will not infringe any third party's proprietary rights in the United States. The foregoing warranties shall not apply to the extent the Software is modified by Metro.

GC-39-G Upon Metro's request the Contractor shall generate modifications of and enhancements to the Software not required by the Contract, at the Contractor's rates charged for comparable Work to its most favored customers.

GC-40 AGENT TO ACCEPT SERVICE

The Contractor shall maintain within Los Angeles County a duly authorized agent as identified in the Article entitled NOTICE AND SERVICE THEREOF of the Special Provisions to accept service of legal process on its behalf, and shall keep Metro advised of such authorized agent name and address during the duration of the Contract and for three (3) years after Final Payment, or as long as the Contractor has warranty obligations under the Article entitled WARRANTY herein, whichever period terminates later. In the event that no such duly authorized agent is on file with Metro, the Contractor agrees that the Secretary of State of the State of California shall be the Contractor's authorized agent for service of legal process.

GC-41 CONFLICT OF INTEREST*

GC-41-A Contractor warrants that it has not employed or retained any company or person, other than a bonafide employee working solely for Contractor, to solicit or secure the Contract and that is has not paid or agreed to pay any company or person, other than a bona fide employee working solely for Contractor, any fee, commission, percentage, brokerage fee, gifts or any other consideration, contingent upon or resulting from the award or making of the Contract. For breach of this warranty, or violation of any other prohibition in this Article, Metro shall have the right to terminate the Contract for failure of Contractor to fulfill its Contract obligations.

GC-41-B Contractor agrees that, for the term of the Contract, no member, officer, or employee of Metro, or of a local public body during their employment and for one (1) year thereafter, shall have any interest, direct or indirect, in the Contract, or to any benefit arising thereof as prohibited by Government Code § 1090 and 87100.

GC-41-C The employment by Contractor of personnel on the payroll of Metro for the performance of Work under the Contract will not be permitted, even though such employment may be outside of the employee's regular working hours or on Saturdays, Sundays, holidays, or vacation time. The employment by the Contractor of personnel who have been on Metro payroll within one (1) year prior

to the date of Contract award, where such employment is caused by and/or dependent upon Contractor securing the Contract or a related contract with Metro, is also prohibited.

GC-41-D Neither the Contractor nor its employees nor its subcontractors or their employees shall give or offer to give any campaign contribution to any member of Metro in violation of Government Code Section 84308.

GC-41-E The Contractor shall not be permitted to participate in any capacity in contracts, subcontracts or proposals (solicited or unsolicited) which may arise from its performance under the Contract and from any solicitations relating to the Project.

GC-42 COVENANT AGAINST CONTINGENT FEES*

GC-42-A The Contractor warrants that no person or Authorized Representative has been specifically employed or retained to solicit or obtain the Contract in exchange for a contingent fee, except a bona fide employee or Agent. A breach or violation of this warranty shall be considered a breach of Contract pursuant to the Article entitled TERMINATION FOR DEFAULT herein. In addition to any rights and remedies otherwise provided for in the Contractor by law, Metro may deduct from the TCP or consideration, or otherwise recover, the full amount of the contingent fee.

GC-42-B "Bona fide Agent", as used in this Article, means an established commercial or selling entity that is maintained by the Contractor for the sole purpose of securing business and that neither exerts nor proposes to exert improper influence to solicit or obtain Metro contract(s) nor holds itself out as being able to obtain any Metro contract(s) through improper influence.

GC-42-C "Bona fide employee", as used in this Article, means a person who is employed by the Contractor and subject to the Contractor's supervision and control as to time, place, and manner of performance and who neither exerts nor proposes to exert improper influence to solicit or obtain Metro contract(s) nor holds itself out as being able to obtain any Metro contract(s) through improper influence.

GC-42-D "Contingent fee", as used in this Article, means any commission, percentage, or other sum that is payable only upon success in securing an Metro contract.

GC-42-E "Improper influence," as used in this Article, means any influence that induces or tends to induce an Metro employee, officer, Contractor, Subcontractor, Authorized Representative, or Consultant to give consideration or to act regarding an Metro Contract on any basis other than the merits of the matter.

GC-43 NO WAIVER

GC-43-A Failure of Metro to enforce at any time, or from time to time, any provision of the Contract shall not be construed as a waiver thereof.

No waiver by Metro of any breach of any provision of the Contract shall constitute a waiver of any other breach or of such provision.

Failure or delay by Metro to insist upon strict performance of any terms or conditions of the Contract, or to exercise any rights or remedies provided herein by law, shall not be deemed a waiver of any right of Metro to insist upon strict performance of the Contractor's obligations set forth in the Contract, or any of its rights or remedies as to any prior or subsequent default hereunder.

GC-44 CONFIDENTIALITY*

Contractor agrees that for and during the entire term of the Contract, any information, data, figures, records, findings and the like received or generated by the Contractor in the performance of the Contract, shall be considered and kept as the private and privileged records of Metro and will not be divulged to any person, firm, corporation, or other entity except on the direct authorization of Metro. Further, upon termination of the Contract for any cause, Contractor agrees that it will continue to treat as private and privileged any information, data, figures, records and the like, and will not release any such information to any person, firm, corporation or other entity, either by statement, deposition, or as a witness, except upon direct written authority of Metro.

The Contractor shall not publish information or technical data acquired or generated by the Contractor in performing the Contract until such time as such information or technical data is released in published reports by Metro.

GC-45 SAFETY AND LOSS PREVENTION *

This Article is to be construed in its broadest sense for the protection of persons and property by the Contractor and no action or omission by Metro, the Contracting Officer, any Authorized Representative or any other person shall relieve the Contractor of any of its obligations and duties hereunder.

A. Metro's Safety Principles

1. Safety is a 24/7 priority
2. Safety is everyone's responsibility
3. Accidents and injuries are preventable
4. Working safely is a condition of employment
5. Training is essential for good safety performance
6. Management is accountable for safety

B. Contractor Responsibilities

The Contractor is responsible for:

1. Complying with all applicable safety Laws
2. Enforcing Worksite safety practices; and

3. The discovery, determination and correction of any unsafe conditions related to the Contractor's performance of the Work or Goods supplied by the Contractor on Metro property.
4. The Contractor shall cooperate and coordinate with Metro and with other METRO Contractors on safety matters and shall promptly comply with any specific safety instructions or directions given to the Contractor by METRO.

C. Safety Practices

1. The Contractor shall inform its personnel of METRO safety practices and the requirements of Metro's safety program identified in **Metro Safety Manual for Other Than Major Construction**.
2. If any of the Contractor's personnel are required to visit any Worksites, the Contractor shall furnish suitable safety equipment and enforce the use of such equipment by those personnel. The Contractor shall cooperate and coordinate with Metro and with other Metro Contractors on safety matters and shall promptly comply with any specific safety instructions or directions given to the Contractor by Metro.

GC-46 ENGLISH REQUIREMENTS *

At all times, all Contractor personnel on site must have sufficient knowledge of the English language to comprehend safety related directions and requirements. At all times the Contractor shall have a lead representative on site who has sufficient comprehension of the English language to read, write, speak and understand all job related directions and discussions.

End Of General Conditions (Services)

COMPENSATION & PAYMENT PROVISIONS (FIRM FIXED PRICE)

Note:

Articles flagged with an asterisk (*) are Flow-down requirements as defined in Article SUBCONTRACTORS AND SUPPLIERS in Contract Document GENERAL CONDITIONS.

CP-01 BASIS OF COMPENSATION *

Contractor will be paid the Contract Price in accordance with the following Articles, the Payment Schedule in the Article entitled COMPENSATION in the Form of Contract and all other applicable terms and conditions of the Contract.

CP-02 MILESTONE PAYMENTS

A. Applicability

This Article applies only if the Payment Schedule in the Contract provides for Milestone Payments.

B. Definition

A Milestone Payment is a payment of a portion to the Contract Price for completion of the Work based upon the Payment Schedule defined below.

C. Application for Progress Payment

Contractor's Applications for Progress Payments ("Applications") shall contain:

1. The original and two copies of the invoice, dated and identifying the Contract Number;

2. A description of the Work completed and how the Milestone Payment was calculated;

3. Certification or proof from subcontractors / suppliers that payments have been made to them for the portion of their work that has been accepted by LACMTA and for which Contractor has been paid;

4. Any other documentation Metro requires to process the Progress Payment;

5. The Contractor's signature and certification that the Work has been performed in accordance with the Contract, using the form attached hereto as Attachment 1; and

6. Signature of Metro's Authorized Representative acknowledging that the Work described in the Application has been done in accordance with the Contract.

7. Certification for Request for Payment attached as Exhibit 1

D. Terms of Payment

1. Contractor shall submit the Application to Metro, based on the Payment Schedule.

2. Metro will make Milestone Payments within thirty (30) days after it's receipt of an undisputed and properly submitted Application. Upon receipt of an Application, Metro shall:

   a. Review the Application to determine if it is complete and meets Contractual requirements.

   b. Return any Application that is not complete or does not meet Contractual requirements, setting forth in writing the reasons for the determination.

   c. No Milestone Payments shall be made for Work not performed in accordance with the Contract.

E. The Contractor shall be paid for the Milestone Payments for Earned Value Categories listed below upon completion and approval of the milestone requirements as follows:

1. LACMTA will make payments for the Price Proposal Items as provided in Price Proposal Form (PF-1), Contract Price Summary, with the payment schedule as described below.

2. Milestone Payments are generally listed in the sequence of the Work to be performed. LACMTA at its discretion may elect to pay a Milestone Payment out of sequence if Contractor has completed Work for that portion of the Milestone. LACMTA also at its discretion may elect to make partial payment for a Milestone Payment if it is determined that a discrete portion of the Work has been completed and the remaining portion of the milestone does not have any material impact on the schedule or quality of the Work.

3. Title to material included in any Milestone payment request shall pass to LACMTA upon payment by LACMTA. Said title shall be free of all encumbrances. However, such transfer of title shall not relieve the Contractor of its responsibility for the furnishing, installation, fabrication or inclusion of said materials as a deliverable element of Vehicles procured in accordance with the requirements of the Contract.

4. Milestone Payments for total price of Price Proposal Form (PF-1), Contract Price Summary are specified below as percentages of the total price for each Milestone listed. Proposed Deviations from Non-Technical Terms and Conditions, Proposers may propose alternate Milestone Payments for consideration by LACMTA.

The LACMTA shall make milestone payments for the Vehicles according to the following schedule:

Ten percent (10%) of the Total Price for the Base Vehicles will be paid as a milestone payment following:

A. Pre-Production Deliverables (4% of Total Base Vehicle Price)

1. Completion of the initial Pre-Production Meeting with receipt of bilaterally approved minutes, and a detailed itemization of significant changes from manufacturers standard CNG configuration (this shall specifically include a listing of all major system and subsystem components and any structural modifications made to comply with contractual requirements).
2. Receipt and acceptance of Production Schedule and Critical Path Milestone schedule.
3. Receipt and acceptance of the Contractor's Quality Assurance Manual and ISO 9001 Quality Assurance Procedures.
4. Receipt and acceptance of the Contractor's Warranty Plan.

B. Pilot Bus Acceptance (3% of the Total Base Vehicle Price)

1. Pilot Bus as required under SP-06.
2. Draft manuals if not previously delivered.
3. Any other outstanding Contract Deliverables required prior to Pilot Bus acceptance.
4. Receipt of In-Process and As Built Drawings (TS-5.6.8)
5. Mutually agreed upon action items for the First Article Vehicle.

C. First Article Bus Acceptance (3% of the Total Base Vehicle Price)

1. First Article Bus as required under SP-08.
2. Final manuals if not previously delivered.
3. Any other Contract Deliverables required prior to First Article Bus Acceptance.
4. Mutually agreed upon action items for Production Buses.

Note: First Article Milestone Payment will only apply to 1 vehicle. If additional First Article Inspections are required (see SP-22, Continuity of Production) then such buses will be paid in accordance with Article D and E listed below.

D. Milestone Payment for Production Vehicles (This payment shall **NOT** apply to the Pilot Vehicle or First Article Vehicle.)

1. **For 40' and 60' CNG Buses -** Ninety percent (90%) of the Total Price of each Production Vehicle including Option Vehicles will be paid within 30 days after Acceptance of each Vehicle.

2. **For 40' and 60' Zero Emission (ZE) Buses**

   a. Eighty percent (80%) of the Total Price of each Production Vehicle in the Base Order, including Option Vehicles, will be paid within 30 days after Acceptance of each Vehicle. (This payment shall not apply to the Pilot Vehicle or First Article Vehicle.
   b. Ten percent (10%) of the Total Price of each Production Vehicle in the Base Order, including Option Vehicles, will be paid, upon compliance with all of the following conditions:

      - After completion of 15,000 miles in service
      - All pending warranty/technical/Emission issues closed
      - Sustained 75% or better vehicle availability during 30 days immediately prior to payment

3. **For 40' and 60' CNG and ZE Buses**

   Withhold – Metro reserves the right to withhold payments from the amount due to the Contractor equivalent to the dollar value of the:

   - Labor commitment that is not attained by the Contractor pursuant to the Contractor's Local Employment Program (SP-38). The withheld amount shall be released upon Contractor's proof of attainment of its Labor Employment Program commitments.
   - Warranty Liquidated Damages (SP40.20) accrued due to Contractor's failure to meet the warranty requirements.

E. Milestone Payments for total price of Price Proposal Form (PF-1), Contract Price Summary, Item 2, Spare Parts, from Schedule A, Form PF-2, shall be made upon delivery and acceptance of spare parts to LACMTA. The spare parts shall be delivered in partial separate shipments and shall be of the latest configuration. The Contractor shall submit for LACMTA's approval a list of spare parts to be delivered from the total list of spare parts on Form PF-2, prior to any shipment. The Contractor shall furnish to LACMTA at the time of the shipment, an itemized breakdown of the quantities and prices of items shipped. The

shipments shall be made thirty (30) days prior to the delivery of the First Article Vehicle.

F. Milestone Payments for total price of Price Proposal Form (PF-1), Contract Price Summary, Item 3, Special Tools, from Schedule B, Form PF-3, shall be made upon delivery and acceptance of special tools to LACMTA. The special tools shall be delivered in partial separate shipments and shall be of the latest configuration. The Contractor shall submit for LACMTA's approval a list of special tools to be delivered from the total list of special tools on Form PF-3, prior to any shipment. The Contractor shall furnish to LACMTA at the time of the shipment, an itemized breakdown of the quantities and prices of items shipped. The shipments shall be made thirty (30) days prior to the delivery of the First Article Vehicle.

G. Milestone Payments for total price of Price Proposal Form (PF-1), Contract Price Summary, Item 4, Diagnostic Test Equipment (DTE) for base buy, from Schedule C, Form PF-4, shall be made upon delivery and acceptance of DTE to LACMTA. The DTE shall be delivered in partial separate shipments and shall be of the latest configuration. The Contractor shall submit for LACMTA's approval a list of DTE to be delivered from the total list of DTE on Form PF-4, prior to any shipment. The Contractor shall furnish to LACMTA at the time of the shipment, an itemized breakdown of the quantities and prices of items shipped. The shipments shall be made thirty (30) days prior to the delivery of the First Article Vehicle.

H. Milestone Payments for total price of Price Proposal Form (PF-1), Contract Price Summary, Item 5, Training Aids, from Schedule D, Form PF-5, shall be made upon delivery and acceptance of DTE to LACMTA. The Training Aids shall be delivered in partial separate shipments and shall be of the latest configuration. The Contractor shall submit for LACMTA's approval a list of Training Aids to be delivered from the total list of Training Aids on Form PF-5, prior to any shipment. The Contractor shall furnish to LACMTA at the time of the shipment, an itemized breakdown of the quantities and prices of items shipped. The shipments shall be made thirty (30) days prior to the delivery of the First Article Vehicle.

I. Milestone payments for total price of Price Proposal Form (PF-1), Contract Price Summary, Item 6, Manuals (Technical Publications) are specified below as percentages of the total price for each milestone listed.

Milestone	Description	Milestone Percentage	Cumulative Percentage
A)	Approval of each category of draft manuals listed in TS- 5.6.4.	50	50
B)	Approval and acceptance of each category of final	50	100

Milestone	Description	Milestone Percentage	Cumulative Percentage
	manuals listed in TS-5.6.4.		

J. Full payment for Price Proposal Form (PF-1), Contract Price Summary, **Item 7, Performance Bond** shall be made upon providing the executed certificate.

K. Milestone payments for total price of Price Proposal Form (PF-1), Contract Price Summary, Item 8, Training is specified below as percentages of the total price for each milestone listed.

Milestone	Description	Milestone Percentage	Cumulative Percentage
A)	Approval of Training Program Curriculum and schedule (TS-5.6.1).	10	10
B)	Approval of training materials, manuals, guides and aids (TS-5.6.1, TS 5.6.2 and TS- 5.6.3).	30	40
C)	Successful completion of operating and maintenance training programs (TS 5.6).	60	100

L. Milestone payments for total price of Price Proposal Form (PF-1), Contract Price Summary, **Item 9, Vehicle Delivery Charge** is 100% of the total price payable 30 days after acceptance of each Vehicle including Option Vehicles.

CP-03 PAYMENT TO SUBCONTRACTORS *

A. Applicability

This Article applies only if the Contractor has employed Subcontractors.

B. Requirements

1. Progress Payments - Contractor shall pay each Subcontractor under this Contract for satisfactory performance of its Subcontract no later than seven (7) days after its receipt of each Progress Payment from Metro.

2. Final Payment to Subcontractors - The Contractor shall pay to each Subcontractor all amounts it has retained from payments under the Subcontract within seven (7) days after the Subcontractor's Work is satisfactorily completed.

3. Delay in Payment – Contractor shall not delay payment beyond the seven (7) day time limit except for good cause, and only upon the prior written approval of Metro.

C. Failure to Comply

If Metro determines that the Contractor has failed to comply with this Article, Metro may give written notice to the Contractor and the Contractor's Surety describing the default, that the default shall be cured, and if the default is not cured as provided the Article entitled TERMINATION FOR DEFAULT in the GENERAL CONDITIONS of this Contract, the Contract may be terminated for default as provided therein, or Metro may exercise any other remedy it has under the Contract or Law.

CP-04 PAYMENT OF TAXES *

Unless otherwise specifically provided in this Contract, the Contract Price includes compensation for all taxes the Contractor is required to pay by Laws in effect on the date the Contractor's bid was opened. The Contractor shall pay all federal, state, and local taxes, and duties applicable to and assessable against any Work, including but not limited to retail sales and use, transportation, export, import, business, and special taxes. The Contractor shall ascertain and pay the taxes when due. The Contractor will maintain auditable Records, subject to Metro reviews, confirming that tax payments are current at all times.

CP-05 FINAL PAYMENT *

A. Final Acceptance

After Final Acceptance of the Work, as provided in the General Conditions of this Contract, Final Payment will be made as follows:

1. Prior to Final Acceptance of the Contract, as provided in the General Conditions of this Contract, the Contractor shall prepare and submit an Application for Final Payment to Metro including:

   a. The proposed total amount due the Contractor, segregated by items on the Payment Schedule, Amendments, Change Orders, and other bases for payment;

   b. Deductions for prior Progress Payments;

   c. Amounts retained;

d. List of Claims the Contractor is filing concurrently with the Application for Final Payment, or a statement that no Claims will be filed with the Application for Final Payment; and

e. List of pending unsettled Claims, stating claimed amounts.

2. Prior Progress Payments shall be subject to correction in Metro's review of the Application for Final Payment. Claims filed with the Application for Final Payment, or at any time thereafter prior to Final Payment, must be otherwise timely under the Contract and applicable Law.

3. Metro will review the Contractor's Application for Final Payment will forward any required changes or corrections to the Contractor. Within ten (10) days after receipt of required changes from Metro, the Contractor will make the changes, and, if applicable, list Claims that will be filed as a result of the required changes, and shall submit the revised Application for Final Payment. Upon acceptance by Metro, the revised Application for Final Payment will become the approved Application for Final Payment.

4. If no Claims have been filed with the initial or any revised Application for Final Payment and no Claims remain unsettled within thirty (30) days after Final Acceptance of the Work by Metro, and agreements are reached on all issues regarding the Application for Final Payment, Metro, in exchange for an executed release, satisfactory in form and substance to Metro, will pay the entire sum found due on the approved Application for Final Payment, including the amount, if any, allowed on settled Claims.

5. The release from the Contractor shall be from any and all Claims arising under the Contract, except for Claims that with the concurrence of Metro are specifically reserved, and shall release and waive all unreserved Claims against Metro and its officers, directors, employees and Authorized Representatives. The release shall be accompanied by a certification by the Contractor that:

   a. It has resolved all Subcontractor, Supplier and other Claims that are related to the settled Claims included in the Final Payment;

   b. It has no reason to believe that any party has a valid Claim against the Contractor or Metro which has not been communicated in writing by the Contractor to Metro as of the date of the Certificate;

   c. All warranties are in full force and effect; and

   d. The releases and warranties shall survive final payment.

6. If any Claims remain open, Metro may make final Payment subject to resolution of those Claims. Metro may withhold from the Final Payment an amount not to exceed one hundred fifty percent (150%) of the amount of the open Claims.

B. Discovery of Deficiencies *

Notwithstanding Metro's acceptance of the Application for Final Payment and irrespective of whether it is before or after Final Payment has been made, Metro shall not be precluded from subsequently showing that:

1. The true and correct amount payable for the Work is different from that previously accepted;

2. The previously accepted Work did not conform to the Contract requirements; or

3. A previous payment, or portion thereof, for Work was improperly made.

   Metro shall not be estopped from demanding and recovering damages from the Contractor, as appropriate, under any of the foregoing circumstances as permitted under the Contract or applicable Law.

CP-06 AUDIT REQUIREMENTS *

A. Applicability

This Section applies to the Contractor, its Subcontractors and Suppliers. The Contractor, its Subcontractors and Suppliers shall be subject to audit at any reasonable time by the Authorized Auditors for;

1. Any Costs proposed for a Modification, or
2. Defective Cost or pricing on the Contract including any Modification.

B. Defined Terms

Audit: audit, examine, verify, review, excerpt, vouch or transcribe Contractor's, Subcontractors' or Suppliers' Records.

Authorized Auditors: Metro employees, any firms appointed by Metro or other authorized agencies acting as agents of a Governmental Entity. For federally funded Contracts, Authorized Auditors shall also include the FTA Administrator, the Comptroller General of the United States, or any of their duly authorized representatives.

Costs: Amounts (both direct and indirect) claimed to be due and payable, or anticipated to be incurred in performing the proposed Modification.

Records: All of the Contractor's, Subcontractors' or Suppliers' Cost or pricing data supporting the Modification or Element thereof, including but not limited to books, data, Records, documents, reports, computations and projections, accounting procedures and practices and other evidence, in all forms (e.g. paper or machine readable media such as disk, tape, etc.) or types (e.g., databases, applications software, database management software, utilities, etc.), sufficient to properly reflect the performance of the

Work and all Costs claimed to have been incurred or anticipated to be incurred in performing the Work on a proposed Modification. Any information provided by the Contractor, Subcontractor or Supplier on machine-readable media shall be provided in a format accessible and readable by the Authorized Auditors. The detail and depth of Records required as backup support for Audits shall be that which adequately establishes and maintains visibility of both allowable, and identified unallowable costs including directly associated costs.

Reproduce: copy, download, transcribe, print etc. by any means whatsoever free of charge.

C. Access

1. Records

Upon reasonable written advance notice to the Contractor, Subcontractors or Suppliers, with a copy sent to the Contractor's Authorized Representative, the Authorized Auditors shall have access during Contractor's normal business hours to all Records related to Costs or performance of the proposed Modification for the purpose of Auditing.

2. Worksites

For any federally funded major capital project, the Authorized Auditors shall include the FTA Administrator or his authorized representatives including any PMO Contractor. Access shall include the Worksite.

D. Records Retention

The Contractor, Subcontractors and Suppliers shall maintain all Records required under this Contract for a period of not less than three years after the date of Termination, in whole or in part or Final Payment, whichever is later. In the event of litigation or settlement of claims arising from the performance of this Contract, the Contractor, Subcontractor and Suppliers shall maintain all Records related to this Contract until Metro or any Governmental Agency or their duly authorized representatives have disposed of all such litigation, appeals, claims or exceptions related thereto.

E. Reproduction of Records

The Authorized Auditors shall have the right to Reproduce any Contractor, Subcontractor or Supplier Records related to Costs proposed for a Modification. The Contractor, Subcontractor or Supplier shall make said evidence (or to the extent accepted by the Authorized Auditors, photographs, micro-photographs or other authentic reproductions thereof) available to the Authorized Auditors at the Contractor's offices at all reasonable times and without charge.

F. Modifications

The Contractor, Subcontractors or Suppliers shall maintain and segregate Cost and pricing data and Records sufficient to properly reflect all direct and indirect Costs of whatever nature claimed to have been incurred or anticipated to be incurred in connection with a Modification to the Contract.

G. Defective Cost and Pricing Data

FAR 52-215-10 Price Reduction for Defective Cost or Pricing Data and 52.215-11 Price Reduction for Defective Cost or Pricing Data-Modifications shall apply to this Contract. The term Government referred to in the FAR clauses shall include Metro for purposes of this Contract.

H. Disposition of Audit Findings

The Contracting Officer may use all evidence in the Records including the Audit findings to:

1. Negotiate Modifications, or

2. Demand payment from the Contractor or adjust any Contractor's invoice to:

   a. Reduce amounts found by the Contracting Officer to be unallowable costs; or

   b. Adjust for prior overpayments or underpayments.

CP-07 LIQUIDATED DAMAGES

If the Work and specified portions of the Work are not completed and delivered according to the delivery schedule within the number of days set forth in Section SP-10 of the Special Provisions, damage will be sustained by LACMTA. It is and will be impracticable to ascertain the actual damage which LACMTA will sustain. Damage to LACMTA in the case of failure by the Contractor to complete specified portions of Work within the time as required therefore by the terms of this Contract will include, but not be limited to, the following:

1. Delays in the completion and operation of LACMTA's Transit System;
2. Unreasonable inconvenience to the public;
3. Loss of revenue;
4. Increased costs of Contract administration; and
5. Delays and increased costs to other Contractors.

In the event of and by reason of such delay, subject to the provisions of Section GC-20 of the General Conditions entitled EXTENSION OF TIME, the Contractor shall pay to LACMTA the amount set forth in these provisions as liquidated

damages for each day's delay or fraction thereof in completion of the Work as specified in the Special Provisions. LACMTA may deduct the sum of liquidated damages from any monies due or that may become due the Contractor, or if such monies are insufficient, the Contractor or its surety shall pay to LACMTA any deficiency. The remedies provided herein are not exclusive, and are in addition to other rights and remedies provided by law or under this Contract.

A. Just Compensation

In lieu of actual damages, in the event of late submittal, delivery, or acceptance of any deliverables, including vehicles, explicitly noted in Section SP-8, the Contractor agrees to pay LACMTA an amount of money as a reasonable estimate of just compensation for damages contemplated in this Article.

B. The Contractor agrees to make payment in the above amounts in the event of late delivery, and agrees that LACMTA may withhold monies for such from any funds due.

C. Limitations of Liability

Liquidated Damages for late delivery of buses will be limited, for all causes, to a maximum of ten (10) percent of the total price of the Contract.

D. LACMTA Rights

Application of the "Liquidated Damages" provisions of the Contract in no way alters LACMTA's rights under the TERMINATION FOR DEFAULT - DAMAGES FOR DELAY - TIME EXTENSIONS Article of the General Conditions.

Contract No.: OP28367-000
FORTY-FOOT (40') AND SIXTY FOOT (60') LOW FLOOR CNG OR ZERO EMISSION BUS PROCUREMENT

EXHIBIT 1 - PAYMENT CERTIFICATION

1. I hereby certify to the best of my knowledge and belief that:

   A. This Payment Request represents a true and correct statement of the Work performed;

   B. The Work completed to date under this Contract is in full accordance with the terms of the Contract; and

   C. All Subcontractors and/or Suppliers who have performed Work on the project through the closing date of the prior Payment Request have been paid their proportionate share of all previous payments from Metro.

2. I understand that it is a violation of both the federal and California False Claims Acts to knowingly present or cause to be presented to Metro a false claim for payment or approval. A claim includes a demand or request for money. It is also a violation of the False Claims Acts to knowingly make use of a false Record or statement to get a false claim paid. The term "knowingly" includes either actual knowledge of the information, deliberate ignorance of the truth or falsity of the information, or reckless disregard for the truth or falsity of the information. Proof of specific intent to defraud is not necessary under the False Claims Acts. I understand that the penalties under the Federal False Claims Act and State of California False Claims Act are non-exclusive, and are in addition to any other criminal and/or civil remedies which Metro may have either under contract or law.

I certify under penalty of perjury, under the laws of the State of California, that the foregoing is true and correct

Firm: _____

Signature: _____

Name of Certifying Official: _____

Title: _____

Date of Execution: _____

END OF COMPENSATION & PAYMENT PROVISIONS

GROUP A - U[illegible]/600 40' CNG BUSES
FORM PF-1 (CNG - 40') - CONTRACT PRICE SUMMARY
(SECOND BEST AND FINAL OFFER)

Proposer: ELDORADO NATIONAL (CALIFORNIA), INC.

RFP No.: OP28367

RFP Title: FORTY FOOT (40') AND SIXTY FOOT (60') LOW FLOOR CNG OR ZEB BUS PROCUREMENT

1.0 CONTRACT FOR 295 BUSES (BASE BUY)

No.	Qty.	Description of Item		Taxable Unit Price	Unit Price	Total Price
1	295	40' Low Floor CNG Buses (Base Buy) from PF-1A	Values derived from PF-1A*:	$595,632.00	$615,372.00	$181,534,740.00
1a	Lot	Manuals (Base Buy) (TS 5.6.4)		$2,281.50	Lump Sum	$23,400.00
1b	295	Vehicle Delivery Charge for Base Buy	Value of all taxable delivery charges per bus**:		$275.00	$81,125.00
1c		Tax (Base Buy)		9.75%	$58,074.12	$17,134,146.90
2	Lot	Reserved				
3	Lot	Reserved				
4	Lot	Reserved				
5	Lot	Reserved				
6	Lot	Reserved				
7	Lot	Performance Bond (Base Buy)			Lump Sum	$119,336.00
8	1,000	Total Training Hours for Base Buy***			$175,000.00	
8a	900	Contractor (Proposer/Prime) Base Buy			$175.00	$157,500.00
8b	100	Subcontractor/Supplier Base Buy			$175.00	$17,500.00
9	295	Reserved			$	

1.0 Total Price for CONTRACT for 295 Base Buy Buses (Sum of Items "1" through "9") to be the BASIS for Price Proposal evaluation

In U.S. Dollars Using Words: ONE HUNDRED & NINETY-NINE MILLION SIXTY-SEVEN THOUSAND SEVEN HUNDRED FOU

In U.S. Dollars Using Figures: $199,067,747.90

NOTE

* Taxable Unit Price is the Unit Price less 1.14 Accessibility Provisions on PF-1A

** Input the taxable portion of the Delivery Charge under the Taxable Unit Price column and the total Delivery Charge under the Unit Price column

*** Training Hours for Base Buy are only estimates and not a guaranteed level of effort. The total for this Line is a Not-to-Exceed provisional amount.

GROUP A - U 600 40' CNG BUSES
FORM PF-1 (CNG - 40') - CONTRACT PRICE SUMMARY
(SECOND BEST AND FINAL OFFER)

Proposer: ELDORADO NATIONAL (CALIFORNIA), INC.
RFP No.: OP28367
RFP Title: FORTY FOOT (40') AND SIXTY FOOT (60') LOW FLOOR CNG OR ZEB BUS PROCUREMENT

2.0 CONTRACT FOR 150 UP TO 305 BUSES (OPTION BUY)

No.	Qty.	Description of Item		Taxable Unit Price	Unit Price	Total Price
10	305	40' Low Floor CNG Buses (Option Buy) from PF-1A for 150 to 305 vehicles*		$595,632.00	$615,372.00	$187,688,460.00
10a	Lot	Manuals (Option Buy) (TS 5.6.4)***		$2,281.50	Lump Sum	$23,400.00
10b	305	Vehicle Delivery Charge for Option Buy	Value of all taxable delivery charges per bus**:	$0.00	$275.00	$83,875.00
10c		Tax (Option Buy)		9.75%	$58,074.12	$17,714,888.10
11		Reserved			$	$
12	Lot	Performance Bond for Option Buy***			Lump Sum	$123,421.00
13	500	Total Training Hours for Option Buy****			$87,500.00	
13a	450	Contractor (Proposer/Prime) Option Buy			$175.00	$78,750.00
13b	50	Subcontractor/Supplier Option Buy			$175.00	$8,750.00
14		Reserved			$	$

2.0 Total Price for CONTRACT for 150 Up to 305 Option Buy Buses (Sum of Items "10" through "14") to be the BASIS for Price Proposal evaluation

In U.S. Dollars Using Words: TWO-HUNDRED FIVE MILLION SEVEN-HUNDRED TWENTY-ONE THOUSAND FIVE-HUNDRED FORTY-FOUR DOLLARS & TEN CENTS

In U.S. Dollars Using Figures: $205,721,544.10

NOTE
* Taxable Unit Price is the Unit Price less 1.14 Accessibility Provisions on PF-1A
** Input the taxable portion of the Delivery Charge under the Taxable Unit Price column and the total Delivery Charge under the Unit Price column
*** For proposal purposes only, Manuals and Bond prices are for all 305 bus Options exercised. Actual cost will depend on Option quantity ordered.
**** Training Hours for Option Buy are only estimates and not a guaranteed level of effort. The total for this Line is a Not-to-Exceed provisional amount.

GROUP A - U[illegible]600 40' CNG BUSES
FORM PF-1 (CNG - 40') - CONTRACT PRICE SUMMARY
(SECOND BEST AND FINAL OFFER)

Proposer: ELDORADO NATIONAL (CALIFORNIA), INC.

RFP No.: OP28367

RFP Title: FORTY FOOT (40') AND SIXTY FOOT (60') LOW FLOOR CNG OR ZEB BUS PROCUREMENT

3.0 OPTIONAL VEHICLE CONFIGURATION

No.	Qty.	Description of Item		Unit Price	Total Price
15	1	3 ADA Securement Configuration TS 81.5 (Total 15a - 15d)			$6,370.00
15a		Direct Materials/Equipment		$5,750.00	
15b		Labor Installation Costs		$620.00	
15c		Non Recurring Cost		$0.00	
15d		Other Costs (Identify)		$0.00	
16	1	4 ADA Securement Configuration TS 81.5 (Total 16a - 16d)			$10,170.00
16a		Direct Materials/Equipment		$9,150.00	
16b		Labor Installation Costs		$1,020.00	
16c		Non Recurring Cost		$0.00	
16d		Other Costs (Identify)		$0.00	
17	600	Reserved****			
17a	295	Reserved			
17b	305	Reserved			
18	600	25-Year Certified CNG Tanks			$522,000.00
18a	295	25 Yr Certified CNG Tanks for Base Buy	$256,650.00	$870.00	
18b	305	25 Yr Certified CNG Tanks for Option Buy for 150 up to 305 vehicles	$265,350.00	$870.00	
19	600	Complete Automatic Passenger Counter System TS 86.3 (Total 19a - 19h)			$2,757,600.00
19a	295	Direct Materials/Equipment for Base Buy APC		$4,136.00	
19b	295	Labor Installation Costs for Base Buy APC		$460.00	
19c	295	Non Recurring Cost for Base Buy APC		$	
19d	295	Other Costs (Identify) for Base Buy APC		$	
		Total for Base Buy APC	$1,355,820.00	$4,596.00	
19e	305	Direct Materials/Equipment for Option Buy APC for 150 up to 305 vehicles		$4,136.00	
19f	305	Labor Installation Costs for Option Buy APC for 150 up to 305 vehicles		$460.00	
19g	305	Non Recurring Cost for Option Buy APC for 150 up to 305 vehicles		$	
19h	305	Other Costs (Identify) for Option Buy APC for 150 up to 305 vehicles		$	

GROUP A - UP 300 40' CNG BUSES
FORM PF-1 (CNG - 40') - CONTRACT PRICE SUMMARY
(SECOND BEST AND FINAL OFFER)

Proposer: ELDORADO NATIONAL (CALIFORNIA), INC.
RFP No.: OP28367
RFP Title: FORTY FOOT (40') AND SIXTY FOOT (60') LOW FLOOR CNG OR ZEB BUS PROCUREMENT

		Total for Option Buy APC for 150 up to 305 vehicles	$1,401,780.00	$4,596.00	
20	600	Enhanced 360 degree Camera System TS 86.1 (Total 20a - 20h)			$579,000.00
20a	295	Direct Materials/Equipment for Base Buy Enhanced Camera System		$869.00	
20b	295	Labor Installation Costs for Base Buy Enhanced Camera System		$96.00	
20c	295	Non Recurring Cost for Base Buy Enhanced Camera System		$	
20d	295	Other Costs (Identify) for Base Buy Enhanced Camera System		$	
		Total for Base Buy Enhanced Camera System	$284,675.00	$965.00	
20e	305	Direct Materials/Equipment for Option Buy Enhanced Camera System for 150 up to 305 vehicles		$869.00	
20f	305	Labor Installation Costs for Option Buy Enhanced Camera System for 150 up to 305 vehicles		$96.00	
20g	305	Non Recurring Cost for Option Buy Enhanced Camera System for 150 up to 305 vehicles		$	
20h	305	Other Costs (Identify) for Option Buy Enhanced Camera System for 150 up to 305 vehicles		$	
		Total for Option Buy Enhanced Camera System for 150 up to 305 vehicles	$294,325.00	$965.00	
21	600	USB Ports for Passenger Charging Only			$288,000.00
21a	295	USB Ports for Passenger Charging Only for Base Buy	$141,600.00	$480.00	
21b	305	USB Ports for Passenger Charging Only for Option Buy for 150 up to 305 vehicles	$146,400.00	$480.00	
22	600	Optional Wireless Stop Request Switches (Bus set)			$291,000.00
22a	295	Optional Wireless Stop Request Switches (Bus set) for Base Buy	$143,075.00	$485.00	
22b	305	Optional Wireless Stop Request Switches (Bus set) for Option Buy for 150 up to 305 vehicles	$147,925.00	$485.00	
23	600	Optional Full Color Destination Sign Sets (TS 86.3)			$2,070,000.00
23a	295	Optional Full Color Destination Sign Sets (TS 86.3) for Base Buy	$1,017,750.00	$3,450.00	
23b	305	Optional Full Color Destination Sign Sets (TS 86.3) for Option Buy for 150 up to 305 vehicles	$1,052,250.00	$3,450.00	
24	Lot	Spare Parts (From Schedule A, Form PF-2)			$2,237,668.65
25	Lot	Special Tools (Schedule B Form PF-3)			$7,710.00
26	Lot	Diagnostic Test Equipment (Schedule C, Form PF-4)			$355,010.00
27	Lot	Training Aids (Schedule D, Form PF-5)			$958,460.00

3.0 Total Price for OPTIONAL VEHICLE CONFIGURATION (Sum of Items "15 through 27") for OPTIONAL EQUIPMENT to be BASIS for Price Proposal evaluation.

In U.S. Dollars Using Words: TEN-MILLION EIGHT-TWO THOUSAND NINE-HUNDRED EIGHTY-EIGHT DOLLARS & SIXTY-F

GROUP A - UP 300 40' CNG BUSES
FORM PF-1 (CNG - 40') - CONTRACT PRICE SUMMARY
(SECOND BEST AND FINAL OFFER)

Proposer: ELDORADO NATIONAL (CALIFORNIA), INC.
RFP No.: OP28367
RFP Title: FORTY FOOT (40') AND SIXTY FOOT (60') LOW FLOOR CNG OR ZEB BUS PROCUREMENT

In U.S. Dollars Using Figures:	$10,082,988.65

**** Proposer shall provide base Low Nox Engine for each bus with the following Emission Levels:
ISLG engine is not the base engine requirement. Low Nox engine is the base requirement and therefore no longer an option.

Oxides of Nitrogen (NOx) Grams per brake horsepower-hour	Particulate Matter (PM) grams per brake horsepower hour
0.02	0.01

4.0 CONTRACT FOR BASE BUY, OPTION BUY, AND OPTIONALVEHICLE CONFIGURATION

No.	Qty.	Description of Item	Total Price
1.0		Total Price for CONTRACT for 295 Base Buy Buses to be the BASIS for Price Proposal evaluation	$199,067,747.90
2.0		Total Price for CONTRACT for 150 Up to 305 Option Buy Buses to be the BASIS for Price Proposal evaluation	$205,721,544.10
3.0		Total Price for OPTIONAL VEHICLE CONFIGURATION for OPTIONAL EQUIPMENT to be BASIS for Price Proposal evaluatior	$10,082,988.65
4.0		Total Price for CONTRACT for 295 Base Buy Buses, for 150 up to 305 Option Buy Buses, and Optional Vehicle Configuration for Optional Equipment combined to be the overall BASIS for Price Proposal evaluation	

In U.S. Dollars Using Words: FOUR-HUNDRED FOURTEEN MILLION EIGHT-HUNDRED SEVENTY-TWO THOUSAND TWO-HUNDRED EIGHT DOLLARS & SIXTY-FIVE CENTS

In U.S. Dollars Using Figures:	$414,872,280.65

(Signature of Person Executing Proposal) — Date: 4/5/2017

TONY WAYNE VICE PRESIDENT & GENERAL MANAGI
Type Name, Title

GROUP A - UP TO 600 40' CNG BUSES
FORM PF1A (CNG - 40')
SUBSYSTEM EQUIPMENT
(SECOND BEST AND FINAL OFFER)

Proposer: ELDORADO NATIONAL (CALIFORNIA), INC
RFP No. OP28367

NO.	DESCRIPTION	BASE BUY OF ITEM		
1	Purchased Subsystem Equipment (Items 1.1 through 1.99) **			
1.1	TS 9.	Propulsion Power Assembly (PPA)***		$18,372
1.2	TS 9.	Engine		$60,324
1.3	TS 10.	Cooling System		$12,650
1.4	TS 18.	Fuel System		$68,300
1.5	TS 31.	Suspension		$19,950
1.6	TS 33.	Steering System		$4,950
1.7	TS 37.	Brakes		$3,260
1.8	TS 39.	Pneumatic System		$6,850
1.9	TS 42.	Charging System		$36,800
1.10	TS 44.	Multiplex Control System		$24,200
1.11	TS 54.	HVAC Climate Control System		$29,450
1.12	TS 78.	Passenger Seats		$28,955
1.13	TS 80.	Doors		$14,830
1.14	TS 81.	Accessibility Provisions		$19,740
1.15	TS 86.	Communications		$3,244
1.16	TS 11	Transmission		$21,028
1.99		All other bus subsystem equipment not included above		$242,469

TOTAL CNG BUS PRICE $615,372

* Transfer Total CNG Bus Price to Contract Price Summary Form (PF-1 - Unit Price column, line Item 1 - **Base Buy**

Notes: 1. ** Price shall include design, engineering, manufacturing/assembly, testing, shipping, profit and other associated costs. Price for each subsystem equipment shall include all applicable apparatus.

2. Price for line Item Nos. 1a-27 in the CONTRACT PRICE SUMMARY(Form PF-1) shall not be included in computing price of any of the line items above.

3. *** PPA unit price for line item 1.1 excludes prices for items 1.2 through 1.99

GROUP A - UP TO 600 40' CNG BUSES
FORM PF1A (CNG - 40')
SUBSYSTEM EQUIPMENT
(SECOND BEST AND FINAL OFFER)

NO.	DESCRIPTION	OPTION BUY OF ITEM		
2	Purchased Subsystem Equipment (Items 2.1 through 2.99) **			
2.1	TS 9.	Propulsion Power Assembly (PPA)***		$18,372
2.2	TS 9.	Engine		$60,324
2.3	TS 10.	Cooling System		$12,650
2.4	TS 18.	Fuel System		$68,300
2.5	TS 31.	Suspension		$19,950
2.6	TS 33.	Steering System		$4,950
2.7	TS 37.	Brakes		$3,260
2.8	TS 39.	Pneumatic System		$6,850
2.9	TS 42.	Charging System		$36,800
2.10	TS 44.	Multiplex Control System		$24,200
2.11	TS 54.	HVAC Climate Control System		$29,450
2.12	TS 78.	Passenger Seats		$28,955
2.13	TS 80.	Doors		$14,830
2.14	TS 81.	Accessibility Provisions		$19,740
2.15	TS 86.	Communications		$3,244
2.16	TS 11	Transmission		$21,028
2.99		All other bus subsystem equipment not included above		$242,469

TOTAL CNG BUS PRICE OPTION QUANTITY $615,372

* Transfer Total CNG Bus Price to Contract Price Summary Form (PF-1 - Unit Price column, line item 10 - Option Buy)

Notes: 1. ** Price shall include design, engineering, manufacturing/assembly, testing, shipping, profit and other associated costs. Price for each subsystem equipment shall include all applicable apparatus.

2. Price for line Item Nos. 1-9 and 10a-27 in the CONTRACT PRICE SUMMARY(Form PF-1) shall not be included in computing price of any of the line items above.

3. *** PPA unit price for line item 2.1 excludes prices for items 2.2 through 2.99

(Signature of Person Executing Proposal) 4/5/2017 Date

TONY WAYNE /VICE PRESIDENT & GENERAL MANAGER
Type Name, Title

GROUP A - UP TO 600 40' CNG BUSES
FORM PF-2 (CNG- 40') - SCHEDULE A OF PRICES SPARE PARTS (OPTIONAL)
(SECOND BEST AND FINAL OFFER)

Proposer: ELDORADO NATIONAL (CALIFORNIA), INC.
RFP No.: OP28367
RFP Title: FORTY FOOT (40') AND SIXTY FOOT (60') LOW FLOOR CNG OR ZEB BUS PROCUREMENT

NO.	UNIT	DESCRIPTION OF ITEM	QTY	UNIT PRICE	TOTAL PRICE
LOW NOX ENGINE					
1	Ea.	Propulsion Power Assembly (See Definition in SP-1)	3	$86,270.00	$258,810.00
2	Ea.	Air Compresser	5	$6,760.00	$33,800.00
3	Ea.	Turbo	3	$1,982.00	$5,946.00
4	Ea.	EGR Cooler	20	$1,110.47	$22,209.40
5	Ea.	EGR Valve	10	$610.68	$6,106.80
6	Ea.	Delta P Sensor	10	$347.66	$3,476.60
7	Ea.	Mass. Air Flow Sensor	10	$1,067.56	$10,675.60
8	Ea.	Oxygen Sensor	20	$223.61	$4,472.20
9	Ea.	Catalyst	5	$3,574.95	$17,874.75
10	Ea.	Cylinder Head	5	$4,513.81	$22,569.05
11	Ea.	Pistons Kits	60	$325.00	$19,500.00
12	Bus Set	Rod Bearings	10	$64.00	$640.00
13	Bus Set	Main Bearing	10	$219.27	$2,192.70
14	Ea.	Liners	60	$191.87	$11,512.20
15	Ea.	Head Gasket	5	$428.75	$2,143.75
16	Ea.	Upper Gasket Set	5	$844.99	$4,224.95
17	Ea.	Oil Pan Gasket	20	$133.60	$2,672.00
18	Ea.	Stiffener Plate Gasket	20	$92.85	$1,857.00
19	Ea.	Oil Pan	5	$505.51	$2,527.55
20	Ea.	Throttle Actuator	5	$574.16	$2,870.80
21	Ea.	Fuel Control Valve	10	$1,429.19	$14,291.90
22	Ea.	Ignition Control Module	10	$1,648.45	$16,484.50
23	Ea.	Ignition Coils	120	$175.23	$21,027.60
24	Ea.	Engine Harness	5	$1,493.62	$7,468.10
25	Ea.	Ignition Harness	10	$167.53	$1,675.30
26	Ea.	Oil Cooler	5	$179.73	$898.65
27	Ea.	Lube Pump	5	$275.51	$1,377.55
28	Ea.	Front Crank Seal	10	$30.54	$305.40
29	Ea.	Rear Seal	10	$28.65	$286.50
30	Ea.	Water Pump	10	$175.03	$1,750.30
31	Ea.	Vibration Damper	10	$344.21	$3,442.10
32	Ea.	Belt Tensioner (If applicable)	20	$145.47	$2,909.40
33	Ea.	CoolantTermperature Sensor	20	$11.21	$224.20
34	Ea.	Oil Pressure Sensor	10	$98.10	$981.00
35	Ea.	Fuel Pressure Sensor	10	$144.34	$1,443.40
36	Ea.	Low Fuel Pressure Regulator	10	$1,222.22	$12,222.20
37	Ea.	Engine Cradle	5	$1,420.00	$7,100.00
38	Ea.	Belt Guard	5	$358.80	$1,794.00
39	Ea.	Complete Engine Package (See definition in TS-2)	4	$66,430.00	$265,720.00
40	Bus Set	Spark Plugs	15	$42.02	$630.30
41	Bus Set	Adaptation Kit (Eng to Trans)	3	$1,066.00	$3,198.00
42	Ea.	PPA Dollies	8	$685.00	$5,480.00
COOLING SYSTEM					
1	Ea.	Radiator Packages (See definition in TS-2)	5	$7,715.00	$38,575.00
2	Ea.	Thermal Management Controllers	5	$598.32	$2,991.60
3	Bus Set	Fan Resistors	20	$48.60	$972.00
4	Bus Set	CAN Interface Cables	5	$101.25	$506.25
5	Ea.	Fan Reversal LED Panel	5	$593.39	$2,966.95
6	Ea.	Fan Assembly	30	$40.66	$1,219.80
7	Ea.	Coolant Reservoir	10	$556.20	$5,562.00
8	Ea.	Transmission Cooler	10	$648.00	$6,480.00
9	Bus Set	Pressure Relief Valve	20	$23.85	$477.00
10	Ea.	Radiator Cap	30	$5.27	$158.10
11	Ea.	Coolant Overflow Tank	10	$36.29	$362.90

GROUP A - UP TO 600 40' CNG BUSES
FORM PF-2 (CNG- 40') - SCHEDULE A OF PRICES SPARE PARTS (OPTIONAL)
(SECOND BEST AND FINAL OFFER)

Proposer: ELDORADO NATIONAL (CALIFORNIA), INC.
RFP No.: OP28367
RFP Title: FORTY FOOT (40') AND SIXTY FOOT (60') LOW FLOOR CNG OR ZEB BUS PROCUREMENT

NO.	UNIT	DESCRIPTION OF ITEM	QTY	UNIT PRICE	TOTAL PRICE
CHARGING SYSTEM					
1	Ea.	Alternator	10	$9,750.00	$97,500.00
2	Ea.	Voltage Regulators	10	$351.00	$3,510.00
3	Ea.	Batteries	40	$203.77	$8,150.80
4	Ea.	Battery Equilizer	20	$418.50	$8,370.00
5	Ea.	Battery Disconnect	10	$31.82	$318.20
6	Ea.	Battery Separator	5	$297.00	$1,485.00
7	Ea.	Power Distribution Panel in Battery Compartment	5	$267.30	$1,336.50
8	Ea.	Low Voltage Disconnect	10	$44.55	$445.50
9	Ea.	Circuit Breaker 80A	20	$31.59	$631.80
10	Ea.	Circuit Breaker 100A	20	$39.15	$783.00
11	Ea.	Circuit Breaker 120A or 130A, whichever applies	20	$49.95	$999.00
12	Bus Set	Fuse and Circuit Breaker Panels	5	$310.50	$1,552.50
SUSPENSION					
1	Bus Set	Air Ride Beams	10	$2,310.00	$23,100.00
2	Bus Set	Air Bags	20	$672.00	$13,440.00
3	Ea.	Front Axle	10	$4,879.85	$48,798.50
4	Ea.	Rear Axle	10	$3,946.07	$39,460.70
5	Bus Set	Radius Rods	5	$412.80	$2,064.00
6	Bus Set	Shocks	10	$383.68	$3,836.80
7	Bus Set	Leveling Valve Front	10	$191.81	$1,918.10
8	Bus Set	Leveling Valve Rear	10	$191.81	$1,918.10
DRIVE TRAIN					
1	Ea.	Transmission	5	$21,028.00	$105,140.00
2	Ea.	TCM Programmed	5	$611.00	$3,055.00
3	Ea.	Adaptation Kit (Trans to Eng)	2	$1,066.00	$2,132.00
4	Ea.	Drive Shaft	10	$544.00	$5,440.00
5	Ea.	Differential	15	$6,972.00	$104,580.00
STEERING SYSTEM					
1	Bus Set	Steering Gear and Linkage	10	$1,172.50	$11,725.00
2	Ea.	Steering Column	10	$596.77	$5,967.70
3	Ea.	Steering Shaft	10	$135.30	$1,353.00
4	Ea.	Steering Box Assembly	10	$277.78	$2,777.80
5	Ea.	Power Steering Gear Assembly	10	$893.97	$8,939.70
PNEUMATIC SYSTEM					
1	Bus Set	Air Tanks (Complete Sets)	10	$352.00	$3,520.00
2	Ea.	Air Dryer	10	$400.66	$4,006.60
3	Ea.	Air Governor	10	$68.80	$688.00
4	Bus Set	Pressure Reducing Valves	10	$28.80	$288.00
5	Bus Set	Check Valves	10	$57.60	$576.00
6	Bus Set	Brake Control Valve	10	$46.40	$464.00
7	Bus Set	Brake Pedal Valve	10	$134.54	$1,345.40
8	Bus Set	Quick Release Valve	10	$17.60	$176.00
9	Bus Set	Parking Relay Valve	10	$57.60	$576.00
10	Bus Set	Parking Control Valve	10	$46.40	$464.00
11	Bus Set	Air Brake Tubing	10	$134.54	$1,345.40
12	Bus Set	Solenoid Valve Assembly	10	$17.60	$176.00
FUEL SYSTEM					
1	Bus Set	Fuel Cylinder Assembly	2	$68,300.00	$136,600.00
2	Ea.	Fill Manifold	2	$592.00	$1,184.00

GROUP A - UP TO 600 40' CNG BUSES
FORM PF-2 (CNG- 40') - SCHEDULE A OF PRICES SPARE PARTS (OPTIONAL)
(SECOND BEST AND FINAL OFFER)

Proposer: ELDORADO NATIONAL (CALIFORNIA), INC.
RFP No.: OP28367
RFP Title: FORTY FOOT (40') AND SIXTY FOOT (60') LOW FLOOR CNG OR ZEB BUS PROCUREMENT

NO.	UNIT	DESCRIPTION OF ITEM	QTY	UNIT PRICE	TOTAL PRICE
3	Bus Set	Shut Off Valve Assembly	5	$440.00	$2,200.00
4	Bus Set	PRD'S	10	$134.40	$1,344.00
5	Ea.	High Fuel Pressure Regulator	20	$600.00	$12,000.00
6	Bus Set	Defueling Valves	5	$1,560.00	$7,800.00
7	Ea.	Low/High Pressure Filer Assembly	5	$704.00	$3,520.00
8	Bus Set	Fuel Pressure Gauges	10	$88.00	$880.00
9	Bus Set	Defueling Switches	5	$41.60	$208.00
10	Bus Set	Manifold Shut Off Valve Assembly	10	$325.00	$3,250.00
11	Bus Set	Solenoid Valve Assembly	10	$376.00	$3,760.00
12	Bus Set	Fuel Line Assembly	10	$576.00	$5,760.00
13	Ea.	Low Pressure Sensor	20	$144.00	$2,880.00
14	Ea.	Proximity Switch @ the Fuel Fill Door	20	$7.94	$158.80
15	Bus Set	Fuel Line Assembly	5	$576.00	$2,880.00
16	Bus Set	Vent Tubes	5	$137.60	$688.00
17	Ea.	Control Harness	5	$240.00	$1,200.00
18	Ea.	Proximity Switch @ the Fast Fill Recepticle	20	$7.94	$158.80
DOORS					
1	Bus Set	Complete Base Plate and Operator Assembly	5	$1,920.00	$9,600.00
2	Bus Set	Front/Rear Turning Shaft Assembly	5	$1,864.00	$9,320.00
3	Bus Set	Door Panels	5	$6,387.00	$31,935.00
4	Bus Set	Door Glass	2	$1,816.00	$3,632.00
BODY INTERIOR					
1	Bus Set	Interior AVA Sign Assembly	5	$1,580.00	$7,900.00
2	Ea.	Destination Sign Controller	2	$512.00	$1,024.00
3	Ea.	Next Stop Sign	5	$256.00	$1,280.00
4	Bus Set	Interior Speaker Assembly	10	$192.00	$1,920.00
5	Ea.	Microphone Hand Set	5	$92.80	$464.00
6	Ea.	Visor/Sun Shade(s) Front & Side	10	$316.80	$3,168.00
7	Bus Set	Access Panels	5	$960.00	$4,800.00
8	Bus Set	Light Covers	5	$916.80	$4,584.00
9	Bus Set	Modesty Panels	10	$880.00	$8,800.00
10	Bus Set	Ceiling Panels	10	$1,472.00	$14,720.00
11	Bus Set	Side Wall Trim Panel	10	$480.00	$4,800.00
12	Bus Set	Floor Covering	5	$2,470.00	$12,350.00
13	Bus Set	Wheelchair Securement Devices	5	$1,248.00	$6,240.00
14	Bus Set	Passenger Seat	4	$34,087.00	$136,348.00
15	Bus Set	Seat Track	2	$388.00	$776.00
16	Ea.	Operator Seat	5	$2,680.00	$13,400.00
17	Ea.	Farebox Grabrail	4	$248.00	$992.00
18	Bus Set	Manual Release Mechanism	6	$47.00	$282.00
19	Bus Set	Passenger Hand Strap	10	$496.00	$4,960.00
20	Ea.	HVAC Return Grill	5	$390.00	$1,950.00
BODY EXTERIOR					
1	Bus Set	Passenger Windows	2	$14,186.40	$28,372.80
2	Bus Set	Replacement Pass Side Window Glass (if not bonded)	2	$4,560.00	$9,120.00
3	Bus Set	Side Window Film or Guards	5	$1,847.00	$9,235.00
4	Bus Set	Windshield	3	$680.00	$2,040.00
5	Bus Set	Operator Window	2	$1,139.68	$2,279.36
6	Bus Set	Access Door Set (excluding engine door and HVAC access door)	3	$2,180.00	$6,540.00
7	Ea.	Engine Door	2	$623.00	$1,246.00
8	Ea.	HVAC Rear Attic Door	2	$428.80	$857.60
9	Ea.	Bike Rack	2	$1,469.00	$2,938.00
10	Ea.	Emergency Roof Hatch	2	$249.20	$498.40
11	Bus Set	Windshield Wiper Assy.	3	$766.96	$2,300.88
12	Ea.	Windsheild Washer Reservoir	2	$52.80	$105.60
13	Bus Set	Mirrors	4	$971.28	$3,885.12
14	Bus Set	Bumper	3	$2,208.00	$6,624.00
15	Bus Set	Mud Guards	3	$104.00	$312.00

GROUP A - UP TO 600 40' CNG BUSES
FORM PF-2 (CNG- 40') - SCHEDULE A OF PRICES SPARE PARTS (OPTIONAL)
(SECOND BEST AND FINAL OFFER)

Proposer: ELDORADO NATIONAL (CALIFORNIA), INC.
RFP No.: OP28367
RFP Title: FORTY FOOT (40') AND SIXTY FOOT (60') LOW FLOOR CNG OR ZEB BUS PROCUREMENT

NO.	UNIT	DESCRIPTION OF ITEM	QTY	UNIT PRICE	TOTAL PRICE
16	Ea.	Head Lights	10	$742.00	$7,420.00
17	Bus Set	Front Turn Signal	10	$54.40	$544.00
18	Bus Set	Side Marker Lights	10	$128.00	$1,280.00

GROUP A - UP TO 600 40' CNG BUSES
FORM PF-2 (CNG- 40') - SCHEDULE A OF PRICES SPARE PARTS (OPTIONAL)
(SECOND BEST AND FINAL OFFER)

Proposer: ELDORADO NATIONAL (CALIFORNIA), INC.
RFP No.: OP28367
RFP Title: FORTY FOOT (40') AND SIXTY FOOT (60') LOW FLOOR CNG OR ZEB BUS PROCUREMENT

NO.	UNIT	DESCRIPTION OF ITEM	QTY	UNIT PRICE	TOTAL PRICE
19	Bus Set	Rear Door Lights	10	$64.00	$640.00
20	Bus Set	Under Hood Hazard Lights	10	$115.20	$1,152.00
21	Ea.	License Plate Installation	5	$20.80	$104.00
22	Bus Set	CNG Tank Cover Installation	4	$3,800.00	$15,200.00
23	Bus Set	Exterior Trim (including fender skirts, exit door trim and trim pieces covering joints between body panels)	4	$1,387.00	$5,548.00
CLIMATE CONTROL SYSTEM					
1	Ea.	Compressor	2	$6,800.00	$13,600.00
2	Ea.	Controller	2	$300.00	$600.00
3	Ea.	Evaporator	2	$6,300.00	$12,600.00
4	Ea.	Condensor	2	$410.25	$820.50
5	Ea.	Blower Assembly	4	$555.00	$2,220.00
6	Ea.	Thermostat	2	$55.79	$111.58
7	Ea.	Marine Pump	3	$603.00	$1,809.00
WHEELCHAIR					
1	Bus Set	Ramp Assembly	3	$7,995.00	$23,985.00
2	Bus Set	Valve Assembly	2	$87.00	$174.00
3	Bus Set	Electrical Harness	2	$348.40	$696.80
4	Ea.	Ramp	2	$7,995.00	$15,990.00
5	Ea.	Controller	2	$707.38	$1,414.76
6	Ea.	Motor	3	$819.00	$2,457.00
BRAKES					
1	Bus Set	Pressure Switches (include all for each Bus Set)	10	$585.00	$5,850.00
2	Bus Set	Protection Valve	10	$84.00	$840.00
3	Bus Set	Brake Air Chamber	10	$269.70	$2,697.00
4	Bus Set	Brake Wear Indicator	5	$390.00	$1,950.00
5	Ea.	ABS Electronic Control Unit	5	$388.50	$1,942.50
6	Ea.	ABS Harness	2	$367.50	$735.00
7	Bus Set	ABS Sensor	5	$295.50	$1,477.50
MULTIPLEX CONTROLS SYSTEM					
1	Ea.	Event Data Recorder	2	$2,200.00	$4,400.00
2	Ea.	DVR	2	$5,535.40	$11,070.80
3	Bus Set	Complete Bus Wiring Harnesses	2	$21,071.15	$42,142.30
4	Bus Set	Communication Module (Gateway Module)	10	$3,630.00	$36,300.00
5	Bus Set	Multiplex Module	10	$6,610.81	$66,108.10
6	Bus Set	Wheels	5	$2,860.00	$14,300.00
			Total Unit Price	$508,812.21	
				TOTAL PARTS BUY	$2,237,668.65

In U.S. Dollars Using Words:
TWO-MILLION TWO-HUNDRED THIRTY-SEVEN THOUSAND SIX-HUNDRED SIXTY-EIGHT DOLLARS &

Authorized Signature

4/5/2017
Date

TONY WAYNE
Print Name

GROUP A - UP TO 600 40' CNG BUSES
FORM PF-3 (CNG -40') - SCHEDULE B OF PRICES SPECIAL TOOLS (OPTIONAL)
(SECOND BEST AND FINAL OFFER)

Proposer: ELDORADO NATIONAL(CALIFORNIA), INC.

RFP No.: OP28367

RFP Title: FORTY FOOT (40') AND SIXTY FOOT (60') LOW FLOOR CNG OR ZEB BUS PROCUREMENT

NO.	UNIT	DESCRIPTION OF ITEM	QTY	UNIT PRICE	TOTAL PRICE
TOWING					
1	Set	Special Towing Equipment Adapters (TS 25) Note: Make sure towing equipment can do front lift and flat towing	15	$386.00	$5,790.00
1	Set	Rear recovery devices / tie downs (TS 25)	2	$505.00	$1,010.00
DOLLIES					
1	Ea.	PPA Dollies	2	$455.00	$910.00
OTHER SPECIAL TOOLS					
		OEM to identify and recommend unit(s) required		$0.00	$0.00
				$0.00	$0.00
				$0.00	$0.00
				$0.00	$0.00
				$0.00	$0.00
				$0.00	$0.00
				$0.00	$0.00
				$0.00	$0.00
				$0.00	$0.00
				$0.00	$0.00
			Total Unit Price	$1,346.00	
				TOTAL BUY	$7,710.00

In U.S. Dollars Using Words:
SEVEN-THOUSAND SEVEN-HUNDRED TEN DOLLARS

Authorized Signature

4/5/2017
Date

TONY WAYNE
Print Name

GROUP A - UP TO 600 40' CNG BUSES

FORM PF-4 (CNG-40') - SCHEDULE C OF PRICES DIAGNOSTIC TEST EQUIPMENT (OPTIONAL)

(SECOND BEST AND FINAL OFFER)

Proposer: ELDORADO NATIONAL (CALIFOORNIA), INC.
RFP No.: OP28367
RFP Title: FORTY FOOT (40') AND SIXTY FOOT (60') LOW FLOOR CNG OR ZEB BUS PROCUREMENT

NO.	UNIT	DESCRIPTION OF ITEM	QTY	UNIT PRICE	TOTAL PRICE
ENGINE/TRANSMISSION (TS 5.6.5)					
1	Ea.	Engine Diagnostic software, including necessary cables and connectors	30	$1,170.00	$35,100.00
2	Ea.	Transmission diagnostic software, including necessary cables and connectors	30	$1,170.00	$35,100.00
3	Ea.	Nexiq Technologies USB Link PC to Vehicle Interface	30	$774.00	$23,220.00
4	Ea.	ABS diagnostic software, including necessary cables and connectors	30	$1,370.00	$41,100.00
5	Ea.	Engine Cooling Diagnostic or Programming Software	30	$0.00	$0.00
ELECTRICAL SYSTEM (TS 5.6.5)					
1	Ea.	Multiplex System PC software and connection kit	30	$332.00	$9,960.00
INTERIOR (TS 5.6.5)					
1	Ea.	Video Security Diagnostic Kits	30	$105.00	$3,150.00
2	Ea.	Destination Sign Diagnostic Equipment	30	$0.00	$0.00
HEATING VENTILATION/AIR CONDITIONING (HVAC) (TS 5.6.5.)					
1	Ea.	A/C Interface Software and cable	30	$585.00	$17,550.00
DIAGNOSTIC PCs SPECIFICATIONS (TS 5.6.5)					
1	Ea.	Diagnostic Laptop PC (See TS 5.6.6 for Specifications)	30	$2,925.00	$87,750.00
DOOR DIAGNOSTIC TOOLS AND EQUIPMENT (TS 5.6.5)					
1	Ea.	Door System Diagnostic/Programming Software, tools and equipment	30	$905.00	$27,150.00
COMMUNICATIONS (TS 86.1)					
1	Ea.	System Management Tool for use at up to (13) MTA Operating Divisions per TS 86.1	1	$74,930.00	$74,930.00
			Total Unit Price	$84,266.00	
				TOTAL BUY	$355,010.00

In U.S. Dollars Using Words:
THREE-HUNDRED FIFTY-FIVE THOUSAND & TEN DOLLARS

Authorized Signature

4/5/2017
Date

TONY WAYNE
Print Name

GROUP A - UP TO 600 40' CNG BUSES
FORM PF-5 (CNG - 40')- SCHEDULE D OF PRICES TRAINING AIDS (OPTIONAL)
(SECOND BEST AND FINAL OFFER)

Proposer: ELDORADO NATIONAL (CALIFORNIA), INC.
RFP No.: OP28367
RFP Title: FORTY FOOT (40') & SIXTY FOOT (60') LOW FLOOR CNG OR ZEB BUS PROCUREMENT

NO.	UNIT	DESCRIPTION OF ITEM	QTY	UNIT PRICE	TOTAL PRICE
1	Ea.	One complete running engine and transmission assembly, including cooling and fueling systems, mounted ona suitable roll around stand (TS 5.6.3 a.)	1	$193,200.00	$193,200.00
2	Ea.	Static Transmission Assembly Note: If the Contractor is offering an Allison B400 transmission, a visual transmission is not required (TS 5.6.3 b.)	1	$0.00	$0.00
3	Ea.	Complete Static Front Axle Assembly TS 5.6.3.c.	1	$16,400.00	$16,400.00
4	Ea.	Complete Static Rear Axle Assembly TS 5.6.3.d.	1	$18,500.00	$18,500.00
ATECH ELECTRICAL TRAINING BOARDS - General Electrical Training (TS 5.6.3 e.)					
1	Kit	GM Specialized Electronic Trainer	10	$2,100.00	$21,000.00
2	Kit	GM Electronic Instructor's Guide (Books Only - Stages 1, 2, & 3)	10	$95.00	$950.00
3	Kit	4 Resistors	10	$35.00	$350.00
4	Kit	Dual Filament Light	10	$46.00	$460.00
5	Kit	Horn	10	$121.00	$1,210.00
6	Kit	Blank Board	10	$24.00	$240.00
SYSTEM SIMULATION TRAINING BOARDS					
1	Ea.	Anti-Lock Brake/Air Brake Board (TS 5.6.3.f.)	1	$32,000.00	$32,000.00
2	Ea.	Electric Air Conditioning Training Simulator Module (TS 5.6.3.g.)	1	$29,700.00	$29,700.00
3	Ea.	Fire Suppression (TS 5.6.3.h.)	1	$7,200.00	$7,200.00
4	Ea.	Video Security System (TS 5.6.3.i.)	1	$9,250.00	$9,250.00
5	Ea.	Destination Sign (TS 5.6.3.j.)	1	$6,000.00	$6,000.00
6	Ea.	Multiplex Electrical Training Board (TS 5.6.3.k.)	2	$23,500.00	$47,000.00
E-LARNING INTERACTIVE TRAINING MEDIA (TS 5.6.3)					
1	Hr.	Module 1	6	$23,000.00	$138,000.00
2	Hr.	Module 2	3	$23,000.00	$69,000.00
3	Hr.	Module 3	3	$23,000.00	$69,000.00
4	Hr.	Module 4	2	$23,000.00	$46,000.00
5	Hr.	Module 5	4	$23,000.00	$92,000.00
6	Hr.	Module 6	2	$23,000.00	$46,000.00
7	Hr.	Module 7	2	$23,000.00	$46,000.00
8	Hr.	Module 8	1	$23,000.00	$23,000.00
9	Hr.	Module 9	1	$23,000.00	$23,000.00
10	Hr.	Module 10	1	$23,000.00	$23,000.00
				TOTAL BUY	$958,460.00

GROUP A - UP TO 600 40' CNG BUSES

FORM PF-5 (CNG - 40')- SCHEDULE D OF PRICES TRAINING AIDS (OPTIONAL)

(SECOND BEST AND FINAL OFFER)

In U.S. Dollars Using Words:

NINE-HUNDRED FIFTY-EIGHT THOUSAND FOUR-HUNDRED SIXTY DOLLARS

Authorized Signature

4/5/2017
Date

TONY WAYNE
Print Name

EXHIBIT B - STATEMENT OF WORK

Reference Volume II – Technical Specifications (TS)

- Technical Specifications – 40 Foot CNG dated February 28, 2017

Offeror's Response – PR 2.7 Local Employment Program-BAFO No. 2

TAB 9: The Proposer shall provide a Local Employment Plan (LEP) setting forth its specific commitments for creating new employment opportunities for Local Workers…:

ElDorado National (California), Inc. (ENC) is a state of California Corporation with all of its operational facilities including, manufacturing, engineering, purchasing, aftermarket parts, warranty and service support, etc. located in Riverside, CA.

ENC understands that LACMTA's Local Employment Program as identified in SP-38 is a voluntary program with 50 bonus points possible during the scoring of proposals. At time of Best and Final Offer (SECOND BAFO)~~), ENC is submitting all of the required documents in an effort to be in compliance with the required Local Employment Plan and Local Facility Capital Investments and thus, be able to take advantage of the potential 50 bonus points available.~~, ENC is submitting the relevant Labor Value and Manpower Summary Forms as well as documents addressing the eight (8) questions under PR 2.7 which can be found below and on the accompanying pages.

ENC submits its Local Employment Plan and Local Facility Capital Investments in an effort to be in full compliance with all Local Employment Plan requirements and thus, be able to take full advantage of the potential 50 bonus points available during the evaluation.

ENC's Local Employment Program as noted below is being submitted in a separately sealed envelope and marked accordingly.

PR 2.7 Local Employment Plan – Overview

ENC commits to:

- Total Local Worker's Wages and Benefits From 2017 thru contract completion-
  - $42.2 m
- Total Capital Improvements of:
  - $3.7 m
- Total Training and Certification program of:
  - $210 k

Offeror's Response – PR 2.7 Local Employment Program-BAFO No. 2

PR 2.7 Local Employment Plan – Q&A

1. **Question:** Demonstrate our understanding of employment and job market conditions in California including, an understanding of and plans for coordinating with applicable publicly and privately funded workforce development groups in the hiring of local workers.

   Response: ENC has a long standing and well established relationship with the local workforce. We assess wages yearly to insure competitive pay scales for both skilled and entry-level positions. ENC's entry level wages are near the 25th percentile for Riverside County as well as all other direct skilled and unskilled positions. ENC is also partnered with several local labor and staffing agencies to help offset our training pool and direct hire needs. ENC is committed to the training and development of our employees and offer certification programs for our welders and painters as well as on-the-job training of 160 hours for all shop floor positions. Between these two programs ENC estimates it will spend $210 k on training and development for Metro's bus order fulfillment.

2. **Question:** Provide a commitment to hire Disadvantaged Workers that equals a total of 10% of the total wages and benefits for all Local Workers.

   Response: While ENC does not have a formal hiring policy for hiring Disadvantaged workers, we do provide an ADA accessible facility and currently meet Metro's requirement of hiring 10% disadvantaged workers. ENC will remain committed to the hiring of disadvantaged worker throughout Metro's order.

3. **Question:** Provide the estimated number of California Resident FTE jobs proposed in the Local Employment Plan, its direct dollar value specific to the contract. Identify the estimated number of jobs by trade or craft.

   Response: There will be an estimated 83 additional positions added to ENC's Riverside California's manufacturing facility and the direct dollar value will be an estimated $5.7 m over the course of the contract. See the Local Employment Plan, locations tab, column G for number of hires by category. It is ENC's full intention to continue employing these additional positions after the Metro's contract is fulfilled.

4. **Question:** Describe the quality and range of California employment opportunities included in the proposed Local Employment Plan.

   Response: ENC's workforce is totally California based. All professional and manufacturing positions (except national regional sales) are from California so the quality and range of local employment is extensive (see attached set of job descriptions for each additional position). Furthermore ENC's vendor base is in Southern California increasing the local labor advantage in both range and quality. It is ENC's full intention to continue employing these additional positions after the Metro's contract is fulfilled.

5. **Question:** Identify the location(s) of assembly and manufacture of the vehicles and describe any plans to build a new facility in California or invest in upgrades, repairs and renovations to an existing facility in California.

   Response: All of our assembly is done in one facility located in Riverside, California. ENC's capital plan includes:
   - $2.8 m RCTO (thermal oxidizing unit) to our facility in preparation for the increased demand that LACMTA would place on our facility. The unit reduces the VOC emission by up to 98%, reducing ENC's carbon footprint and improving Southern California's air quality.

Offeror's Response – PR 2.7 Local Employment Program-BAFO No. 2

- $170 k LED lighting upgrade
- $100 k overhead crane upgrade
- $100 k welding machine addition
- $100 k brake press
- $100 k material movers
- $100 k air filtration/ventilation
- $200 k in facility repairs/renovations (new exterior paint and interior finishes)

6. **Question:** Describe outreach and recruitment plans for the Local Employment Plan

   Response: ENC's manufacturing recruitment plan consists of permanently hiring our current contract labor which serves as our training pool for permanent labor base. We then would use our local labor agencies to backfill our training pool. The professional recruitment plan is well established, as ENC partners with area colleges in an extensive internship program that has already filled 5 professional positions. We currently have 5 more interns working and training here to sustain our professional positions needs in the future.

7. **Question:** Describe our approach to encourage subcontractor and supplier participation in the Local Employment Plan.

   Response: 49% of ENC's vendor base is located in Southern California which employs approximately 150 people. As ENC would grow our production by 25% with the LACMTA order it would logically progress to that local vendor base. Unfortunately they do not have the capacity to segregate the LACMTA's order volume from their regular production.

8. **Question:** Provide the name of the Plan Administrator and contact information including name, title, company, address, telephone and email.

   Response:

   Randy Troutman
   Vice President of Operations

   Eldorado National (California), Inc.,
   9670 Galena Street
   Riverside, CA 92509

   P. 260-301-1660
   Email- randy.troutman@eldorado-ca.com

Los Angeles County
Metropolitan Transportation Authority

One Gateway Plaza
Los Angeles, CA 90012-2952

213.922.2000 Tel
metro.net

Metro

MAEL-007 **Response Required:** No

Date: November 8, 2017

File Nos.:

Action Item(s):

CDRL:

Richard Himes
Contract Administration Manager
Eldorado National (California), Inc. (ENC)
9670 Galena Street
Riverside, CA 92509

SUBJECT: **EXECUTED CONTRACT MODIFICATION NO. 1**
OP28367-000 40' LOW FLOOR CNG TRANSIT BUSES

Reference: Correspondence MAEL-002, 005; ENC Proposal/email – Passenger Seats dated 10/24/17

Dear Mr. Himes:

Enclosed is your executed original of the subject modification.

If you have any questions, I can be reached at 213.922.7334 or e-mail at hernandezel@metro.net.

Sincerely,

Elizabeth Hernandez
Principal Contract Administrator

cc: Wayne Okubo
Kwesi Annan
Phil Rabottini

LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY

CONTRACT NO. OP28367-000, CONTRACT MODIFICATION NO.: 1

FOR: FORTY FOOT (40') LOW FLOOR CNG TRANSIT BUSES

This Contract Modification No. 1 to Contract No.: OP28367-000 is made effective on the 6th day of November 2017 by and between the LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY, hereinafter referred to as "MTA", and EL DORADO NATIONAL (CALIFORNIA), INC., hereinafter referred to as "CONTRACTOR".

WHEREAS, CONTRACTOR and MTA entered into Contract No.: OP28367-000 effective August 15, 2017, (the "Existing Contract") and;

WHEREAS, CONTRACTOR and MTA desire to modify the Existing Contract as provided herein;

Now, therefore, it is mutually agreed, by and between the parties as follows:

1. MTA to procure line items under the Base Buy Vehicle Contract for Optional Vehicle Configuration, Special Tools and Diagnostic Equipment in the total amount of $1,722,225 for an aggregate increase in the total Contract Price from $199,067,748 to $200,789,973. Article IV COMPENSATION shall read as follows:

   ARTICLE IV: COMPENSATION

   A. Contract Price

   In consideration of the Contractor's full performance of the Work, and in accordance with the terms of the Contract, Metro will pay the Contractor the Contract Price of $200,789,973 ~~$199,067,748~~, inclusive of tax and delivery as provided in this Article and in the Contract Document entitled Compensation and Payment Provisions.

   Contract Options may be exercised unilaterally by LACMTA in accordance with Special Provisions Article SP-28, Options.

2. **Article I: CONTRACT DOCUMENTS ORDER OF PRECEDENCE** – Revise date on Special Provisions (Pro Form 089)

   Special Provisions, (Pro Form 089, Dated 07/01/09 ~~01/11/16~~)

3. Revise as SP-06 as follows:

   SP-06 Pilot Vehicle

   The Contractor shall produce ~~one~~ Two (2) Pilot Vehicles. These ~~is~~ Pilot Vehicles shall be ~~one~~ two of the ultimate quantity of the Vehicle order. The Pilot Vehicles shall demonstrate that the Vehicles fully meet all requirements of the Contract.

   ~~The~~ Pilot Vehicle One shall be produced and delivered to LACMTA for a minimum of ninety (90) days prior to the initiation of any production activities for the remaining vehicles unless

otherwise authorized in writing by LACMTA. In the event that non-compliance is identified, LACMTA shall, to the extent practicable, notify the Contractor of said non-compliance. No later than the end of the ninety-day period, LACMTA shall issue a written report to the Contractor that advises the Contractor of any non-compliance issues and/or any proposed Modifications or changes required on the remaining Vehicles. Contractor shall perform the necessary corrective actions to address the non-compliance issues prior to acceptance of the Pilot Vehicle One. Upon LACMTA's acceptance of the Pilot Vehicle One, a Notice to Proceed shall be issued for Contractor to proceed with the manufacturing of the production vehicles.

In the event that the Pilot Vehicle One does not initially comply with all performance criteria contained in the Technical Specifications, LACMTA shall have the right to retain a portion of any Milestone Payment that may have been established for the Pilot Vehicle. The amount to be withheld shall be based on the lack of compliance and may equal up to the entire Milestone Payment amount for the Pilot Vehicle. This amount shall be withheld until compliance is demonstrated. In the event that the compliance is subsequently determined to be impossible to achieve, LACMTA may require all or a portion of the Milestone Payment for the Pilot Vehicle to be forfeited as a penalty for the non-compliance. The amount of the penalty shall be negotiated by the parties.

Pilot Vehicle Two shall remain in the possession of the Contractor. The Contractor shall utilize Pilot Vehicle Two for testing, validation of compliance with all performance criteria in the Technical Specifications, and shall conform to any corrective actions/changes required by LACMTA based on findings made on Pilot Vehicle One.

Milestone Payment on Pilot Vehicle Two shall be made upon delivery and acceptance as a production vehicle.

A summary of the changes to Contract Modification No. 1 is enclosed as Attachment I.

Except as expressly amended hereby, the Existing Contract remains in full force and effect as originally executed.

IN WITNESS WHEREOF, the parties have caused this Contract Modification No. 22 to the Existing Contract to be executed by their respective officers duly authorized on the date first written above.

EL DORADO NATIONAL (CALIFORNIA), INC.

By: _____
Signature

TONY WAYNE
Type or Print Name

11/6/17
Date

LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY

Philip A. Washington
Chief Executive Officer

By: _____
Wayne Okubo
Director, Contract Administration

11/8/17
Date

CONTRACT NO.: OP28367-000 – ENC 40' CNG TRANSIT BUSES
Contract Modification No. 1
Attachment 1
Summary of Changes to Contract Volume I - Commercial Terms and Conditions

Ref #	Modification No.	Contract Section No.	Paragraph number, Paragraph title, and Paragraph changes. Additions are in bolded Red and deletions are in crossed out bolded Blue
1	1		Procure line items under the Base Buy Vehicle Contract for Optional Vehicle Configuration, Special Tools and Diagnostic Equipment in the total amount of $1,722,225 for an aggregate increase in the total Contract Price from $199,067,748 to $200,789,973. ARTICLE IV: COMPENSATION A. Contract Price In consideration of the Contractor's full performance of the Work, and in accordance with the terms of the Contract, Metro will pay the Contractor the Contract Price of **$200,789,973** ~~**$199,067,748**~~, inclusive of tax and delivery as provided in this Article and in the Contract Document entitled Compensation and Payment Provisions. Contract Options may be exercised unilaterally by LACMTA in accordance with Special Provisions Article SP-28, Options.
2	1	Vol. 1 Article V	Revise date for Special Provisions ARTICLE I: CONTRACT DOCUMENTS ORDER OF PRECEDENCE A. This Contract includes this Form of Contract and the other following Contract Documents and Attachments, which are incorporated herein and made a part of this Contract. B. Except as otherwise specified herein, in the event of any conflict, the precedence of the Contract Documents shall be as follows: 1. Form of Contract, (Pro Form 18, Dated 08/08/14) 2. Regulatory Requirements, (Pro Form 039, Dated 02/03/16) 3. Special Provisions, (Pro Form 089, Dated **07/01/09** ~~**01/11/16**~~) 4. General Conditions, (Pro Form 038, Dated 01/11/16) 5. Compensation and Payment Provisions, Firm Fixed Price, (Pro Form 040, Dated 08/23/13) 6. Technical Specifications, (Dated 08/10/17) C. An Amendment or Change to this Contract shall take its precedence from the term it amends. All other documents and terms and conditions shall remain unchanged.
3	1	Vol. 1 SP-06	Change to two Pilot Vehicles **SP-06 PILOT VEHICLE**

CONTRACT NO.: OP28367-000 – ENC 40' CNG TRANSIT BUSES
Contract Modification No. 1
Attachment 1
Summary of Changes to Contract Volume I - Commercial Terms and Conditions

Ref #	Modification No.	Contract Section No.	Paragraph number, Paragraph title, and Paragraph changes. Additions are in bolded Red and deletions are in crossed out bolded Blue
			The Contractor shall produce ~~one~~ **Two (2)** Pilot Vehicle**s**. These ~~is~~ Pilot Vehicle**s** shall be ~~one~~ **two** of the ultimate quantity of the Vehicle order. The Pilot Vehicle**s** shall demonstrate that the Vehicles fully meet all requirements of the Contract. ~~The~~ Pilot Vehicle **One** shall be produced and delivered to LACMTA for a minimum of ninety (90) days prior to the initiation of any production activities for the remaining vehicles unless otherwise authorized in writing by LACMTA. In the event that non-compliance is identified, LACMTA shall, to the extent practicable, notify the Contractor of said non-compliance. No later than the end of the ninety-day period, LACMTA shall issue a written report to the Contractor that advises the Contractor of any non-compliance issues and/or any proposed Modifications or changes required on the remaining Vehicles. Contractor shall perform the necessary corrective actions to address the non-compliance issues prior to acceptance of the Pilot Vehicle **One**. Upon LACMTA's acceptance of the Pilot Vehicle **One,** a Notice to Proceed shall be issued for Contractor to proceed with the manufacturing of the production vehicles. In the event that the Pilot Vehicle **One** does not initially comply with all performance criteria contained in the Technical Specifications, LACMTA shall have the right to retain a portion of any Milestone Payment that may have been established for the Pilot Vehicle. The amount to be withheld shall be based on the lack of compliance and may equal up to the entire Milestone Payment amount for the Pilot Vehicle. This amount shall be withheld until compliance is demonstrated. In the event that the compliance is subsequently determined to be impossible to achieve, LACMTA may require all or a portion of the Milestone Payment for the Pilot Vehicle to be forfeited as a penalty for the non-compliance. The amount of the penalty shall be negotiated by the parties. **Pilot Vehicle Two shall remain in the possession of the Contractor. The Contractor shall utilize Pilot Vehicle Two for testing, validation of compliance with all performance criteria in the Technical Specifications, and shall conform to any corrective actions/changes required by LACMTA based on findings made on Pilot Vehicle One.** **Milestone Payment on Pilot Vehicle Two shall be made upon delivery and acceptance as a production vehicle.**

Los Angeles County
Metropolitan Transportation Authority

One Gateway Plaza
Los Angeles, CA 90012-2952

213.922.2000 Tel
metro.net

Metro

MAEL-010 **Response Required:** No

Date: December 15, 2017

File Nos.:

Action Item(s):

CDRL:

Richard Himes
Contract Administration Manager
Eldorado National (California), Inc. (ENC)
9670 Galena Street
Riverside, CA 92509

SUBJECT: **EXECUTED CONTRACT MODIFICATION NO. 2**
OP28367-000 40' LOW FLOOR CNG TRANSIT BUSES

Reference: PRICING FORMS (PF1/1A); MAEL-001; 004; ELMA-003; MAEL-009; ELMA-018

Dear Mr. Himes:

Enclosed is your executed original of the subject modification.

If you have any questions, I can be reached at 213.922.7334 or e-mail at hernandezel@metro.net.

Sincerely,

Elizabeth Hernandez
Principal Contract Administrator

cc: Wayne Okubo
Kwesi Annan
Phil Rabottini

LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY

CONTRACT NO. OP28367-000, CONTRACT MODIFICATION NO.: 2

FOR: FORTY FOOT (40') LOW FLOOR CNG TRANSIT BUSES

This Contract Modification No. 2 to Contract No.: OP28367-000 is made effective on the 6th day of December 2017 by and between the LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY, hereinafter referred to as "MTA", and EL DORADO NATIONAL (CALIFORNIA), INC., hereinafter referred to as "CONTRACTOR".

WHEREAS, CONTRACTOR and MTA entered into Contract No.: OP28367-000 effective August 15, 2017, as amended by Contract Modification No. 1, November 6, 2017, (the "Existing Contract") and;

WHEREAS, CONTRACTOR and MTA desire to modify the Existing Contract as provided herein;

Now, therefore, it is mutually agreed, by and between the parties as follows:

1. Change in the supplier for transmission from Allison to Voith for an aggregate decrease in the total Contract Price from $200,789,973 to $198,759,641. Article IV COMPENSATION shall read as follows:

   ARTICLE IV: COMPENSATION

   A. Contract Price

   1. In consideration of the Contractor's full performance of the Work, and in accordance with the terms of the Contract, Metro will pay the Contractor the Contract Price of $198,759,641 ~~$200,789,973~~ inclusive of tax and delivery as provided in this Article and in the Contract Document entitled Compensation and Payment Provisions.

   Contract Options may be exercised unilaterally by LACMTA in accordance with Special Provisions Article SP-28, Options.

2. Revise SP-05 as follows:

SP-05 <u>APPROVED SUBCONTRACTORS</u>

Subcontractor	Services Performed	DBE/ MBE/ WBE
VOITH Turbo, Inc. ~~Valley Power Systems, Inc.~~	Voith DIWA.6 Transmission ~~Allison Transmission~~	

3. Revised Pricing Forms: PF 1, PF-1A and PF-2 as attached to this modification

Except as expressly amended hereby, the Existing Contract remains in full force and effect as originally executed.

IN WITNESS WHEREOF, the parties have caused this Contract Modification No. 2 to the Existing Contract to be executed by their respective officers duly authorized on the date first written above.

EL DORADO NATIONAL (CALIFORNIA), INC.

By: _____
Signature

Tony Wayne
Type or Print Name

12/11/17
Date

LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY

Philip A. Washington
Chief Executive Officer

By: _____
Elizabeth Hernandez
Principal Contract Administrator

12/15/17
Date

GROUP A - UP TO 600 40' CNG BUSES
FORM PF-1 (CNG - 40') - CONTRACT PRICE SUMMARY
Contract Modification No. 2

Proposer: ELDORADO NATIONAL (CALIFORNIA), INC.

Contract No.: OP28367-000

Contract Title: FORTY FOOT (40') LOW FLOOR CNG BUS PROCUREMENT

1.0 CONTRACT FOR 295 BUSES (BASE BUY)

No.	Qty.	Description of Item		Taxable Unit Price	Unit Price	Total Price
1	295	40' Low Floor CNG Buses (Base Buy) from PF-1A	Values derived from PF-1A*:	$594,425.87	$614,166	$181,178,932
1a	Lot	Manuals (Base Buy) (TS 5.6.4)		$2,281.50	Lump Sum	$23,400.00
1b	295	Vehicle Delivery Charge for Base Buy	Value of all taxable delivery charges per bus**:		$275.00	$81,125.00
1c		Tax (Base Buy)		9.75%	$57,956.52	$17,099,455.59
2	Lot	Reserved				
3	Lot	Reserved				
4	Lot	Reserved				
5	Lot	Reserved				
6	Lot	Reserved				
7	Lot	Performance Bond (Base Buy)			Lump Sum	$119,336.00
8	1,000	Total Training Hours for Base Buy***			$175,000.00	
8a	900	Contractor (Proposer/Prime) Base Buy			$175.00	$157,500.00
8b	100	Subcontractor/Supplier Base Buy			$175.00	$17,500.00
9	1	System Management Tool for use at up to (13) MTA Operating Divisions per TS 86.1			$74,930.00	$74,930.00
10a	15	Special Towing Equipment (TS 25)			$386.00	$5,790.00
10b		Tax		9.75%	$37.64	$564.53
11a	2	Rear Recovery Devices/Tie Downs (TS 25)			$505.00	$1,010.00
11b		Tax		9.75%	$49.24	$98.48

1.0 Total Price for CONTRACT for 295 Base Buy Buses (Sum of Items "1" through "11b") to be the BASIS for Price Proposal evaluation

In U.S. Dollars Using Words: ONE HUNDRED & NINETY-EIGHT MILLION SEVEN HUNDRED FIFTY NINE THOUSAND SIX HUNDRED FORTY ONE DOLLARS

In U.S. Dollars Using Figures: $198,759,641

NOTE * Taxable Unit Price is the Unit Price less 1.14 Accessibility Provisions on PF-1A

GROUP A - UP TO 600 40' CNG BUSES
FORM PF-1 (CNG - 40') - CONTRACT PRICE SUMMARY
Contract Modification No. 2

Proposer: ELDORADO NATIONAL (CALIFORNIA), INC.

Contract No.: OP28367-000

Contract Title: FORTY FOOT (40') LOW FLOOR CNG BUS PROCUREMENT

** Input the taxable portion of the Delivery Charge under the Taxable Unit Price column and the total Delivery Charge under the Unit Price column

*** Training Hours for Base Buy are only estimates and not a guaranteed level of effort. The total for this Line is a Not-to-Exceed provisional amount.

GROUP A - UP TO 600 40' CNG BUSES
FORM PF-1 (CNG - 40') - CONTRACT PRICE SUMMARY
Contract Modification No. 2

Proposer: ELDORADO NATIONAL (CALIFORNIA), INC.

Contract No.: OP28367-000

Contract Title: FORTY FOOT (40') LOW FLOOR CNG BUS PROCUREMENT

2.0 CONTRACT FOR 150 UP TO 305 BUSES (OPTION BUY)

No.	Qty.	Description of Item		Taxable Unit Price	Unit Price	Total Price
10	305	40' Low Floor CNG Buses (Option Buy) from PF-1A for 150 to 305 vehicles*		$594,426.00	$614,166.00	$187,320,630.00
10a	Lot	Manuals (Option Buy) (TS 5.6.4)***		$2,281.50	Lump Sum	$23,400.00
10b	305	Vehicle Delivery Charge for Option Buy	Value of all taxable delivery charges per bus**:	$0.00	$275.00	$83,875.00
10c		Tax (Option Buy)		9.75%	$57,956.54	$17,679,024.68
11		Reserved			$	$
12	Lot	Performance Bond for Option Buy***			Lump Sum	$123,421.00
13	500	Total Training Hours for Option Buy****			$87,500.00	
13a	450	Contractor (Proposer/Prime) Option Buy			$175.00	$78,750.00
13b	50	Subcontractor/Supplier Option Buy			$175.00	$8,750.00
14		Reserved			$	$

2.0 Total Price for CONTRACT for 150 Up to 305 Option Buy Buses (Sum of Items "10" through "14") to be the BASIS for Price Proposal evaluation

In U.S. Dollars Using Words: TWO-HUNDRED FIVE MILLION THREE HUNDRED SEVENTEEN THOUSAND EIGHT HUNDRED FIFTY ONE DOLLARS

In U.S. Dollars Using Figures: $205,317,851

NOTE

* Taxable Unit Price is the Unit Price less 1.14 Accessibility Provisions on PF-1A

** Input the taxable portion of the Delivery Charge under the Taxable Unit Price column and the total Delivery Charge under the Unit Price column

*** For proposal purposes only, Manuals and Bond prices are for all 305 bus Options exercised. Actual cost will depend on Option quantity ordered.

**** Training Hours for Option Buy are only estimates and not a guaranteed level of effort. The total for this Line is a Not-to-Exceed provisional amount.

GROUP A - UP TO 600 40' CNG BUSES
FORM PF-1 (CNG - 40') - CONTRACT PRICE SUMMARY
Contract Modification No. 2

Proposer: ELDORADO NATIONAL (CALIFORNIA), INC.

Contract No.: OP28367-000

Contract Title: FORTY FOOT (40') LOW FLOOR CNG BUS PROCUREMENT

3.0 OPTIONAL VEHICLE CONFIGURATION

No.	Qty.	Description of Item		Unit Price	Total Price
15	1	3 ADA Securement Configuration TS 81.5 (Total 15a - 15d)			$6,370.00
15a		Direct Materials/Equipment		$5,750.00	
15b		Labor Installation Costs		$620.00	
15c		Non Recurring Cost		$0.00	
15d		Other Costs (Identify)		$0.00	
16	1	4 ADA Securement Configuration TS 81.5 (Total 16a - 16d)			$10,170.00
16a		Direct Materials/Equipment		$9,150.00	
16b		Labor Installation Costs		$1,020.00	
16c		Non Recurring Cost		$0.00	
16d		Other Costs (Identify)		$0.00	
17	600	Reserved****			
17a	295	Reserved			
17b	305	Reserved			
18	600	25-Year Certified CNG Tanks			$522,000.00
18a	295	25 Yr Certified CNG Tanks for Base Buy	$256,650.00	$870.00	
18b	305	25 Yr Certified CNG Tanks for Option Buy for 150 up to 305 vehicles	$265,350.00	$870.00	
19	600	Complete Automatic Passenger Counter System TS 86.3 (Total 19a - 19h)			$2,757,600.00
19a	295	Direct Materials/Equipment for Base Buy APC		$4,136.00	
19b	295	Labor Installation Costs for Base Buy APC		$460.00	

GROUP A - UP TO 600 40' CNG BUSES
FORM PF-1 (CNG - 40') - CONTRACT PRICE SUMMARY
Contract Modification No. 2

Proposer: ELDORADO NATIONAL (CALIFORNIA), INC.

Contract No.: OP28367-000

Contract Title: FORTY FOOT (40') LOW FLOOR CNG BUS PROCUREMENT

19c	295	Non Recurring Cost for Base Buy APC		$	
19d	295	Other Costs (Identify) for Base Buy APC		$	
		Total for Base Buy APC	$1,355,820.00	$4,596.00	
19e	305	Direct Materials/Equipment for Option Buy APC for 150 up to 305 vehicles		$4,136.00	
19f	305	Labor Installation Costs for Option Buy APC for 150 up to 305 vehicles		$460.00	
19g	305	Non Recurring Cost for Option Buy APC for 150 up to 305 vehicles		$	
19h	305	Other Costs (Identify) for Option Buy APC for 150 up to 305 vehicles		$	
		Total for Option Buy APC for 150 up to 305 vehicles	$1,401,780.00	$4,596.00	
20	600	Enhanced 360 degree Camera System TS 86.1 (Total 20a - 20h)			$579,000.00
20a	295	Direct Materials/Equipment for Base Buy Enhanced Camera System		$869.00	
20b	295	Labor Installation Costs for Base Buy Enhanced Camera System		$96.00	
20c	295	Non Recurring Cost for Base Buy Enhanced Camera System		$	
20d	295	Other Costs (Identify) for Base Buy Enhanced Camera System		$	
		Total for Base Buy Enhanced Camera System	$284,675.00	$965.00	
20e	305	Direct Materials/Equipment for Option Buy Enhanced Camera System for 150 up to 305 vehicles		$869.00	
20f	305	Labor Installation Costs for Option Buy Enhanced Camera System for 150 up to 305 vehicles		$96.00	
20g	305	Non Recurring Cost for Option Buy Enhanced Camera System for 150 up to 305 vehicles		$	
20h	305	Other Costs (Identify) for Option Buy Enhanced Camera System for 150 up to 305 vehicles		$	
		Total for Option Buy Enhanced Camera System for 150 up to 305 vehicles	$294,325.00	$965.00	
21	600	USB Ports for Passenger Charging Only			$288,000.00
21a	295	USB Ports for Passenger Charging Only for Base Buy	$141,600.00	$480.00	
21b	305	USB Ports for Passenger Charging Only for Option Buy for 150 up to 305 vehicles	$146,400.00	$480.00	

GROUP A - UP TO 600 40' CNG BUSES
FORM PF-1 (CNG - 40') - CONTRACT PRICE SUMMARY
Contract Modification No. 2

Proposer: ELDORADO NATIONAL (CALIFORNIA), INC.

Contract No.: OP28367-000

Contract Title: FORTY FOOT (40') LOW FLOOR CNG BUS PROCUREMENT

22	600	Optional Wireless Stop Request Switches (Bus set)			$291,000.00
22a	295	Optional Wireless Stop Request Switches (Bus set) for Base Buy	$143,075.00	$485.00	
22b	305	Optional Wireless Stop Request Switches (Bus set) for Option Buy for 150 up to 305 vehicles	$147,925.00	$485.00	
23	600	Optional Full Color Destination Sign Sets (TS 86.3)			$2,070,000.00
23a	295	Optional Full Color Destination Sign Sets (TS 86.3) for Base Buy	$1,017,750.00	$3,450.00	
23b	305	Optional Full Color Destination Sign Sets (TS 86.3) for Option Buy for 150 up to 305 vehicles	$1,052,250.00	$3,450.00	
24	Lot	Spare Parts (From Schedule A, Form PF-2)			$2,203,833.65
25	Lot	Special Tools (Schedule B Form PF-3)			$7,710.00
26	Lot	Diagnostic Test Equipment (Schedule C, Form PF-4)			$355,010.00
27	Lot	Training Aids (Schedule D, Form PF-5)			$958,460.00

3.0 Total Price for OPTIONAL VEHICLE CONFIGURATION (Sum of Items "15 through 27") for OPTIONAL EQUIPMENT to be BASIS for Price Proposal evaluation.

In U.S. Dollars Using Words: TEN-MILLION EIGHT-TWO THOUSAND NINE-HUNDRED EIGHTY-EIGHT DOLLARS & SIXTY-FI

In U.S. Dollars Using Figures: $10,049,153.65

**** Proposer shall provide base Low Nox Engine for each bus with the following Emission Levels:
ISLG engine is not the base engine requirement. Low Nox engine is the base requirement and therefore no longer an option.

Oxides of Nitrogen (NOx) Grams per brake horsepower-hour	Particulate Matter (PM) grams per brake horsepower hour
0.02	0.01

4.0 CONTRACT FOR BASE BUY, OPTION BUY, AND OPTIONALVEHICLE CONFIGURATION

No.	Qty.	Description of Item	Total Price
1.0		Total Price for CONTRACT for 295 Base Buy Buses to be the BASIS for Price Proposal evaluation	$198,759,641
2.0		Total Price for CONTRACT for 150 Up to 305 Option Buy Buses to be the BASIS for Price Proposal evaluation	$205,317,851
3.0		Total Price for OPTIONAL VEHICLE CONFIGURATION for OPTIONAL EQUIPMENT to be BASIS for Price Proposal evaluation	$10,049,154

GROUP A - UP TO 600 40' CNG BUSES
FORM PF-1 (CNG - 40') - CONTRACT PRICE SUMMARY
Contract Modification No. 2

Proposer: ELDORADO NATIONAL (CALIFORNIA), INC.

Contract No.: OP28367-000

Contract Title: FORTY FOOT (40') LOW FLOOR CNG BUS PROCUREMENT

4.0 Total Price for CONTRACT for 295 Base Buy Buses, for 150 up to 305 Option Buy Buses, and Optional Vehicle Configuration for Optional Equipment combined to be the overall BASIS for Price Proposal evaluation		
In U.S. Dollars Using Words:	FOUR-HUNDRED FOURTEEN MILLION ONE HUNDRED TWENTY SIX THOUSAND SIX HUNDRED FORTY SIX DOLLARS	
	In U.S. Dollars Using Figures:	$414,126,646

(Signature of Person Executing Proposal)

Date 12/11/07

TONY WAYNE VICE PRESIDENT & GENERAL MANAGEI
Type Name, Title

GROUP A - UP TO 600 40' CNG BUSES
FORM PF-1A (CNG - 40')
SUBSYSTEM EQUIPMENT
CONTRACT MODIFICATION NO. 2

Contractor: ELDORADO NATIONAL (CALIFORNIA), INC
Contract No.: OP28367-000

NO.	DESCRIPTION	BASE BUY OF ITEM		
1	Purchased Subsystem Equipment (Items 1.1 through 1.99) **			
1.1	TS 9.	Propulsion Power Assembly (PPA)***		$18,372
1.2	TS 9.	Engine		$60,324
1.3	TS 10.	Cooling System		$12,650
1.4	TS 18.	Fuel System		$68,300
1.5	TS 31.	Suspension		$19,950
1.6	TS 33.	Steering System		$4,950
1.7	TS 37.	Brakes		$3,260
1.8	TS 39.	Pneumatic System		$6,850
1.9	TS 42.	Charging System		$36,800
1.10	TS 44.	Multiplex Control System		$24,200
1.11	TS 54.	HVAC Climate Control System		$29,450
1.12	TS 78.	Passenger Seats		$28,955
1.13	TS 80.	Doors		$14,830
1.14	TS 81.	Accessibility Provisions		$19,740
1.15	TS 86.	Communications		$3,244
1.16	TS 11	Transmission		$14,261
1.17	TS 78.1	USB Passenger Charging Port		$480
1.18	TS85.1	Wirelesss Stop Request Button		$485
1.19	TS 86.3	Matrix APC		$4,596
1.99		All other bus subsystem equipment not included above		$242,469

TOTAL CNG BUS PRICE * $614,166

* Transfer Total CNG Bus Price to Contract Price Summary Form (PF-1 - Unit Price column, line Item 1 - **Base Buy**

Notes: 1. ** Price shall include design, engineering, manufacturing/assembly, testing, shipping, profit and other associated costs. Price for each subsystem equipment shall include all applicable apparatus.

2. Price for line Item Nos. 1a-27 in the CONTRACT PRICE SUMMARY(Form PF-1) shall not be included in computing price of any of the line items above.

3. *** PPA unit price for line item 1.1 excludes prices for items 1.2 through 1.99

GROUP A - UP TO 600 40' CNG BUSES
FORM PF-1A (CNG - 40')
SUBSYSTEM EQUIPMENT
CONTRACT MODIFICATION NO. 2

NO.	DESCRIPTION	OPTION BUY OF ITEM		
2	Purchased Subsystem Equipment (Items 2.1 through 2.99) **			
2.1	TS 9.	Propulsion Power Assembly (PPA)***		$18,372
2.2	TS 9.	Engine		$60,324
2.3	TS 10.	Cooling System		$12,650
2.4	TS 18.	Fuel System		$68,300
2.5	TS 31.	Suspension		$19,950
2.6	TS 33.	Steering System		$4,950
2.7	TS 37.	Brakes		$3,260
2.8	TS 39.	Pneumatic System		$6,850
2.9	TS 42.	Charging System		$36,800
2.10	TS 44.	Multiplex Control System		$24,200
2.11	TS 54.	HVAC Climate Control System		$29,450
2.12	TS 78.	Passenger Seats		$28,955
2.13	TS 80.	Doors		$14,830
2.14	TS 81.	Accessibility Provisions		$19,740
2.15	TS 86.	Communications		$3,244
2.16	TS 11	Transmission		$14,261
2.17	TS 78.1	USB Passenger Charging Port		$480
2.18	TS85.1	Wirelesss Stop Request Button		$485
2.19	TS 86.3	Matrix APC		$4,596
2.99		All other bus subsystem equipment not included above		$242,469

TOTAL CNG BUS PRICE OPTION QUANTITY $614,166

*Transfer Total CNG Bus Price to Contract Price Summary Form (PF-1 - Unit Price column, line item 10 - Option Buy)

Notes: 1. ** Price shall include design, engineering, manufacturing/assembly, testing, shipping, profit and other associated costs. Price for each subsystem equipment shall include all applicable apparatus.

2. Price for line item Nos. 1-9 and 10a-27 in the CONTRACT PRICE SUMMARY(Form PF-1) shall not be included in computing price of any of the line items above.

3. *** PPA unit price for line item 2.1 excludes prices for items 2.2 through 2.99

(Signature of Person Executing Proposal) 12/11/17 Date

GROUP A - UP TO 600 40' CNG BUSES
FORM PF-1A (CNG - 40')
SUBSYSTEM EQUIPMENT
CONTRACT MODIFICATION NO. 2

TONY WAYNE /VICE PRESIDENT & GENERAL MANAGER
Type Name, Title

GROUP A - UP TO 600 40' CNG BUSES
FORM PF-2 (CNG- 40') - SCHEDULE A OF PRICES SPARE PARTS (OPTIONAL)
CONTRACT MODIFICATION NO. 2

CONTRACTOR: ELDORADO NATIONAL (CALIFORNIA), INC.
Contract No.: OP28367-000
Contract Title: FORTY FOOT (40') LOW FLOOR CNG BUS PROCUREMENT

NO.	UNIT	DESCRIPTION OF ITEM	QTY	UNIT PRICE	TOTAL PRICE
LOW NOX ENGINE					
1	Ea.	Propulsion Power Assembly (See Definition in SP-1)	3	$86,270.00	$258,810.00
2	Ea.	Air Compressor	5	$6,760.00	$33,800.00
3	Ea.	Turbo	3	$1,982.00	$5,946.00
4	Ea.	EGR Cooler	20	$1,110.47	$22,209.40
5	Ea.	EGR Valve	10	$610.68	$6,106.80
6	Ea.	Delta P Sensor	10	$347.66	$3,476.60
7	Ea.	Mass. Air Flow Sensor	10	$1,067.56	$10,675.60
8	Ea.	Oxygen Sensor	20	$223.61	$4,472.20
9	Ea.	Catalyst	5	$3,574.95	$17,874.75
10	Ea.	Cylinder Head	5	$4,513.81	$22,569.05
11	Ea.	Pistons Kits	60	$325.00	$19,500.00
12	Bus Set	Rod Bearings	10	$64.00	$640.00
13	Bus Set	Main Bearing	10	$219.27	$2,192.70
14	Ea.	Liners	60	$191.87	$11,512.20
15	Ea.	Head Gasket	5	$428.75	$2,143.75
16	Ea.	Upper Gasket Set	5	$844.99	$4,224.95
17	Ea.	Oil Pan Gasket	20	$133.60	$2,672.00
18	Ea.	Stiffener Plate Gasket	20	$92.85	$1,857.00
19	Ea.	Oil Pan	5	$505.51	$2,527.55
20	Ea.	Throttle Actuator	5	$574.16	$2,870.80
21	Ea.	Fuel Control Valve	10	$1,429.19	$14,291.90
22	Ea.	Ignition Control Module	10	$1,648.45	$16,484.50
23	Ea.	Ignition Coils	120	$175.23	$21,027.60
24	Ea.	Engine Harness	5	$1,493.62	$7,468.10
25	Ea.	Ignition Harness	10	$167.53	$1,675.30
26	Ea.	Oil Cooler	5	$179.73	$898.65
27	Ea.	Lube Pump	5	$275.51	$1,377.55
28	Ea.	Front Crank Seal	10	$30.54	$305.40
29	Ea.	Rear Seal	10	$28.65	$286.50
30	Ea.	Water Pump	10	$175.03	$1,750.30
31	Ea.	Vibration Damper	10	$344.21	$3,442.10
32	Ea.	Belt Tensioner (If applicable)	20	$145.47	$2,909.40
33	Ea.	CoolantTermperature Sensor	20	$11.21	$224.20
34	Ea.	Oil Pressure Sensor	10	$98.10	$981.00
35	Ea.	Fuel Pressure Sensor	10	$144.34	$1,443.40
36	Ea.	Low Fuel Pressure Regulator	10	$1,222.22	$12,222.20
37	Ea.	Engine Cradle	5	$1,420.00	$7,100.00
38	Ea.	Belt Guard	5	$358.80	$1,794.00
39	Ea.	Complete Engine Package (See definition in TS-2)	4	$66,430.00	$265,720.00
40	Bus Set	Spark Plugs	15	$42.02	$630.30
41	Bus Set	Adaptation Kit (Eng to Trans)	3	$1,066.00	$3,198.00
42	Ea.	PPA Dollies	8	$685.00	$5,480.00
COOLING SYSTEM					
1	Ea.	Radiator Packages (See definition in TS-2)	5	$7,715.00	$38,575.00
2	Ea.	Thermal Management Controllers	5	$598.32	$2,991.60
3	Bus Set	Fan Resistors	20	$48.60	$972.00
4	Bus Set	CAN Interface Cables	5	$101.25	$506.25
5	Ea.	Fan Reversal LED Panel	5	$593.39	$2,966.95
6	Ea.	Fan Assembly	30	$40.66	$1,219.80
7	Ea.	Coolant Reservoir	10	$556.20	$5,562.00
8	Ea.	Transmission Cooler	10	$648.00	$6,480.00
9	Bus Set	Pressure Relief Valve	20	$23.85	$477.00
10	Ea.	Radiator Cap	30	$5.27	$158.10
11	Ea.	Coolant Overflow Tank	10	$36.29	$362.90

GROUP A - UP TO 600 40' CNG BUSES
FORM PF-2 (CNG- 40') - SCHEDULE A OF PRICES SPARE PARTS (OPTIONAL)
CONTRACT MODIFICATION NO. 2

CONTRACTOR: ELDORADO NATIONAL (CALIFORNIA), INC.
Contract No.: OP28367-000
Contract Title: FORTY FOOT (40') LOW FLOOR CNG BUS PROCUREMENT

NO.	UNIT	DESCRIPTION OF ITEM	QTY	UNIT PRICE	TOTAL PRICE
CHARGING SYSTEM					
1	Ea.	Alternator	10	$9,750.00	$97,500.00
2	Ea.	Voltage Regulators	10	$351.00	$3,510.00
3	Ea.	Batteries	40	$203.77	$8,150.80
4	Ea.	Battery Equilizer	20	$418.50	$8,370.00
5	Ea.	Battery Disconnect	10	$31.82	$318.20
6	Ea.	Battery Separator	5	$297.00	$1,485.00
7	Ea.	Power Distribution Panel In Battery Compartment	5	$267.30	$1,336.50
8	Ea.	Low Voltage Disconnect	10	$44.55	$445.50
9	Ea.	Circuit Breaker 80A	20	$31.59	$631.80
10	Ea.	Circuit Breaker 100A	20	$39.15	$783.00
11	Ea.	Circuit Breaker 120A or 130A, whichever applies	20	$49.95	$999.00
12	Bus Set	Fuse and Circuit Breaker Panels	5	$310.50	$1,552.50
SUSPENSION					
1	Bus Set	Air Ride Beams	10	$2,310.00	$23,100.00
2	Bus Set	Air Bags	20	$672.00	$13,440.00
3	Ea.	Front Axle	10	$4,879.85	$48,798.50
4	Ea.	Rear Axle	10	$3,946.07	$39,460.70
5	Bus Set	Radius Rods	5	$412.80	$2,064.00
6	Bus Set	Shocks	10	$383.68	$3,836.80
7	Bus Set	Leveling Valve Front	10	$191.81	$1,918.10
8	Bus Set	Leveling Valve Rear	10	$191.81	$1,918.10
DRIVE TRAIN					
1	Ea.	Transmission	5	$14,261.00	$71,305.00
2	Ea.	TCM Programmed	5	$611.00	$3,055.00
3	Ea.	Adaptation Kit (Trans to Eng)	2	$1,066.00	$2,132.00
4	Ea.	Drive Shaft	10	$544.00	$5,440.00
5	Ea.	Differential	15	$6,972.00	$104,580.00
STEERING SYSTEM					
1	Bus Set	Steering Gear and Linkage	10	$1,172.50	$11,725.00
2	Ea.	Steering Column	10	$596.77	$5,967.70
3	Ea.	Steering Shaft	10	$135.30	$1,353.00
4	Ea.	Steering Box Assembly	10	$277.78	$2,777.80
5	Ea.	Power Steering Gear Assembly	10	$893.97	$8,939.70
PNEUMATIC SYSTEM					
1	Bus Set	Air Tanks (Complete Sets)	10	$352.00	$3,520.00
2	Ea.	Air Dryer	10	$400.66	$4,006.60
3	Ea.	Air Governor	10	$68.80	$688.00
4	Bus Set	Pressure Reducing Valves	10	$28.80	$288.00
5	Bus Set	Check Valves	10	$57.60	$576.00
6	Bus Set	Brake Control Valve	10	$46.40	$464.00
7	Bus Set	Brake Pedal Valve	10	$134.54	$1,345.40
8	Bus Set	Quick Release Valve	10	$17.60	$176.00
9	Bus Set	Parking Relay Valve	10	$57.60	$576.00
10	Bus Set	Parking Control Valve	10	$46.40	$464.00
11	Bus Set	Air Brake Tubing	10	$134.54	$1,345.40
12	Bus Set	Solenoid Valve Assembly	10	$17.60	$176.00
FUEL SYSTEM					
1	Bus Set	Fuel Cylinder Assembly	2	$68,300.00	$136,600.00
2	Ea.	Fill Manifold	2	$592.00	$1,184.00

GROUP A - UP TO 600 40' CNG BUSES
FORM PF-2 (CNG- 40') - SCHEDULE A OF PRICES SPARE PARTS (OPTIONAL)
CONTRACT MODIFICATION NO. 2

CONTRACTOR: ELDORADO NATIONAL (CALIFORNIA), INC.
Contract No.: OP28367-000
Contract Title: FORTY FOOT (40') LOW FLOOR CNG BUS PROCUREMENT

NO.	UNIT	DESCRIPTION OF ITEM	QTY	UNIT PRICE	TOTAL PRICE
3	Bus Set	Shut Off Valve Assembly	5	$440.00	$2,200.00
4	Bus Set	PRD'S	10	$134.40	$1,344.00
5	Ea.	High Fuel Pressure Regulator	20	$600.00	$12,000.00
6	Bus Set	Defueling Valves	5	$1,560.00	$7,800.00
7	Ea.	Low/High Pressure Filer Assembly	5	$704.00	$3,520.00
8	Bus Set	Fuel Pressure Gauges	10	$88.00	$880.00
9	Bus Set	Defueling Switches	5	$41.60	$208.00
10	Bus Set	Manifold Shut Off Valve Assembly	10	$325.00	$3,250.00
11	Bus Set	Solenoid Valve Assembly	10	$376.00	$3,760.00
12	Bus Set	Fuel Line Assembly	10	$576.00	$5,760.00
13	Ea.	Low Pressure Sensor	20	$144.00	$2,880.00
14	Ea.	Proximity Switch @ the Fuel Fill Door	20	$7.94	$158.80
15	Bus Set	Fuel Line Assembly	5	$576.00	$2,880.00
16	Bus Set	Vent Tubes	5	$137.60	$688.00
17	Ea.	Control Harness	5	$240.00	$1,200.00
18	Ea.	Proximity Switch @ the Fast Fill Recepticle	20	$7.94	$158.80
DOORS					
1	Bus Set	Complete Base Plate and Operator Assembly	5	$1,920.00	$9,600.00
2	Bus Set	Front/Rear Turning Shaft Assembly	5	$1,864.00	$9,320.00
3	Bus Set	Door Panels	5	$6,387.00	$31,935.00
4	Bus Set	Door Glass	2	$1,816.00	$3,632.00
BODY INTERIOR					
1	Bus Set	Interior AVA Sign Assembly	5	$1,580.00	$7,900.00
2	Ea.	Destination Sign Controller	2	$512.00	$1,024.00
3	Ea.	Next Stop Sign	5	$256.00	$1,280.00
4	Bus Set	Interior Speaker Assembly	10	$192.00	$1,920.00
5	Ea.	Microphone Hand Set	5	$92.80	$464.00
6	Ea.	Visor/Sun Shade(s) Front & Side	10	$316.80	$3,168.00
7	Bus Set	Access Panels	5	$960.00	$4,800.00
8	Bus Set	Light Covers	5	$916.80	$4,584.00
9	Bus Set	Modesty Panels	10	$880.00	$8,800.00
10	Bus Set	Ceiling Panels	10	$1,472.00	$14,720.00
11	Bus Set	Side Wall Trim Panel	10	$480.00	$4,800.00
12	Bus Set	Floor Covering	5	$2,470.00	$12,350.00
13	Bus Set	Wheelchair Securement Devices	5	$1,248.00	$6,240.00
14	Bus Set	Passenger Seat	4	$34,087.00	$136,348.00
15	Bus Set	Seat Track	2	$388.00	$776.00
16	Ea.	Operator Seat	5	$2,680.00	$13,400.00
17	Ea.	Farebox Grabrail	4	$248.00	$992.00
18	Bus Set	Manual Release Mechanism	6	$47.00	$282.00
19	Bus Set	Passenger Hand Strap	10	$496.00	$4,960.00
20	Ea.	HVAC Return Grill	5	$390.00	$1,950.00
BODY EXTERIOR					
1	Bus Set	Passenger Windows	2	$14,186.40	$28,372.80
2	Bus Set	Replacement Pass Side Window Glass (if not bonded)	2	$4,560.00	$9,120.00
3	Bus Set	Side Window Film or Guards	5	$1,847.00	$9,235.00
4	Bus Set	Windshield	3	$680.00	$2,040.00
5	Bus Set	Operator Window	2	$1,139.68	$2,279.36
6	Bus Set	Access Door Set (excluding engine door and HVAC access door)	3	$2,180.00	$6,540.00
7	Ea.	Engine Door	2	$623.00	$1,246.00
8	Ea.	HVAC Rear Attic Door	2	$428.80	$857.60
9	Ea.	Bike Rack	2	$1,469.00	$2,938.00
10	Ea.	Emergency Roof Hatch	2	$249.20	$498.40
11	Bus Set	Windshield Wiper Assy.	3	$766.96	$2,300.88
12	Ea.	Windsheild Washer Reservoir	2	$52.80	$105.60
13	Bus Set	Mirrors	4	$971.28	$3,885.12
14	Bus Set	Bumper	3	$2,208.00	$6,624.00
15	Bus Set	Mud Guards	3	$104.00	$312.00

GROUP A - UP TO 600 40' CNG BUSES
FORM PF-2 (CNG- 40') - SCHEDULE A OF PRICES SPARE PARTS (OPTIONAL)
CONTRACT MODIFICATION NO. 2

CONTRACTOR: ELDORADO NATIONAL (CALIFORNIA), INC.
Contract No.: OP28367-000
Contract Title: FORTY FOOT (40') LOW FLOOR CNG BUS PROCUREMENT

NO.	UNIT	DESCRIPTION OF ITEM	QTY	UNIT PRICE	TOTAL PRICE
16	Ea.	Head Lights	10	$742.00	$7,420.00
17	Bus Set	Front Turn Signal	10	$54.40	$544.00
18	Bus Set	Side Marker Lights	10	$128.00	$1,280.00

GROUP A - UP TO 600 40' CNG BUSES
FORM PF-2 (CNG- 40') - SCHEDULE A OF PRICES SPARE PARTS (OPTIONAL)
CONTRACT MODIFICATION NO. 2

CONTRACTOR: ELDORADO NATIONAL (CALIFORNIA), INC.
Contract No.: OP28367-000
Contract Title: FORTY FOOT (40') LOW FLOOR CNG BUS PROCUREMENT

NO.	UNIT	DESCRIPTION OF ITEM	QTY	UNIT PRICE	TOTAL PRICE
19	Bus Set	Rear Door Lights	10	$84.00	$840.00
20	Bus Set	Under Hood Hazard Lights	10	$115.20	$1,152.00
21	Ea.	License Plate Installation	5	$20.80	$104.00
22	Bus Set	CNG Tank Cover Installation	4	$3,800.00	$15,200.00
23	Bus Set	Exterior Trim (including fender skirts, exit door trim and trim pieces covering joints between body panels)	4	$1,387.00	$5,548.00
CLIMATE CONTROL SYSTEM					
1	Ea.	Compressor	2	$6,800.00	$13,600.00
2	Ea.	Controller	2	$300.00	$600.00
3	Ea.	Evaporator	2	$6,300.00	$12,600.00
4	Ea.	Condensor	2	$410.25	$820.50
5	Ea.	Blower Assembly	4	$555.00	$2,220.00
6	Ea.	Thermostat	2	$55.79	$111.58
7	Ea.	Marine Pump	3	$603.00	$1,809.00
WHEELCHAIR					
1	Bus Set	Ramp Assembly	3	$7,995.00	$23,985.00
2	Bus Set	Valve Assembly	2	$87.00	$174.00
3	Bus Set	Electrical Harness	2	$348.40	$696.80
4	Ea.	Ramp	2	$7,995.00	$15,990.00
5	Ea.	Controller	2	$707.38	$1,414.76
6	Ea.	Motor	3	$819.00	$2,457.00
BRAKES					
1	Bus Set	Pressure Switches (include all for each Bus Set)	10	$585.00	$5,850.00
2	Bus Set	Protection Valve	10	$84.00	$840.00
3	Bus Set	Brake Air Chamber	10	$269.70	$2,697.00
4	Bus Set	Brake Wear Indicator	5	$390.00	$1,950.00
5	Ea.	ABS Electronic Control Unit	5	$388.50	$1,942.50
6	Ea.	ABS Harness	2	$367.50	$735.00
7	Bus Set	ABS Sensor	5	$295.50	$1,477.50
MULTIPLEX CONTROLS SYSTEM					
1	Ea.	Event Data Recorder	2	$2,200.00	$4,400.00
2	Ea.	DVR	2	$5,535.40	$11,070.80
3	Bus Set	Complete Bus Wiring Harnesses	2	$21,071.15	$42,142.30
4	Bus Set	Communication Module (Gateway Module)	10	$3,630.00	$36,300.00
5	Bus Set	Multiplex Module	10	$6,610.81	$66,108.10
6	Bus Set	Wheels	5	$2,860.00	$14,300.00
			Total Unit Price	$502,045.21	
			TOTAL PARTS BUY		$2,203,833.65

In U.S. Dollars Using Words:
TWO-MILLION TWO-HUNDRED THREE THOUSAND EIGHT-HUNDRED THIRTY-THREE DOLLARS & SIXTY-FIVE CENTS

Authorized Signature

12/8/2017
Date

TONY WAYNE
Print Name

Los Angeles County
Metropolitan Transportation Authority

One Gateway Plaza
Los Angeles, CA 90012-2952

213.922.2000 Tel
metro.net

Metro

MAEL-013 **Response Required:** No

Date: January 3, 2018

File Nos.:

Action Item(s):

CDRL:

Richard Himes
Contract Administration Manager
Eldorado National (California), Inc. (ENC)
9670 Galena Street
Riverside, CA 92509

SUBJECT: **EXECUTED CONTRACT MODIFICATION NO. 3**
OP28367-000 40' LOW FLOOR CNG TRANSIT BUSES

Reference: MAEL-002, 011; ELMA-007; ELMA-008; ELMA-015; ELMA-017 Revised

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Dear Mr. Himes:

Enclosed is your executed original of the subject modification.

If you have any questions, I can be reached at 213.922.7334 or e-mail at hernandezel@metro.net.

Sincerely,

Elizabeth Hernandez
Principal Contract Administrator

cc: Wayne Okubo
Kwesi Annan
Phil Rabottini

LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY

CONTRACT NO. OP28367-000, CONTRACT MODIFICATION NO.: 3

FOR: FORTY FOOT (40') LOW FLOOR CNG TRANSIT BUSES

This Contract Modification No. 3 to Contract No.: OP28367-000 is made effective on the 27th day of December 2017 by and between the LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY, hereinafter referred to as "MTA", and EL DORADO NATIONAL (CALIFORNIA), INC., hereinafter referred to as "CONTRACTOR".

WHEREAS, CONTRACTOR and MTA entered into Contract No.: OP28367-000 effective August 15, 2017, as amended by Contract Modification No. 1, dated November 6, 2017, and Contract Modification No. 2, dated December 6, 2017 (the "Existing Contract") and;

WHEREAS, CONTRACTOR and MTA desire to modify the Existing Contract as provided herein;

Now, therefore, it is mutually agreed, by and between the parties as follows:

1. Change in the bike rack model from Trilogy 3 to Apex 3 from supplier Sportsworks for an aggregate decrease of $67,666 in the total Contract Price from $198,759,641 to $198,691,975. Article IV COMPENSATION shall read as follows:

   ARTICLE IV: COMPENSATION

   A. Contract Price

   1. In consideration of the Contractor's full performance of the Work, and in accordance with the terms of the Contract, Metro will pay the Contractor the Contract Price of $198,691,975 ~~$198,759,641~~ inclusive of tax and delivery as provided in this Article and in the Contract Document entitled Compensation and Payment Provisions.

   Contract Options may be exercised unilaterally by LACMTA in accordance with Special Provisions Article SP-28, Options.

2. Revised Pricing Forms: PF 1, PF-1A and PF-2 as attached to this modification no. 3.

Except as expressly amended hereby, the Existing Contract remains in full force and effect as originally executed.

IN WITNESS WHEREOF, the parties have caused this Contract Modification No. 3 to the Existing Contract to be executed by their respective officers duly authorized on the date first written above.

EL DORADO NATIONAL (CALIFORNIA), INC.

By: _____
Signature

LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY

Philip A. Washington
Chief Executive Officer

TONY WAYNE
Type or Print Name

1/2/18
Date

By: Elizabeth Hernandez
Elizabeth Hernandez
Principal Contract Administrator

1/3/18
Date

GROUP A - UP TO 600 40' CNG BUSES
FORM PF-1 (CNG - 40') - CONTRACT PRICE SUMMARY
Contract Modification No. 3

Proposer: ELDORADO NATIONAL (CALIFORNIA), INC.

Contract No.: OP28367-000

Contract Title: FORTY FOOT (40') LOW FLOOR CNG BUS PROCUREMENT

1.0 CONTRACT FOR 295 BUSES (BASE BUY)

No.	Qty.	Description of Item		Taxable Unit Price	Unit Price	Total Price
1	295	40' Low Floor CNG Buses (Base Buy) from PF-1A	Values derived from PF-1A*:	$594,216.87	$613,957	$181,117,277
1a	Lot	Manuals (Base Buy) (TS 5.6.4)		$2,281.50	Lump Sum	$23,400.00
1b	295	Vehicle Delivery Charge for Base Buy	Value of all taxable delivery charges per bus**:		$275.00	$81,125.00
1c		Tax (Base Buy)		9.75%	$57,936.14	$17,093,444.22
2	Lot	Reserved				
3	Lot	Reserved				
4	Lot	Reserved				
5	Lot	Reserved				
6	Lot	Reserved				
7	Lot	Performance Bond (Base Buy)			Lump Sum	$119,336.00
8	1,000	Total Training Hours for Base Buy***			$175,000.00	
8a	900	Contractor (Proposer/Prime) Base Buy			$175.00	$157,500.00
8b	100	Subcontractor/Supplier Base Buy			$175.00	$17,500.00
9	1	System Management Tool for use at up to (13) MTA Operating Divisions per TS 86.1			$74,930.00	$74,930.00
10a	15	Special Towing Equipment (TS 25)			$386.00	$5,790.00
10b		Tax		9.75%	$37.64	$564.53
11a	2	Rear Recovery Devices/Tie Downs (TS 25)			$505.00	$1,010.00
11b		Tax		9.75%	$49.24	$98.48

1.0 Total Price for CONTRACT for 295 Base Buy Buses (Sum of Items "1" through "11b") to be the BASIS for Price Proposal evaluation

In U.S. Dollars Using Words: ONE HUNDRED NINETY-EIGHT MILLION SIX HUNDRED NINETY ONE THOUSAND NINE HUNDRED SEVENTY FIVE DOLLARS

In U.S. Dollars Using Figures: $198,691,975

NOTE * Taxable Unit Price is the Unit Price less 1.14 Accessibility Provisions on PF-1A

GROUP A - UP TO 600 40' CNG BUSES
FORM PF-1 (CNG - 40') - CONTRACT PRICE SUMMARY
Contract Modification No. 3

Proposer: ELDORADO NATIONAL (CALIFORNIA), INC.

Contract No.: OP28367-000

Contract Title: FORTY FOOT (40') LOW FLOOR CNG BUS PROCUREMENT

** Input the taxable portion of the Delivery Charge under the Taxable Unit Price column and the total Delivery Charge under the Unit Price column

*** Training Hours for Base Buy are only estimates and not a guaranteed level of effort. The total for this Line is a Not-to-Exceed provisional amount.

GROUP A - UP TO 600 40' CNG BUSES
FORM PF-1 (CNG - 40') - CONTRACT PRICE SUMMARY
Contract Modification No. 3

Proposer: ELDORADO NATIONAL (CALIFORNIA), INC.

Contract No.: OP28367-000

Contract Title: FORTY FOOT (40') LOW FLOOR CNG BUS PROCUREMENT

2.0 CONTRACT FOR 150 UP TO 305 BUSES (OPTION BUY)

No.	Qty.	Description of Item		Taxable Unit Price	Unit Price	Total Price
10	305	40' Low Floor CNG Buses (Option Buy) from PF-1A for 150 to 305 vehicles*		$594,217.00	$613,957.00	$187,256,885.00
10a	Lot	Manuals (Option Buy) (TS 5.6.4)***		$2,281.50	Lump Sum	$23,400.00
10b	305	Vehicle Delivery Charge for Option Buy	Value of all taxable delivery charges per bus**:	$0.00	$275.00	$83,875.00
10c		Tax (Option Buy)		9.75%	$57,936.16	$17,672,809.54
11		Reserved			$	$
12	Lot	Performance Bond for Option Buy***			Lump Sum	$123,421.00
13	500	Total Training Hours for Option Buy****			$87,500.00	
13a	450	Contractor (Proposer/Prime) Option Buy			$175.00	$78,750.00
13b	50	Subcontractor/Supplier Option Buy			$175.00	$8,750.00
14		Reserved			$	$

2.0 Total Price for CONTRACT for 150 Up to 305 Option Buy Buses (Sum of items "10" through "14") to be the BASIS for Price Proposal evaluation

In U.S. Dollars Using Words: TWO-HUNDRED FIVE MILLION TWO HUNDRED FORTY SEVEN THOUSAND EIGHT HUNDRED NINETY ONE DOLLARS

In U.S. Dollars Using Figures: $205,247,891

NOTE

* Taxable Unit Price is the Unit Price less 1.14 Accessibility Provisions on PF-1A

** Input the taxable portion of the Delivery Charge under the Taxable Unit Price column and the total Delivery Charge under the Unit Price column

*** For proposal purposes only, Manuals and Bond prices are for all 305 bus Options exercised. Actual cost will depend on Option quantity ordered.

**** Training Hours for Option Buy are only estimates and not a guaranteed level of effort. The total for this Line is a Not-to-Exceed provisional amount.

GROUP A - UP TO 600 40' CNG BUSES
FORM PF-1 (CNG - 40') - CONTRACT PRICE SUMMARY
Contract Modification No. 3

Proposer: ELDORADO NATIONAL (CALIFORNIA), INC.

Contract No.: OP28367-000

Contract Title: FORTY FOOT (40') LOW FLOOR CNG BUS PROCUREMENT

3.0 OPTIONAL VEHICLE CONFIGURATION

No.	Qty.	Description of Item		Unit Price	Total Price
15	1	3 ADA Securement Configuration TS 81.5 (Total 15a - 15d)			$6,370.00
15a		Direct Materials/Equipment		$5,750.00	
15b		Labor Installation Costs		$620.00	
15c		Non Recurring Cost		$0.00	
15d		Other Costs (Identify)		$0.00	
16	1	4 ADA Securement Configuration TS 81.5 (Total 16a - 16d)			$10,170.00
16a		Direct Materials/Equipment		$9,150.00	
16b		Labor Installation Costs		$1,020.00	
16c		Non Recurring Cost		$0.00	
16d		Other Costs (Identify)		$0.00	
17	600	Reserved****			
17a	295	Reserved			
17b	305	Reserved			
18	600	25-Year Certified CNG Tanks			$522,000.00
18a	295	25 Yr Certified CNG Tanks for Base Buy	$256,650.00	$870.00	
18b	305	25 Yr Certified CNG Tanks for Option Buy for 150 up to 305 vehicles	$265,350.00	$870.00	
19	600	Complete Automatic Passenger Counter System TS 86.3 (Total 19a - 19h)			$2,757,600.00
19a	295	Direct Materials/Equipment for Base Buy APC		$4,136.00	
19b	295	Labor Installation Costs for Base Buy APC		$460.00	

GROUP A - UP TO 600 40' CNG BUSES
FORM PF-1 (CNG - 40') - CONTRACT PRICE SUMMARY
Contract Modification No. 3

Proposer: ELDORADO NATIONAL (CALIFORNIA), INC.

Contract No.: OP28367-000

Contract Title: FORTY FOOT (40') LOW FLOOR CNG BUS PROCUREMENT

19c	295	Non Recurring Cost for Base Buy APC		$	
19d	295	Other Costs (Identify) for Base Buy APC		$	
		Total for Base Buy APC	$1,355,820.00	$4,596.00	
19e	305	Direct Materials/Equipment for Option Buy APC for 150 up to 305 vehicles		$4,136.00	
19f	305	Labor Installation Costs for Option Buy APC for 150 up to 305 vehicles		$460.00	
19g	305	Non Recurring Cost for Option Buy APC for 150 up to 305 vehicles		$	
19h	305	Other Costs (Identify) for Option Buy APC for 150 up to 305 vehicles		$	
		Total for Option Buy APC for 150 up to 305 vehicles	$1,401,780.00	$4,596.00	
20	600	Enhanced 360 degree Camera System TS 86.1 (Total 20a - 20h)			$579,000.00
20a	295	Direct Materials/Equipment for Base Buy Enhanced Camera System		$869.00	
20b	295	Labor Installation Costs for Base Buy Enhanced Camera System		$96.00	
20c	295	Non Recurring Cost for Base Buy Enhanced Camera System		$	
20d	295	Other Costs (Identify) for Base Buy Enhanced Camera System		$	
		Total for Base Buy Enhanced Camera System	$284,675.00	$965.00	
20e	305	Direct Materials/Equipment for Option Buy Enhanced Camera System for 150 up to 305 vehicles		$869.00	
20f	305	Labor Installation Costs for Option Buy Enhanced Camera System for 150 up to 305 vehicles		$96.00	
20g	305	Non Recurring Cost for Option Buy Enhanced Camera System for 150 up to 305 vehicles		$	
20h	305	Other Costs (Identify) for Option Buy Enhanced Camera System for 150 up to 305 vehicles		$	
		Total for Option Buy Enhanced Camera System for 150 up to 305 vehicles	$294,325.00	$965.00	
21	600	USB Ports for Passenger Charging Only			$288,000.00
21a	295	USB Ports for Passenger Charging Only for Base Buy	$141,600.00	$480.00	
21b	305	USB Ports for Passenger Charging Only for Option Buy for 150 up to 305 vehicles	$146,400.00	$480.00	

GROUP A - UP TO 600 40' CNG BUSES
FORM PF-1 (CNG - 40') - CONTRACT PRICE SUMMARY
Contract Modification No. 3

Proposer: ELDORADO NATIONAL (CALIFORNIA), INC.

Contract No.: OP28367-000

Contract Title: FORTY FOOT (40') LOW FLOOR CNG BUS PROCUREMENT

22	600	Optional Wireless Stop Request Switches (Bus set)			$291,000.00
22a	295	Optional Wireless Stop Request Switches (Bus set) for Base Buy	$143,075.00	$485.00	
22b	305	Optional Wireless Stop Request Switches (Bus set) for Option Buy for 150 up to 305 vehicles	$147,925.00	$485.00	
23	600	Optional Full Color Destination Sign Sets (TS 86.3)			$2,070,000.00
23a	295	Optional Full Color Destination Sign Sets (TS 86.3) for Base Buy	$1,017,750.00	$3,450.00	
23b	305	Optional Full Color Destination Sign Sets (TS 86.3) for Option Buy for 150 up to 305 vehicles	$1,052,250.00	$3,450.00	
24	Lot	Spare Parts (From Schedule A, Form PF-2)			$2,203,445.65
25	Lot	Special Tools (Schedule B Form PF-3)			$7,710.00
26	Lot	Diagnostic Test Equipment (Schedule C, Form PF-4)			$355,010.00
27	Lot	Training Aids (Schedule D, Form PF-5)			$958,460.00

3.0 Total Price for OPTIONAL VEHICLE CONFIGURATION (Sum of Items "15 through 27") for OPTIONAL EQUIPMENT to be BASIS for Price Proposal evaluation.

In U.S. Dollars Using Words: TEN-MILLION FORTY EIGHT THOUSAND SEVEN HUNDRED SIXTY FIVE DOLLARS & SIXTY-FIVE CENTS

In U.S. Dollars Using Figures: $10,048,765.65

**** Proposer shall provide base Low Nox Engine for each bus with the following Emission Levels:
ISLG engine is not the base engine requirement. Low Nox engine is the base requirement and therefore no longer an option.

Oxides of Nitrogen (NOx) Grams per brake horsepower-hour	Particulate Matter (PM) grams per brake horsepower hour
0.02	0.01

GROUP A - UP TO 600 40' CNG BUSES
FORM PF-1 (CNG - 40') - CONTRACT PRICE SUMMARY
Contract Modification No. 3

Proposer: ELDORADO NATIONAL (CALIFORNIA), INC.

Contract No.: OP28367-000

Contract Title: FORTY FOOT (40') LOW FLOOR CNG BUS PROCUREMENT

4.0 CONTRACT FOR BASE BUY, OPTION BUY, AND OPTIONALVEHICLE CONFIGURATION

No.	Qty.	Description of Item	Total Price
1.0		Total Price for CONTRACT for 295 Base Buy Buses to be the BASIS for Price Proposal evaluation	$198,691,975
2.0		Total Price for CONTRACT for 150 Up to 305 Option Buy Buses to be the BASIS for Price Proposal evaluation	$205,247,891
3.0		Total Price for OPTIONAL VEHICLE CONFIGURATION for OPTIONAL EQUIPMENT to be BASIS for Price Proposal evaluation	$10,048,766
4.0		Total Price for CONTRACT for 295 Base Buy Buses, for 150 up to 305 Option Buy Buses, and Optional Vehicle Configuration for Optional Equipment combined to be the overall BASIS for Price Proposal evaluation	

In U.S. Dollars Using Words: FOUR-HUNDRED THIRTEEN MILLION NINE HUNDRED EIGHTY EIGHT THOUSAND SIX HUNDRED THIRTY ONE DOLLARS

In U.S. Dollars Using Figures: $413,988,631

(Signature of Person Executing Proposal)

Date: 6/2/18

TONY WAYNE VICE PRESIDENT & GENERAL MANAGEI

Type Name, Title

GROUP A - UP TO 600 40' CNG BUSES
FORM PF-1A (CNG - 40')
SUBSYSTEM EQUIPMENT
CONTRACT MODIFICATION NO. 3

Contractor: ELDORADO NATIONAL (CALIFORNIA), INC
Contract No.: OP28367-000

NO.	DESCRIPTION	BASE BUY OF ITEM	
1	Purchased Subsystem Equipment (Items 1.1 through 1.99) **		
1.1	TS 9.	Propulsion Power Assembly (PPA)***	$18,372
1.2	TS 9.	Engine	$60,324
1.3	TS 10.	Cooling System	$12,650
1.4	TS 18.	Fuel System	$68,300
1.5	TS 31.	Suspension	$19,950
1.6	TS 33.	Steering System	$4,950
1.7	TS 37.	Brakes	$3,260
1.8	TS 39.	Pneumatic System	$6,850
1.9	TS 42.	Charging System	$36,800
1.10	TS 44.	Multiplex Control System	$24,200
1.11	TS 54.	HVAC Climate Control System	$29,450
1.12	TS 78.	Passenger Seats	$28,955
1.13	TS 80.	Doors	$14,830
1.14	TS 81.	Accessibility Provisions	$19,740
1.15	TS 86.	Communications	$3,244
1.16	TS 11	Transmission	$14,261
1.17	TS 78.1	USB Passenger Charging Port	$480
1.18	TS85.1	Wirelesss Stop Request Button	$485
1.19	TS 86.3	Matrix APC	$4,596
1.99		All other bus subsystem equipment not included above	$242,260

TOTAL CNG BUS PRICE *$613,957

*Transfer Total CNG Bus Price to Contract Price Summary Form (PF-1 - Unit Price column, line Item 1 - **Base Buy**

Notes: 1. ** Price shall include design, engineering, manufacturing/assembly, testing, shipping, profit and other associated costs. Price for each subsystem equipment shall include all applicable apparatus.

2. Price for line Item Nos. 1a-27 in the CONTRACT PRICE SUMMARY(Form PF-1) shall not be included in computing price of any of the line items above.

3. *** PPA unit price for line item 1.1 excludes prices for items 1.2 through 1.99

GROUP A - UP TO 600 40' CNG BUSES
FORM PF-1A (CNG - 40')
SUBSYSTEM EQUIPMENT
CONTRACT MODIFICATION NO. 3

NO.	DESCRIPTION	OPTION BUY OF ITEM		
2	Purchased Subsystem Equipment (Items 2.1 through 2.99) **			
2.1	TS 9.	Propulsion Power Assembly (PPA)***		$18,372
2.2	TS 9.	Engine		$60,324
2.3	TS 10.	Cooling System		$12,650
2.4	TS 18.	Fuel System		$68,300
2.5	TS 31.	Suspension		$19,950
2.6	TS 33.	Steering System		$4,950
2.7	TS 37.	Brakes		$3,260
2.8	TS 39.	Pneumatic System		$6,850
2.9	TS 42.	Charging System		$36,800
2.10	TS 44.	Multiplex Control System		$24,200
2.11	TS 54.	HVAC Climate Control System		$29,450
2.12	TS 78.	Passenger Seats		$28,955
2.13	TS 80.	Doors		$14,830
2.14	TS 81.	Accessibility Provisions		$19,740
2.15	TS 86.	Communications		$3,244
2.16	TS 11	Transmission		$14,261
2.17	TS 78.1	USB Passenger Charging Port		$480
2.18	TS85.1	Wirelesss Stop Request Button		$485
2.19	TS 86.3	Matrix APC		$4,596
2.99		All other bus subsystem equipment not included above		$242,260
	TOTAL CNG BUS PRICE OPTION QUANTITY		*	$613,957

* Transfer Total CNG Bus Price to Contract Price Summary Form (PF-1 - Unit Price column, line item 10 - Option Buy)

Notes: 1. ** Price shall include design, engineering, manufacturing/assembly, testing, shipping, profit and other associated costs. Price for each subsystem equipment shall include all applicable apparatus.

2. Price for line Item Nos. 1-9 and 10a-27 in the CONTRACT PRICE SUMMARY(Form PF-1) shall not be included in computing price of any of the line items above.

3. *** PPA unit price for line item 2.1 excludes prices for items 2.2 through 2.99

(Signature of Person Executing Proposal) — Date: 1/2/18

TONY WAYNE /VICE PRESIDENT & GENERAL MANAGER
Type Name, Title

GROUP A - UP TO 600 40' CNG BUSES
FORM PF-2 (CNG- 40') - SCHEDULE A OF PRICES SPARE PARTS (OPTIONAL)
CONTRACT MODIFICATION NO. 3

CONTRACTOR: ELDORADO NATIONAL (CALIFORNIA), INC.
Contract No.: OP28367-000
Contract Title: FORTY FOOT (40') LOW FLOOR CNG BUS PROCUREMENT

NO.	UNIT	DESCRIPTION OF ITEM	QTY	UNIT PRICE	TOTAL PRICE
LOW NOX ENGINE					
1	Ea.	Propulsion Power Assembly (See Definition in SP-1)	3	$86,270.00	$258,810.00
2	Ea.	Air Compresser	5	$6,760.00	$33,800.00
3	Ea.	Turbo	3	$1,982.00	$5,946.00
4	Ea.	EGR Cooler	20	$1,110.47	$22,209.40
5	Ea.	EGR Valve	10	$610.68	$6,106.80
6	Ea.	Delta P Sensor	10	$347.66	$3,476.60
7	Ea.	Mass. Air Flow Sensor	10	$1,067.56	$10,675.60
8	Ea.	Oxygen Sensor	20	$223.61	$4,472.20
9	Ea.	Catalyst	5	$3,574.95	$17,874.75
10	Ea.	Cylinder Head	5	$4,513.81	$22,569.05
11	Ea.	Pistons Kits	60	$325.00	$19,500.00
12	Bus Set	Rod Bearings	10	$64.00	$640.00
13	Bus Set	Main Bearing	10	$219.27	$2,192.70
14	Ea.	Liners	60	$191.87	$11,512.20
15	Ea.	Head Gasket	5	$428.75	$2,143.75
16	Ea.	Upper Gasket Set	5	$844.99	$4,224.95
17	Ea.	Oil Pan Gasket	20	$133.60	$2,672.00
18	Ea.	Stiffener Plate Gasket	20	$92.85	$1,857.00
19	Ea.	Oil Pan	5	$505.51	$2,527.55
20	Ea.	Throttle Actuator	5	$574.16	$2,870.80
21	Ea.	Fuel Control Valve	10	$1,429.19	$14,291.90
22	Ea.	Ignition Control Module	10	$1,648.45	$16,484.50
23	Ea.	Ignition Coils	120	$175.23	$21,027.60
24	Ea.	Engine Harness	5	$1,493.62	$7,468.10
25	Ea.	Ignition Harness	10	$167.53	$1,675.30
26	Ea.	Oil Cooler	5	$179.73	$898.65
27	Ea.	Lube Pump	5	$275.51	$1,377.55
28	Ea.	Front Crank Seal	10	$30.54	$305.40
29	Ea.	Rear Seal	10	$28.65	$286.50
30	Ea.	Water Pump	10	$175.03	$1,750.30
31	Ea.	Vibration Damper	10	$344.21	$3,442.10
32	Ea.	Belt Tensioner (If applicable)	20	$145.47	$2,909.40
33	Ea.	CoolantTermperature Sensor	20	$11.21	$224.20
34	Ea.	Oil Pressure Sensor	10	$98.10	$981.00
35	Ea.	Fuel Pressure Sensor	10	$144.34	$1,443.40
36	Ea.	Low Fuel Pressure Regulator	10	$1,222.22	$12,222.20
37	Ea.	Engine Cradle	5	$1,420.00	$7,100.00
38	Ea.	Belt Guard	5	$358.80	$1,794.00
39	Ea.	Complete Engine Package (See definition in TS-2)	4	$66,430.00	$265,720.00
40	Bus Set	Spark Plugs	15	$42.02	$630.30
41	Bus Set	Adaptation Kit (Eng to Trans)	3	$1,066.00	$3,198.00
42	Ea.	PPA Dollies	8	$685.00	$5,480.00
COOLING SYSTEM					
1	Ea.	Radiator Packages (See definition in TS-2)	5	$7,715.00	$38,575.00
2	Ea.	Thermal Management Controllers	5	$598.32	$2,991.60
3	Bus Set	Fan Resistors	20	$48.60	$972.00
4	Bus Set	CAN Interface Cables	5	$101.25	$506.25
5	Ea.	Fan Reversal LED Panel	5	$593.39	$2,966.95
6	Ea.	Fan Assembly	30	$40.66	$1,219.80
7	Ea.	Coolant Reservoir	10	$556.20	$5,562.00
8	Ea.	Transmission Cooler	10	$648.00	$6,480.00
9	Bus Set	Pressure Relief Valve	20	$23.85	$477.00
10	Ea.	Radiator Cap	30	$5.27	$158.10
11	Ea.	Coolant Overflow Tank	10	$36.29	$362.90

GROUP A - UP TO 600 40' CNG BUSES
FORM PF-2 (CNG- 40') - SCHEDULE A OF PRICES SPARE PARTS (OPTIONAL)
CONTRACT MODIFICATION NO. 3

CONTRACTOR: ELDORADO NATIONAL (CALIFORNIA), INC.
Contract No.: OP28367-000
Contract Title: FORTY FOOT (40') LOW FLOOR CNG BUS PROCUREMENT

NO.	UNIT	DESCRIPTION OF ITEM	QTY	UNIT PRICE	TOTAL PRICE
CHARGING SYSTEM					
1	Ea.	Alternator	10	$9,750.00	$97,500.00
2	Ea.	Voltage Regulators	10	$351.00	$3,510.00
3	Ea.	Batteries	40	$203.77	$8,150.80
4	Ea.	Battery Equilizer	20	$418.50	$8,370.00
5	Ea.	Battery Disconnect	10	$31.82	$318.20
6	Ea.	Battery Separator	5	$297.00	$1,485.00
7	Ea.	Power Distribution Panel in Battery Compartment	5	$267.30	$1,336.50
8	Ea.	Low Voltage Disconnect	10	$44.55	$445.50
9	Ea.	Circuit Breaker 80A	20	$31.59	$631.80
10	Ea.	Circuit Breaker 100A	20	$39.15	$783.00
11	Ea.	Circuit Breaker 120A or 130A, whichever applies	20	$49.95	$999.00
12	Bus Set	Fuse and Circuit Breaker Panels	5	$310.50	$1,552.50
SUSPENSION					
1	Bus Set	Air Ride Beams	10	$2,310.00	$23,100.00
2	Bus Set	Air Bags	20	$672.00	$13,440.00
3	Ea.	Front Axle	10	$4,879.85	$48,798.50
4	Ea.	Rear Axle	10	$3,946.07	$39,460.70
5	Bus Set	Radius Rods	5	$412.80	$2,064.00
6	Bus Set	Shocks	10	$383.68	$3,836.80
7	Bus Set	Leveling Valve Front	10	$191.81	$1,918.10
8	Bus Set	Leveling Valve Rear	10	$191.81	$1,918.10
DRIVE TRAIN					
1	Ea.	Transmission	5	$14,261.00	$71,305.00
2	Ea.	TCM Programmed	5	$611.00	$3,055.00
3	Ea.	Adaptation Kit (Trans to Eng)	2	$1,066.00	$2,132.00
4	Ea.	Drive Shaft	10	$544.00	$5,440.00
5	Ea.	Differential	15	$6,972.00	$104,580.00
STEERING SYSTEM					
1	Bus Set	Steering Gear and Linkage	10	$1,172.50	$11,725.00
2	Ea.	Steering Column	10	$596.77	$5,967.70
3	Ea.	Steering Shaft	10	$135.30	$1,353.00
4	Ea.	Steering Box Assembly	10	$277.78	$2,777.80
5	Ea.	Power Steering Gear Assembly	10	$893.97	$8,939.70
PNEUMATIC SYSTEM					
1	Bus Set	Air Tanks (Complete Sets)	10	$352.00	$3,520.00
2	Ea.	Air Dryer	10	$400.66	$4,006.60
3	Ea.	Air Governor	10	$68.80	$688.00
4	Bus Set	Pressure Reducing Valves	10	$28.80	$288.00
5	Bus Set	Check Valves	10	$57.60	$576.00
6	Bus Set	Brake Control Valve	10	$46.40	$464.00
7	Bus Set	Brake Pedal Valve	10	$134.54	$1,345.40
8	Bus Set	Quick Release Valve	10	$17.60	$176.00
9	Bus Set	Parking Relay Valve	10	$57.60	$576.00
10	Bus Set	Parking Control Valve	10	$46.40	$464.00
11	Bus Set	Air Brake Tubing	10	$134.54	$1,345.40
12	Bus Set	Solenoid Valve Assembly	10	$17.60	$176.00
FUEL SYSTEM					
1	Bus Set	Fuel Cylinder Assembly	2	$68,300.00	$136,600.00
2	Ea.	Fill Manifold	2	$592.00	$1,184.00

GROUP A - UP TO 600 40' CNG BUSES
FORM PF-2 (CNG- 40') - SCHEDULE A OF PRICES SPARE PARTS (OPTIONAL)
CONTRACT MODIFICATION NO. 3

CONTRACTOR: ELDORADO NATIONAL (CALIFORNIA), INC.
Contract No.: OP28367-000
Contract Title: FORTY FOOT (40') LOW FLOOR CNG BUS PROCUREMENT

NO.	UNIT	DESCRIPTION OF ITEM	QTY	UNIT PRICE	TOTAL PRICE
3	Bus Set	Shut Off Valve Assembly	5	$440.00	$2,200.00
4	Bus Set	PRD'S	10	$134.40	$1,344.00
5	Ea.	High Fuel Pressure Regulator	20	$600.00	$12,000.00
6	Bus Set	Defueling Valves	5	$1,560.00	$7,800.00
7	Ea.	Low/High Pressure Filer Assembly	5	$704.00	$3,520.00
8	Bus Set	Fuel Pressure Gauges	10	$88.00	$880.00
9	Bus Set	Defueling Switches	5	$41.60	$208.00
10	Bus Set	Manifold Shut Off Valve Assembly	10	$325.00	$3,250.00
11	Bus Set	Solenoid Valve Assembly	10	$376.00	$3,760.00
12	Bus Set	Fuel Line Assembly	10	$576.00	$5,760.00
13	Ea.	Low Pressure Sensor	20	$144.00	$2,880.00
14	Ea.	Proximity Switch @ the Fuel Fill Door	20	$7.94	$158.80
15	Bus Set	Fuel Line Assembly	5	$576.00	$2,880.00
16	Bus Set	Vent Tubes	5	$137.60	$688.00
17	Ea.	Control Harness	5	$240.00	$1,200.00
18	Ea.	Proximity Switch @ the Fast Fill Recepticle	20	$7.94	$158.80
DOORS					
1	Bus Set	Complete Base Plate and Operator Assembly	5	$1,920.00	$9,600.00
2	Bus Set	Front/Rear Turning Shaft Assembly	5	$1,864.00	$9,320.00
3	Bus Set	Door Panels	5	$6,387.00	$31,935.00
4	Bus Set	Door Glass	2	$1,816.00	$3,632.00
BODY INTERIOR					
1	Bus Set	Interior AVA Sign Assembly	5	$1,580.00	$7,900.00
2	Ea.	Destination Sign Controller	2	$512.00	$1,024.00
3	Ea.	Next Stop Sign	5	$256.00	$1,280.00
4	Bus Set	Interior Speaker Assembly	10	$192.00	$1,920.00
5	Ea.	Microphone Hand Set	5	$92.80	$464.00
6	Ea.	Visor/Sun Shade(s) Front & Side	10	$316.80	$3,168.00
7	Bus Set	Access Panels	5	$960.00	$4,800.00
8	Bus Set	Light Covers	5	$916.80	$4,584.00
9	Bus Set	Modesty Panels	10	$880.00	$8,800.00
10	Bus Set	Ceiling Panels	10	$1,472.00	$14,720.00
11	Bus Set	Side Wall Trim Panel	10	$480.00	$4,800.00
12	Bus Set	Floor Covering	5	$2,470.00	$12,350.00
13	Bus Set	Wheelchair Securement Devices	5	$1,248.00	$6,240.00
14	Bus Set	Passenger Seat	4	$34,087.00	$136,348.00
15	Bus Set	Seat Track	2	$388.00	$776.00
16	Ea.	Operator Seat	5	$2,680.00	$13,400.00
17	Ea.	Farebox Grabrail	4	$248.00	$992.00
18	Bus Set	Manual Release Mechanism	6	$47.00	$282.00
19	Bus Set	Passenger Hand Strap	10	$496.00	$4,960.00
20	Ea.	HVAC Return Grill	5	$390.00	$1,950.00
BODY EXTERIOR					
1	Bus Set	Passenger Windows	2	$14,186.40	$28,372.80
2	Bus Set	Replacement Pass Side Window Glass (if not bonded)	2	$4,560.00	$9,120.00
3	Bus Set	Side Window Film or Guards	5	$1,847.00	$9,235.00
4	Bus Set	Windshield	3	$680.00	$2,040.00
5	Bus Set	Operator Window	2	$1,139.68	$2,279.36
6	Bus Set	Access Door Set (excluding engine door and HVAC access door)	3	$2,180.00	$6,540.00
7	Ea.	Engine Door	2	$623.00	$1,246.00
8	Ea.	HVAC Rear Attic Door	2	$428.80	$857.60
9	Ea.	Bike Rack	2	$1,275.00	$2,550.00
10	Ea.	Emergency Roof Hatch	2	$249.20	$498.40
11	Bus Set	Windshield Wiper Assy.	3	$766.96	$2,300.88
12	Ea.	Windsheild Washer Reservoir	2	$52.80	$105.60
13	Bus Set	Mirrors	4	$971.28	$3,885.12
14	Bus Set	Bumper	3	$2,208.00	$6,624.00
15	Bus Set	Mud Guards	3	$104.00	$312.00

GROUP A - UP TO 600 40' CNG BUSES
FORM PF-2 (CNG- 40') - SCHEDULE A OF PRICES SPARE PARTS (OPTIONAL)
CONTRACT MODIFICATION NO. 3

CONTRACTOR: ELDORADO NATIONAL (CALIFORNIA), INC.
Contract No.: OP28367-000
Contract Title: FORTY FOOT (40') LOW FLOOR CNG BUS PROCUREMENT

NO.	UNIT	DESCRIPTION OF ITEM	QTY	UNIT PRICE	TOTAL PRICE
16	Ea.	Head Lights	10	$742.00	$7,420.00
17	Bus Set	Front Turn Signal	10	$54.40	$544.00
18	Bus Set	Side Marker Lights	10	$128.00	$1,280.00
19	Bus Set	Rear Door Lights	10	$64.00	$640.00
20	Bus Set	Under Hood Hazard Lights	10	$115.20	$1,152.00
21	Ea.	License Plate Installation	5	$20.80	$104.00
22	Bus Set	CNG Tank Cover Installation	4	$3,800.00	$15,200.00
23	Bus Set	Exterior Trim (including fender skirts, exit door trim and trim pieces covering joints between body panels)	4	$1,387.00	$5,548.00
CLIMATE CONTROL SYSTEM					
1	Ea.	Compressor	2	$6,800.00	$13,600.00
2	Ea.	Controller	2	$300.00	$600.00
3	Ea.	Evaporator	2	$6,300.00	$12,600.00
4	Ea.	Condensor	2	$410.25	$820.50
5	Ea.	Blower Assembly	4	$555.00	$2,220.00
6	Ea.	Thermostat	2	$55.79	$111.58
7	Ea.	Marine Pump	3	$603.00	$1,809.00
WHEELCHAIR					
1	Bus Set	Ramp Assembly	3	$7,995.00	$23,985.00
2	Bus Set	Valve Assembly	2	$87.00	$174.00
3	Bus Set	Electrical Harness	2	$348.40	$696.80
4	Ea.	Ramp	2	$7,995.00	$15,990.00
5	Ea.	Controller	2	$707.38	$1,414.76
6	Ea.	Motor	3	$819.00	$2,457.00
BRAKES					
1	Bus Set	Pressure Switches (Include all for each Bus Set)	10	$585.00	$5,850.00
2	Bus Set	Protection Valve	10	$84.00	$840.00
3	Bus Set	Brake Air Chamber	10	$269.70	$2,697.00
4	Bus Set	Brake Wear Indicator	5	$390.00	$1,950.00
5	Ea.	ABS Electronic Control Unit	5	$388.50	$1,942.50
6	Ea.	ABS Harness	2	$367.50	$735.00
7	Bus Set	ABS Sensor	5	$295.50	$1,477.50
MULTIPLEX CONTROLS SYSTEM					
1	Ea.	Event Data Recorder	2	$2,200.00	$4,400.00
2	Ea.	DVR	2	$5,535.40	$11,070.80
3	Bus Set	Complete Bus Wiring Harnesses	2	$21,071.15	$42,142.30
4	Bus Set	Communication Module (Gateway Module)	10	$3,630.00	$36,300.00
5	Bus Set	Multiplex Module	10	$6,610.81	$66,108.10
6	Bus Set	Wheels	5	$2,860.00	$14,300.00
			Total Unit Price	$501,851.21	
				TOTAL PARTS BUY	$2,203,445.65

In U.S. Dollars Using Words:
TWO-MILLION TWO HUNDRED THREE THOUSAND FOUR HUNDRED FORTY FIVE DOLLARS & SIXTY-FIVE CENTS

Authorized Signature

6/2/18
Date

TONY WAYNE
Print Name

Los Angeles County
Metropolitan Transportation Authority

One Gateway Plaza
Los Angeles, CA 90012-2952

213.922.2000 Tel
metro.net

Metro

MAEL-016 **Response Required:** No

Date: January 31, 2018

File Nos.:

Action Item(s):

CDRL:

Richard Himes
Contract Administration Manager
Eldorado National (California), Inc. (ENC)
9670 Galena Street
Riverside, CA 92509

SUBJECT: **EXECUTED CONTRACT MODIFICATION NO. 4**
OP28367-000 40' LOW FLOOR CNG TRANSIT BUSES

Reference: MAEL-002, 011; ELMA-007; ELMA-008; ELMA-015; ELMA-017 Revised; MAEL-015

Dear Mr. Himes:

Enclosed is your executed original of the subject modification.

If you have any questions, I can be reached at 213.922.7334 or e-mail at hernandezel@metro.net.

Sincerely,

Elizabeth Hernandez
Principal Contract Administrator

cc: Wayne Okubo
Kwesi Annan
Phil Rabottini

LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY

CONTRACT NO. OP28367-000, CONTRACT MODIFICATION NO.: 4

FOR: FORTY FOOT (40') LOW FLOOR CNG TRANSIT BUSES

This Contract Modification No. 4 to Contract No.: OP28367-000 is made effective on the 19th day of January 2018 by and between the LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY, hereinafter referred to as "MTA", and EL DORADO NATIONAL (CALIFORNIA), INC., hereinafter referred to as "CONTRACTOR".

WHEREAS, CONTRACTOR and MTA entered into Contract No.: OP28367-000 effective August 15, 2017, as amended by Contract Modification No. 1, dated November 6, 2017, Contract Modification No. 2, dated December 6, 2017, and Contract Modification No. 3 dated December 27, 2017, (the "Existing Contract") and;

WHEREAS, CONTRACTOR and MTA desire to modify the Existing Contract as provided herein;

Now, therefore, it is mutually agreed, by and between the parties as follows:

Modify and revise the technical specifications for Group A 40' CNG Buses with the Conformed Metro Technical Specifications Volume II dated January 19, 2018 (attached).

A summary of the changes to the Technical Specifications is enclosed as Attachment 1.

Except as expressly amended hereby, the Existing Contract remains in full force and effect as originally executed.

IN WITNESS WHEREOF, the parties have caused this Contract Modification No. 4 to the Existing Contract to be executed by their respective officers duly authorized on the date first written above.

EL DORADO NATIONAL (CALIFORNIA), INC.

By: _____
Signature

TONY WAYNE
Type or Print Name

1/29/18
Date

LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY

Philip A. Washington
Chief Executive Officer

By: _____
Elizabeth Hernandez
Principal Contract Administrator

1/31/18
Date

Los Angeles County Metropolitan Transportation Authority

Technical Specifications

(GROUP A - 40-FOOT CNG BUSES)
Contract Modification No. 4
(January 19, 2018)
Contract No.: OP28367-000

FORTY-FOOT (40') LOW FLOOR CNG BUS PROCUREMENT

November 10, 2017

VOLUME II OF II

Contents

SECTION 6: TECHNICAL SPECIFICATIONS 9
TS 1. Scope 9
TS 2. Definitions 9
TS 2.1 Abbreviations 16
TS 3. Referenced Publications 19
TS 4. Legal Requirements 19
TS 5. Overall Requirements 19
TS 5.1 Weight 19
TS 5.2 Capacity 19
TS 5.3 Service Life 19
TS 5.4 Maintenance and Inspection 20
TS 5.5 Interchangeability 20
TS 5.6 Training 21
TS 5.7 Operating Environment 29
TS 5.8 Noise 29
TS 5.9 Fire Safety 30
TS 5.10 Fire Suppression 30
TS 5.11 Gas Detection System (GDS) 31
TS 5.12 Respect for the Environment 31
TS 5.13 Water Leak Testing 31
TS 5.14 Fasteners and Securements 32
TS 6. Physical Size 33
TS 6.1 Bus Length 33
TS 6.2 Bus Width 33
TS 6.3 Bus Height 34
TS 6.4 Step Height 34
TS 6.5 Underbody Clearance 34
TS 6.6 Ramp Clearances 34
TS 6.7 Ground Clearance 34
TS 6.8 Floor Height 35
TS 6.9 Interior Headroom 35
TS 6.10 Aisle Width 35
TS 7. Power Requirements 36
TS 7.1 Top Speed 36
TS 7.2 Grade-ability 36
TS 7.3 Acceleration 36
TS 7.4 Operating Range 37
TS 8. Fuel Economy (Design Operating Profile) 38
TS 9. Engine (Near-zero 0.02 g/bhp NOx Engine Option?) 39
TS 9.1 Engine (CNG) 40
TS 9.2 Propulsion System (Electric) 41
TS 10. Cooling Systems 42
TS 10.1 Engine Cooling 43
TS 10.2 Charge Air Cooling 44
TS 10.3 Transmission Cooling 44
TS 10.4 Electric Drive System Cooling 45
TS 11. Transmission (Conventional Powertrain) 45
TS 12. Retarder (Transit Bus) 45
TS 13. Engine Brake (Commuter Bus) 46

TS 14. Mounting 46
TS 14.1 Service 46
TS 15. Hydraulic Systems 47
TS 15.1 Fluid Lines 48
TS 15.2 Fittings and Clamps 48
TS 15.3 Charge Air Piping 49
TS 16. Radiator 49
TS 17. Oil and Hydraulic Lines 49
TS 18. Fuel 49
TS 18.1 Fuel Lines 49
TS 18.2 Design and Construction 50
TS 19. Emissions and Exhaust 53
TS 19.1 Exhaust Emissions 53
TS 19.2 Exhaust System 53
TS 19.3 Exhaust After-treatment 53
TS 19.4 Particulate After-treatment 53
TS 20. General 53
TS 20.1 Design 53
TS 21. Altoona Testing 54
TS 21.1 Structural Validation 54
TS 22. Distortion 54
TS 23. Resonance and Vibration 54
TS 23.1 Engine Compartment Bulkheads 54
TS 23.2 Crashworthiness (Transit Bus) 54
TS 24. Corrosion 55
TS 25. Towing 55
TS 26. Jacking 56
TS 27. Hoisting 56
TS 28. Floor 57
TS 28.1 Design (Transit Bus) 57
TS 28.2 Design (Commuter Bus) 57
TS 28.3 Design (Articulated Transit Bus) 57
TS 28.4 Strength 57
TS 28.5 Construction 57
TS 28.6 Construction (Commuter Bus) 57
TS 29. Platforms 58
TS 29.1 Driver’s Area 58
TS 29.2 Driver’s Platform 58
TS 29.3 Farebox 58
TS 29.4 Rear Step Area to Rear Area (Transit Bus) 59
TS 30. Wheel Housing 59
TS 30.1 Design and Construction 59
TS 30.2 Design and Construction (Transit Bus) 59
TS 30.3 Articulated Joint (Articulated Transit Bus) 60
TS 30.4 Raceway (Articulated Transit Bus) 60
TS 30.5 Bellows 60
TS 31. Suspension 60
TS 31.1 General Requirements 60
TS 31.2 Alignment 60
TS 31.3 Springs and Shock Absorbers 60
TS 32. Wheels and Tires 61
TS 32.1 Wheels 61
TS 32.2 Tires 62
TS 33. Steering 62

TS 33.1 Steering Axle (Transit Bus) 62
TS 33.2 Steering and Tag Axles (Commuter Bus) 62
TS 33.3 Steering Wheel 62
TS 34. Drive Axle 63
TS 34.1 Non-Drive Axle 64
TS 35. Tag Axles (Commuter Coach) 64
TS 36. Turning Radius 64
TS 37. Brakes 65
TS 37.1 Service Brake 65
TS 37.2 Actuation 65
TS 37.3 Friction Material 65
TS 37.4 Hubs and Drums/Discs 65
TS 37.5 Hubs and Drums (Commuter Bus) 66
TS 37.6 Parking/Emergency Brake 66
TS 38. Interlocks (Transit Bus) 66
TS 38.1 Passenger Door Interlocks 66
TS 38.2 Lift Interlocks 67
TS 38.3 Kneel Interlocks 67
TS 38.4 Fuel System Interlocks 67
TS 39. Pneumatic System 68
TS 39.1 General 68
TS 39.2 Air Compressor 69
TS 39.3 Air Lines and Fittings 69
TS 39.4 Air Reservoirs 70
TS 39.5 Air System Dryer 70
TS 40. Overview 70
TS 40.1 Modular Design 71
TS 41. Environmental and Mounting Requirements 71
TS 41.1 Hardware Mounting 72
TS 42. General Electrical Requirements 72
TS 42.1 Batteries 72
TS 42.2 Grounds 75
TS 42.3 Low Voltage/Low Current Wiring and Terminals 75
TS 42.4 Electrical Components 76
TS 42.5 Electrical Compartments 77
TS 43. General Electronic Requirements 77
TS 43.1 Wiring and Terminals 77
TS 44. Multiplexing 78
TS 44.1 General 78
TS 44.2 System Configuration 78
TS 45. Data Communications 79
TS 45.1 General 79
TS 45.2 Drivetrain Level 79
TS 45.3 Multiplex Level 79
TS 45.4 Electronic Noise Control 80
TS 46. Driver’s Area Controls 80
TS 46.1 General 80
TS 46.2 Glare 81
TS 46.3 Visors/Sun Shades 81
TS 46.4 Driver’s Controls 82
TS 46.5 Normal Bus Operation Instrumentation and Controls 82
TS 46.6 Driver Foot Controls 87
TS 46.7 Brake and Accelerator Pedals 88
TS 46.8 Driver Foot Switches 88

TS 47. Driver's Amenities....88
TS 47.1 Coat Hanger....88
TS 47.2 Drink Holder....88
TS 47.3 Storage Box....89
TS 47.4 Repair Card Holder....89
TS 47.5 Safety Equipment....89
TS 47.6 Bus Registration Holders....89
TS 47.7 Trash Hooks....89
TS 48. Windshield Wipers and Washers....89
TS 48.1 Windshield Wipers....89
TS 48.2 Windshield Washers....89
TS 49. Driver's Seat....90
TS 49.1 Dimensions....90
TS 49.2 Seat Belt....91
TS 49.3 Adjustable Armrest....92
TS 49.4 Seat Control Locations....92
TS 49.5 Seat Structure and Materials....92
TS 49.6 Pedestal....92
TS 49.7 Seat Options....92
TS 49.8 Mirrors....92
TS 50. General....94
TS 51. Windshield....94
TS 51.1 Glazing....94
TS 52. Driver's Side Window....94
TS 53. Side Windows....95
TS 53.1 Configuration....95
TS 53.2 Emergency Exit (Egress) Configuration....95
TS 53.3 Configuration....96
TS 53.4 Materials....96
TS 53.5 Rear Window....96
TS 54. Capacity and Performance....96
TS 55. Controls and Temperature Uniformity....97
TS 55.1 Auxiliary Heater....98
TS 56. Air Flow....98
TS 56.1 Passenger Area....98
TS 56.2 Driver's Area....98
TS 56.3 Controls for the Climate Control System (CCS)....99
TS 56.4 Driver's Compartment Requirements....99
TS 56.5 Driver's Cooling....99
TS 57. Air Filtration....99
TS 58. Roof Ventilators....99
TS 59. Maintainability....100
TS 60. Entrance/Exit Area Heating....100
TS 61. Floor-Level Heating....100
TS 61.1 Transit Bus....100
TS 61.2 Commuter Bus....100
TS 62. Design....100
TS 62.1 Materials....100
TS 62.2 Roof-Mounted Equipment (Transit Bus)....101
TS 62.3 Curb Feelers....101
TS 63. Pedestrian Safety....101
TS 64. Repair and Replacement....101
TS 64.1 Side Body Panels (Transit Bus)....101
TS 64.2 Side Body Panels (Commuter Bus)....101

TS 65. Rain Gutters 101
TS 66. License Plate Provisions 101
TS 66.1 Rub rails 101
TS 67. Fender Skirts 102
TS 68. Wheel Covers (Transit Bus) 102
TS 68.1 Splash Aprons 102
TS 69. Service Compartments and Access Doors 102
TS 69.1 Access Doors (Transit Bus) 102
TS 69.2 Access Doors (Commuter Bus) 103
TS 69.3 Access Door Latch/Locks 103
TS 70. Bumpers 103
TS 70.1 Location 103
TS 70.2 Front Bumper 103
TS 70.3 Rear Bumper 103
TS 70.4 Bumper Material 104
TS 70.5 Bicycle Rack 104
TS 71. Finish and Color 104
TS 71.1 Appearance 104
TS 72. Decals, Numbering and Signing 105
TS 72.1 Passenger Information 105
TS 73. Exterior Lighting 105
TS 73.1 Backup Light/Alarm 106
TS 73.2 Doorway Lighting 106
TS 73.3 Turn Signals 106
TS 73.4 Headlights 106
TS 73.5 Brake Lights 107
TS 73.6 Service Area Lighting (Interior and Exterior) 107
TS 74. General Requirements 108
TS 75. Interior Panels 108
TS 75.1 Driver Area Barrier 108
TS 75.2 Modesty Panels 109
TS 75.3 Front End 110
TS 75.4 Rear Bulkhead 110
TS 75.5 Headlining 110
TS 75.6 Fastening 111
TS 75.7 Insulation 111
TS 75.8 Floor Covering 111
TS 75.9 Interior Lighting 112
TS 75.10 Passenger 112
TS 75.11 Driver’s Area 112
TS 75.12 Seating Areas (Transit Bus) 112
TS 75.13 Seating Areas (Commuter Bus) 112
TS 75.14 Vestibules/Doors (Transit Bus) 112
TS 75.15 Vestibules/Doors (Commuter Bus) 112
TS 75.16 Step Lighting 113
TS 75.17 Ramp Lighting (Transit Bus) 113
TS 75.18 Turntable Lighting (Articulated Bus) 113
TS 75.19 Farebox Lighting 113
TS 76. Fare Collection 113
TS 77. Interior Access Panels and Doors (Transit Bus) 114
TS 77.1 Floor Panels 114
TS 78. Passenger Seating 114
TS 78.1 Arrangements and Seat Style (Transit Bus) 114
TS 78.2 Rearward Facing Seats (Transit Bus) 115

TS 78.3 Turntable Seating (Articulated Bus) 115
TS 78.4 Padded Inserts/Cushioned Seats (Transit Bus) 115
TS 78.5 Seat back fitness 115
TS 78.6 Drain Hole in Seats 115
TS 78.7 Arrangements and Seat Style (Commuter Bus) 116
TS 78.8 Hip-to-Knee Room 116
TS 78.9 Foot Room 116
TS 78.10 Aisles (Transit Bus) 116
TS 78.11 Aisles (Commuter Bus) 116
TS 78.12 Dimensions (Transit Bus) 116
TS 78.13 Structure and Design (Transit Bus) 117
TS 78.14 Structure and Design (Commuter Bus) 118
TS 78.15 Construction and Materials (Transit Bus) 118
TS 78.16 Construction and Materials (Commuter Bus) 118
TS 79. Passenger Assists (Transit Bus) 119
TS 79.1 Assists (Transit Bus) 119
TS 79.2 Front Doorway 119
TS 79.3 Vestibule (Transit Bus) 119
TS 79.4 Rear Doorway(s) (Transit Bus) 120
TS 79.5 Overhead (Transit Bus) 120
TS 79.6 Longitudinal Seat Assists (Transit Bus) 120
TS 79.7 Wheel Housing Barriers/Assists (Transit Bus) 120
TS 80. Passenger Doors 121
TS 80.1 Transit Bus 121
TS 80.2 Commuter Bus 121
TS 80.3 Materials and Construction 121
TS 80.4 Dimensions 122
TS 80.5 Door Glazing 122
TS 80.6 Door Projection (Transit Bus) 123
TS 80.7 Door Height Above Pavement 123
TS 80.8 Closing Force 123
TS 80.9 Actuators 124
TS 80.10 Emergency Operation 124
TS 80.11 Door Control 124
TS 80.12 Door Controller 125
TS 80.13 Door Open/Close 125
TS 81. Accessibility Provisions 125
TS 81.1 Loading Systems 125
TS 81.2 Lift 125
TS 81.3 Loading System for 30 to 60-ft Low-Floor Bus 126
TS 81.4 Loading System for Level Boarding on a 45 to 60ft Low-Floor BRT 126
TS 81.5 Wheelchair Accommodations 126
TS 81.6 Interior Circulation 129
TS 82. Wheelchair Lifts (Commuter Bus) 129
TS 82.1 Lift 129
TS 82.2 Lift Door 129
TS 82.3 Lift Width 129
TS 82.4 Lighting Requirements 129
TS 82.5 Securement System 129
TS 82.6 Roof Ventilation/Escape Hatches 129
TS 83. Destination Signs 129
TS 84. Passenger Information and Advertising (Transit Bus) 131
TS 84.1 Interior Displays 131
TS 84.2 Exterior Displays 131

TS 85. Passenger Stop Request/Exit Signal 131
TS 85.1 Transit Bus 131
TS 85.2 Commuter Bus 132
TS 85.3 Signal Chime 132
TS 86. Communications 132
TS 86.1 Camera Surveillance System 133
TS 86.2 Public Address System 136
TS 86.3 Automatic Passenger Counter (APC) 136
TS 86.4 Radio Handset and Control System 136
TS 86.5 ITS Provisions Power Supply 137
TS 86.6 ITS Provisions Conduits 138
TS 86.7 Provisions, Automated Vehicle Announcement (AVA) System 139
TS 86.8 ITS Provisions, Wireless Local Area Network (WLAN) 139
TS 86.9 ITS Provisions, Radio Antennas 139
TS 86.10 ITS Provisions, Global Positioning System (GPS) 139
TS 86.11 ITS Provisions, IBSS 139
TS 87. Event Data Recorders 140
TS 88. Appendix 140
TS 88.1 Approved Equals 140
TS 88.2 Maintainability Requirements 141
TS 88.3 Technical Contract Deliverables 142
TS 88.4 Decals/Signs 143
TS 88.5 References 147
TS 88.6 Holders 148

SECTION 6: TECHNICAL SPECIFICATIONS

GENERAL (TS 1-TS 5)

TS 1. Scope

These technical specifications contain the LACMTA's requirements for wheelchair accessible low floor transit buses, which accommodate the widest spectrum of passengers including children, adults, the elderly, and the physically disabled, conforming to all applicable ADA regulations. These buses shall provide maximum passenger appeal in appearance, comfort, and safety; combined with excellence in operating characteristics, standardization with existing LACMTA fleet, economy of operation, maximum efficiency, optimum seating, and conformity with federal, state and local regulations and emission standards. Buses shall include interior and exterior styling features in common with existing Metro BRT type buses such as streamlined appearance. These buses shall incorporate a high level of subsystem integration coordinated with central diagnostic functions and single point Operator interface. Buses shall have a minimum expected life of 12 years or 500,000 miles, whichever comes first. Refer to Table 17 for design life goals.

Metro will consider and evaluate proposals of Zero Emission (ZE) buses that meet legal, dimensional, maintainability and performance requirements outlined in this document. Vendors proposing electric buses for consideration should also include a list of any specialty equipment used for fueling and/or recharging vehicle, any specialty support and/or diagnostic equipment, and any other unique equipment that will be necessary to support daily operation of the vehicle. Any specialty equipment required to support the ZEB project should be itemized and listed along with estimated installation costs as part of each Contractor's proposal. Any ZE buses proposed in response to this solicitation shall meet CARB's definition for zero emission buses.

These technical specifications have been prepared with emphasis on in-service reliability. The basic structure of the bus including major suspension components shall be designed to last the life of the bus without major overhaul or replacement.

Wherever brand, manufacturer or product names are indicated in the Technical Specification, they are included for the purpose of establishing identification and a general description of the Goods, Equipment, Components or parts. Wherever such names appear, the term "OR APPROVED EQUAL" is deemed to follow. The decision whether a proposed Item is an approved equal will be rendered by LACMTA as defined by Contract SP-34 Non-Restrictive Clauses.

TS 2. Definitions

Ackerman Geometry: A geometric arrangement of linkages in the steering of a vehicle designed to solve the problem of wheels on the inside and outside of a turn needing to trace out circles of different radii. The intention of Ackermann geometry is to avoid the need for tires to slip sideways when following the path around a curve.

Alternative: An alternative specification condition to the default bus configuration. LACMTA may define alternatives to the default configuration to satisfy local operating requirements. Alternatives for the default configuration will be clearly identified.

Ambient Temperature: The temperature of the surrounding air. For testing purposes, ambient temperature must be between 16°C (50°F) and 38°C (100°F).

Analog Signals: A continuously variable signal that is solely dependent upon magnitude to express information content.

Aspect Ratio: The ratio of height to width of a character.

Audible Discrete Frequency: An audible discrete frequency is determined to exist if the sound power level in any 1/3-octave band exceeds the average of the sound power levels of the two adjacent 1/3-octave bands by four decibels (dB) or more.

Auxiliary Power System: Provides single or three phase power for functions other than propulsion.

Battery: One or more electrochemical cells that convert stored chemical energy into electricity.

Battery Compartment: Low-voltage energy storage, i.e. 12/24 VDC batteries.

Battery Management System (BMS): Monitors energy, as well as temperature, cell or module voltages, and total pack voltage. The BMS adjusts the control strategy algorithms to maintain the batteries at uniform state of charge and optimal temperatures.

Braking Resistor: Device that converts electrical energy into heat, typically used as a retarder to supplement or replace the regenerative braking.

Burst Pressure: The highest pressure reached in a container during a burst test.

Capacity (fuel container): The water volume of a container in gallons (liters).

Cells: Individual components (i.e., battery or capacitor cells).

Code: A legal requirement.

Combination Gas Relief Device: A relief device that is activated by a combination of high pressures or high temperatures, acting either independently or together.

Composite Container for Compressed Gas: A container fabricated of two or more materials that interact to facilitate the container design criteria.

Compressed Natural Gas (CNG): Mixtures of hydrocarbon gases and vapors consisting principally of methane in gaseous form that has been compressed for use as a vehicular fuel.

Container: A pressure vessel, cylinder or cylinders permanently manifold together, used to store compressed gas.

Container Appurtenances: Devices connected to container openings for safety, control or operating purposes.

Container Valve: A valve connected directly to a container outlet.

Curb Weight: Weight of vehicle, including maximum fuel, oil and coolant; and all equipment required for operation and required by this Specification, but without passengers or driver.

dBA: Decibels with reference to 0.0002 microbar as measured on the “A” scale.

DC to DC Converter: A module that converts a source of direct current from one voltage level to another.

Default Configuration Bus: The bus described if no alternatives are selected. Signing, colors, the destination sign reading list and other information must be provided by the LACMTA.

Defueling: The process of removing fuel from a tank or container.

Defueling Port: Device that allows for vehicle defueling, or the point at which this occurs

Design Operating Profile: The anticipated design requirements are based on LACMTA's operating environment for LACMTA's service area and as designed in TS 5.7. Specific characteristics include; "CBD type" urban heavy-duty duty-cycle, high passenger loading, five to 100 percent relative humidity, temperature range of -10°F to 120°F, and elevation range of 200 feet below sea level to 3,000 feet above sea level.

Destroyed: Physically made permanently unusable.

Discrete Signal: A signal that can take only pre-defined values, usually of a binary 0 or 1 nature, where 0 is battery ground potential and 1 is a defined battery positive potential.

Driver's Eye Range: The 95th-percentile ellipse defined in SAE Recommended Practice J941, except that the height of the ellipse shall be determined from the seat at its reference height.

Duty Cycle: A service cycle that utilizes only the CBD portion of the FTA ADB heavy-duty transit Vehicle cycle. The CBD portion shall be further modified to add 20 minutes of idle time.

Electric: A vehicle that uses one distinct power sources to propel the vehicle.

Electric System Controller (ESC): Regulates energy flow throughout electric system components in order to provide motive performance and accessory loads, as applicable, while maintaining critical system parameters (voltages, currents, temperatures, etc.) within specified operating ranges.

Electric Drive System (EDS): The mechanical and/or electromechanical components, including traction motors and energy storage system, which comprise the traction drive portion of the electric propulsion system.

Electronic Parts Catalog (EPC): Digital versions of the illustrated parts catalog that can upload into Metro's Enterprise Asset Management (EAM) or Enterprise Resource Planning (ERP) systems.

Energy Density: The relationship between the weight of an energy storage device and its power output in units of watt-hours per kilogram (Wh/kg).

Energy Storage System (ESS): A component or system of components that stores energy and for which its supply of energy is rechargeable by the on-vehicle system (engine/regenerative braking/ generator) or an off-vehicle energy source.

Engine Package: Complete engine assembly incorporating accessories necessary for operation as applicable. Package shall include at a minimum; turbocharger(s), supercharger(s), electronic control modules, manifolds, throttle body, starter, air compressor, hydraulic pump and engine mounted filters.

Extended Warranty: Warranties that extend past the minimum warranty periods defined in the warranty requirements.

Failures Classifications are listed below**.**

- **Class 1 Failure (Physical Safety):** A failure that could lead directly to passenger, bus operator or other injury and/or results in a crash.
- **Class 2 Failure (Road Call):** A failure resulting in an interruption of service. Passengers are removed from the bus at the point of failure; the bus is unable to continue in revenue service. Service is discontinued until the bus is replaced or repaired at the point of failure.
- **Class 3 Failure (Bus Change):** A failure that requires removal of the bus from service during its assignments. The bus is operable to a rendezvous point but cannot be used in passenger service until repairs are made.
- **Class 4 Failure (Bad Order):** A failure not related to safety that degrades the operation of the bus but does not require the bus's removal from service.

Fill Pressure for Compressed Gas: The pressure attained at the actual time of filling. Fill pressure varies according to the gas temperatures in the container, which are dependent on the charging parameters and the ambient conditions. The maximum dispensed pressure shall not exceed 125 percent of service pressure.

Fireproof: Materials that will not burn or melt at temperatures less than 2000 °F.

Fire Resistant: Materials that have a flame spread index less than 150 as measured in a radiant panel flame test per ASTM-E 162.

Firewall: A fire resistant barrier designed to slow the spread of fire for a prescribed period of time.

Flow Capacity: For natural gas flow, this is the capacity in volume per unit time (normal cubic meters/minute or standard cubic feet per minute) discharged at the required flow rating pressure.

Free Floor Space: Floor area available to standees, excluding the area under seats, area occupied by feet of seated passengers, the vestibule area forward of the standee line, and any floor space indicated by manufacturer as non-standee areas such as, the floor space "swept" by passenger doors during operation. Floor area of 1.5 sq. ft. shall be allocated for the feet of each seated passenger that protrudes into the standee area.

Fuel Cell: A device that converts the chemical energy from a fuel into electricity through a chemical reaction with oxygen and another oxidizing agent.

Fuel Line: The pipe, tubing or hose on a vehicle, including all related fittings, through which natural gas passes.

Fuel Management System: Fuel system components that control or contribute to engine air fuel mixing and metering, and the ignition and combustion of a given air-fuel mixture. The fuel management system would include, but is not limited to, reducer/regulator valves, fuel metering equipment (e.g. carburetor, injectors), sensors (e.g., main throttle, waste gate).

Fusible Material: A metal, alloy or other material capable of being melted by heat.

Gross Axle Weight Rating (GAWR): The maximum total weight as determined by the axle manufacturer, at which the axle can be safely and reliably operated for its intended purpose.

Gross Load: 150 pounds for every designed passenger seating position, for the driver, and for each 1.5 sq.-ft. of free floor space.

Gross Vehicle Weight (GVW): Curb weight plus gross load.

Gross Vehicle Weight Rating (GVWR): The maximum total weight as determined by the vehicle manufacturer, at which the vehicle can be safely and reliably operated for its intended purpose.

Hazardous Voltage: Greater than 50 volts (AC and DC).

Head Injury Criteria (HIC): The following equation presents the definition of head injury criteria:

$$\left[\frac{1}{t_1 - t_2}\int_{-t1}^{t_2}(a)dt\right]^{2.5}(t_2 - t_1)$$

Where a = the resultant acceleration at the center of gravity of the head form expressed as a multiple of g, the acceleration of gravity. t_1 and t_2 = any two points in time during the impact.

High Pressure: Those portions of the CNG fuel system exposed to full container or cylinder pressure.

High Voltage (HV): Greater than 600 volts (AC and DC).

High Voltage Charger: Regulated DC supply used to charge the propulsion battery pack.

Hose: Flexible line.

Illustrated Parts Catalog (IPC): A series of assemblies and sub-assemblies that combine into a parts manual with sections. Metro recognizes that a complete illustrated part catalog includes component breakdown in a disassembly sequence and their illustrations.

Intermediate Pressure: The portion of a CNG system after the first pressure regulator, but before the engine pressure regulator. Intermediate pressure on a CNG vehicle is generally from 3.5 to 0.5 MPa (510 to 70 psi).

Inverter: A module that converts DC to and from AC.

Jerk: The rate of change of acceleration shall be minimized throughout the acceleration/deceleration range and shall not be greater than 15.5 mph/sec/sec (0.3g/sec).

Labeled: Equipment or materials to which has been attached a label, symbol or other identifying mark of an organization, which is acceptable to the authority having jurisdiction and concerned with product evaluation, which maintains periodic inspection of production labeled equipment or materials, and by labeling, the manufacturer indicates compliance with appropriate standards or performance in a specified manner.

Leakage: Release of contents through a Defect or a crack. See *Rupture*.

Line: All tubes, flexible and hard, that carry fluids.

Liner: Inner gas-tight container or gas container to which the overwrap is applied.

Local Regulations: Regulations below the state level.

Low-Floor Bus: A bus that, between at least the front (entrance) and rear (exit) doors, has a floor sufficiently low and level so as to remove the need for steps in the aisle between the doors and in the vicinity of these doors.

Low Voltage (LV): 50 volts or less (AC and DC).

Low Voltage Generation: Provides 12 or 24 volt DC to properly charge and maintain the charge on low voltage batteries as well as provide power for a variety of bus systems including; lighting, multiplex and other control modules.

Lower Explosive Limit: The lowest concentration of gas where, given an ignition source, combustion is possible.

Maintenance Personnel Skill Levels: Defined below are the LACMTA's maintenance personnel skill levels:

- **3M:** LACMTA Mechanic

- **2M:** Bus Service Attendant

Master Run Switch: Rotary four-position switch controlling the following functions:

- **Off:** All systems off
- **Day Run:** All electrical systems and engine on except; headlights, parking lights, and marker lights
- **Night Run:** All electrical systems and engine on including; headlights, parking lights, marker lights, and interior light system
- **Night Park**: Same as "Off" except that marker lights, destination signs, parking lights, curbside interior lights, and instrument panel lights are on

Maximum Service Temperature: The maximum temperature to which a container/cylinder will be subjected in normal service.

Metallic Hose: A hose whose strength depends primarily on the strength of its metallic parts; it can have metallic liners or covers, or both.

Metering Valve: A valve intended to control the rate of flow of natural gas.

Module: An assembly of individual components.

Motor (Electric): A device that converts electrical energy into mechanical energy.

Motor (Traction): An electric motor used to power the driving wheels of the bus.

Operating Pressure: The varying pressure developed in a container during service.

Physical Layer: The first layer of the seven-layer International Standards Organization (ISO) Open Systems Interconnect (OSI) reference model. This provides the mechanical, electrical, functional and procedural characteristics required to gain access to the transmission medium (e.g., cable) and is responsible for transporting binary information between computerized systems.

Pipe: Nonflexible line.

Power: Work or energy divided by time.

Power Density: Power divided by mass, volume or area.

Pressure Relief Device (PRD): A pressure and/or temperature activated device used to vent the container/cylinder contents and thereby prevent rupture of an NGV fuel container/cylinder, when subjected to a standard fire test as required by fuel container/cylinder standards.

Propulsion Power Assembly (PPA): System that provides propulsion for the vehicle proportional to operator commands. Includes; engine, transmission, cooling and other applicable systems (See SP-01).

Primary Power Unit (PPU): System that provides propulsion power for the vehicle proportional to operator commands. Includes; controllers, energy conversion, electric drive, cooling and other applicable systems (See SP-01).

Radiator Package: Complete system with accessories necessary for operation. Package shall include at a minimum; heat exchanger(s), cooling fan(s), electronic controller(s) with diagnostic communications and alternator if applicable.

Real-Time Clock (RTC): Computer clock that keeps track of the current time.

Regenerative Braking: Deceleration of the bus by switching motors to act as generators, which return vehicle kinetic energy to the energy storage system.

Rejectable Damage: In terms of NGV fuel containers/cylinders, this is damage as outlined in CGA C-6.4, "Methods for External Visual Inspection of Natural Gas Vehicle Fuel Containers and Their Installations," and in agreement with the manufacturer's recommendations.

Response Time: Response times shall be measured from the activation or deactivation of the accelerator or brake pedal to the initial response of an on-board accelerometer measuring longitudinal Bus acceleration. Response times for power to brake, brake to power, coast to power and coast to brake shall be no greater than 0.20 seconds.

Retarder: Device used to augment or replace some of the functions of primary friction based braking systems of the bus.

Rupture: Sudden and unstable damage propagation in the structural components of the container resulting in a loss of contents. See *Leakage*.

Seated Load: 150 pounds for every designed passenger seating position and for the driver.

SLW (Seated Load Weight): Curb weight plus seated load.

Serial Data Signals: A current loop based representation of ASCII or alphanumeric data used for transferring information between devices by transmitting a sequence of individual bits in a prearranged order of significance.

Service Life: The Bus shall be designed to operate in transit service at least 40,000 miles per year for 12 years or 500,000 miles.

Service Pressure: The settled pressure at a uniform gas temperature of 21°C (70°F) and full gas content. It is the pressure for which the equipment has been constructed, under normal conditions. Also referred to as the nominal service pressure or working pressure.

Settled Pressure: The gas pressure when a given settled temperature, usually 21°C (70°F), is reached.

Settled Temperature: The uniform gas temperature after any change in temperature caused by filling has dissipated.

Simplified Technical English (STE): A set of writings rules that guide non-English speaking technician writers. Four steps are used to establish a simplified technical dictionary:

- Keyword
- Approved meaning
- Approved example
- What is not approved (sample sentences)

Solid State Alternator: A module that converts high-voltage DC to low-voltage DC (typically 12/24 volt systems).

Sources of Ignition: Devices or equipment that because of their modes of use or operation, are capable of providing sufficient thermal energy to ignite flammable compressed natural gas-air mixtures when introduced into such a mixture, or when such a mixture comes into contact with them.

Special Tools: Tools not normally stocked by the LACMTA.

Specification: A particular or detailed statement, account or listing of the various elements, materials, dimensions, etc. involved in the manufacturing and construction of a product.

Standard: A firm guideline from a consensus group.

Standards: Standards referenced in "Technical Specifications" are the latest revisions unless otherwise stated.

Standee Line: A line marked across the bus aisle to designate the areas that passengers may not occupy when the bus is moving.

State of Charge (SOC): Quantity of electric energy remaining in the battery relative to the maximum rated amp-hour (Ah) capacity of the battery expressed in a percentage. This is a dynamic measurement used for the energy storage system. A full SOC indicates that the energy storage system cannot accept further charging from charging device or the regenerative braking system.

Stress Loops: The "pigtails" commonly used to absorb flexing in piping.

Structure: The basic body, including floor deck material and installation, load-bearing external panels, structural components, axle mounting provisions and suspension beams and attachment points.

Tamper Resistant: Fasteners or components that cannot be easily removed or modified using pocket knives, coins, or other similar items commonly carried by passengers.

Thermally Activated Gas Relief Device: A relief device that is activated by high temperatures and generally contains a fusible material.

Vestibule: Area in front of the standee line, including Operator's area.

Wheelchair: A mobility aid belonging to any class of three- or four-wheeled devices, usable indoors, designed for and used by individuals with mobility impairments, whether operated manually or powered. A "common wheelchair" is such a device that does not exceed 30 inches in width and 48 inches in length measured two inches above the ground, and does not weigh more than 600 pounds. when occupied.

Wheelchair Ramp: A device for allowing ingress and egress of persons or wheelchairs between ground or curb level and the floor level of the bus. The terms "wheelchair ramp" and "ramp" are used interchangeably in this specification.

Zero Emission Bus, (ZEB): A bus meeting California Air Resources Board zero emission standard.

TS 2.1 Abbreviations

Abbreviation and Acronyms

A/C	air conditioning
ABS	anti-lock braking system
AC	alternating current
ACQ	alkaline copper quaternary
ADA	Americans with Disabilities Act
AFSS	automatic fire suppression system
Ah	amp hour
ALR	auto-locking retractor
ANSI	American National Standards Institute
APA	The Engineered Wood Association, formerly the American Plywood Association
APC	Automatic Passenger Counter
APTA	American Public Transportation Association

ASHRAE	American Society of Heating, Refrigerating, and Air Conditioning Engineers
ASTM	ASTM International, formerly the American Society for Testing and Materials
ATC	Automatic Traction Control
ATMS	Advanced Transportation Management System
AVA	Automated Voice Annunciation
AVL	Automatic Vehicle Location
AWG	American Wire Gauge
AWS	American Welding Society
BAFO	Best and Final Offer
BMCS	Bureau of Motor Carrier Safety
BMS	Battery Management System
BRT	Bus Rapid Transit
CALOSHA	California Occupational Safety and Health Administration
CAL TITLE 13	California Code of Regulations, Title 13, Motor Vehicle Code
CAN	Controller Area Network
CARB	California Air Resources Board
CBD	Central Business District
CCS	climate control system
CCTV	closed-circuit television
cfm	cubic feet per minute
CGA	Compressed Gas Association
CNG	compressed natural gas
CSA	Canadian Standards Association
dB	decibel
DBE	disadvantaged business enterprise
DC	direct current
DDU	driver display unit
DEF	diesel exhaust fluid
DOT	Department of Transportation
DPF	diesel particulate filter
ECM	engine control and monitoring
ECS	emission control system
ELR	emergency locking retractor
EMI	electromagnetic interference
EPA	Environmental Protection Agency
ESS	energy storage system
FEA	finite element analysis
FEMA	failure mode effects analysis
FM	Factory Mutual
FMCSA	Federal Motor Carrier Safety Administration
FMCSR	Federal Motor Carrier Safety Regulations
FMVSS	Federal Motor Vehicle Safety Standards
Ft.	foot or feet
FTA	Federal Transit Administration
GAWR	gross axle weight rating
GPS	global positioning system
GVW	gross vehicle weight
GVWR	gross vehicle weight rating
H-point	hip-point
EDS	electric drive system
HMI	human-machine interface
ESC	electric system controller
HV	high voltage
HVAC	heating, ventilation and air conditioning

IBSS	Incident Based Surveillance System
I/O	input/output
IEEE	Institute of Electrical and Electronics Engineers
In.	inch or inches
ISO	International Standards Organization
LAN	local area network
lb.	pound
lbs.	pounds
LCD	liquid crystal display
LED	light emitting diode
LEL	lower explosive limit
LV	low voltage
mA	milliampere
MDT	mobile data terminal
MPa	mega-Pascal
MTTF	mean time to fix
NC	normally closed
NFPA	National Fire Protection Association
NGV	natural gas vehicle
NOx	nitrogen oxide
NO	normally open
NTP	notice to proceed
OCU	operator control unit
OEM	original equipment manufacturer
OSI	Open Systems Interconnect
PA	public address system
PMO	project management oversight
PPA	propulsion power assembly
PPU	primary propulsion unit or prime power unit
PPV	price per vehicle
PRD	pressure relief device
psia	**pounds per square inch absolute**
psi	pounds per square inch
RF	radio frequency
RFI	radio frequency interference
rms	**root mean square**
RTC	real-time clock
SAE	SAE International, formerly the Society of Automotive Engineers
SAS	silent alarm system
scf	standard cubic feet
scfm	**standard cubic feet a minute**
SLW	seated load weight
SOC	state of charge
SPI	Society of the Plastics Industry
UFS	Universal Fare System
UL	Underwriters Laboratories
UNECE	United Nations Economic Commission for Europe
USDHEW	United State Department of Health, Education, and Welfare
V	volt or volts
VAC	volt or volts AC
VDC	volts of direct current
Wh	watt-hours
VIN	vehicle information number
ZEB	zero emission bus

TS 3. Referenced Publications

The documents or portions thereof referenced within this specification shall be considered part of the requirements of the specification. The edition indicated for each referenced document is the current edition, as of the date of the LACMTA issuance of this specification.

TS 4. Legal Requirements

The Contractor shall comply with all applicable federal, state and local regulations. These shall include but not be limited to ADA, as well as state and local accessibility, emissions, safety and security requirements. Local regulations are defined as those below the state level.

Buses shall meet all applicable FMVSS and shall accommodate all applicable FMCSR regulations in effect at location of the LACMTA and the date of manufacture.

In the event of any conflict between the requirements of these specifications and any applicable legal requirement, the legal requirement shall prevail. Technical requirements that exceed the legal requirements are not considered to conflict.

TS 5. Overall Requirements

The Contractor shall ensure that the application and installation of major bus subcomponents and systems are compliant with all such subcomponent vendors' requirements and recommendations. Contractor and LACMTA shall identify subcomponent vendors that shall submit installation/application approval documents, (including necessary documents and/or diagrams to verify configuration), with the completion of the Pilot and First Article Bus. Components used in the vehicle shall be of heavy-duty design and proven in transit service.

The Contractor shall submit to LACMTA the life expectancy of specified components in LACMTA's revenue service and duty cycle per the attached list I Life Cycle Cost Submittal Form. The projected life expectancy shall be based upon actual in-service experience wherever practical. If in-service data is not available, the projected life expectancy shall be based upon durability testing utilizing the best applicable industry practices as may be promulgated by such organizations as SAE, ANSI, ASTM or other acknowledged industry organizations.

Without exception, all technical information, drawings, nameplates, etc. shall be written in the English language. For all means of communications, i.e., letters, cables, telephone conversations, meetings, etc., the English language shall be used. The English System of units shall be used in connection with this Contract.

TS 5.1 Weight

It shall be a design goal to construct each bus as light in weight as possible without degradation of safety, appearance, comfort, traction or performance.

Buses at a capacity load shall not exceed the tire factor limits, brake test criteria or structural design criteria.

The Contractor shall submit a certified weight slip for the curb weight of each axle as well as the total curb weight of each bus upon delivery.

TS 5.2 Capacity

The vehicle shall be designed to carry the gross vehicle weight, which shall not exceed the bus GVWR.

TS 5.3 Service Life

The minimum useful design life of the bus in transit service shall be at least 12 years or 500,000 miles. It shall be capable of operating at least 40,000 miles per year, including the 12th year.

TS 5.4 Maintenance and Inspection

Scheduled maintenance tasks shall be related and shall be grouped in maximum mileage intervals. Scheduled maintenance actions such as filter or belt replacements and other adjustments shall not be required at intervals of less than 6,000 miles except for routine daily service performed during fueling operations. Higher levels of scheduled maintenance tasks shall occur at even multiples of not less than 6,000 miles.

Test ports, as required, shall be provided for commonly checked functions on the bus, such as air intake, exhaust, hydraulic, pneumatic, brakes, charge-air and engine cooling systems.

The bus manufacturer shall give prime consideration to the routine problems of maintaining the vehicle. All bus components and systems, both mechanical and electrical, which will require periodic physical work or inspection processes, shall be installed so that a minimum of time is consumed in gaining access to the critical repair areas. To the extent practical, disconnection or removal of components unrelated to a specific maintenance and/or repair task shall be unnecessary. It shall not be necessary to disassemble portions of the Bus structure and/or equipment such as seats and flooring under seats in order to gain access to these areas. Relative accessibility of components, measure in time to gain access, shall be prioritized for items requiring more frequent service.

Bus shall be designed to facilitate the disassembly, reassembly, servicing or maintenance, using tools and equipment that are normally available as standard commercial items. Bus design shall include features that maximize the intervals between scheduled service requirements for major bus systems while minimizing service time needed to perform the preventative maintenance work. Design goal shall be to minimize diagnostic time required for major bus systems repair.

Requirements for the use of unique specialized tools will be minimized. The body and structure of the Bus shall be designed for ease of maintenance and repair. Individual panels or other equipment that may be damaged in normal service shall be repairable or replaceable. Ease of repair shall be related to the vulnerability of the item to damage in service.

Contractor shall provide a list of all special tools and pricing required for maintaining this equipment. Said list shall be submitted as a supplement to Form PF-3-Schedule B of Prices Special Tools.

> **NOTE:** Tools such as compartment door keys, bellows gauges and other tools that are required for daily maintenance and inspections shall not be included in the special tool list and shall be furnished for each bus.

TS 5.5 Interchangeability

Unless otherwise agreed, all units and components procured under this Contract, whether provided by Suppliers or manufactured by the Contractor, shall be duplicates in design, manufacture and installation to ensure interchangeability among buses in each order group in this procurement. This interchangeability shall extend to the individual components as well as to their locations in the buses. These components shall include, but are not limited to, passenger window hardware, interior trim, lamps, lamp lenses and seat assemblies. Components with non-identical functions shall not be, or appear to be, interchangeable.

Any one component or unit used in the construction of these buses shall be an exact duplicate in design, manufacture and assembly for each bus in each order group in this Contract. Contractor shall identify and secure approval for any changes in components or unit construction provided within a Contract.

In the event that the Contractor is unable to comply with the interchangeability requirement, the Contractor must notify the LACMTA and obtain the LACMTA's prior written approval, including any changes in pricing.

LACMTA shall review proposed product changes on a case-by-case basis and shall have the right to require extended warranties to ensure that product changes perform at least as well as the originally supplied products.

TS 5.6 Training

The Contractor shall have one or more qualified instructors who shall be available at the LACMTA between the hours of 7:00 a.m. and 5:00 p.m. during the period immediately after acceptance of the Pilot Bus. Contractor provided Instructor(s) shall conduct regular and "train the trainer" type classes, for various size groups, to advise LACMTA trainers and mechanics on the proper operation and maintenance of equipment. Training shall be provided throughout the Contract period up to the conclusion of the initial Warranty period for the Option Buses, one (1) year following receipt of the final bus.

Base Order Buses

The Contractor shall provide pricing for up to 1,000 Instructor class-room hours with the bus order. The LACMTA shall approve the proposed trainers and their qualifications, proposed subjects and scheduling of the classes conducted by the Contractor at the time of Pilot Bus review. Training shall be provided throughout the Contract period up to the conclusion of the initial Warranty period following receipt of the final Bus.

Option Order Buses

For each Option order, Contractor shall also be required to provide Instructor training. The quantity of training hours shall be determined by the quantity of Option Buses ordered and shall be equal to five hours of training per Option Bus up to a maximum of 500 instructor class-room hours for each Option order. The LACMTA may elect to reduce the amount of training required for the Option orders. The LACMTA shall approve the proposed trainers and their qualifications, proposed subjects and scheduling of the classes conducted by the Contractor.

TS 5.6.1 Training Curriculum

The Contractor shall develop and submit a training curriculum using the most current version Microsoft Office Word and/or Power Point, subject to LACMTA approval. The curriculum will be discussed during Pre-Production meetings and submitted to the LACMTA no later than 30 days prior to delivery of the Pilot Bus. The curriculum shall be designed specifically for the LACMTA Bus order and shall cover all major systems ordered on the buses including, but not limited to:

- Engine/Propulsion System
- Transmission/Electric Drive
- HVAC System
- Electrical Systems
- Electronic Controls and Sub-systems
- Special Equipment (Fire and Gas Detection, Operator's seats etc.)
- ABS Brake System
- Steering and Suspension
- Pneumatic System
- Passenger Door/Wheelchair ramp system
- Fuel/Battery system and delivery
- Maintenance Bus Orientation
- Operator Bus Orientation
- Security Camera System
- Bus Defueling Procedures
- Engine/Propulsion Cooling System
- Electronic Cooling System
- PPU
- Energy Storage System (including BMS)
- Automatic Passenger Counter

TS 5.6.2 Teaching Materials

The Contractor shall provide to the LACMTA Maintenance Instruction Department visual and other teaching materials as needed during classroom instruction. Teaching materials shall be subject to LACMTA approval. Typical teaching materials include items such as; printed technical literature, training modules, service training and operating manuals, slides, DVD presentations, overhead presentations, etc.

TS 5.6.3 Optional Training Aids

The items in this section are discretionary and may be purchased through this contract, subject to LACMTA approval.

Special Training Aids

The Contractor shall supply pricing for items a through k, special training aids, as listed below for use by LACMTA training staff. Pricing for these aids is to be provided to the LACMTA on Form PF-5-Schedule D of Prices Training Aids. The Special Training aids are to be provided not later than the delivery date for the first production Bus.

System Simulation Training Boards must be designed to imitate a described bus system and shall be mounted vertically on a sturdy roll around frame. Simulation Boards can be approximately three- foot by six foot and in no case larger than four feet by eight feet. Boards shall not be taller than 7 feet to enable the training boards to pass through doors. Simulation boards shall be provided with a 120 VAC power cord. The use of actual Bus components for simulation is desired; however, extremely bulky or heavy items such as large fan motors, A/C compressor, starter, alternators, engine controls, transmission controls, doors, and other similar devices may be smaller or modeled.

a) **One complete running engine and transmission assembly -** Including cooling and fueling systems, mounted on a suitable roll around stand.
b) **One complete static transmission assembly** - For visual purposes, mounted on a roll around stand with considerable cut-away sections that improve visibility and insight into the operation of the transmission.
c) **One complete static front axle assembly** - For visual purposes, mounted on a roll around stand with considerable cut-away sections that improve visibility and insight into the operation of the front axle assembly.
d) **One complete static rear axle assembly** - For visual purposes, mounted on a roll around stand with considerable cut-away sections that improve visibility and insight into the operation of the rear axle assembly.
e) **ATECH Electrical Training Board Kits** - General electrical training. Kit to include GM Specialized Electronic Trainer, Guide Book, four resistors, dual filament light, blank board and horn.

System Simulation Training Boards:

f) **Anti-Lock Brake / Air Brake Board -** Fully functional ABS training board. Bendix design bus disc brake air system training board with all air valve and electrical instrumentation.
g) **Electric Air Conditioning Training Simulator Module -** A/C system training board to highlight new system products. Board must be fully functional and shall be made to give mechanics a general perspective of A/C and heating components. Module should be similar to what is used during APTA bus Roadeo competitions.
h) **Fire Suppression -** One complete bus set of equipment on display board of fire and gas detection system
i) **Video Security System** – One complete bus set of equipment for training simulator including all cameras, DVR and the monitor system.
j) **Destination Sign –** One complete bus set of equipment for training simulator including all signs, cables and controller.

k) **Multiplex Electrical Training Board -** A mock-up board, where key components including all functioning switches, modules, lights, diagnostic ports, and diagnostic switches are replicated on a functional model, shall be provided as a tool for diagnostic, design verification and training purposes.

E-Learning/Interactive Training Media

The Contractor shall provide pricing for 25 hours of CNG/Electric Bus interactive learning seat time to LACMTA on Form PF-5 Schedule D of Prices, Training Aids. The media shall provide a high level of student interactivity, including but not limited to: questions review, component identification, tool use, circuit building, component testing. The 25 hours shall be broken down as follows:

TABLE 1

E-Learning Media Hours

CNG Bus			Electric Bus		
Module #	System	Hrs.	Module #	System	Hrs.
Module 1	Engine and Transmission	6	Module 1	Safety Procedures	1
Module 2	Electrical System	3	Module 2	Powertrain	4
Module 3	Vehicle Multiplex System	3	Module 3	Electrical System	4
Module 4	HVAC System	2	Module 4	Vehicle Multiplex System	3
Module 5	Brake, Axles, and Air System	4	Module 5	HVAC System	2
Module 6	CNG Fuel System	2	Module 6	Brake, Axles, and Air System	4
Module 7	Entrance/Exit Doors	2	Module 7	PM Procedures	2
Module 8	Cooling System	1	Module 8	Entrance/Exit Doors	2
Module 9	Wheelchair Ramp	1	Module 9	Cooling System	1
Module 10	Towing and Recovery	1	Module 10	Wheelchair Ramp	1
			Module 11	Towing and Recovery	1

Each module shall include: introduction, component operation, component testing, system diagnosis, and diagnostic software/tool use. The content in each module shall be presented with the following breakdown: video content (5-10 percent), slide content with V/O (40-45 percent), student interactivity (45 percent), skills assessment (5 percent). All modules shall have LA Metro branding and a full electronic text student handout. All handouts shall be in MS Word and editable.

The content shall be delivered via DVD, ready for installation and operational on any platform including Microsoft, MAC and Android. All content shall be developed using HTML5 programming and optimized for web browsing. All content shall be navigated through an industry standard e-learning programs graphical user interface (GUI) subject to LACMTA approval.

TS 5.6.4 Manuals

Manual Review and Approval

The Contractor shall be solely responsible for the accuracy and completeness of the manuals and the conversion of the Parts manual into Electronic Parts Catalog (EPC). The LACMTA will assemble a technical review committee to define acceptance criteria of the manuals deliverables, quality standards, file formats, expected results and the testing methods to be used. The Contractor shall put together a team with the technical capabilities to successfully complete these deliverables to LACMTA's satisfaction.

The Contractor will be required to participate in Manual Review and Approval process and attend one service manual review meeting held at the LACMTA shortly following LACMTA Notice to Proceed. Except for the Parts Index, the draft manuals shall be shipped simultaneously with the first Pilot Bus. The final meeting will be scheduled after receipt of draft manuals but prior to the ship date of the first Production Bus.

Draft Manuals

Except for the Parts Index, the Contractor shall provide the LACMTA with draft manuals simultaneously with the Pilot Bus: Draft manuals shall include:

- Ten draft hardcopies each of the Service, Parts and Operator's manuals plus a list of all proposed OEM Component Repair manuals, simultaneously to the shipping of the first Pilot Bus.
- Draft Parts manuals are further defined to include a minimum of 95 percent of all part numbers with an error rate of less than 5 percent. It will be the responsibility of the Contractor to ensure the accuracy of all part numbers.
- Hard copy manuals shall be provided in suitable 3-post binders clearly identified with the Bus manufacturer and model number, LACMTA Bus series number, revision date, and table of contents.
- A part number index shall be submitted for review at least 60 days prior to the scheduled ship date of the first production Bus.

Final Manuals

Final DVD editions of Service, Parts and Operator's manuals must be delivered within 90 days after the start date for production Buses. Following the 90 day period after start of production the LACMTA may withhold $10,000 per Bus delivered until all maintenance and parts manuals are received.

- Ten final hardcopy sets of Service and Parts manuals shall be provided for each 100 Buses and 12 total sets for Subsystem OEM manuals.
- For any Option Buses, four hardcopy sets of Service manuals shall be provided for each 100 Option Buses.
- Twenty final edition Service and Parts manuals excluding subsystem OEM component manuals shall be provided on DVD
- The Contractor shall supply two final hardcopy Operator's manuals per every 10 buses and five total final electronic copies on DVD.
- Contractor shall supply a listing of diagnostic codes with final service manuals delivered that covers trouble shooting fault trees/codes related to the PPU.

If separate subsystem OEM component supplier manuals are provided for preventative maintenance, diagnostics, parts and repair, then the number of manuals provided shall correspond with the quantities described above.

Manuals on DVD

Final edition Service and Parts manuals shall include an index and search function to locate items by subject, part name, or system. Updates shall be delivered to the Maintenance Instruction Department as they occur. Updates must be identified with effected system and with update revision dates.

The DVD versions shall be provided with licenses which permit the MTA to load the manuals on an unlimited number of MTA computers and/or server units. Neither generic nor poor quality reproductions shall be acceptable. Manuals must be in English. The DVD version may consist of multiple DVDs.

The Contractor must be able to work with the 3rd party EPC provider (Digabit, Inc., 850 Englewood Pkwy. #200, Englewood, CO 80110 (Phone # 303 957-2822)) directly to convert their Parts manual into an EPC format suitable for use with LACMTA's current ERP/EAM systems. EPC integration shall include the ability of the contractor to provide information in the current format for initial EPC publishing needs and continue working with the EPC publishing provider using current data formatting standards over the life cycle of the bus.

Manual - Updates

Updates to the manuals covering revisions, corrections or additions shall be grouped and released to the LACMTA as discovered or disclosed by LACMTA at a minimum of once per year but not to exceed three times per year for 12 years. Updates shall be provided in electronic and hardcopy format and shall be delivered to the LACMTA Maintenance Instruction Department. Updates must be identified with defected system and with update revision dates.

Service Manuals

Service manuals shall be divided into separate sections as listed below:

a) Preventative Maintenance Procedures (PMP) by component or system **-** Specifically for use at LACMTA Operating Divisions. Procedures must identify what inspection criteria procedures are needed for each component or system at intervals by time or mileage. Daily inspection is not acceptable criteria for preventative maintenance.
b) Diagnostic Procedures - Include troubleshooting guides for all air, fluid, mechanical and electrical systems. Include schematics for fuel, air, hydraulic, coolant, HVAC, multiplex, braking and electrical with wiring harness drawings.
c) Component Repair/Service - The manuals must be organized to show every subsystem in the bus including all re-buildable components used. For example, the steering box, air compressor, power steering pump, differential, transmission/electric drive/electric drive and PPU must be included. Component Reference Diagrams must be specific and referenced by exact exploded view diagrams.

PMP Section

PMP manuals shall be specific for the LACMTA's bus order and shall include the manufactures inspection and maintenance requirements for buses covered by this procurement and shall not contain any unrelated or unnecessary requirements. All routine maintenance schedule requirements, including maintenance of major subsystems, shall be provided in one master PMP matrix. The master PMP matrix shall include; specific service task, service mileage, and PMP service manual section reference. The PMP manual shall also include remove-and replace instructions for all sub-system components including: PPA, engine, transmission, starter, alternator, A/C compressor, air compressor, etc.

Diagnostic Section

Diagnostic manuals which may be integrated with the maintenance manual shall include isometric, phantom, and schematic illustrations as necessary to completely describe each system including but not limited to location and routing of air, hydraulic, water, lines and electrical harnesses including all anchor and attachment points. Diagnostic manuals shall also include trouble shooting guides necessary to complete running repairs for all supplied Bus equipment.

All wiring schematics and wiring harness drawings required in Service Manuals shall be provided in a separate publication in 11 X 17 inch uniform format. OEM schematics and those provided by all subsystem manufacturers shall be uniform diagrams with an emphasis on readability by mechanics performing diagnostic functions. Drawings shall provide functional grouping, continuity and interfacing at all connection points to eliminate unnecessary interfacing between multiple drawings and subsystem supplier drawings. Electrical schematic drawings shall include diagrams to clearly and accurately show locations of all electrical connectors splice and ground points for the Bus wiring harnesses.

Component Repair/Service Section

Fourteen sets of Repair Manuals necessary to rebuild all Contractor supplied Units including: PPU, transmission/electric drive, HVAC system, starter, alternator, air compressor, etc., shall be provided. Each copy shall be the latest hardcopy edition issued by the OEM component manufacturer. Repair manuals shall be comprehensive and shall cover all aspects of repair from tear-down through final test as recommended by the Bus OEM. Repair manuals shall be grouped in sets and with a table of contents. Each set shall be organized and mounted onto a suitable table top holding rack subject to LACMTA approval. The LACMTA requires fourteen sets of wall posters with the repair manuals showing subsystem, component and part assembly, parts numbers, torque values, installation notes, etc. A list of subsystem component repair manuals shall be submitted for LACMTA review at time of Pilot Bus delivery.

Parts Manuals

Must be specific and referenced by exact exploded-view diagrams and organized to coordinate with Service Manuals for ease of use. Parts manuals shall be specific to the LACMTA bus order including subsystem OEM PPU and transmission/electric drive parts listings. IPC and EPC manuals provided shall include illustrations with necessary exploded diagrams and data arranged so that part numbers can be readily found and identified in the illustration for each system and subsystem component, assembly, subassembly or piece part, from an

orderly breakdown of the complete bus. An assembly or subassembly is an identifiable portion of a component of a system or subsystem.

Parts manuals shall contain a reference part number index, listed in numerical order with descriptions, and page numbers. The comprehensive number index shall include major subsystem parts numbers which includes the PPU, transmission/electric drive/, and air conditioning. A part number index shall be submitted for review at least 60 days prior to the scheduled ship date of the first production bus.

The parts list index shall also be provided to the LACMTA in a PC spreadsheet file on a DVD compatible with Microsoft Excel and include subsystem supplier part numbers, part description, and price. OEM component supplier part numbers are required.

Price List

Ten copies of the current price list shall be provided separately as a supplement to the final parts manuals. Price lists shall be updated at least annually and provided for the life of the bus as they are updated.

Operator's Manuals

The Operator manuals shall be specific to the LACMTA bus configuration and designed for a LACMTA Bus Operator target audience, without extraneous material or information. Manuals shall clearly outline the features and controls, indicators necessary for safe and proper operation of the buses including ADA equipment.

TS 5.6.5 Special Equipment

Option, Special Service Equipment

The items in this section are discretionary and may be purchased through this contract, subject to LACMTA approval.

The Contractor shall supply pricing for 30 sets of Special Service Equipment listed below for use by LACMTA training staff. Pricing for this special service equipment is to be provided to the LACMTA on Form PF-4-Schedule C of Prices Special Service Equipment.

The LACMTA is aware that diagnostic equipment and/or software has been developed or is being developed by many of the OEMs to assist in the maintenance of the Buses. Proposer is required to submit a list of recommended special equipment, software and/or diagnostic tools deemed necessary to provide state-of-the-art service for the bus systems. Depending on the type of available equipment and/or software, the LACMTA may wish to obtain complete sets of such Special Service Equipment and/or software, plus any additional tools identified by the OEM manufacturer required to diagnose, calibrate, or remove-and-replace, all equipment provided with this bus order. The purchase of any such Special Equipment and/or software is at the sole option of the LACMTA. Because of technological changes which may occur prior to and during the actual production of the buses, the LACMTA reserves the right to issue Change Orders for updated diagnostic equipment, tools and software, and other Special Service Equipment at any time prior to Contract closeout.

For the Base order or any Option order that is exercised the Contractor shall provide pricing for Diagnostic Tools and Equipment listed below. The quantities listed below are for 300 Base Vehicles. Quantities for Diagnostic Tools and Equipment of Option Vehicles will be determined at the time the Option is exercised. At a minimum, Proposers shall provide a complete listing of such currently available equipment and/or software and the proposed pricing in the Price Forms.

Engine/Propulsion and Electric Drive/Transmission:

- Engine/Propulsion Diagnostic software, including necessary cables and connectors with one year software registration.
- Transmission/Electric Drive diagnostic software, including necessary cables and connectors.
- PPU diagnostic software, including necessary cables and adapters.

- Nexiq Technologies USB Link PC to Vehicle Interface.
- ABS/Regenerative Braking diagnostic software, including necessary cables and connectors.
- Engine/Propulsion cooling system diagnostic or programming software.
- Power Management diagnostic tools and software.
- Battery Management diagnostic tools and software.

Electrical/Vehicle Control System:

- Multiplex/Vehicle Control software and connection kit to include applicable cables, connectors and translator boxes, no registration or upgrade fees attached.
- Diagnostic laptop (to be defined) to include: applicable cables, connectors and translator boxes.
- Multiplex Module programmers, (if applicable).

Energy Storage and BMS

- Power management diagnostic software and connection kit to include applicable cables and adapters, including registration fees.

Doors

- Door System diagnostic or programming software.

Interior:

- ITS Diagnostic Kits including test fixture(s) and associated software application(s) that allows for installing components of each group, (Video Security, IBSS and Destination Sign) so that all the components of each group are easily accessible for programming, replacement, adjustment and troubleshooting including but not limited to all cables, DVR docking station, cameras, etc. Diagnostic kits should be integrated with the Training Aids to allow off-the-bus training and familiarization of the systems.
- Destination Sign Diagnostic Equipment (J1708 Protocol Boxes/software).

Heating Ventilation Air Conditioning (HVAC):

- A/C interface software and cable.

Diagnostic PC:

- Diagnostic laptops with necessary interface cables, power adapters.

TS 5.6.6 Diagnostic Laptop PC Specifications

Optional diagnostic laptop shall be Dell Latitude E5570 at a minimum contain the following:

TABLE 2
Laptop Specifications

Category	Description
Processor	Intel Core i5-6300U (Dual Core, 2.4GHz, 3M cache)
Operating System	Windows 7 Professional English, French, Spanish 64-bit (Includes Windows 10 Pro License)
Memory	8GB (2x4GB) 2133MHz DDR4 Memory
Hard Drive	500GB 7200rmp 7.2krpm HD
Video Card	AMD Radeon RT M360, for I5-6300U (Vpro Capable)
Optical Drive	Dell External USB Slim DVD+/-RW Optical Drive
Battery	Primary 4-cell 62W/HR Battery
Adapter	65 Watt AC Adaptor
Power Cord	US Power Cord
LCD	15.6-inch HD (1366x768) Anti-Glare LCD
Wireless	Intel Dual-Band Wireless-AC 8260 Wi-Fi + BTW8260AC 4.1 Wireless

	Driver (2x2)
Keyboard	Internal Dual Pointing Keyboard, English
Security Hardware	Absolute Computrace Complete 5 Year - Education
System Management	No Out-of-Band System Management

System shall be compatible with all diagnostic software. Contractor shall provide a complete listing of all proposed software and hardware to the LACMTA Project Manager prior to purchasing.

Because of the time delay between the procurement process and receipt of computer equipment, the final laptop computer configuration shall be subject to approval by the LACMTA at delivery to ensure it has all of the appropriate and necessary software and is compatible with LACMTA's other existing laptop computers. All laptop PCs shall include a suitable protective carrying "soft" case and a Microsoft mouse.

TS 5.6.7 Recommended Spare Parts List

The Contractor shall attend at least one Parts Provisioning Meeting with the LACMTA's Inventory Planning staff to discuss recommended spare parts. The Parts Provisioning meeting shall occur at least 60 days prior to the first production Bus being delivered. At the meeting, the Contractor shall provide a bill of material and a list of recommended spare parts for the buses ordered. The recommended spare parts list shall include the quantity of each item per bus, the estimated normal lead time, and recommended minimum/maximum quantities. As changes are implemented and corrections are made, the recommended spare parts list shall be updated throughout the Contract period and life of the bus. The Contractor Parts subsequently ordered by LACMTA must be delivered within thirty (30) days after initial Bus delivery or within 30 days of placement of the order, whichever is later.

TS 5.6.8 In-Process and As-Built Drawings

The Contractor shall, no later than 30 days prior to commencing production, supply the LACMTA with two sets of hardcopy scale drawings suitable for conducting repairs on every area of the vehicle, including all major systems and sub-system installations. Electrical and air schematics shall also be provided. In addition, the Contractor shall provide a description of the electronic configuration, layout and functionality of the bus including communication paths and power distribution. Drawings shall be organized in a logical, easily searchable format consistent with parts and or maintenance manuals, and shall include a table of contents searchable by parts or systems descriptions.

Drawings shall also be supplied in electronic format compatible with AutoCAD, PRO-E or other LACMTA approved design software. Contractor shall update these specific drawing to conform to "as-built". Five sets of Conforming drawings shall be delivered to the LACMTA within 60 days after final bus delivery.

Drawings shall include at a minimum the following:

- Entire structure of the bus
- Interior body with dimensions
- Exterior body with dimensions
- Floor
- Glazing and frames
- Engine and Transmission mounts
- PPU installation and mounting
- Fuel containers and supporting structure
- Passenger assists layout
- Seat placement and dimensions
- Passenger door and window dimensions
- Wiring schematics and drawings
- Wiring harnesses and cables drawings
- Plumbing schematics (pneumatic/hydraulic) and drawings

- Suspension
- Any specialized bracketry or mounts
- Battery tray
- Paint Scheme
- Interior decal placement
- Exterior decal placement
- Destination Signs drawings and schematics
- Frame Drainage Plan
- AFSS installation and routing
- ADA device installation

TS 5.7 Operating Environment

The bus shall achieve normal operation in ambient temperature ranges of 0º F to 120º F, at relative humidity between 5 percent and 100 percent, and at altitudes up to 1,500 feet above sea level. Degradation of performance due to atmospheric conditions shall be minimized at temperatures below 0 °F, above 120° F or at altitudes above 1,500 feet. Altitude requirements above 1,500 feet will need separate discussions with the engine manufacturer to ensure that performance requirements are not compromised. Speed, grade-ability and acceleration performance requirements shall be met at, or corrected to, 77° F, 29.31 inches Hg, dry air per SAE J1995 with all accessories on including A/C.

TS 5.8 Noise

Noise Level Test Conditions

Instrumentation and other general requirements shall conform to SAE Standards; J336, J366 and J2805. The bus shall be empty except for test personnel, not to exceed four persons, and the test equipment. All openings shall be closed and all accessories shall be operating at maximum output during the test. The bus shall accelerate at full throttle from a standstill to 35 mph on level commercial asphalt or concrete pavement.

TS 5.8.1 Interior Noise

The combination of inner and outer panels and any material used between them shall provide sufficient sound insulation so that a sound source with a level of 80 dBA measured at the outside skin of the bus shall have a sound level of 65 dBA or less at any point inside the bus. These conditions shall prevail with all openings, including doors and windows, closed and with the engine and accessories switched off.

The bus-generated noise level experienced by a passenger at any seat location in the bus shall not exceed 78 dBA. The driver area shall not experience a noise level of more than 75 dBA. Measurements of interior noise levels shall be taken in accordance with SAEJ2805 for portion of testing under acceleration. The bus shall also be operated at various speeds to check for audible vibrations.

TS 5.8.2 Exterior Noise

Airborne noise generated by the bus and measured from either side shall not exceed 80 dBA under full power acceleration when operated at 0 to 35 mph at curb weight. The maximum noise level generated by the bus pulling away from a stop at full power shall not exceed 83 dBA. The bus-generated noise at curb idle shall not exceed 65dBA. If the noise contains an audible discrete frequency, a penalty of 5 dBA shall be added to the sound level measured. The Contractor shall comply with the exterior noise requirements defined in local laws and ordinances identified by the LACMTA and SAEJ366.

The bus builder shall minimize all transient noises generated by the bus and/or by accessories. These efforts shall include the application of mufflers on exhaust air ports for the kneeling valve, dryer and brake exhaust if their sound levels exceed 78 dBA interior or 83 dBA exterior.

TS 5.9 Fire Safety

The bus shall be designed and manufactured in accordance with all applicable fire safety and smoke emission regulations. These provisions shall include the use of fire-retardant/low-smoke materials, fire detection systems, bulkheads and facilitation of passenger evacuation. A barrier shall separate the passenger and drive system compartments and shall incorporate fire resistant materials to create a firewall. Contractor must provide required certificates of compliance prior to manufacture of the Pilot Bus.

TS 5.9.1 Materials

All materials used in the construction of the passenger compartment of the bus shall be in accordance with the Recommended Fire Safety Practices defined in FTA Docket 90-A, most recent revision. Materials entirely enclosed from the passenger compartment, such as insulation within the sidewalls and sub-floor, need not comply. In addition, smaller components and items, such as seat grab rails, switch knobs, small light lenses, door seals, window seals, steering wheel, steering column and escape hatches shall be exempt from this requirement.

TS 5.10 Fire Suppression

The purpose of the suppression system is to ensure bus and passenger safety and survivability in the event of a fire. The AFSS system design shall include sensors and nozzles in all areas that are known to commonly have bus fires.

The AFSS system shall meet or exceed the environmental requirements of SAE J1211 and be approved by Underwriters Laboratory or Factory Mutual. At a minimum, the engine compartment, rear-mount HVAC compartment, exhaust area and high current electrical areas (except the battery compartment) at rear of bus shall be equipped with an automatic fire sensing and suppression (AFSS) system product, subject to LACMTA approval during proposal period.

AFSS Operation

The AFSS system shall be powered through the solenoid battery cutoff switch(es) and be activated automatically by the AFSS system sensors. The AFSS shall provide a programmable time-delayed signal to the engine shut-down controls following detection of a fire. The AFSS initiated engine shut-down shall include an integrated Engine Stop Over-Ride to permit the Operator more time, if required, to slow and stop the Bus (Refer to Section TS 46.5 Table 9).

The AFSS sensors shall detect fires in monitored areas and immediately activate the fire alarm signal in the Operator's compartment and fire warning light on the Operator's indicator panel. The AFSS system shall activate fast-acting extinguisher(s) which release suppression agent to all areas monitored. If water based, the distribution system shall utilize nozzles for high-pressure water mist, and shall deliver water droplets between 50-80µm (micrometer). After a system discharge, the AFSS shall be able to clear alarm condition and be ready for reactivation following a simple system reset. The only cost to prepare system for reuse will be for recharge of agent and clean up.

AFSS Monitor Panel

The system shall have a supervision monitoring panel located above the Operators' side console subject to LACMTA approval in Pre-Production meetings. Monitor panel shall include visual indicators for a) Operational Status, for sensors, harness, and extinguishers, b) Fire or system discharged, and c) Power Failure. Monitor panel shall be capable of identifying each individual sensor (gas or fire) and location of each sensor. Monitor panel shall be capable of recording and storing system events in non-volatile memory. In the event of power loss, events shall still be retrievable after power is restored.

AFSS Sensor

Linear heat detectors shall be mechanically protected from abrasion with use of a spring wire external jacket. All heat sensors shall be installed per the manufacturer's recommendations to sensor fires, extreme

temperatures or conditions that are sufficient to ignite combustible materials in the monitored areas. The AFSS/GDS control module shall provide a fault signal to the AFSS status indicator located in the Operator's area in the event of a sensor failure, and the fault shall be traceable to each fire and gas sensor for easy diagnostic purposes. Fault data shall be recorded and accessible even after loss of battery power.

AFSS Agent

The agent shall be approved by Underwriters Laboratory or Factory Mutual Research Corporation and have no ozone depleting property and no global warming potential per USA EPA guidelines.

AFSS Cylinder(s)

The AFSS agent cylinders shall use DOT shippable linear actuators or electric solenoid valves (squibs are prohibited) attached to DOT certified bottles which do not require hydrostatic retest for a minimum of twelve years. Cylinder(s) shall be compatible with suppression agents. Each cylinder shall have a pressure gauge with easy to read "Go-No-Go" type indicator which is visible when the cylinder(s) is installed on the bus. Each agent cylinder shall have a low pressure sensor to monitor agent cylinder pressure from the display panel. Low agent cylinder pressure shall indicate a fault condition on the display panel.

TS 5.11 Gas Detection System (GDS)

GDS system shall be provided to monitor the engine compartment and each separate fuel storage area(s) and shall automatically activate audible and visible alarms in the Operators' area at levels of the lower explosive limit (LEL), of natural gas (methane), subject to LACMTA approval during proposal period.

GDS Operation

The GDS system shall be powered through the solenoid battery cutoff switch(es) and be activated automatically by the GDS system sensors. The system shall be capable of detecting gas in concentrations from 20 percent to 100 percent of LEL and shall continue to indicate the presence of gas at concentrations above 100 percent LEL. A control button shall be provided to silence the GDS audible alarm. The GDS shall provide a programmable time-delayed signal to the engine shut-down controls following detection of methane 50 percent LEL of the gas selected for fuel as described in TS 46.5 Table 9. The GDS initiated engine shut-down shall include an integrated Engine Stop Over-Ride to permit the Operator more time, if required, to slow and stop the bus (Refer to Section TS 46.5 Table 9). The GDS shall be in full time sampling mode at all times.

GDS Monitor Panel

The system shall have a supervision monitoring panel located above the Operators' side console area subject to LACMTA approval in Pre-Production meetings. Monitor panel shall indicate operational status of the sensors, harness, and calibration with visual indicators provided on the Operators' indicator panel. Visual indicators shall include a) System OK (power on and calibrated), b) Gas Alarm, c) Service Required and d) Monitor each gas sensor for trace gas, significant gas, and trouble conditions for ease of system diagnostics..

GDS Calibration

System shall not require calibration. System diagnostics shall not require more than 20 minutes and shall provide traceability to individual sensor failures during diagnostic work.

TS 5.12 Respect for the Environment

In the design and manufacture of the bus, the Contractor shall make every effort to reduce the amount of potentially hazardous waste. In accordance with Section 6002 of the Resource Conservation and Recovery Act, the Contractor shall use, whenever possible and allowed by the specifications, recycled materials in the manufacture of the bus.

TS 5.13 Water Leak Testing

The roof, windows, windshields, and all doors of all Buses shall be water tested for a minimum of 30 continuous minutes in order that leaks may be detected and corrected. The HVAC shall be turned on only for

the first 15 minutes of the test. The water test should replicate a sustained driving rain contacting all surfaces equally. Water spray nozzles shall be located to provide an overlapping pattern to effectively test the full length of the roof, sides, front and back of the bus at a flow rate of 0.04 gal/min/ft^2

TS 5.14 Fasteners and Securements

Unless otherwise specified all bolts, nuts and washers shall use Metric or English system dimensions. All bolts, nuts, washers shall be SAE Grade 5 or better and be designed to resist corrosion for the life of the bus. Stainless steel fasteners are required for the structure exterior, suspension system, fuel system, HVAC system, PPA area and mirror/camera attachments. Where the bus design requires high-strength fasteners, zinc plated, or phosphate coated (only if zinc is not available) fasteners shall be provided. Zinc plated fasteners may be used in areas requiring welding. Exceptions to the use of stainless steel or zinc plated fasteners shall be approved on a case-by-case basis.

The use of plastic tie wraps shall be limited to bundling small diameter lines (under one-inch diameter); they shall not be used as an attachment device unless approved by LACMTA during proposal period. The failure of any number of tie wraps over the life of the bus shall not result in a required repair action or service interruption.

All wire harnesses assemblies and wire bundles over 18 inches long shall be secured with suitable wire trays or fully wrapped PTFE or Nylon insulated P-clamps, or other suitable method approved by the LACMTA. P-clamps not used for wiring support shall be orange, fully wrapped silicone insulated. The use of plastic tie wraps shall be limited to bundling wires; they shall not be used as a primary attachment device unless approved by LACMTA during proposal period. The failure of any number of tie wraps shall not result in a required repair action or service interruption. Supports for wires, cables, or harnesses shall be insulated from contact with wire, cable or harness by a fully cushioned, non-conductive material. Supports for all electrical cables, harnesses and bundles will be subject to LACMTA approval during proposal period and shall be of premium quality.

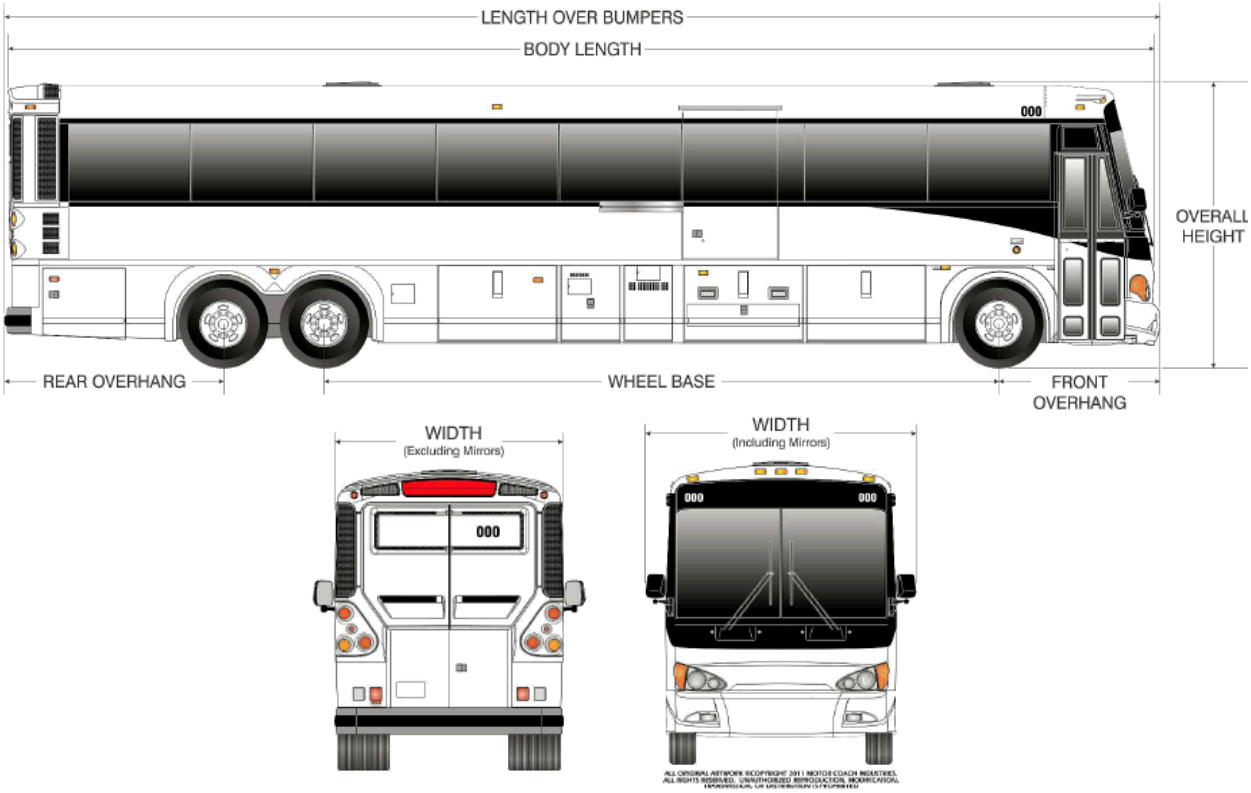
DIMENSIONS (TS 6)

TS 6. Physical Size

With exceptions such as exterior mirrors, marker and signal lights, bumpers, fender skirts, washers, wipers, ad frames, cameras, object detection systems, bicycle racks, feelers and rub-rails, the bus shall have the following overall dimensions as shown in Figure 1 at static conditions and design height.

FIGURE 1

Transit Bus Exterior Dimensions



TS 6.1 Bus Length

For ease of use, the following tolerances will be allowable for each given bus length.

Body Length - 40 feet
Length Over Bumpers –40-1/2 feet to 44 feet

TS 6.2 Bus Width

TS 6.2.1 Transit Bus

102 inches Width Bus

Body width shall be 102 inches (+0, -1 inch).

TS 6.2.2 Commuter Bus

Not applicable.

TS 6.3 Bus Height

Maximum Overall Height

Maximum overall height shall be 135 inches, including all rigid, roof-mounted items such as A/C, exhaust, fuel system and cover, etc.

TS 6.4 Step Height

TS 6.4.1 Transit Bus

The step height shall not exceed 16.0 inches at either doorway without kneeling. A maximum of two steps are allowed to accommodate a raised aisle floor in the rear of the bus.

TS 6.4.2 Commuter Bus

Not applicable.

TS 6.4.3 Articulated Bus

Not applicable.

TS 6.5 Underbody Clearance

The bus shall maintain the minimum clearance dimensions as defined and shown in Figure 2, regardless of load, up to the gross vehicle weight rating.

TS 6.6 Ramp Clearances

The approach angle is the angle measured between a line tangent to the front tire static loaded radius arc, (axle centerline), and the initial point of structural interference forward of the front tire to the ground.

The departure angle is the angle measured between a line tangent to the rear tire static loaded radius arc, (axle centerline), and the initial point of structural interference rearward of the rear tire to the ground.

The break over angle is the angle measured between two lines tangent to the front and rear tire static loaded radius arcs, (axle centerlines), and intersecting at a point on the underside of the vehicle that defines the largest ramp over which the vehicle can roll.

TABLE 3

Default Breakover Angle

Angle	30 to 45 ft. Bus
Approach	9 deg. (min.)
Front breakover	8 deg. (min.)
Departure	8.5 deg. (min.)

TS 6.7 Ground Clearance

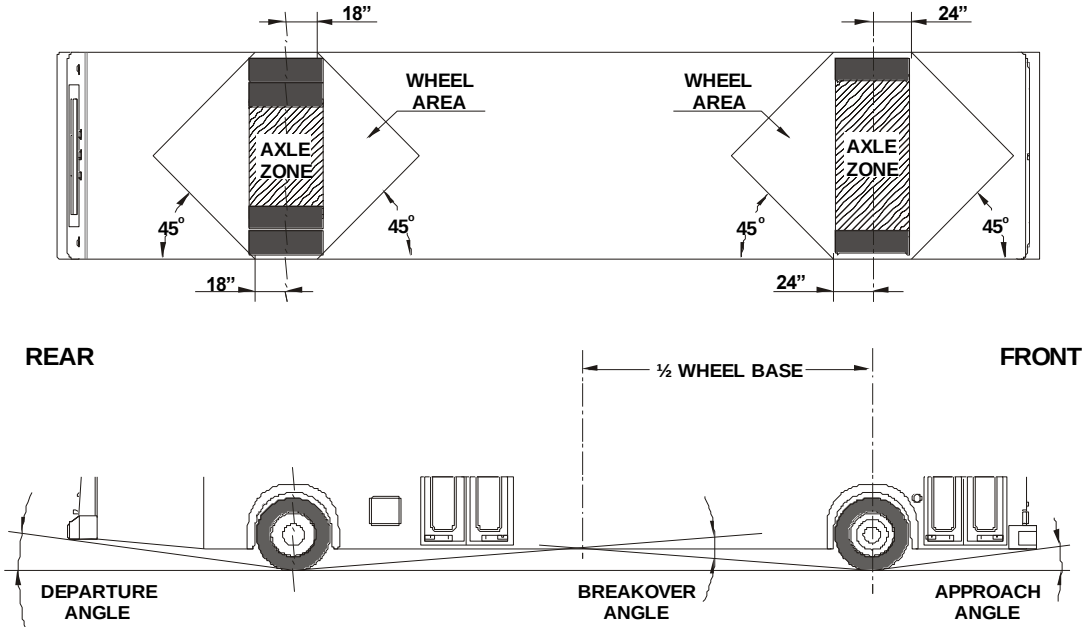
Ground clearance shall be no less than 8.5 inches, (eight inches at jacking pad) except within the axle zone and wheel area.

Axle zone clearance, which is the projected area between tires and wheels on the same axial centerline, shall be no less than 5.4 inches.

Wheel area clearance shall be no less than six inches for parts fixed to the bus body and five inches for parts that move vertically with the axles.

– **FIGURE 2**

Transit Bus Minimum Road Clearance



TS 6.8 Floor Height

TS 6.8.1 Transit Bus

Height of the step above the street shall be no more than 16 inches measured at the centerline of the front and rear doorway. All floor measurements shall be with the bus at the design running height and on a level surface and with the standard installed tires. A maximum of two steps are allowed to accommodate a raised aisle floor in the rear of the bus.

TS 6.8.2 Commuter Bus

Not applicable.

TS 6.9 Interior Headroom

Headroom above the aisle and at the centerline of the aisle seats shall be no less than 78 inches in the forward half of the bus tapering to no less than 74 inches forward of the rear settee. At the centerline of the window seats, headroom shall be no lower than 65 inches reducing to 60 inches at the side wall, except for parcel racks and reading lights, if specified. Headroom at the back of the rear bench seat may be reduced to a minimum of 56 inches, but it shall increase to the ceiling height at the front of the seat cushion. In any area of the bus directly over the head of a seated passenger and positioned where a passenger entering or leaving the seat is prone to strike his or her head, padding shall be provided on the overhead paneling.

TS 6.10 Aisle Width

The minimum clear aisle width between pairs of transverse seats with all attached hardware shall be at least 22 inches.

The aisle width between the front wheelhouses shall be at least 35.5 inches, and the entire area between the front wheelhouses shall be available for passengers and mobility aid devices.

VEHICLE PERFORMANCE (TS 7-TS 8)

TS 7. Power Requirements

The propulsion system shall be sized to provide sufficient power to enable the bus to meet the defined acceleration, top speed and grade-ability requirements, and operate all propulsion-driven accessories using actual road test or dynamometer results and computerized vehicle performance data.

TS 7.1 Top Speed

The bus shall be capable of achieving a top speed of 65 mph on a straight, level road at GVWR with all accessories operating. The bus shall be capable of safely maintaining the vehicle speed for the discrete bus range specified in proposed bus.

> **NOTE:** Values are assumed to be sustained. Manufacturer shall supply LACMTA with data, if there is a variance between peak performance and sustained vehicle performance.

TS 7.2 Grade-ability

Grade-ability requirements shall be met from a standing stop on grades with a dry commercial asphalt or concrete pavement at GVWR with all accessories operating.

The propulsion system shall enable the bus to achieve and maintain a speed of 40 mph on a 2.5 percent ascending grade and 15 mph on a 10 percent ascending grade for the discrete bus range specified in proposed bus.

> **NOTE:** Values are assumed to be sustained. Manufacturer shall supply LACMTA with data, if there is a variance between peak performance and sustained vehicle performance.

TS 7.3 Acceleration

TS 7.3.1 Acceleration (CNG)

The acceleration shall meet the requirements in Table 4 below and shall be sufficiently gradual and smooth to prevent throwing standing passengers off-balance. Acceleration measurement shall commence when the accelerator is depressed.

TABLE 4a

Maximum Start Acceleration Times on a Level Surface[1]

Speed (mph)	Maximum time (seconds)
10	5
20	10
30	18
40	30
50	60
Top speed	

1. Vehicle weight = GVWR

Jerk

The rate of change of acceleration shall be minimized throughout the acceleration/deceleration range and shall not be greater than 15.5 mph/sec/sec (0.3g/sec)

Response Time

Response times shall be measured from the activation or deactivation of the accelerator or brake pedal to the initial response of an on-board accelerometer measuring longitudinal Bus acceleration. Response times for power to brake, brake to power, coast to power and to brake shall be no greater than 0.20 seconds.

TS 7.3.2 Acceleration Electric or Zero Emission

The propulsion and braking systems shall meet the performance requirements of the Duty Cycle.

Braking application and performance shall remain consistent regardless of EV system State of Charge (SOC) or other variances related to regenerative braking.

The system shall be programmable to allow optimization of acceleration and deceleration rate. Performance may be affected when reprogramming.

TABLE 4b

Maximum Start Acceleration Times on a Level Surface[1]

Speed (mph)	Maximum time (seconds)
10	5
20	10
30	18
40	30
50	60
Top speed	

1. Vehicle weight = GVWR

Jerk

The rate of change of acceleration shall be minimized throughout the acceleration/deceleration range and shall not be greater than 15.5 mph/sec/sec (0.3g/sec)

Response Time

Response times shall be measured from the activation or deactivation of the accelerator or brake pedal to the initial response of an on-board accelerometer measuring longitudinal Bus acceleration. Response times for power to brake, brake to power, coast to power and to brake shall be no greater than 0.20 seconds.

TS 7.3.3 Acceleration (Commuter Bus)

Not applicable.

TS 7.4 Operating Range

The operating range of the Bus shall be designed to meet the operating profile as stated in the applicable section and performance requirements as stated below.

TS 7.4.1 Diesel (Transit Bus)

Not applicable.

TS 7.4.2 Diesel (Commuter Bus)

Not applicable.

TS 7.4.3 CNG

A compressed natural gas fuel system consisting of fuel cylinders, filler provisions, fuel lines, pressure reduction, and auxiliary equipment necessary to safely operate under all operating conditions shall be provided. The Contractor shall provide sufficient fuel capacity to give the Bus a 400-mile range before the low fuel warning light comes on. The 400-mile range shall be based on:

- A service cycle that utilizes only the CBD portion of the FTA ADB heavy-duty transit bus cycle as administered by The Altoona Bus Research and Testing Center.
- The CBD portion shall be further modified to add 20 minutes of idle time.

The Contractor shall provide the LACMTA with a technical analysis which supports the proposed CNG fuel system design compliance to the LACMTA's range of operation requirement including the proposed fuel capacity. The analysis shall contain at a minimum:

- Source of fuel economy information (pounds per mile or standard cubic feet per mile).
- Summary of the gas quality used in the calculations.
- Bus condition including weight.

The analysis shall use the natural gas data supplied below based on 70 ° F ambient temperature.

TABLE 5
LACMTA CNG Fuel Properties

Lower Heating Value Btu/lb.	Molecular Weight	Density @ 3,614.7 psia	Density @ 14.7 psia	Specific Gravity
21904	16.734	12.49 lb./cu ft.	0.044 lb./cu ft.	0.580

The analysis shall be provided with the Proposal.

The system shall be capable of refueling at a minimum rate of 5,000 scfm.

TS 7.4.4 Electric (Zero Emission)

The Contractor shall provide sufficient energy storage and changer charging systems to give the bus a cumulative 300-ile daily operating range before the low power warning light comes on. The 300-mile range shall be based on:

- A service cycle that utilizes only the CBD portion of the FTA ADB heavy-duty transit bus cycle with all accessories operating at full capacity.
- The CBD portion shall be further modified to add 20 minutes of idle time.

The Contractor shall provide the LACMTA with a technical analysis which supports the proposed energy storage and charger systems design compliance to the MTA's range of operation requirement including the proposed energy storage system capacity. The analysis shall contain at a minimum:

- Source of energy storage and charger systems information (kilowatt-hour per mile).
- Bus condition including weight.

TS 8. Fuel Economy

Test results from the Altoona fuel economy tests or other applicable test procedures shall be provided to the LACMTA. Results shall include vehicle configuration and test environment information.

POWERPLANT (TS 9-TS 19)

TS 9. Engine

The Propulsion Power Assembly (PPA) shall consist of an engine and transmission, and support equipment mounted in a compartment in the rear of the bus in T-drive configuration. . The propulsion system shall be designed to minimize exhaust emissions and maximize fuel economy while meeting the specified performance requirements.

Prior to manufacturing the Pilot Bus, the Contractor shall coordinate a technical review with the LACMTA and engine and transmission suppliers covering integration and installation design. As part of the technical review, the Contractor shall advise the LACMTA concerning engine and transmission features and control system options, and accessories, and shall conform, to the degree possible, to those already in use at the LACMTA in an effort to increase component and system commonality.

Prior to start of production, the Contractor shall provide documentation from the Sub-suppliers, which supports their approval, that the engine and transmission installation, support system design, and components used specifically for the LACMTA's contract meet the OEM requirements and recommendations.

The engine shall comply with applicable local, state, and/or federal emissions and useful life requirements. Components of the fuel management and/or control system shall have a design life of not less than 150,000 miles without replacement or major service. The lifetime estimate shall be based on the defined design operating profile while operating under conditions in TS 5.7.

The engine shall be equipped with an electronically controlled management system (ECM), compatible with either 12- or 24-volt power distribution. The engine control system shall be capable of transmitting and receiving electronic inputs and data from other drivetrain components and broadcasting that data to other vehicle systems. Communication between electronic drivetrain components and other vehicle systems shall be made using the communications networks. The engine's electronic management system shall monitor operating conditions and provide instantaneous adjustments to optimize both engine and bus performance. The system shall be programmable to allow optimization of parameters or adjustable features.

The engine starting system shall be protected by an interlock that prevents its engagement when the engine is running. Special equipment or procedures may be employed to start the bus when exposed to temperatures less than 30° F for a minimum of four hours without the engine in operation. The integration of all systems on the vehicle relative to engine idle speed shall be the responsibility of the vehicle manufacturer to meet the requirements of LACMTA.

The engine control system shall protect the engine against progressive damage. The system shall monitor conditions critical for safe operation and automatically de-rate power and/or speed and initiate engine shutdown as needed.

The engine shall be designed for city transit bus application. The engine shall be designed to operate without failure for 300,000 miles in LACMTA revenue service without major failure or significant deterioration. Electronic controls, supplied by the OEM engine manufacturer, such as throttle control, programmable control module(s), and engine protection system, shall be provided and integrated with other bus electronic systems.

Automatic Engine Protection/Shutdown Override Feature

A control shall be available to the Operator that when depressed and released will delay the engine shutdown for 30 seconds to allow the bus to be moved. Override action shall be recorded. This data shall be retrievable by the LACMTA.

TS 9.1 Engine (CNG)

The engine shall meet all regulatory requirements when operating on fuel equal to CARB Specifications for Compressed Natural Gas #2292.5. The four predominant characteristics that must be met are Methane, Ethane, Butane, and Propane.

Standard Requirements for a Fast Idle Device

The engine shall be equipped with an operator-controlled fast idle device. The fast idle control shall be a two-way switch mounted on the dash or side console and shall activate only with the transmission in neutral and the parking brake applied. The fast idle device may be activated and controlled automatically by the control system for heavy loads, e.g. air conditioning.

Oil filtration systems shall be approved by the engine and transmission OEM and be designed with by-pass circuits, as needed, in the event that a filter becomes plugged.

TS 9.1.1 Engine Compartment Control Panel

A rear control panel shall be provided for the convenience and safety of LACMTA mechanics. The control panel shall be located in the engine compartment located in an area where it shall not be damaged during repairs. The control panel wiring, switches, and gauges shall be water proof with IP 65 and IP 67 ratings to withstand steam cleaning.

Control Panel Gauges and Indicators

The following mechanical, electrical dial gauges, or digital display, subject to LACMTA approval during proposal period, shall be mounted on, or adjacent to, the engine compartment control panel:

- **Oil Pressure Gauge:** 0-100 psi - Accuracy ± 2, psi, shall indicate oil pressure at a main oil galley.
- **Temperature Gauge:** 0-250° F - Accuracy ± 2° F, shall indicate engine block coolant temperature.
- **Air Filter Restriction Gauge:** 0-20 inches H_20- Accuracy ± 1 inch. H_20, shall indicate air filter restriction.
- **Voltage Gauge(s):** Battery voltage gauge to monitor both 12 and 24-volt electrical systems with a range of 0-48-Volt.

Engine Panel Controls

The following controls shall be located on the engine compartment control panel:

a) **Rear Run Switch:** Three-position toggle switch, marked REAR, OFF, and FRONT positions.
b) **Light Switch:** Two-position toggle switch with waterproof cover labeled "Compartment" for control of the minimum of five LED lamps.
c) **Engine Start:** Starter switch marked "START" shall operate the starter motor only when the rear run switch is in the "REAR" position and transmission is in neutral, and fuel fill door is closed. The Operators start button shall be deactivated when the Rear Run Switch is in “REAR” Position.
d) **Engine Speed Control:** A spring-return control knob or toggle switch marked "ENGINE SPEED" shall be provided that will increase engine RPM from idle to maximum controlled free speed. The switch shall be activated only when the Rear Run Switch is in the "REAR" position, the transmission is in neutral and parking brake set.
e) **Diagnostic Test Ports:** Additional to the ports required in the Operators’ area per Specification Section TS 46.5 and Table 9.

TS 9.2 Propulsion System Electric (Zero Emission)

TS 9.2.1 Propulsion System Description

The bus shall be powered by an electric propulsion system. Function and operation of the bus shall be transparent to the bus operator and passengers. The OEM shall ensure that the bus structure can successfully accept the installation of the propulsion system and be operated on the stated duty-cycle for a period of 12 years without a structural failure. At a minimum, the propulsion system shall comply with applicable local, state and/or federal emissions and useful life requirements. The propulsion system shall comply with local, state and federal (maintenance) and other applicable sections.

The electric drive system shall be rated for the GVWR or greater of the bus.

TS 9.2.2 Propulsion System Service

The propulsion system shall be arranged so that accessibility for all routine maintenance is ensured. No special tools, other than dollies and hoists, shall be required to remove the propulsion system or any subsystems. However, LACMTA shall recognize that properly rated equipment and safety electrical work practices are essential when servicing high-voltage electric components. The air compressor, radiator, all propulsion accessories, and any other component requiring service or replacement shall be easily re moveable. The Contractor shall provide all specialty tools and diagnostic equipment required for maintaining the propulsion system in accordance with the Special Tools List.

All compartments and areas that include components using hazardous or higher voltages, shall incorporate safety warning labels to provide appropriate warning for service personnel. A secondary label shall be included to list the voltages in use within the compartment or area. Labels shall be visible when approaching the area. Labels shall include pictograph symbols for easy recognition.

TS 9.2.3 Primary Propulsion Unit and Traction Motor

The propulsion system may be configured in a variety of methods depending upon type of driver, series and/or parallel. The definition of motor in the context of this specification assumes that the device can provide or consume energy as well as provide or retard mechanical motion.

TS 9.2.4 Energy Storage, Controller and Charging Systems

Design and performance shall be provided to LACMTA. Energy storage shall be of a commercial design capable of operating in the LACMTA transit environment. The primary charging of the energy storage system shall be accomplished by the on-board electric system controller and regenerative braking.

Thermal management will be provided to ensure optimal life and performance of the ESS over the environmental operating range.

Energy storage system SOC correction methods stated in SAE J2711 shall be utilized.

Master Disconnect Switch

A single master switch shall be provided near the battery compartment or other appropriate area for disconnecting of all battery positives in the event of an emergency. The location of the master battery switch shall be clearly identified on the exterior access panel, be accessible in less than 10 seconds for deactivation and prevent corrosion when the batteries are washed off or are in normal service.

In the event of an emergency, turning the master battery switch “Off” with the PPU operating shall shut off the PPU and shall not damage any component of the electrical system. The master battery switch shall be capable of carrying and interrupting the total circuit load. Master battery switch shall be capable of being locked in the “Open” or “Off” position or suitable alternative to prevent accidental turn on.

Shop Charging System

The Contractor shall supply and install battery charger either on the bus or at MTA operating facility capable of recharging the electric/hybrid bus propulsion batteries to a state necessary for the bus to complete a cumulative 300 miles per day according to the route profile as stated in the "Design Operating Profile", and section TS 5.7.

On-Route Charging System

If required to meet daily operating range requirement in Section TS 7.4, battery electric buses will be outfitted with suitable on-route charging systems. The charging system shall be an overhead contact system or an in-ground inductive charging system. All charging systems shall allow driver to easily connect without the need of a complex bus guidance system. Connecting to charging system shall not require the driver to leave his/her seat. Safety protocols shall not energize the charging system until the bus is parked in designated charging position, and the charging system is properly interfaced with the bus. Brake and drive interlock shall prevent inadvertent movement of the bus while charging.

TS 9.2.5 Electric System Controller (ESC)

The ESC regulates energy flow throughout electric system components in order to provide motive performance and accessory loads, as applicable, while maintaining critical system parameters, (e.g., voltages, currents, temperatures, etc.) within specified operating ranges.

The controller shall monitor the process inputs and execute outputs as appropriate to control the operation of all propulsion system components.

Primary Power Unit (PPU)

The PPU and related emission system shall meet California Air Resources Board (CARB) standards for zero emissions.

Contractor shall provide LACMTA with expected durability of the PPU and related emissions systems. The PPU shall be equipped with an electrically controlled management system, compatible with multiplex wiring system and either 12- or 24-volt electrical systems.

The PPU shall have on-board diagnostic capabilities, able to monitor vital functions, store out-of-parameter conditions in memory, and communicate faults and vital conditions to service personnel. Diagnostic reader device connector ports, suitably protected against dirt and moisture, shall be provided in Operator's area and inside PPU compartment. The on-board diagnostic system shall inform the Operator via visual and audible alarms when out-of-parameter conditions exist for vital PPU functions.

Fuel Cell

The fuel cell power assembly shall consist of fuel cell, electric motor, transmission and support equipment (fuel cell driven bus) or fuel cell, battery, transmission and support equipment (battery dominant fuel cell bus). In both cases, the fuel cell can be of any type (characterized by the electrolyte used), however the fuel is limited to hydrogen, only. The fuel cell and its embedded electronics should have a design life of 300,000 miles without failure, significant deterioration, replacement or major service.

TS 9.2.6 Engine

Refer to Section TS 9.1 Engine (CNG).

TS 10. Cooling Systems

The cooling systems shall be of sufficient size and designed to maintain fluids and engine intake air at safe, continuous operating temperatures during the most severe operations possible with the bus loaded to GVWR and with ambient conditions as listed in Section TS 5.7 with a 10 percent minimum reserve capacity in accordance with engine and transmission manufacturers' cooling system requirements. The cooling system fan

controls should sense the temperatures of the operating fluids and the intake air, and if either is above safe operating conditions the cooling fan should be engaged. The fan control system shall be designed with a fail-safe mode of “fan on.” The cooling system shall provide functional service while operating in the design operating profile environment.

The cooling system shall be equipped with ethylene glycol base engine coolant approved by the engine manufacturer and compatible with the LACMTA’s existing coolant product. Use of LACMTA’s standard coolant shall not adversely affect the cooling system’s performance. Coolant shall meet the propulsion system manufacturer’s most stringent requirements for coolant properties.

The cooling system shall be self-purging requiring no special procedures to remove air from the system when coolant is installed or added. Quarter-turn ball valves shall permit complete shut-off of both lines for the heating and defroster units. All low points in the cooling system shall be equipped with drain cocks. The radiator drain plug provided at the radiator shall be a minimum ½-inch dry break type (Refer to TS 88.1 for approved products). The drain plug shall be protected from damage and have a provision for attaching a drain adapter for directing the draining fluid into a container. This shall be accomplished without having the coolant drain onto or through any structure of body parts.

The radiator and charge air cooler unit(s) shall be mounted in such a manner to be replaceable by one LACMTA mechanic within the MTTF specified in TS 88.2. The units shall be easily accessible for cleaning and maintenance by one LACMTA mechanic in less than one hour. Mounting shall be designed so that a LACMTA mechanic can gain full access to the fan side of the units for cleaning without the use of tools. This may be accomplished by swing out design, removable fan shroud section, or suitable inspection door.

For CNG applications, radiator piping shall be stainless steel or brass tubing, if practicable, hoses shall be eliminated. Necessary hoses shall be impervious to all bus fluids. All hoses shall be secured with stainless steel clamps that provide a complete 360-degree seal. The clamps shall maintain a constant tension at all times, expanding and contracting with the hose in response to temperature changes and aging of the hose material. All coolant hoses shall have appropriate sized, constant torque, hose clamps.

TS 10.1 Engine Cooling

A heavy-duty stainless steel radiator surge tank shall provide sufficient draw down capacity as required by the engine manufacturer. A heavy-duty single glass tube, (non-plastic), shall be provided to determine satisfactory engine coolant level accessible by opening the surge tank access door. A spring-loaded, push-button type valve or lever shall be provided to safely release pressure or vacuum in the cooling system no more than 65 inches above the ground. Surge tank filler cap shall have a safety lock. A ¼-inch NPT port shall be provided in a convenient location in the surge tank for the LACMTA's pressure testing equipment, subject to LACMTA approval in Pre-Production meetings. The system shall be designed to allow coolant to be added while the cooling system is at full operating temperature incorporating an un-pressurized coolant overflow reservoir.

The radiator shall be of durable corrosion-resistant construction with metal header tanks for CNG bus only. No heat producing components, such as intake charge-air-coolers, or climate control system components shall be mounted between the engine cooling air intake aperture and the radiator. Sensor port fittings (1/8-inch NPTF) shall be provided in the upper and lower sections of the radiator to allow the use of thermocouple for diagnostics. Louvered fins are not acceptable.

Self-Cleaning

Radiator and charge air cooler fan(s) shall be electrically driven and capable of reverse operations for periodic self-cleaning of the radiator and charge air cooler. For multiple fans, system shall be designed to prevent air recirculation in the event of individual fan failure.

A cooling system pressure gauge with an operating range of 0-30 psi, easily readable through the surge tank access door, shall be installed to monitor static and operating pressures.

TS 10.1.1 Radiator Screen

Screen in Front of Radiator

The radiator input shall be protected by an easily cleanable screen designed to collect large debris. Radiators with a fin density greater than 12 fins per inch or a louvered slit design shall not be used. No heat-producing components or climate-control system components shall be mounted between the engine cooling air intake aperture and the radiator. The radiator and charge air cooler shall be designed to withstand thermal fatigue and vibration associated with the installed configuration. The radiator and charge air cooler cores shall be easily cleaned (to include engine side core surface) with standard pressure-washing equipment.

TS 10.1.2 Coolant

Standard Requirement for Coolant Filtration

The engine cooling system shall be equipped with a properly sized water filter with a spin-on element. When replacing the water filter, only the water in the filter will be lost.

TS 10.1.3 Fan Drive Design

Electric Fans

The bus shall be equipped with an electric fan drive cooling system. A screen guard must be installed on electric motor fans per SAE J1308. (Refer to Section TS 10.1 Engine Cooling). The cooling system shall be equipped with a master controller with the following capabilities:

a) Multiple electric DC brushless pusher type variable speed fans with electronic feedback controls.
b) Communicate on the J1939 CAN data link with system diagnostic reporting via DM1 messaging
c) Review and download data via a laptop with service tool software
d) Capable of software and calibration up-dates, receiving commands from the engine/PPU
e) Sense engine compartment temperature and activate fans if maximum temperature is exceeded.
f) Report fault codes by lighting an engine compartment LED flashing light.
g) Collect and store cooling system and vehicle performance histogram data.
h) If system controller loses communication with the engine/PPU or sensors, it shall direct all fans to go into a default speed mode to avoid vehicle shutdown.
i) If fans lose communication with system controller, they shall go into a default mode to avoid vehicle shutdown.

TS 10.1.4 Mounting

Standard Mounting Design

Mounting location of radiator and charge air cooler shall be the Contractor's standard design. (Refer to Section TS 10 Cooling Systems).

TS 10.2 Charge Air Cooling

The charge air cooling system shall provide maximum air intake temperature reduction with minimal pressure loss. The charge air radiator shall be sized and positioned to meet engine manufacturer's requirements. Air ducting and fittings shall be protected against heat sources and shall be configured to minimize restrictions and maintain sealing integrity.

Charge air piping and fittings shall be designed to minimize air restrictions and leaks.

TS 10.3 Transmission Cooling

The transmission shall be cooled by a dedicated heat exchanger sized to maintain operating fluid within the transmission manufacturer's recommended parameters of flow, pressure and temperature. The transmission cooling system shall be matched to retarder and engine cooling systems to ensure that all operating fluids remain within recommended temperature limits established by each component manufacturer. The engine

cooling system should provide coolant bypass flow to the transmission cooling system with the engine thermostats closed. The heat exchanger will have provisions to drain transmission oil during routine servicing.

TS 10.4 Electric Drive System Cooling

The thermal management system shall maintain electric system components within their design operating temperature limits. Refer to Section TS 10.1 inclusive for additional requirements.

TS 11. Transmission (Conventional Powertrain)

The transmission shall be designed for city transit bus application. The transmission shall be multiple speeds, automatic shift with torque converter, retarder, electronic controls, and have integrated oil cooler. Gross input power, gross input torque and rated input speed shall be compatible with the engine. The transmission shall be designed to operate for not less than 300,000 miles on the design operating profile without replacement or major service. The transmission should be easily removable without disturbing the engine and accessible for service.

The electronic controls shall be capable of transmitting and receiving electronic inputs and data from other drivetrain components and broadcasting that data to other vehicle systems. Communication between electronic drivetrain components and other vehicle systems shall be made using the communications networks. Electronic controls shall provide consistent shift quality and compensate for changing conditions such as variations in vehicle weight and engine power.

The transmission shall be flushed of any non-synthetic transmission oil and filled with an OEM approved synthetic fluid designed for extended drain intervals. Unless otherwise agreed to in writing, the synthetic transmission oil provided by the Contractor shall be compatible with the LACMTA's existing synthetic transmission oil.

A brake pedal application of nominal 6 psi shall be required by the driver to engage forward or reverse range from the neutral position to prevent sudden acceleration of the bus from a parked position.

The electronically controlled transmission shall have on-board diagnostic capabilities, be able to monitor functions, store and time stamp out-of-parameter conditions in memory, and communicate faults and vital conditions to service personnel. The transmission shall contain built-in protection software to guard against severe damage. The on-board diagnostic system shall trigger a visual alarm to the driver when the electronic control unit detects a malfunction.

An electronic transmission fluid level monitoring and protection system shall be provided.

TS 12. Retarder (Transit Bus)

The powertrain shall be equipped with a retarder designed to extend brake lining service life. The application of the retarder shall cause a smooth blending of both retarder and service brake function and shall activate the brake lights.

The retarder application shall be controlled by the throttle pedal and shall be integrated with the ABS system controls so that actuation of ABS shall override the operation of the brake retarder.

Throttle Pedal Activation of the Retarder

The retarder shall apply approximately 1/3 of its total application with a resulting deceleration of no greater than 0.077g when the throttle pedal is completely released. The retarder shall apply approximately 2/3) of its total application with a resulting deceleration of no greater than 0.14g with light brake application. Maximum retarder shall be achieved when brake pedal is fully depressed to engage service brakes, with a maximum resulting deceleration of approximately 0.20g in an empty bus. The resulting decelerations specified include the effects of engine braking, wind resistance and rolling resistance.

The thermostatically controlled cooling fan shall be activated when the retarder is engaged and the coolant temperature reaches the maximum operating temperature established by the engine and transmission manufacturers.

Retarder Disable Switch

The retarder disable switch shall be located behind the destination sign door, subject to LACMTA approval in Pre-Production meetings.

Regenerative Braking

The electric propulsion system shall be equipped with a regenerative braking system designed to extend brake lining service life, and capture braking energy to recharge the Energy Storage System. The application of the regenerative braking shall cause a smooth blending of both regenerative brake and service brake function and shall not activate the brake lights independent of the service brake.

Regenerative Braking Disable Switch

The regenerative braking disable switch shall be located behind the destination sign door, subject to LACMTA approval in preproduction meetings.

TS 13. Engine Brake (Commuter Bus)

Not applicable.

TS 14. Mounting

All PPA/PPU mounting shall be mechanically isolated to minimize transfer of vibration to the body structure and provide a minimum clearance of 0.75 inches Mounts shall control the movement of the PPA/PPU so as not to affect performance of belt-driven accessories or cause strain in piping and wiring connections to the PPA/PPU

PPA/PPU mounts shall be manufactured from high grade rubber material and shall last for three years or 150,000 miles, whichever comes first. PPA/PPU mounts shall not deteriorate from contact with oil, heat, and ozone present in the engine compartment.

All air, fuel, fluid, electrical, and other cabling connecting the cradle assembly to the bus, shall have "bulkhead" connections in the proximity of the fire wall to facilitate the replacement of powertrain assemblies. Hoses, cables, and harnesses shall not require unclamping in order to remove the PPA.

TS 14.1 Service

The propulsion system shall be arranged for ease of access and maintenance. The Contractor shall list all special tools, fixtures or facility requirements recommended for servicing. The muffler, exhaust system, air cleaner, air compressor, starter, alternator, radiator, all accessories and any other component requiring service or replacement shall be easily removable and independent of the engine and transmission removal.

No special tools, other than dollies and hoists, shall be required to remove the PPA/PPU. Two LACMTA mechanics shall be able to remove, replace, and prepare the complete PPA/PPU assembly for service within a MTTF of 12-man hours. The MTTF does not include miscellaneous preparation such as placing the bus on stands and removing the bumper, if necessary.

Engine tune-up, PPA/PPU removal and replacement, cylinder heads, and accessories, including, but not limited to muffler, exhaust system, air compressor, alternator(s), starter, and A/C compressor, shall be serviceable from a flat floor and with the use of a pit or hoist.

The Contractor shall provide two suitable dollies for each spare PPA/PPU purchased under this Contract. The Contractor shall mount and ship any spare PPA/PPUs purchased and delivered under this contract onto these

dollies. The PPA/PPU dollies shall be designed, subject to LACMTA approval in Pre-Production meetings, for long term storage of spare PPA/PPUs and also aid the LACMTA in PPA/PPU replacement to meet the specified MTTF. Use of the PPA/PPU dollies shall be included in the Service manual. The dolly wheels shall be heavy-duty, approximately six inch diameter, with solid steel wheels. The Contractor shall provide the LACMTA with sufficient fabrication drawings needed to manufacture additional dollies.

PPA/PPU driven accessories shall be unit mounted for quick removal and repair. Accessory drive systems including belts shall operate without failure or unscheduled adjustment for 50,000 miles in LACMTA service. Accessories shall be driven at speeds sufficient to assure adequate system performance during extended periods of idle and low route speed operation. To the maximum extent possible, belt drive systems shall be self-adjusting after initial installation adjustment. Belt drives that require manual tensioning shall be designed to facilitate easy service/maintenance, subject to LACMTA approval at the Pre-Production Meeting. Accessory drive belts shall be guarded in accordance with CAL OSHA article 45, Belt and Pulley Drives, Section 4070 "Guarding."

All fillers shall be easily accessible with standard funnels, pour spouts and automatic dispensing equipment.

All fluid fill locations shall be color coded to ensure correct fluid is added: red for transmission fluid, yellow for engine oil. Fill points shall include easy to read labels prominently displayed at the fill point indicating the type and specification of fluid to be added. The engine oil filler cap shall be a spring loaded with sufficient force to retain the cap in a closed position after servicing with no additional action by a service attendant.

All lubricant sumps, including engine, transmission, transmission cooler and hydraulic reservoir, shall be fitted with magnetic type, external, dry break drain plugs of standard size. Any fluid intended to be used on the bus requires a Maintenance Safety Data Sheet (MSDS) to be submitted for LACMTA approval. These fluids shall also be compatible and mixable with the respective LACMTA approved fluids used for the same application.

No engine bypass oil filter.

Engine Oil Pressure and Coolant Temperature Gauges

Engine oil pressure and coolant temperature gauges required in engine compartment.

Engine Air Cleaner

An air cleaner with a dry filter element and a graduated air filter restriction indicator shall be provided. The location of the air intake system shall be designed to minimize the entry of dust and debris and to maximize the life of the air filter. The engine air duct shall be designed to minimize the entry of water into the air intake system. Drainage provisions shall be included to allow any water/moisture to drain prior to entry into air filter.

The engine air inlet system shall be provided which meets the requirements of the OEM engine manufacturer. The air inlet system shall include a heavy-duty, high dust capacity, dry paper air filter with outside-to-inside air flow with an initial efficiency of 99 percent when tested per SAE Standard J726C, latest edition. The air filter shall be positioned for easy access and service, subject to LACMTA approval during proposal period.

Air inlet piping from the air filter to engine inlet shall use T-bolt type heavy duty, minimum ¾ inch wide, band clamps at all joints. One ~~1/8~~1/4 inch NPTF test port, with brass plug, shall be provided near the air filter. The test port shall be positioned for easy accessibility with the engine door open.

TS 15. Hydraulic Systems

Hydraulic system service tasks shall be minimized and scheduled no more frequently than those of other major bus systems. All elements of the hydraulic system shall be easily accessible for service or unit replacement. Critical points in the hydraulic system shall be fitted with service ports so that portable diagnostic equipment may be connected or sensors for an off-board diagnostic system permanently attached to monitor system operation when applicable. A tamper-proof priority system shall prevent the loss of power steering during operation of the Bus if other devices are also powered by the hydraulic system.

The hydraulic system shall operate within the allowable temperature range as specified by the lubricant manufacturer. Any hydraulically driven system shall be subject to LACMTA approval at the Pilot Bus. The hydraulic system shall be filled with premium approved synthetic oil that will demonstrate a mean time between fluid replacements in excess of 50,000 miles. A system shall be provided to easily determine the level of hydraulic fluid in the reservoir.

The system shall be configured and/or shielded so that failure of any line shall not allow hydraulic fluid to spray or drain onto any component operating above the auto ignition temperature of the fluid.

The hydraulic system (steering) shall be located to accommodate easy service. The hydraulic system filter shall be located in the return, low pressure, circuit to the oil reservoir, or internal to the oil reservoir, subject to LACMTA approval at the Pilot Bus. Sufficient pump cleanable strainers shall be installed to keep the hydraulic pump and system free of contamination. The strainers shall be located for easy access and service.

TS 15.1 Fluid Lines

All lines shall be rigidly supported to prevent chafing damage, fatigue failures, degradation and tension strain. Lines should be sufficiently flexible to minimize mechanical loads on the components. Lines passing through a panel, frame or bulkhead shall be protected by grommets (or similar devices) that fit snugly to both the line and the perimeter of the hole that the line passes through to prevent chafing and wear. Pipes and fluid hoses shall not be bundled with or used to support electrical wire harnesses.

Lines shall be as short as practicable and shall be routed or shielded so that failure of a line shall not allow the contents to spray or drain onto any component operable above the auto-ignition temperature of the fluid.

All hoses, pipes, lines and fittings shall be specified and installed per the manufacturer's recommendations. All straight couplings and elbows shall be suitable 4-ply Hi-Line Silicone coated polyester with glossy finish. The straight couplings and elbows shall meet SAE J20R1 Class A rating with a temperature range of -65°F to 350°F. All hoses shall be protected from engine exhaust heat which may cause premature failure.

Unless otherwise specified, all hydraulic, fuel, oil, and air lines shall be made with steel tubing. When rigid lines are not practical, flexible fluid lines shall be kept as short as practical. Flexible lines shall be rubber hoses with braided stainless steel jackets except in applications where premium hoses compatible with the fluid type are required. Standard SAE or JIC end fittings shall be used.

Rigid and flexible lines shall be individually supported and readily accessible for inspection and service, including interior lines inside the bus, subject to LACMTA approval in Pre-Production meetings, and shall not touch one another or any part of the bus. Each individual line or hose shall be identified with a steel tag which includes a line number or designator and OEM part number for easy identification.

TS 15.2 Fittings and Clamps

All clamps shall maintain a constant tension at all times, expanding and contracting with the line in response to temperature changes and aging of the line material. The lines shall be designed for use in the environment where they are installed. For example, high-temperature resistant in the engine compartment, resistant to road salts near the road surface, and so on.

All hose clamps shall be stainless steel. All hoses shall have appropriately sized, constant torque, hose clamps.

All fluid lines shall be secured using anchor blocks or suitable securement devices.

Compression fittings shall be standardized to prevent the intermixing of components. Compression fitting components from more than one manufacturer shall not be mixed, even if the components are known to be interchangeable.

TS 15.3 Charge Air Piping

Refer to Section TS 10.2 Charge Air Cooling.

TS 16. Radiator

Refer to Section TS 10.1 Engine Cooling.

TS 17. Oil and Hydraulic Lines

Oil and hydraulic lines shall be compatible with the substances they carry. The lines shall be designed and intended for use in the environment where they are installed. For example, high–temperature resistant in the engine compartment, resistant to road salts near the road surface, and so on. Lines within the engine compartment shall be composed of steel tubing where practicable, except in locations where flexible lines are required. Flexible lines shall include hose guard shielding with a 450-degree operating range within the engine compartment. High pressure hose ends shall be clamped and secured to prevent movement of line in event of failure of the line or fitting.

Hydraulic lines of the same size and with the same fittings as those on other piping systems of the bus, but not interchangeable, shall be tagged or marked for use on the hydraulic system only.

TS 18. Fuel

TS 18.1 Fuel Lines

Fuel lines shall be securely mounted, braced and supported as designed by the bus manufacturer to minimize vibration and chafing and shall be protected against damage, corrosion or breakage due to strain or wear.

Manifolds connecting fuel containers shall be designed and fabricated to minimize vibration and shall be installed in protected locations to prevent line or manifold damage from unsecured objects or road debris.

Fuel hose and hose connections, where permitted, shall be made from materials resistant to corrosion and fuel and protected from fretting and high heat. Fuel hoses shall be accessible for ease of serviceability.

TS 18.1.1 Fuel Lines, Diesel

Not applicable.

TS 18.1.2 Fuel Lines, CNG

Fuel lines shall comply with NFPA-52. All tubing shall be a minimum of seamless Type 304 stainless steel (ASTM A269 or equivalent). Fuel lines and fittings shall not be fabricated from cast iron, galvanized pipe, aluminum, plastic, or copper alloy with content exceeding 70 percent copper. Lines, fittings, and hoses shall be clear and free from cuttings, burrs or scale. Thread joining material that is impervious to CNG shall be utilized as required. Fuel lines shall be identifiable as fuel lines only. Fuel lines shall be bent using computer numeric machines (CNC) to assure consistency, no hand bending will be permitted.

The bus manufacturer shall have a documented procedure for testing the high pressure line assembly in accordance with NFPA 52 requirements.

Fuel lines shall be securely mounted braced and supported using “split-block” type or stainless steel P clamps; all mounting clamps shall be mounted to a rigid structure to minimize vibration and shall be protected against damage, corrosion or breakage due to strain, rubbing, or wear. “Floating clamps” (not mounted to a rigid structure) shall not be permitted. Fuel lines shall not be used to secure other components (wires, air lines, etc.).

Manifolds connecting fuel containers shall be designed and fabricated to minimize vibration and shall be installed in protected location(s) to prevent line or manifold damage from unsecured objects or road debris.

Fuel hose connections, where permitted, shall be less than 48 inches in length, made from materials resistant to corrosion and action of natural gas, and protected from fretting and high heat and shall be supported approximately every 12 inches Hose support in-between the bus frame and the engine that exceed 12 inches is subject to LACMTA approval during the Pre-Production meeting.

TS 18.2 Design and Construction

TS 18.2.1 Design and Construction, Diesel

Fuel Tank(s)

Not applicable.

TS 18.2.2 Design and Construction, CNG

Fuel Containers/Cylinders

CNG fuel containers/cylinders shall have a minimum service life of 20 years and must be designed, constructed, manufactured, and tested in accordance with the latest revision of at least one of the following:

U.S. Applications:

- NFPA 52-Standard for Compressed Natural Gas (CNG) Vehicular Fuel Systems.
- FMVSS 304.
- Any local standard(s) specifically intended for CNG fuel containers.

The design and construction of the fuel system supplied by the OEM shall comply with federal and local regulations.

The fuel cylinders shall have a 3,600 psi service pressure and a working pressure of 125 percent the service pressure. The fuel cylinders shall be mounted on the roof in such a manner that replacement of one cylinder shall not require the removal of additional cylinders. The fuel cylinders shall also be clearly marked with serial numbers that shall be easily visible to mechanics when installed on the bus. Each cylinder shall have a purchased date no more than six months from the date of released for shipment to the LACMTA.

Fuel cylinder construction shall be in accordance with DOT Standard 304, ANSI NGV2, latest revision design and test criteria. Cylinder shall be designed for the lightest weight possible which does not require a hydrostatic re-qualification. Cylinders shall be certified for refueling pressures to 125 percent of working pressure during temperature compensated fueling.

Installation

Fuel cylinders shall be installed and tested in accordance with ANSI/IAS NGV2, latest revision, Basic Requirements for Compressed Natural Gas Vehicles (NGV) Fuel Containers and NFPA 52, Compressed Natural Gas (CNG) Vehicular Fuel Systems Code, latest revision, Section 303. In the case of a low floor transit bus, the placement of containers shall be limited to the roof of the vehicle or in the compartment above the engine of the vehicle.

Fuel cylinders, attached valves, pressure relief devices, and mounting brackets should be installed and protected so that their operation is not affected by bus washers and environmental agents such as rain, snow, ice or mud. These components should be protected from significant damage caused by road debris or collision.

The roof and above the engine mounted containers shall be contained within a skeletal structure resembling a roll cage and contained within an enclosure. The enclosure shall incorporate a hinged clamshell type access. The access panels shall be designed to offer protection from weather and to be sacrificial as a means of

providing an escape path to atmosphere upon rapid enclosure pressure rise. The latching method shall utilize quick release captive hardware that can be demonstrated to last the life of the bus. Additional shielding shall be provided surrounding end fittings and valves as needed. Shields shall be attached to the bus structure hinged in a manner that permits one mechanic to unlatch and swing the shield open for routine inspections. As practical, electrical components shall not be located within the roof enclosure and if unavoidable, they shall be intrinsically safe.

The cover(s) shall be hinged along the axis of the bus and open to either side providing complete access to the cylinders with mechanic(s) standing on the roof. A safety latch system shall be provided so that the doors when opened cannot inadvertently close during servicing. Failure of the safety latch(es) shall not result in the cover opening while the bus is in operation. The bus roof shall be coated with “anti-slip” paint applied to areas that will accommodate safe access for routine inspections of the fuel cylinders.

Labeling

CNG fuel systems shall be labeled in accordance with NFPA 52, “Compressed Natural Gas (CNG) Vehicular Fuel Systems Code,” latest revision. System expiration dates posted shall match individual cylinder dates. This shall include required labelling in driver area and inspection record labels at fueling area. Each cylinder shall have a purchased date no more than six (6) months from the date of released for shipment to the LACMTA.

Pressure Relief Devices (PRDs)

PRDs must be designed, constructed, manufactured and tested in accordance with ANIS/IAS PRD1, latest revision, “Pressure Relief Devices for Natural Gas Vehicle (NGV) Fuel Containers” and ANSI/IAS NGV2, latest revision, “Basic Requirements for Compressed Natural Gas Vehicle (NGV) Fuel Containers.” All natural gas fuel system piping, including the PRD vent line shall be stainless steel. PRDs shall be vented to the roof area of the Bus with minimum protrusion above the roof line and shall be protected with a suitable cap which shall withstand daily bus wash activity, subject to LACMTA approval during proposal period.

Valves

Valves must be installed in accordance with ANIS/IAS NGV2, latest revision, “Basic Requirements for Compressed Natural Gas Vehicle (NGV) Fuel Containers” and NFPA 52, “Standard for Compressed Natural Gas (CNG) Vehicular Fuel Systems.” Manual valves shall not require the use of a tool to operate.

A quarter turn valve, easily accessible through the fuel door shall isolate the high pressure manifold and fuel storage system from the rest of the engine fuel system. The valve function and open and closed positions shall be clearly marked. An additional minimum ½ inch valve shall be provided for draining the high pressure manifold and any fuel cylinder(s) through a service port. Type and location of the service port shall be subject to LACMTA approval during proposal period.

A primary fuel pressure regulator shall be supplied and mounted in an accessible location for servicing. Coolant lines shall be routed in a manner to prevent trapping air or draining coolant when the regulator is removed for service.

One flow control solenoid operated shut-off valve shall be installed for the system. A control over-ride system shall be provided to operate (open or close) the solenoid valve for defueling. The flow control solenoid valve shall remain in normally closed position until energized, and shall open when the engine is running.

All valves, including solenoid type, shall be designed to operate properly under all possible system flow rates and conditions.

One manually operated shut-off valve and one solenoid valve shall be installed on each individual fuel cylinder or each combined fuel cylinders.

Gauges

Glycerin filled gauges which meets NFPA 52 requirements shall be located in the high and low pressure manifolds which shall indicate fuel system pressure. The high pressure fuel gauge shall have maximum 100 psi increments, 0-5,000 psi, and shall be visible during fueling operations and rated for the maximum system pressure, have welded (not soldered) fittings and have a restrictive orifice. A pressure transducer shall be incorporated into the high pressure fuel manifold which shall provide the Operators' low fuel warning light which shall activate at between 300 and 650 psi.

Fuel Filter

Filters, rated for the system working pressure, shall be provided that meet the engine manufacturer's requirements and are effective for use in LACMTA's CNG compressor environment. Primary and secondary filters shall be coalescing and equipped with a drain valve or plug to periodically drain coalesced contaminants.

Fuel Filler

The fuel filler shall be located 30 to 38 feet measure behind the centerline of the front door, subject to LACMTA approval during proposal period. The filler cap shall be retained to prevent loss and shall be recessed into the body.

The fill and vent receptacles shall be located within an enclosure on the right side of the bus. The access door shall be sized to allow full viewing of gauges, ease of hookups and maneuver of fuel nozzle.

The fuel fill receptacle and vent receptacle attachment shall be robust and capable of routine fueling connects/disconnects without deflection or metal fatigue, and capable of withstanding mechanical loads induced by a fueling drive-away incident without attachment failure. Existing LACMTA fueling system break-away device requires an applied force of 150 lb.-F to cause separation.

A dual fuel filler receptacle shall be located on the right side, rear corner, of the bus, 36 to 50 inches from the street surface. The fill receptacles shall be ANSI/AGA NGV1 or NGV2 certified and shall accept an OPW CT5000 nozzle or approved equal and an OPW CT1000 nozzle or approved equal and shall incorporate dust caps permanently affixed to the receptacles.

A static ground connecting point shall be installed near the fueling receptacles for grounding during fueling/defueling operations.

Fueling System

The fueling port receptacle shall be an ANSI/AGA NGV1 or NGV2 certified receptacle as designated by the LACMTA. The bus shall be capable of being fueled by a LACMTA fuel system nozzle. The fueling port receptacle location shall be such that connection by fueling personnel can be performed without physical strain or interference. A dust cap shall be permanently "tethered" to the fueling port receptacle. To prevent drive-away events, the fueling system shall incorporate a proximity sensor at the fast fill fuel receptacle to detect if a fuel nozzle is connected to it and apply an interlock. A separate sensor shall be incorporated on the fuel fill door. (Refer to Section TS 38.4) The fueling system must be sized to accommodate a minimum fuel flow of 5,000 scfm at 4,250 psi.

Defueling System

The CNG defueling port shall be an NGV-3.1/CGA-12.3 certified receptacle subject to LACMTA approval during proposal period. The CNG defueling port shall be located on the curbside of the bus, in a location that is compatible with the LACMTA's defueling station operation. The defueling system shall incorporate the following characteristics:

- Dust cap permanently "tethered" to the defueling port.
- Device(s) to prevent inadvertent defueling.
- Components compatible with LACMTA's defueling operation.

- The piping and fittings onboard the bus shall be sized to allow the fueling station to meet the following operating parameters:
- Fuel system sized to allow a bus with 20,000 scf on-board to defuel within six hours.
- The atmospheric-vent system shall allow a bus with 20,000 scf of on-board CNG storage to defuel to atmospheric pressure within 80 minutes.
- Location/method of attaching CNG fuel system to earth ground.

TS 19. Emissions and Exhaust

TS 19.1 Exhaust Emissions

The engine and related systems shall meet all applicable emission and engine design guidelines and standards.

The electric vehicle propulsion system shall comply with CARB's zero emissions standard.

TS 19.2 Exhaust System

Exhaust gases and waste heat shall be discharged from the roadside rear corner of the roof. The exhaust pipe shall be of sufficient height to prevent exhaust gases and waste heat from re-entering the bus, discoloring or causing heat deformation to the roof of the bus. The entire exhaust system shall be adequately shielded to prevent heat damage to any bus component, including the exhaust after-treatment compartment area. The exhaust outlet shall be designed to minimize rain, snow or water generated from high-pressure washing systems from entering into the exhaust pipe and causing damage to the after-treatment.

Exhaust system shall incorporate joints as necessary to facilitate removal and replacement of individual components including exhaust muffler or, if required to meet emissions requirements, catalyst units. Mounting cushions, if provided, must last the life of the engine and shall not deteriorate when exposed to high exhaust system temperatures. Exhaust piping joints shall be machined V-band clamp design. Flexible exhaust lines necessary to accommodate engine movement shall be constructed from stainless steel bellows. Exhaust piping in the engine enclosure shall include reusable metal jacket that is easy to replace.

TS 19.3 Exhaust After-treatment

An exhaust after-treatment system will be provided to ensure compliance to all applicable EPA regulations in effect.

Diesel Exhaust Fluid Injection

Not applicable.

TS 19.4 Particulate After-treatment

Not applicable.

STRUCTURE (TS 20-TS 30)

TS 20. General

TS 20.1 Design

The structure of the bus shall be designed to withstand the transit service conditions typical of an urban duty cycle throughout its service life. The vehicle structural frame shall be designed to operate with minimal maintenance throughout the 12-year or 500,000-mile design operating profile. The design operating profile specified by the LACMTA shall be considered for this purpose.

TS 21. Altoona Testing

Prior to acceptance of first bus, the vehicle must have completed any FTA-required Altoona testing. Any items that required repeated repairs or replacement must undergo the corrective action with supporting test and analysis. A report clearly describing and explaining the failures and corrective actions taken to ensure any and all such failures will not occur shall be submitted to the LACMTA.

If available, the Altoona Test Report shall be provided to the LACMTA with the Proposal submittal. If not available, then the report shall be provided prior to First Article Bus acceptance.

TS 21.1 Structural Validation

Baseline Structural Analysis

The structure of the bus shall have undergone appropriate structural testing and/or analysis. At minimum, appropriate structural testing and analysis shall include Altoona testing or finite element analysis (FEA).

TS 22. Distortion

The bus, loaded to GVWR and under static conditions, shall not exhibit deflection or deformation that impairs the operation of the steering mechanism, doors, windows, passenger escape mechanisms or service doors. Static conditions shall include the vehicle at rest with any one wheel or dual set of wheels on a six inch curb or in a six-inch deep hole.

TS 23. Resonance and Vibration

All structure, body and panel-bending mode frequencies, including vertical, lateral and torsional modes, shall be sufficiently removed from all primary excitation frequencies to minimize audible, visible or sensible resonant vibrations during normal service.

TS 23.1 Engine Compartment Bulkheads

The passenger and engine compartment shall be separated by fire-resistant bulkheads. The engine compartment shall include areas where the engine and exhaust system are housed. This bulkhead shall preclude or retard propagation of an engine compartment fire into the passenger compartment and shall be in accordance with the Recommended Fire Safety Practices defined in FTA Docket 90A, latest revision. Only necessary openings shall be allowed in the bulkhead, and these shall be fire-proof. Any passageways for the climate control system air shall be separated from the engine compartment by fireproof material. Piping through the bulkhead shall have copper, brass, or fireproof fittings sealed at the bulkhead with copper or steel piping on the forward side. Wiring may pass through the bulkhead only if connectors or other means are provided to prevent or retard fire propagation through the bulkhead. The conduit and bulkhead connector shall be sealed with fireproof material at the fire wall. Engine access panels in the bulkhead shall be fabricated of fireproof material and secured with fireproof fasteners. These panels, their fasteners and the bulkhead shall be constructed and reinforced to minimize warping of the panels during a fire that will compromise the integrity of the bulkhead. Access panels shall be constructed to prevent vapors and fumes from entering the passenger compartment.

TS 23.2 Crashworthiness (Transit Bus)

Contractor shall be required to provide FEA software analysis or other evidence of compliance with this section during the pre-award audit. The bus body and roof structure shall withstand a static load equal to 150 percent of the curb weight evenly distributed on the roof with no more than a six inches reduction in any interior dimension. Windows shall remain in place and shall not open under such a load. These requirements must be met without the roof-mounted equipment installed.

The bus shall withstand a 25 mph impact by a 4,000-pound automobile at any side, excluding doorways, along either side of the bus with no more than three inches of permanent structural deformation at seated passenger hip height. This impact shall not result in sharp edges or protrusions in the bus interior.

Exterior panels below 35 inches from ground level shall withstand a static load of 2,000 pounds applied perpendicular to the bus by a pad no larger than five sq. inches. This load shall not result in deformation that prevents installation of new exterior panels to restore the original appearance of the bus.

The bus, at GVWR and under static conditions, shall not exhibit deformation or deflection that impairs operation of doors, windows, or other mechanical elements. Static conditions include the bus at rest with any one wheel or dual set of wheels on a 6-inch curb or in a six-inch deep hole.

All structure, body, and panel-bending mode frequencies, including vertical, lateral, and torsional modes, shall be sufficiently removed from all primary excitation frequencies to minimize audible, visible, or sensible resonant vibrations during normal service.

TS 24. Corrosion

The bus flooring, sides, roof, understructure and axle suspension components shall be designed to resist corrosion or deterioration from atmospheric conditions and de-icing materials for a period of 12 years or 500,000 miles, whichever comes first. It shall maintain structural integrity and nearly maintain original appearance throughout its service life, with the LACMTA's use of proper cleaning and neutralizing agents.

All materials that are not inherently corrosion resistant shall be protected with corrosion-resistant coatings. All joints and connections of dissimilar metals shall be corrosion resistant and shall be protected from galvanic corrosion. All body joints and seams shall be protected by application of polyurethane based sealer, or approved equal, at assembly. Representative samples of all materials and connections shall withstand a two-week (336-hour) salt spray test in accordance with ASTM Procedure B-117 with no structural detrimental effects to normally visible surfaces and no weight loss of over one percent.

The entire bus understructure, including wheel housings, shall be spray-coated prior to installation of sub-assemblies with suitable corrosion preventative undercoating which meets the bus manufacturer's corrosion protection specifications. The Contractor shall provide a copy of its proposed undercoating system program at the first Pre-Production meeting.

Corrosion Resistance Requirements for Exposed and Interior Surfaces of Tubing throughout Entire Vehicle

All exposed surfaces and the interior surfaces of tubing and other enclosed members shall be corrosion resistant through incorporation of intrinsically corrosion-resistant materials or through the application of a corrosion protection system.

Additional Corrosion Resistance Requirements

Alternatively the vehicle may be constructed using only inherently corrosion-resistant materials and fasteners such as stainless steel or composites to minimize deterioration

TS 25. Towing

Towing attachment points shall be provided on the front of the bus. Each towing device, when used with a load equalizing sling, shall withstand, without permanent deformation, tension loads up to 1.2 times the curb weight of the bus within 20 degrees of the longitudinal axis of the bus. If applicable, the rear towing device(s) shall not provide a toehold for unauthorized riders. The method of attaching the LACMTA's towing bar shall require the specific approval of the LACMTA in Pre-Production meetings and shall not require the removal, or disconnection, of front suspension or steering components. Removal of the bike rack is permitted for attachment of towing devices. Contractor shall provide 15 sets of any special towing equipment adapters, if required, so that the LACMTA is able to flat tow the bus. Contractor shall demonstrate compliance with these provisions using the Pilot Bus.

Provision of Connectors for Towing

Shop air connectors shall be provided at the front and rear of the bus and shall be capable of supplying all pneumatic systems of the bus with externally sourced compressed air. The location of these shop air connectors shall facilitate towing operations. A second air supply should be provided to allow the rear service brakes to be applied using the tow truck brake signal air pressure to apply the rear primary service brakes.

All male fittings shall have an additional quarter turn manual shut off valve provided near the front bumper for use only during towing, subject to LACMTA approval in Pre-Production meetings. Fittings shall be protected against dirt and moisture when not in use. Air connectors shall be LACMTA standard air chucks conveniently located in the engine compartment. Air lines leading to the external air shall include hand shut-off valves.

Lifted (Unsupported) Front Axle and Flat Towing Capability

The front towing attachment points shall allow attachment of the LACMTA's standard tow bar. The front towing attachment points shall permit towing of the bus at curb weight by the towing device(s) and the LACMTA tow bar without damage to anybody panel or component. These devices shall permit common flat towing.

Two rear recovery devices/tie downs shall permit lifting and towing of the bus for a short distance, such as in cases of an emergency, to allow access to provisions for front towing of bus. The method of attaching the tow bar or adapter shall require the specific approval of the LACMTA in pre-production meetings. Any tow bar or adapter exceeding 50 pounds should have means to maneuver or allow for ease of use and application. Each towing device shall accommodate a crane hook with a one-inch throat.

TS 26. Jacking

It shall be possible to safely jack up the bus, at curb weight, with a common 10-ton floor jack with or without special adapter, when a tire or dual set is completely flat and the bus is on a level, hard surface, without crawling under any portion of the bus. Jacking from a single point shall permit raising the bus sufficiently high to remove and reinstall a wheel and tire assembly. Jacking pads located on the axle or suspension near the wheels shall permit easy and safe jacking with scissors or bottle jack with the flat tire or dual set on a six inches high run-up block not wider than a single tire. The bus shall withstand such jacking at any one or any combination of wheel locations without permanent deformation or damage.

Jacking and changing any one tire/wheel assembly shall be completed by one LACMTA mechanic. The bus shall withstand such jacking at any one or any combination of wheel locations without permanent deformation or damage.

Yellow Pads

Jacking pads shall be painted safety yellow.

Decals

Apply decals to identify location of jacking pads. The location of the jacking pad shall be identified with a label on the exterior of the bus, directly over the jack pad.

TS 27. Hoisting

The bus axles or jacking plates shall accommodate the lifting pads of a two-post hoist system. Jacking plates, if used as hoisting pads, shall be 5-1/4 square inches, with a turned-down flange not less than ½-inch deep on each side (if applicable) to prevent the bus from falling off the hoist. A model or sample jacking plate shall be provided during Pre-Production meetings for approval by LACMTA. Other pads or the bus structure shall support the bus on jack stands independent of the hoist. The manufacturer may be required to demonstrate compatibility with LACMTA hoists as part of the towing demonstration for TS 25.

TS 28. Floor

TS 28.1 Design (Transit Bus)

The floor shall be essentially a continuous plane, except at the wheel housings and platforms. Where the floor meets the walls of the bus, as well as other vertical surfaces such as platform risers, the surface edges shall be blended with a circular section of radius not less than 3/8 inch or installed in a fully sealed butt joint. Similarly, a molding or cover shall prevent debris accumulation between the floor and wheel housings. The vehicle floor in the area of the entrance and exit doors shall have a lateral slope not exceeding two degrees to allow for drainage.

Floor installation, repair, and replacement method shall be subject to LACMTA approval during proposal period.

Bi-level Floor Design

The floor design shall consist of two levels (bi-level construction). Aft of the rear door extending to the rear settee riser, the floor height may be raised to a height no more than 21 inches above the lower level, with equally spaced steps. An increase slope shall be allowed on the upper level, not to exceed 3.5 degrees off the horizontal.

TS 28.2 Design (Commuter Bus)

Not applicable.

TS 28.3 Design (Articulated Transit Bus)

Not applicable.

TS 28.4 Strength

The floor deck may be integral with the basic structure or mounted on the structure securely to prevent chafing or horizontal movement and designed to last the life of the bus. Sheet metal screws shall not be used to retain the floor, and all floor fasteners shall be serviceable from one side only. Any adhesives, bolts or screws used to secure the floor to the structure shall last and remain effective throughout the life of the bus. Tapping plates, if used for the floor fasteners, shall be no less than the same thickness as a standard nut, and all floor fasteners shall be secured and protected from corrosion for the service life of the bus.

The floor deck shall be reinforced as needed to support passenger loads. At GVWR, the floor shall have an elastic deflection of no more than 0.60 inch from the normal plane. The floor shall withstand the application of 2.5 times gross load weight without permanent detrimental deformation. The floor, with coverings applied, shall withstand a static load of at least 150 pounds applied through the flat end of a ½-inch diameter rod, with 1/32-inch radius, without permanent visible deformation.

TS 28.5 Construction

The floor shall consist of the subfloor and the floor covering that will last the life of the bus. The floor as assembled, including the sealer, attachments and covering shall be waterproof, non-hygroscopic and resistant to mold growth. The subfloor shall be resistant to the effects of moisture, including decay (dry rot). It shall be impervious to wood-destroying insects such as termites.

The floor shall be constructed using composite flooring material approved by the LACMTA during proposal period. All floor surfaces, including edges shall be water proofed, non-hygroscopic, resistant to wet and dry rot, mold growth, and impervious to insects. Floor panels shall be attached to the substructure in such a manner as to be water tight and free from squeaks. Fasteners shall be rust proof.

TS 28.6 Construction (Commuter Bus)

Not applicable.

TS 29. Platforms

TS 29.1 Driver's Area

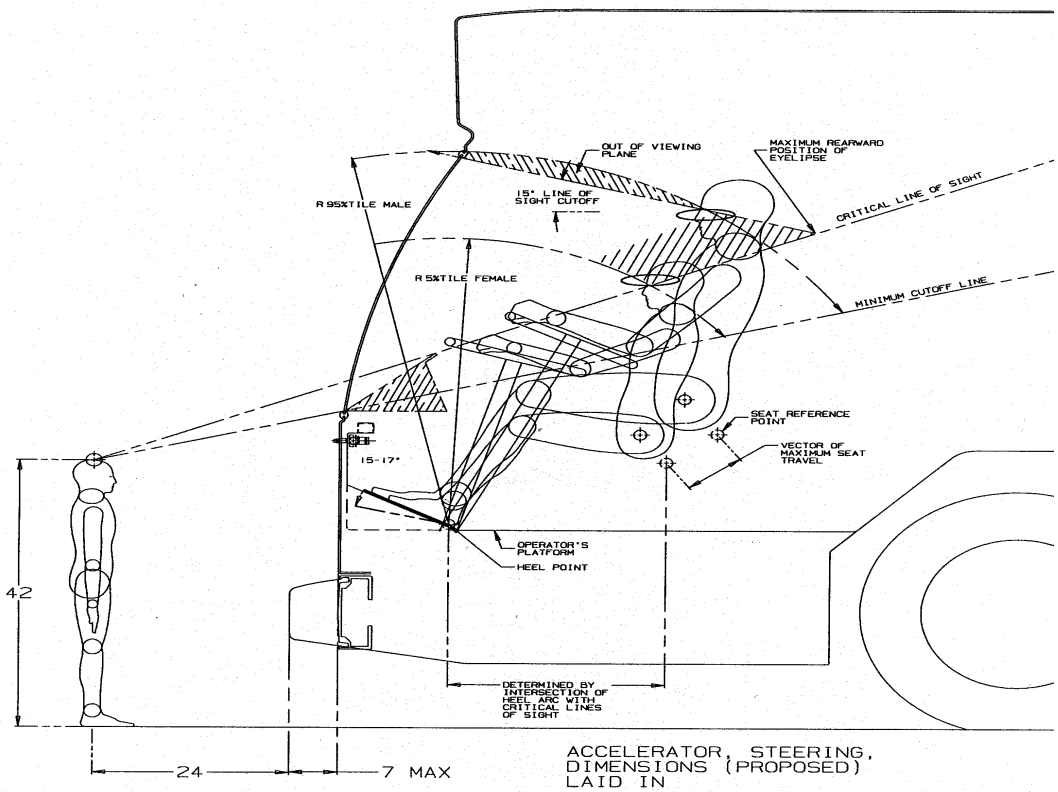
The covering of platform surfaces and risers, except where otherwise indicated, shall be the same material as specified for floor covering Non-corroding metal trim shall be provided and installed with stainless steel hardware along top edges of platforms unless integral nosing is provided.

TS 29.2 Driver's Platform

The driver's platform shall be of a height such that, in a seated position, the driver can see an object located at an elevation of 42 inches above the road surface, 24 inches from the leading edge of the bumper. Notwithstanding this requirement, the platform height shall not position the driver such that the driver's vertical upward view is less than 15 degrees. A warning decal or sign shall be provided to alert the driver to the change in floor level. Figure 3 illustrates a means by which the platform height can be determined, using the critical line of sight.

FIGURE 3

Determining Platform Height



TS 29.3 Farebox

Farebox placement should minimize impact to passenger access and minimize interference with the driver's line of sight.

Driver Interface Required; Platform Needed to Bring Height to Driver Access

If the driver's platform is higher than 12 inches, then the farebox is to be mounted on a platform of suitable height to provide accessibility for the driver without compromising passengers' access. A maximum of two steps shall be allowed for access to the Operator's seat pedestal. Farebox stanchion shall be placed to also provide assistance to Operator when entering/exiting driver's seat.

Stanchions

Stanchions shall be located around the farebox in accordance with ADA requirements. and subject to LACMTA approval during proposal period.

TS 29.4 Rear Step Area to Rear Area (Transit Bus)

If the vehicle is of a bi-level floor design, then a rear step area shall be provided along the center aisle of the bus to facilitate passenger traffic between the upper and lower floor levels. This step area shall be cut into the rear platform and shall be approximately the aisle width, a minimum 12 inches deep and approximately half the height of the upper level relative to the lower level. The horizontal surface of this platform shall be covered with skid-resistant material with a visually contrasting nosing and shall be sloped slightly for drainage. A warning decal or sign shall be provided at the immediate platform area to alert passengers to the change in floor level.

If there is an interior raised floor area, a maximum of two steps shall be allowed for access to the raised floor area behind the rear door. All step riser heights shall be the same. Risers shall be continuous, flat planes across the entire width. Step risers may be inclined, not to exceed 10 degrees from the vertical (nosing edge lower). All corners shall have radii no less than ¼-inch to facilitate cleaning.

Each step shall simultaneously support a 300-pound load evenly distributed over the center half of each step-tread without permanent deformation and with elastic deflection of no more than 1/8-inch. Each step tread shall support a load of 500 pounds evenly distributed over the center half of the tread without permanent deformation. The steps shall be sloped only sufficient to preclude water accumulation.

TS 30. Wheel Housing

TS 30.1 Design and Construction

Sufficient clearance and air circulation shall be provided around the tires, wheels and brakes to preclude overheating when the bus is operating on the design operating profile. Wheel housings shall be constructed of corrosion-resistant and fire-resistant material. Sufficient clearance and air circulation shall be provided around the tires, wheels and brakes to prevent overheating when the bus is operated in revenue service.

Wheel housings, as installed and trimmed, shall withstand impacts of a two- inch steel ball with at least 200 foot-pounds of energy without penetration.

TS 30.2 Design and Construction (Transit Bus)

Interference between the tires and any portion of the bus shall not be possible in maneuvers up to the limit of tire adhesion with weights from curb weight to GVWR. Wheel housings shall be adequately reinforced where seat pedestals are installed. Wheel housings shall have sufficient sound insulation to minimize tire and road noise and meet all noise requirements of this specification.

Design and construction of front wheel housings shall allow for the installation of a radio or electronic equipment storage compartment on the interior top surface.

The finish of the front wheel housings shall be scratch-resistant and complement interior finishes of the bus to minimize the visual impact of the wheel housing. If fiberglass, or other composite material, wheel housings are provided, then they shall be color-impregnated to match interior finishes. The lower portion extending to approximately 10 to 12 inches above the floor shall be equipped with stainless steel trim.

Wheel housings not equipped with seats or equipment enclosure shall have a horizontal assist mounted on the top portion of the housing no more than seven inches higher than the wheel well housing. If required for access to suspension components, installation of access panels in the wheel housing must meet all requirements listed including fastening devices, strength and mounting.

TS 30.3 Articulated Joint (Articulated Transit Bus)

Not applicable.

TS 30.4 Raceway (Articulated Transit Bus)

Not applicable.

TS 30.5 Bellows

Not applicable.

CHASSIS (TS 31-TS 38)

TS 31. Suspension

TS 31.1 General Requirements

The front and rear suspensions shall be pneumatic type. The basic suspension system shall last the service life of the bus without major overhaul or replacement. Adjustment points shall be minimized and shall not be subject to a loss of adjustment in service. Routine adjustments shall be easily accomplished by limiting the removal or disconnecting the components. Heavy-duty height control valves shall be provided to keep the bus body in relatively level position and shall contain a dampening or compensating feature to prevent excessive consumption of air resulting from high-frequency axle movements over rough streets. The height control valves will retain the height of the body in relation to the axles under all loading conditions. Regardless of load, the bus relative height to the centerline of the wheels shall not change more than ± 0.5 inches

TS 31.2 Alignment

All axles should be properly aligned so the vehicle tracks accurately within the size and geometry of the vehicle.

TS 31.3 Springs and Shock Absorbers

TS 31.3.1 Suspension Travel

The suspension system shall permit a minimum wheel travel of three inches jounce-upward travel of a wheel when the bus hits a bump (higher than street surface), and three inches rebound-downward travel when the bus comes off a bump and the wheels fall relative to the body. Elastomeric bumpers shall be provided at the limit of jounce travel. Rebound travel may be limited by elastomeric bumpers or hydraulically within the shock absorbers. Suspensions shall incorporate appropriate devices for automatic height control so that regardless of load the bus height relative to the centerline of the wheels does not change more than ½ inch at any point from the height required. The safe operation of a bus cannot be impacted by ride height up to one inch from design normal ride height.

TS 31.3.2 Damping

Vertical damping of the suspension system shall be accomplished by hydraulic shock absorbers mounted to the suspension arms or axles and attached to an appropriate location on the chassis. Damping shall be sufficient to control bus motion to three cycles or less after hitting road perturbations. The shock absorber bushing shall be made of elastomeric material that will last the life of the shock absorber. The damper shall incorporate a secondary hydraulic rebound stop. Shock absorber travel shall be centered on suspension travel to equalize travel to stops in jounce and rebound.

TS 31.3.3 Lubrication

Standard Grease Fittings

Components that do not require regular greasing are desired. A review of all components available that do not require greasing shall be provided with proposal. All elements of steering, suspension and drive systems

requiring scheduled lubrication shall be provided with grease fittings conforming to SAE Standard J534. These fittings shall be located for ease of inspection and shall be accessible with a standard grease gun from a pit or with the bus on a hoist. Each element, requiring lubrication, shall have its own grease fitting with a relief path. The lubricant specified shall be standard for all elements on the bus serviced by standard fittings and shall be required no less than every 6,000 miles.

TS 31.3.4 Kneeling/Raising

Kneeling

A kneeling system shall lower the entrance of the bus a minimum of 2.75 inches during loading or unloading operations regardless of load up to GVWR, measured at the longitudinal centerline of the entrance door by the driver. The kneeling control shall provide the following functions:

- Downward control must be held to allow downward kneeling movement.
- Release of the control during downward movement must completely stop the lowering motion and hold the height of the bus at that position.
- Upward control actuation must allow the bus to return to normal floor height without the driver having to hold the control.

The brake and throttle interlock shall prevent movement when the bus is kneeled. The kneeling control shall be disabled when the bus is in motion. The bus shall kneel at a maximum rate of 1.25 inches per second at essentially a constant rate reaching fully kneeled position within 4.5 seconds. After kneeling, the bus shall rise within 3 seconds to a height permitting the bus to resume service and shall rise to the correct operating height within 7 seconds regardless of load up to GVWR. During the lowering and raising operation, the maximum vertical acceleration shall not exceed 0.2g, and the jerk shall not exceed 0.3g/second.

An indicator visible to the Operator shall be illuminated until the bus is raised to a height adequate for safe street travel. An audible warning alarm will sound simultaneously with the operation of the kneeler to alert boarding passengers and minimize the sound directed to other areas. The audible alarm sound level shall be automatically adjustable to compensate for ambient sound levels. A warning light mounted near the curbside of the front door, a minimum 2.5 inches diameter amber lens, shall be provided that will blink when the kneel feature is activated. Kneeling shall not be operational while the wheelchair ramp is deployed or in operation.

Raising

The bus shall incorporate a system controlled by the Operator that permits the bus to raise (to account for high curbs) 2.75 inches, measured from normal ride height at the center of the bottom front step regardless of passenger load up to GVWR. Brake and throttle interlock shall be activated to prevent movement when the Bus is raised. The bus shall rise at a maximum rate of 1.25 inches per second at essentially a constant rate reaching fully raised position within 4.5 seconds. After rising the bus shall recover (lower) within 3.5 seconds to a ride height permitting the bus to resume service and shall fully recover to the correct operating ride height within 10 seconds. During the lowering operation, the maximum acceleration shall not exceed 0.2g and the jerk shall not exceed 0.3g/sec. measured on the front door step tread.

An indicator visible to the Operator shall be illuminated until the bus has recovered to a height adequate for safe operation. The indicator lights shall be clearly labeled. Warning devices that operate with the high curb system which are visible and audible to passengers near the curbside of the front door shall be provided.

TS 32. Wheels and Tires

TS 32.1 Wheels

All wheels shall be interchangeable and shall be removable without a puller. Wheels shall be compatible with tires in size and load-carrying capacity. Front wheels and tires shall be balanced and counter weighted as an assembly per SAE J1986. Wheel stud nut(s) shall be 1.50-inch in size, (or metric equivalent), and shall be finished with rust preventative in natural steel with no paint.

Wheels and tires shall be removable without disturbing the fender skirts.

Aluminum Wheel

Wheels shall be Alcoa Durabrite polished aluminum. Wheels must be sized to accommodate disc brakes at all wheel locations.

TS 32.2 Tires

Tires shall be suitable for the conditions of transit service and sustained operation at the maximum speed capability of the bus. Load on any tire at GVWR shall not exceed the tire Supplier's rating.

The tires shall be provided under a lease agreement between LACMTA and the tire Supplier. Tires are to be furnished to the Contractor by the LACMTA or authorized representative. Contractor shall provide the LACMTA with a record listing tires installed for each bus delivered. The information shall include the LACMTA brand serial number and mounting location on the bus. Contractor shall conform to tire manufacturer specifications for maximum road speed and duty cycle during bus delivery.

TS 33. Steering

Electrically driven hydraulic assisted or electrically assisted steering shall be provided. The steering gear shall be an integral type with the number and length of flexible lines minimized or eliminated. Steering torque applied by the Operator shall not exceed 10 foot-pounds with the front wheels straight ahead. Steering torque may increase to 70 foot-pounds when the wheels are approaching the steering stops. Steering effort shall be measured with the Bus at Seated Load Weight (SLW), stopped with the brakes released and the engine at normal idling speed on clean, dry, level, commercial asphalt pavement with the tires inflated to recommended pressure. Power steering failure shall not result in loss of steering control. While the bus is in operation, the steering effort shall not exceed 55 pounds at the steering wheel rim and perceived free play in the steering system shall not materially increase as a result of power assist failure. Gearing shall require no more than seven turns of the steering wheel lock-to-lock.

TS 33.1 Steering Axle (Transit Bus)

Solid Beam Axle and Grease-Type Front Bearings and Seals

The front axle shall be solid beam, non-driving with a load rating sufficient for the bus loaded to GVWR and shall be equipped with preferred unitized grease type front wheel bearings and seals.

All friction points on the front axle shall be equipped with replaceable bushings or inserts and, if needed, lubrication fittings easily accessible from a pit or hoist.

The steering geometry of the outside wheel shall be within two degrees of true Ackerman up to 50 percent lock measured at the inside wheel. The steering geometry shall be within three degrees of true Ackerman for the remaining 100 percent lock measured at the inside wheel.

TS 33.2 Steering and Tag Axles (Commuter Bus)

Not applicable.

TS 33.3 Steering Wheel

TS 33.3.1 Turning Effort

Steering effort shall be measured with the bus at GVWR, stopped with the brakes released and the engine at normal idling speed on clean, dry, level, commercial asphalt pavement and the tires inflated to recommended pressure.

Under these conditions, the torque required to turn the steering wheel 10 degrees shall be no less than 5 foot-pounds and no more than 10 foot-pounds. Steering torque may increase to 70 foot.-pounds when the wheels are approaching the steering stops, as the relief valve activates.

Power steering failure shall not result in loss of steering control. With the bus in operation, the steering effort shall not exceed 55 pounds at the steering wheel rim, and perceived free play in the steering system shall not materially increase as a result of power assist failure. Gearing shall require no more than seven turns of the steering wheel lock-to-lock.

Caster angle shall be selected to provide a tendency for the return of the front wheels to the straight position with minimal assistance from the driver.

TS 33.3.2 Steering Wheel, General

The steering wheel diameter shall be approximately 18 to 20 inches; the rim diameter shall be ⅞ to 1¼ inches and shaped for firm grip with comfort for long periods of time.

Steering wheel spokes and wheel thickness shall ensure visibility of the dashboard so that vital instrumentation is clearly visible at center neutral position (within the range of a 95th-percentile male, as described in SAE 1050a, Sections 4.2.2 and 4.2.3). Placement of steering column must be as far forward as possible, but either in-line with or behind the instrument cluster.

Foam-covered steering wheel is not acceptable. The steering wheel shall be removable with a standard or universal puller.

TS 33.3.3 Steering Column Tilt

The steering column shall have full tilt capability with an adjustment range of no less than 35 degrees and easily adjustable by the driver.

Steering column shall be a tilt and telescopic model. Column shall be easily adjustable while driver is seated in the driver's seat. The mechanism for adjustments shall be designed for ease of use, durability, utilize detents to position and lock the steering column and not require tightening by hand to apply a clamping force.

TS 33.3.4 Steering Wheel Telescopic Adjustment

The steering wheel shall have full telescoping capability and have a minimum telescopic range of two inches (but no more than 5 inches) and a minimum low-end adjustment of 32 inches, measured from the top of the steering wheel rim in the horizontal position, (0 degrees slope), to the cab floor at the heel point.

TABLE 6

Steering Wheel Height[1] Relative to Angle of Slope

At Minimum Telescopic Height Adjustment (+0 in.)		At Maximum Telescopic Height Adjustment (+5 in.)	
Angle of Slope	**Height**	**Angle of Slope**	**Height**
0 degrees	32 inches	0 degrees	34 inches
15 degrees	26.2 inches	15 degrees	31.2 inches
25 degrees	24.6 inches	25 degrees	29.6 inches
35 degrees	22.5 inches	35 degrees	27.5 inches

1. Measured from bottom portion closest to driver.

TS 34. Drive Axle

The bus shall be driven by a heavy-duty axle with a load rating sufficient for the bus loaded to GVWR. The drive axle shall have a design life to operate for not less than 300,000 miles on the design operating profile without replacement or major repairs. The lubricant drain plug shall be magnetic type. If a planetary gear

design is employed, the oil level in the planetary gears shall be easily checked through the plug or sight gauge. The axle and driveshaft components shall be rated for both propulsion and retardation modes with respect to duty cycle.

NOTE: The retardation duty cycle can be more aggressive than propulsion.

The drive shaft shall be guarded to prevent hitting any critical systems, including brake lines, bus floor or the ground, in the event of a tube or universal joint failure.

End tubes shall be threaded to allow for adjustment of wheel bearing nuts.

Wheel bearings shall be sealed, unitized construction.

Rear axle shall use full synthetic oil meeting axle manufacturer's specifications.

NOTE: Trip recorder to be used in place of hub odometer. (Refer to Section TS 43.1.3)

TS 34.1 Non-Drive Axle

The non-drive axle is the drive axle without the drive gear with a load rating sufficient for the load to GVWR.

TS 35. Tag Axles (Commuter Coach)

Not applicable.

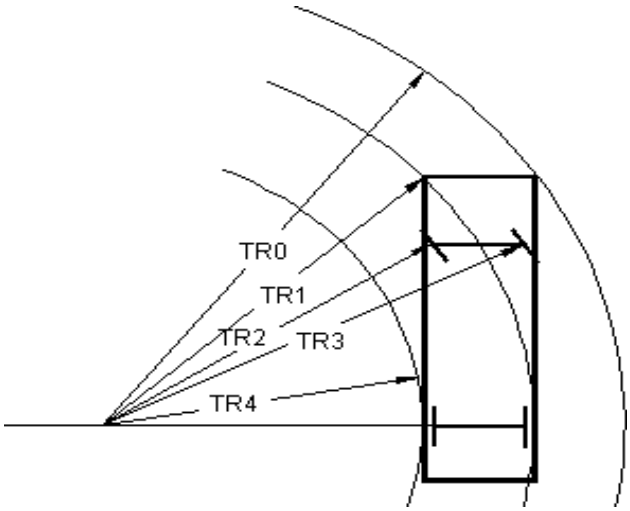
TS 36. Turning Radius

Outside body corner turning radius shall not exceed the maximum at SLW. The front tires shall not rub or interfere in any manner with the bus body parts when turned in either direction under all operating conditions. The turning radius shall be consistent from bus to bus and left to right with no more than six inch difference in measured radius.

TABLE 7
Maximum Turning Radius

Bus Length (approximate)	Maximum Turning Radius (see Figure 4)
40 ft.	44 ft. (TR0)

FIGURE 4
Turning Radius



TS 37. Brakes

TS 37.1 Service Brake

The entire service brake system, including ABS controls, friction material, shall meet applicable FMVSS standards. The entire brake system, including friction material, shall have overhaul or replacement life goal of at least 45,000 miles when operated under LACMTA service.

Brakes shall be self-adjusting. Mechanical Brake Wear indicators, (visible brake sensors), shall utilize stainless steel exposed push rods.

TS 37.2 Actuation

Air-Actuated Brakes

Service brakes shall be controlled and actuated by a compressed air system. Force to activate the brake pedal control shall be an essentially linear function of the bus deceleration rate and shall not exceed 70 pounds at a point seven inches above the heel point of the pedal to achieve maximum braking. The heel point is the location of the driver's heel when his or her foot is rested flat on the pedal and the heel is touching the floor or heel pad of the pedal. The ECU for the ABS system shall be protected, yet in an accessible location to allow for ease of service.

The total braking effort shall be distributed between all wheels in such a ratio as to ensure equal friction material wear rate at all wheel locations. Manufacturer shall demonstrate compliance by providing a copy of a thermodynamic brake balance test upon request.

TS 37.3 Friction Material

The brake linings shall be made of non-asbestos material. In order to aid maintenance personnel in determining extent of wear, a provision such as a scribe line or chamfer indicating the thickness at which replacement becomes necessary shall be provided on each brake lining. No bolts or rivets shall be used to retain the brake lining.

TS 37.4 Hubs and Drums/Discs

Replaceable unitized wheel bearing seals shall run on replaceable wear surfaces. Wheel bearings and hub seals and unitized hub assemblies shall not leak or weep lubricant when operating on the design operating profile for the duration of the initial manufacturer's warranty or 100,000 miles, whichever is longer.

Axle hubs shall be HUB pilot wheel mounting. Hubs shall be painted semi-gloss (50 percent) black with no paint on mating surfaces.

Disc Brakes on All Axles

The bus shall be equipped with disc brakes on all axles, and the brake discs shall allow machining of each side of the disc to obtain smooth surfaces per manufacturer's specifications.

The brake system material and design shall be selected to absorb and dissipate heat quickly so that the heat generated during braking operation does not glaze brake linings.

TS 37.5 Hubs and Drums (Commuter Bus)

Not applicable

TS 37.6 Parking/Emergency Brake

Air Brakes

The parking brake shall be a spring-operated system, actuated by a valve that exhausts compressed air to apply the brakes. The parking brake may be manually enabled when the air pressure is at the operating level per FMVSS 121.

The parking brake shall be actuated by a valve mounted convenient to the Operator, subject to LACMTA approval in Pre-Production meetings. In the event of total loss of air pressure, spring brakes shall be applied automatically.

An audible warning alarm shall be activated when the Master Run switch is in "Off" position or transmission is in neutral and parking brake is not actuated.

Emergency Brake

An emergency brake release shall be provided to release the brakes in the event of automatic emergency brake application. The driver shall be able to manually depress and hold down the emergency brake release valve to release the brakes and maneuver the bus to safety. Once the driver releases the emergency brake release valve, the brakes shall engage to hold the bus in place.

Parking and Emergency brake controls shall be equipped with powder coated metal knobs (no plastic knobs). Colored "yellow" for Parking, and "green" for Emergency release functions.

TS 38. Interlocks (Transit Bus)

TS 38.1 Passenger Door Interlocks

To prevent opening mid and rear passenger doors while the bus is in motion, a speed sensor shall be integrated with the door controls to prevent the mid/rear doors from being enabled or opened unless the bus speed is less than 3 mph.

To preclude movement of the bus, an accelerator interlock shall lock the accelerator in the closed position, and a brake interlock shall engage the service brake system to stop movement of the bus when the driver's door control is moved to a mid/rear door enable or open position, or a mid or rear door panel is opened more than three inches from the fully closed position (as measured at the leading edge of the door panel). This interlock shall also be applied when the emergency release system for the doors is activated.

The interlock engagement shall bring the bus to a smooth stop and shall be capable of holding a fully loaded bus on a six percent grade, with the engine at idle and the transmission in gear, until the interlocks are released. These interlock functions shall be active whenever the vehicle master run switch is in any run position.

All door systems employing brake and accelerator interlocks shall be supplied with supporting failure mode effects analysis (FEMA) documentation, which demonstrates that failure modes are of a failsafe type, thereby never allowing the possibility of release of interlock while an interlocked door is in an unsecured condition, unless the Master Door Interlock switch has been actuated to intentionally release the interlocks. Built in redundancy shall prevent the system from becoming unsafe while a single point failure exists anywhere in the system.

Brake interlock regulator shall be non-adjustable.

Once activated the brake interlock shall not release until the operator makes a 6 psi service brake application.

Accelerator and brake interlock shall not be applied when front door is opened.

TS 38.2 Lift Interlocks

When front ramp/kneel enable switch is activated an accelerator interlock shall disable the accelerator and a brake interlock shall engage the service brake system to stop movement of the bus. Interlocks shall not be released until ramp is fully stowed and the operator makes a 6 psi service brake application.

TS 38.3 Kneel Interlocks

When front ramp/kneel enable switch is activated an accelerator interlock shall disable the accelerator and a brake interlock shall engage the service brake system to stop movement of the bus. Interlocks shall not be released until bus returns to normal operating height and the Operator makes a 6 psi service brake application.

TS 38.4 Fuel/Charging System Interlocks

CNG

The bus shall be designed to remove ignition power from the engine, prevent the transmission from going into gear and disable the engine starter when the sensor detects a fuel nozzle connected to the fast fill receptacle. The interlock shall be of the type such that if the sensor fails, the bus will not start. The system shall provide a separate interlock preventing starting of the engine when fuel fill door is in open position. Both sensing systems shall be a high-reliability design with minimum 95 percent availability for correct operation and function. This interlock shall also be of the type such that if the sensor fails, the bus will not start.

~~The bus shall ignore a failure of the CNG fuel nozzle proximity sensor as long as the fuel door is closed and the engine is running. It shall not remove ignition power to the engine under these conditions. However, when an operator parks the bus and shuts down the engine, he/she shall not be able to restart the engine. The fuel nozzle proximity sensor shall prohibit the engagement of the starting circuit and engage the "FUELING IN PROCESS" indication on the dash monitor. That will be a cue to a mechanic that the fuel nozzle proximity sensor or its connection is faulty and needs to be checked or replaced.~~The fuel nozzle proximity sensor prohibits the engagement of the starting circuit and engages the "Fueling in Process" indication on the dash monitor.

Zero Emission

The bus shall be designed to remove ignition power from the PPU and prevent the drive system from engaging when the sensor detects a charger connected to the charge port. The interlock shall be of the type such that if the sensor fails, the bus will not run. The sensing systems shall be a high-reliability design with minimum 95 percent availability for correct operation and function. This interlock shall also be of the type such that if the sensor fails, the bus will not run.

TS 39. Pneumatic System

TS 39.1 General

The bus air system shall operate the air-powered accessories and the braking system with reserve capacity. The bus air system shall meet requirements of California Code 13 CCR 1245 for air leakage and shall not leak as defined by the following tests:

a) The air pressure in new buses shall not decrease by more than 10 psi over the first 10-minute period of time immediately following initial air build up, as indicated on the brake reservoir dash gauges, (as per TP-FMVSS121).
b) With the air system fully charged, cooled off and stabilized for 10 minutes, the brake interlock applied, and no other accessories in use (i.e., opening/closing the doors, air actuated wipers), a new bus shall not leak more than 1 psi over the following 15 minutes as indicated on the brake reservoir dash gauges.

Provision shall be made to apply shop air to the bus air systems. A quarter turn manual shut-off valve with quick disconnect fitting shall be easily accessible and located in the engine compartment and shall supply air prior to the air dryer, subject to LACMTA approval in Pre-Production meetings.

Air for the compressor shall be filtered. The air system shall be protected per FMVSS 121 (S5.1.2.3).

Air System Design Operating Profile

The bus air system shall operate the air-powered accessories and the braking system with reserve capacity, as defined by using the following test(s):

With bus loaded to GVWR and operating under normal conditions, the air system and its major components (air compressors, air dryers) shall be designed to operate under the Manhattan Operating Profile as defined per SAE J2711 or an equivalent, without exceeding the technical specifications of the major components. Operating under normal conditions implies –

- All air actuated accessories on.
- Retarders/regenerative brakes in use.
- Ambient temperatures between 32°F and 100°.F;
- One kneel operation on every 4th bus stop as defined per SAE J2711.
- Interlock shall be set at each stop.

TABLE 8
Air System Test Profiles

Operating profile (Extract from SAE J2711)	Speed [mph]		Stops [#]	Distance [miles]	Stops [#/miles]
	Top	Average			
UDDS (high speed bus operation)	58.00	19	28.00	11.10	2.53
Orange County (intermediate speed bus operation)	40.63	12.7	31.00	6.54	4.75
Manhattan (low speed bus operation)	25.30	6.8	40.00	4.13	9.69

Kneeling operation shall be achieved as per TS 31.3.4 and implies:

- Bus brought to a complete stop;
- Open all doors (implies activation of brake interlock(s))
- Kneel to meet TS 31.3.4 requirements;
- Wait 10 seconds;

- Close all doors;
- Apply service brakes to release brake interlock(s);
- Raise the bus to safe operation of suspension systems

TS 39.2 Air Compressor

The electrically-driven air compressor shall be sized (designed) to charge the entire air system on new buses from 0 psi to 120 psi in less than five minutes for a single unit bus not exceeding the fast idle speed (~1000 rpm) setting of the engine.

Charge time procedure and conditions: with air spring inflated and the bus at curb weight, all air tanks except emergency tank(s) fully drained, brake interlock, service brakes and air system accessories (i.e., doors, wipers, kneeling device or leveling), must not be activated or engaged during charge up procedure.

The electrically-driven air compressor shall be designed to supply air operating under the Air System Design Operating Profile while remaining within the manufactures air compressor specifications. The discharge temperature (measured at the compressor outlet using a probe thermocouple) shall not exceed 360º F, (410º F for oil-less compressors) excluding temperature spikes of durations less than two seconds and two percent of compressor charge time. Air compressor duty-cycle shall not exceed the compressor manufacturers rating in any 10-minute period under the Manhattan Operating Profile.

Air Compressor Governor

Air governor shall be adjustable with a cap and a red stripe from the cap to the governor body using tamper resistant paint and be mounted in a suitable location which will be easily accessible for maintenance.

TS 39.3 Air Lines and Fittings

Air lines, except necessary flexible lines, shall conform to the installation and material requirements of SAE Standard J1149 for copper tubing with standard, brass, flared or ball sleeve fittings, or SAE Standard J844 for nylon tubing if not subject to temperatures over 200 ° F. The air on the delivery side of the compressor where it enters nylon housing shall not be above the maximum limits as stated in SAE J844. Nylon tubing shall be installed in accordance with the following color-coding standards:

- **Green:** Indicates primary brakes and supply.
- **Red:** Indicates secondary brakes.
- **Brown:** Indicates parking brake.
- **Yellow:** Indicates compressor governor signal.
- **Black:** Indicates accessories.

Line supports shall prevent movement, flexing, tension, strain and vibration. Copper lines shall be supported to prevent the lines from touching one another or any component of the bus. To the extent practicable and before installation, the lines shall be pre-bent on a fixture that prevents tube flattening or excessive local strain. Copper lines shall be bent only once at any point, including pre-bending and installation. Bends shall be provided with large radius, (sweeps), to minimize restrictions to lines. Rigid lines shall be supported at no more than 5-ft. intervals. Nylon lines may be grouped and shall be supported at 30-inch intervals or less. Nylon lines shall incorporate press-to-connect type fittings allowing rapid replacement of lines.

The compressor discharge line between PPA/PPU and body-mounted equipment shall be flexible Teflon hose with a braided stainless steel jacket. Other lines necessary to maintain system reliability shall be flexible Teflon hose with a braided stainless steel jacket. End fittings shall be standard SAE or JIC brass or steel, flared, swivel-type fittings. Flexible hoses shall be as short as practicable and individually supported. They shall not touch one another or any part of the bus except for the supporting grommets. Flexible lines shall be supported at 2-ft. intervals or less.

Air lines shall be clean before installation and shall be installed to minimize air leaks. All air lines shall be routed to prevent water traps to the extent possible. Grommets or insulated clamps shall protect the air lines at all points where they pass through understructure components.

TS 39.4 Air Reservoirs

All air reservoirs shall meet the requirements of FMVSS Standard 121 and SAE Standard J10 and shall be equipped with guarded or flush type drain valves below floor level. Major structural members shall protect these valves and any automatic moisture ejector valves from road hazards. Reservoirs shall be sloped toward the drain valve. All air reservoirs shall have drain valves mounted below floor level with lines routed to eliminate the possibility of water traps. All air tanks shall have check valves at the inlet side for isolation.

TS 39.5 Air System Dryer

The air system shall be equipped with an air dryer located before the first (supply system) air tank. The air dryer system shall operate automatically and be sized to eliminate moisture and oil in the air system at maximum air compressor discharge volume when engine is at full rated speed and load. The air dryer system shall require minimum routine maintenance. Desiccant shall be replaceable by spin-on filter in 15 minutes or less.

Air system dryer components shall be readily accessible for service and inspection. To the extent practical, disconnection or removal of components unrelated to a specific maintenance and/or repair task shall be unnecessary. Alternating tower air dryers will not be permitted. The air system air dryer shall be located as far from the compressor as possible and in ambient air flow to allow air to cool prior to entering the air dryer. Inlet air temperature to the dryer shall not exceed 150 degrees F.

Requirement for Additional Oil Separator Provision

A provision shall be included to collect/remove oil from the air system to prevent affecting function and/or damaging pneumatic system components. The oil separator shall operate automatically and be sized to eliminate moisture and oil in the air system at maximum air compressor discharge volume when engine is at full rated speed and load.

ELECTRICAL, ELECTRONIC AND DATA COMMUNICATION SYSTEMS (TS 40-TS 45)

TS 40. Overview

The Contractor shall coordinate a technical review with the LACMTA covering control system integration, installation, and design. As part of the technical review, the Contractor shall advise the LACMTA concerning control system features, options, and accessories, and shall conform, to the degree possible, to those already in use at the LACMTA in an effort to increase component and system commonality. The Contractor shall provide documentation including a description of control system operation and system schematics.

A listing of the software part number and revision number and procedure for obtaining new releases shall be identified for each component which is software controlled.

The electrical system will consist of vehicle battery systems and components that generate, distribute and store power throughout the vehicle (i.e., generator, voltage regulator, wiring, relays and connectors).

Electronic devices are individual systems and components that process and store data, integrate electronic information or perform other specific functions.

The data communication system consists of the bi-directional communications networks that electronic devices use to share data with other electronic devices and systems. Communication networks are essential to integrating electronic functions, both onboard the vehicle and off.

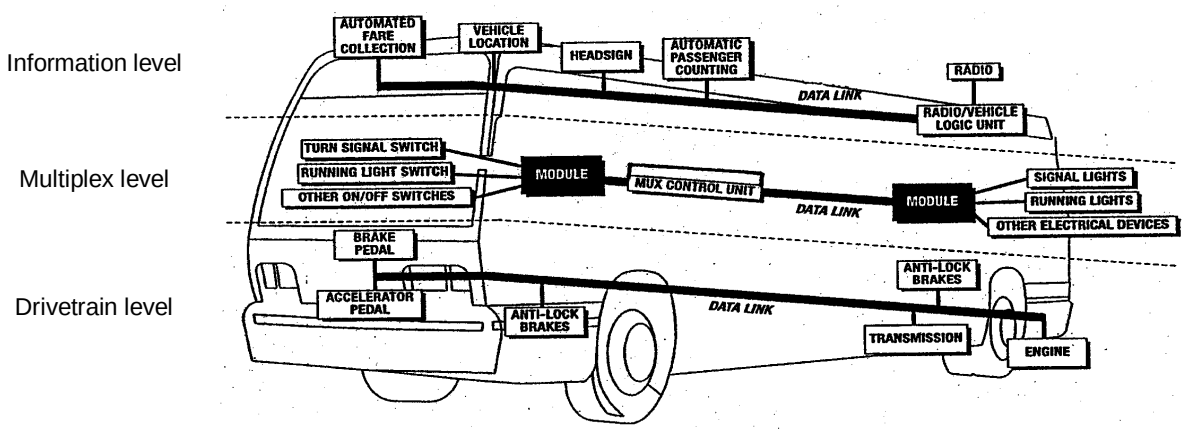
Information level systems that require vehicle information for their operations or provide information shall adhere to J1939 data standard.

Data communications systems are typically divided into three levels to reflect the use of multiple data networks:

- **Drivetrain level:** Components related to the drivetrain including the propulsion system components (engine and transmission), and anti-lock braking system (ABS), which may include traction control.
- **Information level:** Components whose primary function is the collection, control or display of data that is not necessary to the safe drivability of the vehicle (i.e., the vehicle will continue to operate when those functions are inoperable). These components typically consist of those required for automatic vehicle location (AVL) systems, destination signs, fare boxes, passenger counters, radio systems, automated voice and signage systems, video surveillance and similar components.
- **Multiplex level:** Electrical or electronic devices controlled through input/output signals such as discrete, analog and serial data information (i.e., on/off switch inputs, relay or relay control outputs). Multiplexing is used to control components not typically found on the drivetrain or information levels, such as lights; wheelchair lifts; doors; heating, ventilation and air conditioning (HVAC) systems; and gateway devices.

FIGURE 5

Data Communications Systems Levels



TS 40.1 Modular Design

Design of the electrical, electronic and data communication systems shall be modular so that each electronic device, apparatus panel, or wiring bundle is easily separable from its interconnect by means of connectors.

Propulsion system wiring shall incorporate an independent wiring harness(es). Replacement of the engine/propulsion compartment wiring harness(es) shall not require pulling wires through any bulkhead or removing any terminals from the wires.

TS 41. Environmental and Mounting Requirements

The electrical system and its electronic components shall be capable of operating in the area of the vehicle in which they will be installed, as recommended in SAE J1455.

Electrical and electronic equipment shall not be located in an environment that will reduce the performance or shorten the life of the component or electrical system when operating within the design operating profile. No vehicle component shall generate, or be affected by, electromagnetic interference or radio frequency interference (EMI/RFI) that can disturb the performance of electrical/electronic equipment as defined in SAE J1113 and UNECE Council Directive 95/54 (R 10).

The LACMTA shall follow recommendations from bus manufacturers and subsystem Suppliers regarding methods to prevent damage from voltage spikes generated from welding, jump starts, shorts, etc.

TS 41.1 Hardware Mounting

The mounting of the hardware shall not be used to provide the sole source ground, and all hardware shall be isolated from potential EMI/RFI, as referenced in SAE J1113.

All electrical/electronic hardware mounted in the interior of the vehicle shall be inaccessible to passengers and hidden from view unless intended to be viewed. The hardware shall be mounted in such a manner as to protect it from splash or spray.

All electrical/electronic hardware mounted on the exterior of the vehicle that is not designed to be installed in an exposed environment shall be mounted in a sealed enclosure.

All electrical/electronic hardware and its mounting shall comply with the shock and vibration requirements of SAE J1455.

All system components shall be easily accessible without requiring any special tools.

TS 42. General Electrical Requirements

TS 42.1 Batteries

TS 42.1.1 Low-Voltage Batteries (24V)

Four Group 31 Maintenance-Free Batteries

Batteries shall be a minimum of four absorbed glass mat thin plate pure lead technology group 31 series, heavy-duty, lead-acid, sealed top battery units for: a) engine starting (including fuel controls, electronic control units and ignition system), and b) other bus loads as needed, subject to LACMTA approval during proposal period. Each battery shall have a purchase date no more than six months from the date of release for shipment to the LACMTA. Positive and negative terminal ends shall be the same size.

Each battery shall have a minimum of 1,000 cold cranking amps and a reserve capacity of no less than 200 minutes. Warranty shall begin at the date of bus acceptance and shall cover an unconditional 48 months.

Starting Batteries

Batteries used for starting the engine shall be located as close to the starter as possible. Starting batteries shall be protected from power loss in the event that lights or other loads are inadvertently left on, up to two hours, which would normally drain the batteries when the engine is not running. Starting with a full charge, starting batteries shall have sufficient energy to provide adequate power after a minimum of five continuous days (Master Run switch “Off”, Master Battery switch “On”, all lights off, LACMTA installed ITS equipment operating) without charging or engine operation to then properly start the bus.

TS 42.1.2 Battery Cables

The battery terminal ends and cables shall be color-coded with red for the primary positive, black for negative and another color for any intermediate voltage cables. Positive and negative battery cables shall not cross each other if at all possible, be flexible and sufficiently long to reach the batteries with the tray in the extended position without stretching or pulling on any connection and shall not lie directly on top of the batteries. Except as interrupted by the master battery switch, battery and starter wiring shall be continuous cables with connections secured by bolted terminals and shall conform to specification requirements of SAE Standard J1127 – Type SGT, SGX or GXL and SAE Recommended Practice J541.

2100 strand 4/0 cable or greater recommended. Battery cables shall be flexible and of sufficient length to reach the batteries when the battery tray is in the extended position without stretching or pulling on any connection or resting on top of the batteries or on the compartment floor when the tray is stowed. A diagram showing proper

cable connections and interconnections shall be located in the battery enclosure. Cables shall be arranged to prevent incorrect installation. Except as interrupted by the master battery disconnect switch(s), solenoid battery cutoff and necessary bus bar(s), battery wiring shall be continuous cables with connections secured by bolted terminals. Heavy-duty battery cables shall not be bent in a radius which stresses insulation and promotes propagation of cracking.

TS 42.1.3 Jump Start

Jump-Start Connector

Independently wired quick connect-disconnect receptacles (one for systems which use a battery equalizer) shall be provided. Connections to jump start connector assembly(s) shall be made through 4/0 cables to the respective battery circuit. Female receptacles equipped with approximately one- foot 2/0 pigtail cables shall be provided, which are spliced with 4/0 cables that lead to the battery circuit. One 12-volt (if not an equalizer equipped system), and one 24-volt, female labeled receptacles shall be provided to boost start the bus. The receptacles shall be designed to prevent incorrect connection of the LACMTA's jumper cable(s) and shall be provided with protective cover attached with a lanyard. The receptacle(s) shall be located on the curbside rear corner of the bus for convenient jumper cable connection, subject to LACMTA approval in Pre-Production meetings. The receptacle(s) must be labeled. Cables used shall not be bent is such a manner that the radius places stresses on the cable insulation, promoting propagation of cracks.

TS 42.1.4 Battery Compartment

The battery compartment shall prevent accumulation of water and debris on top of the batteries and shall be vented and self-draining. It shall be accessible only from the outside of the vehicle. All components within the battery compartment, and the compartment itself, shall be protected from damage or corrosion from the electrolyte. The inside surface of the battery compartment's access door shall be electrically insulated, as required, to prevent the battery terminals from shorting on the door if the door is damaged in an accident or if a battery comes loose. Battery enclosure, including access door or cover, shall be constructed of fiberglass, suitable plastic material, or stainless steel.

The battery quick disconnect access door shall be identified with a decal.

The battery hold-down bracket shall be constructed of a non-metallic material (plastic or fiberglass).

This access door shall not require any special locking devices to gain access to the switch. The door shall be flush-fitting and incorporate a spring tensioner or equal to retain the door in a closed position when not in use.

The batteries shall be securely mounted on a self-draining stainless steel or other non-corrosive material tray that can accommodate the size and weight of the batteries without deformation. The battery tray shall pull out easily and properly support the batteries while they are being serviced. The tray shall allow each battery cell to be easily serviced and filled. A locking device shall retain the battery tray to the stowed position. A maximum of four batteries shall be securely mounted on each heavy-duty battery tray which shall accommodate the battery system. Tray(s) shall pull out on heavy-duty rollers or swing out easily from outside the bus for service, inspection, and replacement.

If not located in the engine compartment, the same fire-resistant properties must apply to the battery compartment. Sparking devices shall not be located within the battery box.

TS 42.1.5 Auxiliary Electronic Power Supply

If required, gel-pack, or any form of sealed (non-venting) batteries used for auxiliary power are allowed to be mounted on the interior of the vehicle if they are contained in an enclosed, non-airtight compartment and accessible only to maintenance personnel. This compartment shall contain a warning label prohibiting the use of vented lead-acid batteries.

TS 42.1.6 Master Battery Switch

A single master switch shall be provided near the battery compartment for disconnecting of all battery positives (12- and 24 volts), except for safety devices such as the fire suppression system and other systems as specified. The location of the master battery switch shall be clearly identified on the exterior access panel, be accessible in less than 10 seconds for deactivation and prevent corrosion from fumes and battery acid when the batteries are washed off or are in normal service.

Turning the master switch “Off” with the PPA/PPU operating shall shut off the engine/PPU and shall not damage any component of the electrical system. The master battery switch shall be capable of carrying and interrupting the total circuit load. Master battery switch shall be capable of being locked in the “Open” or “Off” position.

Single Switch

The batteries shall be equipped with a single switch for disconnecting both 12- and 24 volt power.

Solenoid Battery Cutoff

A low voltage disconnect(s) shall be provided to monitor the battery bank voltage. When the voltage drops below the disconnect voltage, the device(s) opens the solenoid(s), removing power from all parasitic 12- and 24 volts loads that cannot be disconnected through the Master Battery Switch, ensuring that the batteries will maintain the ability to start the bus after being parked for extended periods of up to two months. A toggle switch for overriding automatic operation of Solenoid Battery Cutoff shall be provided.

TS 42.1.7 Low-Voltage Generation and Distribution

The low-voltage generating system shall properly charge batteries with a low state of charge and maintain the state of charge on fully charged batteries. When the vehicle is at standard idle the total low voltage generator load shall not exceed 60 percent of the low voltage generator nameplate rating. The Contractor shall estimate the parasitic loads during the initial stage of the bus design and shall submit a draft report to LACMTA at the Pre-Production meetings. A final report shall be submitted during the Pilot Bus configuration audit. The report shall include:

- Nominal current draw of each 12- and 24 volt system and subsystem
- Calculations of parasitic loads in sleep mode, including LACMTA installed equipment
- The estimated battery discharge time before Low Voltage Disconnect is activated

Voltage monitoring and over-voltage output protection (recommended at 32 volt) shall be provided.

Dedicated power and ground shall be provided as specified by the component or system manufacturer. Cabling to the equipment must be sized to supply the current requirements of heavy-duty systems with no greater than a five percent voltage drop across the length of the cable. Cables with bolted connections shall also meet requirements of SAE J541 for heavy-duty applications.

TS 42.1.8 Circuit Protection

All branch circuits, except battery-to-starting motor and battery-to-generator/alternator circuits, shall be protected by current-limiting devices such as circuit breakers, fuses or solid state devices sized to the requirements of the circuit. Electronic circuit protection for the cranking motor shall be provided to prevent engaging of the motor for more than 30 seconds at a time to prevent overheating. The circuit breakers or fuses shall be easily accessible for authorized personnel.

Fuses shall be used only where it can be demonstrated that circuit breakers are not practical. This requirement applies to in-line fuses supplied by either the Contractor or a Supplier. Fuse holders shall be constructed to be rugged and waterproof. All manual reset circuit breakers critical to the operation of the bus shall be mounted in a location convenient to the LACMTA mechanic with visible indication of open circuits. LACMTA shall consider

the application of automatic reset circuit breakers on a case-by-case basis. The Contractor shall show all in-line fuses in the final harness drawings. Any manually resettable circuit breakers shall provide a visible indication of open circuits.

Circuit breakers or fuses shall be sized to a minimum of 15 percent larger than the total circuit load. The current rating for the wire used for each circuit must exceed the size of the circuit protection being used.

TS 42.2 Grounds

The battery shall be grounded to the vehicle chassis/frame at one location only, as close to the batteries as possible. When using a chassis ground system, the chassis shall be grounded to the frame in multiple locations, evenly distributed throughout the vehicle to eliminate ground loops. No more than three ground ring/spade terminal connections shall be made per ground stud. Electronic equipment requiring an isolated ground to the battery (i.e., electronic ground) shall not be grounded through the chassis. Redundant grounds shall be provided for all electrical equipment except where it can be demonstrated that they are not feasible or practical. Grounds shall not be carried through hinges, bolted joints (unless they are specifically designed as electrical connectors), or power plant mountings. Ground shall be installed in accordance with SAE J1908, Electrical Grounding Practice.

Buses shall include grounding straps mounted under the bus near both front and rear axle areas to dissipate any static electric charge that may accumulate on the buses during use.

TS 42.3 Low Voltage/Low Current Wiring and Terminals

All power and ground wiring shall conform to specification requirements of SAE Recommended Practice J1127, J1128 and J1292 for type GXL and SXL wiring. Double insulation shall be maintained as close to the junction box, electrical compartment or terminals as possible. The requirement for double insulation shall be met by wrapping the harness with plastic electrical tape or by sheathing all wires and harnesses with non-conductive, rigid or flexible conduit. All wires for electrical components and terminations, either at the harness level or individual wires, including bus controls, A/C, engine, transmission, and door systems, with the exception of battery cables, shall be labeled, stamped or color-coded in a fashion that allows unique identification at a spacing not exceeding four inches. All exposed wiring connections for power and ground shall be protected against corrosion by application of an anti-corrosive paste.

Wiring harnesses shall not contain wires of different voltage classes unless all wires within the harness are insulated for the highest voltage present in the harness. Kinking, grounding at multiple points, stretching, and exceeding minimum bend radius shall be prevented.

Strain-relief fittings shall be provided at all points where wiring enters electrical compartments. Grommets or other protective material shall be installed at points where wiring penetrates metal structures outside of electrical enclosures. Wiring supports shall be protective and non-conductive at areas of wire contact and shall not be damaged by heat, water, solvents or chafing.

To the extent practicable, wiring shall not be located in environmentally exposed locations under the vehicle. Wiring and electrical equipment necessarily located under the vehicle shall be insulated from water, heat, corrosion and mechanical damage. Where feasible, front to rear electrical harnesses should be installed above the window line of the vehicle.

All Bus OEM attributed wiring harnesses over five feet long and containing at least five wires shall include 10 percent (minimum one wire) excess wires for spares. This requirement for spare wires does not apply to data links and communication cables. A minimum of 50 percent of the spare wire shall be the same size as the largest wire in the harness excluding the battery cables. Wiring harness length shall allow a minimum of four inches service loop to permit end terminals to be replaced twice without pulling, stretching or replacing the wire.

Crimp on terminals shall use a clear heat shrinkable sleeve that seals the connection and improves the pull out resistance of the termination. Terminals shall be crimped to the wiring according to the connector manufacturer's recommendations for techniques and tools. All cable connectors shall be locking type, keyed and sealed, unless enclosed in watertight cabinets or vehicle interior. Pins shall be removable, crimp contact type, of the correct size and rating for the wire being terminated. Unused pin positions shall be sealed with sealing plugs. Adjacent connectors shall either use different inserts or different insert orientations to prevent incorrect connections.

Terminals shall be crimped, corrosion-resistant and full ring type or interlocking lugs with insulating ferrules. When using pressure type screw terminal strips, only stranded wire shall be used. Insulation clearance shall ensure that wires have a minimum of "visible clearance" and a maximum of two times the conductor diameter or 1/16 inch, whichever is less. When using shielded or coaxial cable, upon stripping of the insulation, the metallic braid shall be free from frayed strands that can penetrate the insulation of the inner wires. Individual slip-on "spade" or "blade" type connectors are acceptable on a case-by-case basis.

Ultra-sonic and T-splices may be used with 7 AWG or smaller wire. When a T-splice is used, it shall meet these additional requirements:

- It shall include a mechanical clamp in addition to solder on the splice.
- The wire shall support no mechanical load in the area of the splice.
- The wire shall be supported to prevent flexing.

All splicing shall be staggered in the harness so that no two splices are positioned in the same location within the harness. Wiring harnesses shall include labeling for harness part number, connector identification and splice locations.

Wiring located in the engine compartment shall be routed away from high-heat sources or shielded and/or insulated from temperatures exceeding the wiring and connector operating requirements.

The instrument panel and wiring shall be easily accessible for service from the driver's seat or top of the panel. The instrument panel shall be separately removable and replaceable without damaging the instrument panel or gauges. Wiring shall have sufficient length and be routed to permit service without stretching or chafing the wires.

TS 42.4 Electrical Components

All electrical components, including switches, relays, flashers and circuit breakers, shall be heavy-duty designs with either a successful history of application in heavy-duty vehicles or design specifications for an equivalent environment. To the extent practical, these components shall be designed to last the service life of the Bus and shall be replaceable in less than 5 minutes by an LACMTA mechanic. Sockets for plug-in components, such as relays and circuit breakers, shall be keyed for proper installation and alignment. Plug-in components shall be positively retained in sockets.

All electric motors shall be heavy-duty brushless type where practical, and have a continuous duty rating of no less than 40,000 hours (except cranking motors, washer pumps and wiper motors). Electric motors shall be located for easy replacement and shall be replaceable in less than 30 minutes by an LACMTA mechanic.

Location of electronic modules shall be reviewed for environmental suitability such as heat, water, vibrations, contamination from dust and debris, and other electrical equipment. The system including modules, external wire, connectors, and data bus wiring shall be designed to operate under LACMTA's Design Operating Profile. All electrical components including relays and circuit breakers must remain unaffected while bus is operated in up to 15 inches of standing water.

TS 42.5 Electrical Compartments

All relays, controllers, flashers, circuit breakers and other electrical components shall be mounted in easily accessible electrical compartments. All compartments exposed to the outside environment shall be corrosion-resistant and sealed to prevent moisture from normal sources, including engine compartment cleaning, reaching the electrical components and circuits in each box. The components and their functions in each electrical compartment shall be identified and their location recorded on a schematic drawing permanently attached to the inside of the access panel or door. The drawing shall be protected from oil, grease, fuel and abrasion. Electrical compartment fires shall not propagate outside the box.

The front compartment shall be completely serviceable from the driver's seat, vestibule or from the outside. "Rear start and run" controls shall be mounted in an accessible location in the engine compartment and shall be protected from the environment.

TS 43. General Electronic Requirements

If an electronic component has an internal real-time clock, it shall provide its own battery backup to monitor time when battery power is disconnected, and/or it may be updated by a network component. If an electronic component has an hour meter, it shall record accumulated service time without relying on battery backup.

Suppliers shall ensure that their electronic equipment is self-protecting in the event of shorts in the cabling, and also in over-voltage (over 32V DC on a 24V DC nominal voltage rating with a maximum of 50V DC) and reverse polarity conditions. If an electronic component is required to interface with other components, it shall not require external pull-up and/or pull-down resistors. Where this is not possible, the use of a pull-up or pull-down resistor shall be limited as much as possible and easily accessible, shielded, and labeled.

TS 43.1 Wiring and Terminals

Kinking, grounding at multiple points, stretching and reducing the bend radius below the manufacturer's recommended minimum shall not be permitted. The load side shall have a minimum of 18 gage load transfer wire.

Individual slip-on "spade" or "blade" type connectors are acceptable on a case-by-case basis during Pre-Production meeting review.

TS 43.1.1 Discrete I/O (Inputs/Outputs)

All wiring to I/O devices, either at the harness level or individual wires, shall be labeled, stamped or color-coded in a fashion that allows unique identification at a spacing not exceeding four inches. Wiring for each I/O device shall be bundled together. If the I/O terminals are the same voltages, then jumpers may be used to connect the common nodes of each I/O terminal.

TS 43.1.2 Shielding

All wiring that requires shielding shall meet the following minimum requirements. A shield shall be generated by connecting to a ground, which is sourced from a power distribution bus bar or chassis. A shield shall be connected at one location only, typically at one end of the cable. However certain standards or special requirements, such as SAE J1939 or RF applications, have separate shielding techniques that also shall be used as applicable.

When using shielded or coaxial cable, upon stripping of the insulation, the metallic braid shall be free from frayed strands, which can penetrate the insulation of the inner wires. To prevent the introduction of noise, the shield shall not be connected to the common side of a logic circuit.

TS 43.1.3 Communications

The data network cabling shall be selected and installed according to the selected protocol requirements. The physical layer of all network communication systems shall not be used for any purpose other than communication between the system components, unless provided for in the network specifications.

Communications networks that use power line carriers (e.g., data modulated on a 24 volt-power line) shall meet the most stringent applicable wiring and terminal specifications.

Mounting and electrical provisions shall be provided to allow LACMTA installation of existing Fleetwatch JX-55 Vehicle Interface Module in the Operator's area, subject to LACMTA approval during proposal period. A separate J1708 and J1939 interface connector shall be provided inside the ITS enclosure for connection to the existing LACMTA's JX-55 device.

TS 43.1.4 Radio Frequency (RF)

RF components, such as radios, video devices, cameras, global positioning systems (GPS), etc; shall use coaxial or approved cable to carry the signal. All RF systems require special design consideration for losses along the cable. Connectors shall be minimized, since each connector and crimp has a loss that will attribute to attenuation of the signal. Cabling should allow for the removal of antennas or attached electronics without removing the installed cable between them. If this cannot be done, then a conduit of sufficient size shall be provided for ease of attachment of antenna and cable assembly. The corresponding component vendors shall be consulted for proper application of equipment, including installation of cables.

TS 43.1.5 Audio

Cabling used for microphone level and line level signals shall be 22 AWG minimum with shielded twisted pair. Cabling used for amplifier level signals shall be 18 AWG minimum.

TS 44. Multiplexing

TS 44.1 General

The primary purpose of the multiplexing system is control of components necessary to operate the vehicle. This is accomplished by processing information from input devices and controlling output devices through the use of an internal logic program.

Versatility and future expansion shall be provided for by expandable system architecture. The multiplex system shall be capable of accepting new inputs and outputs through the addition of new modules and/or the utilization of existing spare inputs and outputs. All like components in the multiplex system shall be modular and interchangeable with self-diagnostic capabilities. The modules shall be easily accessible for troubleshooting electrical failures and performing system maintenance. Multiplex input/output modules shall use solid-state devices to provide extended service life and individual circuit protection.

Ten percent of the total number of inputs and outputs, or at least one each for each voltage type utilized (0V, 12V, and 24V), at each module location shall be designated as spares.

TS 44.2 System Configuration

Multiplexing may either be distributed or centralized. A distributed system shall process information on multiple control modules within the network. A centralized system shall process the information on a single control module. Either system shall consist of several modules connected to form a control network.

TS 44.2.1 I/O Signals

The input/output for the multiplex system may contain three types of electrical signals: discrete, analog or serial data.

Discrete signals shall reflect the on/off status of switches, levers, limit switches, lights, etc. Analog signals shall reflect numerical data as represented by a voltage signal (0-12V, 10-24V, etc.) or current signal (4-20 mA). Both types of analog signals shall represent the status of variable devices such as rheostats, potentiometers, temperature probes, etc. Serial data signals shall reflect ASCII or alphanumeric data used in the communication between other on-board components.

TS 45. Data Communications

TS 45.1 General

All data communication networks shall be either in accordance with a nationally recognized interface standard, such as those published by SAE, IEEE or ISO, or shall be published to the LACMTA with the following minimum information:

- Protocol requirements for all timing issues (bit, byte, packet, inter-packet timing, idle line timing, etc.) packet sizes, error checking and transport (bulk transfer of data to/from the device).
- Data definition requirements that ensure access to diagnostic information and performance characteristics.
- The capability and procedures for uploading new application or configuration data.
- Access to revision levels of data, application software and firmware.
- The capability and procedures for uploading new firmware or application software.
- Evidence that applicable data shall be broadcast to the network in an efficient manner such that the overall network integrity is not compromised.

Any electronic vehicle components used on a network shall be conformance tested to the corresponding network standard.

TS 45.2 Drivetrain Level

Drivetrain components, consisting of the engine, transmission, retarder, anti-lock braking system and all other related components, shall be integrated and communicate fully with respect to vehicle operation with data using SAE Recommended Communications Protocols such as J1939 and/or J1708/J1587 with forward and backward compatibilities or other open protocols.

TS 45.2.1 Diagnostics, Fault Detection and Data Access

Drivetrain performance, maintenance and diagnostic data, and other electronic messages shall be formatted and transmitted on the communications networks.

The drivetrain level shall have the ability to record abnormal events in memory and provide diagnostic codes and other information to service personnel. At a minimum, this network level shall provide live/fail status, current hardware serial number, software/data revisions and uninterrupted timing functions. The communication port(s) shall be located in the Operator's area, Engine Compartment Control Panel, and ITS Enclosure area, subject to LACMTA approval in Pre-Production meetings.

TS 45.2.2 Programmability (Software)

The drivetrain level components shall be programmable by LACMTA with limitations as specified by the sub-system Supplier.

TS 45.3 Multiplex Level

TS 45.3.1 Data Access

Diagnostic and status information shall be made available via a communication port on the multiplex system. The location of the communication port shall be easily accessible inside or adjacent to the ITS Enclosure subject to LACMTA approval in Pre-Production meetings.

A J1708 hardware gateway shall be included to interface with the ATMS wireless communications system for transmittal of diagnostic fault codes from multiplex and drivetrain systems.

TS 45.3.2 Diagnostics and Fault Detection

The multiplex system shall have a proven method of determining its status (system health and input/output status) and detecting either active (online) or inactive (offline) faults through the use of on-board visual/audible indicators.

In addition to the indicators, the system shall employ an advanced diagnostic and fault detection system, which shall be accessible via either a personal computer or a handheld unit. Either unit shall have the ability to check logic function. The diagnostic data can be incorporated into the information level network or the central data access system.

TS 45.3.3 Programmability (Software)

The multiplex system shall have security provisions to protect its software from unwanted changes. This shall be achieved through any or all of the following procedures:

- Password protection.
- Limited distribution of the configuration software.
- Limited access to the programming tools required to change the software.
- Hardware protection that prevents undesired changes to the software.

Provisions for programming the multiplex system shall be possible through a PC or laptop. The multiplex system shall have proper revision control to ensure that the hardware and software are identical on each vehicle equipped with the system. Revision control shall be provided by all of the following:

- Hardware component identification where labels are included on all multiplex hardware to identify components.
- Hardware series identification where all multiplex hardware displays the current hardware serial number and firmware revision employed by the module.
- Software revision identification where all copies of the software in service displays the most recent revision number.
- A method of determining which version of the software is currently in use in the multiplex system.

Revision control labels shall be electronic.

TS 45.4 Electronic Noise Control

Electrical and electronic sub-systems and components on all buses shall not emit electromagnetic radiation that will interfere with on-board systems, components or equipment, telephone service, radio or TV reception or violate regulations of the Federal Communications Commission.

Electrical and electronic sub-systems on the Buses shall not be affected by external sources of RFI/EMI. This includes, but is not limited to, radio and TV transmission, portable electronic devices including computers in the vicinity of/or on board the buses, AC or DC power lines, and RFI/EMI emissions from other vehicles.

DRIVER PROVISIONS, CONTROLS AND INSTRUMENTATION (TS 46-TS 49)

TS 46. Driver’s Area Controls

TS 46.1 General

In general, when designing the driver’s area, it is recommended that SAE J833, “Human Physical Dimensions,” be used.

Switches and controls shall be divided into basic groups and assigned to specific areas, (Refer to Table 9), in conformance with SAE Recommended Practice J680, Revised 1988, “Location and Operation of Instruments and Controls in Motor Truck Cabs,” and be essentially within the hand reach envelope described in SAE Recommended Practice J287, “Driver Hand Control Reach”.

All controls (switches, pushbuttons, knobs, etc.) and indicators shall be labeled and lighted for optimum visibility in all operating conditions. Switches and controls shall be ergonomically placed in a manner which prevents accidental operation. Knobs shall be securely mounted and affixed to preclude loosening. The side console shall be insulated to IP56 level of protection to prevent ingress of water into the components of the panel.

All controls, indicators, and signals necessary for the operation of the bus shall be conveniently positioned in the Operator's area in one of the following locations.

- Front Console Panel.
- Side Console (located on left side of the Operator).
- Floor Mounted.

TS 46.2 Glare

The driver’s work area shall be designed to minimize glare to the extent possible. Objects within and adjacent to this area shall be matte black or dark gray in color wherever possible to reduce the reflection of light onto the windshield. The use of polished metal and light-colored surfaces within and adjacent to the driver’s area shall be avoided.

TS 46.3 Visors/Sun Shades

A sun visor and scissor type sun shade/screen shall be provided to maximize driver’s visibility.

Front and Side Window Sun Shade/Visor

An adjustable scissor type pull down solid band sun shade shall be provided for the driver’s windshield.

Driver’s side window shall have both sun visor and scissor type sun screen.

The sun shade/screen shall be provided in accordance with the California Vehicle Code §26708.2 and must have a sticker or label indicating that the shade/screen should only be used by operators who possess a letter or other document signed by a licensed optometrist certifying that the person must be shaded from the sun due to a physical condition.

Sun shades/screens or visors shall be shaped or positioned to minimize light leakage between the device and windshield pillars. Sun shades/screens or visors shall store out of the way and shall not obstruct airflow from the climate control system or interfere with other equipment, such as the radio handset or the destination control. Deployment of the sun shades/screens or visors shall not restrict vision of the rearview mirrors. Sun shade/screen or visor construction and materials shall be strong enough to resist breakage during adjustments. Sun shades/screens or visors, when deployed, shall be effective in the driver’s field of view at angles more than five degrees above the horizontal. Sun shades and visors shall not be transparent.

Visor adjustments shall be made easily by hand with positive locking and releasing devices and shall not be subject to damage by over-tightening. Visors used on driver’s window shall extend across the entire width of window and cover a minimum of six inches when flipped down.

For driver’s window, scissor type sun shades/screens shall have minimum 35 percent light transmittance and shall be capable of being lowered to the midpoint of the driver’s window. When deployed, the shade/screen shall be secure, stable and shall not rattle, sway or intrude into the driver’s field-of-view due to the motion of

the Bus or as a result of air movement. Once lowered, the shade/screen shall remain in the lowered position until returned to the stowed position by the driver.

TS 46.4 Driver's Controls

Frequently used controls must be in easily accessible locations. These include the door control, kneel control, windshield wiper/washer controls, ramp, and lift and run switch. Any switches and controls necessary for the safe operation of the bus shall be conveniently located and shall provide for ease of operation. They shall be identifiable by shape, touch and permanent markings. Controls also shall be located so that passengers may not easily tamper with control settings.

All panel-mounted switches and controls shall be marked with easily read identifiers. Graphic symbols shall conform to SAE Recommended Practice J2402, "Road Vehicles – Symbols For Controls, Indicators, and Tell Tales," where available and applicable. Color of switches and controls shall be dark, or red for emergency use, with contrasting typography or symbols.

Mechanical switches and controls shall be replaceable, and the wiring at these controls shall be serviceable from a convenient location. Switches, controls and instruments shall be dust- and water-resistant.

TS 46.5 Normal Bus Operation Instrumentation and Controls

The following list identifies bus controls used to operate the bus. These controls are either frequently used or critical to the operation of the bus. They shall be located within easy reach of the Operator. The Operator shall not be required to stand or turn to view or actuate these controls unless specified otherwise.

Systems or components monitored by onboard diagnostics system shall be displayed in clear view of the Operator and provide visual and/or audible indicators. The intensity of indicators shall permit easy determination of on/off status in bright sunlight but shall not cause a distraction or visibility problem at night. All indicators shall be illuminated using backlighting.

The instrument display monitor shall be LCD color touch screen that displays safety related information in a large easy to read gauge or graphic format. LACMTA prefers a system which incorporates the instruments, and diagnostics.

Wherever possible, sensors shall be of the closed circuit type so that failure of the circuit and/or sensor shall activate the malfunction indicator.

The indicator panel shall be located in Area 1 or Area 5, within easy view of the operator instrument panel. All indicators shall have a method of momentarily testing their operation. The audible alarm shall be tamper-resistant and shall have an outlet level between 80 and 83 dBA when measured at the location of the Operator's ear.

On-board displays visible to the Operator shall be limited to indicating the status of those functions described herein that are necessary for the operation of the bus. All other indicators needed for diagnostics and their related interface hardware shall be concealed and protected from unauthorized access. Table 9 represents instruments and alarms. The intent of the overall physical layout of the indicators shall be in a logical grouping of systems and severity nature of the fault.

Gauges shall be readable in all direct or reflected sunlight conditions. All lighting in the dash area shall be a red, orange or blue color, clear incandescent, or an approved equal. No unlit dash markings shall be permitted.

Space shall be provided on the panel for future additions of no less than five spare indicators as the capability of onboard diagnostic systems improves.

TABLE 9 (Transit Bus)

Transit Bus Instruments and Alarms

No.	Device	Description	Location	Function	Visual/ Audible
Instruments					
1.	Air pressure gauge	Air Brake Reservoir gauge(s) 0-150 psi range- Accuracy ± 3.5% at cut-out pressure, 10 psi increments, 2-inch minimum. Green needle for Primary system and Red needle for Secondary system	Dash zone 2	Visual indication of primary and secondary air systems	Red Light and buzzer
2.	Destination sign interface	Destination sign interface panel	In approved location on head sign door	Facilitates driver interaction with destination sign system, manual entry	LCD display
3.	Farebox interface/ OCU	Farebox Bus operator interface panel	Near farebox	Facilitates driver interaction with farebox system	LCD display
4.	Mobile data terminal/ATMS	Mobile data terminal Bus operator interface panel	Above operators left	Facilitates driver interaction with communication system and master log-on	LCD display with visual status and text messages
5.	Speedometer	Speedometer 0-75 mph range - with odometer, and diagnostic capability, 5-mile increments. Accuracy ± 2 mph. Unit shall be installed so as to be easily readable by the operator.	Dash zone 2	Visual indication of speed and distance traveled, accumulated vehicle mileage, fault condition display	Visual
Controls					
1.	Automatic Fire Suppression System (AFSS) Manual Discharge	Red push button with protective cover	Side console or dash zone 1	Permits driver to override and manually discharge fire suppression system	Red light
2.	AFSS Shutdown over ride	Momentary push button	Over operator's left	Restarts the engine shutdown timer each time the switch is pressed	
3.	Auxiliary power	12-volt power receptacle	Radio Compartment	Power diagnostic equipment	
4.	Dash panel lights	Rotary rheostat or stepping switch	Side Console or Dash zone 1	Provides adjustment for light intensity in night run position	
5.	Defroster fan	Rotary, minimum three-position with detent	Side console or Dash zone 1	Permits defroster fan: off, low, medium or high	
6.	Defroster temperature	Variable position	Side console or Dash zone 1	Adjusts defroster water flow and temperature	
7.	Diagnostic test port- front	SAE data port	Operator's area subject to approval	J1708 and J1939 communications ports	
8.	Drive selector	Touch panel switch	Side console or right front dash	Provides selection of propulsion: forward, reverse and neutral	Gear selection
9.	Driver's ventilation	Infinitely variable speed	Side console or Dash zone 1	Permits supplemental ventilation with infinitely variable speed fan	

TABLE 9 (Transit Bus)

Transit Bus Instruments and Alarms

No.	Device	Description	Location	Function	Visual/ Audible
10.	Engine run, rear	Three-position switch	Engine compartment control panel	Permits running engine from rear start, normal front run position and off	Amber light on dash
11.	Engine shutdown override	Momentary switch with operation protection	Side console	Permits driver to override auto engine shutdown	
12.	Engine start, front	Approved momentary switch	Side console	Activates engine starter motor	
13.	Engine start, rear	Approved momentary switch	Engine compartment control panel	Activates engine starter motor Starter switch marked "START" shall operate the starter motor only when the rear run switch is in the "REAR" position and transmission is in neutral, and fuel fill door is closed. The Operators start button shall be deactivated when the Rear Run Switch is in “REAR” Position	
14.	Exterior Door Switch	Key Switch	Switch shall be located behind an exterior access door near the front curb side of the Bus a minimum of 45 inches above the ground.	Allows operator to close/open, and lock/unlock the front door from outside the bus	
15.	Farebox Lighting Bypass Switch	Switch, ON-OFF	Side console	Controls farebox light	
16.	Fast idle	Two-position switch	Side console	Selects high idle speed of engine	
17.	Front door ramp	Three-position momentary switch	Dash zone 3 or 5	Permits deploy and stow of front ramp	Red light
18.	Front door ramp/kneel enable	Two-position switch	Dash zone 5	Permits ramp and kneel activation from front door area, key required	Red dash indicator Exterior alarm and Amber light
19.	Front kneel	Three-position momentary switch	Dash zone 3 or 5	Permits kneeling activation and raise and normal at front door remote location	Amber or red dash indicator. Ext alarm and Amber light
20.	Gas Detection System (GDS) Shutdown over ride	Momentary push button	Over operator’s left	Restarts the engine shutdown timer each time the switch is pressed	
21.	Hazard flashers	Two-position switch	Side console	Activates emergency flashers	Two green lights and Click
22.	High beam	Push button with detent	Left foot panel	Permits driver to go between low and high beam	Blue light

TABLE 9 (Transit Bus)

Transit Bus Instruments and Alarms

No.	Device	Description	Location	Function	Visual/ Audible
23.	Horn Button	Push button	Button in steering wheel	Activates horn	Dual Horn sound 410 and 500 Hz at 110 dB
24.	HVAC	Switch or switches to control HVAC	Side console	Permits selection of passenger ventilation: off, cool, heat, low fan, high fan or full auto with on/off only	
25.	Indicator/ alarm test button	Momentary switch or programming[1]		Permits driver to activate test of sentry, indicators and audible alarms	All visuals and audible
26.	Interior lights	Three-position switch	Side console	Selects mode of passenger compartment lighting: off, on, normal	
27.	Left remote mirror	Four-position type	Side console	Permits two-axis adjustment of left exterior mirror	
28.	Master door/ interlock	Two position	Out of operator's reach behind the destination sign door	Permits driver override to disable door and brake/throttle interlock	Red light/Buzzer
29.	Master run switch	Rotary, four-position detent	Side console	Master control for bus with; "off," "Day" run, "Night" run and "Night Park" lights positions	
30.	Microphone	Flexible mounting	Subject to LACMTA approval	Permits driver to make announcements with both hands on the wheel and focusing on road conditions	
31.	Operator's area light switch	Switch	Side console	Controls operator light	
32.	Operator's Heater Control	Rotary knob	Dash zone 3 or 5	Controls operator heater	
33.	PA manual switch	Slide switch	In approved location	Permits driver to manually activate public address microphone	
34.	Park brake release	Pneumatic PPV – Green knob	Side console	Permits driver to push and hold to release brakes	Green knob
35.	Parking brake	Pneumatic PPV –Yellow knob	Side console or Dash zone 1	Permits driver to apply and release parking brake	Red light
36.	Passenger Chime Switch	Switch, ON-OFF	Side console	Controls chime sound	
37.	Passenger door control	Five-position handle type detent	Side console, forward	Permits open/close control of front and rear passenger doors	
38.	Public Address System, Speaker Selector	Switch INTERIOR-BOTH-EXTERIOR	Side console	Select speaker location	
39.	Public Address System, Volume Control	Pushbutton	DCM	Select speaker volume	

TABLE 9 (Transit Bus)

Transit Bus Instruments and Alarms

No.	Device	Description	Location	Function	Visual/ Audible
40.	Remote Engine Speed Control	Rotary rheostat or spring-loaded toggle switch	Engine compartment control panel	Permits technician to raise and lower engine RPM from engine compartment A spring return control Knob marked "ENGINE SPEED" shall be provided which will increase engine RPM from idle to maximum controlled free speed. The control shall be activated only when the Rear Run Switch is in the "REAR" position, the transmission is in neutral and parking brake set.	
41.	Retarder disable	Single-pole with detent	Behind the destination sign door	Permits driver override to disable brake retardation/regeneration	Red light
42.	Right remote mirror	Four-position toggle type	Side console	Permits two-axis adjustment of right exterior mirror	
43.	Silent alarm	Guarded toggle switch, NO and NC contacts	Side console	Activates emergency radio alarm at dispatch and permits covert microphone and/or enables destination sign emergency message	
44.	Turn signals	Momentary push button (two required) raised from other switches	Left foot panel	Activates left and right turn signals	Two green lights and audible indicator
45.	Windshield washer	Push button	Side console or Dash zone 1	Activates windshield washers	
46.	Windshield wiper	One-variable rotary position operating both wipers	Side console or Dash zone 1	Variable speed control of left and right windshield wipers	
Alarms/Indicators					
1.	ABS indicator	Detects system status	Dash zone 2	Displays system failure	Amber light
2.	AFSS Fire detection	Bus operator display	Above operators left	Indication of fire detection activation	Buzzer and red light fire bell
3.	AFSS Status	Okay	Above operators left		Green light
4.	Back-Up	Intermittent sonic alarm	Rear of bus	Reverse gear activated alarm	Beep
5.	Bike rack deployed indicator	Detects bike rack position	Dash zone 2	Indication of bike rack not being in fully stowed position	Amber or red light. Mirror or direct visual allowed.
6.	Charging system indicator (12/24 V)	Detect charging system status	Dash zone 2	Detects no charge condition	Solid red light and buzzer
7.	Check Engine	Engine Check	Dash zone 2		Amber light
8.	Check Transmission	Transmission Check	Dash zone 2		Amber light
9.	Door obstruction	Sensing of door obstruction	Dash zone 2	Indication of rear door sensitive edge activation	Red light and buzzer

TABLE 9 (Transit Bus)
Transit Bus Instruments and Alarms

No.	Device	Description	Location	Function	Visual/ Audible
10.	GDS Methane detection	Indication of 20% LEL	Above operators left	Detects levels of methane	Flashing red at 20% LEL
11.	GDS Methane detection	Indication of 50% LEL	Above operators left	Detects levels of methane	Solid red at 50% LEL sonic horn
12.	GDS Methane detection function	Detection of system integrity	Above operators left	Detects system failure	No start condition, amber light
13.	HVAC indicator	Detects system status	Dash zone 2	Displays system failure	Amber or red light
14.	Low fuel indicator	Amber light	Dash zone 2	Indication of low fuel system level	Amber light
15.	Low system air pressure	Sensing low primary and secondary air tank pressure	Dash zone 2	Indication of low air system pressure	Buzzer and red light
16.	SCR gauge	Level Indicator	Dash zone 2	Displays level of SCR tank and indicates with warning light when low	Red light
17.	Seat Belt Warning	Switch on seat belt latch. Audible alarm and red light	Dash zone 2	Indicates when seat belt is not latched as required	Buzzer and red light
18.	Security Camera System	Camera Fail	Dash zone 2	Indicates system readiness including hard drive installed and system functionality.	Amber light
19.	Speed	Speed	Dash zone 2	Indicates bus speed is less than or equal to 3 mph	Amber light
20.	Stop Engine	Stop Engine	Dash zone 2		Buzzer and red light
21.	Stop Request	Stop Requested	Dash zone 2		Green light, chime
22.	Warning interlocks deactivated	Red indicator light	Dash panel center	Illuminates to warn driver that interlocks have been deactivated.	Red light, sonic alarm
23.	Wheelchair Stop Request	Stop Requested	Wheelchair Chime		Amber light, chime

TS 46.6 Driver Foot Controls

Accelerator and brake pedals shall be designed for ankle motion. Foot surfaces of the pedals and the floor adjacent to pedals shall be faced with wear-resistant, nonskid, replaceable material. Heel rests shall be provided. All foot controls must be installed in a manner that removal can be accomplished by one mechanic working inside the bus.

TS 46.6.1 Pedal Angle

The vertical angle of the accelerator and brake pedals shall be determined from a horizontal plane regardless of the slope of the cab floor. The accelerator and brake pedals shall be positioned at an angle of 37 to 50 degrees at the point of initiation of contact and extend downward to an angle of 10 to 18 degrees at full throttle.

The location of the brake and accelerator pedals shall be determined by the manufacturer, based on space needs, visibility, lower edge of windshield, and vertical H-point.

TS 46.6.2 Pedal Dimensions and Position

The floor-mounted accelerator pedal shall be 10 to 12 inches long and three to four inches wide. Clearance around the pedal must allow for no interference precluding operation.

Pedal travel shall be limited by stops under the pedals. Contractor must provide proof that the ergonomics are appropriate before the Pilot Bus is accepted.

1 to 2 inches Between Brake and Accelerator Pedals

The accelerator and brake pedals shall be positioned such that the spacing between them, measured at the heel of the pedals, is between one and two inches. Both pedals should be located approximately on the same plane coincident to the surface of the pedals.

TS 46.7 Brake and Accelerator Pedals

Brake Pedal

Non-adjustable brake pedal

TS 46.8 Driver Foot Switches

Floor-Mounted Foot Control Platform

The angle of the turn signal platform shall be determined from a horizontal plane, regardless of the slope of the cab floor. The turn signal platform shall be angled at a minimum of 10 degrees and a maximum of 37 degrees. It shall be located no closer to the seat front than the heel point of the accelerator pedal.

Contractor must provide proof that the ergonomics are appropriate before the Pilot Bus is accepted.

Turn Signal Controls

Turn signal controls shall be floor-mounted, foot-controlled, water-resistant, heavy-duty, momentary contact switches.

Foot Switch Control

The control switches for the turn signals shall be mounted on an inclined, floor-mounted stainless steel enclosure or metal plate mounted to an incline integrated into the driver's platform, located to the left of the steering column. The location and design of this enclosure shall be such that foot room for the operator is not impeded. The inclined mounting surface shall be skid-resistant. All other controls, including high beam shall be in a location approved in Pre-Production meetings.

The foot switches shall be UL-listed, heavy-duty type, of a rugged, corrosion-resistant metal construction. The directional foot switches shall be momentary type, while those for the high beam shall be latching type. The spacing of the switches shall be such that inadvertent simultaneous deflection of switches is prevented.

TS 47. Driver's Amenities

TS 47.1 Coat Hanger

Coat Hook

A stainless steel, aluminum, or approved equal, coat hook shall be furnished and installed, subject to LACMTA approval in Pre-Production meetings.

TS 47.2 Drink Holder

No drink holder.

TS 47.3 Storage Box

Storage Box

An enclosed driver storage area shall be provided with a positive latching door and/or lock. The minimum size shall be 2,100 cubic inches.

TS 47.4 Repair Card Holder

A card holder shall be provided in the Operators' area at a location accessible to mechanics standing in the front entry area with the passenger door open, subject to LACMTA approval in Pre-Production meetings, (Refer to Section TS 88.6for Reference). Sample card holder shall be provided by the LACMTA upon request.

TS 47.5 Safety Equipment

The following items shall be provided and installed within seven feet of the Operator's seat in a location that is easy reach, subject to LACMTA approval in Pre-Production meetings.

- DOT approved heavy-duty emergency reflector kit stored in a storage box.
- Five-pound multipurpose fire extinguisher mounted with universal bracket.

TS 47.6 Bus Registration Holders

A Bus registration holder shall be installed above the Operator near the ceiling, subject to LACMTA approval in Pre-Production meetings.

TS 47.7 Trash Hooks

The Contractor shall provide two interior metal hooks in the area near the farebox for LACMTA supplied plastic trash bags (see attachment). Placement and selection of the hooks shall be reviewed on the Pilot Bus and are subject to LACMTA approval.

TS 48. Windshield Wipers and Washers

TS 48.1 Windshield Wipers

The bus shall be equipped with either a single-control or dual-control, electric, variable speed intermittent windshield wiper(s). At 65 mph, no more than 10 percent of the wiped area shall be lost due to windshield wiper lift. For two-piece windshields, both wipers shall park along the center edges of the windshield glass. Windshield wiper motors and mechanisms shall be easily accessible for repairs or service. The fastener that secures the wiper arm to the drive mechanism shall be corrosion-resistant. After each stroke, the wiper arm shall return to the parked position.

No part of the windshield wiper mechanism shall be damaged by manual manipulation of the arms for cleaning. Windshield wiper motors and mechanism shall be easily accessible for repairs or service from inside or outside the bus and shall be removable as complete units.

Intermittent Wiper with Variable Control

A variable-speed feature shall be provided to allow adjustment of wiper speed for both sides of the windshield between approximately 5 to 16 or 5 to 30 cycles per minute.

An intermittent wiper control shall be provided. The unit shall provide an Operator 5 to 30 second's variance in dwell time of the wiper arms.

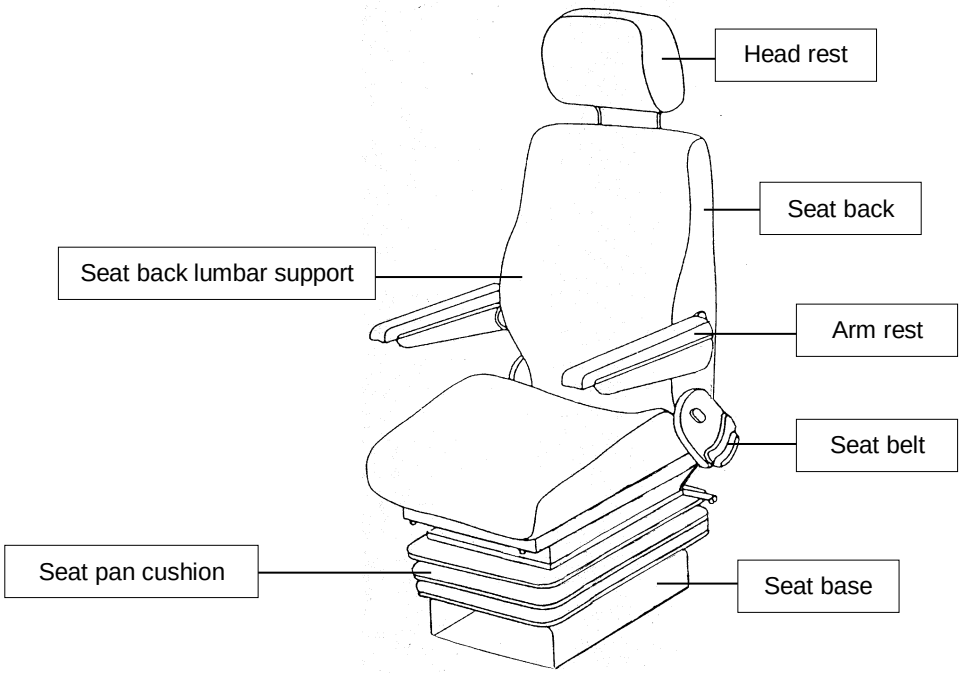
TS 48.2 Windshield Washers

The windshield washer system, when used with the wipers, shall deposit washing fluid evenly and completely wet the entire wiped area.

The windshield washer system shall have a minimum three-gallon reservoir, located for easy refilling from outside of the bus. Reservoir pumps, lines and fittings shall be corrosion-resistant. The reservoir shall be translucent for easy determination of fluid level, if visible, or a fluid level indicator shall be provided.

TS 49. Driver's Seat

FIGURE 6
Driver's Seat



TS 49.1 Dimensions

The driver's seat shall be comfortable and adjustable so that people ranging in size from a 95th-percentile male to a 5th-percentile female may operate the bus.

The heavy-duty Operator's seat shall support Operators' in the orthopedically correct seating position.

TS 49.1.1 Seat Pan Cushion Length

Measurement shall be from the front edge of the seat pan to the rear at its intersection with the seat back. The adjustment of the seat pan length shall be no less than 16.5 inches at its minimum length and no more than 20.5 inches at its maximum length.

TS 49.1.2 Seat Pan Cushion Height

Measurement shall be from the cab floor to the top of the level seat at its center midpoint. The seat shall adjust in height from a minimum of 14 inches, with a minimum six- inch vertical range of adjustment.

TS 49.1.3 Seat Pan Cushion Slope

Measurement is the slope of the plane created by connecting the two high points of the seat, one at the rear of the seat at its intersection with the seat back and the other at the front of the seat just before it waterfalls downward at the edge. The slope can be measured using an inclinometer and shall be stated in degrees of incline relative to the horizontal plane (0 degrees). The seat pan shall adjust in its slope from no less than plus 12 degrees (rearward "bucket seat" incline), to no less than minus five degrees (forward slope).

TS 49.1.4 Seat Base Fore/Aft Adjustment

Measurement is the horizontal distance from the heel point to the front edge of the seat. The minimum and maximum distances shall be measured from the front edge of the seat when it is adjusted to its minimum seat pan depth (approximately 15 inches). On all low-floor buses, the seat-base shall travel horizontally a minimum of 11 inches. It shall adjust no closer to the heel point than six inches.

TS 49.1.5 Seat Pan Cushion Width

The driver's seat shall be appropriately dampened to support a minimum weight of 380 pounds. The suspension shall be capable of dampening adjustment in both directions.

Rubber snubbers shall be provided to prevent metal-to-metal contact. Seat suspension shall incorporate a primary and secondary system to minimize bottoming during travel when driving over uneven street surfaces and potholes.

TS 49.1.6 Seat Suspension

The driver's seat shall be appropriately dampened to support a minimum weight of 380 pounds. The suspension shall be capable of dampening adjustment in both directions.

Rubber bumpers shall be provided to prevent metal-to-metal contact.

TS 49.1.7 Seat Back

Width

Measurement is the distance between the outermost points of the front of the seat back, at or near its midpoint in height. The seat back width shall be no less than 19 inches Seat back will include dual recliner gears on both sides of the seat.

Height

Standard height seat back

TS 49.1.8 Headrests

Four-way adjustable headrest

TS 49.1.9 Seat Back Lumbar Support

Measurement is from the bottom of the seat back at its intersection with the seat pan to the top of the lumbar cushioning. The seat back shall provide adjustable depth lumbar back support with three individual operating lumbar cells within a minimum range of seven to 11 inches.

TS 49.1.10 Seat Back Angle Adjustment

The seat back angle shall be measured relative to a level seat pan, where 90 degrees is the upright position and 90 degrees-plus represents the amount of recline.

The seat back shall adjust in angle from a minimum of no more than 90 degrees (upright) to at least 110 degrees (reclined), with infinite adjustment in between.

TS 49.2 Seat Belt

The belt assembly should include a dual sensitive FMVSS209 emergency-locking retractor (ELR) with maximum inertia tolerance within the lock mechanism. All seat belts should be stored in automatic retractors. The belts shall be mounted to the seat frame so that the driver may adjust the seat without resetting the seat belt. Seat belt shall latch on the operator's right side and include a standard 4.7-inch receptor with seat belt alarm. Seat belt shall include orange three-point webbing and shall have an adjustable shoulder strap D-loop

capable of accommodating a 95th-percentile male to a 5th-percentile female. The design of seat belt retraction and driver's area shall incorporate features to prevent damage to the bus or switches and controls when seat belt is released.

The seat and seat belt assemblies as installed in the bus shall withstand static horizontal forces as required in FMVSS 207 and 210. An audible alarm and warning light shall be installed to alert the driver when the seat belt is not in use and the parking brake is released and the master run switch is in "Day Run" or "Night Run".

Belt Length

The lap/shoulder belt assembly shall accommodate all drivers ranging in size from a 95th-percentile male to a 5th-percentile female and shall extend a minimum of 74 inches in length from the retractor.

TS 49.3 Adjustable Armrest

No armrests.

TS 49.4 Seat Control Locations

While seated, the driver shall be able to make seat adjustments by hand without complexity, excessive effort or being pinched. Heavy-duty adjustment mechanisms and controls shall hold the adjustments and shall not be subject to inadvertent changes.

TS 49.5 Seat Structure and Materials

Cushions

The seat bottom shall be at least 4.5 inches of molded silicone foam material in the seating area. The seat back shall be at least three inches of molded polyurethane foam material.

Cushion Materials

Solid black vinyl upholstery (non-perforated vinyl - pleather)

TS 49.6 Pedestal

Four-inch powder coated steel riser with internal tethers.

TS 49.7 Seat Options

Not applicable.

TS 49.8 Mirrors

TS 49.8.1 Exterior Mirrors

The bus shall be equipped with a corrosion-resistant, outside rearview mirrors mounted with stable supports to minimize vibration. Mirrors shall be firmly attached to the bus to minimize vibration and to prevent loss of adjustment with a breakaway or snap/spring-back mounting system. Mirrors shall permit the driver to view the roadway along the sides of the bus, including the rear wheels. Mirrors shall be positioned in a way that will minimize blind spots and high enough to avoid contact with pedestrians and bicyclists. Mirrors shall have integrated turn signals on both sides. Mirrors shall retract or fold sufficiently to allow bus washing operations but avoid contact with windshield. Mechanical stops shall prevent the mirror from contacting the windshield. Detents or friction plates shall be provided to allow positive positioning of mirror arms at pre-determined angles along their adjustment range.

Mirror head assemblies shall be replaceable with simple hand tools in less than 5 minutes. Mirrors shall be made of tempered plate glass or have safety backing to prevent shattering subject to approval during proposal period. Convex mirrors shall be provided, located below the exterior mirrors, on the curb and street side. The

convex mirrors shall be integral to the main mirror arm in a similar manner to prevent damage to the exterior mirrors if the convex mirror is hit during operation.

Electrical connection shall be water proof, and located in area protected from bus wash action, and accessible for maintenance to replace mirrors and electrical connections. Adjustment of the mirrors shall be provided by two nubbin switches located to the left of the Operator, subject to LACMTA approval during proposal period. Mirror control wires shall terminate at the bus body adjacent to the mirror bracket attachment point with break-away connector plugs designed to prevent damage to bus wiring in the event the mirror head is damaged due to impact.

Curbside Mirrors

The mirror shall be mounted such that its lower edge is as high as possible but at least 76 inches above the street surface and is visible through the right side portion of the windshield that is cleaned by the windshield wiper. Front door operation shall not affect the view provided by the right side mirror.

Street Side Mirrors

The street side mirror shall be accessible through the Operator's side window. Mirror control wires shall terminate at the bus body adjacent to the mirror bracket attachment point with break-away connector plugs designed to prevent damage to bus wiring in the event the mirror head is damaged due to impact. Street side mirror shall be overhead mounted in a position to minimize potential contact with vehicles or cyclists, subject to LACMTA approval during proposal period.

Remote Adjustment of Curbside Mirror

The driver shall be able to adjust the curbside mirror remotely while seated in the driving position. The control for remote positioning of the mirror shall be a single switch or device.

Remote Adjustment of Street Side Mirror

The driver shall be able to adjust the street-side mirror remotely while seated in the driving position. The control for remote positioning of the mirror shall be a single switch or device.

TS 49.8.2 Interior Mirrors

Mirrors shall be provided to permit the Operator to observe passengers throughout the bus, including entrances and exits, and directly in front of the bus during bicycle loading and unloading activities without leaving his seat and without shoulder movement, subject to LACMTA approval in Pre-Production meetings. Inside mirrors shall not be in the line of sight and obstruct the view of the right outside mirror. Mirror installations shall be placed such that there is no obstruction of the view in other mirrors.

- A convex mirror shall be provided above the front door for use by the Operator in determining that the front door is clear of passengers.
- Mirror(s) shall be provided so that with a full standee load, including standees in the entry area, the Operator will be able to observe passengers in the front and rear door, anywhere in the aisle, and in the rear seats.

Mirror Dimensions

TABLE 10
Mirror Dimensions

SIZE	DESCRIPTION
8"X15" or 8"x16 "	Convex, Operator's Rearview

12" Diameter	Convex, Exit Door
6” Diameter	Relay Mirror
7"x10"	Convex, Front Entrance

WINDOWS (TS 50-TS 53)

TS 50. General

A minimum of 10,000 sq. inches of window area, including operator and door windows, shall be required on each side of the standard configuration bus.

TS 51. Windshield

The windshield shall permit an Operator’s field-of-view as referenced in SAE Recommended Practice J1050. The vertically upward view shall be a minimum of 15 degrees, measured above the horizontal and excluding any shaded band. The vertically downward view shall permit detection of an object 3.5 ft. high no more than two feet. in front of the bus. The horizontal view shall be a minimum of 90 degrees above the line of sight. Any binocular obscuration due to a center divider may be ignored when determining the 90-degree requirement, provided that the divider does not exceed a three-degree angle in the Operator’s field-of-view. Windshield pillars shall not exceed 10 degrees of binocular obscuration. The windshield shall be designed and installed to minimize external glare as well as reflections from inside the bus.

The windshield shall be easily replaceable by removing zip-locks from the windshield retaining moldings. Bonded-in-place windshields shall not be used. Winglets may be bonded.

TS 51.1 Glazing

The windshield glazing material shall have a ¼ inch nominal thickness laminated safety glass conforming to the requirements of ANSI Z26.1 Test Grouping 1A and the Recommended Practices defined in SAE J673.

Glazing shall be solar management glass (SMG) tinted green. The hue shall be consistent throughout the procurement.

Shaded Band

The upper portion of the windshield above the driver’s field-of-view shall have a blue or green, shaded band with a luminous transmittance of six to 10 percent when tested in accordance to ASTM D-1003.

TS 52. Driver’s Side Window

The driver’s side window shall be a high-visibility sliding type, that minimizes window frame or other obstructions to driver’s visibility, requiring only the front half of sash to open and latch upon closing, and shall open sufficiently to permit the seated Operator to easily adjust the street-side outside rearview mirror. When in an open position, the window shall not rattle or close during braking. This window section shall slide in tracks or channels designed to last the service life of the bus. The Operator’s side window shall not be bonded in place and shall be easily replaceable. The glazing material shall have a single-density tint.

The driver’s view, perpendicular through Operator’s side window glazing, should extend a minimum of 29 inches (736 mm) to the rear of the heel point on the accelerator, and in any case must accommodate a 95th percentile male operator. The view through the glazing at the front of the assembly should begin not more than 26 inches (560 mm) above the Operator’s floor to ensure visibility of an under-mounted convex mirror. Driver’s window construction shall maximize ability for full opening of the window.

The driver's side window glazing material shall have a ¼ inch nominal thickness laminated safety glass conforming to the requirements of ANSI Z26.1-1996 Test Grouping 2 and the Recommended Practices defined in SAE J673.

Light transmittance shall be a maximum of 75 percent on the glass area below 53 inches from the Operator platform floor. On the top fixed over bottom slider configuration, the top fixed area above 53 inches may have a maximum one percent light transmittance.

The window frame shall not block the view of the street side mirror when in the fully closed or fully open positions. Operator's side window upper portion above the sunshade shall be shaded dark. Glazing shall be solar management glass tinted blue or green to match the windshield. The hue shall be consistent throughout the procurement.

TS 53. Side Windows

TS 53.1 Configuration

Side window assemblies shall be constructed of heavy-duty aluminum shall be easily replaceable without disturbing adjacent windows and shall be mounted so that flexing or vibration from engine operation or normal road excitation is not apparent. Window assemblies shall incorporate "change in place" design to permit replacement (removal and installation) of each glazing (transparent glass piece less any framing) from windows installed on the bus. This requirement shall permit one mechanic to enter the bus and remove and install each glazing using common hand tools in 60 minutes, or less. The window shall be fully serviceable immediately following replacement of glazing. Change in place method shall be tamper resistant. An additional six minutes will be added for each glazing replacement, if necessary, for replacement of the associated anti-vandalism sacrificial film.

All frame surfaces and components (except the emergency escape handles) shall be finished with black anodizing. Emergency escape latches shall be red, and labeled to indicate their purpose and function. Miscellaneous hardware, such as fasteners and latches, shall be the window manufacturer's standard hardware.

Transom style side windows shall extend from the shoulder height of a seated 5th-percentile female passenger to the eye level of a standing 95th-percentile male passenger in the front section; the rear section window upper edge shall be approximately 56 inches above the floor at the start of the raised deck and no less than 51 inches at the rearmost window's upper edge. Each individual window glazing shall be easily replaceable without removing the entire window assembly or disturbing adjacent window assemblies and shall be mounted so that flexing or vibration from engine operation or normal road excitation is not apparent. To the extent practical, the number of different sizes of windows should be minimized.

Quick Change Passenger Side Windows

Glazing in the window assembly shall be capable of being replaced without removing the window from its installed position on the bus using simple hand tools. The glazing shall be held in place mechanically by a system constructed to last the life of the vehicle.

Traditional Frame

- Fully fixed.
- Openable windows with inward-opening transom panels

TS 53.2 Emergency Exit (Egress) Configuration

Minimum Egress

All side windows shall be fixed in position, except as necessary to meet the emergency escape requirements.

TS 53.3 Configuration

Operable Windows with Inward-Opening Transom Panels (Fixed Bottom, Tip-In Top)

Each side window shall incorporate an upper transom portion. The transom shall be between 20 and 35 percent of the total window area. The lower portion of the window shall be fixed. The transom portion shall be hinged along the lower edge and open inward.

Side windows shall have an upper section that can be opened inward a minimum of four inches to provide maximum interior ventilation. When opened the upper window section shall not interfere with access to the passenger signal pull cable. The operable section shall be a minimum of eight inches and a maximum of 10 inches in height, hinged at the bottom, and shall be the full width of all windows. In the event of a latch failure the upper window section shall remain in the closed position, and shall latch in the closed position by means of a gas filled cylinder or mechanical spring. Rearmost windows which are lower than shoulder height for seated passengers shall not be opened or equipped with emergency escape provisions, subject to LACMTA approval in Pre-Production meeting.

TS 53.4 Materials

Safety Glass Glazing Panels

Side windows glazing material shall have a minimum of 3/16-inch nominal thickness tempered safety glass. The material shall conform to the requirements of ANSI Z26.1-1996 Test Grouping 2 Safety Glazing Materials and the Recommended Practices defined in SAE J673. Windows on the bus sides and in the rear door shall be grey tint (13 percent) luminous transmittance as measured by ASTM D-1003), complementary to the bus exterior. The maximum solar energy transmittance shall not exceed 20 percent, as measured by ASTM E-424. Luminous transmittance shall be measured by ASTM D-1003. Windows over the destination signs shall not be tinted. To the extent practical, side window glazing for fixed and emergency egress windows shall be interchangeable.

Anti-Vandalism Sacrificial Film

All glazing material that is aft of the front standee line, and in front of the exit door, shall be equipped with an interior single layer 6 mil minimum laminated film. All glazing material that is aft of, and including, the exit door shall be equipped with an interior four layer laminated film. Both types of window film installations are subject to LACMTA approval during proposal period. This material shall be easily installed and removed without the use of specialized tools. Film shall adhere to the window and be resistant to peeling, curling and discoloration by ultraviolet rays. The film shall withstand normal cleaning operations.

TS 53.5 Rear Window

No requirement for rear window.

HEATING, VENTILATING AND AIR CONDITIONING (TS 54-TS 61)

TS 54. Capacity and Performance

The HVAC climate control system shall be modular design and capable of controlling the temperature and maintaining the humidity levels of the interior of the bus as defined in the following paragraphs. Contractor shall supply an all-electric driven A/C system with full hermetic or semi-hermetic sealed compressor (no open drive compressor). System shall include - brushless; AC compressor, condenser fan, and evaporator blower motors. High voltage alternator/generator shall be brushless.

With the bus running at the design operating profile with corresponding door opening cycle, and carrying a number of passengers equal to 150 percent of the seated load, the HVAC system shall control the average passenger compartment temperature within a range between 65 º to 80°F, while maintaining the relative humidity to a value of 50 percent or less. The system shall maintain these conditions while subjected to any outside ambient temperatures within a range of 10º to 95°F and at any ambient relative humidity levels between five and 50 percent.

When the bus is operated in outside ambient temperatures of 95º to 115°F, the interior temperature of the bus shall be permitted to rise 0.5° for each degree of exterior temperature in excess of 95°F.

System capacity testing, including pull-down/warm-up, stabilization and profile, shall be conducted in accordance to the APTA's "Recommended Instrumentation and Performance Testing for Transit Bus Air Conditioning System."

The recommended locations of temperature probes are only guidelines and may require slight modifications to address actual bus design. Care must be taken to avoid placement of sensing devices in the immediate path of an air duct outlet. In general, the locations are intended to accurately represent the interior passenger area.

To the extent practical, self-sealing couplings shall be used to break and seal the refrigerant lines during removal of major components such as the refrigerant compressor or condenser.

The condenser shall be located to efficiently transfer heat to the atmosphere, and shall not ingest air warmed by the bus mechanical equipment above the ambient temperature or discharge air into any other system of the bus. The condenser and evaporator fan motors shall be brushless and shall be easy to replace in a maximum of one man-hour using simple hand tools. Fan motor replacement shall not require removal of fan housing or air ducting.

The air conditioning system shall employ an accumulator or other strategy in the low pressure circuit to prevent liquid refrigerant from entering the compressor during operation.

Additional testing shall be performed as necessary to ensure compliance to performance requirements stated herein.

Capacity and Performance Requirements

The air-conditioning portion of the HVAC system shall be capable of reducing the passenger compartment temperature from 110 º to 90 °F in less than 20 minutes after engine start-up. Engine temperature shall be within the normal operating range at the time of start-up of the cool-down test, and the engine speed shall be limited to fast idle, which may be activated by a driver-controlled device. During the cool-down period, the refrigerant pressure shall not exceed safe high-side pressures, and the condenser discharge air temperature, measured 6 inches from the surface of the coil, shall be less than 45 °F above the condenser inlet air temperature. The appropriate solar load as recommended in the APTA "Recommended Instrumentation and Performance Testing for Transit Bus Air Conditioning System," shall be used. There shall be no passengers on board, and the doors and windows shall be closed. The air conditioning system shall meet these performance requirements using R134a or 407c.

TS 55. Controls and Temperature Uniformity

The HVAC system excluding the driver's heater/defroster shall be centrally controlled with an advanced electronic/diagnostic control system with provisions for extracting/reading data. The system shall be compliant with J1939 Communication Protocol for receiving and broadcasting of data.

Hot engine coolant water shall be delivered to the HVAC system driver's defroster/heater and other heater cores by means of an auxiliary coolant pump, sized for the required flow, which is brushless and seal-less having a minimum maintenance free service life for both the brushless motor and the pump of at least 40,000 hours at full power.

If provided, outside openings for air intake shall be located to ensure cleanliness of air entering the climate control system, particularly with respect to exhaust emissions from the bus and adjacent traffic. All intake openings shall be baffled to prevent entry of water.

Manual Mode Selection of Climate Control System

After manual selection and/or activation of climate control system operation mode, all interior climate control system requirements for the selected mode shall be attained automatically to within ± (2)°F of specified temperature control set-point.

Manually Adjustable Temperature Control Set Point

The climate control system shall have the provision to allow the driver to adjust the temperature control set-point at a minimum of between 68 and 72°F. From then on, all interior climate control system requirements shall be attained automatically, unless re-adjusted by driver.

The driver shall have full control over the defroster and driver's heater. The driver shall be able to adjust the temperature in the driver's area through air distribution and fans. The interior climate control system shall switch automatically to the ventilating mode if the refrigerant compressor or condenser fan fails.

Interior temperature distribution shall be uniform to the extent practicable to prevent hot and/or cold spots. After stabilization with doors closed, the temperatures between any two points in the passenger compartment in the same vertical plane, and six to 72 inches above the floor, shall not vary by more than five (5) °F with doors closed. The interior temperatures, measured at the same height above the floor, shall not vary more than ± five (5) °F from the front to the rear from the average temperature determined in accordance with APTA's "Recommended Instrumentation and Performance Testing for Transit Bus Air Conditioning System." Variations of greater than ± five (5) °F will be allowed for limited, localized areas provided the majority of the measured temperatures fall within the specified requirement.

TS 55.1 Auxiliary Heater

No auxiliary heater.

TS 56. Air Flow

TS 56.1 Passenger Area

The cooling mode of the interior climate control system shall introduce air into the bus at or near the ceiling height at a minimum rate of 25 cubic feet per minute (cfm) per passenger based on the standard configuration bus carrying a number of passengers equal to 150 percent of the seated load. Airflow shall be evenly distributed throughout the bus, with air velocity not exceeding 100 feet per minute on any passenger. The ventilating mode shall provide air at a minimum flow rate of 20 cfm per passenger. Air vents shall direct air flow away from open windows, if provided.

Airflow may be reduced to 15 cfm per passenger (150 percent of seated load), when operating in the heating mode. The fans shall not activate until the heating element has warmed sufficiently to ensure at least 70 °F air outlet temperature. The heating air outlet temperature shall not exceed 120 °F under any normal operating conditions.

Heater circulating pump shall be brushless and seal-less.

The climate control blower motors and fan shall be designed such that their operation complies with the interior noise level requirements.

TS 56.2 Driver's Area

The bus interior climate control system shall deliver at least 100 cfm of air to the driver's area when operating in the ventilating and cooling modes. Adjustable nozzles shall permit variable distribution or shutdown of the airflow. Airflow in the heating mode shall be reduced proportionally to the reduction of airflow into the passenger area. The windshield defroster unit shall meet the requirements of SAE Recommended Practice J381, "Windshield Defrosting Systems Performance Requirements," and shall have the capability of diverting

heated air to the driver's feet and legs. The defroster or interior climate control system shall maintain visibility through the driver's side window.

TS 56.3 Controls for the Climate Control System (CCS)

The controls for the driver's compartment for heating, ventilation and cooling systems shall be integrated and shall meet the following requirements:

- The heat/defrost system fan shall be controlled by a separate switch that has an "Off" position and at least two positions for speed control.
- A manually operated or electronically modulated control valve shall control the coolant flow through the heater core.
- If a cable-operated manual control valve is used, the cable length shall be kept to a minimum to reduce cable seizing. Heater water control valves shall be "positive" type, when closed. The method of operating remote valves shall be subject to LACMTA approval during proposal period.

TS 56.4 Driver's Compartment Requirements

A separate heating, ventilation and defroster system for the driver's area shall be provided and shall be controlled by the driver. The system shall meet the following requirements:

- The heater and defroster system shall provide heating for the driver and heated air to completely defrost and defog the windshield, driver's side window, and the front door glasses in all operating conditions. Fan(s) shall be able to draw air from the bus body interior and/or the exterior through a control device and pass it through the heater core to the defroster system and over the driver's feet. A minimum capacity of 100 cfm shall be provided. The driver shall have complete control of the heat and fresh airflow for the driver's area.
- The defroster supply outlets shall be located at the lower edge of the windshield. These outlets shall be durable and shall be free of sharp edges that can catch clothes during normal daily cleaning. The system shall be such that foreign objects such as coins or tickets cannot fall into the defroster air outlets. Adjustable ball vents or louvers shall be provided at the left of the driver's position to allow direction of air onto the side window in order to maintain visibility.

A ventilation system shall be provided to ensure driver comfort and shall be capable of providing fresh air. Vents shall be controllable by the driver from the normal driving position. Decals shall be provided, indicating "operating instructions" and "fresh air" and "recirculating air" positions. When closed, vents shall be sealed to prevent the migration of water or air into the bus.

TS 56.5 Driver's Cooling

A separate booster fan unit shall provide 100 cfm of air to the driver's area through directionally adjustable nozzles and an infinitely variable fan control, both of which shall be located above the driver.

TS 57. Air Filtration

Air shall be filtered before discharge into the passenger compartment. The filter shall meet the ANSI/ASHRAE 52.2 requirement for five percent or better atmospheric dust spot efficiency, 50 percent weight arrestance, and a minimum dust holding capacity of 120 g per 1000 cfm cell. Air filters shall be easily removable for service.

More efficient air filtration may be provided to maintain efficient heater and/or evaporator operation. Moisture drains from air intake openings shall be located so that they will not be subject to clogging from road dirt.

TS 58. Roof Ventilators

At least one roof ventilator shall be provided in the roof of the bus.

Each ventilator shall be easily opened and closed manually. Ventilators with lever type release handles are not permitted. When open with the bus in motion, this ventilator shall provide fresh air inside the bus. The ventilator shall cover an opening area no less than 425 sq. inches and shall be capable of being positioned as a scoop with either the leading or trailing edge open no less than four inches, or with all four edges raised simultaneously to a height of no less than 3.5 inches. An escape hatch shall be incorporated into the roof ventilator. Roof ventilator(s) shall be sealed to prevent entry of water when closed.

TS 59. Maintainability

Manually controlled shut-off valves in the refrigerant lines shall allow isolation of the compressor and dehydrator filter for service. To the extent practicable, self-sealing couplings utilizing O-ring seals shall be used to break and seal the refrigerant lines during removal of major components, such as the refrigerant compressor.

The condenser shall be located to efficiently transfer heat to the atmosphere and shall not ingest air warmed above the ambient temperature by the bus mechanical equipment, or to discharge air into any other system of the bus. The location of the condenser shall preclude its obstruction by wheel splash, road dirt or debris. HVAC components located within six inches of floor level shall be constructed to resist damage and corrosion. The condenser and evaporator fan motors shall be easy to replace in a maximum of one man-hour using simple hand tools. Fan motor replacement shall not require removal of fan housing or air ducting.

TS 60. Entrance/Exit Area Heating

No requirements for entrance/exit area heating.

TS 61. Floor-Level Heating

TS 61.1 Transit Bus

No requirements for floor-level heating.

TS 61.2 Commuter Bus

Not applicable

EXTERIOR PANELS, FINISHES AND EXTERIOR LIGHTING (TS 62-TS 73)

TS 62. Design

The bus shall have a clean, smooth, simple design, primarily derived from bus performance requirements and passenger service criteria. With the exception of required VIN information, exterior manufacturer's emblem plate or decals shall not be installed unless approved by the LACMTA. The exterior and body features, including grilles and louvers, shall be shaped to facilitate cleaning by automatic bus washers without snagging washer brushes. Water and dirt shall not be retained in or on any bus body feature to freeze or bleed out onto the bus after leaving the washer. The body and windows shall be sealed to prevent leaking of air, dust or water under normal operating conditions and during cleaning in automatic bus washers for the service life of the bus.

Exterior panels shall be sufficiently stiff to minimize vibration, drumming or flexing while the bus is in service. When panels are lapped, the upper and forward panels shall act as a watershed. However, if entry of moisture into the interior of the vehicle is prevented by other means, then rear cap panels may be lapped otherwise. The windows, hatches and doors shall be able to be sealed. Accumulation of spray and splash generated by the bus's wheels shall be minimized on windows and mirrors.

TS 62.1 Materials

Body materials shall be selected and the body fabricated to reduce maintenance, extend durability and provide consistency of appearance throughout the service life of the bus. Detailing shall be kept simple, and add-on devices and trim shall be minimized and integrated into the basic design.

The total structure shall be designed for maximum; strength, reliability, and durability, while maintaining minimum weight. The overall structure shall be designed to prevent the penetration of fluids, including lubricants, into the structure of the bus. All exposed surfaces shall be uniform in appearance with no unevenness or random irregularities in finish, including seam areas.

TS 62.2 Roof-Mounted Equipment (Transit Bus)

The bus roof shall be coated with “anti-slip” paint applied to areas that will accommodate safe access for routine inspections of the fuel cylinders.

TS 62.3 Curb Feelers

The bus shall be equipped with one curb feeler located at front door area. Curb feeler sample shall be provided by the LACMTA upon request. Installation of curb feeler shall be subject to LACMTA approval at the Pilot Bus.

TS 63. Pedestrian Safety

Exterior protrusions along the side and front of the bus greater than ½ inch and within 80 inches of the ground shall have a radius no less than the amount of the protrusion. The exterior rearview mirrors, cameras and required lights and reflectors are exempt from the protrusion requirement. Grilles, doors, bumpers and other features on the sides and rear of the bus shall be designed to minimize toeholds or handholds.

Exterior protrusions shall not cause a line-of-sight blockage for the driver.

TS 64. Repair and Replacement

TS 64.1 Side Body Panels (Transit Bus)

Structural elements supporting exterior body panels shall allow side body panels below the windows to be repaired in lengths not greater than 12.5 feet. Exterior panels shall not be installed or retained with visible rivets or fasteners unless specifically approved by LACMTA. Exterior panels that function as service and access doors shall be similar in construction, being made of aluminum, fiberglass, or stainless steel. All body panels, including those with louvers or ventilation openings, shall be designed to prevent persons from gaining a hand or foot hold if attempting to climb the exterior of the bus.

TS 64.2 Side Body Panels (Commuter Bus)

Not applicable.

TS 65. Rain Gutters

Rain gutters shall be provided to prevent water flowing from the roof onto the full length of both curb and street sides of the bus. When the bus is decelerated, the gutters shall not drain onto the windshield, driver’s side window, passenger windows or door boarding area. Gutter cross section shall be no less than 0.25 square inches.

TS 66. License Plate Provisions

Provisions shall be made to mount standard-size U.S. license plates per SAE J686 on the front and rear of the bus. These provisions shall direct-mount or recess the license plates so that they can be cleaned by automatic bus-washing equipment without being caught by the brushes, subject to LACMTA approval in Pre-Production meetings. The rear license plate provision shall be illuminated per SAE J587. License plates shall be mounted on the center or to the left of center and shall not allow a toehold or handhold for unauthorized riders. Front license plate shall be mounted sufficiently to the left of the center to allow clearance for Metro installed bicycle rack banners.

TS 66.1 Rub Rails

No requirement for rub rails.

TS 67. Fender Skirts

Features to minimize water spray from the bus in wet conditions shall be included in wheel housing design. Any fender skirts shall be easily replaceable. They shall be flexible if they extend beyond the allowable body width. Wheels and tires shall be removable with the fender skirts in place.

TS 68. Wheel Covers (Transit Bus)

Wheel covers not required.

TS 68.1 Splash Aprons

Standard Splash Aprons

Splash aprons, composed of ¼ inch minimum composition or rubberized fabric, shall be installed behind and/or in front of wheels as needed to reduce road splash and protect underfloor components. The splash aprons shall extend downward to within six inches off the road surface at static conditions. Apron widths shall be no less than tire widths. Splash aprons shall be bolted to the bus understructure. Splash aprons and their attachments shall be inherently weaker than the structure to which they are attached. The flexible portions of the splash aprons shall not be included in the road clearance measurements. Splash apron shall be installed as necessary to protect the wheelchair loading device from road splash. Other splash aprons shall be installed where necessary to protect bus equipment.

TS 69. Service Compartments and Access Doors

TS 69.1 Access Doors (Transit Bus)

Hinged doors shall be used for the engine compartment and for all auxiliary equipment compartments. Access openings shall be sized for easy performance of tasks within the compartment, including tool operating space. Access doors shall be provided at the front of the bus, only if needed, to service and/or replace the front windshield defroster unit, windshield wiper units, brake application valve, steering gear box, throttle pedal assembly, and associated pressure and electrical switches, airline fittings, and electrical connections. Access doors shall be of rugged construction and shall maintain mechanical integrity and function under normal operations throughout the service life of the bus.

The use of expanded metal for side and rear service doors is prohibited. All access doors shall be aluminum, fiberglass, or stainless steel. They shall close flush with the body surface. All doors shall be hinged at the top or on the forward edge and shall be prevented from coming loose or opening during transit service or in bus washing operations. All access doors shall be retained in the open position by props or counterbalancing with over-center or gas-filled springs with safety props and shall be easily operable by one person. Springs and hinges shall be corrosion resistant. Latch handles shall be flush with, or recessed behind, the body contour and shall be sized to provide an adequate grip for opening. Access doors, when opened, shall not restrict access for servicing other components or systems. Gas springs used for the engine access door shall be designed to operate in temperatures encountered within the engine compartment. In the event of a spring failure, an adequate mechanical locking device shall be provided at a minimum for the engine and air conditioner access doors which is capable of retaining a minimum of 200 percent of the door weight when in the open position. The locking device shall be identified by a distinctive yellow or orange color and be simple to operate by one person when closing the door. Access doors shall hinge up and out of the way to within 30 to 45 degrees of the side of the bus. The fuel fill/charge port door shall be hinged at the top and shall open fully up against the side of the bus subject to LACMTA approval in Pre-Production meetings. Pantographic door mechanisms and barn type doors for engine and A/C system access doors are not acceptable. Large access doors shall be opened and closed by one person including the 5th-percentile female. These doors, when opened, shall not restrict access for servicing other components or systems.

If precluded by design, the manufacturer shall provide door design information specifying how the requirements are met.

TS 69.2 Access Doors (Commuter Bus)

Not applicable.

TS 69.3 Access Door Latch/Locks

Requirement for Latches on Access Doors

Access doors larger than 100 sq. inches in area shall be equipped with corrosion-resistant flush-mounted latches or locks except for coolant and fuel fill or battery-switch access doors. All such access doors that require a tool to open shall be standardized throughout the vehicle and will require a nominal 5/16-inch square male tool to open or lock. The locks shall be standardized so that only one tool is required to open all major access doors on the bus. It is required that locking devices lock clockwise and unlock counter clockwise.

Other Locks and Latches

A key switch shall be provided to lock the front door. The switch shall be located behind an exterior access door near the front curb side of the bus a minimum of 45 inches above the ground. The access door shall be hinged to allow the door to open completely to view and aid inserting the switch key. Access to the switch shall not be obstructed by the bicycle rack in the stowed position. The switch shall use a LACMTA standard key. A sample key will be provided by the LACMTA following the Pre-Production meetings.

The Door Lock system shall be controlled by the bus multiplex system. When the Master Run Switch is in the "Off" position and the Park Brake is applied, the door key switch shall close and lock the front door. If left unattended with the front door locked, the front door lock system shall go to sleep with the bus multiplex system and door shall remain locked. If there is a loss of battery power when the door is locked the door shall remain in the closed unpowered position. When the Operator unlocks the front door with the key, the door shall automatically open and the bus multiplex system shall wake up.

TS 70. Bumpers

TS 70.1 Location

Bumpers shall provide impact protection for the front and rear of the bus with the top of the bumper being 27 inches, ±2 inches, above the ground. Bumper height shall be such that when one bus is parked behind another, a portion of the bumper faces will contact each other.

TS 70.2 Front Bumper

No part of the bus, including the bumper, shall be damaged as a result of a 5mph impact of the bus at curb weight with a fixed, flat barrier perpendicular to the bus's longitudinal centerline. The bumper shall return to its pre-impact shape within 10 minutes of the impact. The bumper shall protect the bus from damage as a result of 6.5 mph impacts at any point by the common carriage with contoured impact surface defined in Figure 2 of FMVSS 301 loaded to 4,000 pounds parallel to the longitudinal centerline of the bus. It shall protect the bus from damage as a result of 5.5 mph impacts into the corners at a 30-degree angle to the longitudinal centerline of the bus. The energy absorption system of the bumper shall be independent of every power system of the bus and shall not require service or maintenance in normal operation during the service life of the bus. The bumper may increase the overall bus length specified by no more than seven inches.

TS 70.3 Rear Bumper

No part of the bus, including the bumper, shall be damaged as a result of a two mph impact with a fixed, flat barrier perpendicular to the longitudinal centerline of the bus. The bumper shall return to its pre-impact shape within 10 minutes of the impact. When using a yard tug with a smooth, flat plate bumper two feet wide contacting the horizontal centerline of the rear bumper, the bumper shall provide protection at speeds up to five mph, over pavement discontinuities up to one inch high, and at accelerations up to two mph/sec. The rear bumper shall protect the bus, when impacted anywhere along its width by the common carriage with contoured impact surface defined in Figure 2 of FMVSS 301 loaded to 4,000 pounds, at four mph parallel to or up to a 30-degree angle to, the longitudinal centerline of the bus. The rear bumper shall be shaped to preclude

unauthorized riders standing on the bumper. The bumper shall not require service or maintenance in normal operation during the service life of the bus. The bumper may increase the overall bus length specified by no more than six inches.

TS 70.4 Bumper Material

Bumper material shall be corrosion-resistant black polyurethane type material and withstand repeated impacts of the specified loads without sustaining damage. Visible surfaces shall be semi-gloss black. These bumper qualities shall be sustained throughout the service life of the bus.

TS 70.5 Bicycle Rack

A front mounted fold-up three-position black bicycle rack shall be provided to conform to amended Section 35400 of California Vehicle Code that took effect in September 2014. The installed bicycle rack shall not interfere with towing the bus. California Code Title 13 requires that bike racks be installed with a way for the Operator to determine whenever the bike rack is deployed.

TS 71. Finish and Color

TS 71.1 Appearance

Contractor shall utilize the LACMTA's existing local color scheme in its exterior paint design, (see Technical Specification Attachment 1-Metro Local Exterior and Interior Fleet Standards for reference). Exterior colors shall be applied over a white base color. The manufacturer shall submit for LACMTA's approval, a drawing showing painting layout including striping bends and breaks during Pre-Production meetings. Drawing shall show location of bends as dimensioned from a convenient reference point. The Pilot Bus shall be painted according to this color scheme for approval by the LACMTA prior to application to the remainder of the buses.

Contractor shall submit to LACMTA all material safety data sheet (MSDS) for all exterior and interior finishing, coatings, adhesives, sealants and paints. Paints and coatings including finishes and sealants shall not contain lead or asbestos.

All exterior surfaces shall be smooth and free of wrinkles and dents. Exterior surfaces to be painted shall be properly prepared as required by the paint system supplier prior to application of paint to assure a proper bond between the basic surface and successive coats of original paint for the service life of the bus. Drilled holes and cutouts in exterior surfaces shall be made prior to cleaning, priming and painting, where possible, to prevent corrosion. The bus shall be completely painted in such a manner that replacement of exterior lights, windows, mirrors and other items that are applied to the exterior of the bus shall not leave paint outline. Body filler materials may be used for surface dressing, but not for repair of damaged or improperly fitted panels.

Paint shall be applied smoothly and evenly with the finished surface free of visible dirt and the following other imperfections:

- Blisters or bubbles appearing in the topcoat film.
- Chips, scratches, or gouges of the surface finish.
- Cracks in the paint film.
- Craters where paint failed to cover due to surface contamination.
- Overspray.
- Peeling.
- Runs or sags from excessive flow and failure to adhere uniformly to the surface.
- Chemical stains and water spots.
- Dry patch due to incorrect mixing of paint activators.
- Buffing swirls.

All exterior finished surfaces shall be impervious to diesel fuel, gasoline and commercial cleaning agents. Finished surfaces shall resist damage by controlled applications of commonly used graffiti-removing chemicals. The interior of both passenger doors shall be primed with suitable acid-resistant paint.

Proper adhesion between the basic surface and successive coats of the original paint shall be measured using an Elcometer adhesion tester as outlined in ASTM D4541-85. Adhesion shall be a minimum 300 foot.-pounds. The bus manufacturer shall supply test samples of the exterior surface for each step of the painting process that may be subject to adhesion testing per ASTM G4541-87 and ASTM D4145-85. ASTM D4541-93 may be used for inspection testing during assembly of the vehicle.

High Gloss External Paint Finish Quality

Painted surfaces shall have an average 90 gloss as measured in ASTM E97-92, “Standard Test Method For Directional Reflectance” and an orange peel rating of five or more on the Advanced Coating Technologies, Inc., orange peel standard panels set #APR 14941 or LACMTA accepted wave scan equipment Exterior painted surfaces shall have a minimum of 0.5-mil thick primer coat and a minimum 2.5-mil thick finish coat. Mil thickness shall conform to paint manufacturer's specifications.

TS 72. Decals, Numbering and Signing

Contractor shall furnish and apply all decals. Final size and locations shall be approved by LACMTA. Signs shall be durable and fade, chip, and peel-resistant. All “screened” markings shall be coated with a protective abrasion resistant film that resists damage from cleaning chemicals, graffiti, and sunlight. The Contractor shall provide LACMTA with scaled electronic format drawings of the bus interior and exterior on DVD, compatible with AutoCAD, Adobe Illustrator or other LACMTA approved file format. LACMTA shall utilize these drawings to illustrate the locations of all exterior and interior bus decals to be available at the first Pre-Production meeting or upon request. Contractor shall furnish any other markings necessary for identification of windows, hatches, etc., in both English and Spanish. Roof decals should be applied so that the bottom of the numbers point toward the street side. (Refer to Section TS 88.4 for Tables 18-19.)

TS 72.1 Passenger Information

A total of two information "Take One" boxes and one minimum “Take Twelve” unit shall be supplied (Refer to Section TS 88.1 for Approved Products). “Take One” boxes shall be mounted at both the front and rear doors in convenient locations for passengers and the minimum “Take Twelve” unit shall be located in a convenient location towards the front of the bus, subject to LACMTA approval in Pre-Production meetings.

TS 73. Exterior Lighting

Exterior lighting and reflectors shall comply, as applicable, with Part 393, Subpart B of the FMCSA and FMVSS 108. All exterior lights shall be designed to prevent entry and accumulation of moisture or dust. Commercially available LED-type lamps shall be utilized at all exterior lamp locations. Lamps, lenses and fixtures shall be interchangeable to the extent practicable. Two hazard lamps at the rear of the bus shall be visible from behind when the engine service doors are opened. Light lenses shall be designed and located to prevent damage when running the vehicle through an automatic bus washer. Front marker (clearance) lights along with lights located on the roof and sides of the bus shall have protective shields or be of the flush mount type to protect the lens against minor impacts, and be installed in such a manner to prevent water leakage through the roof or side panels. Separate from any marker lights required by FMVSS, LED clearance lamps shall be provided on the roof surface at each bus corner to delineate bus height in accordance with Title 13 of the California Administrative Code Section 641. These four corner clearance lamps shall be lighted when the master switch is in the “Night Run” position.

Standard Lamps

All LED lamps shall be standard installation of the OEM. The entire assembly shall be specifically coated to protect the light from chemical and abrasion degradation.

Potted Lamps

LED lamps shall be potted type and designed to last the life of the bus.

Lamp Size

LED lamps used for tail, brake and turn signal lamps shall be a minimum of seven inches in diameter.

TS 73.1 Backup Light/Alarm

Visible and audible warnings shall inform following vehicles or pedestrians of reverse operation. Visible reverse operation warning shall conform to SAE Standard J593. Audible reverse operation warning shall conform to SAE Recommended Practice J994 Type C or D.

TS 73.2 Doorway Lighting

Lamps at the front and rear passenger doorways shall comply with ADA requirements and shall activate only when the doors open. These lamps shall illuminate the street surface to a level of no less than one foot-candle for a distance of three feet outward from the outboard edge of the door threshold with a passenger standing in the threshold. The lights must be positioned overhead and shall be shielded to protect passengers' eyes from glare.

Lighting for the ramp areas shall be designed to meet Title 13 and ADA and FMVSS 404 standards. Lighting shall be provided to effectively illuminate the ramp area. Light shall be controlled by the ramp master switch on the driver's dash and shall automatically illuminate when this switch is in the "On" position. The lighting design shall minimize the effect of glare on passengers entering the bus through the wheelchair ramp door. During ramp operation, the street surface shall be illuminated to a minimum of six candlepower a distance of three feet beyond the external dimensions of the ramp platform once deployed.

TS 73.3 Turn Signals

Standard Turn Signals

Turn-signal lights shall be provided on the front, rear, curb and street sides of the bus in accordance with FMVSS 108 and Part 393, Subpart B of the FMCSA as applicable. Two LED seven-inch diameter amber turn/hazard warning lights, one on each side of engine compartment, shall be furnished.

Forward and rear facing supplemental LED cornering lights shall be provided on the curb side of bus only. With the master switch in the "Night Run" position, the cornering lights shall illuminate the street surfaces no less than three feet outward of the body only when activated by right-hand turn signal at 15 mph or less.

Cornering lights shall illuminate the street surfaces for 15 seconds when the doors close and the master switch is in "Night Run" position to assist an operator determine whether or not the areas by the doors are clear of people.

Wraparound Front Turn Signals

Front turn signals shall be of wrap-around design or shall be designed to be visible from the front and the near side of the bus.

TS 73.4 Headlights

Headlamps shall be designed for replacement of bulb without removing the headlamp bezel.

Standard Installation

Standard OEM headlight installation shall be provided in accordance with FMVSS 108 and Part 393, Subpart B of the FMCSA as applicable.

Daytime Running Lights

Headlamps shall not incorporate a daytime running light feature.

LED/Halogen

Low beam headlamps shall be LED. High beam headlamps shall be halogen or LED. Lenses shall be resistant to hazing and yellowing, and have proper hardness to resist surface scratches and stone chips, subject to LACMTA approval during proposal period.

TS 73.5 Brake Lights

TS 73.5.1 Transit Bus

Brake lights shall be provided in accordance with FMVSS 108 and Part 393, Subpart B of the FMCSA as applicable.

High and Center Mount Red Brake Lamp

Bus shall include red, high and center mount brake lamp(s) along the backside of the bus in addition to the lower brake lamps required under FMVSS 108. The high and center mount brake lamp(s) shall illuminate steady with brake application. Two LED seven-inch diameter sealed tail lights shall be mounted on each side of the engine closure door or rear end panels, so that the lights are not affected by engine heat (Refer to Section TS 88.1 for Approved Products). The (red) stop/tail lights shall be mounted directly above the (amber) directional signal lights. Two additional LED (red) stop lights shall be located above the engine compartment door on the centerline of the bus. If stop and tail lights are not visible from the rear when engine door is in the open position, two LED four-inch diameter amber hazard warning lights, one on each side of engine compartment, shall be furnished and activated by the turn signals. Each light shall be replaceable as an individual unit. Plastic lenses shall be protected with a high performance scratch and chemical resistant coating to prevent deterioration.

TS 73.5.2 Commuter Bus

Not applicable.

TS 73.6 Service Area Lighting (Interior and Exterior)

LED lamps with a minimum 264 lumens each shall be provided in the engine and all other compartments where service may be required to generally illuminate the area for night emergency repairs or adjustments. These service areas shall include, but not be limited to, PLC compartment(s), battery box(es), the engine compartment, the communication box, junction/apparatus panels and passenger door operator compartments. Lighting shall be adequate to light the space of the service areas to levels needed to complete typical emergency repairs and adjustments. The service area lamps shall be suitable for the environment in which they are mounted. A minimum of five lamps shall be provided for engine compartment illumination. A common automotive electric lighter accessory socket shall be provided on, or adjacent to, the rear control panel to power 12-volt portable service lights and diagnostic computers, subject to LACMTA approval in Pre-Production meetings.

Engine compartment lamps shall be controlled by a switch mounted near the rear start controls. All other service area lamps shall be controlled by switches mounted on or convenient to the lamp assemblies. Power to the service area lighting shall be programmable. Power shall latch on with activation of the switch and shall be automatically discontinued (timed out) after 60 minutes to prevent damage caused by inadvertently leaving the service area lighting switch in the “On” position after repairs are made.

INTERIOR PANELS AND FINISHES (TS 74-TS 77)

TS 74. General Requirements

Materials shall be selected on the basis of maintenance, durability, appearance, safety, flammability and tactile qualities. Materials shall be strong enough to resist everyday abuse and be vandalism and corrosion resistant. The interior shall be light colored, well lighted, simple, modern, and free from superficial design motifs. There shall be no sharp depressions or inaccessible areas, and it shall be easy to clean and maintain. Trim and attachment details shall be kept simple and unobtrusive. Interior trim shall be secured to avoid resonant vibrations under normal operational conditions.

Interior surfaces more than 10 inches below the lower edge of the side windows or windshield shall be shaped so that objects placed on them fall to the floor when the bus is parked on a level surface. With the exception of the Operators' area and dash, the entire interior shall be cleanable with a hose that utilizes a liquid soap attachment. Interior shall accommodate periodic usage of commercially available cleaning agents, solvents and other chemicals for graffiti cleaning and pest control. Any components and other electrical components within close proximity to these surfaces shall also be resistant to this cleaning method.

Additional anti-graffiti/vandalism treatments shall be applied to interior surfaces, subject to LACMTA approval during proposal period, to allow easy cleaning and removal of markings, adhesives, paint, scribing and etching on surfaces.

Interior surfaces, where possible, to be stainless steel or other vandalism resistant material.

TS 75. Interior Panels

Panels shall be easily replaceable and tamper-resistant. They shall be reinforced, as necessary, to resist vibration, denting, vandalism and other rigors of transit bus service. Individual trim panels and parts shall be interchangeable to the extent practicable.

Interior panel required to meet FMVSS 302.

Interior panels installed behind the exit door, (except for ceiling), shall be textured stainless steel only. Panels in other areas of the bus shall be stainless or other material as determined to best match appearance with the rear section of the bus subject to LACMTA approval during proposal period.

Fire Resistance

Materials shall comply with the Recommended Fire Safety Practices defined in FTA Docket 90-A, most recent revision.

TS 75.1 Driver Area Barrier

TS 75.1.1 Transit Bus

A barrier or bulkhead between the driver and the street-side front passenger seat shall be provided. The barrier shall minimize glare and reflections in the windshield directly in front of the barrier from interior lighting during night operation. Location and shape must permit full seat travel and reclining possibilities that can accommodate the shoulders of a 95th-percentile male. The partition shall have a side return and stanchion to prevent passenger from reaching the driver by standing behind the driver's seat. The lower area between the seat and enclosure must be accessible to the driver. The partition must be strong enough in conjunction with entire partition assembly for mounting of such equipment as flare kits, fire extinguishers (1.2 kg), microcomputer, public address amplifier, etc. Dark or black enclosures are preferred behind the driver's head. The enclosure should be isolated for noise control.

Wheel-Well-to-Ceiling Configuration of Driver's Barrier

The driver's barrier shall extend from the top of the wheel well to the ceiling the level of the seated driver and shall fit close to the bus side windows and wall to prevent passengers from reaching the driver or the driver's personal effects.

Driver's Area Barrier Door

A driver door of a ruggedized design intended for use in a transit bus environment shall be provided. It shall be a split door design. Upper and lower doors shall be opened or closed independently of each other. LACMTA may consider a single door with sliding glass. Each door, when closed, shall have a mechanism to latch from inside the operator compartment. Provision shall be made for emergency responders to gain access to a latched operator compartment. Door panels shall be standardized so that they are interchangeable from bus to bus. The door must allow access to all panels, dash and destination sign without requiring removal of the door.

The clear see-through AS2 polycarbonate panel or laminated safety glass in the driver door shall have no speaker holes. The clear panel shall resist clouding and discoloration by ultraviolet rays and by use of the cleaners currently in use at LACMTA.

The driver door shall minimize glare and reflections in the windshield directly in front of the barrier from interior lighting during night operation. It shall be installed in compliance with Driver Provisions, Controls and Instrumentation specified in TS 46 and any applicable ADA or safety standards.

The driver door shall not block boarding passengers from viewing the live display video monitor that is mounted above the driver's seat.

The driver door shall be supported by tapping plates in bus frame structure in order for the door to blend in with bus interior decor.

The farebox handrail and driver's paddle clipboard shall be designed and positioned so that the driver door will automatically latch upon closing without interfering with full farebox function while allowing mounting the farebox OCU, RAM dual pivot arm and driver's paddle clipboard in a manner that is ergonomic to an operator in the driver's seat.

With the bus on level ground, upper and lower doors, when open but not secured to the side, shall stay put where they are left, neither opening nor closing, without application of an external force. When closed, these doors shall not adversely impact the ingress and egress of passengers including those in a wheelchair or other mobility assistive device (i.e. fully ADA compliant). When fully open and secured, these doors shall be designed to minimize the impact on the ingress and egress of passengers including those in a wheelchair or other mobility assistive device.

The entire drive door assembly shall be replaceable in 30 minutes or less. The see-through panel in the barrier shall be replaced in 15 minutes or less using simple hand tools. Door hinges shall be a quick-release type to allow easy, rapid removal of the door panels.

TS 75.1.2 Commuter Bus

Not applicable.

TS 75.2 Modesty Panels

Sturdy divider panels constructed of durable, unpainted, stainless steel complementing the interior shall be provided to act as both a physical and visual barrier for seated passengers in front of each leading row of forward facing seats.

Design and installation of modesty panels located in front of forward-facing seats shall include a handhold or grab handle along its top edge. These dividers shall be mounted on the sidewall and shall project toward the

aisle no farther than passenger knee projection in longitudinal seats or the aisle side of the transverse seats. Modesty panels shall extend from at least the window opening of the side windows, and those forward of transverse seats shall extend downward to one and 1.5 inches above the floor. Panels forward of longitudinal seats shall extend to below the level of the seat cushion. Dividers positioned at the doorways shall provide no less than a 2.5 inches clearance between the modesty panel and a fully open, inward opening door, or the path of a deploying flip-out ramp to protect passengers from being pinched. Modesty panels installed at doorways shall be equipped with grab rails if passengers assist are not provided by other means.

The modesty panel and its mounting shall withstand a static force of 250 pounds applied to a four × four inch area in the center of the panel without permanent visible deformation.

At the rear door area a clear non-glass panel from above the modesty panel to the top of the daylight opening and attached to the stanchion.

Modesty panels shall be bolted or riveted to handrails or installed in U-channels with self-locking nuts and securely attached to stanchion and body side. Modesty panels located at the forward edge of the upper floor area shall be attached along the top to handrails for added stiffness. Panels shall be attached to bottom extruded anodized aluminum rails for stiffness.

TS 75.3 Front End

The entire front end of the bus shall be sealed to prevent debris accumulation behind the dash and to prevent the driver's feet from kicking or fouling wiring and other equipment. The front end shall be free of protrusions that are hazardous to passengers standing at the front of the standee line area of the bus during rapid decelerations. Paneling across the front of the bus and any trim around the driver's compartment shall be formed metal or composite material. Composite dash panels shall be reinforced as necessary, vandal-resistant and replaceable. All colored, painted and plated parts forward of the driver's barrier shall be finished with a surface that reduces glare. Any mounted equipment must have provision to support the weight of equipment.

TS 75.4 Rear Bulkhead

The rear bulkhead and all rear interior surfaces, including air return grille, access doors and covers, with the exception of bus ceiling and enclosures adjacent to ceiling, shall be embossed stainless steel with "leather grain" finish. Ceiling and enclosures adjacent to ceiling shall be made of durable, corrosion resistant, easily cleanable material subject to LACMTA approval. Surfaces, other than ceiling, not made of stainless material shall be uniform in color and match lighting panels to the extent possible. Finish shall permit easy removal of paint, grease, fingerprints, and ink. They shall be designed and reinforced, as necessary, to resist vibration, denting, vandalism, and other rigors encountered in LACMTA service. The rear bulkhead paneling shall be contoured to fit the ceiling, side walls and seat backs so that any litter or trash will tend to fall to the floor or seating surface when the bus is on a level surface. Any air vents in this area shall be louvered to reduce airflow noise and to reduce the probability of trash or litter being thrown or drawn through the grille. If it is necessary to remove the panel to service components located on the rear bulkhead, the panel shall be hinged or shall be able to be easily removed and replaced. Grilles where access to or adjustment of equipment is required shall be heavy-duty and designed to minimize damage and limit unauthorized access. Unless otherwise specified, all wiring harnesses in the engine compartment shall terminate there for ease of replacement. Wire harnesses going through the bulkhead shall have a junction at the bulkhead.

TS 75.5 Headlining

Ceiling panels shall be made of durable, corrosion resistant, easily cleanable material subject to LACMTA approval during proposal period. Headlining shall be supported to prevent buckling, drumming or flexing and shall be secured without loose edges. Headlining materials shall be treated or insulated to prevent marks due to condensation where panels are in contact with metal members. Moldings and trim strips, as required to make the edges tamperproof, shall be stainless steel, aluminum or plastic, colored to complement the ceiling material. Headlining panels covering operational equipment mounted above the ceiling shall have an access panel installed to permit access to the equipment. Antenna access panel may be hinged or removable using

captive tamper proof screws. Individual head lining panels shall be easily replaceable by one mechanic using simple hand tools in a maximum of 30 minutes not including stanchion removal.

TS 75.6 Fastening

Interior panels shall be attached so that there are no exposed unfinished or rough edges or rough surfaces. Fasteners should be corrosion resistant. Panels and fasteners shall not be easily removable by passengers. Exposed interior fasteners should be minimized, and where required shall be tamper-resistant.

TS 75.7 Insulation

Any insulation material used between the inner and outer panels shall minimize the entry and/or retention of moisture. Insulation properties shall be unimpaired during the service life of the bus. The insulation material shall be non-hygroscopic, non-asbestos, and resistant to fungus and breeding of insects. Any insulation material used shall not absorb or retain oils or water and shall be designed to prevent casual damage that may occur during maintenance operations.

The combination of inner and outer panels on the sides, roof, wheel wells and ends of the bus, and any material used between these panels, shall provide a thermal insulation sufficient to meet the interior temperature requirements. The bus body shall be thoroughly sealed so that the driver or passengers cannot feel drafts during normal operations with the passenger doors closed.

FTA Docket 90-A

All insulation materials, except for insulation entirely enclosed from the passenger compartment, shall comply with the Recommended Fire Safety Practices defined in FTA Docket 90-A, most recent revision.

TS 75.8 Floor Covering

All interior floor areas shall be covered with a combination of gray colored smooth and ribbed slip resistant rubber or equivalent floor covering bonded to the subfloor that remains effective in all weather conditions with 12-year unconditional warranty, subject to LACMTA approval. The floor covering, as well as transitions of flooring materials from the main floor area and to the step areas shall be smooth and present no tripping hazards. The floor covering shall closely fit the sidewall cove or extend to the top of the cove. Floor covering applied to wheel housing may be separate pieces. To the extent practical, the center strip may be two-piece and shall extend from the rear seat between the aisle seats to the front standee line.

The floor covering in the entry area shall be ribs aligned transversely (perpendicular to the entrance door), and longitudinally (in line with the aisle), and shall be joined together smoothly. The integrally molded yellow standee line shall be integrally molded yellow at least two inches (± 1/8 inch) wide and shall have a consistent dimension across the bus aisle in line with the operator's barrier.

The floor covering in the passenger area shall match the flooring in the entry area. The center strip shall be ribs aligned with the aisle. At the rear door a separate ribbed strip as wide as the door opening shall extend from the center strip to the door with ribs aligned transversely (perpendicular to the door). The floor under the seats shall be covered with smooth surface flooring material. The floor covering shall closely fit the sidewall cove or extend to the top of the cove. The wheel housings may be separate pieces. The wheelchair parking area floor shall be covered with blue smooth flooring material that extends into adjacent senior seating areas.

Interior step treads (if required) shall be covered with ribbed flooring material or other non-slip flooring material. The first step shall be yellow, and the second (if needed) shall have two inches wide yellow nosing the full width of the tread, which is fully blended, into the tread material. Sides of the steps shall be the same color as the yellow nosing or rest of the floor, and fully sealed to prevent peeling, tripping hazards, and water intrusion. The edge of any interior steps shall have minimal overhang. Special coating for the step tread section may be acceptable subject to LACMTA approval during the Pre-Production meeting.

TS 75.9 Interior Lighting

Commercially available LED-type lamps shall be utilized at all interior lamp locations. The light source shall be located to minimize windshield glare, with distribution of the light focused primarily on the passengers' reading plane while casting sufficient light onto the advertising display. The lighting system may be designed to form part of or the entire air distribution duct. The lighting system shall meet FCC Part 18; Class A regulation for EMI conducted and radiated emissions.

TS 75.10 Passenger

An overhead LED lighting system shall provide general illumination in the passenger compartment. The lens material shall be translucent polycarbonate. Lenses shall be designed to effectively "mask" the light source. Lenses shall be sealed to inhibit incursion of dust and insects yet be easily removable for service. Access panels shall be provided to allow servicing of components located behind light panels. The entire light fixture shall be hinged to provide easy access to bus wiring and equipment mounted behind the light fixture. The fixture lens cover shall be easy to remove and clean and shall be retained by vandal resistant threaded screws.

Automatically Dimming First Row Lights

The first light on each side (behind the driver and the front door) is normally turned on only when the front door is opened, in "Night Run" and "Night Park" As soon as the door closes, these lights shall go out. These lights shall be turned on at any time if the switch is in the "On" position. Access to the wiring interconnects shall not require removing the fixture from the bus structure.

Dimming Second Row Lights

To help eliminate windshield reflection on suburban roads where street lighting is at a low level, the second light on each side, when "Night Run" or "Night Park" is selected, shall be controlled by the switch; off in "Off" and dimmed in "Normal." These lights shall be turned fully on at any time if the switch is in the "On" position.

The interior lighting design shall be subject to LACMTA approval during proposal period.

TS 75.11 Driver's Area

The driver's area shall have a light to provide general illumination, and it shall illuminate the half of the steering wheel nearest the driver to a minimum level of five foot-candles. This light shall be controlled by a switch that is convenient to the operator. The Operator's light shall be off when the Master Run Switch is in the "Off" position.

TS 75.12 Seating Areas (Transit Bus)

The interior lighting system shall provide a minimum 15 foot-candle illumination on a one square foot plane at an angle of 45 degrees from horizontal, centered 33 inches above the floor and 24 inches in front of the seat back at each seat position. Allowable average light level for the rear bench seats shall be seven-foot-candles.

TS 75.13 Seating Areas (Commuter Bus)

Not applicable.

TS 75.14 Vestibules/Doors (Transit Bus)

Floor surface in the aisles shall be a minimum of 10 foot-candles, and the vestibule area a minimum of four foot-candles with the front doors open and a minimum of two foot-candles with the front doors closed. The front entrance area and curb lights (if needed) shall illuminate when the front door is open and master run switch is in the "lights" positions. Rear exit area and curb lights shall illuminate when the rear door is unlocked.

TS 75.15 Vestibules/Doors (Commuter Bus)

Not applicable.

TS 75.16 Step Lighting

Step lighting for the intermediate steps between lower and upper floor levels shall be a minimum of four (4) foot-candles and shall illuminate in all engine run positions. The step lighting shall be low-profile to minimize tripping and snagging hazards for passengers and shall be shielded as necessary to protect passengers' eyes from glare.

Front and rear passenger door areas shall be lighted to meet ADA requirements.

When the Master Switch is in the "Night Run" position, the front and rear door area lights shall be on when the doors are open and off when the doors are closed.

TS 75.17 Ramp Lighting (Transit Bus)

Exterior and interior ramp lighting shall comply with CFR Part 49, Section 38.31.

Lights shall be provided at the doorway equipped with the wheelchair access system to floodlight the loading area.

Lighting for the ramp areas shall be designed to meet Title 13 and ADA and FMVSS 404 standards. Lighting shall be provided to effectively illuminate the ramp area. The light shall be wired through the ramp master toggle switch on the driver's dash and shall automatically illuminate when this switch is in the "On" position. The lighting design shall minimize the effect of glare on passengers entering the bus through the wheelchair ramp door. During ramp operation, the street surface shall be illuminated to a minimum of six candlepower a distance of three feet beyond the external dimensions of the ramp platform once deployed.

TS 75.18 Turntable Lighting (Articulated Bus)

Not applicable.

TS 75.19 Farebox Lighting

TS 75.19.1 Transit Bus

A light fixture shall be mounted in the ceiling above the farebox location. The fixture shall be capable of projecting a concentrated beam of light on the farebox. The light shall illuminate the top of the fare box and the surrounding floor area to a minimum of 15 foot-candles. This light will automatically come on whenever the front doors are opened and the run switch is in the "Night Run" or "Night Park" position. A by-pass switch shall be provided on the Operator's side console to keep the fare box light on when activated.

TS 75.19.2 Commuter Bus

Not applicable.

TS 76. Fare Collection

Space and structural provisions shall be made for installation of 41-inch GFI Genfare Odyssey Validation farebox and shall be as far forward as practicable. Location of the fare collection device shall not restrict traffic in the vestibule, including wheelchairs if a front door loading device is used, and shall allow the driver to easily reach the farebox controls and to view the fare register. The farebox shall not restrict access to the driver area, shall not restrict operation of driver controls and shall not — either by itself or in combination with stanchions, transfer mounting, cutting and punching equipment, or route destination signs — restrict the driver's field-of-view per SAE Recommended Practice J1050. The location and mounting of the fare collection device shall allow use, without restriction, by passengers. The farebox location shall permit accessibility to the vault for easy manual removal or attachment of suction devices. Meters and counters on the farebox shall be readable on a daily basis. The floor under the farebox shall be reinforced as necessary to provide a sturdy mounting platform and to prevent shaking of the farebox.

Adjacent to the farebox area and within easy reach of the Operator, Contractor shall provide a small clipboard approximately 4.5 inches by 5.5 inches to hold the operator schedule, (paddle).

The Contractor shall provide and install GFI Genfare Odyssey Validation farebox base plate, power leads and ITS interface cable, subject to LACMTA approval in Pre-Production meetings.

> **Note:** Proposers are to contact GFI Genfare directly to determine correct part numbers, harness length requirements, etc. The under floor reinforcement shall be of adequate strength to anchor the farebox using GFI installation kit D22581-0005 or equivalent. Reinforcement plate shall include permanently attached nuts to secure the farebox base plate to the floor.

A circuit breaker protected, 20-amp, 24-Volt DC battery circuit, shall be provided and powered through the battery connect switches. This power circuit shall include a grounded lead. A one-inch inside diameter waterproof conduit shall be provided from the ITS enclosure to the farebox base plate mounting location, through the bus floor, to protect the power leads and ITS interface cable, subject to LACMTA approval in Pre-Production meetings. Farebox end of conduit shall protrude above the floor at a minimum 1/2 inch to prevent moisture from entering the conduit.

TS 77. Interior Access Panels and Doors (Transit Bus)

Access for maintenance and replacement of equipment shall be provided by panels and doors that appear to be an integral part of the interior. Removal of fixtures or equipment unrelated to the repair task to gain access shall be precluded or used only subject to LACMTA approval in Pre-Production meetings. Access doors shall be hinged with gas props or over-center springs, where practical, to hold the doors out of the mechanic's way, subject to LACMTA approval during pre-production meetings. All overhead doors shall be hinged at the top and shall be prevented from coming loose or opening during transit service or in bus cleaning operations. Access doors, when opened, shall not restrict access for servicing other components or systems Retention of all interior access panels shall be with tamper proof screws. Panel fasteners shall be standardized so that only one tool is required to service all special fasteners within the Bus subject to LACMTA approval in Pre-Production meetings. All fasteners that retain access panels, excluding wheel well housing, and floor access panels, shall be captive in the cover. Removable light panels are not considered access panels unless specifically approved by LACMTA. Access doors in the Operators' area forward of the standee line (including the front door actuator compartment) shall be secured with hand screws or latches and shall prevent entry of mechanism lubricant into the Bus interior.

TS 77.1 Floor Panels

Access openings in the floor shall be sealed to prevent entry of fumes and water into the bus interior. Flooring material at or around access openings shall be flush with the floor and shall be edge-bound with stainless steel or another material that is acceptable to the LACMTA to prevent the edges from coming loose. Access openings shall be asymmetrical so that reinstalled flooring shall be properly aligned. Fasteners shall tighten flush with the floor.

The number of special fastener tools required for panel and access door fasteners shall be minimized.

PASSENGER ACCOMMODATIONS (TS 78-TS 82)

TS 78. Passenger Seating

TS 78.1 Arrangements and Seat Style (Transit Bus)

The passenger seating arrangement in the bus shall be such that seating capacity is maximized with a minimum of 38 seats, and in compliance to the following requirements:

> **Note:** The LACMTA recognizes that ramp location, foot room, hip-to-knee room, doorway type, width, seat construction, floor level type, seat spacing requirements, ramp or lift, number of wheelchair positions, etc. ultimately affect seating capacity and layout.

Forward-Facing Seat Configuration

Passenger seats shall be arranged in a transverse, forward-facing configuration, except at the wheel housings and turntable, if applicable, where aisle-facing seats may be arranged as appropriate with due regard for passenger access and comfort. Other areas where aisle-facing seats may be provided are at wheelchair securement areas and platforms (such as for fuel tank storage space). The first forward facing seats at the curbside and street side shall be designated as reserved seating for the senior, the blind and a person on a cane or crutch. All reserved seating shall use seat inserts covered with Blue Chips fabric.

Rear Seats

The rear seat assembly shall accommodate four or five passengers as needed to meet the minimum seating requirement. A maximum of three of the rear seat(s) shall be hinged to fully open for easy access to the engine compartment. The hinged seats shall latch in the closed position and be supported by a convenient prop in the open position.

USB Ports

Type A USB device charging ports shall be provided for all seat locations. For transverse seats there shall be a dual port USB connector at double passenger seat locations, and a single port USB connector at the single passenger seat locations, mounted along the seat rails. At the rear settee there shall be a dual USB connector on each end of the settee positions along the seat rails. At the wheelchair flip up seat locations, a dual USB connector shall be positioned such that it is easily accessible with the seat in either wheelchair or seating position. On any fixed longitudinal seats, a single port USB connector per seat shall be located on the seat rail adjacent to the seat. The exact locations of the charging ports shall be reviewed and approved by LACMTA during Proposal period. The USB connectors shall include spring loaded access doors that provide dust and water resistance to IP 64 rating. The ports shall be powered only when engine is running and shall provide five volts at two amps minimum power.

TS 78.2 Rearward Facing Seats (Transit Bus)

Rearward facing seats not allowed.

TS 78.3 Turntable Seating (Articulated Bus)

Not applicable.

TS 78.4 Padded Inserts/Cushioned Seats (Transit Bus)

Non-Padded Inserts

The passenger seats shall be equipped with vandal-resistant non-padded inserts throughout the bus.

Non-Padded Seat Configuration

Seats inserts shall be securely attached and shall be detachable by means of a simple release mechanism so that they are easily removable by the maintenance staff but not by passengers. To the extent practicable, seat inserts shall be interchangeable throughout the bus. Materials shall have high resistance to tearing, flexing and wetting.

TS 78.5 Seat Back Fitness

Back Insert Seat Configuration

The seat back insert thickness shall not exceed one inch in the knee room area.

TS 78.6 Drain Hole in Seats

The bottom insert shall be fitted with a riveted drain hole.

TS 78.7 Arrangements and Seat Style (Commuter Bus)

Not applicable.

TS 78.8 Hip-to-Knee Room

Hip-to-knee room measured from the center of the seating position, from the front of one seat back horizontally across the highest part of the seat to vertical surface immediately in front, shall be a minimum of 26 inches. At all seating positions in paired transverse seats immediately behind other seating positions, hip-to-knee room shall be no less than 26 inches.

TS 78.9 Foot Room

Foot room, measured at the floor forward from a point vertically below the front of the seat cushion, shall be no less than 14 inches. Seats immediately behind the wheel housings and modesty panels may have foot room reduced.

TS 78.10 Aisles (Transit Bus)

The aisle between the seats shall be no less than 20 inches wide at seated passenger hip height. Seat backs shall be shaped to increase this dimension to no less than 24 inches at 32 inches above the floor (standing passenger hip height).

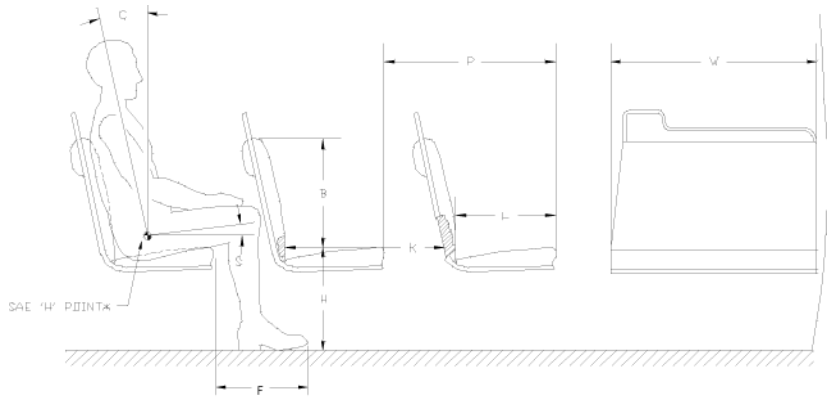
TS 78.11 Aisles (Commuter Bus)

Not applicable.

TS 78.12 Dimensions (Transit Bus)

FIGURE 7

Seating Dimensions and Standard Configuration



Seat dimensions for the various seating arrangements shall have the dimensions as follows (Refer to Figure 7):

- The width, W, of the two-passenger transverse seat shall be a minimum 35 inches.
- The length, L, shall be 17 inches, ±1 inch.
- The seat back height, B, shall be a minimum of 15 inches.
- The seat height, H, shall be 17 inches, ± one inch for the rear lounge (or settee) and longitudinal seats, and seats located above raised areas for storage of under-floor components, a cushion height of up to 18 inches, ± two inches, will be allowed. This shall also be allowed for limited transverse seats, but only with the expressed approval of the LACMTA during proposal period.
- Foot room = F.
- The seat cushion slope, S, shall be between five and 11 degrees.

- The seat back slope, C, shall be between eight and 17 degrees.
- Hip to knee room = K.
- The pitch, P, is shown as reference only.

TS 78.13 Structure and Design (Transit Bus)

The passenger seat frame and its supporting structure shall be constructed and mounted so that space under the seat is maximized and is completely free of obstructions to facilitate cleaning.

Seats, structures and restraints around the securement area should not infringe into the mobility device envelope or maneuverability.

The transverse seat structure shall be fully cantilevered from the sidewall with sufficient strength for the intended service. The lowest part of the seat assembly that is within 12 inches of the aisle shall be at least 10 inches above the floor.

In locations at which cantilevered installation is precluded by design and/or structure, other seat mounting may be allowed.

All transverse objects — including seat backs, modesty panels, and longitudinal seats — in front of forward-facing seats shall not impart a compressive load in excess of 1,000 pounds onto the femur of passengers ranging in size from a 5th-percentile female to a 95th-percentile male during a 10g deceleration of the bus. This deceleration shall peak at 0.05 to 0.015 seconds from initiation. Permanent deformation of the seat resulting from two 95th-percentile males striking the seat back during this 10g deceleration shall not exceed two inches, measured at the aisle side of the seat frame at height H. The seat back should not deflect more than 14 inches, measured at the top of the seat back, in a controlled manner to minimize passenger injury. Structural failure of any part of the seat or sidewall shall not introduce a laceration hazard.

The seat assembly shall withstand static vertical forces of 500 pounds applied to the top of the seat cushion in each seating position with less than ¼-inch permanent deformation in the seat or its mountings. The seat assembly shall withstand static horizontal forces of 500 pounds evenly distributed along the top of the seat back with less than ¼-inch permanent deformation in the seat or its mountings. The seat backs at the aisle position and at the window position shall withstand repeated impacts of two 40-pound sandbags without visible deterioration. One sandbag shall strike the front 40,000 times and the other sandbag shall strike the rear 40,000 times. Each sandbag shall be suspended on a 36-inch pendulum and shall strike the seat back 10,000 times each from distances of 6, 8, 10, and 12 inches Seats at both seating positions shall withstand 4,000 vertical drops of a 40-pound sandbag without visible deterioration. The sandbag shall be dropped 1,000 times each from heights of 6, 8, 10 and 12 inches. Seat cushions shall withstand 100,000 randomly positioned 3.5-inch drops of a squirming, 150 pounds, smooth-surfaced, buttocks-shaped striker with only minimal wear on the seat covering and no failures to seat structure or cushion suspension components.

The back of each transverse seat shall incorporate a handhold no less than ⅞ inch in diameter for standees and seat access/egress. The handhold shall not be a safety hazard during severe decelerations. The handhold shall extend above the seat back near the aisle so that standees shall have a convenient vertical assist, no less than four inches long that may be grasped with the full hand. This handhold shall not cause a standee using this assist to interfere with a seated 50th-percentile male passenger. The handhold shall also be usable by a 5th-percentile female, as well as by larger passengers, to assist with seat access/egress for either transverse seating position. The upper rear portion of the seat back and the seat back handhold immediately forward of transverse seats shall be padded and/or constructed of energy absorbing materials. During a 10g deceleration of the bus, the HIC number (as defined by SAE Standard J211a) shall not exceed 400 for passengers ranging in size from a 5th percentile female through a 95th percentile male.

The seat back handhold may be deleted from seats that do not have another transverse seat directly behind and where a vertical assist is provided.

Longitudinal seats shall be the same general design as transverse seats but without seat back handholds. Longitudinal seats may be mounted on the wheelhouses. Armrests shall be included on the ends of each set of longitudinal seats except on the forward end of a seat set that is immediately to the rear of a transverse seat, the driver's barrier, or a modesty panel, when these fixtures perform the function of restraining passengers from sliding forward off the seat. Armrests are not required on longitudinal seats located in the wheelchair parking area that fold up when the armrest on the adjacent fixed longitudinal seat is within 3.5 inches of the end of the seat cushion. Soft padded arm rests shall not be utilized. Armrests shall not be included in the design of forward facing seats. Armrests shall be located from seven to nine inches above the seat cushion surface. The area between the armrest and the seat cushion shall be closed by a barrier or panel. The top and sides of the armrests shall have a minimum width of one inch and shall be free from sharp protrusions that form a safety hazard.

Seat back handhold and armrests shall withstand static horizontal and vertical forces of 250 pounds applied anywhere along their length with less than ¼-inch permanent deformation. Seat back handhold and armrests shall withstand 25,000 impacts in each direction of a horizontal force of 125 pounds with less than ¼-inch permanent deformation and without visible deterioration.

TS 78.14 Structure and Design (Commuter Bus)

Not applicable.

TS 78.15 Construction and Materials (Transit Bus)

Passenger seats and supporting structure shall be stainless steel. Complete seat assemblies shall be interchangeable to the extent practical. Seats panels shall be brushed (180 grit polish) stainless steel and shall be attached to the seat frame with tamperproof fasteners. Surface texture shall be consistent throughout the seat material, with no visually exposed portion painted. All visually exposed metal of the standard seat structure including mounting brackets and other components shall be stainless steel.

The seats shall be contoured for individuality, lateral support, and maximum comfort and shall fit the framework to reduce exposed edges. Objects within any portion of the head or chest impact zone such as handholds and seat backs shall not have sharp corners or edges less than ¼-inch radius.

Selected materials shall minimize damage from vandalism and shall reduce cleaning time. The seats shall be attached to the frame with tamper-resistant fasteners and is subject to LACMTA approval in Pre-Production meetings. To the extent practical, seat inserts shall be interchangeable throughout the bus. Each seat insert shall be easily replaceable in less than one minute using simple hand tools and shall be demonstrated not to fail for a minimum of ten insert changes. The fabric material shall have high resistance to tearing, flexing, and wetting and the coloring shall be consistent throughout the seat material, with no visually exposed portion painted. Any exposed metal touching the sides or the floor of the bus shall be stainless steel. The seat, pads and cushions shall be contoured for individuality, lateral support and maximum comfort and shall fit the framework to reduce exposed edges.

The minimum radius of any part of the seat back, handhold or modesty panel in the head or chest impact zone shall be a nominal ¼-inch. The seat back and seat back handhold immediately forward of transverse seats shall be constructed of energy-absorbing materials to provide passenger protection and, in a severe crash, allow the passenger to deform the seating materials in the impact areas. Complete seat assemblies shall be interchangeable to the extent practicable.

Refer to Section TS 88.1 for seat fabric.

TS 78.16 Construction and Materials (Commuter Bus)

Not applicable.

TS 79. Passenger Assists (Transit Bus)

Passenger assists in the form of full grip, vertical stanchions or handholds shall be provided for the safety of standees and for ingress/egress. Passenger assists shall be convenient in location, shape, and size for both the 95th-percentile male and the 5th-percentile female standee. Starting from the entrance door and moving anywhere in the bus and out the exit door, a vertical assist shall be provided on the aisle side of each forward facing aisle seating position. The vertical assists on the first forward facing reserved seats at the curbside and street side shall include an easily cleaned tactile feedback surface for passengers, such as knurling. All handholds and stanchions at front doorway, around farebox, and at interior steps for bi-level designs shall be yellow PVC coated, yellow powder coated or yellow nylon coated. Coating shall be 3-mil minimum thickness. Six overhead grey grab straps are to be provided on each side of the wheelchair areas. Vertical assists shall additionally be provided toward the center of three and four passenger aisle facing seats attached to seat frame and overhead assist. Wheel housings not equipped with seats or equipment enclosure shall have a horizontal assist mounted on the top portion of the housing no more than seven inches higher than the wheel well housing.

The forward-most vertical stanchions on either side of the aisle immediately behind the driver's area shall be stainless steel finish.

TS 79.1 Assists (Transit Bus)

Excluding those mounted on the seats and doors, the assists shall have a cross-sectional diameter between 1¼ and 1.5 inches or shall provide an equivalent gripping surface with no corner radii less than ¼ inch. Assists shall extend from near the leading edge of the seat and shall be functionally continuous with the overhead assist. All passenger assists shall permit a full hand grip with no less than 1.5 inches of knuckle clearance around the assist. Passenger assists shall be designed to minimize catching or snagging of clothes or personal items and shall be capable of passing the NHTSA Drawstring Test.

A crash resulting in a one- foot intrusion shall not produce sharp edges, loose rails, or other potentially dangerous conditions associated with a lack of structural integrity of the assists.

Any joints in the assist structure shall be underneath supporting brackets and securely clamped to prevent passengers from moving or twisting the assists. Seat handholds may be of the same construction and finish as the seat frame. Door mounted passenger assists shall be of anodized aluminum, stainless steel or powder-coated metal. Connecting tees and angles may be powder-coated metal castings or molded plastic. Assists shall withstand a force of 300 pounds applied over a 12-inch lineal dimension in any direction normal to the assist without permanent visible deformation. Assists shall be provided on both sides of passenger doors to provide safe ingress and egress. All passenger assist components, including brackets, clamps, screw heads and other fasteners used on the passenger assists shall be designed to eliminate pinching, snagging and cutting hazards and shall be free from burrs or rough edges.

TS 79.2 Front Doorway

Front doors, or the entry area, shall be fitted with ADA-compliant assists and shall be no less than 0.75 inch in width. Assists shall be as far outward as practicable, but shall be located no farther inboard than six inches from the outside edge of the entrance step and shall be easily grasped by a 5th-percentile female boarding from street level. Door assists shall be functionally continuous with the horizontal front passenger assist and the vertical assist and the assists on the wheel housing or on the front modesty panel.

TS 79.3 Vestibule (Transit Bus)

The aisle side of the driver's barrier, the wheel housings, and when applicable the modesty panels shall be fitted with vertical passenger assists that are functionally continuous with the overhead assist and that extend to within 36 inches of the floor. These assists shall have sufficient clearance from the barrier to prevent inadvertent wedging of a passenger's arm.

A horizontal passenger assist shall be located across the front of the bus and shall prevent passengers from sustaining injuries on the fare collection device or windshield in the event of a sudden deceleration. Without restricting the vestibule space, the assist shall provide support for a boarding passenger from the front door through the fare collection procedure. Passengers shall be able to lean against the assist for security while paying fares. The assist shall be no less than 36 inches above the floor. The assists at the front of the bus shall be arranged to permit a 5th-percentile female passenger to easily reach from the door assist, to the front assist, to vertical assists on the driver's barrier, wheel housings or front modesty panel. The front assist should not impede wheelchair boarding and provide adequate clearance and access to the farebox during vaulting and maintenance.

TS 79.4 Rear Doorway(s) (Transit Bus)

Vertical assists that are functionally continuous with the overhead assist shall be provided at the aisle side of the transverse seat immediately forward of the rear door and on the aisle side of the rear door modesty panel(s). Passenger assists shall be provided on modesty panels that are functionally continuous with the rear door assists. Rear doors, or the exit area, shall be fitted with assists having a cross-sectional diameter between 1¼ and 1.5 inches or providing an equivalent gripping surface with no corner radii less than ¼ inch, and shall provide at least 1.5 inches of knuckle clearance between the assists and their mounting. The assists shall be designed to permit a 5th-percentile female to easily move from one assist to another during the entire exiting process. The assists shall be located no farther inboard than six inches from the outside edge of the rear doorway step.

TS 79.5 Overhead (Transit Bus)

Except forward of the standee line and at the rear door, a continuous, full grip, overhead assist shall be provided. The assist shall be convenient to standees anywhere in the Bus and shall be located over the center of the aisle seating position of the forward facing seats. The assist shall be no less than 70 inches above the floor and shall terminate at the rear bulkhead or curve up to the ceiling with a minimum six-inch radius.

Grab straps shall be vinyl fabric. A minimum of six grab straps or other extensions as necessary shall be provided for overhead sections above each wheelchair securement area for the use by passengers that cannot reach to 70 inches.

Overhead assists shall simultaneously support 150 pounds on any 12-inch length. No more than five percent of the full grip feature shall be lost due to assist supports.

TS 79.6 Longitudinal Seat Assists (Transit Bus)

Longitudinal seats shall have vertical assists located between every other designated seating position, except for seats that fold/flip up to accommodate wheelchair securement. Assists shall extend from near the leading edge of the seat and shall be functionally continuous with the overhead assist. Assists shall be staggered across the aisle from each other where practicable and shall be no more than 52 inches apart or functionally continuous for a 5th percentile female passenger. A vertical assist or grab rail shall be provided convenient to the outer rear settee seats if they are immediately behind an aisle facing seat subject to LACMTA approval in Pre-Production meetings.

TS 79.7 Wheel Housing Barriers/Assists (Transit Bus)

Unless passenger seating is provided on top of wheel housing, passenger assists shall be mounted around the exposed sides of the wheel housings no more than seven inches higher than the wheel well housing, (and propulsion compartments if applicable), which shall also be designed to prevent passengers from sitting on wheel housings. Such passenger assists shall also effectively retain items, such as bags and luggage, placed on top of wheel housing.

TS 80. Passenger Doors

TS 80.1 Transit Bus

Doors shall be fully electrically powered.

Doorways will be provided in the locations and styles as follows. Passenger doors and doorways shall comply with ADA requirements.

All passenger door components, except door panels and glazing, must come from one single manufacture, subject to LACMTA approval during proposal period.

TABLE 11
Door Locations and Styles

Front Door				
Location	Slide Glide	Double (Two-Piece Pantograph	Single (One-Piece Pantograph)	Outside Sliding Plug
Forward of the front wheels and under direct observation of the driver.	X			

Rear Doors(s)						
Location	Slide Glide	Outward Opening Swing With Manual Emergency Reset	Outward Opening Swing With Auto Emergency Reset	Double (Two-Piece Pantograph	Single (One-Piece Pantograph)	Outside Sliding Plug
Alternative 1: Curbside doorway centerline located rearward of the point midway between the front door centerline and the rearmost seat back.	X					X

TS 80.1.1 Front Door

Door shall be forward of the front wheels and under direct observation of the driver.

TS 80.1.2 Rear Door(s)

Curbside doorway centerline located rearward of the point midway between the front door centerline and the rearmost seat back.

TS 80.2 Commuter Bus

TS 80.2.1 Front door

Not applicable.

TS 80.3 Materials and Construction

Structure of the doors, their attachments, inside and outside trim panels and any mechanism exposed to the elements shall be durable and corrosion-resistant. Pantographic type passenger rear doors are not acceptable. Door panel construction shall be of corrosion-resistant metal or reinforced non-metallic composite materials. When fully opened, the doors shall provide a firm support and shall not be damaged if used as an assist by passengers during ingress or egress. Door edges shall be sealed to prevent infiltration of exterior moisture,

noise, dirt and air elements from entering the passenger compartment, to the maximum extent possible based on door types.

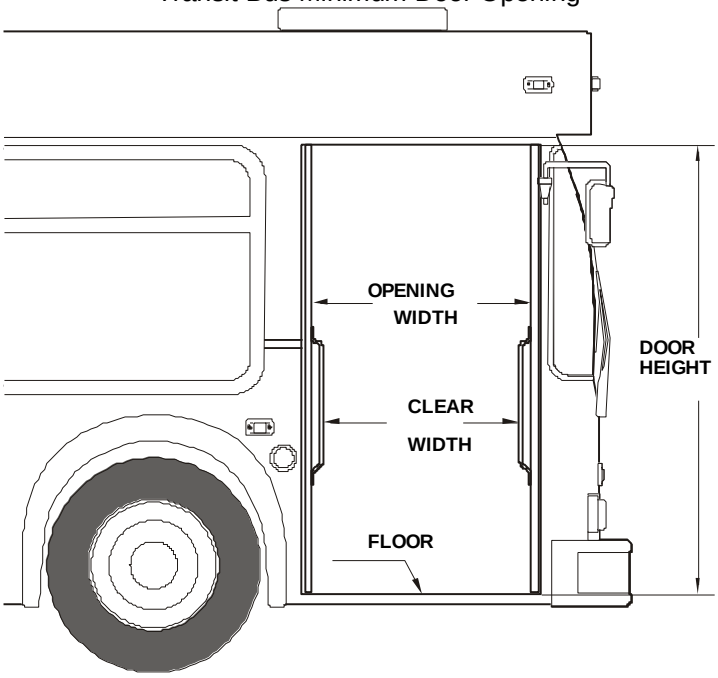
The closing edge of each door panel shall have no less than two inches of soft weather stripping. The doors, when closed, shall be effectively sealed, and the hard surfaces of the doors shall be at least four inches apart. The combined weather seal and window glazing elements of the front door shall not exceed 10 degrees of binocular obstruction of the driver's view through the closed door. The lower section of the rear door shall be solid and constructed of the same material as the door. The interior rear door surface below the door glass shall be protected by a replaceable stainless steel or aluminum "Kick Panel" that is easily replaceable with simple hand tools.

TS 80.4 Dimensions

TS 80.4.1 Transit Bus

FIGURE 8

Transit Bus Minimum Door Opening



When open, the doors shall leave an opening no less than 76 inches in height.

31¾-inch Minimum Doorway Clear Width

Front door clear width shall be a minimum of 31¾ inches with the doors fully opened.

Rear door opening clear width shall be a minimum of 24 inches with the doors fully opened.

TS 80.4.2 Commuter Bus

Not applicable.

TS 80.5 Door Glazing

The upper section of both front and rear doors shall be glazed for no less than 45 percent of the respective door opening area of each section. The lower section of the front door shall be glazed for no less than 25 percent of the door opening area of the section.

Door glazing shall be easily replaceable.

Zip type glazing rubber or quick change glazing exterior frame.

The front door glazing material shall have a minimum of 3/16-inch nominal thickness tempered safety glass. The material shall conform to the requirements of ANSI Z26.1-1996 Test Grouping 2 Safety Glazing Materials and the Recommended Practices defined in SAE J673. Tinting shall be blue or green to match the windshield.

The rear door panel glazing material shall have a nominal ¼-inch thick tempered glass conforming to the requirements of ANSI Z26.1 Test Grouping 2 and the Recommended Practices defined in SAE J673.

TS 80.6 Door Projection (Transit Bus)

TS 80.6.1 Exterior

The exterior projection of the front doors beyond the side of the bus shall be minimized and shall not block the line of sight of the rear exit door via the curb side mirror when the doors are fully open. The exterior projection of both doors shall be minimized and shall not exceed 13 inches during the opening or closing cycles or when doors are fully opened.

TS 80.6.2 Interior

Projection inside the bus shall not exceed 21 inches, cause an obstruction of the rear door mirror, or cause a hazard for standees.

TS 80.7 Door Height Above Pavement

It shall be possible to open and close either passenger door when the bus loaded to gross vehicle weight rating is not knelt and parked with the tires touching an eight-inch high curb on a street sloping toward the curb so that the street side wheels are five inches higher than the right side wheels.

When the bus is at operating level, opened doors shall be 14 to 16 inches above the ground.

TS 80.8 Closing Force

Closing door edge speed shall not exceed 12 inches per second, and opening door speed shall not exceed 19 inches per second. Power doors shall not slam closed under any circumstance, even if the door is obstructed during the closing cycle. If a door is obstructed during the closing cycle, the pressure exerted on the obstruction shall not increase once initial contact has been made.

Doors closed by a return spring or counterweight-type device shall be equipped with an obstruction-sensing device that, at a minimum, alerts the driver if an obstruction is detected between the closing doors. Doors closed by a return spring or counterweight type device, when unlocked, shall be capable of being pushed to the point where the door starts to open with a force not to exceed 25 pounds applied to the center edge of the forward door panel.

Whether or not the obstruction sensing system is present or functional, it shall be possible to withdraw a 1.5 inches diameter cylinder from between the center edges of a closed and locked door with an outward force not greater than 35 pounds.

The door system shall be designed in accordance with Title 13 of the California Administrative Code Section 1267.

TS 80.8.1 Rear Door Closing Force (Transit Bus)

Power-close rear doors shall be equipped with an obstruction-sensing system such that if an obstruction is within the path of the closing doors, the doors will stop and/or reverse direction prior to imparting a 10-pound

force on one sq. inch of that obstruction. A contactless obstruction sensing system shall also be employed, and it shall be capable of discriminating between the normal doorway environment and passengers or other obstructions within the doorway, and of altering the zones of detection based upon the operating state of the door system.

TS 80.9 Actuators

Doors shall open or close completely in 1.5 to 3 seconds from the time of control actuation and shall be subject to the closing force requirements.

Door actuators shall be adjustable so that the door opening and closing speeds can be independently adjustable to satisfy the above requirements. Actuators and the complex door mechanism shall be concealed from passengers but shall be easily accessible for servicing.

Door actuators and associated linkages shall maximize door holding forces in the fully open and fully closed positions to provide firm, non-rattling, non-fluttering door panels while minimizing the force exerted by the doors on an obstruction midway between the fully open and closed positions.

The rear door actuator(s) shall be under the control of the vehicle operator and shall open and close in response to the position of the driver's door control.

Doors that employ a "swing" or pantograph geometry and/or are closed by a return spring or counterweight-type device shall be equipped with a positive mechanical holding device that automatically engages and prevents the actuation mechanism from being back-driven from the fully closed position. The holding device shall be overcome only when the driver's door control is moved to an "Exit Door Enable" position and the vehicle is moving at a speed of less than 2 mph, or in the event of actuation of the emergency door release.

Locked doors shall require a force of more than 300 pounds to open manually. When the locked doors are manually forced to open, damage shall be limited to the bending of minor door linkage with no resulting damage to the doors, actuators or complex mechanism.

TS 80.9.1 Actuator (Commuter Bus)

Not applicable.

TS 80.9.2 Rear Door Interlocks (Transit Bus)

Refer to Section TS 38 "Interlocks" for door system interlock requirements.

TS 80.10 Emergency Operation

In the event of an emergency, it shall be possible to manually open doors designated as emergency exits from inside the bus using a force of no more than 25 pounds after actuating an unlocking device at the door. The unlocking device shall be clearly marked as an emergency-only device and shall require two distinct actions to actuate. The respective door emergency unlocking device shall be accessible from the doorway area. Activation of the emergency unlocking device shall cause the concurrent application of an interlock to stop the bus. The unlocking device shall be easily reset by the Operator without special tools or opening the door mechanism enclosure. Doors that are required to be classified as "Emergency Exits" shall meet the requirements of FMVSS 217.

In the event of power failure, the doors shall include a means of activating an unlocking device to allow entry from the outside of the bus using a special tool or key.

TS 80.11 Door Control

The door control shall be located in the Operator's area within the hand reach envelope described in SAE Recommended Practice J287, "Driver Hand Control Reach." The driver's door control shall provide tactile

feedback to indicate commanded door position and resist inadvertent door actuation. Door control shall be located on street side

TS 80.12 Door Controller

TS 80.12.1 Transit Bus

Five-Position Driver's Door Controller

The control device shall be protected from moisture. Mounting and location of the door control device handle shall be designed so that it is within comfortable, easy arm's reach of the seated driver. The door control device handle shall be free from interference by other equipment and have adequate clearance so as not to create a pinching hazard.

Position of the door control handle shall result in the following operation of the front and rear doors:

- **Center position:** Front door closed, rear door(s) closed or set to lock.
- **First position forward:** Front door open, rear door(s) closed or set to lock.
- **Second position forward:** Front door open, rear door(s) open or set to open.
- **First position back:** Front door closed, rear door(s) open or set to open.
- **Second position back:** Front door open, rear door(s) open or set to open.

TS 80.12.2 Commuter Bus

Not applicable.

TS 80.13 Door Open/Close

Operator-Controlled Front and Rear Doors

Operation of, and power to, the passenger doors shall be completely controlled by the Operator.

When the Master Control Switch is turned to the "Off" position and the bus is stopped with the parking brake applied the front door shall automatically open. When the Operator reenters the bus and turns the Master Control Switch to any position other than "Off", the door shall remain open until the door control handle is cycled back in the "Close" position and the parking brake is released. The front and rear doors shall remain in commanded state position even if power is removed or lost.

TS 81. Accessibility Provisions

Space and body structural provisions shall be provided at the front door of the bus to accommodate a wheelchair loading system for the widest spectrum of passengers including children, adults, the elderly, and the physically disabled. Buses shall conform to all applicable ADA regulations.

TS 81.1 Loading Systems

Bus shall utilize a low-floor fully-electrically operated preferably self-leveling wheelchair ramp system subject to LACMTA approval during proposal period.

TS 81.2 Lift

Heavy-Duty Ramp System

The wheelchair ramp control system must be capable of communicating with, and receiving commands from, vehicle multiplex system.

TS 81.3 Loading System for 30- to 60-foot Low-Floor Bus

Front Door Location of Loading System, Flip-Out Design Ramp with 1: 6 Slopes

The wheelchair loading system shall be located at the front door, with the preferably self-leveling ramp being of a simple hinged, flip-out type design being capable of deploying to the ground at a maximum 1:6 continuous slope.

An automatically-controlled, power-operated, ramp system designed to maintain minimum slope possible and compliant to requirements defined in 49 CFR Part 38, Subpart B, §38.23c shall provide ingress and egress quickly, safely and comfortably, both in forward and rearward directions, for a passenger in a wheelchair from a level street or curb.

In the stored position of the ramp, no tripping hazards shall be present, and any resulting gaps shall be minimized. The controls shall be simple to operate with no complex phasing operations required, and the loading system operation shall be under the surveillance and complete control of the driver. The bus shall be prevented from moving during the loading or unloading cycle by a throttle and brake interlock system. The loading system shall be inhibited from stowing/deploying when a passenger is on the ramp. A passenger departing or boarding via the ramp shall be able to easily obtain support by grasping the passenger assist located on the doors or other assists provided for this purpose. The system shall be designed to protect the ramp from damage and people on the sidewalk from injury during the lowering/raising phases of operation.

The loading platform shall be covered with a replaceable or renewable nonskid material and shall be fitted with devices to prevent the wheelchair from rolling off the sides during loading or unloading.

Deployment or storage of the ramp shall require no more than 15 seconds. The deployment function shall be capable of providing the minimum possible continuous slope by automatically aligning the inner and outer ramp surfaces. Each operation shall require continuous manual pressure to the momentary switch by the operator and shall not allow unintentional improper access system operation. The device shall function without failure or adjustment for 500 cycles or 5,000 miles in all-weather conditions on the design operating profile when activated once during the idle phase. A manual override system shall permit unloading a wheelchair and storing the device in the event of a primary power failure. The manual operation of the ramp shall not require more than 35 pounds of force. When manually activated the ramp shall not create a hazard for user through unintended movement of the ramp.

TS 81.4 Loading System for Level Boarding on a 45- to 60-foot Low-Floor BRT

Not applicable.

TS 81.5 Wheelchair Accommodations

General

Two wheelchair passenger parking spaces shall be provided, per applicable ADA regulations. Location of spaces shall be as close to the wheelchair ramp or system as practical. Two securement devices or systems shall secure the wheelchair or mobility aids facing toward the front of the vehicle. Two mobility aids shall face rearward.

Forward Facing

Forward facing wheelchair securement and occupant restraint systems shall be the QPod or approved equal, subject to LACMTA approval during proposal period, consisting of the self-tensioning, self- locking features on retractors, without tightening knobs. The retractors shall have the maximum amount of 7,000 pound red webbing attached to the large Transit “J” hooks.

> **Note:** If knobs are required for operation of the system being offered, it shall be indicated at time of bid submission.

Additional equipment, including passenger restraint seat belts and wheelchair securement devices complying with all applicable provisions of 49 CFR part 571, shall be provided for the two forward facing wheelchair passengers per ADA requirements, subject to LACMTA approval during proposal period.

Rear Facing

Additional wheelchair securement devices and seat belts complying with all applicable provisions of 49 CFR Part 571; shall be provided for the two rearward facing wheelchair passengers.

Optional Third and Fourth Wheelchair Accommodations

Pricing shall be submitted for optional additional third and fourth wheelchair parking spaces. The additional spaces shall be provided per applicable ADA regulations. Location of spaces shall be as close to the wheelchair ramp or system as practical. The additional securement devices or systems shall secure the wheelchair or mobility aids facing toward the front of the vehicle.

Forward facing wheelchair securement and occupant restraint systems shall be the QPod or approved equal, subject to LACMTA approval during proposal period, consisting of the self-tensioning, self- locking features on retractors, without tightening knobs. The retractors shall have the maximum amount of 7,000 pound red webbing attached to the large Transit "J" hooks.

> **Note:** If knobs are required for operation of the system being offered, it shall be indicated at time of bid submission.

Additional equipment, including passenger restraint seat belts and wheelchair securement devices complying with all applicable provisions of 49 CFR Part 571, shall be provided for the two forward facing wheelchair passengers per ADA requirements, subject to LACMTA approval during proposal period.

TS 81.5.1 Forward Facing Accommodations

The occupant restraints shall consist of the aisle side female retractor to be Automatic Locking Retractor [ALR] and the male or wall side retractor shall be Emergency Locking Retractor [ELR], equipped with a pin connector mounted on the tongue for attachment of the shoulder belt female fitting. The shoulder belt retractor shall be Emergency Locking Retractor [ELR], and equipped with a female pin connector, to attach to the male lap belt pin connector to form a Type 2-A lap and shoulder belt combination.

The securement system shall comply with the requirements of the Americans with Disabilities Act [ADA]. The system components shall be certified as being in compliance with the Society of Automotive Engineers, SAE J2249, Wheelchair Tie-Downs and Occupant Restraint Systems for use in Motor Vehicles.

Front Tie-Downs

The front retractors shall include a ratcheting mechanism. The retractors should be sized to accommodate large wheelchairs and be able to stabilize chairs of all types.

Rear Tie-Downs

The two rear retractors shall be equipped with a remote release, which operates both retractors simultaneously.

The retractors shall be mounted to the barrier. The spacing between the two retractors should be sized to accommodate all common wheelchairs, regardless of size.

Remote Release, Paddle Handle

The paddle handle remote release shall be mounted in either the front face of the barrier assembly, near the aisle side or in the forward facing flip-up seat bottom, near the aisle side, depending on the seating configuration.

Retractor Guards

Kick plates or retractor guards shall be installed to guard the retractors from being damaged or depressed by passengers seated behind or adjacent to the wheelchair area.

Guards must be of adequate strength to prevent bending or distortion when used as passenger footrests.

The system shall incorporate storage positions for the wheelchair tie-downs that allow easy access by users and keep the belts clear of the floor.

Occupant Restraints

The aisle side female lap belt retractor of ALR type should be mounted adjacent to or preferable on the same mounting bolt as the aisle side tie-down retractor. The red release lever should be accessible to the operator if release is necessary.

The wall side, male retractor of ELR type, should be mounted adjacent to or preferable on the same mounting bolt as the wall side tie-down retractor. This will ensure that the occupant lap belts may pass through the space between the wheelchair arms and backrest or between the backrest and seat bottom and be allowed to bear directly on the bony structure of the occupant's body or pelvic area.

Occupant restraints shall NOT be mounted in such a manner that belts must pass over wheelchair armrests, side panels, seat backs, barriers, through "D" rings, or other devices that will prevent the belts from following the proper path from the retractor to the occupant.

Male Lap Belt Stowage

A stowage device for the male lap belt Anchorage Adaptor should be mounted on the bottom of the side facing flip-up seat, to attach the male lap belt buckle or tongue when not in use. It should be mounted so it is easily accessible to the wheelchair occupant and/or the Operator.

Shoulder Belt

The shoulder belt retractor of ELR type should be mounted directly to the restraint assembly.

User Instructions

A durable metal instruction plate, describing the operation of the wheelchair securement and occupant restraint systems, shall be placed in an obvious location within the wheelchair securement area.

TS 81.5.2 Rear Facing Accommodations

The securement system shall be placed as near to the accessible entrance as practicable and shall have a clear floor area of 30 inches by 48 inches. Such space shall adjoin, and may overlap, an access path. Not more than six inches of the required clear floor space may be accommodated for footrests under another seat provided there is a minimum of nine inches from the floor to the lowest part of the seat overhanging the space. Fold down seats may be incorporated to accommodate other passengers when a wheelchair or mobility device is not occupying the area.

The securement system shall secure common wheelchairs and mobility aids and shall either be automatic or easily deployed by a person familiar with the system and mobility aid and having average dexterity.

The padded barrier shall extend from a height of 38 inches from the vehicle floor to a height of 56 inches from the vehicle floor with a width of 18 inches, laterally centered immediately in back of the seated individual. Fabric covering on the padded barrier shall be blue, subject to LACMTA approval. The barrier need not be solid provided equivalent protection is afforded.

TS 81.6 Interior Circulation

Maneuvering room inside the bus shall accommodate easy travel for a passenger in a wheelchair from the loading device and from the designated securement area. It shall be designed so that no portion of the wheelchair protrudes into the aisle of the bus when parked in the designated parking space(s). When the positions are fully utilized, an aisle space of no less than 20 inches shall be maintained. As a guide, no width dimension should be less than 34 inches. Areas requiring 90-degree turns of wheelchairs should have a clearance arc dimension no less than 45 inches, and in the parking area where 180-degree turns are expected, space should be clear in a full 60-inches diameter circle. A vertical clearance of 12 inches above the floor surface should be provided on the outside of turning areas for wheelchair footrest.

TS 82. Wheelchair Lifts (Commuter Bus)

TS 82.1 Lift

Not applicable.

TS 82.2 Lift Door

Not applicable.

TS 82.3 Lift Width

Not applicable.

TS 82.4 Lighting Requirements

Not applicable.

TS 82.5 Securement System

Not applicable.

TS 82.6 Roof Ventilation/Escape Hatches

One roof ventilator with lanyard / tether shall be provided and designed to perform as escape hatches in the roof of the bus. The ventilator shall be easily opened and closed manually. Ventilator with lever type release handle is not permitted. When open with the bus in motion, this ventilator shall provide fresh air inside the bus. The ventilator shall cover an opening area no less than 425 sq. inches. and shall be capable of being positioned as a scoop with either the leading or trailing edge open no less than four) inches, or with all four edges raised simultaneously to a height of no less than 3.5 inches. An escape hatch shall be incorporated into the roof ventilator. Roof ventilator shall be sealed to prevent entry of water when closed.

SIGNAGE AND COMMUNICATION (TS 83-TS 87)

TS 83. Destination Signs

An automatic electronic bright white LED destination sign system shall be furnished on the front, on the curbside near the front door, on the right-front windshield area and on the rear of the bus. The destination signs on the front and front curbside shall be bright white high definition. Display areas of destination signs shall be clearly visible in direct sunlight and/or at night. Sign system shall provide optimum visibility of the message display units for passengers and shall meet applicable ADA requirements.

The destination sign compartments shall meet the following minimum requirements:

- Compartments shall be designed to prevent condensation and entry of moisture and dirt.
- Compartments shall be designed to prevent fogging of both compartment window and glazing on unit itself.

- Access shall be provided to allow cleaning of inside compartment window and unit glazing, subject to LACMTA approval in Pre-Production meetings.
- Front window exterior display area shall be sized to allow full visibility of the front destination sign.

Destination signs shall be installed in such a manner as to facilitate easy access and replacement of the entire sign assembly, or components. Components such as electronic control modules shall be replaceable from inside the Bus. Where possible, parts shall be commercially available.

All signs shall be controlled via a single human-machine interface (HMI). In the absence of a single mobile data terminal (MDT), the HMI shall be conveniently located for the bus driver within reach of the seated driver.

The HMI shall include an Ethernet port. Alternatively, the designation sign devices shall be 802.11 Wi-Fi compliant.

Optional Full Color Destination Signs

Pricing for optional full color signs in; Front, Side, Rear and Run Number locations, shall be submitted on Price Form PF-1, Schedule of Optional Vehicle Configuration. The signs shall be capable of utilizing the full color spectrum for displaying characters and background with adjustable resolution to provide optimum clarity for passengers reading the messages. The color signs shall meet all sections of TS 83 requirements for white signs where applicable.

Front Destination Sign

The front destination sign shall have no less than 4,800 pixels, 24 rows by 200 columns, with a message display area of not less than 8.01 inches high by not less than 64.6 inches wide.

Side Destination Sign

Side display area shall have no less than 1,568 pixels, 14 rows by 112 columns with a message display area of not less than 4.3 inches high by not less than 41.6 inches wide. The sign located near the front door shall not block the driver’s critical horizontal line of sight.

Rear Route Number Sign

The route number display area shall have no less than 768 pixels, 16 rows by 48 columns with a message display area of not less than 6.1 inches high by not less than 17.0 inches wide. The rear route number sign shall be located a minimum of 90 inches above ground on the curb side rear corner of the Bus.

Destination Sign Control

Power to the sign system shall be controlled by the Bus "Master Run" switch. Sign system shall be operable in all switch positions except "Off".

Destination messages, route designations, and public relations messages shall be independently selectable via the Operator's Control Unit (OCU) which shall include a display monitor. The OCU shall communicate to the main processor board via a standard RS 485 serial bus and SAE J1708. Software shall be capable of programming 10,000 message lines. The number of public relations messages shall be limited only by the remaining number of message lines not used for destination purposes. The three-digit destination code shall accept all hexadecimal numbers (i.e. 0-9, A, B, C, D, E, & F).

The rear route number sign shall be controlled by the same OCU that operates the destination signs. The OCU display monitor readout shall show the exact information displayed on the destination signs and route number sign.

Sign displays shall have alternating message capability with programmable blanking time between message lines as may be required. Variable blanking times shall be programmable between 0.5 to 25 seconds in duration. Each line message or blanking time for each message shall be individually programmable. The

message display units shall incorporate an automatic blanking feature that will cause the display area to blank within 30 seconds of the bus master power switch being turned “Off”.

An emergency message shall be initiated by the closure, or opening, of a dry contact switch or relay. The emergency message shall be displayed on the exterior of the bus only. The OCU shall not display the emergency message. The destination sign shall automatically resume normal operation only after battery power to the destination sign system is removed and restored through the battery disconnect switch.

Destination Sign Programming

The electronic sign system shall be programmable via an integral connector located in the front destination sign area. Software shall be furnished for programming the sign system via an IBM compatible lap-top computer. Software shall be capable of providing a high degree of flexibility to create, or select preprogrammed, fonts and graphic displays. The sign shall have the capability of being programmed in the field using a PC or field programmer. Message program information shall be transferable to and/or from the field programmer device, via a USB 2.0 or better.

The LACMTA shall provide the Contractor with a complete listing of destination sign readings for initial sign programming by the manufacturer.

Run Number Sign

A three-character electronic run number display shall be provided at a LACMTA approved location in the right front windshield. All three character spaces shall have the capability to display 0, 1, 2, 3, 4, 5, 6, 7, 8, 9 and X readings.

TS 84. Passenger Information and Advertising (Transit Bus)

TS 84.1 Interior Displays

Provisions shall be made on the rear of the driver’s barrier or equipment box located on the wheel well for a frame to retain information such as routes and schedules.

A total of two information "Take One" boxes and one minimum “Take Twelve” unit shall be supplied. The “Take One” boxes shall be mounted at both the front and rear doors in convenient locations for passengers and the “Take Twelve” unit shall be located in a convenient location towards the front of the bus, subject to LACMTA approval in Pre-Production meetings.

Advertising media 11 inches high and 0.09 inch thick shall be retained near the juncture of the bus ceiling and sidewall. The retainers may be concave and shall support the media without adhesives. The media shall be illuminated by the interior light system.

TS 84.2 Exterior Displays

Not applicable.

TS 85. Passenger Stop Request/Exit Signal

TS 85.1 Transit Bus

A "Stop Requested" message shall be displayed on AVA message sign in yellow or amber LED when the passenger "Stop Requested" signal system is activated. The "Stop Requested" message shall remain visible until one or both passenger doors are opened. The message shall be visible to the seated passengers. A switch to deactivate the signal system shall be provided on the Operator’s control panel.

A minimum of 12 wireless stop request signal buttons utilizing a yellow housing shall be evenly distributed in the passenger cabin to be functionally accessible to all seated passengers subject to LACMTA approval in Pre-Production meetings. The buttons shall not incorporate internal battery power to operate and shall include, as part of the system, a means to easily troubleshoot failures. Of those, one each stop request button shall be

located after the standee line above the front wheel wells on the vertical stanchion and on the ITS enclosure. Stop Request buttons in the ADA and senior seating areas shall be located 45 inches above the floor. Two additional Stop Request buttons shall be placed in senior seating area.

TS 85.2 Commuter Bus

Not applicable.

TS 85.3 Signal Chime

TS 85.3.1 Transit Bus

A single “Stop Requested” chime shall sound when the system is first activated. A double chime shall sound anytime the system is activated from wheelchair passenger areas.

Buttons for exit signals located in the wheelchair and senior passenger areas shall be no higher than four feet above the floor. Instructions shall be provided to clearly indicate function and operation of the exit signals.

TS 85.3.2 Commuter Bus

Not applicable.

TS 86. Communications

An equipment enclosure shall be provided to accommodate installation of LACMTA provided equipment, such as the LACMTA’s radio system and future ITS equipment. The ITS enclosure shall include a minimum of four modular slide out trays which are easily removable and can be repositioned to accommodate changes in equipment position as needed. The existing ATMS radio requires a clear space above the bottom slide out tray with a minimum of 15 inches high, 19.5 inches wide, and 25 inches deep. The clear space above the second and third slide out trays shall be sized to accommodate Contractor supplied DVR and other equipment. Unless otherwise specified, additional ITS equipment provided and installed by the Contractor shall also be installed within the ITS enclosure. The enclosure shall be located directly behind the Operator's area on the street side wheel housing.

The ITS enclosure shall be as large as practical to facilitate future expansion of ITS equipment. The ITS enclosure shall be splash-proof and properly ventilated when the service door is secured. Slide out trays shall incorporate heavy-duty slide or roller mechanism to support a minimum of 150 pounds of loading and shall be able to withstand the normal shock and vibration, (under full load) experienced in LACMTA revenue service, without damage to the locks, slide or roller mechanisms. Slide out trays shall have locking mechanisms which automatically lock the trays in the stored and extended positions. Once a tray is locked, slides shall not have any horizontal play. L-shaped aluminum plate shall be mounted on the bottom tray to secure ITS equipment. LACMTA shall provide sample slide out trays with L-shaped plate during Pre-Production meetings.

Service light(s) with suitable switch shall be provided within the enclosure, subject to LACMTA approval in Pre-Production meetings. The Contractor shall provide 12-volt power outlet in the ITS Compartment.

Communication System Integration

All bus subsystems shall be integrated to the maximum extent feasible with Metro’s existing on-board communication systems. This may include using J1708 and J1939 CAN-Bus vehicle network, Wi-Fi and cell modem(s), Bluetooth, or Metro’s ATMS voice and data radio VHF communication system. Sub-systems should avoid using designs that require the use of new, stand alone, dedicated and/or proprietary communication networks. Sub-systems should also avoid using fee based subscription services for communication or data processing. Other factors being equal, preference will be given to subsystems that take advantage of existing Metro vehicle communication infrastructure and management systems.

All on-board systems that use a date/time stamp for incident or fault code tracking should be designed to automatically synchronize with other on-board systems through a recognized communication standard such as

SAE J1939, and/or be synchronized to the recognized standard for time synchronization (such as “GPS” time). To the extent practical, when a GPS reference is used, the various systems shall share a common antenna or signal.

TS 86.1 Camera Surveillance System

An automatic digital video recording system shall be provided powered directly from batteries, bypassing the Master Battery Disconnect Switch(es), to operate (record images) at all times with the Master Control Switch in any position except "Off”. The system shall operate up to one hour (independently programmable) after the Master Switch is turned off. The system shall be self-initiating and operate at any time, with the Master switch in any position, including “Off”, if triggered by the activation of the Bus SAS. When triggered, the system shall tag images (write protect) to prevent overwrite.

All cameras must automatically adjust to light changes to capture images that have sufficient clarity at night, with bus lights on and off. A day-to-night demonstration shall be required to establish camera performance and final placement for optimum views and clarity. The LACMTA shall witness the demonstration and approve the final placement of the cameras. This demonstration must be successfully completed prior to approval of the Pilot Bus(es).

The types (part numbers), of cameras shall be minimized with a single camera type for interior, and a single camera type for exterior of Bus. Exceptions to this requirement shall be considered on a case-by-case basis during Pre-Production meetings.

Interior Cameras

The camera housing shall be vandal resistant but allow access for routine servicing. Field of view of the cameras shall be adjusted with a 60 degree vertical and 60 degree horizontal without relocating the camera. Each camera shall be IP type color images. Front interior camera(s) at front door passenger boarding area shall record audio subject to LACMTA approval during Pre-Production meetings.

Cameras shall be placed for best recording of the following five areas:

a) Forward 1/3 of passenger area, view of front vestibule, farebox transactions and field-of-view to include Operator and image of bus number located on Operator’s barrier.
b) Front door, passenger boarding.
c) Rear door, passenger exiting.
d) Middle 1/3 passenger area.
e) Rear 1/3 passenger seating area starting from behind rear door with a primary emphasis on the rearmost seats.

Interior Camera Monitors

A video monitoring system including two, color, LCD video monitors with a minimum 15 inch diagonal dimension and all necessary brackets, cabling and other equipment needed for installation shall be provided to allow passengers easy viewing of video images captured by existing interior bus cameras. Monitors and equipment shall be installed in compliance with Driver Provisions, Controls and Instrumentation (Refer to Sections TS 46 -TS 48) and any applicable ADA or safety standards.

The first monitor shall be mounted above the driver’s area facing the entrance door and display a live video feed of the passengers boarding the bus.

The second monitor shall be mounted in passenger area of the bus facing the rear of the bus and display a live video feed of the passengers riding on the bus including those in wheelchair securement areas.

The monitors shall be of a ruggedized design intended for use in a transit bus environment including suitable protection from overvoltage and spikes generated from jump starts, shorts, etc. Monitors and equipment shall

not be installed in a manner or located such that the performance or life of the components or system will be shortened when operating within the design operating profile.

Monitors shall include a replaceable shield or durable film over the monitor screens to protect them from vandalism. This sacrificial layer shall be replaceable in 5e minutes or less using simple hand tools.

Monitor enclosures and screens shall not be affected by periodic cleaning using commercially available cleaning agents, solvents and other chemicals used for removal of graffiti.

Exterior Cameras

Cameras shall be IP type, rated for water spray and submersion, (IP65 and IP67), housed in impact resistant, moisture resistant, low profile housings which do not protrude more than 2.5 inches from the bus body. If used, a cover placed over the camera lens shall be glass. Curbside camera housings shall be ruggedized to protect from impacts with trees and other objects encountered during routine service. This shall include a supplemental metal shield if necessary to meet this requirement. The camera circuitry and lens shall be easily replaceable from inside the bus or by removing the housing from outside the bus using common hand tools. Camera positions and adjustment are subject to LACMTA approval at Pilot Bus. Reusable waterproof seals to prevent water damage to the camera and circuitry shall be provided which will not require the use of additional sealant such as silicon after servicing the camera. The system shall be designed or configured such that the failure of any individual camera will not affect operation of the remaining cameras.

Cameras shall be placed for best recording of the following four areas:

a) Forward looking through windshield (Accident Surveillance)
b) The curb side area of the bus, (including exit door), and street from 10 feet beyond front bumper to 10 feet beyond rear bumper
c) Street side area of the bus and street from ten feet beyond the front bumper to 10 feet beyond the rear bumper
d) Rear camera shall view the ground behind the bus from the bumper to approximately 25 feet back when gear select is placed in “Reverse” position.

Forward Accident Surveillance Camera

The forward looking surveillance camera shall be positioned to obtain images of the exterior front of the bus and forward approximately 100 feet of roadway to record images in the event of an accident.

Camera Monitor

Dash mounted monitor for viewing of selected camera images when; gear selector is placed in “Reverse” or passenger doors are open. Monitor shall be user configurable and capable of simultaneous display of images from multiple cameras. Final monitor configuration is subject to LACMTA approval during Pre-Production meetings

Central Processor

The video security system central processor shall be packaged in a suitable ventilated, shock mounted and splash resistant enclosure keyed to LACMTA standards, located within the ITS enclosure, subject to LACMTA approval in Pre-Production meetings. Images shall be stored by the system on a removable mobile rated hard drive provided with a security lock typical to the existing LACMTA base station.

Images stored on the hard drive shall be organized for automatic transmittal via a digital modem. The hard drive shall have capacity to store a minimum of 240 images per second for 30 continuous days (18 hours per day) before automatic overwrite occurs.

The DVR shall be capable of recording in multiple formats including JPEG and in H.264 compression with up to D1 resolution to avoid loss of detail on zoomed images. The DVR must be able to switch record rate,

compression and resolution seamlessly without loss of video during transition. System shall be capable of accepting both analog NTSC and high definition wide dynamic range IP cameras.

All image requests and subsequent downloaded files shall have the capability to be stored on a hard drive. The hard drive shall be easily removed and video files viewed at a separate location equipped with the same drive mechanism.

System Management Tool

Central Processor shall utilize GPS data to synchronize system time and tag video files with location coordinates allowing files to be searched on a geographic location basis using the System Management Tool. Camera Surveillance System shall utilize a WLAN compatible with wireless networks in use at LACMTA divisions and shall incorporate a system management tool for; wireless download of video files in a timely manner, software upgrades, camera checks, configuration changes and health reports as required. Final configuration is subject to LACMTA approval in Pre-Production meetings.

System management tool shall be a virtual implementation and provide expansion capability including compatibility with existing video management applications at LACMTA.

In addition, System Management Tool shall**:**

- Be configured to run in Master-Slave mode under Virtual Box.
- Provide the ability to replicate user accounts and passwords from Master to Slave.
- Include provisions for future application authentication to Metro Microsoft Active Directory.
- Allow user management at Master server and all Slave servers with inherent accounts from Master.
- Backup the restore virtual image via the host operating system to last backup state.
- Support Metro Enterprise backup and archive management tools such as IBM Tivoli.
- Support use of Metro's MS Windows 2008 R2 approval image on host servers with Metro domain and security policies.
- Allow NAS storage at remote sites.
- Include OS and application security and patch management process.
- Be optimized for hardware utilization in shared computing resources with Orbital DIS.

Given the current Metro wireless specification, Camera Surveillance System shall be able to wirelessly download 30 minutes of video in less than 30 minutes.

WLAN shall also be capable of transmitting encrypted video images or files on a real-time basis to a laptop PC held by law enforcement personal adjacent to or behind the bus. DVR status and event data shall also be made available through J1708/1587 interface to ATMS VAN. DVR shall be individually programmable to record each camera sequentially.

The system management tool for use at up to 13 LACMTA operating divisions shall be provided, subject to LACMTA approval in Pre-production meetings.

Enhanced Video Recording System Option

Pricing for optional features to enhance the video recording system shall be provided on Price Form PF-1, Schedule of Optional Vehicle Configuration. The features shall include items listed below along with any other enhancements that Contractor believes would improve functionality and ease of use for the video recording system.

- Ability of video system to analyze and discern events such as wheelchair passengers and generate report information with summary data such as wheelchair passenger count and boarding/alighting locations, subject to LACMTA approval.
- The ability to utilize the dash mounted display for diagnostic work or configuration changes on the DVR.
- Incorporation of a 360 degree camera(s) for better surveillance of bus interior.

TS 86.2 Public Address System

Contractor shall install a public address (PA) system which enables the Operator to perform audible announcements. A switch shall be provided to allow the Operator to select announcements either inside, outside, or both. The location of the gooseneck microphone is subject to LACMTA approval in Pre-Production meetings.

PA Amplifier

The PA amplifier shall be supplied in the ITS compartment convenient for adjustments (Refer to Section TS 88.1 Approved Equals). The amplifier shall be supplied with a 12-volt DC switched service. The amplifying system shall be balanced such that no adjustment of volume is necessary when switching from inside to outside. The system shall automatically mute when not in use.

Gooseneck Microphone

A microphone shall be mounted on a heavy-duty black anti-glare gooseneck with quick release input jack. The gooseneck microphone shall be mounted in a position to allow the operators' to comfortably speak without using their hands. The microphone, when deployed, shall remain stable in its' position and be easily adjusted by the Operator to reach approximately four inches from their mouth, in all normal seat adjustment positions. A strain relief (p-clip or equal) shall be installed near the base as needed to prevent a gooseneck failure when the microphone is pulled to its adjustment limit. A padded bracket shall be provided to support the gooseneck when not in use.

TS 86.2.1 Speakers

Interior and exterior speakers shall be of sufficient capacity to ensure that they are not damaged when full amplified power is applied. Inside speakers shall broadcast, in a clear tone, announcements that are clearly perceived from all seat positions at approximately the same volume level. Speakers shall be located in the light panel/HVAC duct to deter vandalism. The speakers shall not be mounted directly on the surface of the ceiling panels. A weather-proof speaker(s) shall be provided outside the bus so that announcements can be clearly heard by passengers standing near the door equipped with the wheelchair access. Interior loudspeakers shall be installed with proper phasing. Total impedance seen at the input connecting end shall be 4 to 8 Ohms. Mounting shall be accomplished with riv-nuts and machine screws.

Speaker wires from each individual speaker (inside and outside) shall terminate in the ITS enclosure.

TS 86.3 Automatic Passenger Counter (APC)

Provisions and necessary cables for installation of door sensors and analyzer(s) for IRMA-Matrix with J1708 infrared APC system; including software integration, testing, first article acceptance and any other items necessary for proper operation shall be provided, subject to LACMTA approval in Pre-Production meetings.

TS 86.4 Radio Handset and Control System

Make Ready Provisions

The Contractor shall provide "Make Ready Provisions" that will accommodate post-delivery installation of LACMTA provided equipment such as radio and future Intelligent Transportation System (ITS) equipment. Detail design of the ITS Make Ready Provisions shall be finalized during Pre-Production meetings and Pilot Bus build. Make Ready Provisions shall be approved by the LACMTA prior to start of production. The provisions shall include specified equipment, (such as antennas and preinstalled cabling), space for LACMTA provided ITS equipment, power supply circuits, conduit system, and structural mounting provisions.

The following devices are to be included in the LACMTA's ITS system for installation by the LACMTA after delivery of the bus:

a) Voice Radio.
b) Data Radio.

~~c)~~ AVA System Processor (Part of In Vehicle Unit (IVU)).
d) Automatic Passenger Counting (APC) Processor.
e) Automatic Passenger Counting (APC) Door Sensors.
f) J1708 Vehicle Area Network Controller (Part of IVU)
g) Driver Control Module (DCM).
h) Automatic Vehicle Locator (AVL) Processor (Part of IVU).

TS 86.4.1 Drivers Speaker

Not applicable.

TS 86.4.2 Handset

Contractor will supply and install a handset for driver use. (Refer to Section TS 88.1 Approved Equals).

TS 86.4.3 Driver Control Module (DCM)

Space and mounting provisions shall be provided for an ATMS Driver Control Module (DCM) (Orbital Sciences 111240-1DCM). The DCM installation provisions shall appear as an integral part of the operator area design. The location of the DCM shall provide the Operator with a free and unobstructed view of the DCM controls/display and be within easy reach of the Operator. The DCM shall be positioned to minimize glare and maximize readability in all lighting conditions and Operator seat positions.

Provisions for the DCM shall accommodate the following specifications:

TABLE 12
DCM Specifications

Property	Specification
Maximum height:	8 inches
Maximum width:	8.7 inches
Maximum depth:	3.1 inches
Housing:	Splash proof and UV resistant
Shock tolerance:	18g for 3 ms
Vibration tolerance:	4g peak rms @ 5 to 150 Hz

Contractor shall install a driver display unit as close to the driver's instrument panel as possible.

TS 86.4.4 Emergency Alarm

Contractor shall install an emergency alarm that is accessible to the driver but hidden from view. The guarded Silent Alarm System (SAS) switch shall be mounted on control panel located to the left of seated Operator, (Refer to Section TS 88.1 Approved Equals). The four-corner clearance lamps shall flash when the SAS is activated. Two 16ga leads, (color to be determined during Pre-Production meetings), shall be wired to the normally closed SAS switch terminals and routed to the ITS Equipment enclosure. SAS switch location and lead wire routing is subject to LACMTA approval in Pre-Production meetings.

TS 86.5 ITS Provisions Power Supply

The ITS enclosure shall be provided with protected power buss circuits for the future LACMTA installed ITS equipment. These power requirements are in addition to Contractor provided equipment power requirements. Each power buss will include mounting provisions for up to six individual manual resetting circuit breakers for branch circuits feeding equipment located within the enclosure.

TABLE 13
ITS Power Provisions

Source	Volt	Circuit	Quantity
Through Battery Disconnect Switch(es)	12	20-amp, DC	1
	24	20-amp, DC	1
	Gnd	Return for 20 amp circuits	1
Ignition	12	10-amp, DC multiplex controlled circuit.	2
	24	10-amp, DC multiplex controlled circuit.	2
	Gnd	Return for switched circuits	2

TS 86.6 ITS Provisions Conduits

A system of pre-installed "ITS conduits" will be provided to assist with future installation and replacement of wiring and cabling associated with the LACMTA's ITS equipment listed in TS 86.4. ITS Conduits, in conjunction with existing bus wire ways, will be required where future LACMTA installation and replacement of cabling is not practical due to obstructions from items such as interior paneling, bus structure or other assemblies. In general, conduits exposed to the interior of the bus shall be water tight and have a minimum 1.5 inch inside diameter and be routed to permit pulling cables, including connectors, through the conduits using a preinstalled "pull wire". Conduits will be terminated at the ITS enclosure using suitable reusable water tight fittings. Conduit installation shall follow best commercial practices with regard to drip loops and routing to avoid moisture problems.

Conduits, in conjunction with existing bus wire ways, shall permit interconnection of ITS sub-systems and devices as follows:

TABLE 14
ITS Conduits

From	Termination
Antenna, Data Radio Transceiver	ITS Enclosure
Antenna, GPS Receiver	ITS Enclosure
Antenna, Voice Radio Transceiver	ITS Enclosure
Antenna, Wireless LAN	ITS Enclosure
Antenna, Two spare positions	ITS Enclosure
APC Door Sensors, Front Door	ITS Enclosure
APC Door Sensors, Rear Door	ITS Enclosure
Engine Control Processor	ITS Enclosure
Exterior Speaker	ITS Enclosure
Farebox	ITS Enclosure, 1" ID
Front Dash	ITS Enclosure
Head sign Compartment	Front Dash
Interior Information Sign, Front	ITS Enclosure
Interior Information Sign, Rear	ITS Enclosure
Interior Speakers	ITS Enclosure

Operator Control Unit, Operator Dash	ITS Enclosure
PLC Compartment	ITS Enclosure
Radio Control Head	ITS Enclosure, 2 ¼ “ ID
Security System Processor	ITS Enclosure
Transmission Control Processor	ITS Enclosure
Upper Center Windshield	ITS Enclosure, 1-1/2” ID

TS 86.7 Provisions, Automated Vehicle Announcement (AVA) System

Structural provisions and necessary cables shall be provided in the ceiling to install two AVA signs constructed to withstand the heavy-duty environmental and service conditions found in transit operations. The front sign shall be located near the standee line. The rear double-sided sign shall be positioned adjacent to the exit door and forward of the interior steps.

Both the front and rear double-sided signs shall be installed by Contractor.

TS 86.8 ITS Provisions, Wireless Local Area Network (WLAN)

WLAN antenna, including five leads; two Cellular, two Wi-Fi and one GPS and an additional Wi-Fi antenna inside the bus for passenger. Sierra Wireless, InMotion MG90 or an approved equal wireless router/switch and feedline shall be installed, subject to LACMTA approval in Pre-Production meetings. (Refer to Section TS 88.1 Approved Equals). Router shall include gateway activation and client license fees as well as preferred AS, AMM with 3-year and group 2 per gateway. Power for wireless router/switch shall be independently timed by the router to allow automatic turn-off one hour or more after bus is parked as a configurable feature of the router.

TS 86.9 ITS Provisions, Radio Antennas

Provide two Antenna Specialists (508 MHz and 900 MHz) radio antennas for voice and data radios. The antennas should have a feedline of RG-142 signal loss and physical quality specifications or better. The antennas shall be attached to the roof with antenna leads routed through 3/4-inch inside diameter conduits to the ITS enclosure. Antenna leads shall be type RG142 coaxial cable connected at the antenna by a soldered type N connector and 90-degree type N adapter with a minimum four-inch service loop. A type N soldered connector and a RG142 reducer shall be supplied for the radio connections in the ITS enclosure. The antenna mounting and lead termination shall be accessible from the Bus interior, subject to LACMTA approval in Pre-Production meetings. Antennas shall not be painted. (Refer to Section TS 88.1 Approved Equals).

TS 86.10 ITS Provisions, Global Positioning System (GPS)

A Global Positioning Satellite (GPS) Antenna and feedline shall be provided. The GPS Antenna shall be mounted on the centerline of the roof of the bus near the front, with a quick connector, within two feet from the antenna, for future replacement, subject to LACMTA approval in Pre-Production meetings. Refer to Section TS 88.1 Approved Equals.

TS 86.11 ITS Provisions, Incident Based Surveillance System (IBSS)

Complete mounting provisions, modules and necessary cables for the most current LACMTA IBSS, (SmartDrive), shall be provided running from the center windshield area to the ITS enclosure, permitting installation of EDR and completion of system by the bus manufacturer**.** All modules including SmartDrive SR3 for EDR shall be supplied by Contractor through existing SmartDrive Contract for installation by Bus manufacturer. Battery and ignition power and a separate J1939 communication connection shall be supplied in the ITS enclosure, subject to LACMTA approval in Pre-Production meetings.

TS 87. Event Data Recorder (EDR)

EDR shall be installed on the bus. The unit shall be installed as low as possible. The EDR shall be able to communicate over the Jl939 CAN line and shall be equipped with three-axis accelerometer. The system shall be capable of recording available fault codes including DM1 messages. Settings are to be finalized with the LACMTA during Pre-Production. The EDR shall broadcast via the Jl939 data communication link severe impact events to the vehicle monitoring system and also trigger an event in the camera system. The EDR shall also tag an event from a signal received over the Jl939 CAN line from the silent alarm switch signal and the camera event button and in turn broadcast these events to the vehicle monitoring system. The EDR shall also record the following operational data:

- Head lights on or off.
- Turn signals and hazard lights on or off.
- Ignition on or off.
- Low air pressure warning.
- Whether moving in forward or reverse or idling.
- Parking brake is on or off.
- Retarder switch on or off

TS 88. Appendix

TS 88.1 Approved Equals

The following table lists products which have been approved for the bus procurement. The list only contains products which are of interest to the LACMTA and is not intended to be a comprehensive listing of every product which is required for the manufacture of the subject buses. Product categories not listed are left to the discretion of the Contractor so long as the product complies with the specifications. Product specification information is for reference only and may not reflect the latest or future improvements by manufacturers. Any change, revision, or substitution of specified products requires approval of the LACMTA. To add to or revise this list, Contractor must submit a written request per the Specification by the due date found in the RFP for approved equals.

TABLE 15
Approved Products

PRODUCT	MANUFACTURER	PRODUCT SPECIFICATION
Air Coupling	AMFLO	CP1, CP2, C1, C2
Air Coupling	Tru Flate	12-124, 13-124, 12-134, 13-134
Air Coupling	Parker	2C, 3C, B12, B13
Amplifier, PA	Motorola Solutions Inc.	120039-2
Antenna, Data Radio	Antenna Specialty Co.	ASPRC-572MOT, 508 MHz
Antenna, GPS	ACS Transport	120076-4
Antenna, Voice Radio	Antenna Specialty Co.	ASPG931MOT, 900 MHz
Antenna, WLAN	Mobile Mark	RM3-2400
Drain Plug, Dry Brake	FEMCO	As needed
Farebox – Reference only	GFI Odyssey	C24003-0501FB
Farebox Baseplate	GFI Odyssey	D22581-0003
Fluid, Rear Axle		Full Synthetic
Fluid, Transmission		Full Synthetic
Fuel Receptacle, fast fill	OPW	CL50

PRODUCT	MANUFACTURER	PRODUCT SPECIFICATION
Fuel Receptacle, slow fill	OPW	LB36
Jumper Receptacle-24 Volt	Whitaker	3298
Microphone	REI	
Radio Handset	Motorola	P/N12004-8
Registration Holder	Truck-Lite	97960
Seat Insert Fabric	Holdsworth	Sunrise/Sunset
Seat Insert Fabric	LaFranch King's Plus Fabric	Sunrise/Sunset
Seat Insert Fabric		Blue
Silent Alarm Switch	Microswitch	Part No. 4TL 1-3 with spring loaded black
Take-One Box	Beemak Plastic	BP-750-CT
Minimum Take-Twelve Box	**Transit Information Products**	407160
Trip Recorder (Replaces Hubodometer)	FleetWatch	JX55
Wireless Router (Wi-Fi System)	Sierra Wireless	InMotion, MG90
Wireless Router AMM	Sierra Wireless	9010230
Wireless Router Gateway activation	Sierra Wireless	IMTSER524
Wireless Router Client License	Sierra Wireless	9010208

TS 88.2 Maintainability Requirements

Mean Time to Fix

Maintenance requirements stated in mean time to fix (MTTF) are established below in Table 16. Unless otherwise indicated, these figures represent the total elapsed labor time (hours/minutes) required to complete the maintenance task by one mechanic. The figures do not include time required to prepare the bus such as bringing the bus to the hoist, raising it, etc.

The Contractor shall be required to demonstrate these maintenance tasks using the information as contained in the Service and Parts manuals. The demonstrations shall be conducted on the Pilot Bus and may occur at LACMTA facilities. Should a failure of a demonstration occur, the Manufacturer may be required to modify its bus design or service manual information as necessary and re-demonstrate the procedure on the Pilot Bus. The purpose of these demonstrations is to validate the maintenance manual, special tool requirements, and MTTF.

TABLE 16
MTTF

SERVICE TASK	MTTF (hrs./min.)
INSPECTION:	
6,000 Mile Inspection	7.5 hr.
Daily Inspections	10 min.
Brake Inspection	15 min.
REMOVE AND REPLACE:	
A/C Blower Motor	1 hr.
A/C Condenser Motor	1 hr.

SERVICE TASK	MTTF (hrs./min.)
Alternator	2 hr.
Access for Door Motor Adjustment	< 2 min.
Air Compressor	2 hr.
Air Dryer Desiccant	15 min.
Batteries Set	45 min.
Brake Application Valve	1 hr.
Engine/Transmission PPA (2 mechanics)	6 hr.
Engine ECM	2 hr.
Exterior Mirror Glass	< 5 min.
Headlining Panels, Interior individual (less handrails)	< 30 min.
Power Steering Gear Box Assembly	2 hr.
PPA mounts, complete set	2 hr.
Radiator (2 mechanics)	3 hr.
Seat Insert	< 1 min.
Shocks, Each	45 min.
Starter	1.5 hr
Transmission unit	8 hr.
Wheel Change, Front	45 min.
Wheel Change, Rear Dual	60 min.
Window glazing, Passenger	60 min.
Window guard, Passenger and Door	6 min.
Wiper Motor	20 min.
Operators Seat	30 min.
Electronic Unit (Regulator, PLC Module, Relay, Fuse, etc.)	15 min.
Lamps, Passenger Lights	15 min.

Mean Miles Between Failures

Table 17 lists minimum design goals for mean miles between failures (MMBF) on critical areas of bus.

TABLE 17
MMBF Goals

Type	Description	Design Goal
Class 1:	Physical Safety	Mean distance greater than 1,000,000 miles
Class 2:	Road Call	Mean distance greater than 10,000 miles
	Stalling	
	Interlock, F/R Doors	
	No Start	
	SEL/CEL	
Class 2:	Diagnostic Light	Mean distance greater than 50,000 miles

	Electrical failure	
	Stalling	
	Low Air	
	Suspension	
	HVAC	
	Charging System	
	Pneumatic System	
Class 2:	ADA- Ramp, Securement	Mean distance greater than 75,000 miles

TS 88.3 Technical Contract Deliverables

Contractor shall provide a table of contract deliverables, documentation and/or demonstrations as scheduled in the Contract documents during the proposal period. See Table 20 attachment for reference on technical submittal items.

Test Procedures

Contractor shall submit an overall test procedure for each design qualification and conformance/acceptance testing for approval to LACMTA at least 30 days prior to the scheduled date of the test. The Contractor shall provide all equipment and instrumentation required to conduct the tests. Along with the title referencing the specification requirement, the test procedure shall include at a minimum the following:

- Test objective
- Description of the type of report to be submitted
- Success/failure criteria
- Sequence of testing
- Equipment/instrumentation list with calibration dates
- Description of test setup including necessary diagrams
- Test methodology
- Procedure for data evaluation

The report shall be submitted within 30 days after completion of testing and shall follow industry standard format for submittal of technical papers. The reports shall include analysis along with necessary; photographs, charts and measured/accumulated data to support conclusions. Reports shall include a statement certifying compliance to specification requirements along with a list of any deficiencies.

TS 88.4 Decals/Signs

TABLE 18a

Exterior – Metro Local (Poppy)

DRAWING REFERENCE	QTY	DESCRIPTION	CS CATALOG #	DIMENSION
A	3	Vehicle ID_4.5” White	CS0130	N/A
B	1	CNG Large_7.75”	CS0140	1-11/16” x 7-3/4”
C	1	SHUT OFF VALVE_1”(H)	CS0144	N/A
D	2	Battery Disconnect	CS55486	6-1/2” x 6-1/2”
E	4	Jack Points_3.75”(H)	CS5489	2” x 3-3/4”
F	2	Metro Local_7”(H)	CS0204	N/A

DRAWING REFERENCE	QTY	DESCRIPTION	CS CATALOG #	DIMENSION
G	2	Nation's Largest Clean-Air Fleet_ 3.5" (H)	CS0131	N/A
H	2	Metro_17. 5"(H)	CS0185	N/A
I	2	Local_16.25"(H)	CS0196	N/A
J	2	CA LICENSE ID_1.5"(H)	CS0129	N/A
K	2	Metro Local_5.5" (H)	CS0202	N/A
L	1	Circle M_7.5"(H)	CS0133	N/A
M	1	Welcome Aboard_1",3/4"(H) Bienvenidos Exact Fare Please Tenga Pasaje Exacto Per Favor	CS0127	N/A
N	3	323.GO.METRO_7/8"(H) metro.net_11/16"(H)	CS0148	N/A
O	1	American Flag_Boarding	CS0125	6-3/4" x 3-1/2"
P	1	ISA Wheelchair	CS1000	6" x 6"
Q	1	ADA Kneeling Bus	CS0143	5-1/2" x 7"
R	2	Local_12"(H)	CS0198	N/A
S	1	Metro Local_1.5"(H)	CS0135	N/A
T	2	Circle M_4.5"(H)	CS0132	4-1/2" Dia.
U	1	Vehicle ID_2.625"(H)_White	CS0351	N/A
V	1	American Flag_Driver	CS0126	6-3/4" x 3-1/2"
W	1	Circle M_10"(H)	CS0134	10" Dia.
X	1	Danger-Do Not Turn In Front Of Bus_8.5"(H)	CS0146	N/A
Y	1	CNG Small_4"(H)	CS0141	6-1/2" x 4"

TABLE 18b
Exterior - Metro Rapid (Red)

DRAWING REFERENCE	QTY	DESCRIPTION	CS CATALOG #	DIMENSION
A	3	Vehicle ID_4.5" White	CS0130	N/A
B	1	CNG Large_7.75"	CS0140	1-11/16" x 7-3/4"
C	1	SHUT OFF VALVE_1"(H)	CS0144	N/A
D	1	Battery Disconnect	CS55486	6-1/2" x 6-1/2"
E	4	Jack Points_3.75"(H)	CS5489	2" x 3-3/4"
F	2	Metro Rapid_7"(H)	CS0210	N/A
G	2	Nation's Largest Clean-Air Fleet_ 3.5" (H)	CS0131	N/A
H	2	Metro_17.5"(H)	CS0185	N/A
I	2	Rapid_16.25"(H)	CS0197	N/A
J	2	CA LICENSE ID_1.5"(H)	CS0129	N/A
K	2	Metro Rapid_5.5" (H)	CS0208	N/A

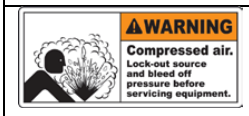
DRAWING REFERENCE	QTY	DESCRIPTION	CS CATALOG #	DIMENSION
L	1	Circle M_7.5”(H)	CS0133	N/A
M	1	Welcome Aboard_1”,3/4”(H) Bienvenidos Exact Fare Please Tenga Pasaje Exacto Per Favor	CS0127	N/A
N	3	323.GO.METRO_7/8”(H) metro.net_11/16”(H)	CS0148	N/A
O	1	American Flag Boarding	CS0125	6-3/4” x 3-1/2”
P	1	ISA Wheelchair	CS1000	6” x 6”
Q	1	ADA Kneeling Bus	CS0143	5-1/2” x 7”
R	2	Rapid_12”(H)	CS0199	N/A
S	1	Metro Rapid_1.5”(H)	CS0157	N/A
T	2	Circle M_4.5”(H)	CS0132	4-1/2” Dia.
U	1	Vehicle ID_2.625”(H)_White	CS0351	N/A
V	1	American Flag Driver	CS0126	6-3/4” x 3-1/2”
W	1	Circle M_10”(H)	CS0134	10” Dia.
X	1	Danger-Do Not Turn In Front Of Bus_8.5”(H)	CS0146	N/A
Y	1	CNG Small_4”(H)	CS0141	6-1/2” x 4”

TABLE 19a
Interior – Metro All

DRAWING REFERENCE	QTY	DESCRIPTION	CS CATALOG #	DIMENSION
A	4	Security Camera in Operation	CS5382	1’-0”x3-1/4”
B	2	Reserved for Seniors	CS5382	1’-7”x4”
C	3	Reserved for Mobility Devices	CS5401	1’-7”x4”
D	2	Please Remain in Securement	CS0230	10”x5-1/4”
E	3	Watch Your Step	CS5421	1’-4-1/4”x3”
F	1	Bus Maximum Height	CS0234	4-1/4”x2-1/8”
G	1	Bus Drivers Carry No Cash	CS5508	1’-1/4”x4-1/4”
H	1	PC640	CS5814	1’-4-3/4”x4-1/4”
I	1	Unnecessary Conversation	CS0155	4-1/4”x4-1/4”
J	1	Financial Responsibility	CS0162	3-3/4”x3-3/4”
K	1	Welcome to Metro	CS0152	5/8”x3-1/2”
L	1	Exit Rear Door	CS5505	11”x3-1/4”
M	1	Reserved for Mobility Devices	CS5505	11”x3-1/4”
N	2	Caution Door Opens Automatically	CS5511	3-3/8”x7”

TABLE 19b
High Voltage – Metro ZE Bus

Note: Table 19b applies to zero emission bus decals. Location and quantity of these decals will vary depending on the individual bus configuration. Final layout will be determined during Pre-Production meetings.

Area	Description	Size - Inches	Location	Qty	Total
1. Lock Out Compartment		4 x 6	Inside the compartment - Next to the switch	1	AR
		4 x 6	Inside the compartment - Next to the switch	1	AR
2. Battery Compartment(s)		6 x 4	Inside the compartment - On the battery box	1	AR
		4 x 6	Inside the compartment - On the battery box	1	AR
	XXX VOLTS	1 x 4	Inside the compartment - On the battery box	1	AR
		2 x 3	On the battery enclosure door, visible from outside	1	AR
3. Automatic Start Equipment		2 x 4	On the equipment	1	AR
		2 x 4	On the compressor	1	AR
	XXX VOLTS AC 3 PHASE	1 x 6	On the equipment and control boxes	1	AR
	XXX VOLTS	1 x 4	On the equipment and control boxes	1	AR
4. Auxiliary Motor Controller(s)	XXX VOLTS AC 3 PHASE	1 x 6	On the control box(es) and motor(s)	1	AR
5. PPU and Hazardous Voltage Area(s)		2 x 3	On the enclosure door, visible from outside	1	AR
		6 x 4	On the enclosure door, visible from inside	1	AR
	XXX VOLTS	1 x 4	Inside the compartment	1	AR
		4 x 6	On the enclosure door, visible from inside	1	AR

Area	Description	Size - Inches	Location	Qty	Total
6. Charging Connector (Bus Side)		2 x 3	On the enclosure door, visible from inside	1	AR
7. Charging Connector (Station Side)		2 x 3	Next to each charging connector	1	AR

TS 88.5 References

SAE #	Title	Date Published
J10	Air Brake Reservoir Performance and Identification Requirements.	Dec 04, 2013
J211	Instrumentation for Impact Test—Part 2: Photographic Instrumentation	June 16, 2014
J287	Driver Hand Control Reach	March 11, 2016
J366	Exterior Sound Level for Heavy Trucks and Buses	Sept 12, 2011
J381	Windshield Defrosting Systems Test Procedure and Performance Requirements - Trucks, Buses, and Multipurpose Vehicles.	Jan 27, 2009
J534	Lubrication Fittings	Aug 11, 2015
J537	Storage Batteries	May 23, 2011
J541	Voltage Drop for Starting Motor Circuits	July 16, 2013
J587	License Plate Illumination Devices (Rear Registration Plate Illumination Devices)	Aug 21, 2012
J593	Backup Lamps (Reversing Lamps)	Aug 26, 2010
J673	Automotive Safety Glasses	July 6, 2015
J680	Location and Operation of Instruments and Controls in Motor Truck Cabs, Recommended Practice	Sep 1, 1988
J686	Motor Vehicle License Plates	Aug 7, 2012
J689	Curbstone Clearance, Approach, Departure, and Ramp Break over Angles—Passenger Car and Light Truck	Aug 26, 2009
J726	Air Cleaner Test Code	June 27, 2002
J833	Human Physical Dimensions	May 29, 2003
J844	Nonmetallic Air Brake System Tubing	Dec 19, 2012
J941	Motor Vehicle Drivers' Eye Locations	Mar 3, 2010
J994	Alarm—Backup—Electric Laboratory Performance Testing	Sept 17, 2014
J1050	Describing and Measuring the Driver's Field of View	Feb 13, 2009
J1113	Electromagnetic Compatibility Component Test Procedure Part 42, Conducted Transient Emissions	Dec 8, 2010
J1127	Low Voltage Battery Cable	Dec 3, 2015
J1128	Low Voltage Primary Cable	Dec 3, 2015
J1149	Metallic Air Brake System Tubing and Pipe	Oct 21, 2015
J1211	Handbook for Robustness Validation of Automotive Electronic Modules	Nov 19, 2012
J1292	Automobile and Motor Bus Wiring	Jan 1, 2008
J1308	Fan Guard for Off-Road Machines	Dec 17, 2013
J1455	Recommended Environmental Practices for Electronic Equipment Design in Heavy-Duty Vehicle Applications	Aug 24, 2012
J1587	Electronic Data Interchange Between Microcomputer Systems in Heavy-Duty Vehicle Applications, Recommended Practice	Jan 4, 2013
J1708	Serial Data Communications Between Microcomputer Systems in Heavy-Duty Vehicle Applications	Dec 12, 2010
J1908	Electrical Grounding Practice	Jan 1, 1996
J1986	Balance Weight and Rim Flange Design Specifications, Test Procedures, and Performance Recommendations	March 18, 2016

J1939	Data Link Layer	March 3, 2016
J1995	Engine Power Test Code - Spark Ignition and Compression Ignition - Gross Power Rating, Standard;	Jan 10, 2014
J2249	Wheelchair Tiedown and Occupant Restraint Systems for Use in Motor Vehicles	Jan 29, 1999
J2402	Road Vehicles—Symbols for Controls, Indicators, and Tell-tales	Jan 7, 2010
J2711	Recommended Practice for Measuring Fuel Economy and Emissions of Hybrid-Electric and Conventional Heavy-Duty Vehicles	Sept 20, 2002
J2805	Measurement of Noise Emitted by Accelerating Road Vehicle	Nov 10, 2015
J2808	Lane Departure Warning Systems Minimum Performance Requirements	March 9, 2015

TS 88.6 Holders

FIGURE 9

Bad Order (B.O.) Card Holder

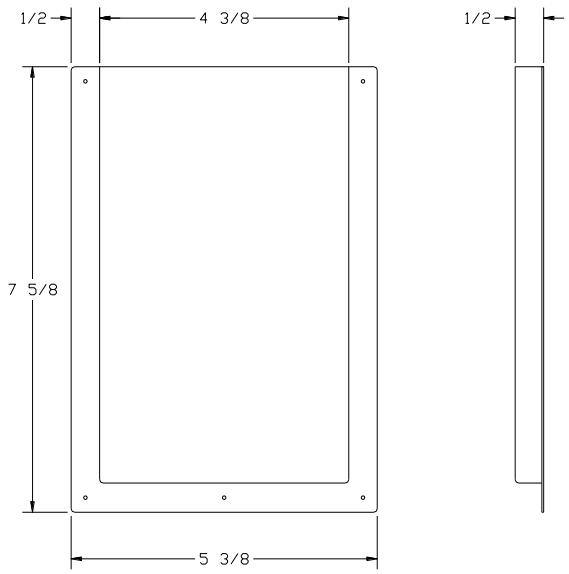
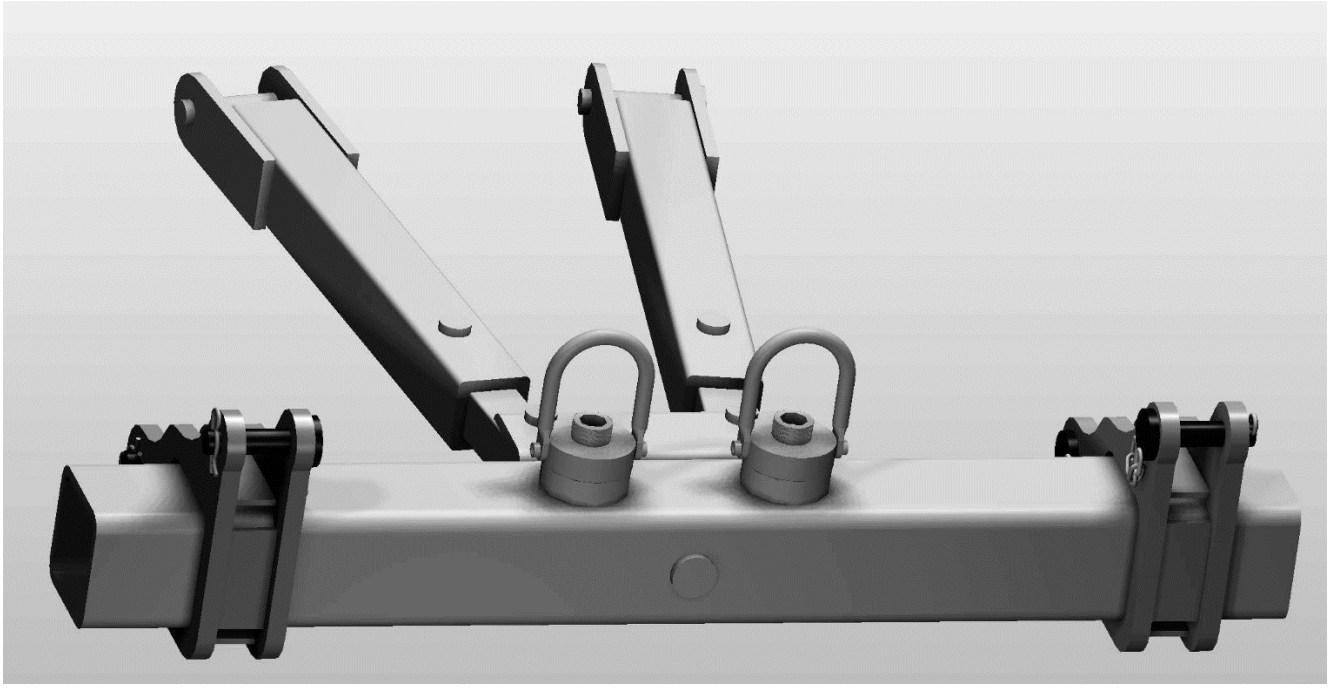


FIGURE 10

Typical Trash Bag Hooks

FIGURE 11

Metro Tow Device



Technical Contract Deliverables

Contractor shall provide a table of contract deliverables, documentation, samples and/or demonstrations as scheduled in the Contract documents. Table 20, provided as reference for Technical submittal items, is representative and not intended to be all inclusive.

TABLE 20

Contract Deliverable Items

Item	Section	Title	Deliverable	Schedule	Requirement
1	TS 4	Legal Requirements	Certification	Pre-production Meetings	The Contractor shall comply with all applicable federal, state and local regulations. These shall include but not be limited to ADA, as well as state and local accessibility, safety and security requirements. Local regulations are defined as those below the state level.
2	TS 5	Overall Requirements	Documentation	With Pilot Bus and First Article Bus	Contractor and LACMTA shall identify subcomponent vendors that shall submit installation/application approval documents , (including necessary documents and/or diagrams to verify configuration),with the completion of a Pilot Bus and First Article Bus.
3	TS 5.4	Maintenance and Inspection	Documents	Proposal Period	Contractor shall provide a list of all special tools and pricing required for maintaining this equipment. Said list shall be submitted as a supplement to Form PF-3 Schedule B of Prices Special Tools.
4	TS 5.6	Training	Documents	Proposal Period	The Contractor shall provide pricing for up to 1,000 Instructor class-room hours with the Bus order. For each Option order, Contractor shall also be required to provide Instructor training. The quantity of training hours shall be determined by the quantity of Option Buses ordered and shall be equal to five hours of training per Option bus up to a maximum of 500 instructor class-room hours for each Option order.
5	TS 5.6	Training, Base Order Buses	Documentation	30 days after pilot bus delivery	The LACMTA shall approve the proposed trainers and their qualifications, proposed subjects and scheduling of the classes conducted by the Contractor at the time of pilot bus review.
6	TS 5.6	Training, Option Order Buses	Documentation	30 days prior to delivery of Option pilot bus	The LACMTA shall approve the proposed trainers and their qualifications, proposed subjects and scheduling of the classes conducted by the Contractor.
7	TS 5.6.1	Training Curriculum	Documents	30 days prior to delivery of pilot bus	The Contractor shall develop and submit a training curriculum using the most current version Microsoft Office Word and/or Power Point, subject to LACMTA approval.

Item	Section	Title	Deliverable	Schedule	Requirement
8	TS 5.6.2	Teaching Materials	Documents, materials	30 days prior to training	The Contractor shall provide to the LACMTA Maintenance Instruction Department visual and other teaching materials as needed during classroom instruction.
9	TS 5.6.3	Optional Training Aids	Documents	Proposal Period	The Contractor shall supply pricing for items a – k, special training aids, as listed below for use by LACMTA training staff. Pricing for these aids is to be provided to the LACMTA on Form PF-5-Schedule D of Prices Training Aids.
10	TS 5.6.3	Optional Training Aids, E-Learning/Interactive Training Media	Documents	Proposal Period	The Contractor shall provide pricing for 25 hours of CNG/Electric Bus interactive learning seat time on Form PF-5-Schedule D of Prices Training Aids. The media shall provide a high level of student interactivity, including but not limited to: questions review, component identification, tool use, circuit building, component testing. All content shall be navigated through an industry standard e-learning programs graphical user interface (GUI) subject to LACMTA approval.
11	TS 5.6.4	Manuals, Manual Review and Approval	Documents	After NTP	The Contractor will be required to participate in Manual Review and Approval process and attend one service manual review meeting held at the LACMTA shortly following LACMTA Notice to Proceed.
12	TS 5.6.4	Manuals, Draft Manuals, Manual Review and Approval	Documents	With pilot bus	The Contractor shall provide the LACMTA with: Ten draft hardcopies each of the Service, Parts and Operator's manuals plus a list of all proposed OEM Component Repair manuals, simultaneously to the shipping of the first Pilot Bus.
13	TS 5.6.4	Manuals, Draft Manuals, Parts Index	Hardcopy, Spreadsheet	60 days prior to production 60	A part number index shall be submitted for review at least 60 days prior to the scheduled ship date of the first production Bus.
14	TS 5.6.4	Manuals, Final Manuals	Documents	90 days after start of production	Ten final hardcopy sets of Service and Parts manuals, shall be provided for each 100 Buses and twelve 12 total sets of Subsystem OEM manuals.
15	TS 5.6.4	Manuals, Final Manuals	Documents	90 days after start of production	Contractor shall supply a listing of diagnostic codes with final service manuals delivered that covers trouble shooting fault trees/codes related to the PPU.
16	TS 5.6.4	Manuals, Final Manuals	Documents	90 days after start of production	Final DVD editions of Service, Parts and Operator's manuals must be delivered within 90 days after the start date for production Buses.

Item	Section	Title	Deliverable	Schedule	Requirement
17	TS 5.6.4	Manuals, Component Repair/Service Section	Documents	90 days after start of production	Fourteen sets of Repair Manuals necessary to rebuild all Contractor supplied Units including: PPU, transmission/electric drive, HVAC system, starter, alternator, air compressor, etc., shall be provided.
18	TS 5.6.4	Manuals, Component Repair/Service Section	Hardware	90 days after start of production	Each set shall be organized and mounted onto a suitable table top holding rack subject to LACMTA approval
19	TS 5.6.4	Manuals, Price List	Hardcopy, Spreadsheet	90 days after start of production and updated annually	Ten copies of the current price list shall be provided separately as a supplement to the final parts manuals. Price lists shall be updated at least annually and provided for the life of the Bus as they are updated.
20	5.6.5	Special Equipment, Option, Special Service Equipment	Documents	Proposal Period	The LACMTA is aware that diagnostic equipment and/or software has been developed or is being developed by many of the OEMs to assist in the maintenance of the Buses. Proposer is required to submit a list of recommended special equipment, software and/or diagnostic tools deemed necessary to provide state-of-the-art service for the bus systems. Depending on the type of available equipment and/or software, the LACMTA may wish to obtain complete sets of such Special Service Equipment and/or software, plus any additional tools identified by the OEM manufacturer required to diagnose, calibrate, or remove-and-replace, all equipment provided with this Bus order.
21	TS 5.6.6	Diagnostic Laptop PC Specifications	Laptops	Delivery of first production bus	Because of the time delay between the procurement process and receipt of computer equipment, the final laptop computer configuration shall be subject to approval by the LACMTA at delivery…
22	TS 5.6.8	In-Process and As-Built Drawings	Scale Drawings	30 days prior to production	The Contractor shall, no later than 30 days prior to commencing production, supply the LACMTA with two sets of harcopy scale drawings suitable for conducting repairs on every area of the vehicle, including all major systems and sub-system installations. Electrical and air schematics shall also be provided. In addition, the Contractor shall provide a description of the electronic configuration, layout and functionality of the Bus including communication paths and power distribution.
23	TS 5.6.8	In-Process and As-Built Drawings	Scale Drawings	60 days after final bus delivery	Five sets of Conforming drawings shall be delivered to the LACMTA within 60 days after final Bus delivery.

Item	Section	Title	Deliverable	Schedule	Requirement
24	TS 5.7	Operating Environment	Test Documentation	Pre-Production Meetings	The bus shall achieve normal operation in ambient temperature ranges of 0º F to 120º F, at relative humidity between 5 percent and 100 percent, and at altitudes up to 3,000 feet above sea level. Degradation of performance due to atmospheric conditions shall be minimized at temperatures below 0 °F, above 120° F or at altitudes above 3,000 feet.
25	TS 5.8	Noise	Demonstration	Pilot Vehicle at Factory	The Contractor shall be required to demonstrate that vehicle-generated sound levels do not exceed the maximum interior and exterior values.
26	TS 5.8.1	Interior Noise	Test Documentation	Pilot Vehicle Prior to Production	The Contractor shall provide test documentation that vehicle has sufficient sound insulation to achieve 65 dBA or lower at any point inside the bus with an 80 dBA sound source at outside skin of the bus.
27	TS 5.9	Fire Safety	Certification	Pre-Production Meetings	Contractor must provide required certificates of compliance prior to manufacture of the Pilot Bus.
28	TS 5.10	Fire Suppression	Documentation	Proposal Period	The AFSS system shall meet or exceed the environmental requirements of SAE J1211.
29	TS 5.10	Fire Suppression	Documents	Proposal Period	At a minimum, the engine compartment, HVAC compartment, exhaust area and high current electrical areas (except the battery compartment) at rear of bus shall be equipped with an automatic fire sensing and suppression (AFSS) system product, subject to LACMTA approval during proposal period.
30	TS 5.10	Fire Suppression, AFSS Monitor Panel	Documenst	Pre-Production Meetings	The system shall have a supervision monitoring panel located above the operators' side console subject to LACMTA approval…
31	TS 5.10	Fire Suppression System, AFSS Agent	Documentation	Pre-Production Meetings	The agent shall be approved by Underwriters Laboratory or Factory Mutual Research Corporation and have no ozone depleting property and no global warming potential per USA EPA guidelines.
32	TS 5.10	Fire Suppression System (AFSS Cylinders)	Documentation	Pre-Production Meetings	The AFSS agent cylinders shall use DOT shippable linear actuators or electric solenoid valves (squibs are prohibited) attached to DOT certified bottles which do not require hydrostatic retest for a minimum of twelve (12) years. Cylinder(s) shall be compatible with suppression agents. Each cylinder shall have a pressure gauge with easy to read "Go-NoGo" type indicator which is visible when the cylinder(s) is installed on the Bus.

Item	Section	Title	Deliverable	Schedule	Requirement
33	TS 5.11	Gas Detection System (GDS)	Documents	Proposal Period	GDS system shall be provided to monitor the engine compartment and each separate fuel storage area(s) and shall automatically activate…
34	TS 5.11	Gas Detection System (GDS), GDS Monitor Panel	Documents	Pre-production Meetings	The system shall have a supervision monitoring panel located above the operators' side console area subject to LACMTA approval
35	TS 5.13	Water Leak Testing	Test	All buses	The roof, windows, windshields, and all doors of all Vehicles shall be water tested for a minimum of 30 continuous minutes in order that leaks may be detected and corrected. The HVAC shall be turned on only for the first 15 minutes of the test.
36	TS 5.14	Fasteners and Securements	Documentation, Samples	Proposal Period	Supports for all electrical cables, harnesses and bundles will be subject to LACMTA approval and shall be of premium quality.
37	TS 6	Physical Size	Test Documentation	Pilot Vehicle at Factory	Vehicles furnished under these specifications shall comply with physical size.
38	TS 7.	Vehicle Performance, Power Requirements	Documentation	Proposal Period	The propulsion system shall be sized to provide sufficient power to enable the bus to meet the defined acceleration, top speed, and gradability requirements, and operate all propulsion-driven accessories using actual road test or dynamometer results and computerized vehicle performance data.
39	TS 7	Vehicle Performance	Demonstration	Pilot Vehicle at Factory	The Contractor shall be required to demonstrate acceleration, top speed, and grad**e**ability requirements.
40	TS 7.4.3	Operating Range, CNG	Documentation	Proposal Period	The Contractor shall provide sufficient fuel capacity to give the bus a 400 mile range before the low fuel warning light comes on. The Contractor shall provide the LACMTA with a technical analysis which supports the proposed CNG fuel system design compliance to the LACMTA's range of operation requirement including the proposed fuel capacity.
41	TS 7.4.4	Operation Range, Electric (Zero Emission)	Documenation	Proposal Period	The Contractor shall provide sufficient energy storage and changer charging systems to give the bus a cumulative 300 mile daily operating range before the low energy warning light comes on. The Contractor shall provide the LACMTA with a technical analysis which supports the proposed energy storage and charger systems design compliance to the MTA's range of operation requirement including the proposed energy storage system capacity.

Item	Section	Title	Deliverable	Schedule	Requirement
42	TS 9.	Engine	Meeting and Documentation	Pre-production Meetings	Prior to manufacturing the Pilot bus, the Contractor shall coordinate a technical review with the LACMTA and engine and transmission suppliers covering integration and installation design. As part of the technical review, the Contractor shall advise the LACMTA concerning engine and transmission features and control system options, and accessories, and shall conform, to the degree possible, to those already in use at the LACMTA in an effort to increase component and system commonality.
43	TS 9	Engine	Certificate	Prior to start of production	Prior to start of production, the Contractor shall provide documentation from the Subsuppliers, which supports their approval, that the engine and transmission installation, support system design, and components used specifically for the LACMTA's contract meet the OEM requirements and recommendations.
44	TS 9.1	Engine (CNG	Documentation	Pre-production Meetings	Oil filtration systems shall be approved by the engine and transmission OEM and be designed with by-pass circuits, as needed, in the event that a filter becomes plugged.
45	TS 9.1.1	Engine, Compartment Control Panel Gauges and Indicators	Documents	Proposal Period	The following mechanical, electrical dial gauges, or digital display, subject to LACMTA approval during proposal period, shall be mounted on, or adjacent to, the engine compartment control panel: • Oil Pressure Gauge, • Temperature Gauge, • Air Filter Restriction Gauge, • Voltage Gauge(s).
46	TS 9.2.2	Propulsion System Service	Documents, Drawings	Proposal Period	The propulsion system shall be arranged so that accessibility for all routine maintenance is ensured. No special tools, other than dollies and hoists, shall be required to remove the propulsion system or any subsystems.
47	TS 9.2.4	Energy Storage, Controller and Charging Systems	Documents, Drawings	Proposal Period	Energy storage shall be of a commercial design capable of operating in the LACMTA transit environment.
48	TS 9.2.5	Electric System Controller (ESC), Primary Power Unit (PPU)	Documents, Drawings	Proposal Period	The PPU shall have on-board diagnostic capabilities, able to monitor vital functions, store out-of-parameter conditions in memory, and communicate faults and vital conditions to service personnel. Diagnostic reader device connector ports, suitably protected against dirt and moisture, shall be provided in operator's area and inside PPU compartment.

Item	Section	Title	Deliverable	Schedule	Requirement
49	TS 10.	Cooling Systems	Test or Certification	Pre-Production Meetings	The cooling systems shall be of sufficient size and designed to maintain fluids and engine intake air at safe, continuous operating temperatures during the most severe operations possible with the bus loaded to GVWR and with conditions as listed in Section TS 5.7 with a 10 percent minimum reserve capacity in accordance with engine and transmission manufacturer's cooling system requirements. The cooling system fan controls should sense the temperatures of the operating fluids and the intake air, and if either is above safe operating conditions the cooling fan should be engaged. The fan control system shall be designed with a fail-safe mode of "fan on." The cooling system shall provide functional service while operating in the design operating profile environment.
50	TS 10	Cooling Systems	Demonstration	Pilot Vehicle Delivery in LA	The cooling system shall be self purging requiring no special procedures to remove air from the system when coolant is installed or added.
51	TS 10.1	Engine Cooling	Documents	Pre-Production Meetings	Surge tank filler cap shall have a safety lock. A 1/4 inch NPT port shall be provided in a convenient location in the surge tank for the LACMTA's pressure testing equipment, subject to LACMTA approval..
52	TS 12	Retarder (Transit Bus), Retarder Disable Switch	Documents, Drawings	Pre-Production Meetings	The retarder disable switch shall be located behind the destination sign door, subject to LACMTA approval
53	TS 14.1	Service	Documents, Drawings	Proposal Period	No special tools, other than dollies and hoists, shall be required to remove the PPA/PPU Two LACMTA mechanics shall be able to remove, replace, and prepare the complete PPA/PPU assembly for service within a MTTF of 12-man hours.
54	TS 14.1	Service	Approval	Within 60 days after final bus delivery	The Contractor shall provide two suitable PPA/PPU dollies for each spare PPA/PPU purchased under this Contract.
55	TS 14.1	Service	Documents. Drawings	Pre-production Meetings	The PPA/PPU dollies shall be designed, subject to LACMTA approval in pre-production meetings…
56	TS 14.1	Service	Drawings	Last Vehicle Delivery	The Contractor shall provide the LACMTA with sufficient fabrication drawings needed to manufacture additional dollies.
57	TS 14.1	Service	Documents, Drawings	Pre-production Meetings	Belt drives that require manual tensioning shall be designed to facilitate easy service/maintenance, subject to LACMTA approval

Item	Section	Title	Deliverable	Schedule	Requirement
58	TS 14.1	Service	Certificate	Pre-production Meetings	Accessory drive belts shall be guarded in accordance with CAL OSHA article 45, Belt and Pulley Drives, Section 4070 "Guarding".
59	TS 14.1	Service, Engine Air Cleaner	Drawings	Proposal Period	The air filter shall be positioned for easy access and service, subject to LACMTA approval…
60	TS 15	Hydraulic Systems	Demonstration	Pilot Vehicle at Factory	Any hydraulically driven system shall be subject to LACMTA approval at the Pilot Bus.
61	TS 15	Hydraulic Systems	Demonstration	Pilot Vehicle at Factory	The hydraulic system (steering) shall be located to accommodate easy service. The hydraulic system filter shall be located in the return, low pressure, circuit to the oil reservoir, or internal to the oil reservoir, subject to LACMTA approval at the Pilot Bus.
62	TS 15.1	Fluid Lines	Documents, Drawings	Pre-production Meetings	Rigid and flexible lines shall be individually supported and readily accessible for inspection and service, including interior lines inside the bus,…
63	TS 18.1.2	Fuel Lines, CNG	Documentation	Pre-production Meetings	Fuel lines shall comply with NFPA-52. All tubing shall be a minimum of seamless Type 304 stainless steel (ASTM A269 or equivalent). Fuel lines shall be identifiable as fuel lines only. Fuel lines shall be bent using computer numeric machines (CNC) to assure consistency, no hand bending will be permitted. The bus manufacturer shall have a documented procedure for testing the high pressure line assembly
64	TS 18.1.2	Fuel Lines, CNG	Documentation	Pre-production Meetings	Hose support in-between the bus frame and the engine that exceed 12 inches is subject to LACMTA approval…
65	TS 18.2.2	Design and Construction, CNG, Fuel Containers/Cylinders	Documentation	Pre-production Meetings	Fuel cylinder construction shall be in accordance with DOT Standard 304, ANSI NGV2, latest revision, design and test criteria. Cylinder shall be designed for the lightest weight possible which does not require a hydrostatic re-qualification. Cylinders shall be certified for refueling pressures to 125 percent of working pressure during temperature compensated fueling.
66	TS 18.2.2	Design and Construction, CNG, Pressure Relief Devices (PRDs)	Documents, Drawings	Proposal Period	PRDs shall be vented to the roof area of the Bus with minimum protrusion above the roof line and shall be protected with a suitable cap which shall withstand daily bus wash activity, subject to LACMTA approval…

Item	Section	Title	Deliverable	Schedule	Requirement
67	TS 18.2.2	Design and Construction, CNG, Valves	Documents, Drawings	Proposal Period	An additional minimum 1/2 inch valve shall be provided for draining the high pressure manifold and any fuel cylinder(s) through a service port. Type and location of the service port shall be subject to LACMTA approval…
68	TS 18.2.2	Design and Construction, CNG, Gauges	Documentation	Pre-production Meetings	Glycerin filled gauges which meet NFPA 52 requirements shall be located in the high and low pressure manifolds which shall indicate fuel system pressure.
69	TS 18.2.2	Design and Construction, CNG, Fuel Filler	Documents, Drawings	Proposal Period	The fuel filler shall be located 30 to 38 feet measure behind the centerline of the front door, subject to LACMTA approval…
70	TS 18.2.2	Design and Construction, CNG, Defueling System	Documents, Drawings	Proposal Period	The CNG defueling port shall be an NGV-3.1/CGA-12.3 certified receptacle subject to LACMTA approval…
71	TS 21	Altoona Testing	Documentation	Proposal or First Article Bus	A report clearly describing and explaining the failures and corrective actions taken to ensure any and all such failures will not occur shall be submitted to the LACMTA.
72	TS 23.2	Crashworthiness, (Transit Bus)	Certification	Pre-Award Audit	Contractor shall be required to provide FEA software analysis or other evidence of compliance with this section during the Pre-Award Audit.
73	TS 24.	Corrosion	Certification	Pre-production Meetings	Representative samples of all materials and connections shall withstand a two-week (336-hour) salt spray test in accordance with ASTM Procedure B-117 with no structural detrimental effects to normally visible surfaces and no weight loss of over 1 percent.
74	TS 24.	Corrosion	Documentation	Pre-production Meetings	The Contractor shall provide a copy of its proposed undercoating system program…
75	TS 25.	Towing	Demonstration	Pilot Vehicle Delivery in LA	Contractor shall provide fifteen (15) sets of any special towing equipment adapters, if required, so that the LACMTA is able to flat tow the Bus.
76	TS 25	Towing	Demonstration	Pilot Vehicle Delivery in LA	Contractor shall demonstrate compliance with these provisions using the Pilot Vehicle.
77	TS 25	Towing	Documents, Samples	Pre-production Meetings	All male fittings shall have an additional quarter turn manual shut off valve provided near the front bumper for use only during towing, subject to LACMTA approval
78	TS 25.	Towing	Demonstration	Pilot Vehicle Delivery in LA	Two rear recovery devices/tie downs shall permit lifting and towing of the bus for a short distance, such as in cases of an emergency, to allow access to provisions for front towing of bus.
79	TS 26.	Jacking	Demonstration	Pilot Vehicle Delivery in LA	Jacking and changing any one tire/wheel assembly shall be completed by one LACMTA mechanic.

Item	Section	Title	Deliverable	Schedule	Requirement
80	TS 27.	Hoisting	Demonstration	Pilot Vehicle Delivery in LA	The Contractor may be required to demonstrate compatibility with LACMTA hoists as part of the towing demonstration...
81	TS 27	Hoisting	Samples	Pre-production Meetings	A model or sample jacking plate shall be provided during Pre-Production meetings for approval by LACMTA.
82	TS 28.1	Floor, Design (Transit Bus)	Documents, Drawings	Proposal Period	Floor installation, repair, and replacement method shall be subject to LACMTA approval…
83	TS 28.5	Floor, Construction	Documentation	Proposal Period	The floor shall be constructed using composite flooring material approved by the LACMTA during proposal period.
84	TS 29.3	Farebox, Stanchions	Documents, Drawings	Proposal Period	Stanchions shall be located around the farebox in accordance with ADA requirements and subject to LACMTA approval…
85	TS 30.1	Wheel Housing, Design & Construction	Certification Documentation	Pre-production Meetings	Wheel housings shall be constructed of corrosion-resistant and fire-resistant material. Sufficient clearance and air circulation shall be provided around the tires, wheels and brakes to prevent overheating when the bus is operated in revenue service. Wheel housings, as installed and trimmed, shall withstand impacts of a two- inch steel ball with at least 200 foot-pounds of energy without penetration.
86	TS 31.3.3	Suspension, Lubrication, Standard Grease Fittings	Demonstration	Pilot Vehicle at Factory	All elements of steering, suspension and drive systems requiring scheduled lubrication shall be provided with grease fittings conforming to SAE Standard J534 (Zerk Fitting).
87	TS 31.3.4	Suspension, Springs and Shock Absorbers, Kneeling	Demonstration	Pilot Vehicle at Factory	A kneeling system shall lower the entrance(s) of the bus a minimum of 2.75 in. during loading or unloading operations regardless of load up to GVWR, measured at the longitudinal centerline of the entrance door(s) by the driver. The bus shall kneel at a maximum rate of 1.25 inches per second at essentially a constant rate reaching fully kneeled position within 4.5 seconds. After kneeling, the bus shall rise within 3 seconds to a height permitting the bus to resume service and shall rise to the correct operating height within 7 seconds regardless of load up to GVWR. During the lowering and raising operation, the maximum vertical acceleration shall not exceed 0.2g, and the jerk shall not exceed 0.3g/second.

Item	Section	Title	Deliverable	Schedule	Requirement
88	TS 31.3.4	Suspension, Springs and Shock Absorbers, Raising	Demonstration	Pilot Vehicle at Factory	The Bus shall incorporate a system controlled by the operator that permits the Bus to raise (to account for high curbs) 2.75 inches, measured from normal ride height at the center of the bottom front step regardless of passenger load up to GVWR. The Bus shall raise at a maximum rate of 1.25 inches per second at essentially a constant rate reaching fully raised position within 4.5 seconds. After rising the Bus shall recover (lower) within 3.5 seconds to a ride height permitting the Bus to resume service and shall fully recover to the correct operating ride height within 10 seconds. During the lowering operation, the maximum acceleration shall not exceed 0.2g and the jerk shall not exceed 0.3g/sec. measured on the front door step tread.
89	TS 32.2	Tires	Documentation	With Each Vehicle	Contractor shall provide the LACMTA with a record listing tires installed for each Bus delivered. The information shall include the LACMTA brand serial number and mounting location on the Bus. Contractor shall conform to tire manufacturer specifications for maximum road speed and duty cycle during Bus delivery.
90	TS 33.	Steering	Test Documentation, or Demonstration	Pilot Vehicle at Factory	Electrically driven hydraulic assisted, or electrically assisted steering shall be provided. The steering gear shall be an integral type with the number and length of flexible lines minimized or eliminated. Steering torque applied by the operator shall not exceed 10 foot-pounds with the front wheels straight ahead. Steering torque may increase to 70 foot-pounds when the wheels are approaching the steering stops. Steering effort shall be measured with the Bus at Seated Load Weight (SLW), stopped with the brakes released and the engine at normal idling speed on clean, dry, level, commercial asphalt pavement with the tires inflated to recommended pressure. Power steering failure shall not result in loss of steering control. While the Bus is in operation, the steering effort shall not exceed 55 pounds at the steering wheel rim and perceived free play in the steering system shall not materially increase as a result of power assist failure. Gearing shall require no more than seven turns of the steering wheel lock-to-lock.

Item	Section	Title	Deliverable	Schedule	Requirement
91	TS 33.3.3	Steering Wheel, Steering Column Tilt	Demonstration	Pilot Vehicle at Factory	Steering column shall be a tilt and telescopic model. The steering column shall have full tilt capability with an adjustment range of no less than 35 degrees and be easily adjustable by the driver. The mechanism for adjustments shall be designed for ease of use, durability, utilize detents to position and lock the steering column and not require tightening by hand to apply a clamping force.
92	TS 33.3.4	Steering Wheel Telescopic Adjustment	Demonstration	Pilot Vehicle at Factory	The steering wheel shall have full telescoping capability and have a minimum telescopic range of 2 inches but no more than 5 inches and a minimum low-end adjustment of 32 in., measured from the top of the steering wheel rim in the horizontal position, (zero degrees' slope), to the cab floor at the heel point.
93	TS 37.1	Service Brake	Certification, Test Documentation	Pre-Production Meetings	The entire service brake system, including ABS controls, friction material, shall meet applicable FMVSS standards. The entire brake system, including friction material, shall have overhaul or replacement life goal of at least 45,000 miles when operated under LACMTA service. Brakes shall be self-adjusting. Mechanical brake wear indicators, (visible brake sensors), shall utilize stainless steel exposed push rods.
94	TS 37.6	Parking/Emergency Brake, Air Brakes	Documents, Drawings	Pre-Poduction Meetings	The parking brake shall be actuated by a valve mounted convenient to the operator, subject to LACMTA approval…
95	TS 39.1	Pneumatic System, General	Documents, Samples	Pre-Production Meetings	A quarter turn manual shut-off valve with quick disconnect fitting shall be easily accessible and located in the engine compartment and shall supply air prior to the air dryer, subject to LACMTA approval…
96	TS 39.2	Pnuematic System, Air Compressor	Demonstration	Pilot Vehicle at Factory	The electrically-driven air compressor shall be sized (designed) to charge the entire air system on new buses from 0 psi to 120 psi in less than five minutes for a single unit and bus not exceeding the fast idle speed (~1000 rpm) setting of the engine.

Item	Section	Title	Deliverable	Schedule	Requirement
97	TS 39.2	Pnuematic System, Air Compressor	Documention	Pilot Vehicle Prior To Production	The electrically-driven air compressor shall be designed to supply air operating under the Air System Design Operating Profile while remaining within the manufactures air compressor specifications. The discharge temperature (measured at the compressor outlet using a probe thermocouple) shall not exceed 360ºF, excluding temperature spikes of durations less than two seconds and two percent of compressor charge time. Air compressor duty-cycle shall not exceed 30 percent in any 10 minute period under the Manhattan Operating Profile.
98	TS 39.4	Pneumatic System, Air Reservoirs	Documentation	Pre-proPuction Meetings & Pilot Vehicle at Factory	All air reservoirs shall meet the requirements of FMVSS Standard 121 and SAE Standard J10 and shall be equipped with drain plugs and guarded or flush type drain valves below floor level. Major structural members shall protect these valves and any automatic moisture ejector valves from road hazards. Reservoirs shall be sloped toward the drain valve. All air reservoirs shall have drain valves mounted below floor level with lines routed to eliminate the possibility of water traps and/or freezing in the drain line. All air tanks shall have check valves at the inlet side for isolation.
99	TS 40	Electrical, Electronic and Data Communications, Overview	Approval	Prior to Pilot Bus completion	The Contractor shall coordinate a technical review with the LACMTA covering control system integration, installation, and design. As part of the technical review, the Contractor shall advise the LACMTA concerning control system features, options, and accessories, and shall conform, to the degree possible, to those already in use at the LACMTA in an effort to increase component and system commonality. The Contractor shall provide documentation including a description of control system operation and system schematics.
100	TS 40	Electrical, Electronic and Data Communications, Overview	Deliverable	Pilot Vehicle at Factory	A listing of the software part number and revision number and procedure for obtaining new releases shall be identified for each component which is software controlled.
101	TS 40.1	Electrical, Electronic and Data Communications, Modular Design	Demonstration	Pilot Vehicle at Factory	Replacement of the engine/propulsion compartment wiring harness(es) shall not require pulling wires through any bulkhead or removing any terminals from the wires.
102	TS 41	Environmental and Mounting Requirements	Test Documentation	Pilot Vehicle Prior To Production	The electrical system and its electronic components shall be capable of operating in the area of the vehicle in which they will be installed, as recommended in SAE J1455.

Item	Section	Title	Deliverable	Schedule	Requirement
103	TS 41	Environmental and Mounting Requirements	Certification	Pilot Vehicle Prior To Production	No vehicle component shall generate, or be affected by, electromagnetic interference or radio frequency interference (EMI/RFI) that can disturb the performance of electrical/electronic equipment as defined in SAE J1113 and UNECE Council Directive 95/54 (R 10).
104	TS 42.1.1	General Electrical Requirements, Low Voltage Batteries (24V)	Documents	Proposal Period	Batteries shall be a minimum of four absorbed glass mat thin plate pure lead technology group 31 series, heavy-duty, lead-acid, sealed top battery units for: a) engine starting (including fuel controls, electronic control units and ignition system), and b) other bus loads as needed, subject to LACMTA approval…
105	TS 42.1.1	General Electrical Requirements, Low-Voltage Batteries	Demonstration Test	Pilot Vehicle Prior To Production	Starting with a full charge, starting batteries shall have sufficient energy to provide adequate power after a minimum of five continuous days (Master Run switch "Off", Master Battery switch "On", all lights off, LACMTA installed ITS equipment operating) without charging or engine operation to then properly start the bus.
106	TS 42.1.3	General Electrical Requirements, Jump Start	Documents, Samples	Pre-Production Meetings	Female receptacles equipped with approximately one-foot 2/0 pigtail cables shall be provided. The receptacle(s) shall be located on the curbside rear corner of the Bus for convenient jumper cable connection, subject to LACMTA approval…
107	TS 42.1.7	General Electrical Requirements, Low-Voltage Generation and Distribution	Documentation	Pre-Production Meetings	The Contractor shall estimate the parasitic loads during the initial stage of the bus design and shall submit a draft report to LACMTA at the Pre-Production meetings.
108	TS 42.1.7	General Electrical Requirements, Low-Voltage Generation and Distribution	Documentation	Pilot Vehicle Prior To Production	The Contractor shall estimate the parasitic loads during the initial stage of the bus design and shall submit a draft report to LACMTA at the Pre-Production meetings. A final report shall be submitted during the Pilot Bus configuration audit.
109	TS 42.4	General Electrical Requirements, Electrical Components	Certification	Pre-Production Meetings	Location of electronic modules shall be reviewed for environmental suitability such as heat, water, vibrations, contamination from dust and debris, and other electrical equipment. The system including modules, external wire, connectors, and data Bus wiring shall be designed to operate under LACMTA's Design Operating Profile. All electrical components including relays and circuit breakers must remain unaffected while bus is operated in up to 15 inches of standing water.

Item	Section	Title	Deliverable	Schedule	Requirement
110	TS 43.1.3	General Electronic Requirements, Communications	Documents, Drawings	Proposal Period	Mounting and electrical provisions shall be provided to allow LACMTA installation of existing Fleetwatch JX-55 Vehicle Interface Module in the Operator's area, subject to LACMTA approval…
111	TS 45.2.1	Data Communications, Diagnostics, Fault Detection and Data Access	Documents, Drawings	Pre-Production Meetings	The communication port(s) shall be located in the Operator's area, Engine Compartment Control Panel, and ITS Enclosure area, subject to LACMTA approval…
112	TS 45.3.1	Multiplex Level, Data Access	Documents, Drawings	Pre-Production Meetings	Diagnostic and status information shall be made available via a communication port on the multiplex system. The location of the communication port shall be easily accessible inside or adjacent to the ITS Enclosure subject to LACMTA approval…
113	TS 46.1	Driver's Area Controls, General	Documentation	Pre-Production Meetings	Switches and controls shall be divided into basic groups and assigned to specific areas, (Refer to Table 9) in conformance with SAE Recommended Practice J680, Revised 1988, "Location and Operation of Instruments and Controls in Motor Truck Cabs," and be essentially within the hand reach envelope described in SAE Recommended Practice J287, "Driver Hand Control Reach.
114	TS 46.2	Driver's Area Controls, Glare	Inspection	Pilot Vehicle at Factory	The driver's work area shall be designed to minimize glare to the extent possible. Objects within and adjacent to this area shall be matte black or dark gray in color wherever possible to reduce the reflection of light onto the windshield. The use of polished metal and light-colored surfaces within and adjacent to the driver's area shall be avoided.
115	TS 46.8	Driver Foot Switches, Solid state Foot Switch Control	Documents, Drawings	Pre-Production Meetings	The inclined mounting surface shall be skid-resistant. All other controls, including high beam shall be in a location approved…
116	TS 47.1	Driver's Amenities, Coat Hanger	Documents, Samples	Pre-Production Meetings	A stainless steel, aluminum, or approved equal, coat hook shall be furnished and installed, subject to LACMTA approval.
117	TS 47.4	Repair Card Holder	Documents, Drawings	Pre-Production Meetings	A card holder shall be provided in the operators' area at a location accessible to mechanics standing in the front entry area with the passenger door open, subject to LACMTA approval…

Item	Section	Title	Deliverable	Schedule	Requirement
118	TS 47.5	Safety Equipment	Documents, Drawings	Pre-Production Meetings	The following items shall be provided and installed within seven feet of the Operator's seat in a location that is easy reach, subject to LACMTA approval… a) DOT approved heavy-duty emergency reflector kit stored in a storage box. b) 5-pound (5 lb.) multipurpose fire extinguisher mounted with universal bracket.
119	TS 47.6	Bus Registration Holders	Documents, Drawings	Pre-Production Meetings	A Bus registration holder shall be installed above the operator near the ceiling, subject to LACMTA approval…
120	TS 47.7	Trash Hooks	Demonstration	Pilot Vehicle at Factory	Placement and selection of the hooks shall be reviewed on the Pilot Bus and are subject to LACMTA approval.
121	TS 49.1	Driver's Seat, Dimensions	Certification	Pre-pPoduction Meetings	The driver's seat shall be comfortable and adjustable so that people ranging in size from a 95th-percentile male to a 5th-percentile female may operate the bus. The heavy-duty Operator's seat shall support Operators' in the orthopedically correct seating position.
122	TS 49.8.1	Exterior Mirrors	Documents, Drawings	Proposal Period	Mirrors shall be made of tempered plate glass or have safety backing to prevent shattering subject to approval…
123	TS 49.8.1	Exterior Mirrors	Documents, Drawings	Proposal Period	Adjustment of the mirrors shall be provided by two nubbin switches located to the left of the Operator, subject to LACMTA approval…
124	TS 49.8.1	Exterior Mirrors, Street Side Mirrors	Documents, Drawings	Proposal Period	Street side mirror shall be overhead mounted in a position to minimize potential contact with vehicles or cyclists, subject to LACMTA approval…
125	TS 49.8.2	Interior Mirrors	Documents, Drawings	Pre-Production Meetings	Mirrors shall be provided to permit the operator to observe passengers throughout the Bus, including entrances and exits, and directly in front of the bus during bicycle loading and unloading activities without leaving his seat and without shoulder movement, subject to LACMTA approval…

Item	Section	Title	Deliverable	Schedule	Requirement
126	TS 51.	Windshield	Certification	Pre-Production Meetings	The windshield shall permit an operator's field of view as referenced in SAE Recommended Practice J1050. The vertically upward view shall be a minimum of 15 degrees, measured above the horizontal and excluding any shaded band. The vertically downward view shall permit detection of an object 3.5 feet high no more than two) feet in front of the bus. The horizontal view shall be a minimum of 90 degrees above the line of sight. Any binocular obscuration due to a center divider may be ignored when determining the 90-degree requirement, provided that the divider does not exceed a three-- degree angle in the operator's field of view. Windshield pillars shall not exceed 10 degrees of binocular obscuration.
127	TS 51.	Windshield	Inspection	Prior to Pilot Vehicle Acceptance	The windshield shall be designed and installed to minimize external glare as well as reflections from inside the bus. Windshield shall be two-piece design
128	TS 52.	Driver's Side Window	Certification	Pre-production Meetings	The driver's side window glazing material shall have a ¼ in. nominal thickness laminated safety glass conforming with the requirements of ANSI Z26.1-1996 Test Grouping 2 and the Recommended Practices defined in SAE J673. Light transmittance shall be maximum 75 percent on the glass area below 53 in. from the operator platform floor. On the top fixed over bottom slider configuration, the top fixed area above 53 inches may have a maximum one percent light transmittance.
129	TS 53.3	Side Windows, Configuration	Documents, Drawings	Proposal Period	Rearmost windows which are lower than shoulder height for seated passengers shall not be opened or equipped with emergency escape provisions, subject to LACMTA approval…
130	TS 53.4	Side Windows, Materials, Safety Glass Glazing Panels	Certification	Pre-production Meetings	Side windows glazing material shall have a minimum of 3/16 in. nominal thickness tempered safety glass. The material shall conform to the requirements of ANSI Z26.1-1996 Test Grouping 2 and the Recommended Practices defined in SAE J673. Windows on the bus sides and in the rear door shall be grey tint (13-50 percent) luminous transmittance as measured by ASTM D-1003), complementary to the bus exterior. The maximum solar energy transmittance shall not exceed 37 percent, as measured by ASTM E-424.

Item	Section	Title	Deliverable	Schedule	Requirement
131	TS 53.4	Side Windows, Materials, Anti-Vandalism Sacrificial Film	Certification	Proposal Period	All glazing material that is aft of the front standee line, and in front of the exit door, shall be equipped with an interior single layer 6 mil minimum laminated film. All glazing material that is aft of, and including, the exit door shall be equipped with an interior four layer laminated film. Both types of window film installations are subject to LACMTA approval…
132	TS 54	HVAC, Capacity and Performance	Test Documentation	Prior to Pilot Vehicle Acceptance	The HVAC climate control system shall be modular design and capable of controlling the temperature and maintaining the humidity levels of the interior of the bus as defined in the following paragraphs. With the bus running at the design operating profile with corresponding door opening cycle, and carrying a number of passengers equal to 150 percent of the seated load, the HVAC system shall control the average passenger compartment temperature within a range between 65 º and 80°F, while maintaining the relative humidity to a value of 50 percent or less. The system shall maintain these conditions while subjected to any outside ambient temperatures within a range of 10 º to 95 °F and at any ambient relative humidity levels between 5 and 50 percent. System capacity testing, including pull-down/warm-up, stabilization and profile, shall be conducted in accordance to the APTA's "Recommended Instrumentation and Performance Testing for Transit Bus Air Conditioning System.
133	TS 56.2	HVAC, Driver's Area	Test Documentation	Prior to Pilot Vehicle Acceptance	The windshield defroster unit shall meet the requirements of SAE Recommended Practice J381, "Windshield Defrosting Systems Performance Requirements," and shall have the capability of diverting heated air to the driver's feet and legs. The defroster or interior climate control system shall maintain visibility through the driver's side window.
134	TS 56.3	HVAC, Controls for the Climate Control System	Documents, Drawings	Proposal Period	Heater water control valves shall be "positive" type, when closed. The method of operating remote valves shall be subject to LACMTA approval…
135	TS 57	HVAC, Air Filtration	Certification	Pre-production Meetings	Air shall be filtered before discharge into the passenger compartment. The filter shall meet the ANSI/ASHRAE 52.2 requirement for 5 percent or better atmospheric dust spot efficiency, 50 percent weight arrestance, and a minimum dust holding capacity of 120 g per 1000 cfm cell. Air filters shall be easily removable for service.

Item	Section	Title	Deliverable	Schedule	Requirement
136	TS 62.3	Design, Curb Feelers	Sample	Upon Request	Curb feeler sample shall be provided to Contractor upon request.
137	TS 62.3	Design, Curb Feelers	Demonstration	Pilot Vehicle at Factory	Installation of curb feeler shall be subject to LACMTA approval…
138	TS 66	License Plate Provisions	Documents, Drawings	Pre-production Meetings	These provisions shall direct-mount or recess the license plates so that they can be cleaned by automatic bus-washing equipment without being caught by the brushes, subject to LACMTA approval…
139	TS 69.1	Service Compartments & Access Doors, Access Doors	Documents, Drawings	Pre-production Meetings	The fuel fill/charge port door shall be hinged at the top and shall open fully up against the side of the Bus subject to LACMTA approval…
140	TS 70.2	Bumpers, Front Bumper	Certification	Pre-production Meetings	No part of the bus, including the bumper, shall be damaged as a result of a five (5) mph impact of the bus at curb weight with a fixed, flat barrier perpendicular to the bus's longitudinal centerline. The bumper shall return to its pre-impact shape within ten minutes of the impact. The bumper shall protect the bus from damage as a result of 6.5 mph impacts at any point by the common carriage with contoured impact surface defined in Figure 2 of FMVSS 310 loaded to 4,000 lbs parallel to the longitudinal centerline of the bus. It shall protect the bus from damage as a result of 5.5 mph impacts into the corners at a 30-degree angle to the longitudinal centerline of the bus.
141	TS 70.3	Bumpers, Rear Bumper	Certification	Pre-Production Meetings	No part of the bus, including the bumper, shall be damaged as a result of a two mph impact with a fixed, flat barrier perpendicular to the longitudinal centerline of the bus. The bumper shall return to its pre-impact shape within ten minutes of the impact. When using a yard tug with a smooth, flat plate bumper two feet wide contacting the horizontal centerline of the rear bumper, the bumper shall provide protection at speeds up to five mph, over pavement discontinuities up to one inch high, and at accelerations up to two mph/sec. The rear bumper shall protect the bus, when impacted anywhere along its width by the common carriage with contoured impact surface defined in Figure 2 of FMVSS 301 loaded to 4000 lbs, at four mph parallel to or up to a 30-degree angle to, the longitudinal centerline of the bus.
142	TS 70.5	Bicycle Rack	Documents, Drawings	Pre-Production Meetings	The installed bicycle rack shall not interfere with towing the Bus. California Code Title 13 requires that bike racks be installed with a way for the Operator to determine whenever the bike rack is deployed.

Item	Section	Title	Deliverable	Schedule	Requirement
143	TS 71.1	Finish and Color, Appearance	Documentation	Pre-production Meetings/Pilot Vehicle	Contractor shall utilize the LACMTA's existing local color scheme in its exterior paint design, (see Technical Specification Attachment 1-Metro Local Exterior and Interior Fleet Standards for reference). Exterior colors shall be applied over a white base color. The manufacturer shall submit for MTA's approval, a drawing showing painting layout including striping bends and breaks, during Pre-Production meetings. The Pilot Bus shall be painted according to this color scheme for approval by the LACMTA prior to application to the remainder of the buses..
144	TS 71.1	Finish and Color, Appearance	Documentation	With Each Vehicle	Exterior painted surfaces shall have a minimum of 0.5-mil thick primer coat and a minimum 2.5-mil thick finish coat. Mil thickness shall conform to paint manufacturer's specifications.
145	TS 72.1	Decals, Numbering and Signing, Passenger Information	Documents, Drawings	Pre-production Meetings	“Take One” boxes shall be mounted at both the front and rear doors in convenient locations for passengers and the minimum “Take Twelve” unit shall be located in a convenient location towards the front of the bus, subject to LACMTA approval...
146	TS 73.2	Exterior Lighting, Doorway Lighting	Test Documentation	Pilot Vehicle Prior to Production	Lamps at the front and rear passenger doorways shall comply with ADA requirements and shall activate only when the doors open. These lamps shall illuminate the street surface to a level of no less than one foot-candle for a distance of threefeet outward from the outboard edge of the door threshold with a passenger standing in the threshold. The lights must be positioned overhead and shall be shielded to protect passengers’ eyes from glare.
147	TS 73.4	Exterior, Lighting, Headlights	Documents, Drawings	Proposal Period	Lenses shall be resistant to hazing and yellowing, and have proper hardness to resist surface scratches and stone chips, subject to LACMTA approval…
148	TS 74	Interior Panels & Finishes, General Requirements	Documents, Drawings	Proposal Period	Additional anti-graffiti/vandalism treatments shall be applied to interior surfaces, subject to LACMTA approval…
149	TS 75.	Interior Panels	Certification	Preproduction Meetings	Interior panel required to meet FMVSS 302. Materials shall comply with the Recommended Fire Safety Practices defined in FTA Docket 90-A, most recent revision.
150	TS 75	Interior Panels	Documents, Drawings	Proposal Period	Panels in other areas of the bus shall be stainless or other material as determined to best match appearance with the rear section of the bus subject to LACMTA approval…
151	TS 75.2	Interior Panels, Modesty Panel	Certification	Pilot Vehicle Prior To Production	The modesty panel and its mounting shall withstand a static force of 250 lbs applied to a four inch × four inch area in the center of the panel without permanent visible deformation.

Item	Section	Title	Deliverable	Schedule	Requirement
152	TS 75.2	Interior Panels, Modesty Panel	Inspection	Pilot Vehicle at Factory	At the rear door area a clear non-glass panel from above the modesty panel to the top of the daylight opening and attached to the stanchion.
153	TS 75.4	Interior Panels, Rear Bulkhead	Documents, Drawings	Proposal Period	Ceiling and enclosures adjacent to ceiling shall be made of durable, corrosion resistant, easily cleanable material subject to LACMTA approval…
154	TS 75.8	Interior Panels, Floor Covering	Certification	Preproduction Meetings & Pilot Vehicle at Factory	All interior floor areas shall be covered with a combination of gray color smooth and ribbed slip resistant rubber or equivalent floor covering that remains effective in all weather conditions with 12-year unconditional warranty, subject to LACMTA approval.
155	TS 75.8	Interior Panels, Floor Covering	Documents, Drawings	Proposal Period	The edge of any interior steps shall have minimal overhang. Special coating for the step tread section may be acceptable subject to LACMTA approval…
156	TS 75.9	Interior Panels, Interior Lighting	Documents, Drawings	Proposal Period	The lighting system shall meet FCC Part 18; Class A regulation for EMI conducted and radiated emissions. The interior lighting design shall be subject to LACMTA approval.
157	TS 75.12	Interior Panels, Seating Area(s) (Transit Bus)	Test Documentation	Pilot Vehicle Prior to Production	The interior lighting system shall provide a minimum 15 foot-candle illumination on a one square- foot plane at an angle of 45 degrees from horizontal, centered 33 inches above the floor and 24 inches in front of the seat back at each seat position. Allowable average light level for the rear bench seats shall be seven foot-candles.
158	TS 75.14	Interior Panels, Vestibules/Doors (Transit Bus)	Test Documentation	Pilot Vehicle Prior to Production	Floor surface in the aisles shall be a minimum of 10 foot-candles, and the vestibule area a minimum of four foot-candles with the front doors open and a minimum of two foot-candles with the front doors closed. The front entrance area and curb lights (if needed) shall illuminate when the front door is open and master run switch is in the “lights” positions. Rear exit area and curb lights shall illuminate when the rear door is unlocked
159	TS 75.16	Interior Panels, Step Lighting	Test Documentation	Pilot Vehicle Prior to Production	Step lighting for the intermediate steps between lower and upper floor levels shall be a minimum of four foot-candles and shall illuminate in all engine run positions.

Item	Section	Title	Deliverable	Schedule	Requirement
160	TS 75.17	Interior Panels, Ramp Lighting (Transit Bus)	Test Documentation	Pilot Vehicle Prior to Production	Exterior and interior ramp lighting shall comply with CFR Part 49, Section 38.31. Lights shall be provided at the doorway equipped with the wheelchair access system to floodlight the loading area. The light shall be wired through the ramp master toggle switch on the driver's dash and shall automatically illuminate when this switch is in the "On" position. During ramp operation, the street surface shall be illuminated to a minimum of six candlepower a distance of three (3) feet beyond the external dimensions of the ramp platform once deployed.
161	TS 75.19.1	Farebox Lighting, Transit Bus	Test Documentation	Pilot Vehicle Prior to Production	A light fixture shall be mounted in the ceiling above the farebox location. The fixture shall be capable of projecting a concentrated beam of light on the farebox. The light shall illuminate the top of the fare box and the surrounding floor area to a minimum of 15 foot-candles.
162	TS 76	Fare Collection	Documents, Drawings	Pre-Production Meetings	The Contractor shall provide and install GFI Genfare Odyssey Validation farebox base plate, power leads and ITS interface cable, subject to LACMTA approval…
163	TS 76	Fare Collection	Documents, Drawings	Pre-Production Meetings	A one-inch inside diameter waterproof conduit shall be provided from the ITS enclosure to the farebox base plate mounting location, through the Bus floor, to protect the power leads and ITS interface cable, subject to LACMTA approval…
164	TS 77	Interior Access Panels and Doors (Transit Bus)	Documents, Drawings	Pre-Production Meetings	Removal of fixtures or equipment unrelated to the repair task to gain access shall be precluded or used only subject to LACMTA approval…
165	TS 77	Interior Access Panels and Doors (Transit Bus)	Documents, Drawings	Pre-Production Meetings	Access doors shall be hinged with gas props or nover-center springs, where practical, to hold the doors out of the mechanic's way subject to LACMTA approval during pre-production meetings. All overhead doors shall be hinged at the top and shall be prevented from coming loose or opening during transit service or in bus cleaning operations. Panel fasteners shall be standardized so that only one tool is required to service all special fasteners within the Bus subject to LACMTA approval…

Item	Section	Title	Deliverable	Schedule	Requirement
166	TS 78.13	Passenger Seating, Structure and Design	Test Documentation	Pre-Production Meetings	Seat back handhold and armrests shall withstand static horizontal and vertical forces of 250 lbs applied anywhere along their length with less than ¼-inch permanent deformation. Seat back handhold and armrests shall withstand 25,000 impacts in each direction of a horizontal force of 125 lbs with less than ¼-inch permanent deformation and without visible deterioration.
167	TS 78.15	Passenger Seating, Construction and Materials	Documents, Drawings	Pre-Production Meetings	Selected materials shall minimize damage from vandalism and shall reduce cleaning time. The seats shall be attached to the frame with tamper-resistant fasteners and is subject to LACMTA approval…
168	TS 79.	Passenger Assists, (Transit Bus)	Demonstration	Pilot Vehicle at Factory	Passenger assists shall be convenient in location, shape, and size for both the 95th-percentile male and the 5th-percentile female standee.
169	TS 79.1	Assists (Transit Bus)	Certification & Test Documentation	Pre-Production Meetings	Passenger assists shall be capable of passing the NHTSA Drawstring Test. A crash resulting in a one- foot intrusion shall not produce sharp edges, loose rails, or other potentially dangerous conditions associated with a lack of structural integrity of the assists.
170	TS 79.1	Assists, (Transit Bus)	Test Documentation	Pre-Production Meetings	Assists shall withstand a force of 300 lbs applied over a 12-inch lineal dimension in any direction normal to the assist without permanent visible deformation.
171	TS 79.1	Assists, (Transit Bus)	Inspection	Pilot Vehicle at Factory	All passenger assists shall permit a full hand grip with no less than 1½ inches of knuckle clearance around the assist.
172	TS 79.3	Vestibule (Transit Bus)	Demonstration	Pilot Vehicle at Factory	The front assist should not impede wheelchair boarding and provide adequate clearance and access to the farebox during vaulting and maintenance.
173	TS 79.6	Longitudinal Seat Assists (Transit Bus)	Documents, Drawings	Pre-Production Meetings	A vertical assist or grabrail shall be provided convenient to the outer rear settee seats if they are immediately behind an aisle facing seat subject to LACMTA approval…
174	TS 80.1	Passenger Doors, Transit Bus	Documents, Drawings	Proposal Period	All passenger door components, except door panels and glazing, must come from one single manufacture, subject to LACMTA approval…
175	TS 81.1	Accessibility Provisions, Loading Systems	Documents, Drawings	Proposal Period	Bus shall utilize a low-floor fully electrically operated, preferably self-leveling wheelchair ramp system subject to LACMTA approval…

Item	Section	Title	Deliverable	Schedule	Requirement
176	TS 81.3	Accessibility Provisions, Lift	Test Documentation	Pre-Production & Pilot Vehicle Prior To Production	The loading platform shall be covered with a replaceable or renewable nonskid material and shall be fitted with devices to prevent the wheelchair from rolling off the sides during loading or unloading. Deployment or storage of the ramp shall require no more than 15 seconds. Each operation shall require continues manual pressure to the momentary switch by the operator and shall not allow unintentional improper access system operation. The device shall function without failure or adjustment for 500 cycles or 5,000 miles in all-weather conditions on the design operating profile when activated once during the idle phase. A manual override system shall permit unloading a wheelchair and storing the device in the event of a primary power failure. The manual operation of the ramp shall not require more than 35 lbs of force.
177	TS 81.5	Wheelchair Accommodations	Documents, Drawings	Proposal Period	Forward facing wheelchair securement and occupant restraint systems shall be the QPod or approved equal, subject to LACMTA approval…
178	TS 81.5.2	Wheelchair Accommodations, Rear Facing	Documents, Drawings	Pre-Production Meetings	Fabric covering on the padded barrier shall be blue, subject to LACMTA approval.
179	TS 83	Signage and Communication, Destination Signs	Documents, Drawings	Pre-Production Meetings	The destination sign compartments shall meet the following minimum requirements. Compartments shall be designed to prevent condensation and entry of moisture and dirt. Compartments shall be designed to prevent fogging of both compartment window and glazing on unit itself. Access shall be provided to allow cleaning of inside compartment window and unit glazing, subject to LACMTA approval in Pre-Production meetings. Front window exterior display area shall be sized to allow full visibility of the front destination sign.
180	TS 83.	Destination Signs, (Programming)	Deliverable	Pilot Vehicle Delivery in L.A.	Software shall be furnished for programming the sign system via an IBM compatible lap-top computer.

Item	Section	Title	Deliverable	Schedule	Requirement
181	TS 84.1	Passenger Information, Interior Displays	Documents, Drawings	Pre-Production Meetings	“Take one” boxes shall be mounted at both the front and rear doors in convenient locations for passengers and the minimum “take twelve” unit shall be located in a convenient location towards the front of the bus, subject to LACMTA approval...
182	TS 85.1	Passenger Stop Request/Exit Signal	Documents, Drawings	Pre-Production Meetings	A minimum of twelve stop request signal buttons utilizing a yellow housing shall be evenly distributed in the passenger cabin to be functionally accessible to all seated passengers subject to LACMTA approval...
183	TS 85.1	Passenger Stop Request/Exit Signal	Documents, Drawings	Proposal Period	Pricing for the installation of a wireless pushbutton switch system shall be provided on PF-1 Form, Schedule of Optional Vehicle Configuration.
184	TS 86	Communications	Documents, Drawings	Pre-Production Meetings	Service light(s) with suitable switch shall be provided within the enclosure, subject to LACMTA approval.
185	TS 86.1	Camera Surveillance System	Demonstration	Pilot Vehicle at Factory	A day-to-night demonstration shall be required to establish camera performance and final placement for optimum views and clarity. The LACMTA shall witness the demonstration and approve the final placement of the cameras. This demonstration must be successfully completed prior to approval of the pilot bus(s).
186	TS 86.1	Camera Surveillance System, Interior Cameras	Documents, Drawings	Pre-Production Meetings	Front interior camera(s) at front door passenger boarding area shall record audio subject to LACMTA approval...

Item	Section	Title	Deliverable	Schedule	Requirement
187	TS 86.1	Camera Surveillance System, Interior Cameras, Exterior Cameras	Documentation	Pilot Vehicle at Factory	Cameras shall be placed for best recording of the following five (5) areas: a) Forward 1/3 of passenger area, view of front vestibule, farebox transactions and field of view to include operator and image of bus number located on operator's barrier b) Front door, passenger boarding c) Rear door, passenger exiting d) Middle 1/3 passenger area e) Rear 1/3 passenger seating area starting from behind rear door with a primary emphasis on the rearmost seats. Cameras shall be placed for best recording of the following four (4) areas: a) Forward looking through windshield (Accident Surveillance) b) The curb side area of the Bus, (including exit door), and street from ten feet beyond front bumper to ten feet beyond rear bumper c) Street side area of the Bus and street from ten feet beyond the front bumper to ten feet beyond the rear bumper d) Rear camera shall view the ground behind the Bus from the bumper to approximately 25 feet back
188	TS 86.1	Exterior Cameras	Demonstration	Pilot Vehicle at Factory	Camera positions and adjustment are subject to LACMTA approval…
189	TS 86.1	Camera Monitor	Documentation	Pre-Production Meetings	Final monitor configuration is subject to LACMTA approval during pre-production meetings.
190	TS 86.1	Camera Surveillance System, Central Processor	Inspection	Pilot Vehicle at Factory	The video security system central processor shall be packaged in a suitable ventilated shock mounted and splash resistant enclosure keyed to LACMTA standards, located within the ITS enclosure, subject to LACMTA approval…

Item	Section	Title	Deliverable	Schedule	Requirement
191	TS 86.1	System Management Tool	Documentation	Pre-Production Meetings	shall incorporate a system management tool for; wireless download of video files in a timely manner, software upgrades, camera checks, configuration changes and health reports as required. Final configuration is subject to LACMTA approval.
192	TS 86.1	System Management Tool	Documentation	Proposal Period	Pricing of the system management tool for use at up to 13 LACMTA operating divisions shall be provided to the LACMTA on Price Form PF-4, Schedule C of Prices of Diagnostic Test Equipment.
193	TS 86.1	Enhanced Video Recording System Option	Documentation	Proposal Period	Pricing for optional features to enhance the video recording system shall be provide d on Price Form PF-1, Schedule of Optional Vehicle Configuration. Ability of video system to analyze and discern events such as wheelchair passengers and generate report information with summary data such as wheelchair passenger count and boarding/alighting locations. The ability to utilize the dash mounted display for diagnostic work or configuration changes on the DVR. Incorporation of a 360 degree camera(s) for better surveillance of bus interior.
194	TS 86.2	Public Address System	Documentation	Pre-Production Meetings	The location of the gooseneck microphone is subject to LACMTA approval in pre-production meetings.
195	TS 86.3	Automatic Passenger Counter (APC)	Documentation	Pre-Production Meetings	Provisions and necessary cables for installation of door sensors and analyzer(s) for IRMA-3 infrared APC system shall be provided subject to LACMTA approval.
196	TS 86.3	Automatic Passenger Counter (APC)	Documentation	Proposal Period	As an option, LACMTA may consider incorporating an installation of IRMA-Matrix infrared APC System. Pricing to include; installation, cabling, door sensors, analyzer(s), software, integration testing, first article acceptance and any other items necessary for proper operation shall be submitted on form PF-1, Schedule of Optional Vehicle Configuration.
197	TS 86.4.4	Emergency Alarm	Documentation	Pre-Production Meetings	SAS switch location and lead wire routing is subject to LACMTA approval...
198	TS 86.8	ITS Provisions, WLAN	Documentation	Pre Production Meetings	Sierra Wireless InMotion MG90 or an approved equal wireless router/switch and feedline shall be installed, subject to LACMTA approva**l…**

Item	Section	Title	Deliverable	Schedule	Requirement
199	TS 86.9	ITS Provisions, Radio Antennas	Documentation	Pre-Production Meetings	The antenna mounting and lead termination shall be accessible from the Bus interior, subject to LACMTA approval**…**
200	TS 86.10	ITS Provisions, Global Positioning System (GPS)	Documentation	Pre-Production Meetings	The GPS Antenna shall be mounted on the centerline of the roof of the bus near the front, with a quick disconnect, within two feet from the antenna, for future replacement subject to LACMTA approval… See TS 88.1 Approved Equals.
201	TS 86.11	ITS Provisions, IBSS	Documentation	Pre-Production Meetings	Battery and ignition power and a separate J1939 communication connection shall be supplied in the ITS enclosure, subject to LACMTA approval…
202	TS 88.2	Maintainability Requirements	Demonstration	Pilot Vehicle at Factory and in LA	The Contractor shall be required to demonstrate these maintenance tasks using the information contained in the service and parts manuals.

Los Angeles County
Metropolitan Transportation Authority

One Gateway Plaza
Los Angeles, CA 90012-2952

213.922.2000 Tel
metro.net

Metro

MAEL-019 **Response Required:** No

Date: March 19, 2018

File Nos.:

Action Item(s):

CDRL:

Richard Himes
Contract Administration Manager
Eldorado National (California), Inc. (ENC)
9670 Galena Street
Riverside, CA 92509

SUBJECT: **EXECUTED CONTRACT MODIFICATION NO. 5**
OP28367-000 40' LOW FLOOR CNG TRANSIT BUSES

Reference: MAEL-014, 017; ELMA-028; 032; 034

Dear Mr. Himes:

Enclosed is your executed original of the subject modification.

If you have any questions, I can be reached at 213.922.7334 or e-mail at hernandezel@metro.net.

Sincerely,

Elizabeth Hernandez
Principal Contract Administrator

cc: Wayne Okubo
Kwesi Annan
Phil Rabottini

LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY

CONTRACT NO. OP28367-000, CONTRACT MODIFICATION NO.: 5

FOR: FORTY FOOT (40') LOW FLOOR CNG TRANSIT BUSES

This Contract Modification No. 5 to Contract No.: OP28367-000 is made effective on the 12th day of February 2018 by and between the LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY, hereinafter referred to as "MTA", and EL DORADO NATIONAL (CALIFORNIA), INC., hereinafter referred to as "CONTRACTOR".

WHEREAS, CONTRACTOR and MTA entered into Contract No.: OP28367-000 effective August 15, 2017, as amended by Contract Modification No. 1, dated November 6, 2017, Contract Modification No. 2, dated December 6, 2017, Contract Modification No. 3 dated December 27, 2017 and Contract Modification No. 4 dated January 19, 2018 (the "Existing Contract") and;

WHEREAS, CONTRACTOR and MTA desire to modify the Existing Contract as provided herein;

Now, therefore, it is mutually agreed, by and between the parties as follows:

1. Change in the rear axle model from Meritor 71000 to Meritor 79000, and retrofit of two pilot buses with upgraded rear axle model for an aggregate increase of $355,714 in the total Contract Price from $198,691,975 to $199,047,689. Article IV COMPENSATION shall read as follows:

   ARTICLE IV: COMPENSATION

   A. Contract Price

   1. In consideration of the Contractor's full performance of the Work, and in accordance with the terms of the Contract, Metro will pay the Contractor the Contract Price of $199,047,689 ~~$198,691,975~~ inclusive of tax and delivery as provided in this Article and in the Contract Document entitled Compensation and Payment Provisions.

   Contract Options may be exercised unilaterally by LACMTA in accordance with Special Provisions Article SP-28, Options.

2. Revised Pricing Forms: PF 1 and PF-1A as attached to this modification no. 5.

Except as expressly amended hereby, the Existing Contract remains in full force and effect as originally executed.

IN WITNESS WHEREOF, the parties have caused this Contract Modification No. 5 to the Existing Contract to be executed by their respective officers duly authorized on the date first written above.

EL DORADO NATIONAL (CALIFORNIA), INC.

By: _____
Signature

LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY
Philip A. Washington
Chief Executive Officer

TONY WAYNE
Type or Print Name

8/12/18
Date

By: [signature]
Elizabeth Hernandez
Principal Contract Administrator

3/15/18
Date

GROUP A - UP TO 600 40' CNG BUSES
FORM PF-1 (CNG - 40') - CONTRACT PRICE SUMMARY
Contract Modification No. 5

Proposer: ELDORADO NATIONAL (CALIFORNIA), INC.

Contract No.: OP28367-000

Contract Title: FORTY FOOT (40') LOW FLOOR CNG BUS PROCUREMENT

1.0 CONTRACT FOR 295 BUSES (BASE BUY)

No.	Qty.	Description of Item		Taxable Unit Price	Unit Price	Total Price
1	295	40' Low Floor CNG Buses (Base Buy) from PF-1A	Values derived from PF-1A*:	$595,257.25	$614,997	$181,424,188.75
1a	Lot	Manuals (Base Buy) (TS 5.6.4)		$2,281.50	Lump Sum	$23,400.00
1b	295	Vehicle Delivery Charge for Base Buy	Value of all taxable delivery charges per bus**:		$275.00	$81,125.00
1c		Tax (Base Buy)		9.75%	$58,037.58	$17,123,368
2	2	Pilot Buses Retrofit with Rear Axle Upgrade			$8,600	$17,201
2a		Tax		9.75%	$838.55	$1,677
3	Lot	Reserved				
4	Lot	Reserved				
5	Lot	Reserved				
6	Lot	Reserved				
7	Lot	Performance Bond (Base Buy)			Lump Sum	$119,336.00
8	1,000	Total Training Hours for Base Buy***			$175,000.00	
8a	900	Contractor (Proposer/Prime) Base Buy			$175.00	$157,500.00
8b	100	Subcontractor/Supplier Base Buy			$175.00	$17,500.00
9	1	System Management Tool for use at up to (13) MTA Operating Divisions per TS 86.1			$74,930.00	$74,930.00
10a	15	Special Towing Equipment (TS 25)			$386.00	$5,790.00
10b		Tax		9.75%	$37.64	$564.53
11a	2	Rear Recovery Devices/Tie Downs (TS 25)			$505.00	$1,010.00
11b		Tax		9.75%	$49.24	$98.48

1.0 Total Price for CONTRACT for 295 Base Buy Buses (Sum of items "1" through "11b") to be the BASIS for Price Proposal evaluation

In U.S. Dollars Using Words: ONE HUNDRED NINETY-NINE MILLION FORTY SEVEN THOUSAND SIX HUNDRED SIXTY TWO DOLLARS

In U.S. Dollars Using Figures: $199,047,689

GROUP A - UP TO 600 40' CNG BUSES
FORM PF-1 (CNG - 40') - CONTRACT PRICE SUMMARY
Contract Modification No. 5

Proposer: ELDORADO NATIONAL (CALIFORNIA), INC.

Contract No.: OP28367-000

Contract Title: FORTY FOOT (40') LOW FLOOR CNG BUS PROCUREMENT

NOTE

* Taxable Unit Price is the Unit Price less 1.14 Accessibility Provisions on PF-1A

** Input the taxable portion of the Delivery Charge under the Taxable Unit Price column and the total Delivery Charge under the Unit Price column

*** Training Hours for Base Buy are only estimates and not a guaranteed level of effort. The total for this Line is a Not-to-Exceed provisional amount.

GROUP A - UP TO 600 40' CNG BUSES
FORM PF-1 (CNG - 40') - CONTRACT PRICE SUMMARY
Contract Modification No. 5

Proposer: ELDORADO NATIONAL (CALIFORNIA), INC.

Contract No.: OP28367-000

Contract Title: FORTY FOOT (40') LOW FLOOR CNG BUS PROCUREMENT

2.0 CONTRACT FOR 150 UP TO 305 BUSES (OPTION BUY)

No.	Qty.	Description of Item		Taxable Unit Price	Unit Price	Total Price
10	305	40' Low Floor CNG Buses (Option Buy) from PF-1A for 150 to 305 vehicles*		$595,257.38	$614,997	$187,574,161.25
10a	Lot	Manuals (Option Buy) (TS 5.6.4)***		$2,281.50	Lump Sum	$23,400.00
10b	305	Vehicle Delivery Charge for Option Buy	Value of all taxable delivery charges per bus**:	$0.00	$275.00	$83,875.00
10c		Tax (Option Buy)		9.75%	$58,037.59	$17,703,747.84
11		Reserved			$	$
12	Lot	Performance Bond for Option Buy***			Lump Sum	$123,421.00
13	500	Total Training Hours for Option Buy****			$87,500.00	
13a	450	Contractor (Proposer/Prime) Option Buy			$175.00	$78,750.00
13b	50	Subcontractor/Supplier Option Buy			$175.00	$8,750.00
14		Reserved			$	$

2.0 Total Price for CONTRACT for 150 Up to 305 Option Buy Buses (Sum of Items "10" through "14") to be the BASIS for Price Proposal evaluation

In U.S. Dollars Using Words: TWO-HUNDRED FIVE MILLION TWO HUNDRED FORTY SEVEN THOUSAND EIGHT HUNDRED NINETY ONE DOLLARS

In U.S. Dollars Using Figures: $205,596,105

NOTE

* Taxable Unit Price is the Unit Price less 1.14 Accessibility Provisions on PF-1A

** Input the taxable portion of the Delivery Charge under the Taxable Unit Price column and the total Delivery Charge under the Unit Price column

*** For proposal purposes only, Manuals and Bond prices are for all 305 bus Options exercised. Actual cost will depend on Option quantity ordered.

**** Training Hours for Option Buy are only estimates and not a guaranteed level of effort. The total for this Line is a Not-to-Exceed provisional amount.

GROUP A - UP TO 600 40' CNG BUSES
FORM PF-1 (CNG - 40') - CONTRACT PRICE SUMMARY
Contract Modification No. 5

Proposer: ELDORADO NATIONAL (CALIFORNIA), INC.

Contract No.: OP28367-000

Contract Title: FORTY FOOT (40') LOW FLOOR CNG BUS PROCUREMENT

3.0 OPTIONAL VEHICLE CONFIGURATION

No.	Qty.	Description of Item		Unit Price	Total Price
15	1	3 ADA Securement Configuration TS 81.5 (Total 15a - 15d)			$6,370.00
15a		Direct Materials/Equipment		$5,750.00	
15b		Labor Installation Costs		$620.00	
15c		Non Recurring Cost		$0.00	
15d		Other Costs (Identify)		$0.00	
16	1	4 ADA Securement Configuration TS 81.5 (Total 16a - 16d)			$10,170.00
16a		Direct Materials/Equipment		$9,150.00	
16b		Labor Installation Costs		$1,020.00	
16c		Non Recurring Cost		$0.00	
16d		Other Costs (Identify)		$0.00	
17	600	Reserved****			
17a	295	Reserved			
17b	305	Reserved			
18	600	25-Year Certified CNG Tanks			$522,000.00
18a	295	25 Yr Certified CNG Tanks for Base Buy	$256,650.00	$870.00	
18b	305	25 Yr Certified CNG Tanks for Option Buy for 150 up to 305 vehicles	$265,350.00	$870.00	
19	600	Complete Automatic Passenger Counter System TS 86.3 (Total 19a - 19h)			$2,757,600.00
19a	295	Direct Materials/Equipment for Base Buy APC		$4,136.00	
19b	295	Labor Installation Costs for Base Buy APC		$460.00	

GROUP A - UP TO 600 40' CNG BUSES
FORM PF-1 (CNG - 40') - CONTRACT PRICE SUMMARY
Contract Modification No. 5

Proposer: ELDORADO NATIONAL (CALIFORNIA), INC.

Contract No.: OP28367-000

Contract Title: FORTY FOOT (40') LOW FLOOR CNG BUS PROCUREMENT

19c	295	Non Recurring Cost for Base Buy APC		$	
19d	295	Other Costs (Identify) for Base Buy APC		$	
		Total for Base Buy APC	$1,355,820.00	$4,596.00	
19e	305	Direct Materials/Equipment for Option Buy APC for 150 up to 305 vehicles		$4,136.00	
19f	305	Labor Installation Costs for Option Buy APC for 150 up to 305 vehicles		$460.00	
19g	305	Non Recurring Cost for Option Buy APC for 150 up to 305 vehicles		$	
19h	305	Other Costs (Identify) for Option Buy APC for 150 up to 305 vehicles		$	
		Total for Option Buy APC for 150 up to 305 vehicles	$1,401,780.00	$4,596.00	
20	600	Enhanced 360 degree Camera System TS 86.1 (Total 20a - 20h)			$579,000.00
20a	295	Direct Materials/Equipment for Base Buy Enhanced Camera System		$869.00	
20b	295	Labor Installation Costs for Base Buy Enhanced Camera System		$96.00	
20c	295	Non Recurring Cost for Base Buy Enhanced Camera System		$	
20d	295	Other Costs (Identify) for Base Buy Enhanced Camera System		$	
		Total for Base Buy Enhanced Camera System	$284,675.00	$965.00	
20e	305	Direct Materials/Equipment for Option Buy Enhanced Camera System for 150 up to 305 vehicles		$869.00	
20f	305	Labor Installation Costs for Option Buy Enhanced Camera System for 150 up to 305 vehicles		$96.00	
20g	305	Non Recurring Cost for Option Buy Enhanced Camera System for 150 up to 305 vehicles		$	
20h	305	Other Costs (Identify) for Option Buy Enhanced Camera System for 150 up to 305 vehicles		$	
		Total for Option Buy Enhanced Camera System for 150 up to 305 vehicles	$294,325.00	$965.00	
21	600	USB Ports for Passenger Charging Only			$288,000.00
21a	295	USB Ports for Passenger Charging Only for Base Buy	$141,600.00	$480.00	
21b	305	USB Ports for Passenger Charging Only for Option Buy for 150 up to 305 vehicles	$146,400.00	$480.00	

GROUP A - UP TO 600 40' CNG BUSES
FORM PF-1 (CNG - 40') - CONTRACT PRICE SUMMARY
Contract Modification No. 5

Proposer: ELDORADO NATIONAL (CALIFORNIA), INC.

Contract No.: OP28367-000

Contract Title: FORTY FOOT (40') LOW FLOOR CNG BUS PROCUREMENT

22	600	Optional Wireless Stop Request Switches (Bus set)			$291,000.00
22a	295	Optional Wireless Stop Request Switches (Bus set) for Base Buy	$143,075.00	$485.00	
22b	305	Optional Wireless Stop Request Switches (Bus set) for Option Buy for 150 up to 305 vehicles	$147,925.00	$485.00	
23	600	Optional Full Color Destination Sign Sets (TS 86.3)			$2,070,000.00
23a	295	Optional Full Color Destination Sign Sets (TS 86.3) for Base Buy	$1,017,750.00	$3,450.00	
23b	305	Optional Full Color Destination Sign Sets (TS 86.3) for Option Buy for 150 up to 305 vehicles	$1,052,250.00	$3,450.00	
24	Lot	Spare Parts (From Schedule A, Form PF-2)			$2,203,445.65
25	Lot	Special Tools (Schedule B Form PF-3)			$7,710.00
26	Lot	Diagnostic Test Equipment (Schedule C, Form PF-4)			$355,010.00
27	Lot	Training Aids (Schedule D, Form PF-5)			$958,460.00

3.0 Total Price for OPTIONAL VEHICLE CONFIGURATION (Sum of Items "15 through 27") for OPTIONAL EQUIPMENT to be BASIS for Price Proposal evaluation.

In U.S. Dollars Using Words: TEN-MILLION FORTY EIGHT THOUSAND SEVEN HUNDRED SIXTY FIVE DOLLARS & SIXTY-FIVE CENTS

In U.S. Dollars Using Figures: $10,048,765.65

**** Proposer shall provide base Low Nox Engine for each bus with the following Emission Levels:
ISLG engine is not the base engine requirement. Low Nox engine is the base requirement and therefore no longer an option.

Oxides of Nitrogen (NOx) Grams per brake horsepower-hour	Particulate Matter (PM) grams per brake horsepower hour
0.02	0.01

GROUP A - UP TO 600 40' CNG BUSES

FORM PF-1 (CNG - 40') - CONTRACT PRICE SUMMARY

Contract Modification No. 5

Proposer: ELDORADO NATIONAL (CALIFORNIA), INC.

Contract No.: OP28367-000

Contract Title: FORTY FOOT (40') LOW FLOOR CNG BUS PROCUREMENT

4.0 CONTRACT FOR BASE BUY, OPTION BUY, AND OPTIONALVEHICLE CONFIGURATION

No.	Qty.	Description of Item	Total Price
1.0		Total Price for CONTRACT for 295 Base Buy Buses to be the BASIS for Price Proposal evaluation	$199,047,689
2.0		Total Price for CONTRACT for 150 Up to 305 Option Buy Buses to be the BASIS for Price Proposal evaluation	$205,596,105
3.0		Total Price for OPTIONAL VEHICLE CONFIGURATION for OPTIONAL EQUIPMENT to be BASIS for Price Proposal evaluation	$10,048,766
4.0		Total Price for CONTRACT for 295 Base Buy Buses, for 150 up to 305 Option Buy Buses, and Optional Vehicle Configuration for Optional Equipment combined to be the overall BASIS for Price Proposal evaluation	

In U.S. Dollars Using Words: FOUR-HUNDRED THIRTEEN MILLION NINE HUNDRED EIGHTY EIGHT THOUSAND SIX HUNDRED THIRTY ONE DOLLARS

In U.S. Dollars Using Figures: $414,692,560

(Signature of Person Executing Proposal)

3/12/12
Date

TONY WAYNE VICE PRESIDENT & GENERAL MANAGEI
Type Name, Title

GROUP A - UP TO 600 40' CNG BUSES
FORM PF-1A (CNG - 40')
SUBSYSTEM EQUIPMENT
CONTRACT MODIFICATION NO. 5

Contractor: ELDORADO NATIONAL (CALIFORNIA), INC
Contract No.: OP28367-000

NO.	DESCRIPTION	BASE BUY OF ITEM		
1	Purchased Subsystem Equipment (Items 1.1 through 1.99) **			
1.1	TS 9.	Propulsion Power Assembly (PPA)***		$18,372
1.2	TS 9.	Engine		$60,324
1.3	TS 10.	Cooling System		$12,650
1.4	TS 18.	Fuel System		$68,300
1.5	TS 31.	Suspension		$19,950
1.6	TS 33.	Steering System		$4,950
1.7	TS 37.	Brakes		$3,260
1.8	TS 39.	Pneumatic System		$6,850
1.9	TS 42.	Charging System		$36,800
1.10	TS 44.	Multiplex Control System		$24,200
1.11	TS 54.	HVAC Climate Control System		$29,450
1.12	TS 78.	Passenger Seats		$28,955
1.13	TS 80.	Doors		$14,830
1.14	TS 81.	Accessibility Provisions		$19,740
1.15	TS 86.	Communications		$3,244
1.16	TS 11	Transmission		$14,261
1.17	TS 78.1	USB Passenger Charging Port		$480
1.18	TS85.1	Wirelesss Stop Request Button		$485
1.19	TS 86.3	Matrix APC		$4,596
1.99	TS 34	Meritor Rear Axle Upgrade		$1,040
		All other bus subsystem equipment not included above		$242,260
	TOTAL CNG BUS PRICE			* $614,997.25

* Transfer Total CNG Bus Price to Contract Price Summary Form (PF-1 - Unit Price column, line Item 1 - **Base Buy**

Notes: 1. ** Price shall include design, engineering, manufacturing/assembly, testing, shipping, profit and other associated costs. Price for each subsystem equipment shall include all applicable apparatus.

2. Price for line Item Nos. 1a-27 in the CONTRACT PRICE SUMMARY(Form PF-1) shall not be included in computing price of any of the line items above.

3. *** PPA unit price for line item 1.1 excludes prices for items 1.2 through 1.99

GROUP A - UP TO 600 40' CNG BUSES
FORM PF-1A (CNG - 40')
SUBSYSTEM EQUIPMENT
CONTRACT MODIFICATION NO. 5

NO.	DESCRIPTION	OPTION BUY OF ITEM		
2	Purchased Subsystem Equipment (Items 2.1 through 2.99) **			
2.1	TS 9.	Propulsion Power Assembly (PPA)***		$18,372
2.2	TS 9.	Engine		$60,324
2.3	TS 10.	Cooling System		$12,650
2.4	TS 18.	Fuel System		$68,300
2.5	TS 31.	Suspension		$19,950
2.6	TS 33.	Steering System		$4,950
2.7	TS 37.	Brakes		$3,260
2.8	TS 39.	Pneumatic System		$6,850
2.9	TS 42.	Charging System		$36,800
2.10	TS 44.	Multiplex Control System		$24,200
2.11	TS 54.	HVAC Climate Control System		$29,450
2.12	TS 78.	Passenger Seats		$28,955
2.13	TS 80.	Doors		$14,830
2.14	TS 81.	Accessibility Provisions		$19,740
2.15	TS 86.	Communications		$3,244
2.16	TS 11	Transmission		$14,261
2.17	TS 78.1	USB Passenger Charging Port		$480
2.18	TS85.1	Wirelesss Stop Request Button		$485
2.19	TS 86.3	Matrix APC		$4,596
1.99	TS 34	Meritor Rear Axle Upgrade		$1,040
		All other bus subsystem equipment not included above		$242,260

TOTAL CNG BUS PRICE OPTION QUANTITY $614,997

*Transfer Total CNG Bus Price to Contract Price Summary Form (PF-1 - Unit Price column, -line item 10 - Option Buy)

Notes: 1. ** Price shall include design, engineering, manufacturing/assembly, testing, shipping, profit and other associated costs. Price for each subsystem equipment shall include all applicable apparatus.

2. Price for line Item Nos. 1-9 and 10a-27 in the CONTRACT PRICE SUMMARY(Form PF-1) shall not be included in computing price of any of the line items above.

3. *** PPA unit price for line item 2.1 excludes prices for items 2.2 through 2.99

(Signature of Person Executing Proposal) 3/12/12 Date

TONY WAYNE /VICE PRESIDENT & GENERAL MANAGER
Type Name, Title

Los Angeles County
Metropolitan Transportation Authority

One Gateway Plaza
Los Angeles, CA 90012-2952

213.922.2000 Tel
metro.net

Metro

MAEL-024 **Response Required: No**

Date: May 3, 2018

File Nos.:

Action Item(s):

CDRL:

Richard Himes
Contract Administration Manager
Eldorado National (California), Inc. (ENC)
9670 Galena Street
Riverside, CA 92509

SUBJECT: **EXECUTED CONTRACT MODIFICATION NO. 5**
OP28367-000 40' LOW FLOOR CNG TRANSIT BUSES

Reference: MAEL-022, 023, ELMA-026

Dear Mr. Himes:

Enclosed is your executed original of the subject modification.

If you have any questions, I can be reached at 213.922.7334 or e-mail at hernandezel@metro.net.

Sincerely,

Elizabeth Hernandez
Principal Contract Administrator

cc: Wayne Okubo
Kwesi Annan
Phil Rabottini

CDRL NO.: n/a

LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY

CONTRACT NO. OP28367-000, CONTRACT MODIFICATION NO.: 6

FOR: FORTY FOOT (40') LOW FLOOR CNG TRANSIT BUSES

This Contract Modification No. 6 to Contract No.: OP28367-000 is made effective on the 23rd day of April 2018 by and between the LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY, hereinafter referred to as "MTA", and EL DORADO NATIONAL (CALIFORNIA), INC., hereinafter referred to as "CONTRACTOR".

WHEREAS, CONTRACTOR and MTA entered into Contract No.: OP28367-000 effective August 15, 2017, as amended by Contract Modification No. 1, dated November 6, 2017, Contract Modification No. 2, dated December 6, 2017, Contract Modification No. 3 dated December 27, 2017, Contract Modification No. 4 dated January 19, 2018, and Contract Modification No. 5 dated February 12, 2018 (the "Existing Contract") and;

WHEREAS, CONTRACTOR and MTA desire to modify the Existing Contract as provided herein;

Now, therefore, it is mutually agreed, by and between the parties as follows:

1. Revise SP-05 as follows:

SP-05 APPROVED SUBCONTRACTORS

Subcontractor	Services Performed	DBE/ MBE/ WBE
~~Amerex~~ Kidde Technologies, Inc.	Methane Gas Detection System	

Except as expressly amended hereby, the Existing Contract remains in full force and effect as originally executed.

IN WITNESS WHEREOF, the parties have caused this Contract Modification No. 6 to the Existing Contract to be executed by their respective officers duly authorized on the date first written above.

EL DORADO NATIONAL (CALIFORNIA), INC.

By: _____
Signature

TONY WAYNE
Type or Print Name

4/30/18
Date

LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY
Philip A. Washington
Chief Executive Officer

By: _____
Elizabeth Hernandez
Principal Contract Administrator

5/3/18
Date

Los Angeles County
Metropolitan Transportation Authority

One Gateway Plaza
Los Angeles, CA 90012-2952

213.922.2000 Tel
metro.net

Metro

MAEL-030 **Response Required:** No

Date: October 12, 2018

File Nos.:

Action Item(s):

CDRL:

Richard Himes
Contract Administration Manager
Eldorado National (California), Inc. (ENC)
9670 Galena Street
Riverside, CA 92509

SUBJECT: **EXECUTED CONTRACT MODIFICATION NO. 7**
OP28367-000 40' LOW FLOOR CNG TRANSIT BUSES

Reference: MAEL-029, 023, ELMA-044; 046

Dear Mr. Himes:

Enclosed is your executed original of the subject modification.

If you have any questions, I can be reached at 213.922.7334 or e-mail at hernandezel@metro.net.

Sincerely,

Elizabeth Hernandez
Principal Contract Administrator

cc: Wayne Okubo
Kwesi Annan

CDRL NO.: n/a

LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY

CONTRACT NO. OP28367-000, CONTRACT MODIFICATION NO.: 7

FOR: FORTY FOOT (40') LOW FLOOR CNG TRANSIT BUSES

This Contract Modification No. 7 to Contract No.: OP28367-000 is made effective on the 3RD day of October 2018 by and between the LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY, hereinafter referred to as "MTA", and EL DORADO NATIONAL (CALIFORNIA), INC., hereinafter referred to as "CONTRACTOR".

WHEREAS, CONTRACTOR and MTA entered into Contract No.: OP28367-000 effective August 15, 2017, as amended by Contract Modification No. 1, dated November 6, 2017, Contract Modification No. 2, dated December 6, 2017, Contract Modification No. 3 dated December 27, 2017, Contract Modification No. 4 dated January 19, 2018, Contract Modification No. 5 dated February 12, 2018 and Contract Modification No. 6 dated April 23, 2018 (the "Existing Contract") and;

WHEREAS, CONTRACTOR and MTA desire to modify the Existing Contract as provided herein;

Now, therefore, it is mutually agreed, by and between the parties as follows:

1. Change bike rack from Sportsworks Apex 3 to Byk Rak 3 position for an aggregate decrease of $102,361, inclusive of applicable taxes, in the total Contract Price from $199,047,689 to $198,945,328. Article IV COMPENSATION shall read as follows:

ARTICLE IV: COMPENSATION

A. Contract Price

1. In consideration of the Contractor's full performance of the Work, and in accordance with the terms of the Contract, Metro will pay the Contractor the Contract Price of $198,945,328 ~~$199,047,689~~ inclusive of tax and delivery as provided in this Article and in the Contract Document entitled Compensation and Payment Provisions.

Contract Options may be exercised unilaterally by LACMTA in accordance with Special Provisions Article SP-28, Options.

2. Revised Pricing Forms: PF 1, PF-1A and PF 2 as attached to this modification no. 7.

Except as expressly amended hereby, the Existing Contract remains in full force and effect as originally executed.

IN WITNESS WHEREOF, the parties have caused this Contract Modification No. 7 to the Existing Contract to be executed by their respective officers duly authorized on the date first written above.

EL DORADO NATIONAL (CALIFORNIA), INC.

By: _____

LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY
Philip A. Washington

Signature

Tony Wayne

Type or Print Name

10/10/18

Date

Chief Executive Officer

By: Elizabeth Hernandez

Elizabeth Hernandez

Principal Contract Administrator

10/12/18

Date

GROUP A - UP TO 600 40' CNG BUSES
FORM PF-1 (CNG - 40') - CONTRACT PRICE SUMMARY
Contract Modification No.: 7

Proposer: ELDORADO NATIONAL (CALIFORNIA), INC.

Contract No.: OP28367-000

Contract Title: FORTY FOOT (40') LOW FLOOR CNG BUS PROCUREMENT

1.0 CONTRACT FOR 295 BUSES (BASE BUY)

No.	Qty.	Description of Item		Unit Price	Taxable Unit Price	Total Price
1	295	40' Low Floor CNG Buses (Base Buy) from PF-1A	Values derived from PF-1A*:	$594,941.09	$614,681	$181,330,921.55
1a	Lot	Manuals (Base Buy) (TS 5.6.4)		$2,281.50	Lump Sum	$23,400.00
1b	295	Vehicle Delivery Charge for Base Buy	Value of all taxable delivery charges per bus**:		$275.00	$81,125.00
1c		Tax (Base Buy)		9.75%	$58,006.76	$17,114,275
2	2	Pilot Buses Retrofit with Rear Axle Upgrade			$8,600	$17,201
2a		Tax		9.75%	$838.55	$1,677
3	Lot	Reserved				
4	Lot	Reserved				
5	Lot	Reserved				
6	Lot	Reserved				
7	Lot	Performance Bond (Base Buy)			Lump Sum	$119,336.00
8	1,000	Total Training Hours for Base Buy***			$175,000.00	
8a	900	Contractor (Proposer/Prime) Base Buy			$175.00	$157,500.00
8b	100	Subcontractor/Supplier Base Buy			$175.00	$17,500.00
9	1	System Management Tool for use at up to (13) MTA Operating Divisions per TS 86.1			$74,930.00	$74,930.00
10a	15	Special Towing Equipment (TS 25)			$386.00	$5,790.00
10b		Tax		9.75%	$37.64	$564.53
11a	2	Rear Recovery Devices/Tie Downs (TS 25)			$505.00	$1,010.00
11b		Tax		9.75%	$49.24	$98.48

1.0 Total Price for CONTRACT for 295 Base Buy Buses (Sum of Items "1" through "11b") to be the BASIS for Price Proposal evaluation

In U.S. Dollars Using Words: ONE HUNDRED NINETY-EIGHT MILLION NINE HUNDRED FORTY FIVE THOUSAND THREE HUNDRED TWENTY EIGHT DOLLARS

In U.S. Dollars Using Figures: $198,945,328

GROUP A - UP TO 600 40' CNG BUSES
FORM PF-1 (CNG - 40') - CONTRACT PRICE SUMMARY
Contract Modification No.: 7

Proposer: ELDORADO NATIONAL (CALIFORNIA), INC.

Contract No.: OP28367-000

Contract Title: FORTY FOOT (40') LOW FLOOR CNG BUS PROCUREMENT

NOTE

* Taxable Unit Price is the Unit Price less 1.14 Accessibility Provisions on PF-1A

** Input the taxable portion of the Delivery Charge under the Taxable Unit Price column and the total Delivery Charge under the Unit Price column

*** Training Hours for Base Buy are only estimates and not a guaranteed level of effort. The total for this Line is a Not-to-Exceed provisional amount.

GROUP A - UP TO 600 40' CNG BUSES
FORM PF-1 (CNG - 40') - CONTRACT PRICE SUMMARY
Contract Modification No.: 7

Proposer: ELDORADO NATIONAL (CALIFORNIA), INC.

Contract No.: OP28367-000

Contract Title: FORTY FOOT (40') LOW FLOOR CNG BUS PROCUREMENT

2.0 CONTRACT FOR 150 UP TO 305 BUSES (OPTION BUY)

No.	Qty.	Description of Item		Taxable Unit Price	Unit Price	Total Price
10	305	40' Low Floor CNG Buses (Option Buy) from PF-1A for 150 to 305 vehicles*		$594,941.22	$614,681	$187,477,732.45
10a	Lot	Manuals (Option Buy) (TS 5.6.4)***		$2,281.50	Lump Sum	$23,400.00
10b	305	Vehicle Delivery Charge for Option Buy	Value of all taxable delivery charges per bus**:	$0.00	$275.00	$83,875.00
10c		Tax (Option Buy)		9.75%	$58,006.77	$17,694,346.03
11		Reserved			$	$
12	Lot	Performance Bond for Option Buy***			Lump Sum	$123,421.00
13	500	Total Training Hours for Option Buy****			$87,500.00	
13a	450	Contractor (Proposer/Prime) Option Buy			$175.00	$78,750.00
13b	50	Subcontractor/Supplier Option Buy			$175.00	$8,750.00
14		Reserved			$	$

2.0 Total Price for CONTRACT for 150 Up to 305 Option Buy Buses (Sum of Items "10" through "14") to be the BASIS for Price Proposal evaluation

In U.S. Dollars Using Words: TWO-HUNDRED FIVE MILLION FOUR HUNDRED NINETY THOUSAND TWO HUNDRED SEVENTY FOUR DOLLARS

In U.S. Dollars Using Figures: $205,490,274

NOTE
- * Taxable Unit Price is the Unit Price less 1.14 Accessibility Provisions on PF-1A
- ** Input the taxable portion of the Delivery Charge under the Taxable Unit Price column and the total Delivery Charge under the Unit Price column
- *** For proposal purposes only, Manuals and Bond prices are for all 305 bus Options exercised. Actual cost will depend on Option quantity ordered.
- **** Training Hours for Option Buy are only estimates and not a guaranteed level of effort. The total for this Line is a Not-to-Exceed provisional amount.

GROUP A - UP TO 600 40' CNG BUSES
FORM PF-1 (CNG - 40') - CONTRACT PRICE SUMMARY
Contract Modification No.: 7

Proposer: ELDORADO NATIONAL (CALIFORNIA), INC.

Contract No.: OP28367-000

Contract Title: FORTY FOOT (40') LOW FLOOR CNG BUS PROCUREMENT

3.0 OPTIONAL VEHICLE CONFIGURATION

No.	Qty.	Description of Item		Unit Price	Total Price
15	1	3 ADA Securement Configuration TS 81.5 (Total 15a - 15d)			$6,370.00
15a		Direct Materials/Equipment		$5,750.00	
15b		Labor Installation Costs		$620.00	
15c		Non Recurring Cost		$0.00	
15d		Other Costs (Identify)		$0.00	
16	1	4 ADA Securement Configuration TS 81.5 (Total 16a - 16d)			$10,170.00
16a		Direct Materials/Equipment		$9,150.00	
16b		Labor Installation Costs		$1,020.00	
16c		Non Recurring Cost		$0.00	
16d		Other Costs (Identify)		$0.00	
17	600	Reserved****			
17a	295	Reserved			
17b	305	Reserved			
18	600	25-Year Certified CNG Tanks			$522,000.00
18a	295	25 Yr Certified CNG Tanks for Base Buy	$256,650.00	$870.00	
18b	305	25 Yr Certified CNG Tanks for Option Buy for 150 up to 305 vehicles	$265,350.00	$870.00	
19	600	Complete Automatic Passenger Counter System TS 86.3 (Total 19a - 19h)			$2,757,600.00
19a	295	Direct Materials/Equipment for Base Buy APC		$4,136.00	
19b	295	Labor Installation Costs for Base Buy APC		$460.00	

GROUP A - UP TO 600 40' CNG BUSES
FORM PF-1 (CNG - 40') - CONTRACT PRICE SUMMARY
Contract Modification No.: 7

Proposer: ELDORADO NATIONAL (CALIFORNIA), INC.

Contract No.: OP28367-000

Contract Title: FORTY FOOT (40') LOW FLOOR CNG BUS PROCUREMENT

19c	295	Non Recurring Cost for Base Buy APC		$	
19d	295	Other Costs (Identify) for Base Buy APC		$	
		Total for Base Buy APC	$1,355,820.00	$4,596.00	
19e	305	Direct Materials/Equipment for Option Buy APC for 150 up to 305 vehicles		$4,136.00	
19f	305	Labor Installation Costs for Option Buy APC for 150 up to 305 vehicles		$460.00	
19g	305	Non Recurring Cost for Option Buy APC for 150 up to 305 vehicles		$	
19h	305	Other Costs (Identify) for Option Buy APC for 150 up to 305 vehicles		$	
		Total for Option Buy APC for 150 up to 305 vehicles	$1,401,780.00	$4,596.00	
20	600	Enhanced 360 degree Camera System TS 86.1 (Total 20a - 20h)			$579,000.00
20a	295	Direct Materials/Equipment for Base Buy Enhanced Camera System		$869.00	
20b	295	Labor Installation Costs for Base Buy Enhanced Camera System		$96.00	
20c	295	Non Recurring Cost for Base Buy Enhanced Camera System		$	
20d	295	Other Costs (Identify) for Base Buy Enhanced Camera System		$	
		Total for Base Buy Enhanced Camera System	$284,675.00	$965.00	
20e	305	Direct Materials/Equipment for Option Buy Enhanced Camera System for 150 up to 305 vehicles		$869.00	
20f	305	Labor Installation Costs for Option Buy Enhanced Camera System for 150 up to 305 vehicles		$96.00	
20g	305	Non Recurring Cost for Option Buy Enhanced Camera System for 150 up to 305 vehicles		$	
20h	305	Other Costs (Identify) for Option Buy Enhanced Camera System for 150 up to 305 vehicles		$	
		Total for Option Buy Enhanced Camera System for 150 up to 305 vehicles	$294,325.00	$965.00	
21	600	USB Ports for Passenger Charging Only			$288,000.00
21a	295	USB Ports for Passenger Charging Only for Base Buy	$141,600.00	$480.00	
21b	305	USB Ports for Passenger Charging Only for Option Buy for 150 up to 305 vehicles	$146,400.00	$480.00	

GROUP A - UP TO 600 40' CNG BUSES
FORM PF-1 (CNG - 40') - CONTRACT PRICE SUMMARY
Contract Modification No.: 7

Proposer: ELDORADO NATIONAL (CALIFORNIA), INC.

Contract No.: OP28367-000

Contract Title: FORTY FOOT (40') LOW FLOOR CNG BUS PROCUREMENT

22	600	Optional Wireless Stop Request Switches (Bus set)			$291,000.00
22a	295	Optional Wireless Stop Request Switches (Bus set) for Base Buy	$143,075.00	$485.00	
22b	305	Optional Wireless Stop Request Switches (Bus set) for Option Buy for 150 up to 305 vehicles	$147,925.00	$485.00	
23	600	Optional Full Color Destination Sign Sets (TS 86.3)			$2,070,000.00
23a	295	Optional Full Color Destination Sign Sets (TS 86.3) for Base Buy	$1,017,750.00	$3,450.00	
23b	305	Optional Full Color Destination Sign Sets (TS 86.3) for Option Buy for 150 up to 305 vehicles	$1,052,250.00	$3,450.00	
24	Lot	Spare Parts (From Schedule A, Form PF-2)			$2,203,445.65
25	Lot	Special Tools (Schedule B Form PF-3)			$7,710.00
26	Lot	Diagnostic Test Equipment (Schedule C, Form PF-4)			$355,010.00
27	Lot	Training Aids (Schedule D, Form PF-5)			$958,460.00

3.0 Total Price for OPTIONAL VEHICLE CONFIGURATION (Sum of Items "15 through 27") for OPTIONAL EQUIPMENT to be BASIS for Price Proposal evaluation.

In U.S. Dollars Using Words: TEN-MILLION FORTY EIGHT THOUSAND SEVEN HUNDRED SIXTY FIVE DOLLARS & SIXTY-FIVE CENTS

In U.S. Dollars Using Figures: $10,048,765.65

**** Proposer shall provide base Low Nox Engine for each bus with the following Emission Levels:
ISLG engine is not the base engine requirement. Low Nox engine is the base requirement and therefore no longer an option.

Oxides of Nitrogen (NOx) Grams per brake horsepower-hour	Particulate Matter (PM) grams per brake horsepower hour
0.02	0.01

GROUP A - UP TO 600 40' CNG BUSES
FORM PF-1 (CNG - 40') - CONTRACT PRICE SUMMARY
Contract Modification No.: 7

Proposer: ELDORADO NATIONAL (CALIFORNIA), INC.

Contract No.: OP28367-000

Contract Title: FORTY FOOT (40') LOW FLOOR CNG BUS PROCUREMENT

4.0 CONTRACT FOR BASE BUY, OPTION BUY, AND OPTIONALVEHICLE CONFIGURATION

No.	Qty.	Description of Item	Total Price
1.0		Total Price for CONTRACT for 295 Base Buy Buses to be the BASIS for Price Proposal evaluation	$198,945,328
2.0		Total Price for CONTRACT for 150 Up to 305 Option Buy Buses to be the BASIS for Price Proposal evaluation	$205,490,274
3.0		Total Price for OPTIONAL VEHICLE CONFIGURATION for OPTIONAL EQUIPMENT to be BASIS for Price Proposal evaluation	$10,048,766
4.0		Total Price for CONTRACT for 295 Base Buy Buses, for 150 up to 305 Option Buy Buses, and Optional Vehicle Configuration for Optional Equipment combined to be the overall BASIS for Price Proposal evaluation	

In U.S. Dollars Using Words: FOUR-HUNDRED FOURTEEN MILLION FOUR HUNDRED EIGHTY FOUR THOUSAND THREE HUNDRED SIXTY EIGHT DOLLARS

In U.S. Dollars Using Figures: $414,484,368

(Signature of Person Executing Proposal) 05/10/12 Date

TONY WAYNE VICE PRESIDENT & GENERAL MANAGEI
Type Name, Title

GROUP A - UP TO 600 40' CNG BUSES
FORM PF-1A (CNG - 40')
SUBSYSTEM EQUIPMENT
CONTRACT MODIFICATION NO. 7

Contractor: ELDORADO NATIONAL (CALIFORNIA), INC
Contract No.: OP28367-000

NO.	DESCRIPTION	BASE BUY OF ITEM		
1	Purchased Subsystem Equipment (Items 1.1 through 1.99) **			
1.1	TS 9.	Propulsion Power Assembly (PPA)***		$18,372
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1.18	TS85.1	Wirelesss Stop Request Button		$485
1.19	TS 86.3	Matrix APC		$4,596
1.99	TS 34	Meritor Rear Axle Upgrade		$1,040
		All other bus subsystem equipment not included above		$241,944
	TOTAL CNG BUS PRICE			*$614,681

* Transfer Total CNG Bus Price to Contract Price Summary Form (PF-1 - Unit Price column, line Item 1 - Base Buy

Notes:
1. ** Price shall include design, engineering, manufacturing/assembly, testing, shipping, profit and other associated costs. Price for each subsystem equipment shall include all applicable apparatus.
2. Price for line Item Nos. 1a-27 in the CONTRACT PRICE SUMMARY(Form PF-1) shall not be included in computing price of any of the line items above.
3. *** PPA unit price for line item 1.1 excludes prices for items 1.2 through 1.99

GROUP A - UP TO 600 40' CNG BUSES
FORM PF-1A (CNG - 40')
SUBSYSTEM EQUIPMENT
CONTRACT MODIFICATION NO. 7

NO.	DESCRIPTION	OPTION BUY OF ITEM		
2	Purchased Subsystem Equipment (Items 2.1 through 2.99) **			
2.1	TS 9.	Propulsion Power Assembly (PPA)***		$18,372
2.2	TS 9.	Engine		$60,324
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2.19	TS 86.3	Matrix APC		$4,596
1.99	TS 34	Meritor Rear Axle Upgrade		$1,040
		All other bus subsystem equipment not included above		$241,944
	TOTAL CNG BUS PRICE OPTION QUANTITY			$614,681

*Transfer Total CNG Bus Price to Contract Price Summary Form (PF-1 - Unit Price column, line item 10 - Option Buy)

Notes: 1. ** Price shall include design, engineering, manufacturing/assembly, testing, shipping, profit and other associated costs. Price for each subsystem equipment shall include all applicable apparatus.

2. Price for line Item Nos. 1-9 and 10a-27 in the CONTRACT PRICE SUMMARY(Form PF-1) shall not be included in computing price of any of the line items above.

3. *** PPA unit price for line item 2.1 excludes prices for items 2.2 through 2.99

(Signature of Person Executing Proposal) — Date: 10/10/18

TONY WAYNE /VICE PRESIDENT & GENERAL MANAGER
Type Name, Title

GROUP A - UP TO 600 40' CNG BUSES
FORM PF-2 (CNG- 40') - SCHEDULE A OF PRICES SPARE PARTS (OPTIONAL)
CONTRACT MODIFICATION NO. 7

CONTRACTOR: ELDORADO NATIONAL (CALIFORNIA), INC.
Contract No.: OP28367-000
Contract Title: FORTY FOOT (40') LOW FLOOR CNG BUS PROCUREMENT

NO.	UNIT	DESCRIPTION OF ITEM	QTY	UNIT PRICE	TOTAL PRICE
LOW NOX ENGINE					
1	Ea.	Propulsion Power Assembly (See Definition in SP-1)	3	$86,270.00	$258,810.00
2	Ea.	Air Compresser	5	$6,760.00	$33,800.00
3	Ea.	Turbo	3	$1,982.00	$5,946.00
4	Ea.	EGR Cooler	20	$1,110.47	$22,209.40
5	Ea.	EGR Valve	10	$610.68	$6,106.80
6	Ea.	Delta P Sensor	10	$347.66	$3,476.60
7	Ea.	Mass. Air Flow Sensor	10	$1,067.56	$10,675.60
8	Ea.	Oxygen Sensor	20	$223.61	$4,472.20
9	Ea.	Catalyst	5	$3,574.95	$17,874.75
10	Ea.	Cylinder Head	5	$4,513.81	$22,569.05
11	Ea.	Pistons Kits	60	$325.00	$19,500.00
12	Bus Set	Rod Bearings	10	$64.00	$640.00
13	Bus Set	Main Bearing	10	$219.27	$2,192.70
14	Ea.	Liners	60	$191.87	$11,512.20
15	Ea.	Head Gasket	5	$428.75	$2,143.75
16	Ea.	Upper Gasket Set	5	$844.99	$4,224.95
17	Ea.	Oil Pan Gasket	20	$133.60	$2,672.00
18	Ea.	Stiffener Plate Gasket	20	$92.85	$1,857.00
19	Ea.	Oil Pan	5	$505.51	$2,527.55
20	Ea.	Throttle Actuator	5	$574.16	$2,870.80
21	Ea.	Fuel Control Valve	10	$1,429.19	$14,291.90
22	Ea.	Ignition Control Module	10	$1,648.45	$16,484.50
23	Ea.	Ignition Coils	120	$175.23	$21,027.60
24	Ea.	Engine Harness	5	$1,493.62	$7,468.10
25	Ea.	Ignition Harness	10	$167.53	$1,675.30
26	Ea.	Oil Cooler	5	$179.73	$898.65
27	Ea.	Lube Pump	5	$275.51	$1,377.55
28	Ea.	Front Crank Seal	10	$30.54	$305.40
29	Ea.	Rear Seal	10	$28.65	$286.50
30	Ea.	Water Pump	10	$175.03	$1,750.30
31	Ea.	Vibration Damper	10	$344.21	$3,442.10
32	Ea.	Belt Tensioner (If applicable)	20	$145.47	$2,909.40
33	Ea.	CoolantTermperature Sensor	20	$11.21	$224.20
34	Ea.	Oil Pressure Sensor	10	$98.10	$981.00
35	Ea.	Fuel Pressure Sensor	10	$144.34	$1,443.40
36	Ea.	Low Fuel Pressure Regulator	10	$1,222.22	$12,222.20
37	Ea.	Engine Cradle	5	$1,420.00	$7,100.00
38	Ea.	Belt Guard	5	$358.80	$1,794.00
39	Ea.	Complete Engine Package (See definition in TS-2)	4	$66,430.00	$265,720.00
40	Bus Set	Spark Plugs	15	$42.02	$630.30
41	Bus Set	Adaptation Kit (Eng to Trans)	3	$1,066.00	$3,198.00
42	Ea.	PPA Dollies	8	$685.00	$5,480.00
COOLING SYSTEM					
1	Ea.	Radiator Packages (See definition in TS-2)	5	$7,715.00	$38,575.00
2	Ea.	Thermal Management Controllers	5	$598.32	$2,991.60
3	Bus Set	Fan Resistors	20	$48.60	$972.00
4	Bus Set	CAN Interface Cables	5	$101.25	$506.25
5	Ea.	Fan Reversal LED Panel	5	$593.39	$2,966.95
6	Ea.	Fan Assembly	30	$40.66	$1,219.80
7	Ea.	Coolant Reservoir	10	$556.20	$5,562.00
8	Ea.	Transmission Cooler	10	$648.00	$6,480.00
9	Bus Set	Pressure Relief Valve	20	$23.85	$477.00
10	Ea.	Radiator Cap	30	$5.27	$158.10
11	Ea.	Coolant Overflow Tank	10	$36.29	$362.90

GROUP A - UP TO 600 40' CNG BUSES
FORM PF-2 (CNG- 40') - SCHEDULE A OF PRICES SPARE PARTS (OPTIONAL)
CONTRACT MODIFICATION NO. 7

CONTRACTOR: ELDORADO NATIONAL (CALIFORNIA), INC.
Contract No.: OP28367-000
Contract Title: FORTY FOOT (40') LOW FLOOR CNG BUS PROCUREMENT

NO.	UNIT	DESCRIPTION OF ITEM	QTY	UNIT PRICE	TOTAL PRICE
CHARGING SYSTEM					
1	Ea.	Alternator	10	$9,750.00	$97,500.00
2	Ea.	Voltage Regulators	10	$351.00	$3,510.00
3	Ea.	Batteries	40	$203.77	$8,150.80
4	Ea.	Battery Equilizer	20	$418.50	$8,370.00
5	Ea.	Battery Disconnect	10	$31.82	$318.20
6	Ea.	Battery Separator	5	$297.00	$1,485.00
7	Ea.	Power Distribution Panel in Battery Compartment	5	$267.30	$1,336.50
8	Ea.	Low Voltage Disconnect	10	$44.55	$445.50
9	Ea.	Circuit Breaker 80A	20	$31.59	$631.80
10	Ea.	Circuit Breaker 100A	20	$39.15	$783.00
11	Ea.	Circuit Breaker 120A or 130A, whichever applies	20	$49.95	$999.00
12	Bus Set	Fuse and Circuit Breaker Panels	5	$310.50	$1,552.50
SUSPENSION					
1	Bus Set	Air Ride Beams	10	$2,310.00	$23,100.00
2	Bus Set	Air Bags	20	$672.00	$13,440.00
3	Ea.	Front Axle	10	$4,879.85	$48,798.50
4	Ea.	Rear Axle	10	$3,946.07	$39,460.70
5	Bus Set	Radius Rods	5	$412.80	$2,064.00
6	Bus Set	Shocks	10	$383.68	$3,836.80
7	Bus Set	Leveling Valve Front	10	$191.81	$1,918.10
8	Bus Set	Leveling Valve Rear	10	$191.81	$1,918.10
DRIVE TRAIN					
1	Ea.	Transmission	5	$14,261.00	$71,305.00
2	Ea.	TCM Programmed	5	$611.00	$3,055.00
3	Ea.	Adaptation Kit (Trans to Eng)	2	$1,066.00	$2,132.00
4	Ea.	Drive Shaft	10	$544.00	$5,440.00
5	Ea.	Differential	15	$6,972.00	$104,580.00
STEERING SYSTEM					
1	Bus Set	Steering Gear and Linkage	10	$1,172.50	$11,725.00
2	Ea.	Steering Column	10	$596.77	$5,967.70
3	Ea.	Steering Shaft	10	$135.30	$1,353.00
4	Ea.	Steering Box Assembly	10	$277.78	$2,777.80
5	Ea.	Power Steering Gear Assembly	10	$893.97	$8,939.70
PNEUMATIC SYSTEM					
1	Bus Set	Air Tanks (Complete Sets)	10	$352.00	$3,520.00
2	Ea.	Air Dryer	10	$400.66	$4,006.60
3	Ea.	Air Governor	10	$68.80	$688.00
4	Bus Set	Pressure Reducing Valves	10	$28.80	$288.00
5	Bus Set	Check Valves	10	$57.60	$576.00
6	Bus Set	Brake Control Valve	10	$46.40	$464.00
7	Bus Set	Brake Pedal Valve	10	$134.54	$1,345.40
8	Bus Set	Quick Release Valve	10	$17.60	$176.00
9	Bus Set	Parking Relay Valve	10	$57.60	$576.00
10	Bus Set	Parking Control Valve	10	$46.40	$464.00
11	Bus Set	Air Brake Tubing	10	$134.54	$1,345.40
12	Bus Set	Solenoid Valve Assembly	10	$17.60	$176.00
FUEL SYSTEM					
1	Bus Set	Fuel Cylinder Assembly	2	$68,300.00	$136,600.00
2	Ea.	Fill Manifold	2	$592.00	$1,184.00

GROUP A - UP TO 600 40' CNG BUSES
FORM PF-2 (CNG- 40') - SCHEDULE A OF PRICES SPARE PARTS (OPTIONAL)
CONTRACT MODIFICATION NO. 7

CONTRACTOR: ELDORADO NATIONAL (CALIFORNIA), INC.
Contract No.: OP28367-000
Contract Title: FORTY FOOT (40') LOW FLOOR CNG BUS PROCUREMENT

NO.	UNIT	DESCRIPTION OF ITEM	QTY	UNIT PRICE	TOTAL PRICE
3	Bus Set	Shut Off Valve Assembly	5	$440.00	$2,200.00
4	Bus Set	PRD'S	10	$134.40	$1,344.00
5	Ea.	High Fuel Pressure Regulator	20	$600.00	$12,000.00
6	Bus Set	Defueling Valves	5	$1,560.00	$7,800.00
7	Ea.	Low/High Pressure Filer Assembly	5	$704.00	$3,520.00
8	Bus Set	Fuel Pressure Gauges	10	$88.00	$880.00
9	Bus Set	Defueling Switches	5	$41.60	$208.00
10	Bus Set	Manifold Shut Off Valve Assembly	10	$325.00	$3,250.00
11	Bus Set	Solenoid Valve Assembly	10	$376.00	$3,760.00
12	Bus Set	Fuel Line Assembly	10	$576.00	$5,760.00
13	Ea.	Low Pressure Sensor	20	$144.00	$2,880.00
14	Ea.	Proximity Switch @ the Fuel Fill Door	20	$7.94	$158.80
15	Bus Set	Fuel Line Assembly	5	$576.00	$2,880.00
16	Bus Set	Vent Tubes	5	$137.60	$688.00
17	Ea.	Control Harness	5	$240.00	$1,200.00
18	Ea.	Proximity Switch @ the Fast Fill Recepticle	20	$7.94	$158.80
DOORS					
1	Bus Set	Complete Base Plate and Operator Assembly	5	$1,920.00	$9,600.00
2	Bus Set	Front/Rear Turning Shaft Assembly	5	$1,864.00	$9,320.00
3	Bus Set	Door Panels	5	$6,387.00	$31,935.00
4	Bus Set	Door Glass	2	$1,816.00	$3,632.00
BODY INTERIOR					
1	Bus Set	Interior AVA Sign Assembly	5	$1,580.00	$7,900.00
2	Ea.	Destination Sign Controller	2	$512.00	$1,024.00
3	Ea.	Next Stop Sign	5	$256.00	$1,280.00
4	Bus Set	Interior Speaker Assembly	10	$192.00	$1,920.00
5	Ea.	Microphone Hand Set	5	$92.80	$464.00
6	Ea.	Visor/Sun Shade(s) Front & Side	10	$316.80	$3,168.00
7	Bus Set	Access Panels	5	$960.00	$4,800.00
8	Bus Set	Light Covers	5	$916.80	$4,584.00
9	Bus Set	Modesty Panels	10	$880.00	$8,800.00
10	Bus Set	Ceiling Panels	10	$1,472.00	$14,720.00
11	Bus Set	Side Wall Trim Panel	10	$480.00	$4,800.00
12	Bus Set	Floor Covering	5	$2,470.00	$12,350.00
13	Bus Set	Wheelchair Securement Devices	5	$1,248.00	$6,240.00
14	Bus Set	Passenger Seat	4	$34,087.00	$136,348.00
15	Bus Set	Seat Track	2	$388.00	$776.00
16	Ea.	Operator Seat	5	$2,680.00	$13,400.00
17	Ea.	Farebox Grabrail	4	$248.00	$992.00
18	Bus Set	Manual Release Mechanism	6	$47.00	$282.00
19	Bus Set	Passenger Hand Strap	10	$496.00	$4,960.00
20	Ea.	HVAC Return Grill	5	$390.00	$1,950.00
BODY EXTERIOR					
1	Bus Set	Passenger Windows	2	$14,186.40	$28,372.80
2	Bus Set	Replacement Pass Side Window Glass (if not bonded)	2	$4,560.00	$9,120.00
3	Bus Set	Side Window Film or Guards	5	$1,847.00	$9,235.00
4	Bus Set	Windshield	3	$680.00	$2,040.00
5	Bus Set	Operator Window	2	$1,139.68	$2,279.36
6	Bus Set	Access Door Set (excluding engine door and HVAC access door)	3	$2,180.00	$6,540.00
7	Ea.	Engine Door	2	$623.00	$1,246.00
8	Ea.	HVAC Rear Attic Door	2	$428.80	$857.60
9	Ea.	Bike Rack	2	$1,148.00	$2,296.00
10	Ea.	Emergency Roof Hatch	2	$249.20	$498.40
11	Bus Set	Windshield Wiper Assy.	3	$766.96	$2,300.88
12	Ea.	Windsheild Washer Reservoir	2	$52.80	$105.60
13	Bus Set	Mirrors	4	$971.28	$3,885.12
14	Bus Set	Bumper	3	$2,208.00	$6,624.00
15	Bus Set	Mud Guards	3	$104.00	$312.00

GROUP A - UP TO 600 40' CNG BUSES
FORM PF-2 (CNG- 40') - SCHEDULE A OF PRICES SPARE PARTS (OPTIONAL)
CONTRACT MODIFICATION NO. 7

CONTRACTOR: ELDORADO NATIONAL (CALIFORNIA), INC.
Contract No.: OP28367-000
Contract Title: FORTY FOOT (40') LOW FLOOR CNG BUS PROCUREMENT

NO.	UNIT	DESCRIPTION OF ITEM	QTY	UNIT PRICE	TOTAL PRICE
16	Ea.	Head Lights	10	$742.00	$7,420.00
17	Bus Set	Front Turn Signal	10	$54.40	$544.00
18	Bus Set	Side Marker Lights	10	$128.00	$1,280.00
19	Bus Set	Rear Door Lights	10	$64.00	$640.00
20	Bus Set	Under Hood Hazard Lights	10	$115.20	$1,152.00
21	Ea.	License Plate Installation	5	$20.80	$104.00
22	Bus Set	CNG Tank Cover Installation	4	$3,800.00	$15,200.00
23	Bus Set	Exterior Trim (including fender skirts, exit door trim and trim pieces covering joints between body panels)	4	$1,387.00	$5,548.00
CLIMATE CONTROL SYSTEM					
1	Ea.	Compressor	2	$6,800.00	$13,600.00
2	Ea.	Controller	2	$300.00	$600.00
3	Ea.	Evaporator	2	$6,300.00	$12,600.00
4	Ea.	Condensor	2	$410.25	$820.50
5	Ea.	Blower Assembly	4	$555.00	$2,220.00
6	Ea.	Thermostat	2	$55.79	$111.58
7	Ea.	Marine Pump	3	$603.00	$1,809.00
WHEELCHAIR					
1	Bus Set	Ramp Assembly	3	$7,995.00	$23,985.00
2	Bus Set	Valve Assembly	2	$87.00	$174.00
3	Bus Set	Electrical Harness	2	$348.40	$696.80
4	Ea.	Ramp	2	$7,995.00	$15,990.00
5	Ea.	Controller	2	$707.38	$1,414.76
6	Ea.	Motor	3	$819.00	$2,457.00
BRAKES					
1	Bus Set	Pressure Switches (include all for each Bus Set)	10	$585.00	$5,850.00
2	Bus Set	Protection Valve	10	$84.00	$840.00
3	Bus Set	Brake Air Chamber	10	$269.70	$2,697.00
4	Bus Set	Brake Wear Indicator	5	$390.00	$1,950.00
5	Ea.	ABS Electronic Control Unit	5	$388.50	$1,942.50
6	Ea.	ABS Harness	2	$367.50	$735.00
7	Bus Set	ABS Sensor	5	$295.50	$1,477.50
MULTIPLEX CONTROLS SYSTEM					
1	Ea.	Event Data Recorder	2	$2,200.00	$4,400.00
2	Ea.	DVR	2	$5,535.40	$11,070.80
3	Bus Set	Complete Bus Wiring Harnesses	2	$21,071.15	$42,142.30
4	Bus Set	Communication Module (Gateway Module)	10	$3,630.00	$36,300.00
5	Bus Set	Multiplex Module	10	$6,610.81	$66,108.10
6	Bus Set	Wheels	5	$2,860.00	$14,300.00
			Total Unit Price	$501,724.21	
				TOTAL PARTS BUY	$2,203,191.65

In U.S. Dollars Using Words:
TWO-MILLION TWO-HUNDRED THREE THOUSAND ONE HUNDRED NINETY ONE DOLLARS & SIXTY-FIVE CENTS

Authorized Signature

06/10/18
Date

TONY WAYNE
Print Name

Los Angeles County
Metropolitan Transportation Authority

One Gateway Plaza
Los Angeles, CA 90012-2952

213.922.2000 Tel
metro.net

Metro

MAEL-034

Response Required: No

Date: November 13, 2018

File Nos.:

Action Item(s):

CDRL:

Richard Himes
Contract Administration Manager
Eldorado National (California), Inc. (ENC)
9670 Galena Street
Riverside, CA 92509

SUBJECT: **EXECUTED CONTRACT MODIFICATION NO. 8**
OP28367-000 40' LOW FLOOR CNG TRANSIT BUSES

Reference: MAEL-032; ELMA-045(R)

Dear Mr. Himes:

Enclosed is your executed original of the subject modification.

If you have any questions, I can be reached at 213.922.7334 or e-mail at hernandezel@metro.net.

Sincerely,

Elizabeth Hernandez
Principal Contract Administrator

cc: Wayne Okubo
Kwesi Annan

CDRL NO.: n/a

DATE: November 13, 2018

LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY

CONTRACT NO. OP28367-000, CONTRACT MODIFICATION NO.: 8

FOR: FORTY FOOT (40') LOW FLOOR CNG TRANSIT BUSES

This Contract Modification No. 8 to Contract No.: OP28367-000 is made effective on the 26th day of October 2018 by and between the LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY, hereinafter referred to as "MTA", and EL DORADO NATIONAL (CALIFORNIA), INC., hereinafter referred to as "CONTRACTOR".

WHEREAS, CONTRACTOR and MTA entered into Contract No.: OP28367-000 effective August 15, 2017, as amended by Contract Modification No. 1, dated November 6, 2017, Contract Modification No. 2, dated December 6, 2017, Contract Modification No. 3 dated December 27, 2017, Contract Modification No. 4 dated January 19, 2018, Contract Modification No. 5 dated February 12, 2018, Contract Modification No. 6 dated April 23, 2018, and Contract Modification No. 7 dated October 3, 2018, (the "Existing Contract") and;

WHEREAS, CONTRACTOR and MTA desire to modify the Existing Contract as provided herein;

Now, therefore, it is mutually agreed, by and between the parties as follows:

1. Change bus floor covering from RCA to Altro, applicable only to production buses no. 66 to 295 of the Base Buy, for an aggregate increase of $98,972, inclusive of applicable taxes, in the total Contract Price from $198,945,328 to $199,044,300, in accordance with the revised Pricing Forms as attached. Article IV COMPENSATION shall read as follows:

ARTICLE IV: COMPENSATION

A. Contract Price

1. In consideration of the Contractor's full performance of the Work, and in accordance with the terms of the Contract, Metro will pay the Contractor the Contract Price of $199,044,300 ~~$198,945,328~~ inclusive of tax and delivery as provided in this Article and in the Contract Document entitled Compensation and Payment Provisions.

Contract Options may be exercised unilaterally by LACMTA in accordance with Special Provisions Article SP-28, Options.

2. Revised Pricing Forms: PF 1, PF-1A and PF 2 as attached to this modification no. 8.

Except as expressly amended hereby, the Existing Contract remains in full force and effect as originally executed.

IN WITNESS WHEREOF, the parties have caused this Contract Modification No. 7 to the Existing Contract to be executed by their respective officers duly authorized on the date first written above.

EL DORADO NATIONAL (CALIFORNIA), INC.

By: _____
Signature

TONY WAYNE
Type or Print Name

11/5/18
Date

LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY
Philip A. Washington
Chief Executive Officer

By: _____
Wayne Okubo
Director, Contract Administration

11/9/18
Date

GROUP A - UP TO 600 40' CNG BUSES
FORM PF-1 (CNG - 40') - CONTRACT PRICE SUMMARY
Contract Modification No.: 8

Proposer: ELDORADO NATIONAL (CALIFORNIA), INC.

Contract No.: OP28367-000

Contract Title: FORTY FOOT (40') LOW FLOOR CNG BUS PROCUREMENT

1.0 CONTRACT FOR 295 BUSES (BASE BUY)

No.	Qty.	Description of Item		Unit Price	Taxable Unit Price	Total Price
1	229	40' Low Floor CNG Buses (Base Buy) from PF-1A Values derived from PF-1A*:		$595,335.02	$615,075	$140,852,150
	66	[1] 40' Low Floor CNG Buses (Base Buy) from PF-1A		$594,941.09	$614,681	$40,568,948
1a	Lot	Manuals (Base Buy) (TS 5.6.4)		$2,281.50	Lump Sum	$23,400.00
1b	295	Vehicle Delivery Charge for Base Buy	Value of all taxable delivery charges per bus**:		$275.00	$81,125.00
1c	229	Tax (Base Buy Production Bus 67 - 295)		9.75%	$58,045.16	$13,294,624
1d	66	Tax (Base Buy Production Bus 1-66)		9.75%	$58,006.76	$3,828,446
2	2	Pilot Buses Retrofit with Rear Axle Upgrade			$8,600	$17,201
2a		Tax		9.75%	$838.55	$1,677
3	Lot	Reserved				
4	Lot	Reserved				
5	Lot	Reserved				
6	Lot	Reserved				
7	Lot	Performance Bond (Base Buy)			Lump Sum	$119,336.00
8	1,000	Total Training Hours for Base Buy***			$175,000.00	
8a	900	Contractor (Proposer/Prime) Base Buy			$175.00	$157,500.00
8b	100	Subcontractor/Supplier Base Buy			$175.00	$17,500.00
9	1	System Management Tool for use at up to (13) MTA Operating Divisions per TS 86.1			$74,930.00	$74,930.00
10a	15	Special Towing Equipment (TS 25)			$386.00	$5,790.00
10b		Tax		9.75%	$37.64	$564.53
11a	2	Rear Recovery Devices/Tie Downs (TS 25)			$505.00	$1,010.00
11b		Tax		9.75%	$49.24	$98.48

1.0 Total Price for CONTRACT for 295 Base Buy Buses (Sum of Items "1" through "11b") to be the BASIS for Price Proposal evaluation

In U.S. Dollars Using Words: ONE HUNDRED NINETY NINE MILLION FORTY FOUR THOUSAND THREE HUNDRED DOLLARS

In U.S. Dollars Using Figures: $199,044,300

GROUP A - UP TO 600 40' CNG BUSES
FORM PF-1 (CNG - 40') - CONTRACT PRICE SUMMARY
Contract Modification No.: 8

Proposer: ELDORADO NATIONAL (CALIFORNIA), INC.

Contract No.: OP28367-000

Contract Title: FORTY FOOT (40') LOW FLOOR CNG BUS PROCUREMENT

NOTE Unit Prices from Mod. No. 7 for Production Buses 1 - 65

* Taxable Unit Price is the Unit Price less 1.14 Accessibility Provisions on PF-1A

** Input the taxable portion of the Delivery Charge under the Taxable Unit Price column and the total Delivery Charge under the Unit Price column

*** Training Hours for Base Buy are only estimates and not a guaranteed level of effort. The total for this Line is a Not-to-Exceed provisional amount.

GROUP A - UP TO 600 40' CNG BUSES
FORM PF-1 (CNG - 40') - CONTRACT PRICE SUMMARY
Contract Modification No.: 8

Proposer: ELDORADO NATIONAL (CALIFORNIA), INC.

Contract No.: OP28367-000

Contract Title: FORTY FOOT (40') LOW FLOOR CNG BUS PROCUREMENT

2.0 CONTRACT FOR 150 UP TO 305 BUSES (OPTION BUY)

No.	Qty.	Description of Item		Taxable Unit Price	Unit Price	Total Price
10	305	40' Low Floor CNG Buses (Option Buy) from PF-1A for 150 to 305 vehicles*		$595,335.02	$615,075	$187,597,841.45
10a	Lot	Manuals (Option Buy) (TS 5.6.4)***		$2,281.50	Lump Sum	$23,400.00
10b	305	Vehicle Delivery Charge for Option Buy	Value of all taxable delivery charges per bus**:	$0.00	$275.00	$83,875.00
10c		Tax (Option Buy)		9.75%	$58,045.16	$17,706,056.66
11		Reserved			$	$
12	Lot	Performance Bond for Option Buy***			Lump Sum	$123,421.00
13	500	Total Training Hours for Option Buy****			$87,500.00	
13a	450	Contractor (Proposer/Prime) Option Buy			$175.00	$78,750.00
13b	50	Subcontractor/Supplier Option Buy			$175.00	$8,750.00
14		Reserved			$	$

2.0 Total Price for CONTRACT for 150 Up to 305 Option Buy Buses (Sum of Items "10" through "14") to be the BASIS for Price Proposal evaluation

In U.S. Dollars Using Words: TWO-HUNDRED FIVE MILLION EIGHT HUNDRED TWO THOUSAND FIVE HUNDRED SEVENTY ONEDOLLARS

In U.S. Dollars Using Figures: $205,622,094

NOTE

* Taxable Unit Price is the Unit Price less 1.14 Accessibility Provisions on PF-1A

** Input the taxable portion of the Delivery Charge under the Taxable Unit Price column and the total Delivery Charge under the Unit Price column

*** For proposal purposes only, Manuals and Bond prices are for all 305 bus Options exercised. Actual cost will depend on Option quantity ordered.

**** Training Hours for Option Buy are only estimates and not a guaranteed level of effort. The total for this Line is a Not-to-Exceed provisional amount.

GROUP A - UP TO 600 40' CNG BUSES
FORM PF-1 (CNG - 40') - CONTRACT PRICE SUMMARY
Contract Modification No.: 8

Proposer: ELDORADO NATIONAL (CALIFORNIA), INC.

Contract No.: OP28367-000

Contract Title: FORTY FOOT (40') LOW FLOOR CNG BUS PROCUREMENT

3.0 OPTIONAL VEHICLE CONFIGURATION

No.	Qty.	Description of Item		Unit Price	Total Price
15	1	3 ADA Securement Configuration TS 81.5 (Total 15a - 15d)			$6,370.00
15a		Direct Materials/Equipment		$5,750.00	
15b		Labor Installation Costs		$620.00	
15c		Non Recurring Cost		$0.00	
15d		Other Costs (Identify)		$0.00	
16	1	4 ADA Securement Configuration TS 81.5 (Total 16a - 16d)			$10,170.00
16a		Direct Materials/Equipment		$9,150.00	
16b		Labor Installation Costs		$1,020.00	
16c		Non Recurring Cost		$0.00	
16d		Other Costs (Identify)		$0.00	
17	600	Reserved****			
17a	295	Reserved			
17b	305	Reserved			
18	600	25-Year Certified CNG Tanks			$522,000.00
18a	295	25 Yr Certified CNG Tanks for Base Buy	$256,650.00	$870.00	
18b	305	25 Yr Certified CNG Tanks for Option Buy for 150 up to 305 vehicles	$265,350.00	$870.00	
19	600	Complete Automatic Passenger Counter System TS 86.3 (Total 19a - 19h)			$2,757,600.00
19a	295	Direct Materials/Equipment for Base Buy APC		$4,136.00	
19b	295	Labor Installation Costs for Base Buy APC		$460.00	
19c	295	Non Recurring Cost for Base Buy APC		$	

GROUP A - UP TO 600 40' CNG BUSES
FORM PF-1 (CNG - 40') - CONTRACT PRICE SUMMARY
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Contract Title: FORTY FOOT (40') LOW FLOOR CNG BUS PROCUREMENT

19d	295	Other Costs (Identify) for Base Buy APC		$	
		Total for Base Buy APC	$1,355,820.00	$4,596.00	
19e	305	Direct Materials/Equipment for Option Buy APC for 150 up to 305 vehicles		$4,136.00	
19f	305	Labor Installation Costs for Option Buy APC for 150 up to 305 vehicles		$460.00	
19g	305	Non Recurring Cost for Option Buy APC for 150 up to 305 vehicles		$	
19h	305	Other Costs (Identify) for Option Buy APC for 150 up to 305 vehicles		$	
		Total for Option Buy APC for 150 up to 305 vehicles	$1,401,780.00	$4,596.00	
20	600	Enhanced 360 degree Camera System TS 86.1 (Total 20a - 20h)			$579,000.00
20a	295	Direct Materials/Equipment for Base Buy Enhanced Camera System		$869.00	
20b	295	Labor Installation Costs for Base Buy Enhanced Camera System		$96.00	
20c	295	Non Recurring Cost for Base Buy Enhanced Camera System		$	
20d	295	Other Costs (Identify) for Base Buy Enhanced Camera System		$	
		Total for Base Buy Enhanced Camera System	$284,675.00	$965.00	
20e	305	Direct Materials/Equipment for Option Buy Enhanced Camera System for 150 up to 305 vehicles		$869.00	
20f	305	Labor Installation Costs for Option Buy Enhanced Camera System for 150 up to 305 vehicles		$96.00	
20g	305	Non Recurring Cost for Option Buy Enhanced Camera System for 150 up to 305 vehicles		$	
20h	305	Other Costs (Identify) for Option Buy Enhanced Camera System for 150 up to 305 vehicles		$	
		Total for Option Buy Enhanced Camera System for 150 up to 305 vehicles	$294,325.00	$965.00	
21	600	USB Ports for Passenger Charging Only			$288,000.00
21a	295	USB Ports for Passenger Charging Only for Base Buy	$141,600.00	$480.00	
21b	305	USB Ports for Passenger Charging Only for Option Buy for 150 up to 305 vehicles	$146,400.00	$480.00	
22	600	Optional Wireless Stop Request Switches (Bus set)			$291,000.00
22a	295	Optional Wireless Stop Request Switches (Bus set) for Base Buy	$143,075.00	$485.00	

GROUP A - UP TO 600 40' CNG BUSES
FORM PF-1 (CNG - 40') - CONTRACT PRICE SUMMARY
Contract Modification No.: 8

Proposer: ELDORADO NATIONAL (CALIFORNIA), INC.

Contract No.: OP28367-000

Contract Title: FORTY FOOT (40') LOW FLOOR CNG BUS PROCUREMENT

22b	305	Optional Wireless Stop Request Switches (Bus set) for Option Buy for 150 up to 305 vehicles	$147,925.00	$485.00	
23	600	Optional Full Color Destination Sign Sets (TS 86.3)			$2,070,000.00
23a	295	Optional Full Color Destination Sign Sets (TS 86.3) for Base Buy	$1,017,750.00	$3,450.00	
23b	305	Optional Full Color Destination Sign Sets (TS 86.3) for Option Buy for 150 up to 305 vehicles	$1,052,250.00	$3,450.00	
24	Lot	Spare Parts (From Schedule A, Form PF-2)			$2,261,788.13
25	Lot	Special Tools (Schedule B Form PF-3)			$7,710.00
26	Lot	Diagnostic Test Equipment (Schedule C, Form PF-4)			$355,010.00
27	Lot	Training Aids (Schedule D, Form PF-5)			$958,460.00

3.0 Total Price for OPTIONAL VEHICLE CONFIGURATION (Sum of Items "15 through 27") for OPTIONAL EQUIPMENT to be BASIS for Price Proposal evaluation.

In U.S. Dollars Using Words: TEN-MILLION ONE HUNDRED SEEN THOUSAND ONE HUNDRED EIGHT DOLLARS

In U.S. Dollars Using Figures: $10,107,108

**** Proposer shall provide base Low Nox Engine for each bus with the following Emission Levels:
ISLG engine is not the base engine requirement. Low Nox engine is the base requirement and therefore no longer an option.

Oxides of Nitrogen (NOx) Grams per brake horsepower-hour	Particulate Matter (PM) grams per brake horsepower hour
0.02	0.01

GROUP A - UP TO 600 40' CNG BUSES
FORM PF-1 (CNG - 40') - CONTRACT PRICE SUMMARY
Contract Modification No.: 8

Proposer: ELDORADO NATIONAL (CALIFORNIA), INC.

Contract No.: OP28367-000

Contract Title: FORTY FOOT (40') LOW FLOOR CNG BUS PROCUREMENT

4.0 CONTRACT FOR BASE BUY, OPTION BUY, AND OPTIONALVEHICLE CONFIGURATION

No.	Qty.	Description of Item	Total Price
1.0		Total Price for CONTRACT for 295 Base Buy Buses to be the BASIS for Price Proposal evaluation	$199,044,300
2.0		Total Price for CONTRACT for 150 Up to 305 Option Buy Buses to be the BASIS for Price Proposal evaluation	$205,622,094
3.0		Total Price for OPTIONAL VEHICLE CONFIGURATION for OPTIONAL EQUIPMENT to be BASIS for Price Proposal evaluation	$10,107,108
4.0		Total Price for CONTRACT for 295 Base Buy Buses, for 150 up to 305 Option Buy Buses, and Optional Vehicle Configuration for Optional Equipment combined to be the overall BASIS for Price Proposal evaluation	

In U.S. Dollars Using Words: FOUR-HUNDRED FOURTEEN MILLION SEVEN HUNDRED SEVENTY THREE THOUSAND FIVE HUNDRED TWO DOLLARS

In U.S. Dollars Using Figures: $414,773,502

(Signature of Person Executing Proposal)

11/5/18
Date

TONY WAYNE VICE PRESIDENT & GENERAL MANAGE
Type Name, Title

GROUP A - UP TO 600 40' CNG BUSES
FORM PF-1A (CNG - 40')
SUBSYSTEM EQUIPMENT
CONTRACT MODIFICATION NO. 8

Contractor: ELDORADO NATIONAL (CALIFORNIA), INC
Contract No.: OP28367-000

NO.	DESCRIPTION	BASE BUY OF ITEM		
1	Purchased Subsystem Equipment (Items 1.1 through 1.99) **			
1.1	TS 9.	Propulsion Power Assembly (PPA)***		$18,372
1.2	TS 9.	Engine		$60,324
1.3	TS 10.	Cooling System		$12,650
1.4	TS 18.	Fuel System		$68,300
1.5	TS 31.	Suspension		$19,950
1.6	TS 33.	Steering System		$4,950
1.7	TS 37.	Brakes		$3,260
1.8	TS 39.	Pneumatic System		$6,850
1.9	TS 42.	Charging System		$36,800
1.10	TS 44.	Multiplex Control System		$24,200
1.11	TS 54.	HVAC Climate Control System		$29,450
1.12	TS 78.	Passenger Seats		$28,955
1.13	TS 80.	Doors		$14,830
1.14	TS 81.	Accessibility Provisions		$19,740
1.15	TS 86.	Communications		$3,244
1.16	TS 11	Transmission		$14,261
1.17	TS 78.1	USB Passenger Charging Port		$480
1.18	TS85.1	Wirelesss Stop Request Button		$485
1.19	TS 86.3	Matrix APC		$4,596
1.99	TS 34	Meritor Rear Axle Upgrade		$1,040
		All other bus subsystem equipment not included above		$241,944
	TOTAL CNG BUS PRICE		Production Bus 1 - 66	* $614,681
			Add Altro Flooring	$393.80
			Production Bus 67 - 295	$615,075

* Transfer Total CNG Bus Price to Contract Price Summary Form (PF-1 - Unit Price column, line Item 1 - **Base Buy**

Notes: 1. ** Price shall include design, engineering, manufacturing/assembly, testing, shipping, profit and other associated costs. Price for each subsystem equipment shall include all applicable apparatus.

2. Price for line Item Nos. 1a-27 in the CONTRACT PRICE SUMMARY(Form PF-1) shall not be included in computing price of any of the line items above.

3. *** PPA unit price for line item 1.1 excludes prices for items 1.2 through 1.99

GROUP A - UP TO 600 40' CNG BUSES
FORM PF-1A (CNG - 40')
SUBSYSTEM EQUIPMENT
CONTRACT MODIFICATION NO. 8

NO.	DESCRIPTION	OPTION BUY OF ITEM		
2	Purchased Subsystem Equipment (Items 2.1 through 2.99) **			
2.1	TS 9.	Propulsion Power Assembly (PPA)***		$18,372
2.2	TS 9.	Engine		$60,324
2.3	TS 10.	Cooling System		$12,650
2.4	TS 18.	Fuel System		$68,300
2.5	TS 31.	Suspension		$19,950
2.6	TS 33.	Steering System		$4,950
2.7	TS 37.	Brakes		$3,260
2.8	TS 39.	Pneumatic System		$6,850
2.9	TS 42.	Charging System		$36,800
2.10	TS 44.	Multiplex Control System		$24,200
2.11	TS 54.	HVAC Climate Control System		$29,450
2.12	TS 78.	Passenger Seats		$28,955
2.13	TS 80.	Doors		$14,830
2.14	TS 81.	Accessibility Provisions		$19,740
2.15	TS 86.	Communications		$3,244
2.16	TS 11	Transmission		$14,261
2.17	TS 78.1	USB Passenger Charging Port		$480
2.18	TS85.1	Wirelesss Stop Request Button		$485
2.19	TS 86.3	Matrix APC		$4,596
1.99	TS 34	Meritor Rear Axle Upgrade		$1,040
				$242,338
	TOTAL CNG BUS PRICE OPTION QUANTITY			* $615,075

* Transfer Total CNG Bus Price to Contract Price Summary Form (PF-1 - Unit Price column, line item 10 - Option Buy)

Notes: 1. ** Price shall include design, engineering, manufacturing/assembly, testing, shipping, profit and other associated costs. Price for each subsystem equipment shall include all applicable apparatus.

2. Price for line Item Nos. 1-9 and 10a-27 in the CONTRACT PRICE SUMMARY(Form PF-1) shall not be included in computing price of any of the line items above.

3. *** PPA unit price for line item 2.1 excludes prices for items 2.2 through 2.99

(Signature of Person Executing Proposal) — Date: 11/5/18

TONY WAYNE /VICE PRESIDENT & GENERAL MANAGER
Type Name, Title

GROUP A - UP TO 600 40' CNG BUSES
FORM PF-2 (CNG- 40') - SCHEDULE A OF PRICES SPARE PARTS (OPTIONAL)
CONTRACT MODIFICATION NO. 8

CONTRACTOR: ELDORADO NATIONAL (CALIFORNIA), INC.
Contract No.: OP28367-000
Contract Title: FORTY FOOT (40') LOW FLOOR CNG BUS PROCUREMENT

NO.	UNIT	DESCRIPTION OF ITEM	QTY	UNIT PRICE	TOTAL PRICE
LOW NOX ENGINE					
1	Ea.	Propulsion Power Assembly (See Definition in SP-1)	3	$86,270.00	$258,810.00
2	Ea.	Air Compresser	5	$6,760.00	$33,800.00
3	Ea.	Turbo	3	$1,982.00	$5,946.00
4	Ea.	EGR Cooler	20	$1,110.47	$22,209.40
5	Ea.	EGR Valve	10	$610.68	$6,106.80
6	Ea.	Delta P Sensor	10	$347.66	$3,476.60
7	Ea.	Mass. Air Flow Sensor	10	$1,067.56	$10,675.60
8	Ea.	Oxygen Sensor	20	$223.61	$4,472.20
9	Ea.	Catalyst	5	$3,574.95	$17,874.75
10	Ea.	Cylinder Head	5	$4,513.81	$22,569.05
11	Ea.	Pistons Kits	60	$325.00	$19,500.00
12	Bus Set	Rod Bearings	10	$64.00	$640.00
13	Bus Set	Main Bearing	10	$219.27	$2,192.70
14	Ea.	Liners	60	$191.87	$11,512.20
15	Ea.	Head Gasket	5	$428.75	$2,143.75
16	Ea.	Upper Gasket Set	5	$844.99	$4,224.95
17	Ea.	Oil Pan Gasket	20	$133.60	$2,672.00
18	Ea.	Stiffener Plate Gasket	20	$92.85	$1,857.00
19	Ea.	Oil Pan	5	$505.51	$2,527.55
20	Ea.	Throttle Actuator	5	$574.16	$2,870.80
21	Ea.	Fuel Control Valve	10	$1,429.19	$14,291.90
22	Ea.	Ignition Control Module	10	$1,648.45	$16,484.50
23	Ea.	Ignition Coils	120	$175.23	$21,027.60
24	Ea.	Engine Harness	5	$1,493.62	$7,468.10
25	Ea.	Ignition Harness	10	$167.53	$1,675.30
26	Ea.	Oil Cooler	5	$179.73	$898.65
27	Ea.	Lube Pump	5	$275.51	$1,377.55
28	Ea.	Front Crank Seal	10	$30.54	$305.40
29	Ea.	Rear Seal	10	$28.65	$286.50
30	Ea.	Water Pump	10	$175.03	$1,750.30
31	Ea.	Vibration Damper	10	$344.21	$3,442.10
32	Ea.	Belt Tensioner (If applicable)	20	$145.47	$2,909.40
33	Ea.	CoolantTermperature Sensor	20	$11.21	$224.20
34	Ea.	Oil Pressure Sensor	10	$98.10	$981.00
35	Ea.	Fuel Pressure Sensor	10	$144.34	$1,443.40
36	Ea.	Low Fuel Pressure Regulator	10	$1,222.22	$12,222.20
37	Ea.	Engine Cradle	5	$1,420.00	$7,100.00
38	Ea.	Belt Guard	5	$358.80	$1,794.00
39	Ea.	Complete Engine Package (See definition in TS-2)	4	$66,430.00	$265,720.00
40	Bus Set	Spark Plugs	15	$42.02	$630.30
41	Bus Set	Adaptation Kit (Eng to Trans)	3	$1,066.00	$3,198.00
42	Ea.	PPA Dollies	8	$685.00	$5,480.00
COOLING SYSTEM					
1	Ea.	Radiator Packages (See definition in TS-2)	5	$7,715.00	$38,575.00
2	Ea.	Thermal Management Controllers	5	$598.32	$2,991.60
3	Bus Set	Fan Resistors	20	$48.60	$972.00
4	Bus Set	CAN Interface Cables	5	$101.25	$506.25
5	Ea.	Fan Reversal LED Panel	5	$593.39	$2,966.95
6	Ea.	Fan Assembly	30	$40.66	$1,219.80
7	Ea.	Coolant Reservoir	10	$556.20	$5,562.00
8	Ea.	Transmission Cooler	10	$648.00	$6,480.00
9	Bus Set	Pressure Relief Valve	20	$23.85	$477.00
10	Ea.	Radiator Cap	30	$5.27	$158.10
11	Ea.	Coolant Overflow Tank	10	$36.29	$362.90

GROUP A - UP TO 600 40' CNG BUSES
FORM PF-2 (CNG- 40') - SCHEDULE A OF PRICES SPARE PARTS (OPTIONAL)
CONTRACT MODIFICATION NO. 8

CONTRACTOR: ELDORADO NATIONAL (CALIFORNIA), INC.
Contract No.: OP28367-000
Contract Title: FORTY FOOT (40') LOW FLOOR CNG BUS PROCUREMENT

NO.	UNIT	DESCRIPTION OF ITEM	QTY	UNIT PRICE	TOTAL PRICE
CHARGING SYSTEM					
1	Ea.	Alternator	10	$9,750.00	$97,500.00
2	Ea.	Voltage Regulators	10	$351.00	$3,510.00
3	Ea.	Batteries	40	$203.77	$8,150.80
4	Ea.	Battery Equilizer	20	$418.50	$8,370.00
5	Ea.	Battery Disconnect	10	$31.82	$318.20
6	Ea.	Battery Separator	5	$297.00	$1,485.00
7	Ea.	Power Distribution Panel in Battery Compartment	5	$267.30	$1,336.50
8	Ea.	Low Voltage Disconnect	10	$44.55	$445.50
9	Ea.	Circuit Breaker 80A	20	$31.59	$631.80
10	Ea.	Circuit Breaker 100A	20	$39.15	$783.00
11	Ea.	Circuit Breaker 120A or 130A, whichever applies	20	$49.95	$999.00
12	Bus Set	Fuse and Circuit Breaker Panels	5	$310.50	$1,552.50
SUSPENSION					
1	Bus Set	Air Ride Beams	10	$2,310.00	$23,100.00
2	Bus Set	Air Bags	20	$672.00	$13,440.00
3	Ea.	Front Axle	10	$4,879.85	$48,798.50
4	Ea.	Rear Axle	10	$9,721.86	$97,218.60
5	Bus Set	Radius Rods	5	$412.80	$2,064.00
6	Bus Set	Shocks	10	$383.68	$3,836.80
7	Bus Set	Leveling Valve Front	10	$191.81	$1,918.10
8	Bus Set	Leveling Valve Rear	10	$191.81	$1,918.10
DRIVE TRAIN					
1	Ea.	Transmission	5	$14,261.00	$71,305.00
2	Ea.	TCM Programmed	5	$611.00	$3,055.00
3	Ea.	Adaptation Kit (Trans to Eng)	2	$1,066.00	$2,132.00
4	Ea.	Drive Shaft	10	$544.00	$5,440.00
5	Ea.	Differential	15	$6,972.00	$104,580.00
STEERING SYSTEM					
1	Bus Set	Steering Gear and Linkage	10	$1,172.50	$11,725.00
2	Ea.	Steering Column	10	$596.77	$5,967.70
3	Ea.	Steering Shaft	10	$135.30	$1,353.00
4	Ea.	Steering Box Assembly	10	$277.78	$2,777.80
5	Ea.	Power Steering Gear Assembly	10	$893.97	$8,939.70
PNEUMATIC SYSTEM					
1	Bus Set	Air Tanks (Complete Sets)	10	$352.00	$3,520.00
2	Ea.	Air Dryer	10	$400.66	$4,006.60
3	Ea.	Air Governor	10	$68.80	$688.00
4	Bus Set	Pressure Reducing Valves	10	$28.80	$288.00
5	Bus Set	Check Valves	10	$57.60	$576.00
6	Bus Set	Brake Control Valve	10	$46.40	$464.00
7	Bus Set	Brake Pedal Valve	10	$134.54	$1,345.40
8	Bus Set	Quick Release Valve	10	$17.60	$176.00
9	Bus Set	Parking Relay Valve	10	$57.60	$576.00
10	Bus Set	Parking Control Valve	10	$46.40	$464.00
11	Bus Set	Air Brake Tubing	10	$134.54	$1,345.40
12	Bus Set	Solenoid Valve Assembly	10	$17.60	$176.00
FUEL SYSTEM					
1	Bus Set	Fuel Cylinder Assembly	2	$68,300.00	$136,600.00
2	Ea.	Fill Manifold	2	$592.00	$1,184.00

GROUP A - UP TO 600 40' CNG BUSES
FORM PF-2 (CNG- 40') - SCHEDULE A OF PRICES SPARE PARTS (OPTIONAL)
CONTRACT MODIFICATION NO. 8

CONTRACTOR: ELDORADO NATIONAL (CALIFORNIA), INC.
Contract No.: OP28367-000
Contract Title: FORTY FOOT (40') LOW FLOOR CNG BUS PROCUREMENT

NO.	UNIT	DESCRIPTION OF ITEM	QTY	UNIT PRICE	TOTAL PRICE
3	Bus Set	Shut Off Valve Assembly	5	$440.00	$2,200.00
4	Bus Set	PRD'S	10	$134.40	$1,344.00
5	Ea.	High Fuel Pressure Regulator	20	$600.00	$12,000.00
6	Bus Set	Defueling Valves	5	$1,560.00	$7,800.00
7	Ea.	Low/High Pressure Filer Assembly	5	$704.00	$3,520.00
8	Bus Set	Fuel Pressure Gauges	10	$88.00	$880.00
9	Bus Set	Defueling Switches	5	$41.60	$208.00
10	Bus Set	Manifold Shut Off Valve Assembly	10	$325.00	$3,250.00
11	Bus Set	Solenoid Valve Assembly	10	$376.00	$3,760.00
12	Bus Set	Fuel Line Assembly	10	$576.00	$5,760.00
13	Ea.	Low Pressure Sensor	20	$144.00	$2,880.00
14	Ea.	Proximity Switch @ the Fuel Fill Door	20	$7.94	$158.80
15	Bus Set	Fuel Line Assembly	5	$576.00	$2,880.00
16	Bus Set	Vent Tubes	5	$137.60	$688.00
17	Ea.	Control Harness	5	$240.00	$1,200.00
18	Ea.	Proximity Switch @ the Fast Fill Recepticle	20	$7.94	$158.80
DOORS					
1	Bus Set	Complete Base Plate and Operator Assembly	5	$1,920.00	$9,600.00
2	Bus Set	Front/Rear Turning Shaft Assembly	5	$1,864.00	$9,320.00
3	Bus Set	Door Panels	5	$6,387.00	$31,935.00
4	Bus Set	Door Glass	2	$1,816.00	$3,632.00
BODY INTERIOR					
1	Bus Set	Interior AVA Sign Assembly	5	$1,580.00	$7,900.00
2	Ea.	Destination Sign Controller	2	$512.00	$1,024.00
3	Ea.	Next Stop Sign	5	$256.00	$1,280.00
4	Bus Set	Interior Speaker Assembly	10	$192.00	$1,920.00
5	Ea.	Microphone Hand Set	5	$92.80	$464.00
6	Ea.	Visor/Sun Shade(s) Front & Side	10	$316.80	$3,168.00
7	Bus Set	Access Panels	5	$960.00	$4,800.00
8	Bus Set	Light Covers	5	$916.80	$4,584.00
9	Bus Set	Modesty Panels	10	$880.00	$8,800.00
10	Bus Set	Ceiling Panels	10	$1,472.00	$14,720.00
11	Bus Set	Side Wall Trim Panel	10	$480.00	$4,800.00
12	Bus Set	Floor Covering	5	$2,637.58	$13,187.90
13	Bus Set	Wheelchair Securement Devices	5	$1,248.00	$6,240.00
14	Bus Set	Passenger Seat	4	$34,087.00	$136,348.00
15	Bus Set	Seat Track	2	$388.00	$776.00
16	Ea.	Operator Seat	5	$2,680.00	$13,400.00
17	Ea.	Farebox Grabrail	4	$248.00	$992.00
18	Bus Set	Manual Release Mechanism	6	$47.00	$282.00
19	Bus Set	Passenger Hand Strap	10	$496.00	$4,960.00
20	Ea.	HVAC Return Grill	5	$390.00	$1,950.00
BODY EXTERIOR					
1	Bus Set	Passenger Windows	2	$14,186.40	$28,372.80
2	Bus Set	Replacement Pass Side Window Glass (if not bonded)	2	$4,560.00	$9,120.00
3	Bus Set	Side Window Film or Guards	5	$1,847.00	$9,235.00
4	Bus Set	Windshield	3	$680.00	$2,040.00
5	Bus Set	Operator Window	2	$1,139.68	$2,279.36
6	Bus Set	Access Door Set (excluding engine door and HVAC access door)	3	$2,180.00	$6,540.00
7	Ea.	Engine Door	2	$623.00	$1,246.00
8	Ea.	HVAC Rear Attic Door	2	$428.80	$857.60
9	Ea.	Bike Rack	2	$1,148.34	$2,296.68
10	Ea.	Emergency Roof Hatch	2	$249.20	$498.40
11	Bus Set	Windshield Wiper Assy.	3	$766.96	$2,300.88
12	Ea.	Windsheild Washer Reservoir	2	$52.80	$105.60
13	Bus Set	Mirrors	4	$971.28	$3,885.12
14	Bus Set	Bumper	3	$2,208.00	$6,624.00
15	Bus Set	Mud Guards	3	$104.00	$312.00

GROUP A - UP TO 600 40' CNG BUSES
FORM PF-2 (CNG- 40') - SCHEDULE A OF PRICES SPARE PARTS (OPTIONAL)
CONTRACT MODIFICATION NO. 8

CONTRACTOR: ELDORADO NATIONAL (CALIFORNIA), INC.
Contract No.: OP28367-000
Contract Title: FORTY FOOT (40') LOW FLOOR CNG BUS PROCUREMENT

NO.	UNIT	DESCRIPTION OF ITEM	QTY	UNIT PRICE	TOTAL PRICE
16	Ea.	Head Lights	10	$742.00	$7,420.00
17	Bus Set	Front Turn Signal	10	$54.40	$544.00
18	Bus Set	Side Marker Lights	10	$128.00	$1,280.00
19	Bus Set	Rear Door Lights	10	$64.00	$640.00
20	Bus Set	Under Hood Hazard Lights	10	$115.20	$1,152.00
21	Ea.	License Plate Installation	5	$20.80	$104.00
22	Bus Set	CNG Tank Cover Installation	4	$3,800.00	$15,200.00
23	Bus Set	Exterior Trim (including fender skirts, exit door trim and trim pieces covering joints between body panels)	4	$1,387.00	$5,548.00
CLIMATE CONTROL SYSTEM					
1	Ea.	Compressor	2	$6,800.00	$13,600.00
2	Ea.	Controller	2	$300.00	$600.00
3	Ea.	Evaporator	2	$6,300.00	$12,600.00
4	Ea.	Condensor	2	$410.25	$820.50
5	Ea.	Blower Assembly	4	$555.00	$2,220.00
6	Ea.	Thermostat	2	$55.79	$111.58
7	Ea.	Marine Pump	3	$603.00	$1,809.00
WHEELCHAIR					
1	Bus Set	Ramp Assembly	3	$7,995.00	$23,985.00
2	Bus Set	Valve Assembly	2	$87.00	$174.00
3	Bus Set	Electrical Harness	2	$348.40	$696.80
4	Ea.	Ramp	2	$7,995.00	$15,990.00
5	Ea.	Controller	2	$707.38	$1,414.76
6	Ea.	Motor	3	$819.00	$2,457.00
BRAKES					
1	Bus Set	Pressure Switches (include all for each Bus Set)	10	$585.00	$5,850.00
2	Bus Set	Protection Valve	10	$84.00	$840.00
3	Bus Set	Brake Air Chamber	10	$269.70	$2,697.00
4	Bus Set	Brake Wear Indicator	5	$390.00	$1,950.00
5	Ea.	ABS Electronic Control Unit	5	$388.50	$1,942.50
6	Ea.	ABS Harness	2	$367.50	$735.00
7	Bus Set	ABS Sensor	5	$295.50	$1,477.50
MULTIPLEX CONTROLS SYSTEM					
1	Ea.	Event Data Recorder	2	$2,200.00	$4,400.00
2	Ea.	DVR	2	$5,535.40	$11,070.80
3	Bus Set	Complete Bus Wiring Harnesses	2	$21,071.15	$42,142.30
4	Bus Set	Communication Module (Gateway Module)	10	$3,630.00	$36,300.00
5	Bus Set	Multiplex Module	10	$6,610.81	$66,108.10
6	Bus Set	Wheels	5	$2,860.00	$14,300.00
			Total Unit Price	$507,867.92	
				TOTAL PARTS BUY	$2,261,788

In U.S. Dollars Using Words:
TWO-MILLION TWO-HUNDRED THREE THOUSAND FOUR HUNDRED FORTY FIVE DOLLARS & SIXTY-FIVE CENTS

Authorized Signature

11/5/18
Date

TONY WAYNE
Print Name

Los Angeles County
Metropolitan Transportation Authority

One Gateway Plaza
Los Angeles, CA 90012-2952

213.922.2000 Tel
metro.net

Metro

MAEL-037 **Response Required: No**

Date: December 7, 2018

File Nos.:

Action Item(s):

CDRL: n/a

Richard Himes
Contract Administration Manager
Eldorado National (California), Inc. (ENC)
9670 Galena Street
Riverside, CA 92509

SUBJECT: **OP28367-000 40' LOW FLOOR CNG TRANSIT BUSES**
CONTRACT MODIFICATION NO.: 9
TRAINING AIDS

Reference: ELMA-045

Dear Mr. Himes:

Enclosed is your executed original of the subject modification.

Please call me at 213.922.7334 or e-mail at hernandezel@metro.net if you have any questions.

Sincerely,

Elizabeth Hernandez
Principal Contract Administrator

Enclosure: Fully executed Contract Modification No. 9

cc: Kwesi Annan

LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY

CONTRACT NO. OP28367-000, CONTRACT MODIFICATION NO.: 9

FOR: FORTY FOOT (40') LOW FLOOR CNG TRANSIT BUSES

This Contract Modification No. 9 to Contract No.: OP28367-000 is made effective on the 5th day of November 2018 by and between the LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY, hereinafter referred to as "MTA", and EL DORADO NATIONAL (CALIFORNIA), INC., hereinafter referred to as "CONTRACTOR".

WHEREAS, CONTRACTOR and MTA entered into Contract No.: OP28367-000 effective August 15, 2017, as amended by Contract Modification No. 1, dated November 6, 2017, Contract Modification No. 2, dated December 6, 2017, Contract Modification No. 3 dated December 27, 2017, Contract Modification No. 4 dated January 19, 2018, Contract Modification No. 5 dated February 12, 2018, Contract Modification No. 6 dated April 23, 2018, Contract Modification No. 7 dated October 3, 2018, and Contract Modification No. 8 dated October 26, 2018 (the "Existing Contract") and;

WHEREAS, CONTRACTOR and MTA desire to modify the Existing Contract as provided herein;

Now, therefore, it is mutually agreed, by and between the parties as follows:

MTA to procure items from the Pricing Form, line 27 Training Aids (Schedule D Form PF-5), for an aggregate amount of $349,636, inclusive of applicable taxes.

Article IV COMPENSATION shall read as follows:

ARTICLE IV: COMPENSATION

A. Contract Price

1. In consideration of the Contractor's full performance of the Work, and in accordance with the terms of the Contract, Metro will pay the Contractor the Contract Price of $199,044,300, inclusive of tax and delivery as provided in this Article and in the Contract Document entitled Compensation and Payment Provisions.

Contract Options may be exercised unilaterally by LACMTA in accordance with Special Provisions Article SP-28, Options.

2. Training Aids - Additionally, in consideration of the Contractor's full performance of the Work, and in accordance with the terms of the Contract, Metro will pay the Contractor for line items under Pricing Form PF-5 Training Aids in the amount of $349,646 inclusive of tax and delivery as provided in this Article and in the Contract Document entitled Compensation and Payment Provisions, CP- 2 (H).

   a. Ea. One complete running engine and transmission assembly, including cooling and fueling systems, mounted on a suitable roll around stand (TS 5.6.3.a)

b.	Ea.	Anti-Lock Brake Board (TS 5.6.3.f)
c.	Ea.	Electric Air Conditioning Training Simulator Module (TS 5.6. 3.g)
d.	Ea.	Video Security System (TS 5.6.3.i)
e.	Ea.	Multiplex Electrical Training Board (TS 5.6.3.k)
f.	Ea.	Voith DIWA.6 transmission training cutaway (TS 5.6.3.b)

Revised Pricing Forms: PF-1 and PF -5 as attached to this modification no. 9.

Except as expressly amended hereby, the Existing Contract remains in full force and effect as originally executed.

IN WITNESS WHEREOF, the parties have caused this Contract Modification No. 9 to the Existing Contract to be executed by their respective officers duly authorized on the date first written above.

EL DORADO NATIONAL (CALIFORNIA), INC.

By: _____
Signature

TONY WAYNE
Type or Print Name

11/6/18
Date

LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY
Philip A. Washington
Chief Executive Officer

By: _____
Wayne Okubo
Director, Contract Administration

11/14/18
Date

GROUP A - UP TO 600 40' CNG BUSES
FORM PF-1 (CNG - 40') - CONTRACT PRICE SUMMARY
Contract Modification No.: 9

Proposer: ELDORADO NATIONAL (CALIFORNIA), INC.

Contract No.: OP28367-000

Contract Title: FORTY FOOT (40') LOW FLOOR CNG BUS PROCUREMENT

1.0 CONTRACT FOR 295 BUSES (BASE BUY)

No.	Qty.	Description of Item		Unit Price	Taxable Unit Price	Total Price
1	229	40' Low Floor CNG Buses (Base Buy) from PF-1A Values derived from PF-1A*:		$595,335.02	$615,075	$140,852,150
	66	[1] 40' Low Floor CNG Buses (Base Buy) from PF-1A		$594,941.09	$614,681	$40,568,948
1a	Lot	Manuals (Base Buy) (TS 5.6.4)		$2,281.50	Lump Sum	$23,400.00
1b	295	Vehicle Delivery Charge for Base Buy	Value of all taxable delivery charges per bus**:		$275.00	$81,125.00
1c	229	Tax (Base Buy Production Bus 67 - 295)		9.75%	$58,045.16	$13,294,624
1d	66	Tax (Base Buy Production Bus 1-66)		9.75%	$58,006.76	$3,828,446
2	2	Pilot Buses Retrofit with Rear Axle Upgrade			$8,600	$17,201
2a		Tax		9.75%	$838.55	$1,677
3	Lot	Reserved				
4	Lot	Reserved				
5	Lot	Reserved				
6	Lot	Reserved				
7	Lot	Performance Bond (Base Buy)			Lump Sum	$119,336.00
8	1,000	Total Training Hours for Base Buy***			$175,000.00	
8a	900	Contractor (Proposer/Prime) Base Buy			$175.00	$157,500.00
8b	100	Subcontractor/Supplier Base Buy			$175.00	$17,500.00
9	1	System Management Tool for use at up to (13) MTA Operating Divisions per TS 86.1			$74,930.00	$74,930.00
10a	15	Special Towing Equipment (TS 25)			$386.00	$5,790.00
10b		Tax		9.75%	$37.64	$564.53
11a	2	Rear Recovery Devices/Tie Downs (TS 25)			$505.00	$1,010.00
11b		Tax		9.75%	$49.24	$98.48

1.0 Total Price for CONTRACT for 295 Base Buy Buses (Sum of Items "1" through "11b") to be the BASIS for Price Proposal evaluation

In U.S. Dollars Using Words: ONE HUNDRED NINETY NINE MILLION FORTY FOUR THOUSAND THREE HUNDRED DOLLARS

In U.S. Dollars Using Figures: $199,044,300

GROUP A - UP TO 600 40' CNG BUSES
FORM PF-1 (CNG - 40') - CONTRACT PRICE SUMMARY
Contract Modification No.: 9

Proposer: ELDORADO NATIONAL (CALIFORNIA), INC.

Contract No.: OP28367-000

Contract Title: FORTY FOOT (40') LOW FLOOR CNG BUS PROCUREMENT

NOTE Unit Prices from Mod. No. 7 for Production Buses 1 - 65

* Taxable Unit Price is the Unit Price less 1.14 Accessibility Provisions on PF-1A

** Input the taxable portion of the Delivery Charge under the Taxable Unit Price column and the total Delivery Charge under the Unit Price column

*** Training Hours for Base Buy are only estimates and not a guaranteed level of effort. The total for this Line is a Not-to-Exceed provisional amount.

GROUP A - UP TO 600 40' CNG BUSES
FORM PF-1 (CNG - 40') - CONTRACT PRICE SUMMARY
Contract Modification No.: 9

Proposer: ELDORADO NATIONAL (CALIFORNIA), INC.

Contract No.: OP28367-000

Contract Title: FORTY FOOT (40') LOW FLOOR CNG BUS PROCUREMENT

2.0 CONTRACT FOR 150 UP TO 305 BUSES (OPTION BUY)

No.	Qty.	Description of Item		Taxable Unit Price	Unit Price	Total Price
10	305	40' Low Floor CNG Buses (Option Buy) from PF-1A for 150 to 305 vehicles*		$595,335.02	$615,075	$187,597,841.45
10a	Lot	Manuals (Option Buy) (TS 5.6.4)***		$2,281.50	Lump Sum	$23,400.00
10b	305	Vehicle Delivery Charge for Option Buy	Value of all taxable delivery charges per bus**:	$0.00	$275.00	$83,875.00
10c		Tax (Option Buy)		9.75%	$58,045.16	$17,706,056.66
11		Reserved			$	$
12	Lot	Performance Bond for Option Buy***			Lump Sum	$123,421.00
13	500	Total Training Hours for Option Buy****			$87,500.00	
13a	450	Contractor (Proposer/Prime) Option Buy			$175.00	$78,750.00
13b	50	Subcontractor/Supplier Option Buy			$175.00	$8,750.00
14		Reserved			$	$

2.0 Total Price for CONTRACT for 150 Up to 305 Option Buy Buses (Sum of Items "10" through "14") to be the BASIS for Price Proposal evaluation

In U.S. Dollars Using Words: TWO-HUNDRED FIVE MILLION EIGHT HUNDRED TWO THOUSAND FIVE HUNDRED SEVENTY ONEDOLLARS

In U.S. Dollars Using Figures: $205,622,094

NOTE

* Taxable Unit Price is the Unit Price less 1.14 Accessibility Provisions on PF-1A

** Input the taxable portion of the Delivery Charge under the Taxable Unit Price column and the total Delivery Charge under the Unit Price column

*** For proposal purposes only, Manuals and Bond prices are for all 305 bus Options exercised. Actual cost will depend on Option quantity ordered.

**** Training Hours for Option Buy are only estimates and not a guaranteed level of effort. The total for this Line is a Not-to-Exceed provisional amount.

GROUP A - UP TO 600 40' CNG BUSES
FORM PF-1 (CNG - 40') - CONTRACT PRICE SUMMARY
Contract Modification No.: 9

Proposer: ELDORADO NATIONAL (CALIFORNIA), INC.

Contract No.: OP28367-000

Contract Title: FORTY FOOT (40') LOW FLOOR CNG BUS PROCUREMENT

3.0 OPTIONAL VEHICLE CONFIGURATION

No.	Qty.	Description of Item		Unit Price	Total Price
15	1	3 ADA Securement Configuration TS 81.5 (Total 15a - 15d)			$6,370.00
15a		Direct Materials/Equipment		$5,750.00	
15b		Labor Installation Costs		$620.00	
15c		Non Recurring Cost		$0.00	
15d		Other Costs (Identify)		$0.00	
16	1	4 ADA Securement Configuration TS 81.5 (Total 16a - 16d)			$10,170.00
16a		Direct Materials/Equipment		$9,150.00	
16b		Labor Installation Costs		$1,020.00	
16c		Non Recurring Cost		$0.00	
16d		Other Costs (Identify)		$0.00	
17	600	Reserved****			
17a	295	Reserved			
17b	305	Reserved			
18	600	25-Year Certified CNG Tanks			$522,000.00
18a	295	25 Yr Certified CNG Tanks for Base Buy	$256,650.00	$870.00	
18b	305	25 Yr Certified CNG Tanks for Option Buy for 150 up to 305 vehicles	$265,350.00	$870.00	
19	600	Complete Automatic Passenger Counter System TS 86.3 (Total 19a - 19h)			$2,757,600.00
19a	295	Direct Materials/Equipment for Base Buy APC		$4,136.00	
19b	295	Labor Installation Costs for Base Buy APC		$460.00	
19c	295	Non Recurring Cost for Base Buy APC		$	

GROUP A - UP TO 600 40' CNG BUSES
FORM PF-1 (CNG - 40') - CONTRACT PRICE SUMMARY
Contract Modification No.: 9

Proposer: ELDORADO NATIONAL (CALIFORNIA), INC.

Contract No.: OP28367-000

Contract Title: FORTY FOOT (40') LOW FLOOR CNG BUS PROCUREMENT

19d	295	Other Costs (Identify) for Base Buy APC		$	
		Total for Base Buy APC	$1,355,820.00	$4,596.00	
19e	305	Direct Materials/Equipment for Option Buy APC for 150 up to 305 vehicles		$4,136.00	
19f	305	Labor Installation Costs for Option Buy APC for 150 up to 305 vehicles		$460.00	
19g	305	Non Recurring Cost for Option Buy APC for 150 up to 305 vehicles		$	
19h	305	Other Costs (Identify) for Option Buy APC for 150 up to 305 vehicles		$	
		Total for Option Buy APC for 150 up to 305 vehicles	$1,401,780.00	$4,596.00	
20	600	Enhanced 360 degree Camera System TS 86.1 (Total 20a - 20h)			$579,000.00
20a	295	Direct Materials/Equipment for Base Buy Enhanced Camera System		$869.00	
20b	295	Labor Installation Costs for Base Buy Enhanced Camera System		$96.00	
20c	295	Non Recurring Cost for Base Buy Enhanced Camera System		$	
20d	295	Other Costs (Identify) for Base Buy Enhanced Camera System		$	
		Total for Base Buy Enhanced Camera System	$284,675.00	$965.00	
20e	305	Direct Materials/Equipment for Option Buy Enhanced Camera System for 150 up to 305 vehicles		$869.00	
20f	305	Labor Installation Costs for Option Buy Enhanced Camera System for 150 up to 305 vehicles		$96.00	
20g	305	Non Recurring Cost for Option Buy Enhanced Camera System for 150 up to 305 vehicles		$	
20h	305	Other Costs (Identify) for Option Buy Enhanced Camera System for 150 up to 305 vehicles		$	
		Total for Option Buy Enhanced Camera System for 150 up to 305 vehicles	$294,325.00	$965.00	
21	600	USB Ports for Passenger Charging Only			$288,000.00
21a	295	USB Ports for Passenger Charging Only for Base Buy	$141,600.00	$480.00	
21b	305	USB Ports for Passenger Charging Only for Option Buy for 150 up to 305 vehicles	$146,400.00	$480.00	
22	600	Optional Wireless Stop Request Switches (Bus set)			$291,000.00
22a	295	Optional Wireless Stop Request Switches (Bus set) for Base Buy	$143,075.00	$485.00	

GROUP A - UP TO 600 40' CNG BUSES
FORM PF-1 (CNG - 40') - CONTRACT PRICE SUMMARY
Contract Modification No.: 9

Proposer: ELDORADO NATIONAL (CALIFORNIA), INC.

Contract No.: OP28367-000

Contract Title: FORTY FOOT (40') LOW FLOOR CNG BUS PROCUREMENT

22b	305	Optional Wireless Stop Request Switches (Bus set) for Option Buy for 150 up to 305 vehicles	$147,925.00	$485.00	
23	600	Optional Full Color Destination Sign Sets (TS 86.3)			$2,070,000.00
23a	295	Optional Full Color Destination Sign Sets (TS 86.3) for Base Buy	$1,017,750.00	$3,450.00	
23b	305	Optional Full Color Destination Sign Sets (TS 86.3) for Option Buy for 150 up to 305 vehicles	$1,052,250.00	$3,450.00	
24	Lot	Spare Parts (From Schedule A, Form PF-2)			$2,261,788.13
25	Lot	Special Tools (Schedule B Form PF-3)			$7,710.00
26	Lot	Diagnostic Test Equipment (Schedule C, Form PF-4)			$355,010.00
27	Lot	Training Aids (Schedule D, Form PF-5)			$989,385.00

3.0 Total Price for OPTIONAL VEHICLE CONFIGURATION (Sum of Items "15 through 27") for OPTIONAL EQUIPMENT to be BASIS for Price Proposal evaluation.

In U.S. Dollars Using Words: TEN-MILLION ONE HUNDRED THIRD EIGHT THOUSAND ONE HUNDRED THIRTY THREE DOLLARS

In U.S. Dollars Using Figures: **$10,138,033**

**** Proposer shall provide base Low Nox Engine for each bus with the following Emission Levels:
ISLG engine is not the base engine requirement. Low Nox engine is the base requirement and therefore no longer an option.

Oxides of Nitrogen (NOx) Grams per brake horsepower-hour	Particulate Matter (PM) grams per brake horsepower hour
0.02	0.01

GROUP A - UP TO 600 40' CNG BUSES
FORM PF-1 (CNG - 40') - CONTRACT PRICE SUMMARY
Contract Modification No.: 9

Proposer: ELDORADO NATIONAL (CALIFORNIA), INC.

Contract No.: OP28367-000

Contract Title: FORTY FOOT (40') LOW FLOOR CNG BUS PROCUREMENT

4.0 CONTRACT FOR BASE BUY, OPTION BUY, AND OPTIONALVEHICLE CONFIGURATION

No.	Qty.	Description of Item	Total Price
1.0		Total Price for CONTRACT for 295 Base Buy Buses to be the BASIS for Price Proposal evaluation	$199,044,300
2.0		Total Price for CONTRACT for 150 Up to 305 Option Buy Buses to be the BASIS for Price Proposal evaluation	$205,622,094
3.0		Total Price for OPTIONAL VEHICLE CONFIGURATION for OPTIONAL EQUIPMENT to be BASIS for Price Proposal evaluation	$10,138,033
4.0		Total Price for CONTRACT for 295 Base Buy Buses, for 150 up to 305 Option Buy Buses, and Optional Vehicle Configuration for Optional Equipment combined to be the overall BASIS for Price Proposal evaluation	

In U.S. Dollars Using Words: FOUR-HUNDRED FOURTEEN MILLION EIGHT HUNDRED FOUR THOUSAND FOUR HUNDRED TWENTY SEVEN DOLLARS

In U.S. Dollars Using Figures: $414,804,427

(Signature of Person Executing Proposal) 4/6/10 Date

TONY WAYNE VICE PRESIDENT & GENERAL MANAGE
Type Name, Title

GROUP A - UP TO 600 40' CNG BUSES
FORM PF-5 (CNG - 40')- SCHEDULE D OF PRICES TRAINING AIDS (OPTIONAL)
CONTRACT MODIFICATION NO. 9

Contractor ELDORADO NATIONAL (CALIFORNIA), INC.
Contract No.: OP28367-000
Contract Title: FORTY FOOT (40') LOW FLOOR CNG BUS PROCUREMENT

NO.	UNIT	DESCRIPTION OF ITEM	QTY	UNIT PRICE	TOTAL PRICE
1	Ea.	One complete running engine and transmission assembly, including cooling and fueling systems, mounted ona suitable roll around stand (TS 5.6.3 a.)	1	$193,200.00	$193,200.00
2	Ea.	Static Transmission Assembly ~~Note: If the Contractor is offering an Allison B400 transmission, a visual transmission is not required~~ Voith DIWA .6 transmission (TS 5.6.3 b.)	1	$30,925.00	$30,925.00
3	Ea.	Complete Static Front Axle Assembly TS 5.6.3.c.	1	$16,400.00	$16,400.00
4	Ea.	Complete Static Rear Axle Assembly TS 5.6.3.d.	1	$18,500.00	$18,500.00
ATECH ELECTRICAL TRAINING BOARDS - General Electrical Training (TS 5.6.3 e.)					
1	Kit	GM Specialized Electronic Trainer	10	$2,100.00	$21,000.00
2	Kit	GM Electronic Instructor's Guide (Books Only - Stages 1, 2, & 3)	10	$95.00	$950.00
3	Kit	4 Resistors	10	$35.00	$350.00
4	Kit	Dual Filament Light	10	$46.00	$460.00
5	Kit	Horn	10	$121.00	$1,210.00
6	Kit	Blank Board	10	$24.00	$240.00
SYSTEM SIMULATION TRAINING BOARDS					
1	Ea.	Anti-Lock Brake/Air Brake Board (TS 5.6.3.f.)	1	$32,000.00	$32,000.00
2	Ea.	Electric Air Conditioning Training Simulator Module (TS 5.6.3.g.)	1	$29,700.00	$29,700.00
3	Ea.	Fire Suppression (TS 5.6.3.h.)	1	$7,200.00	$7,200.00
4	Ea.	Video Security System (TS 5.6.3.i.)	1	$9,250.00	$9,250.00
5	Ea.	Destination Sign (TS 5.6.3.j.)	1	$6,000.00	$6,000.00
6	Ea.	Multiplex Electrical Training Board (TS 5.6.3.k.)	2	$23,500.00	$47,000.00
E-LARNING INTERACTIVE TRAINING MEDIA (TS 5.6.3)					
1	Hr.	Module 1	6	$23,000.00	$138,000.00
2	Hr.	Module 2	3	$23,000.00	$69,000.00
3	Hr.	Module 3	3	$23,000.00	$69,000.00
4	Hr.	Module 4	2	$23,000.00	$46,000.00
5	Hr.	Module 5	4	$23,000.00	$92,000.00
6	Hr.	Module 6	2	$23,000.00	$46,000.00
7	Hr.	Module 7	2	$23,000.00	$46,000.00
8	Hr.	Module 8	1	$23,000.00	$23,000.00
9	Hr.	Module 9	1	$23,000.00	$23,000.00
10	Hr.	Module 10	1	$23,000.00	$23,000.00
				TOTAL BUY	$989,385.00

GROUP A - UP TO 600 40' CNG BUSES

FORM PF-5 (CNG - 40')- SCHEDULE D OF PRICES TRAINING AIDS (OPTIONAL)

CONTRACT MODIFICATION NO. 9

In U.S. Dollars Using Words:

NINE-HUNDRED EIGHTY NINE THOUSAND THREE HUNDRED EIGHTY FIVE DOLLARS

Authorized Signature

11/6/18
Date

TONY WAYNE
Print Name

Los Angeles County
Metropolitan Transportation Authority

One Gateway Plaza
Los Angeles, CA 90012-2952

213.922.2000 Tel
metro.net

Metro

MAEL-043 **Response Required: No**

Date: January 18, 2019

File Nos.:

Action Item(s):

CDRL: n/a

Richard Himes
Contract Administration Manager
Eldorado National (California), Inc. (ENC)
9670 Galena Street
Riverside, CA 92509

SUBJECT: **OP28367-000 40' LOW FLOOR CNG TRANSIT BUSES**
EXECUTED CONTRACT MODIFICATION NO.: 10
DISADVANTAGED WORKER (SP-38)

Reference: ELMA-053

Dear Mr. Himes:

Enclosed is your executed original of the subject modification.

Please call me at 213.922.7334 or e-mail at hernandezel@metro.net if you have any questions.

Sincerely,

Elizabeth Hernandez
Principal Contract Administrator

Enclosure: Fully executed Contract Modification No. 10

cc: Kwesi Annan

LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY

CONTRACT NO. OP28367-000, CONTRACT MODIFICATION NO.: 10

FOR: FORTY FOOT (40') LOW FLOOR CNG TRANSIT BUSES

This Contract Modification No. 10 to Contract No.: OP28367-000 is made effective on the 9th day of January 2019 by and between the LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY, hereinafter referred to as "MTA", and EL DORADO NATIONAL (CALIFORNIA), INC., hereinafter referred to as "CONTRACTOR".

WHEREAS, CONTRACTOR and MTA entered into Contract No.: OP28367-000 effective August 15, 2017, as amended by Contract Modification No. 1, dated November 6, 2017, Contract Modification No. 2, dated December 6, 2017, Contract Modification No. 3 dated December 27, 2017, Contract Modification No. 4 dated January 19, 2018, Contract Modification No. 5 dated February 12, 2018, Contract Modification No. 6 dated April 23, 2018, Contract Modification No. 7 dated October 3, 2018, Contract Modification No. 8 dated October 26, 2018, and Contract Modification No. 9 dated November 5, 2018 (the "Existing Contract") and;

WHEREAS, CONTRACTOR and MTA desire to modify the Existing Contract as provided herein;

Now, therefore, it is mutually agreed, by and between the parties as follows:

Modify Special Provisions SP-38 to read:

SP-38 LOCAL EMPLOYMENT PROGRAM

A. OBLIGATIONS OF CONTRACTOR

The Contractor shall implement the Local Employment Plan and Local Facility Capital Investments as approved by LACMTA and set forth in Exhibit C of the Contract. The Contractor's Local Employment Plan Commitment Value for Local Workers' Wages and Benefits is $2,506,164. The Contractor's Disadvantaged Worker Commitment Value for Disadvantaged Workers' wages and benefits is $250,616. The Contractor's Local Employment Plan Commitment Value for Local Facility Capital Investments is $3,470,000. The Contractor's Total Local Employment Plan Commitment Value is $5,976,164.

B. STATE OF CALIFORNIA NEW FULL TIME EQUIVALENT (FTE) POSITIONS & LOCAL FACILITY CAPITAL INVESTMENTS

The State of California Resident FTE Positions included under the Contractor's Local Employment Plan shall:

1. Include only Contractor and Subcontractor/Supplier with State of California Resident employees who provide work hours directly allocable to the OP28367-000 program in the State of California. Local Employees that also work on other projects may only be counted to the extent they perform work allocable to the

OP28367-000 Contract. A Local Employee may be expressed as a percentage of one FTE. To be considered eligible for California resident status, workers must maintain a physical presence in California, show intent to make California his or her permanent home, and be a U.S. Citizen or be granted and maintain an allowable immigration status prior to the Contract award date.

Evidence of intent to make California one's permanent home prior to Contract award may include, but is not limited to:

- California voter registration and voting in California elections
- California driver's license
- California automobile registration
- California State income tax obligation on total income
- Ownership of residential property or continuous occupancy or renting of an apartment on a lease basis where your personal belongings are kept
- Active savings and/or checking accounts in a California bank
- Immigration status with legal capacity to establish California residency
- Maintaining a permanent military address and home of record in California
- Military leave and earning statements showing California as legal residence.

2. Not include 1) current employees; 2) former, furloughed, and/or laid off employees who are separated from employment with the Contractor or Subcontractor/Supplier (if applicable) on or after the date of LACMTA's Notice of Intent to Award Letter; 3) employees who will not be working on the project; 4) employees hired by the Contractor or Subcontractor to work on other projects to fill in or replace current employees reassigned to OP28367-000, 5) hours and costs that cannot be segregated and audited pursuant to internal Cost Accounting Systems of the Contractor or Subcontractors;6) Work conducted outside of the State of California; 7) Work performed by Non-State of California residents.

The Local Facility Capital Investments included under the Contractor's Local Employment Plan shall:

1. Include only facility improvements, additions, upgrades, modifications, or major improvements (not ordinary repairs and maintenance) to existing facilities, leased facilities, or newly purchased facilities within the State of California. capital equipment investments may be included only if the equipment has an estimated useful life of at least two (2) years and is valued at $5,000 or more for any individual item. Proposers may include lease costs in their local facility capital investments only if ownership is shifted from the lessor to the lessee by the end of the lease period.
2. Not include: lease costs without a lease to own agreement, utility costs, minor repair costs, capital equipment investments less than $5,000 for any individual item, short term (less than 2 years) capital equipment investments or operating costs.

C. DISADVANTAGED WORKER COMMITMENT

The Disadvantaged Worker Commitment included under the Contractor's Local Employment Plan shall:

1. Include a commitment to hire new Disadvantaged Workers that equals a minimum of 10% of the total of new wages and benefits for all Local Workers. A Disadvantaged Worker is defined as (1) being homeless; (2) being a custodial single parent; (3) receiving public assistance; (4) lacking GED or high school diploma; (5) having a criminal record or other involvement in the criminal justice system; (6) suffering from chronic unemployment; (7) emancipated from the foster care system; or (8) being a veteran of the Iraq/Afghanistan war.

~~C.~~D. REPORTS

The Contractor shall submit quarterly progress reports to LACMTA detailing its adherence to the commitments made in the Local Employment Plan. The quarterly report shall summarize the major actions taken during the prior quarter in implementation of the Employment, and shall:

1. Specify the total number of Local Employee Full Time Equivalent (FTE) work performed in that quarter by type (trade or craft), duration, and location, and disadvantaged worker status, and the annual value of those jobs (expressed in direct OP28367-000 hours expended and people hired);

2. Describe the workforce development and training programs carried out during that quarter and the amount expended by the Contractor for such programs;

3. Describe the quarterly outreach and recruitments coordinated through workforce development and community groups that led to new local hires and;

4. Describe the extent to which the Local Employment Plans producing long-term employment in skilled or trade labor;

5. Describe the value of construction performed toward the Facility Investment Commitment; include copies of design and construction contracts.

If any such report indicates that the Contractor has failed to achieve the Total Local Employment Plan Commitment Value for local employee wages and benefits, Disadvantaged Worker wages and benefits or Facility Investments set forth in its Local Employment Plan for the time period involved, the report shall include a corrective action plan designed to achieve the Total Local Employment Plan Commitment Value, including a time frame within which such corrective actions will be achieved.

~~D.~~E. RELATION TO MILESTONE PAYMENTS

LACMTA reserves the right to review and audit the Contractor's records, books and financial ledgers and cost accounting system at any time during the Contract term for purposes of determining the Contractor's compliance with Total Local Employment Commitment Value. In the event LACMTA determines that there has been a material

failure of the Contractor or its Subcontractors/Suppliers to comply with any requirement of its Local Employment Plan, LACMTA shall notify the Contractor in writing and shall provide the Contractor with thirty (30) days to correct such non-compliance. If such non-compliance is not corrected to the satisfaction of LACMTA within such 30-day period (or such longer period as LACMTA may in its discretion allow), LACMTA may withhold a portion of the next Milestone Payment due to the Contractor under CP-02, in an amount that LACMTA determines in its discretion to be reasonable and appropriate based on the nature and extent of the Contractor's non-compliance. Any amounts withheld by LACMTA under this subsection shall be repaid to the Contractor, as part of the next Milestone Payment due, when the Contractor demonstrates to the satisfaction of LACMTA that it has corrected the non-compliance. Any withholding under this subsection shall not affect the right of LACMTA to exercise other remedies available under this Contract for the Contractor's non-compliance with its Local Employment Plan, including the right to terminate for default in the event of repeated instances of such non-compliance.

Except as expressly amended hereby, the Existing Contract remains in full force and effect as originally executed.

IN WITNESS WHEREOF, the parties have caused this Contract Modification No. 10 to the Existing Contract to be executed by their respective officers duly authorized on the date first written above.

EL DORADO NATIONAL (CALIFORNIA), INC.

By: _____
Signature

TONY WAYNE
Type or Print Name

1/15/19
Date

LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY
Philip A. Washington
Chief Executive Officer

By: _____
Elizabeth Hernandez
Principal Contract Administrator

1/17/19
Date

Los Angeles County
Metropolitan Transportation Authority

One Gateway Plaza
Los Angeles, CA 90012-2952

213.922.2000 Tel
metro.net

Metro

MAEL-045 **Response Required: No**

Date: January 28, 2019

File Nos.:

Action Item(s):

CDRL: n/a

Richard Himes
Contract Administration Manager
Eldorado National (California), Inc. (ENC)
9670 Galena Street
Riverside, CA 92509

SUBJECT: **OP28367-000 40' LOW FLOOR CNG TRANSIT BUSES**
EXECUTED CONTRACT MODIFICATION NO.: 11
METRO REQUESTED CHANGES TO BUS DESIGN/CONFIGURATION

Reference: ELMA-054

Dear Mr. Himes:

Enclosed is your executed original of the subject modification.

Please call me at 213.922.7334 or e-mail at hernandezel@metro.net if you have any questions.

Sincerely,

Elizabeth Hernandez
Principal Contract Administrator

Enclosure: Fully executed Contract Modification No. 11

cc: Kwesi Annan

LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY

CONTRACT NO. OP28367-000, CONTRACT MODIFICATION NO.: 11

FOR: FORTY FOOT (40') LOW FLOOR CNG TRANSIT BUSES

This Contract Modification No. 11 to Contract No.: OP28367-000 is made effective on the 15th day of January 2019 by and between the LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY, hereinafter referred to as "MTA", and EL DORADO NATIONAL (CALIFORNIA), INC., hereinafter referred to as "CONTRACTOR".

WHEREAS, CONTRACTOR and MTA entered into Contract No.: OP28367-000 effective August 15, 2017, as amended by Contract Modification No. 1, dated November 6, 2017, Contract Modification No. 2, dated December 6, 2017, Contract Modification No. 3 dated December 27, 2017, Contract Modification No. 4 dated January 19, 2018, Contract Modification No. 5 dated February 12, 2018, Contract Modification No. 6 dated April 23, 2018, Contract Modification No. 7 dated October 3, 2018, Contract Modification No. 8 dated October 26, 2018, Contract Modification No. 9 dated November 5, 2018, and Contract Modification No. 10 dated January 9, 2019, (the "Existing Contract") and;

WHEREAS, CONTRACTOR and MTA desire to modify the Existing Contract as provided herein;

Now, therefore, it is mutually agreed, by and between the parties as follows:

MTA requested and approved changes to the bus design/configuration for an increase in the aggregate Contract amount of **$279,870**, inclusive of applicable taxes:

A. Heat shield between catalytic converter and HVAC unit
B. Protective layer film for modesty panels
C. Ethernet cable for fare box
D. Ethernet cables for Automatic Passenger Control
E. Redesign of Rear Cross Seat Access to Engine Compartment (Jefferson doors)

Article IV COMPENSATION shall read as follows:

ARTICLE IV: COMPENSATION

A. Contract Price

1. In consideration of the Contractor's full performance of the Work, and in accordance with the terms of the Contract, Metro will pay the Contractor the Contract Price of ~~$199,044,300~~ $199,324,170, inclusive of tax and delivery as provided in this Article and in the Contract Document entitled Compensation and Payment Provisions.

Contract Options may be exercised unilaterally by LACMTA in accordance with Special Provisions Article SP-28, Options.

2. Training Aids - Additionally, in consideration of the Contractor's full performance of the Work, and in accordance with the terms of the Contract, Metro will pay the Contractor for line items under Pricing Form PF-5 Training Aids in the amount of $349,646 inclusive of tax and delivery as provided in this Article and in the Contract Document entitled Compensation and Payment Provisions, CP- 2 (H).

a.	Ea.	One complete running engine and transmission assembly, including cooling and fueling systems, mounted on a suitable roll around stand (TS 5.6.3.a)
b.	Ea.	Anti-Lock Brake Board (TS 5.6.3.f)
c.	Ea.	Electric Air Conditioning Training Simulator Module (TS 5.6. 3.g)
d.	Ea.	Video Security System (TS 5.6.3.i)
e.	Ea.	Multiplex Electrical Training Board (TS 5.6.3.k)
f.	Ea.	Voith DIWA.6 transmission training cutaway (TS 5.6.3.b)

Revised Pricing Forms: PF-1 and PF-1A as attached to this modification no. 11.

Except as expressly amended hereby, the Existing Contract remains in full force and effect as originally executed.

IN WITNESS WHEREOF, the parties have caused this Contract Modification No. 11 to the Existing Contract to be executed by their respective officers duly authorized on the date first written above.

EL DORADO NATIONAL (CALIFORNIA), INC.

By: _____
Signature

TONY WAYNE
Type or Print Name

1/15/19
Date

LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY
Philip A. Washington
Chief Executive Officer

By: _____
Wayne Okubo
Director, Contract Administration

1/24/19
Date

GROUP A - UP TO 600 40' CNG BUSES
FORM PF-1 (CNG - 40') - CONTRACT PRICE SUMMARY
Contract Modification No.: 11

Proposer: ELDORADO NATIONAL (CALIFORNIA), INC.

Contract No.: OP28367-000

Contract Title: FORTY FOOT (40') LOW FLOOR CNG BUS PROCUREMENT

1.0 CONTRACT FOR 295 BUSES (BASE BUY)

No.	Qty.	Description of Item	Taxable Unit Price	Unit Price	Total Price
1	229	40' Low Floor CNG Buses (Base Buy) from PF-1A Values derived from PF-1A*:	$596,199.46	$615,939.30	$141,050,100
	66	[1] 40' Low Floor CNG Buses (Base Buy) from PF-1A	$595,805.53	$615,545.53	$40,626,005
1a	Lot	Manuals (Base Buy) (TS 5.6.4)	$2,281.50	Lump Sum	$23,400.00
1b	295	Vehicle Delivery Charge for Base Buy Value of all taxable delivery charges per bus**:		$275.00	$81,125.00
1c	229	Tax (Base Buy Production Bus 67 - 295)	9.75%	$58,129.45	$13,313,925
1d	66	Tax (Base Buy Production Bus 1-66)	9.75%	$58,091.04	$3,834,009
2	2	Pilot Buses Retrofit with Rear Axle Upgrade		$8,600	$17,201
2a		Tax	9.75%	$838.55	$1,677
3	Lot	Reserved			
4	Lot	Reserved			
5	Lot	Reserved			
6	Lot	Reserved			
7	Lot	Performance Bond (Base Buy)		Lump Sum	$119,336.00
8	1,000	Total Training Hours for Base Buy***		$175,000.00	
8a	900	Contractor (Proposer/Prime) Base Buy		$175.00	$157,500.00
8b	100	Subcontractor/Supplier Base Buy		$175.00	$17,500.00
9	1	System Management Tool for use at up to (13) MTA Operating Divisions per TS 86.1		$74,930.00	$74,930.00
10a	15	Special Towing Equipment (TS 25)		$386.00	$5,790.00
10b		Tax	9.75%	$37.64	$564.53
11a	2	Rear Recovery Devices/Tie Downs (TS 25)		$505.00	$1,010.00
11b		Tax	9.75%	$49.24	$98.48

1.0 Total Price for CONTRACT for 295 Base Buy Buses (Sum of Items "1" through "11b") to be the BASIS for Price Proposal evaluation

In U.S. Dollars Using Words: ONE HUNDRED NINETY NINE MILLION THREE HUNDRED TWENTY FOUR THOUSAND ONE HUNDRED SEVENTY DOLLARS

In U.S. Dollars Using Figures: $199,324,170

GROUP A - UP TO 600 40' CNG BUSES
FORM PF-1 (CNG - 40') - CONTRACT PRICE SUMMARY
Contract Modification No.: 11

Proposer: ELDORADO NATIONAL (CALIFORNIA), INC.

Contract No.: OP28367-000

Contract Title: FORTY FOOT (40') LOW FLOOR CNG BUS PROCUREMENT

NOTE [1] Unit Prices from Mod. No. 7 for Production Buses 1 - 65

* Taxable Unit Price is the Unit Price less 1.14 Accessibility Provisions on PF-1A

** Input the taxable portion of the Delivery Charge under the Taxable Unit Price column and the total Delivery Charge under the Unit Price column

*** Training Hours for Base Buy are only estimates and not a guaranteed level of effort. The total for this Line is a Not-to-Exceed provisional amount.

2.0 CONTRACT FOR 150 UP TO 305 BUSES (OPTION BUY)

No.	Qty.	Description of Item		Taxable Unit Price	Unit Price	Total Price
10	305	40' Low Floor CNG Buses (Option Buy) from PF-1A for 150 to 305 vehicles*		$596,199.46	$615,939.30	$187,861,486.50
10a	Lot	Manuals (Option Buy) (TS 5.6.4)***		$2,281.50	Lump Sum	$23,400.00
10b	305	Vehicle Delivery Charge for Option Buy	Value of all taxable delivery charges per bus**:	$0.00	$275.00	$83,875.00
10c		Tax (Option Buy)		9.75%	$58,129.45	$17,731,762.94
11		Reserved			$	$
12	Lot	Performance Bond for Option Buy***			Lump Sum	$123,421.00
13	500	Total Training Hours for Option Buy****			$87,500.00	
13a	450	Contractor (Proposer/Prime) Option Buy			$175.00	$78,750.00
13b	50	Subcontractor/Supplier Option Buy			$175.00	$8,750.00
14		Reserved			$	$

2.0 Total Price for CONTRACT for 150 Up to 305 Option Buy Buses (Sum of Items "10" through "14") to be the BASIS for Price Proposal evaluation

In U.S. Dollars Using Words: TWO-HUNDRED FIVE MILLION NINE HUNDRED ELEVEN THOUSAND FOUR HUNDRED FORTY FIVE DOLLARS

In U.S. Dollars Using Figures: **$205,911,445**

NOTE * Taxable Unit Price is the Unit Price less 1.14 Accessibility Provisions on PF-1A

** Input the taxable portion of the Delivery Charge under the Taxable Unit Price column and the total Delivery Charge under the Unit Price column

*** For proposal purposes only, Manuals and Bond prices are for all 305 bus Options exercised. Actual cost will depend on Option quantity ordered.

**** Training Hours for Option Buy are only estimates and not a guaranteed level of effort. The total for this Line is a Not-to-Exceed provisional amount.

GROUP A - UP TO 600 40' CNG BUSES
FORM PF-1 (CNG - 40') - CONTRACT PRICE SUMMARY
Contract Modification No.: 11

Proposer: ELDORADO NATIONAL (CALIFORNIA), INC.

Contract No.: OP28367-000

Contract Title: FORTY FOOT (40') LOW FLOOR CNG BUS PROCUREMENT

3.0 OPTIONAL VEHICLE CONFIGURATION

No.	Qty.	Description of Item		Unit Price	Total Price
15	1	3 ADA Securement Configuration TS 81.5 (Total 15a - 15d)			$6,370.00
15a		Direct Materials/Equipment		$5,750.00	
15b		Labor Installation Costs		$620.00	
15c		Non Recurring Cost		$0.00	
15d		Other Costs (Identify)		$0.00	
16	1	4 ADA Securement Configuration TS 81.5 (Total 16a - 16d)			$10,170.00
16a		Direct Materials/Equipment		$9,150.00	
16b		Labor Installation Costs		$1,020.00	
16c		Non Recurring Cost		$0.00	
16d		Other Costs (Identify)		$0.00	
17	600	Reserved****			
17a	295	Reserved			
17b	305	Reserved			
18	600	25-Year Certified CNG Tanks			$522,000.00
18a	295	25 Yr Certified CNG Tanks for Base Buy	$256,650.00	$870.00	
18b	305	25 Yr Certified CNG Tanks for Option Buy for 150 up to 305 vehicles	$265,350.00	$870.00	
19	600	Complete Automatic Passenger Counter System TS 86.3 (Total 19a - 19h)			$2,757,600.00
19a	295	Direct Materials/Equipment for Base Buy APC		$4,136.00	
19b	295	Labor Installation Costs for Base Buy APC		$460.00	
19c	295	Non Recurring Cost for Base Buy APC		$	

GROUP A - UP TO 600 40' CNG BUSES
FORM PF-1 (CNG - 40') - CONTRACT PRICE SUMMARY
Contract Modification No.: 11

Proposer: ELDORADO NATIONAL (CALIFORNIA), INC.

Contract No.: OP28367-000

Contract Title: FORTY FOOT (40') LOW FLOOR CNG BUS PROCUREMENT

19d	295	Other Costs (Identify) for Base Buy APC		$	
		Total for Base Buy APC	$1,355,820.00	$4,596.00	
19e	305	Direct Materials/Equipment for Option Buy APC for 150 up to 305 vehicles		$4,136.00	
19f	305	Labor Installation Costs for Option Buy APC for 150 up to 305 vehicles		$460.00	
19g	305	Non Recurring Cost for Option Buy APC for 150 up to 305 vehicles		$	
19h	305	Other Costs (Identify) for Option Buy APC for 150 up to 305 vehicles		$	
		Total for Option Buy APC for 150 up to 305 vehicles	$1,401,780.00	$4,596.00	
20	600	Enhanced 360 degree Camera System TS 86.1 (Total 20a - 20h)			$579,000.00
20a	295	Direct Materials/Equipment for Base Buy Enhanced Camera System		$869.00	
20b	295	Labor Installation Costs for Base Buy Enhanced Camera System		$96.00	
20c	295	Non Recurring Cost for Base Buy Enhanced Camera System		$	
20d	295	Other Costs (Identify) for Base Buy Enhanced Camera System		$	
		Total for Base Buy Enhanced Camera System	$284,675.00	$965.00	
20e	305	Direct Materials/Equipment for Option Buy Enhanced Camera System for 150 up to 305 vehicles		$869.00	
20f	305	Labor Installation Costs for Option Buy Enhanced Camera System for 150 up to 305 vehicles		$96.00	
20g	305	Non Recurring Cost for Option Buy Enhanced Camera System for 150 up to 305 vehicles		$	
20h	305	Other Costs (Identify) for Option Buy Enhanced Camera System for 150 up to 305 vehicles		$	
		Total for Option Buy Enhanced Camera System for 150 up to 305 vehicles	$294,325.00	$965.00	
21	600	USB Ports for Passenger Charging Only			$288,000.00
21a	295	USB Ports for Passenger Charging Only for Base Buy	$141,600.00	$480.00	
21b	305	USB Ports for Passenger Charging Only for Option Buy for 150 up to 305 vehicles	$146,400.00	$480.00	
22	600	Optional Wireless Stop Request Switches (Bus set)			$291,000.00
22a	295	Optional Wireless Stop Request Switches (Bus set) for Base Buy	$143,075.00	$485.00	

GROUP A - UP TO 600 40' CNG BUSES

FORM PF-1 (CNG - 40') - CONTRACT PRICE SUMMARY

Contract Modification No.: 11

Proposer: **ELDORADO NATIONAL (CALIFORNIA), INC.**

Contract No.: **OP28367-000**

Contract Title: **FORTY FOOT (40') LOW FLOOR CNG BUS PROCUREMENT**

22b	305	Optional Wireless Stop Request Switches (Bus set) for Option Buy for 150 up to 305 vehicles	$147,925.00	$485.00	
23	600	Optional Full Color Destination Sign Sets (TS 86.3)			$2,070,000.00
23a	295	Optional Full Color Destination Sign Sets (TS 86.3) for Base Buy	$1,017,750.00	$3,450.00	
23b	305	Optional Full Color Destination Sign Sets (TS 86.3) for Option Buy for 150 up to 305 vehicles	$1,052,250.00	$3,450.00	
24	Lot	Spare Parts (From Schedule A, Form PF-2)			$2,261,788.13
25	Lot	Special Tools (Schedule B Form PF-3)			$7,710.00
26	Lot	Diagnostic Test Equipment (Schedule C, Form PF-4)			$355,010.00
27	Lot	Training Aids (Schedule D, Form PF-5)			$989,385.00

3.0 Total Price for OPTIONAL VEHICLE CONFIGURATION (Sum of Items "15 through 27") for OPTIONAL EQUIPMENT to be BASIS for Price Proposal evaluation.

In U.S. Dollars Using Words: **TEN-MILLION ONE HUNDRED THIRD EIGHT THOUSAND ONE HUNDRED THIRTY THREE DOLLARS**

In U.S. Dollars Using Figures: **$10,138,033**

**** Proposer shall provide base Low Nox Engine for each bus with the following Emission Levels:
ISLG engine is not the base engine requirement. Low Nox engine is the base requirement and therefore no longer an option.

Oxides of Nitrogen (NOx) Grams per brake horsepower-hour	Particulate Matter (PM) grams per brake horsepower hour
0.02	0.01

GROUP A - UP TO 600 40' CNG BUSES

FORM PF-1 (CNG - 40') - CONTRACT PRICE SUMMARY

Contract Modification No.: 11

Proposer: ELDORADO NATIONAL (CALIFORNIA), INC.

Contract No.: OP28367-000

Contract Title: FORTY FOOT (40') LOW FLOOR CNG BUS PROCUREMENT

4.0 CONTRACT FOR BASE BUY, OPTION BUY, AND OPTIONALVEHICLE CONFIGURATION

No.	Qty.	Description of Item	Total Price
1.0		Total Price for CONTRACT for 295 Base Buy Buses to be the BASIS for Price Proposal evaluation	$199,324,170
2.0		Total Price for CONTRACT for 150 Up to 305 Option Buy Buses to be the BASIS for Price Proposal evaluation	$205,911,445
3.0		Total Price for OPTIONAL VEHICLE CONFIGURATION for OPTIONAL EQUIPMENT to be BASIS for Price Proposal evaluation	$10,138,033
4.0		Total Price for CONTRACT for 295 Base Buy Buses, for 150 up to 305 Option Buy Buses, and Optional Vehicle Configuration for Optional Equipment combined to be the overall BASIS for Price Proposal evaluation	

In U.S. Dollars Using Words: FOUR-HUNDRED FIFTEEN MILLION THREE HUNDRED SEVENTY THREE THOUSAND SIX HUNDRED FORTY NINE DOLLARS

In U.S. Dollars Using Figures: $415,373,649

(Signature of Person Executing Proposal) Date

TONY WAYNE VICE PRESIDENT & GENERAL MANAGER

Type Name, Title

GROUP A - UP TO 600 40' CNG BUSES
FORM PF-1A (CNG - 40')
SUBSYSTEM EQUIPMENT
CONTRACT MODIFICATION NO. 11

Contractor: ELDORADO NATIONAL (CALIFORNIA), INC
Contract No.: OP28367-000

NO.	DESCRIPTION	BASE BUY OF ITEM		
1	Purchased Subsystem Equipment (Items 1.1 through 1.99) **			
1.1	TS 9.	Propulsion Power Assembly (PPA)***		$18,372
1.2	TS 9.	Engine		$60,324
1.3	TS 10.	Cooling System		$12,650
1.4	TS 18.	Fuel System		$68,300
1.5	TS 19.2	Heat shield between catalytic converter and HVAC unit		$332.55
1.6	TS 23.1	Hinge Rear Cross Seat Access to the bulkhead		$65.66
1.7	TS 31.	Suspension		$19,950
1.8	TS 33.	Steering System		$4,950
1.9	TS 37.	Brakes		$3,260
1.10	TS 39.	Pneumatic System		$6,850
1.11	TS 42.	Charging System		$36,800
1.12	TS 44.	Multiplex Control System		$24,200
1.13	TS 54.	HVAC Climate Control System		$29,450
1.14	TS 75.2	Protective film on modesty panels		$116.94
1.15	TS 76	Ethernet Cable to Farebox		$38.38
1.16	TS 78.	Passenger Seats		$28,955
1.17	TS 80.	Doors		$14,830
1.18	TS 81.	Accessibility Provisions		$19,740
1.19	TS 86.	Communications		$3,244
1.20	TS 86.3	Ethernet Cables in ITS enclosue		$310.91
1.21	TS 11	Transmission		$14,261
1.22	TS 78.1	USB Passenger Charging Port		$480
1.23	TS85.1	Wirelesss Stop Request Button		$485
1.24	TS 86.3	Matrix APC		$4,596
1.99	TS 34	Meritor Rear Axle Upgrade		$1,040
		All other bus subsystem equipment not included above		$241,944

TOTAL CNG BUS PRICE

Production Bus 1 - 66	* $615,545.53
Add Altro Flooring (Bus 67 - 295)	$393.80
Production Bus 67 - 295	$615,939.30

* Transfer Total CNG Bus Price to Contract Price Summary Form (PF-1 - Unit Price column, line Item 1 **- Base Buy**

Notes: 1. ** Price shall include design, engineering, manufacturing/assembly, testing, shipping, profit and other associated costs. Price for each subsystem equipment shall include all applicable apparatus.

2. Price for line Item Nos. 1a-27 in the CONTRACT PRICE SUMMARY(Form PF-1) shall not be included in computing price of any of the line items above.

3. *** PPA unit price for line item 1.1 excludes prices for items 1.2 through 1.99

GROUP A - UP TO 600 40' CNG BUSES
FORM PF-1A (CNG - 40')
SUBSYSTEM EQUIPMENT
CONTRACT MODIFICATION NO. 11

NO.	DESCRIPTION	OPTION BUY OF ITEM		
2	Purchased Subsystem Equipment (Items 2.1 through 2.99) **			
2.1	TS 9.	Propulsion Power Assembly (PPA)***		$18,372
2.2	TS 9.	Engine		$60,324
2.3	TS 10.	Cooling System		$12,650
2.4	TS 18.	Fuel System		$68,300
2.5	TS 19.2	Heat shield between catalytic converter and HVAC unit		$332.55
2.6	TS 23.1	Hinge Rear Cross Seat Access to the bulkhead		$65.66
2.7	TS 31.	Suspension		$19,950
2.8	TS 33.	Steering System		$4,950
2.9	TS 37.	Brakes		$3,260
2.10	TS 39.	Pneumatic System		$6,850
2.11	TS 42.	Charging System		$36,800
2.12	TS 44.	Multiplex Control System		$24,200
2.13	TS 54.	HVAC Climate Control System		$29,450
2.14	TS 75.2	Protective film on modesty panels		$116.94
2.15	TS 76	Ethernet Cable to Farebox		$38.38
2.16	TS 78.	Passenger Seats		$28,955
2.17	TS 80.	Doors		$14,830
2.18	TS 81.	Accessibility Provisions		$19,740
2.19	TS 86.	Communications		$3,244
2.20	TS 86.3	Ethernet Cables in ITS enclosue		$310.91
2.21	TS 11	Transmission		$14,261
2.22	TS 78.1	USB Passenger Charging Port		$480
2.23	TS85.1	Wirelesss Stop Request Button		$485
2.24	TS 86.3	Matrix APC		$4,596
2.99	TS 34	Meritor Rear Axle Upgrade		$1,040
		All other bus subsystem equipment not included above including flooring		$242,338

TOTAL CNG BUS PRICE OPTION QUANTITY * $615,939.30

* Transfer Total CNG Bus Price to Contract Price Summary Form (PF-1 - Unit Price column, -line item 10 - Option Buy)

Notes: 1. ** Price shall include design, engineering, manufacturing/assembly, testing, shipping, profit and other associated costs. Price for each subsystem equipment shall include all applicable apparatus.

2. Price for line Item Nos. 1-9 and 10a-27 in the CONTRACT PRICE SUMMARY(Form PF-1) shall not be included in computing price of any of the line items above.

3. *** PPA unit price for line item 2.1 excludes prices for items 2.2 through 2.99

(Signature of Person Executing Proposal) Date

TONY WAYNE /VICE PRESIDENT & GENERAL MANAGER

Type Name, Title

Los Angeles County
Metropolitan Transportation Authority

One Gateway Plaza
Los Angeles, CA 90012-2952

213.922.2000 Tel
metro.net

Metro

MAEL-044 **Response Required: No**

Date: January 24, 2019

File Nos.:

Action Item(s):

CDRL: n/a

Richard Himes
Contract Administration Manager
Eldorado National (California), Inc. (ENC)
9670 Galena Street
Riverside, CA 92509

SUBJECT: **OP28367-000 40' LOW FLOOR CNG TRANSIT BUSES**
EXECUTED CONTRACT MODIFICATION NO.: 12
MATRIX OF TECHNICAL SPECIFICATIONS CHANGES; CONFORMED TECHNICAL SPECIFICATIONS (VOLUME II OF II)

Reference: ELMA-055

Dear Mr. Himes:

Enclosed is your executed original of the subject modification.

Please call me at 213.922.7334 or e-mail at hernandezel@metro.net if you have any questions.

Sincerely,

Elizabeth Hernandez
Principal Contract Administrator

Enclosure: Fully executed Contract Modification No. 12

cc: Kwesi Annan

LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY

CONTRACT NO. OP28367-000, CONTRACT MODIFICATION NO.: 12

FOR: FORTY FOOT (40') LOW FLOOR CNG TRANSIT BUSES

This Contract Modification No. 12 to Contract No.: OP28367-000 is made effective on the 17th day of January 2019 by and between the LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY, hereinafter referred to as "MTA", and EL DORADO NATIONAL (CALIFORNIA), INC., hereinafter referred to as "CONTRACTOR".

WHEREAS, CONTRACTOR and MTA entered into Contract No.: OP28367-000 effective August 15, 2017, as amended by Contract Modification No. 1, dated November 6, 2017, Contract Modification No. 2, dated December 6, 2017, Contract Modification No. 3 dated December 27, 2017, Contract Modification No. 4 dated January 19, 2018, Contract Modification No. 5 dated February 12, 2018, Contract Modification No. 6 dated April 23, 2018, Contract Modification No. 7 dated October 3, 2018, Contract Modification No. 8 dated October 26, 2018, Contract Modification No. 9 dated November 5, 2018, Contract Modification No. 10 dated January 9, 2019, and Contract Modification No. 11 dated January 15, 2019 (the "Existing Contract") and;

WHEREAS, CONTRACTOR and MTA desire to modify the Existing Contract as provided herein;

Now, therefore, it is mutually agreed, by and between the parties as follows:

Changes/revisions to Contract OP28367-000, Technical Specifications - Volume II of II as outlined in Attachment I. A conformed copy of the updated Technical Specifications, dated January 14, 2019, is enclosed with this modification.

Except as expressly amended hereby, the Existing Contract remains in full force and effect as originally executed.

IN WITNESS WHEREOF, the parties have caused this Contract Modification No. 12 to the Existing Contract to be executed by their respective officers duly authorized on the date first written above.

EL DORADO NATIONAL (CALIFORNIA), INC.

By: _____
Signature

TONY WAYNE
Type or Print Name

1/21/19
Date

LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY
Philip A. Washington
Chief Executive Officer

By: _____
Elizabeth Hernandez
Principal Contract Administrator

1/23/19
Date

CONTRACT NO.: OP28367-000
Modification No. 12, Attachment I
Volume II Technical Specification Changes

<table>
<tr><th>Ref #</th><th>Reference #</th><th><u>Paragraph number, Paragraph title, and Paragraph changes.</u>
Additions are in bolded Red and deletions are in crossed out bolded Blue</th></tr>
<tr><td>1</td><td>RFP - Amendment No. 4</td><td>

TS 1. Scope

These technical specifications contain the LACMTA's requirements for wheelchair accessible low floor transit buses, which accommodate the widest spectrum of passengers including children, adults, the elderly, and the physically disabled, conforming to all applicable ADA regulations. These buses shall provide maximum passenger appeal in appearance, comfort, and safety; combined with excellence in operating characteristics, standardization with existing LACMTA fleet, economy of operation, maximum efficiency, optimum seating, and conformity with federal, state and local regulations and emission standards. Buses shall include interior and exterior styling features in common with existing Metro BRT type buses such as streamlined appearance. These buses shall incorporate a high level of subsystem integration coordinated with central diagnostic functions and single point Operator interface. Buses shall have a minimum expected life of 12 years or 500,000 miles, whichever comes first. **Refer to Table 17 for design life goals.**

Metro will consider and evaluate proposals of Zero Emission (ZE) buses that meet legal, dimensional, maintainability and performance requirements outlined in this document. Vendors proposing electric buses for consideration should also include a list of any specialty equipment used for fueling and/or recharging vehicle, any specialty support and/or diagnostic equipment, and any other unique equipment that will be necessary to support daily operation of the vehicle. Any specialty equipment required to support the ZEB project should be itemized and listed along with estimated installation costs as part of each Contractor's proposal. Any ZE buses proposed in response to this solicitation shall meet CARB's definition for zero emission buses.

These technical specifications have been prepared with emphasis on in-service reliability. The basic structure of the bus including major suspension components shall be designed to last the life of the bus without major overhaul or replacement.

Wherever brand, manufacturer or product names are indicated in the Technical Specification, they are included for the purpose of establishing identification and a general description of the Goods, Equipment, Components or parts. Wherever such names appear, the term "OR APPROVED EQUAL" is deemed to follow. The decision whether a proposed Item is an approved equal will be rendered by LACMTA as defined by Contract **~~GC-02-H~~** **SP-34** Non-Restrictive Clauses.

</td></tr>
<tr><td>2</td><td>RFP - Amendment No. 4</td><td>

TS 5.6.6 Diagnostic Laptop PC Specifications

~~Required~~ **Optional** diagnostic laptop shall be Dell Latitude E6540 **and** at a minimum contain the following:

TABLE 2
Laptop Specifications

<table>
<tr><th>Category</th><th>Description</th></tr>
<tr><td>Processor</td><td>Intel Core i5-6300U (Dual Core, 2.4GHz, 3M cache)</td></tr>
<tr><td>Operating System</td><td>Windows 7 Professional English, French, Spanish 64-bit (Includes Windows 10 Pro License)</td></tr>
</table>

</td></tr>
</table>

<table>
<tr><th>Ref #</th><th>Reference #</th><th><u>Paragraph number, Paragraph title, and Paragraph changes.</u>
Additions are in bolded Red and deletions are in crossed out bolded Blue</th></tr>
<tr><td></td><td></td><td>
<table>
<tr><td>Memory</td><td>8GB (2x4GB) 2133MHz DDR4 Memory</td></tr>
<tr><td>Hard Drive</td><td>500GB 7200rmp 7.2krpm HD</td></tr>
<tr><td>Video Card</td><td>AMD Radeon RT M360, for I5-6300U (Vpro Capable)</td></tr>
<tr><td>Optical Drive</td><td>Dell External USB Slim DVD+/-RW Optical Drive</td></tr>
<tr><td>Battery</td><td>Primary 4-cell 62W/HR Battery</td></tr>
<tr><td>Adapter</td><td>65 Watt AC Adaptor</td></tr>
<tr><td>Power Cord</td><td>US Power Cord</td></tr>
<tr><td>LCD</td><td>15.6-inch HD (1366x768) Anti-Glare LCD</td></tr>
<tr><td>Wireless</td><td>Intel Dual-Band Wireless-AC 8260 Wi-Fi + BTW8260AC 4.1 Wireless Driver (2x2)</td></tr>
<tr><td>Keyboard</td><td>Internal Dual Pointing Keyboard, English</td></tr>
<tr><td>Security Hardware</td><td>Absolute Computrace Complete 5 Year - Education</td></tr>
<tr><td>System Management</td><td>No Out-of-Band System Management</td></tr>
</table>
System shall be compatible with all diagnostic software. Contractor shall provide a complete listing of all proposed software and hardware to the LACMTA Project Manager prior to purchasing.
Because of the time delay between the procurement process and receipt of ~~**required**~~ computer equipment, the final laptop computer configuration shall be subject to approval by the LACMTA at delivery to ensure it has all of the appropriate and necessary software and is compatible with LACMTA’s other existing laptop computers. All laptop PCs shall include a suitable protective carrying “soft” case and a Microsoft mouse.
</td></tr>
<tr><td>3</td><td>RFP - Amendment No. 4</td><td>
<h2>TS 9.2.2 Propulsion System Service</h2>
The propulsion system shall be arranged so that accessibility for all routine maintenance is ensured. No special tools, other than dollies and hoists, shall be required to remove the propulsion system or any subsystems. However, LACMTA shall recognize that properly rated equipment and safety electrical work practices are essential when servicing high-voltage electric components. The air compressor, radiator, all propulsion accessories, and any other component requiring service or replacement shall be easily re moveable. The Contractor shall provide all specialty tools and diagnostic equipment required for maintaining the propulsion system in accordance with the Special Tools List.
All compartments and areas that include components using hazardous or higher voltages, shall incorporate safety warning labels to provide appropriate warning for service personnel. A secondary label shall be included to list the voltages in use within the compartment or area. Labels shall be visible when approaching the area. Labels shall include pictograph symbols for easy recognition.
</td></tr>
<tr><td>4</td><td>RFP - Amendment No. 4</td><td>
<h2>TS 10.1 Engine Cooling</h2>
A heavy-duty stainless steel radiator surge tank shall provide sufficient draw down capacity as required by the engine manufacturer. A heavy-duty single glass tube, (non-plastic), shall be provided to determine satisfactory engine coolant level
</td></tr>
</table>

Ref #	Reference #	Paragraph number, Paragraph title, and Paragraph changes. Additions are in bolded **Red** and deletions are in crossed out bolded **Blue**
		accessible by opening the surge tank access door. A spring-loaded, push-button type valve or lever shall be provided to safely release pressure or vacuum in the cooling system with both it and the water filler no more than 65 inches above the ground. Both shall be accessible through the same access door. Surge tank filler cap shall have a safety lock. A ¼-inch NPT port shall be provided in a convenient location in the surge tank for the LACMTA's pressure testing equipment, refer to CDRL Table 20. The system shall be designed to allow coolant to be added while the cooling system is at full operating temperature incorporating an un-pressurized coolant overflow reservoir. The radiator shall be of durable corrosion-resistant construction **with bolt-on, removable, metal header tanks.** No heat producing components, such as intake charge-air-coolers, or climate control system components shall be mounted between the engine cooling air intake aperture and the radiator. Sensor port fittings (1/8-inch NPTF) shall be provided in the upper and lower sections of the radiator to allow the use of thermocouple for diagnostics. Louvered fins are not acceptable. **Self-Cleaning** Radiator and charge air cooler fan(s) shall be electrically driven and capable of reverse operations for periodic self-cleaning of the radiator and charge air cooler. For multiple fans, system shall be designed to prevent air recirculation in the event of individual fan failure. A cooling system pressure gauge with an operating range of 0-30 psi, easily readable through the surge tank access door, shall be installed to monitor static and operating pressures.
5	**RFP - Amendment No. 4**	**TS 42.1.4 Battery Compartment** The battery compartment shall prevent accumulation of water and debris on top of the batteries and shall be vented and self-draining. It shall be accessible only from the outside of the vehicle. All components within the battery compartment, and the compartment itself, shall be protected from damage or corrosion from the electrolyte. The inside surface of the battery compartment's access door shall be electrically insulated, as required, to prevent the battery terminals from shorting on the door if the door is damaged in an accident or if a battery comes loose. Battery enclosure, including access door or cover, shall be constructed of fiberglass, suitable plastic material, or stainless steel. The battery quick disconnect access door shall be identified with a decal. ~~**The decal size shall not be less than 3.5 × 5 inches (8.89 × 12.7 cm).**~~ The battery hold-down bracket shall be constructed of a non-metallic material (plastic or fiberglass).
6	**RFP - Amendment No. 4**	**TS 43.1 Wiring and Terminals** Kinking, grounding at multiple points, stretching and reducing the bend radius below the manufacturer's recommended minimum shall not be permitted. The wires used between data Bus and devices shall consist of UL or CSA approved multi-strand wires. The load side shall have wire UL or CSA approved. Individual slip-on "spade" or "blade" type connectors are acceptable on a case-by-case basis **during Pre-Production meeting review**.

<table>
<tr><th>Ref #</th><th>Reference #</th><th><u>Paragraph number, Paragraph title, and Paragraph changes.</u>
Additions are in bolded Red and deletions are in crossed out bolded Blue</th></tr>
<tr><td></td><td></td><td>This access door shall not require any special locking devices to gain access to the switch. The door shall be flush-fitting and incorporate a spring tensioner or equal to retain the door in a closed position when not in use.
The batteries shall be securely mounted on a self-draining stainless steel or other non-corrosive material tray that can accommodate the size and weight of the batteries without deformation. The battery tray shall pull out easily and properly support the batteries while they are being serviced. The tray shall allow each battery cell to be easily serviced and filled. A locking device shall retain the battery tray to the stowed position. A maximum of four batteries shall be securely mounted on each heavy-duty battery tray which shall accommodate the battery system. Tray(s) shall pull out on heavy-duty rollers or swing out easily from outside the bus for service, inspection, and replacement.
If not located in the engine compartment, the same fire-resistant properties must apply to the battery compartment. Sparking devices shall not be located within the battery box.</td></tr>
<tr><td>7</td><td>RFP - Amendment No. 4</td><td>TS 86.8 ITS Provisions, Wireless Local Area Network (WLAN)
WLAN antenna, including five) leads; two) Cellular, two Wi-Fi and one GPS and an additional Wi-Fi antenna inside the bus for passenger Wi-Fi. Sierra Wireless, InMotion, oMG 2032 or an approved equal wireless router/switch and feedline shall be installed, subject to LACMTA approval in Pre-Production meetings. (Refer to Section TS 88.1 Approved Equals). Power for wireless router/switch shall be independently timed by the router to allow automatic turn-off one hour or more after bus is parked as a configurable feature of the router.</td></tr>
<tr><td>8</td><td>RFP - Amendment No. 4</td><td>TABLE 15
Approved Products
<table><tr><th>PRODUCT</th><th>MANUFACTURER</th><th>PRODUCT SPECIFICATION</th></tr><tr><td>Wireless Router (Wi-Fi System)</td><td><s>InMotion</s> Sierra Wireless</td><td>InMotion, oMG 2032</td></tr></table></td></tr>
<tr><td>9</td><td>RFP - Amendment No. 4</td><td>TS 88.5 References
<table><tr><th>SAE #</th><th>Title</th><th>Date Published</th></tr><tr><td>J1908</td><td>Electrical Grounding Practice</td><td>Jan 1, 1996</td></tr></table></td></tr>
<tr><td>10</td><td>RFP – Amendment No. 5</td><td>TS 5.6.5 Special Equipment

Option, Special Service Equipment
The items in this section are discretionary and may be purchased through this contract, subject to LACMTA approval.
The Contractor shall supply pricing for 30 sets of Special Service Equipment listed below for use by LACMTA training staff. Pricing for this special service equipment is to be provided to the LACMTA on Form PF-4-Schedule C of Prices Special Service Equipment.
The LACMTA is aware that diagnostic equipment and/or software has been</td></tr>
</table>

Ref #	Reference #	Paragraph number, Paragraph title, and Paragraph changes. Additions are in bolded **Red** and deletions are in crossed out bolded **Blue**
		developed or is being developed by many of the OEMs to assist in the maintenance of the Buses. Proposer is required to submit a list of recommended special equipment, software and/or diagnostic tools deemed necessary to provide state-of-the-art service for the bus systems. Depending on the type of available equipment and/or software, the LACMTA may wish to obtain complete sets of such Special Service Equipment and/or software, plus any additional tools identified by the OEM manufacturer required to diagnose, calibrate, or remove-and-replace, all equipment provided with this bus order. The purchase of any such Special Equipment and/or software is at the sole option of the LACMTA. Because of technological changes which may occur prior to and during the actual production of the buses, the LACMTA reserves the right to issue Change Orders for updated diagnostic equipment, tools and software, and other Special Service Equipment at any time prior to Contract closeout. For the Base order or any Option order that is exercised the Contractor shall provide pricing for Diagnostic Tools and Equipment listed below. The quantities listed below are for 300 Base Vehicles. Quantities for Diagnostic Tools and Equipment of Option Vehicles will be determined at the time the Option is exercised. At a minimum, Proposers shall provide a complete listing of such currently available equipment and/or software and the proposed pricing in the Price Forms. **Engine/Propulsion and Electric Drive/Transmission:** • Engine/Propulsion Diagnostic software, including necessary cables and connectors with one year software registration. • Transmission/Electric Drive diagnostic software, including necessary cables and connectors. • PPU diagnostic software, including necessary cables and adapters. • Nexiq Technologies USB Link PC to Vehicle Interface. • ABS/Regenerative Braking diagnostic software, including necessary cables and connectors. • Engine/Propulsion cooling system diagnostic or programming software. • Power Management diagnostic tools and software. • Battery Management diagnostic tools and software. **Electrical/Vehicle Control System:** • Multiplex/Vehicle Control software and connection kit to include applicable cables, connectors and translator boxes, no registration or upgrade fees attached.

Ref #	Reference #	Paragraph number, Paragraph title, and Paragraph changes. Additions are in bolded **Red** and deletions are in crossed out bolded **Blue**
		• Diagnostic laptop (to be defined) to include: applicable cables, connectors and translator boxes. • Multiplex Module programmers, (if applicable). **Energy Storage and BMS** • Power management diagnostic software and connection kit to include applicable cables and adapters, including registration fees. **Doors** • Door System diagnostic or programming software. ~~**Chassis – Undercarriage:**~~ ~~• **Towing Equipment - To tow bus from front or rear hookup.**~~ **Interior:** • Video Security Diagnostic Kits including test fixture(s) and associated software application(s) that allows for installing components of each group, (Video Security, IBSS and Destination Sign) so that all the components of each group are easily accessible for programming, replacement, adjustment and troubleshooting including but not limited to all cables, DVR docking station, cameras, etc. Training aid should be integrated with the training program to allow off-the-bus training and familiarization of the systems. • Destination Sign Diagnostic Equipment (J1708 Protocol Boxes/software). **Heating Ventilation Air Conditioning (HVAC):** • A/C interface software and cable. **Diagnostic PC:** • Diagnostic laptops with necessary interface cables, power adapters.
11	**RFP - Amendment No. 5**	**TS 25.Towing** Towing attachment points shall be provided on the front of the bus. Each towing device, when used with a load equalizing sling, shall withstand, without permanent deformation, tension loads up to 1.2 times the curb weight of the bus within 20 degrees of the longitudinal axis of the bus. If applicable, the rear towing device(s) shall not provide a toehold for unauthorized riders. The method of attaching the LACMTA's towing bar shall require the specific approval of the LACMTA in Pre-Production meetings and shall not require the removal, or disconnection, of front suspension or steering components. Removal of the bike rack is permitted for attachment of towing devices. Contractor shall provide 15 sets of any special towing equipment adapters, if required, so that the LACMTA is able to flat tow the bus. Contractor shall demonstrate compliance with these provisions using the Pilot Bus. **Pricing for the towing equipment is to be provided to the LACMTA on Form**

Ref #	Reference #	Paragraph number, Paragraph title, and Paragraph changes. Additions are in bolded **Red** and deletions are in crossed out bolded **Blue**
		PF-3-Schedule A for CNG and Schedule C for ZE of Prices Special Tools. **Provision of Connectors for Towing** Shop air connectors shall be provided at the front and rear of the bus and shall be capable of supplying all pneumatic systems of the bus with externally sourced compressed air. The location of these shop air connectors shall facilitate towing operations. A second air supply should be provided to allow the rear service brakes to be applied using the tow truck brake signal air pressure to apply the rear primary service brakes. All male fittings shall have an additional quarter turn manual shut off valve provided near the front bumper for use only during towing (AMFLO CP1 and C2), subject to LACMTA approval in Pre-Production meetings. Fittings shall be protected against dirt and moisture when not in use. Air connectors shall be LACMTA standard air chucks conveniently located in the engine compartment. Air lines leading to the external air shall include hand shut-off valves. **Lifted (Unsupported) Front Axle and Flat Towing Capability** The front towing attachment points shall allow attachment of the LACMTA's standard tow bar. The front towing attachment points shall permit towing of the bus at curb weight by the towing device(s) and the LACMTA tow bar without damage to anybody panel or component. These devices shall permit common flat towing. Two rear recovery devices/tie downs shall permit lifting and towing of the bus for a short distance, such as in cases of an emergency, to allow access to provisions for front towing of bus. The method of attaching the tow bar or adapter shall require the specific approval of the LACMTA in pre-production meetings. Any tow bar or adapter exceeding 50 pounds should have means to maneuver or allow for ease of use and application. Each towing device shall accommodate a crane hook with a one-inch throat.
12	**RFP - Amendment No. 5**	**TS 76 Fare Collection** Space and structural provisions shall be made for installation of 41-inch GFI Genfare Odyssey Validation farebox and shall be as far forward as practicable. Location of the fare collection device shall not restrict traffic in the vestibule, including wheelchairs if a front door loading device is used, and shall allow the driver to easily reach the farebox controls and to view the fare register. The farebox shall not restrict access to the driver area, shall not restrict operation of driver controls and shall not — either by itself or in combination with stanchions, transfer mounting, cutting and punching equipment, or route destination signs — restrict the driver's field-of- view per SAE Recommended Practice J1050. The location and mounting of the fare collection device shall allow use, without restriction, by passengers. The farebox location shall permit accessibility to the vault for easy manual removal or attachment of suction devices. Meters and counters on the farebox shall be readable on a daily basis. The floor under the farebox shall be reinforced as necessary to provide a sturdy mounting platform and to prevent shaking of the farebox. Adjacent to the farebox area and within easy reach of the Operator, Contractor shall

<table>
<tr><th>Ref #</th><th>Reference #</th><th><u>Paragraph number, Paragraph title, and Paragraph changes.</u>
Additions are in bolded Red and deletions are in crossed out bolded Blue</th></tr>
<tr><td></td><td></td><td>provide a small clipboard approximately 4.5 inches by 5.5 inches to hold the operator schedule, (paddle).
The Contractor shall provide and install GFI Genfare Odyssey Validation farebox base plate, power leads and ITS interface cable, subject to LACMTA approval in Pre-Production meetings.
Note: Proposers are to contact GFI Genfare directly to determine correct part numbers, harness length requirements, etc. The under floor reinforcement shall be of adequate strength to anchor the farebox using GFI installation kit <s>B22249-0001</s> D22581-0005 or equivalent. Reinforcement plate shall include permanently attached nuts to secure the farebox base plate to the floor.
A circuit breaker protected, 20-amp, 24-Volt DC battery circuit, shall be provided and powered through the battery connect switches. This power circuit shall include a grounded lead. A one-inch inside diameter waterproof conduit shall be provided from the ITS enclosure to the farebox base plate mounting location, through the bus floor, to protect the power leads and ITS interface cable, subject to LACMTA approval in Pre-Production meetings. Farebox end of conduit shall protrude above the floor at a minimum 1/2 inch to prevent moisture from entering the conduit.</td></tr>
<tr><td>13</td><td>RFP - Amendment No. 5</td><td>TS 80.7 Door Height Above Pavement
It shall be possible to open and close either passenger door when the bus loaded to gross vehicle weight rating is not knelt and parked with the tires touching an eight-inch high curb on a street sloping toward the curb so that the street side wheels are five inches higher than the right side wheels.
When the bus is at operating level, opened doors shall be <s>a minimum 15.5</s> 14 to 16 inches above the ground.</td></tr>
<tr><td>14</td><td>RFP - Amendment No. 5</td><td>Note: Table 19b applies to zero emission bus decals. Location and quantity of these decals will vary depending on the individual bus configuration. Final layout will be determined during Pre-Production meetings.

TABLE 19b
High Voltage – Metro ZE Bus
<table>
<tr><th>Area</th><th>Description</th><th>Size - Inches</th><th>Location</th><th>Qty</th><th>Total</th></tr>
<tr><td rowspan="2">1. Lock Out Compartment</td><td>
</td><td>4 x 6</td><td>Inside the compartment - Next to the switch</td><td>1</td><td>AR</td></tr>
<tr><td>
</td><td>4 x 6</td><td>Inside the compartment - Next to the switch</td><td>1</td><td>AR</td></tr>
</table></td></tr>
</table>

CONTRACT NO.: OP28367-000
Modification No. 12, Attachment I
Volume II Technical Specification Changes

Ref #	Reference #	Paragraph number, Paragraph title, and Paragraph changes. Additions are in bolded **Red** and deletions are in crossed out bolded **Blue**						
		2. Battery Compartment(s)		**6 x 4**	**Inside the compartment - On the battery box**	**1**	**AR**	
				4 x 6	**Inside the compartment - On the battery box**	**1**	**AR**	
			XXX VOLTS	**1 x 4**	**Inside the compartment - On the battery box**	**1**	**AR**	
				2 x 3	**On the battery enclosure door, visible from outside**	**1**	**AR**	
		3. Automatic Start Equipment		**2 x 4**	**On the equipment**	**1**	**AR**	
				2 x 4	**On the compressor**	**1**	**AR**	
			XXX VOLTS AC 3 PHASE	**1 x 6**	**On the equipment and control boxes**	**1**	**AR**	
			XXX VOLTS	**1 x 4**	**On the equipment and control boxes**	**1**	**AR**	
		4. Auxiliary Motor Controller(s)	XXX VOLTS AC 3 PHASE	**1 x 6**	**On the control box(es) and motor(s)**	**1**	**AR**	
		5. PPU and Hazardous Voltage Area(s)		**2 x 3**	**On the enclosure door, visible from outside**	**1**	**AR**	
				6 x 4	**On the enclosure door, visible from inside**	**1**	**AR**	
			XXX VOLTS	**1 x 4**	**Inside the compartment**	**1**	**AR**	

<table>
<tr><th>Ref #</th><th>Reference #</th><th><u>Paragraph number, Paragraph title, and Paragraph changes.</u>
Additions are in bolded Red and deletions are in crossed out bolded Blue</th></tr>
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<tr><td></td><td>
</td><td>4 x 6</td><td>On the enclosure door, visible from inside</td><td>1</td><td>AR</td></tr>
<tr><td>6. Charging Connector (Bus Side)</td><td>
</td><td>2 x 3</td><td>On the enclosure door, visible from inside</td><td>1</td><td>AR</td></tr>
<tr><td>7. Charging Connector (Station Side)</td><td>
</td><td>2 x 3</td><td>Next to each charging connector</td><td>1</td><td>AR</td></tr>
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</td></tr>
<tr><td>15</td><td>RFP - Amendment No. 5</td><td>Metro 40ft Decal Guide Revision 8-26-16
Decal document updated with revision date of 8-26-16 to include two additional decals for zero emission buses on last page, CS5775 and CS6289. Location and quantity for these two decals to vary depending on particular bus configuration. Final layout will be determined during Pre-Production meetings.</td></tr>
<tr><td>16</td><td>RFP - Amendment No. 7</td><td>TS 2 Definitions
The following definitions are added to section TS 2.
Engine Package: Complete engine assembly incorporating accessories necessary for operation as applicable. Package shall include at a minimum; turbocharger(s), supercharger(s), electronic control modules, manifolds, throttle body, starter, air compressor, hydraulic pump and engine mounted filters.
Radiator Package: Complete system with accessories necessary for operation. Package shall include at a minimum; heat exchanger(s), cooling fan(s), electronic controller(s) with diagnostic communications and alternator if applicable.</td></tr>
<tr><td>17</td><td>RFP - Amendment No. 7</td><td>TS 5.6.4 Manuals
Manual Review and Approval
The Contractor shall be solely responsible for the accuracy and completeness of the manuals and the conversion of the Parts manual into Electronic Parts Catalog (EPC). The LACMTA will assemble a technical review committee to define acceptance criteria of the manuals deliverables, quality standards, file formats, expected results and the testing methods to be used. The Contractor shall put together a team with the technical capabilities to successfully complete these deliverables to LACMTA’s satisfaction.
The Contractor will be required to participate in Manual Review and Approval process and attend one service manual review meeting held at the LACMTA shortly following LACMTA Notice to Proceed. Except for the Parts Index, the draft manuals shall be shipped simultaneously with the first Pilot Bus. The final meeting will be scheduled after receipt of draft manuals but prior to the ship date of the first Production Bus.
Draft Manuals
Except for the Parts Index, the Contractor shall provide the LACMTA with draft</td></tr>
</table>

Ref #	Reference #	Paragraph number, Paragraph title, and Paragraph changes. Additions are in bolded **Red** and deletions are in crossed out bolded **Blue**
		manuals simultaneously with the Pilot Bus: Draft manuals shall include: • Ten draft hardcopies each of the Service, Parts and Operator's manuals plus a list of all proposed OEM Component Repair manuals, simultaneously to the shipping of the first Pilot Bus. • Draft Parts manuals are further defined to include a minimum of 95 percent of all part numbers with an error rate of less than 5 percent. It will be the responsibility of the Contractor to ensure the accuracy of all part numbers. • Hard copy manuals shall be provided in suitable 3-post binders clearly identified with the Bus manufacturer and model number, LACMTA Bus series number, revision date, and table of contents. • A part number index shall be submitted for review at least 60 days prior to the scheduled ship date of the first production Bus. **Final Manuals** Final DVD editions of Service, Parts and Operator's manuals must be delivered within 90 days after the start date for production Buses. Following the 90 day period after start of production the LACMTA may withhold $10,000 per Bus delivered until all maintenance and parts manuals are received. • Ten final hardcopy sets of Service and Parts manuals shall be provided for each 100 Buses and 12 total sets for Subsystem OEM manuals. • For any Option Buses, four hardcopy sets of Service manuals shall be provided for each 10 Option Buses. • Twenty final edition Service and Parts manuals excluding subsystem OEM component manuals shall be provided on DVD • The Contractor shall supply two final hardcopy Operator's manuals per every 10 buses and five total final electronic copies on DVD. • Contractor shall supply ~~**one diagnostic code card for each bus system**~~ **a listing of diagnostic codes with final service manuals** delivered that covers trouble shooting fault **trees/**codes related to the **PPU** ~~**engine, transmission, ABS system**, **etc**~~. If separate subsystem OEM component supplier manuals are provided for preventative maintenance, diagnostics, parts and repair, then the number of manuals provided shall correspond with the quantities described above. **Manuals on DVD**

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		Final edition Service and Parts manuals shall include an index and search function to locate items by subject, part name, or system. Updates shall be delivered to the Maintenance Instruction Department as they occur. Updates must be identified with effected system and with update revision dates. The DVD versions shall be provided with licenses which permit the MTA to load the manuals on an unlimited number of MTA computers and/or server units. Neither generic nor poor quality reproductions shall be acceptable. Manuals must be in English. The DVD version may consist of multiple DVDs. The Contractor must be able to work with the 3rd party EPC provider (Digabit, Inc., 850 Englewood Pkwy. #200, Englewood, CO 80110 (Phone # 303 957-2822)) directly to convert their Parts manual into an EPC format suitable for use with LACMTA's current ERP/EAM systems. EPC integration shall include the ability of the contractor to provide information in the current format for initial EPC publishing needs and continue working with the EPC publishing provider using current data formatting standards over the life cycle of the bus. **Manual - Updates** Updates to the manuals covering revisions, corrections or additions shall be grouped and released to the LACMTA as discovered or disclosed by LACMTA at a minimum of once per year but not to exceed three times per year for 12 years. Updates shall be provided in electronic and hardcopy format and shall be delivered to the LACMTA Maintenance Instruction Department. Updates must be identified with defected system and with update revision dates. **Service Manuals** Service manuals shall be divided into separate sections as listed below: a) Preventative Maintenance Procedures (PMP) by component or system **-** Specifically for use at LACMTA Operating Divisions. Procedures must identify what inspection criteria procedures are needed for each component or system at intervals by time or mileage. Daily inspection is not acceptable criteria for preventative maintenance. b) Diagnostic Procedures - Include troubleshooting guides for all air, fluid, mechanical and electrical systems. Include schematics for fuel, air, hydraulic, coolant, HVAC, multiplex, braking and electrical with wiring harness drawings. c) Component Repair/Service - The manuals must be organized to show every subsystem in the bus including all re-buildable components used. For example, the steering box, air compressor, power steering pump, differential, transmission/electric drive/electric drive and PPU must be included. Component Reference Diagrams must be specific and referenced by exact exploded view diagrams. **PMP Section** PMP manuals shall be specific for the LACMTA's bus order and shall include the manufactures inspection and maintenance requirements for buses covered by this procurement and shall not contain any unrelated or unnecessary requirements. All

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		routine maintenance schedule requirements, including maintenance of major subsystems, shall be provided in one master PMP matrix. The master PMP matrix shall include; specific service task, service mileage, and PMP service manual section reference. The PMP manual shall also include remove-and replace instructions for all sub-system components including: PPA, engine, transmission, starter, alternator, A/C compressor, air compressor, etc. **Diagnostic Section** Diagnostic manuals which may be integrated with the maintenance manual shall include isometric, phantom, and schematic illustrations as necessary to completely describe each system including but not limited to location and routing of air, hydraulic, water, lines and electrical harnesses including all anchor and attachment points. Diagnostic manuals shall also include trouble shooting guides necessary to complete running repairs for all supplied Bus equipment. All wiring schematics and wiring harness drawings required in Service Manuals shall be provided in a separate publication in 11 X 17 inch uniform format. OEM schematics and those provided by all subsystem manufacturers shall be uniform diagrams with an emphasis on readability by mechanics performing diagnostic functions. Drawings shall provide functional grouping, continuity and interfacing at all connection points to eliminate unnecessary interfacing between multiple drawings and subsystem supplier drawings. Electrical schematic drawings shall include diagrams to clearly and accurately show locations of all electrical connectors splice and ground points for the Bus wiring harnesses. **Component Repair/Service Section** Fourteen sets of Repair Manuals necessary to rebuild all Contractor supplied Units including: PPU, transmission/electric drive, HVAC system, starter, alternator, air compressor, etc., shall be provided. Each copy shall be the latest hardcopy edition issued by the OEM component manufacturer. Repair manuals shall be comprehensive and shall cover all aspects of repair from tear-down through final test as recommended by the Bus OEM. Repair manuals shall be grouped in sets and with a table of contents. Each set shall be organized and mounted onto a suitable table top holding rack subject to LACMTA approval. The LACMTA requires fourteen sets of wall posters with the repair manuals showing subsystem, component and part assembly, parts numbers, torque values, installation notes, etc. A list of subsystem component repair manuals shall be submitted for LACMTA review at time of Pilot Bus delivery. **Parts Manuals** Must be specific and referenced by exact exploded-view diagrams and organized to coordinate with Service Manuals for ease of use. Parts manuals shall be specific to the LACMTA bus order including subsystem OEM PPU and transmission/electric drive parts listings. IPC and EPC manuals provided shall include illustrations with necessary exploded diagrams and data arranged so that part numbers can be readily found and identified in the illustration for each system and subsystem component, assembly, subassembly or piece part, from an orderly breakdown of the complete bus. An assembly or subassembly is an identifiable portion of a component of a system or subsystem.

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		Parts manuals shall contain a reference part number index, listed in numerical order with descriptions, and page numbers. The comprehensive number index shall include major subsystem parts numbers which includes the PPU, transmission/electric drive/, and air conditioning. A part number index shall be submitted for review at least 60 days prior to the scheduled ship date of the first production bus. The parts list index shall also be provided to the LACMTA in a PC spreadsheet file on a DVD compatible with Microsoft Excel and include subsystem supplier part numbers, part description, and price. OEM component supplier part numbers are required. **Price List** Ten copies of the current price list shall be provided separately as a supplement to the final parts manuals. Price lists shall be updated at least annually and provided for the life of the bus as they are updated. **Operator's Manuals** The Operator manuals shall be specific to the LACMTA bus configuration and designed for a LACMTA Bus Operator target audience, without extraneous material or information. Manuals shall clearly outline the features and controls, indicators necessary for safe and proper operation of the buses including ADA equipment.
18	**RFP - Amendment No. 7**	**TS 83 Destination Signs** An automatic electronic bright white LED destination sign system shall be furnished on the front, on the curbside near the front door, on the right-front windshield area and on the rear of the bus. The destination signs on the front and front curbside shall be bright white high definition. Display areas of destination signs shall be clearly visible in direct sunlight and/or at night. Sign system shall provide optimum visibility of the message display units for passengers and shall meet applicable ADA requirements. The destination sign compartments shall meet the following minimum requirements: • Compartments shall be designed to prevent condensation and entry of moisture and dirt. • Compartments shall be designed to prevent fogging of both compartment window and glazing on unit itself. • Access shall be provided to allow cleaning of inside compartment window and unit glazing, subject to LACMTA approval in Pre-Production meetings. • Front window exterior display area shall be sized to allow full visibility of the front destination sign. Destination signs shall be installed in such a manner as to facilitate easy access and replacement of the entire sign assembly, or components. Components such as electronic control modules shall be replaceable from inside the Bus. Where possible, parts shall be commercially available. All signs shall be controlled via a single human-machine interface (HMI). In the

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		absence of a single mobile data terminal (MDT), the HMI shall be conveniently located for the bus driver within reach of the seated driver. **Optional Full Color Destination Signs** **Pricing for optional full color signs in; Front, Side, Rear and Run Number locations, shall be submitted on Price Form PF-1, Schedule of Optional Vehicle Configuration. The signs shall be capable of utilizing the full color spectrum for displaying characters and background with adjustable resolution to provide optimum clarity for passengers reading the messages. The color signs shall meet all sections of TS 83 requirements for white signs where applicable.** **Front Destination Sign** The front destination sign shall have no less than 4,800 pixels, 24 rows by 200 columns, with a message display area of not less than 8.01 inches high by not less than 64.6 inches wide. **Side Destination Sign** Side display area shall have no less than 1,568 pixels, 14 rows by 112 columns with a message display area of not less than 4.3 inches high by not less than 41.6 inches wide. The sign located near the front door shall not block the driver's critical horizontal line of sight. **Rear Route Number Sign** The route number display area shall have no less than 768 pixels, 16 rows by 48 columns with a message display area of not less than 6.1 inches high by not less than 17.0 inches wide. The rear route number sign shall be located a minimum of 90 inches above ground on the curb side rear corner of the Bus. **Destination Sign Control** Power to the sign system shall be controlled by the Bus "Master Run" switch. Sign system shall be operable in all switch positions except "Off". Destination messages, route designations, and public relations messages shall be independently selectable via the Operator's Control Unit (OCU) which shall include a display monitor. The OCU shall communicate to the main processor board via a standard RS 485 serial bus and SAE J1708. Software shall be capable of programming 10,000 message lines. The number of public relations messages shall be limited only by the remaining number of message lines not used for destination purposes. The three-digit destination code shall accept all hexadecimal numbers (i.e. 0-9, A, B, C, D, E, & F). The rear route number sign shall be controlled by the same OCU that operates the destination signs. The OCU display monitor readout shall show the exact information displayed on the destination signs and route number sign. Sign displays shall have alternating message capability with programmable blanking time between message lines as may be required. Variable blanking times shall be programmable between 0.5 to 25 seconds in duration. Each line message or blanking time for each message shall be individually programmable. The message display units shall incorporate an automatic blanking feature that will cause the display area to blank within 30 seconds of the bus master power switch being turned "Off".

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		An emergency message shall be initiated by the closure, or opening, of a dry contact switch or relay. The emergency message shall be displayed on the exterior of the bus only. The OCU shall not display the emergency message. The destination sign shall automatically resume normal operation only after battery power to the destination sign system is removed and restored through the battery disconnect switch. **Destination Sign Programming** The electronic sign system shall be programmable via an integral connector located in the front destination sign area. Software shall be furnished for programming the sign system via an IBM compatible lap-top computer. Software shall be capable of providing a high degree of flexibility to create, or select preprogrammed, fonts and graphic displays. The sign shall have the capability of being programmed in the field using a PC or field programmer. Message program information shall be transferable to and/or from the field programmer device, via a USB 2.0 or better. The LACMTA shall provide the Contractor with a complete listing of destination sign readings for initial sign programming by the manufacturer. **Run Number Sign** A three-character electronic run number display shall be provided at a LACMTA approved location in the right front windshield. All three character spaces shall have the capability to display 0, 1, 2, 3, 4, 5, 6, 7, 8, 9 and X readings.
19	**RFP - Amendment No. 7**	**TS 86.1 Camera Surveillance System** An automatic digital video recording system shall be provided powered directly from batteries, bypassing the Master Battery Disconnect Switch(es), to operate (record images) at all times with the Master Control Switch in any position except "Off". The system shall operate up to one hour (independently programmable) after the Master Switch is turned off. The system shall be self-initiating and operate at any time, with the Master switch in any position, including "Off", if triggered by the activation of the Bus SAS. When triggered, the system shall tag images (write protect) to prevent overwrite. All cameras must automatically adjust to light changes to capture images that have sufficient clarity at night, with bus lights on and off. A day-to-night demonstration shall be required to establish camera performance and final placement for optimum views and clarity. The LACMTA shall witness the demonstration and approve the final placement of the cameras. This demonstration must be successfully completed prior to approval of the Pilot Bus(es). The types (part numbers), of cameras shall be minimized with a single camera type for interior, and a single camera type for exterior of Bus. Exceptions to this requirement shall be considered on a case-by-case basis during Pre-Production meetings. **Interior Cameras** The camera housing shall be vandal resistant but allow access for routine servicing. Field of view of the cameras shall be adjusted with a 60 degree vertical and 60 degree horizontal without relocating the camera. Each camera shall be IP type color images. Front interior camera(s) at front door passenger boarding area shall record

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		audio subject to LACMTA approval during Pre-Production meetings. Cameras shall be placed for best recording of the following five areas: a) Forward 1/3 of passenger area, view of front vestibule, farebox transactions and field-of-view to include Operator and image of bus number located on Operator's barrier. b) Front door, passenger boarding. c) Rear door, passenger exiting. d) Middle 1/3 passenger area. e) Rear 1/3 passenger seating area starting from behind rear door with a primary emphasis on the rearmost seats. **Interior Camera Monitors** A video monitoring system including two, color, LCD video monitors with a minimum 15 inch diagonal dimension and all necessary brackets, cabling and other equipment needed for installation shall be provided to allow passengers easy viewing of video images captured by existing interior bus cameras. Monitors and equipment shall be installed in compliance with Driver Provisions, Controls and Instrumentation (Refer to Sections TS 46 -TS 48) and any applicable ADA or safety standards. The first monitor shall be mounted above the driver's area facing the entrance door and display a live video feed of the passengers boarding the bus. The second monitor shall be mounted in passenger area of the bus facing the rear of the bus and display a live video feed of the passengers riding on the bus including those in wheelchair securement areas. The monitors shall be of a ruggedized design intended for use in a transit bus environment including suitable protection from overvoltage and spikes generated from jump starts, shorts, etc. Monitors and equipment shall not be installed in a manner or located such that the performance or life of the components or system will be shortened when operating within the design operating profile. Monitors shall include a replaceable shield or durable film over the monitor screens to protect them from vandalism. This sacrificial layer shall be replaceable in 5e minutes or less using simple hand tools. Monitor enclosures and screens shall not be affected by periodic cleaning using commercially available cleaning agents, solvents and other chemicals used for removal of graffiti. **Exterior Cameras** Cameras shall be IP type, rated for water spray and submersion, (IP65 and IP67), housed in impact resistant, moisture resistant, low profile housings which do not protrude more than 2.5 inches from the bus body. If used, a cover placed over the camera lens shall be glass. **Curbside camera housings shall be ruggedized to protect from impacts with trees and other objects encountered during routine service. This shall include a supplemental metal shield if necessary to meet**

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		this requirement. The camera circuitry and lens shall be easily replaceable from inside the bus or by removing the housing from outside the bus using common hand tools. Camera positions and adjustment are subject to LACMTA approval at Pilot Bus. Reusable waterproof seals to prevent water damage to the camera and circuitry shall be provided which will not require the use of additional sealant such as silicon after servicing the camera. The system shall be designed or configured such that the failure of any individual camera will not affect operation of the remaining cameras. Cameras shall be placed for best recording of the following four areas: a) Forward looking through windshield (Accident Surveillance) b) The curb side area of the bus, (including exit door), and street from 10 feet beyond front bumper to 10 feet beyond rear bumper c) Street side area of the bus and street from ten feet beyond the front bumper to 10 feet beyond the rear bumper d) Rear camera shall view the ground behind the bus from the bumper to approximately 25 feet back when gear select is placed in “Reverse” position. **Forward Accident Surveillance Camera** The forward looking surveillance camera shall be positioned to obtain images of the exterior front of the bus and forward approximately 100 feet of roadway to record images in the event of an accident. **Camera Monitor** Dash mounted monitor for viewing of selected camera images when; gear selector is placed in “Reverse” or passenger doors are open. Monitor shall be user configurable and capable of simultaneous display of images from multiple cameras. Final monitor configuration is subject to LACMTA approval during Pre-Production meetings **Central Processor** The video security system central processor shall be packaged in a suitable ventilated, shock mounted and splash resistant enclosure keyed to LACMTA standards, located within the ITS enclosure, subject to LACMTA approval in Pre-Production meetings. Images shall be stored by the system on a removable mobile rated hard drive provided with a security lock typical to the existing LACMTA base station. Images stored on the hard drive shall be organized for automatic transmittal via a digital modem. The hard drive shall have capacity to store a minimum of 240 images per second for 30 continuous days (18 hours per day) before automatic overwrite occurs. The DVR shall be capable of recording in multiple formats including JPEG and in H.264 compression with up to D1 resolution to avoid loss of detail on zoomed images. The DVR must be able to switch record rate, compression and resolution seamlessly without loss of video during transition. System shall be capable of

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		accepting both analog NTSC and high definition wide dynamic range IP cameras. All image requests and subsequent downloaded files shall have the capability to be stored on a hard drive. The hard drive shall be easily removed and video files viewed at a separate location equipped with the same drive mechanism. **System Management** Processor shall utilize GPS data to synchronize system time and tag video files with location coordinates allowing files to be searched on a geographic location basis. System shall utilize a WLAN compatible with wireless networks in use at LACMTA divisions and shall incorporate a system management tool for; wireless download of video files in a timely manner, software upgrades, camera checks, configuration changes and health reports as required. Final configuration is subject to LACMTA approval in Pre-Production meetings. System management tool shall be a virtual implementation and provide expansion capability including compatibility with existing video management applications at LACMTA. In addition, System Management Tool shall**:** **~~(include on pricing sheet)~~** • Be configured to run in Master-Slave mode under Virtual Box. • Provide the ability to replicate user accounts and passwords from Master to Slave. • Include provisions for future application authentication to Metro Microsoft Active Directory. • Allow user management at Master server and all Slave servers with inherent accounts from Master. • Backup the restore virtual image via the host operating system to last backup state. • Support Metro Enterprise backup and archive management tools such as IBM Tivoli. • Support use of Metro's MS Windows 2008 R2 approval image on host servers with Metro domain and security policies. • Allow NAS storage at remote sites. • Include OS and application security and patch management process. • Be optimized for hardware utilization in shared computing resources with Orbital DIS. WLAN shall also be capable of transmitting encrypted video images or files on a real-time basis to a laptop PC held by law enforcement personal adjacent to or

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		behind the bus. DVR status and event data shall also be made available through J1708/1587 interface to ATMS VAN. DVR shall be individually programmable to record each camera sequentially. Pricing of the system management tool for use at up to 13 LACMTA operating divisions shall be provided to the LACMTA on Price Form PF-4, Schedule C of Prices of Diagnostic Test Equipment. **Enhanced Video Recording System Option** Pricing for optional features to enhance the video recording system shall be provided on Price Form PF-1, Schedule of Optional Vehicle Configuration. The features shall include items listed below along with any other enhancements that Contractor believes would improve functionality and ease of use for the video recording system. • System Management tool to include video search capability using GPS coordinates as reference. • Ability of video system to analyze and discern events such as wheelchair passengers and generate report information with summary data such as wheelchair passenger count and boarding/alighting locations. • The ability to utilize the dash mounted display for diagnostic work or configuration changes on the DVR. • Incorporation of a 360 degree camera for better surveillance of bus interior.
19	**Contract Mod. No.: 12**	**TS 19.2 Exhaust System** Exhaust gases and waste heat shall be discharged from the roadside rear corner of the roof. The exhaust pipe shall be of sufficient height to prevent exhaust gases and waste heat from re-entering the bus, discoloring or causing heat deformation to the roof of the bus. The entire exhaust system shall be adequately shielded to prevent heat damage to any bus component, including the exhaust after-treatment compartment area. **Heat shield shall be installed between Catalytic Converter and HVAC unit to protect HVAC unit and wire harnesses in the area from radiant heat emanating from the Catalytic Converter after engine shut down, subject to LACMTA approval.** The exhaust outlet shall be designed to minimize rain, snow or water generated from high-pressure washing systems from entering into the exhaust pipe and causing damage to the after-treatment. Exhaust system shall incorporate joints as necessary to facilitate removal and replacement of individual components including exhaust muffler or, if required to meet emissions requirements, catalyst units. Mounting cushions, if provided, must last the life of the engine and shall not deteriorate when exposed to high exhaust system temperatures. Exhaust piping joints shall be machined V-band clamp design. Flexible exhaust lines necessary to accommodate engine movement shall be constructed from stainless steel bellows. Exhaust piping in the engine enclosure shall include reusable metal jacket that is easy to replace.

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20	**Contract Mod. No.: 12**	**TS 23.1 Engine Compartment Bulkheads** The passenger and engine compartment shall be separated by fire-resistant bulkheads. The engine compartment shall include areas where the engine and exhaust system are housed. This bulkhead shall preclude or retard propagation of an engine compartment fire into the passenger compartment and shall be in accordance with the Recommended Fire Safety Practices defined in FTA Docket 90A, latest revision. Only necessary openings shall be allowed in the bulkhead, and these shall be fire-proof. Any passageways for the climate control system air shall be separated from the engine compartment by fireproof material. Piping through the bulkhead shall have copper, brass, or fireproof fittings sealed at the bulkhead with copper or steel piping on the forward side. Wiring may pass through the bulkhead only if connectors or other means are provided to prevent or retard fire propagation through the bulkhead. The conduit and bulkhead connector shall be sealed with fireproof material at the fire wall. Engine access panel**s** in the bulkhead shall be fabricated of fireproof material and **hinged to the bulkhead** ~~**secured**~~ with fireproof fasteners. These panels, their fasteners and the bulkhead shall be constructed and reinforced to minimize warping of the panels during a fire that will compromise the integrity of the bulkhead. Access panels shall be constructed to prevent vapors and fumes from entering the passenger compartment.
21	**Contract Mod. No.: 12**	**TS 73.5.1 Transit Bus** Brake lights shall be provided in accordance with FMVSS 108 and Part 393, Subpart B of the FMCSA as applicable. **High and Center Mount Red Brake Lamp** Bus shall include red, high and center mount brake lamp(s) along the backside of the bus in addition to the lower brake lamps required under FMVSS 108. The high and center mount brake lamp(s) shall illuminate steady with brake application. Two LED seven-inch diameter sealed tail lights **or 2-inch by eighteen-inch LED strip lights** shall be mounted on each side of the engine closure door or rear end panels, so that the lights are not affected by engine heat (Refer to Section TS 88.1 for Approved Products). The (red) stop/tail lights shall be mounted directly above the (amber) directional signal lights. Two additional LED (red) stop lights shall be located above the engine compartment door on the centerline of the bus. If stop and tail lights are not visible from the rear when engine door is in the open position, two LED four-inch diameter amber hazard warning lights, one on each side of engine compartment, shall be furnished and activated by the turn signals. Each light shall be replaceable as an individual unit. Plastic lenses shall be protected with a high performance scratch and chemical resistant coating to prevent deterioration.

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22	**Contract Mod. No.: 12**	**TS 75.2 Modesty Panels** Sturdy divider panels constructed of durable, unpainted, stainless steel complementing the interior shall be provided to act as both a physical and visual barrier for seated passengers in front of each leading row of forward facing seats. Design and installation of modesty panels located in front of forward-facing seats shall include a handhold or grab handle along its top edge. These dividers shall be mounted on the sidewall and shall project toward the aisle no farther than passenger knee projection in longitudinal seats or the aisle side of the transverse seats. Modesty panels shall extend from at least the window opening of the side windows, and those forward of transverse seats shall extend downward to one and 1.5 inches above the floor. Panels forward of longitudinal seats shall extend to below the level of the seat cushion. Dividers positioned at the doorways shall provide no less than a 2.5 inches clearance between the modesty panel and a fully open, inward opening door, or the path of a deploying flip-out ramp to protect passengers from being pinched. Modesty panels installed at doorways shall be equipped with grab rails if passengers assist are not provided by other means. The modesty panel and its mounting shall withstand a static force of 250 pounds applied to a four × four inch area in the center of the panel without permanent visible deformation. At the rear door area a clear non-glass panel**, with multiple layer protective film installed on both sides,** from above the modesty panel to the top of the daylight opening and attached to the stanchion. Modesty panels shall be bolted or riveted to handrails or installed in U-channels with self-locking nuts and securely attached to stanchion and body side. Modesty panels located at the forward edge of the upper floor area shall be attached along the top to handrails for added stiffness. Panels shall be attached to bottom extruded anodized aluminum rails for stiffness.
23	**Contract Mod. No.: 12**	**TS 87 Event Data Recorder (EDR)** EDR shall be installed on the bus. The unit shall be installed as low as possible. The EDR shall be able to communicate over the Jl939 CAN line and shall be equipped with three-axis accelerometer. The system shall be capable of recording available fault codes including DM1 messages. Settings are to be finalized with the LACMTA during Pre-Production. The EDR shall broadcast via the Jl939 data communication link severe impact events to the vehicle monitoring system and also trigger an event in the camera system. The EDR shall also tag an event from a signal received over the Jl939 CAN line from the silent alarm switch signal and the camera event button and in turn broadcast these events to the vehicle monitoring system. The EDR shall also record the following operational data: • Head lights on or off.

Ref #	Reference #	Paragraph number, Paragraph title, and Paragraph changes. Additions are in bolded **Red** and deletions are in crossed out bolded **Blue**
		• Turn signals and hazard lights on or off. • Ignition on or off. • Low air pressure warning. • Whether moving in forward or reverse or idling. • Parking brake is on or off. • Retarder switch on or off • **Brakes – Stopping distance** • **Vehicle Acceleration/Deceleration** • **HVAC operating information** • **Entrance and Exit Doors operating information**

End of Attachment I

Los Angeles County Metropolitan Transportation Authority

Technical Specifications

(GROUP A - 40-FOOT CNG BUSES)
Contract Modification No. 12

Contract No.: OP28367-000

FORTY-FOOT (40') LOW FLOOR CNG BUS PROCUREMENT

January 14, 2019
~~November 10, 2017~~

VOLUME II OF II

Contents

SECTION 6: TECHNICAL SPECIFICATIONS 9
TS 1. Scope 9
TS 2. Definitions 9
TS 2.1 Abbreviations 16
TS 3. Referenced Publications 19
TS 4. Legal Requirements 19
TS 5. Overall Requirements 19
TS 5.1 Weight 19
TS 5.2 Capacity 20
TS 5.3 Service Life 20
TS 5.4 Maintenance and Inspection 20
TS 5.5 Interchangeability 20
TS 5.6 Training 21
TS 5.7 Operating Environment 29
TS 5.8 Noise 29
TS 5.9 Fire Safety 30
TS 5.10 Fire Suppression 30
TS 5.11 Gas Detection System (GDS) 31
TS 5.12 Respect for the Environment 32
TS 5.13 Water Leak Testing 32
TS 5.14 Fasteners and Securements 32
TS 6. Physical Size 33
TS 6.1 Bus Length 33
TS 6.2 Bus Width 33
TS 6.3 Bus Height 34
TS 6.4 Step Height 34
TS 6.5 Underbody Clearance 34
TS 6.6 Ramp Clearances 34
TS 6.7 Ground Clearance 34
TS 6.8 Floor Height 35
TS 6.9 Interior Headroom 35
TS 6.10 Aisle Width 35
TS 7. Power Requirements 36
TS 7.1 Top Speed 36
TS 7.2 Grade-ability 36
TS 7.3 Acceleration 36
TS 7.4 Operating Range 37
TS 8. Fuel Economy (Design Operating Profile) 38
TS 9. Engine (Near-zero 0.02 g/bhp NOx Engine Option?) 39
TS 9.1 Engine (CNG) 40
TS 9.2 Propulsion System (Electric) 41
TS 10. Cooling Systems 42
TS 10.1 Engine Cooling 43
TS 10.2 Charge Air Cooling 44
TS 10.3 Transmission Cooling 44
TS 10.4 Electric Drive System Cooling 45
TS 11. Transmission (Conventional Powertrain) 45
TS 12. Retarder (Transit Bus) 45
TS 13. Engine Brake (Commuter Bus) 46

TS 14. Mounting 46
TS 14.1 Service 46
TS 15. Hydraulic Systems 47
TS 15.1 Fluid Lines 48
TS 15.2 Fittings and Clamps 48
TS 15.3 Charge Air Piping 49
TS 16. Radiator 49
TS 17. Oil and Hydraulic Lines 49
TS 18. Fuel 49
TS 18.1 Fuel Lines 49
TS 18.2 Design and Construction 50
TS 19. Emissions and Exhaust 53
TS 19.1 Exhaust Emissions 53
TS 19.2 Exhaust System 53
TS 19.3 Exhaust After-treatment 53
TS 19.4 Particulate After-treatment 53
TS 20. General 53
TS 20.1 Design 53
TS 21. Altoona Testing 54
TS 21.1 Structural Validation 54
TS 22. Distortion 54
TS 23. Resonance and Vibration 54
TS 23.1 Engine Compartment Bulkheads 54
TS 23.2 Crashworthiness (Transit Bus) 54
TS 24. Corrosion 55
TS 25. Towing 55
TS 26. Jacking 56
TS 27. Hoisting 56
TS 28. Floor 57
TS 28.1 Design (Transit Bus) 57
TS 28.2 Design (Commuter Bus) 57
TS 28.3 Design (Articulated Transit Bus) 57
TS 28.4 Strength 57
TS 28.5 Construction 57
TS 28.6 Construction (Commuter Bus) 57
TS 29. Platforms 58
TS 29.1 Driver’s Area 58
TS 29.2 Driver’s Platform 58
TS 29.3 Farebox 58
TS 29.4 Rear Step Area to Rear Area (Transit Bus) 59
TS 30. Wheel Housing 59
TS 30.1 Design and Construction 59
TS 30.2 Design and Construction (Transit Bus) 59
TS 30.3 Articulated Joint (Articulated Transit Bus) 60
TS 30.4 Raceway (Articulated Transit Bus) 60
TS 30.5 Bellows 60
TS 31. Suspension 60
TS 31.1 General Requirements 60
TS 31.2 Alignment 60
TS 31.3 Springs and Shock Absorbers 60
TS 32. Wheels and Tires 61
TS 32.1 Wheels 61
TS 32.2 Tires 62
TS 33. Steering 62

TS 33.1 Steering Axle (Transit Bus) 62
TS 33.2 Steering and Tag Axles (Commuter Bus) 62
TS 33.3 Steering Wheel 62
TS 34. Drive Axle 63
TS 34.1 Non-Drive Axle 64
TS 35. Tag Axles (Commuter Coach) 64
TS 36. Turning Radius 64
TS 37. Brakes 65
TS 37.1 Service Brake 65
TS 37.2 Actuation 65
TS 37.3 Friction Material 65
TS 37.4 Hubs and Drums/Discs 65
TS 37.5 Hubs and Drums (Commuter Bus) 66
TS 37.6 Parking/Emergency Brake 66
TS 38. Interlocks (Transit Bus) 66
TS 38.1 Passenger Door Interlocks 66
TS 38.2 Lift Interlocks 67
TS 38.3 Kneel Interlocks 67
TS 38.4 Fuel System Interlocks 67
TS 39. Pneumatic System 67
TS 39.1 General 67
TS 39.2 Air Compressor 68
TS 39.3 Air Lines and Fittings 69
TS 39.4 Air Reservoirs 69
TS 39.5 Air System Dryer 70
TS 40. Overview 70
TS 40.1 Modular Design 71
TS 41. Environmental and Mounting Requirements 71
TS 41.1 Hardware Mounting 71
TS 42. General Electrical Requirements 72
TS 42.1 Batteries 72
TS 42.2 Grounds 74
TS 42.3 Low Voltage/Low Current Wiring and Terminals 75
TS 42.4 Electrical Components 76
TS 42.5 Electrical Compartments 76
TS 43. General Electronic Requirements 77
TS 43.1 Wiring and Terminals 77
TS 44. Multiplexing 78
TS 44.1 General 78
TS 44.2 System Configuration 78
TS 45. Data Communications 78
TS 45.1 General 78
TS 45.2 Drivetrain Level 79
TS 45.3 Multiplex Level 79
TS 45.4 Electronic Noise Control 80
TS 46. Driver’s Area Controls 80
TS 46.1 General 80
TS 46.2 Glare 81
TS 46.3 Visors/Sun Shades 81
TS 46.4 Driver’s Controls 81
TS 46.5 Normal Bus Operation Instrumentation and Controls 82
TS 46.6 Driver Foot Controls 87
TS 46.7 Brake and Accelerator Pedals 88
TS 46.8 Driver Foot Switches 88

TS 47. Driver's Amenities 88
TS 47.1 Coat Hanger 88
TS 47.2 Drink Holder 88
TS 47.3 Storage Box 88
TS 47.4 Repair Card Holder 88
TS 47.5 Safety Equipment 89
TS 47.6 Bus Registration Holders 89
TS 47.7 Trash Hooks 89
TS 48. Windshield Wipers and Washers 89
TS 48.1 Windshield Wipers 89
TS 48.2 Windshield Washers 89
TS 49. Driver's Seat 89
TS 49.1 Dimensions 90
TS 49.2 Seat Belt 91
TS 49.3 Adjustable Armrest 92
TS 49.4 Seat Control Locations 92
TS 49.5 Seat Structure and Materials 92
TS 49.6 Pedestal 92
TS 49.7 Seat Options 92
TS 49.8 Mirrors 92
TS 50. General 94
TS 51. Windshield 94
TS 51.1 Glazing 94
TS 52. Driver's Side Window 94
TS 53. Side Windows 95
TS 53.1 Configuration 95
TS 53.2 Emergency Exit (Egress) Configuration 95
TS 53.3 Configuration 95
TS 53.4 Materials 96
TS 53.5 Rear Window 96
TS 54. Capacity and Performance 96
TS 55. Controls and Temperature Uniformity 97
TS 55.1 Auxiliary Heater 98
TS 56. Air Flow 98
TS 56.1 Passenger Area 98
TS 56.2 Driver's Area 98
TS 56.3 Controls for the Climate Control System (CCS) 98
TS 56.4 Driver's Compartment Requirements 99
TS 56.5 Driver's Cooling 99
TS 57. Air Filtration 99
TS 58. Roof Ventilators 99
TS 59. Maintainability 100
TS 60. Entrance/Exit Area Heating 100
TS 61. Floor-Level Heating 100
TS 61.1 Transit Bus 100
TS 61.2 Commuter Bus 100
TS 62. Design 100
TS 62.1 Materials 100
TS 62.2 Roof-Mounted Equipment (Transit Bus) 101
TS 62.3 Curb Feelers 101
TS 63. Pedestrian Safety 101
TS 64. Repair and Replacement 101
TS 64.1 Side Body Panels (Transit Bus) 101
TS 64.2 Side Body Panels (Commuter Bus) 101

TS 65. Rain Gutters 101
TS 66. License Plate Provisions 101
TS 66.1 Rub rails 101
TS 67. Fender Skirts 102
TS 68. Wheel Covers (Transit Bus) 102
TS 68.1 Splash Aprons 102
TS 69. Service Compartments and Access Doors 102
TS 69.1 Access Doors (Transit Bus) 102
TS 69.2 Access Doors (Commuter Bus) 103
TS 69.3 Access Door Latch/Locks 103
TS 70. Bumpers 103
TS 70.1 Location 103
TS 70.2 Front Bumper 103
TS 70.3 Rear Bumper 103
TS 70.4 Bumper Material 104
TS 70.5 Bicycle Rack 104
TS 71. Finish and Color 104
TS 71.1 Appearance 104
TS 72. Decals, Numbering and Signing 105
TS 72.1 Passenger Information 105
TS 73. Exterior Lighting 105
TS 73.1 Backup Light/Alarm 106
TS 73.2 Doorway Lighting 106
TS 73.3 Turn Signals 106
TS 73.4 Headlights 106
TS 73.5 Brake Lights 107
TS 73.6 Service Area Lighting (Interior and Exterior) 107
TS 74. General Requirements 108
TS 75. Interior Panels 108
TS 75.1 Driver Area Barrier 108
TS 75.2 Modesty Panels 109
TS 75.3 Front End 110
TS 75.4 Rear Bulkhead 110
TS 75.5 Headlining 110
TS 75.6 Fastening 111
TS 75.7 Insulation 111
TS 75.8 Floor Covering 111
TS 75.9 Interior Lighting 112
TS 75.10 Passenger 112
TS 75.11 Driver’s Area 112
TS 75.12 Seating Areas (Transit Bus) 112
TS 75.13 Seating Areas (Commuter Bus) 112
TS 75.14 Vestibules/Doors (Transit Bus) 112
TS 75.15 Vestibules/Doors (Commuter Bus) 112
TS 75.16 Step Lighting 113
TS 75.17 Ramp Lighting (Transit Bus) 113
TS 75.18 Turntable Lighting (Articulated Bus) 113
TS 75.19 Farebox Lighting 113
TS 76. Fare Collection 113
TS 77. Interior Access Panels and Doors (Transit Bus) 114
TS 77.1 Floor Panels 114
TS 78. Passenger Seating 114
TS 78.1 Arrangements and Seat Style (Transit Bus) 114
TS 78.2 Rearward Facing Seats (Transit Bus) 115

TS 78.3 Turntable Seating (Articulated Bus) ... 115
TS 78.4 Padded Inserts/Cushioned Seats (Transit Bus) ... 115
TS 78.5 Seat back fitness ... 115
TS 78.6 Drain Hole in Seats ... 115
TS 78.7 Arrangements and Seat Style (Commuter Bus) ... 116
TS 78.8 Hip-to-Knee Room ... 116
TS 78.9 Foot Room ... 116
TS 78.10 Aisles (Transit Bus) ... 116
TS 78.11 Aisles (Commuter Bus) ... 116
TS 78.12 Dimensions (Transit Bus) ... 116
TS 78.13 Structure and Design (Transit Bus) ... 117
TS 78.14 Structure and Design (Commuter Bus) ... 118
TS 78.15 Construction and Materials (Transit Bus) ... 118
TS 78.16 Construction and Materials (Commuter Bus) ... 118
TS 79. Passenger Assists (Transit Bus) ... 119
TS 79.1 Assists (Transit Bus) ... 119
TS 79.2 Front Doorway ... 119
TS 79.3 Vestibule (Transit Bus) ... 119
TS 79.4 Rear Doorway(s) (Transit Bus) ... 120
TS 79.5 Overhead (Transit Bus) ... 120
TS 79.6 Longitudinal Seat Assists (Transit Bus) ... 120
TS 79.7 Wheel Housing Barriers/Assists (Transit Bus) ... 120
TS 80. Passenger Doors ... 121
TS 80.1 Transit Bus ... 121
TS 80.2 Commuter Bus ... 121
TS 80.3 Materials and Construction ... 121
TS 80.4 Dimensions ... 122
TS 80.5 Door Glazing ... 122
TS 80.6 Door Projection (Transit Bus) ... 123
TS 80.7 Door Height Above Pavement ... 123
TS 80.8 Closing Force ... 123
TS 80.9 Actuators ... 124
TS 80.10 Emergency Operation ... 124
TS 80.11 Door Control ... 124
TS 80.12 Door Controller ... 125
TS 80.13 Door Open/Close ... 125
TS 81. Accessibility Provisions ... 125
TS 81.1 Loading Systems ... 125
TS 81.2 Lift ... 125
TS 81.3 Loading System for 30 to 60-ft Low-Floor Bus ... 126
TS 81.4 Loading System for Level Boarding on a 45 to 60ft Low-Floor BRT ... 126
TS 81.5 Wheelchair Accommodations ... 126
TS 81.6 Interior Circulation ... 129
TS 82. Wheelchair Lifts (Commuter Bus) ... 129
TS 82.1 Lift ... 129
TS 82.2 Lift Door ... 129
TS 82.3 Lift Width ... 129
TS 82.4 Lighting Requirements ... 129
TS 82.5 Securement System ... 129
TS 82.6 Roof Ventilation/Escape Hatches ... 129
TS 83. Destination Signs ... 129
TS 84. Passenger Information and Advertising (Transit Bus) ... 131
TS 84.1 Interior Displays ... 131
TS 84.2 Exterior Displays ... 131

TS 85. Passenger Stop Request/Exit Signal 131
TS 85.1 Transit Bus 131
TS 85.2 Commuter Bus 132
TS 85.3 Signal Chime 132
TS 86. Communications 132
TS 86.1 Camera Surveillance System 133
TS 86.2 Public Address System 136
TS 86.3 Automatic Passenger Counter (APC) 136
TS 86.4 Radio Handset and Control System 136
TS 86.5 ITS Provisions Power Supply 137
TS 86.6 ITS Provisions Conduits 138
TS 86.7 Provisions, Automated Vehicle Announcement (AVA) System 139
TS 86.8 ITS Provisions, Wireless Local Area Network (WLAN) 139
TS 86.9 ITS Provisions, Radio Antennas 139
TS 86.10 ITS Provisions, Global Positioning System (GPS) 139
TS 86.11 ITS Provisions, IBSS 139
TS 87. Event Data Recorders 140
TS 88. Appendix 140
TS 88.1 Approved Equals 140
TS 88.2 Maintainability Requirements 141
TS 88.3 Technical Contract Deliverables 142
TS 88.4 Decals/Signs 143
TS 88.5 References 147
TS 88.6 Holders 148

SECTION 6: TECHNICAL SPECIFICATIONS

GENERAL (TS 1-TS 5)

TS 1. Scope

These technical specifications contain the LACMTA's requirements for wheelchair accessible low floor transit buses, which accommodate the widest spectrum of passengers including children, adults, the elderly, and the physically disabled, conforming to all applicable ADA regulations. These buses shall provide maximum passenger appeal in appearance, comfort, and safety; combined with excellence in operating characteristics, standardization with existing LACMTA fleet, economy of operation, maximum efficiency, optimum seating, and conformity with federal, state and local regulations and emission standards. Buses shall include interior and exterior styling features in common with existing Metro BRT type buses such as streamlined appearance. These buses shall incorporate a high level of subsystem integration coordinated with central diagnostic functions and single point Operator interface. Buses shall have a minimum expected life of 12 years or 500,000 miles, whichever comes first. Refer to Table 17 for design life goals.

Metro will consider and evaluate proposals of Zero Emission (ZE) buses that meet legal, dimensional, maintainability and performance requirements outlined in this document. Vendors proposing electric buses for consideration should also include a list of any specialty equipment used for fueling and/or recharging vehicle, any specialty support and/or diagnostic equipment, and any other unique equipment that will be necessary to support daily operation of the vehicle. Any specialty equipment required to support the ZEB project should be itemized and listed along with estimated installation costs as part of each Contractor's proposal. Any ZE buses proposed in response to this solicitation shall meet CARB's definition for zero emission buses.

These technical specifications have been prepared with emphasis on in-service reliability. The basic structure of the bus including major suspension components shall be designed to last the life of the bus without major overhaul or replacement.

Wherever brand, manufacturer or product names are indicated in the Technical Specification, they are included for the purpose of establishing identification and a general description of the Goods, Equipment, Components or parts. Wherever such names appear, the term "OR APPROVED EQUAL" is deemed to follow. The decision whether a proposed Item is an approved equal will be rendered by LACMTA as defined by Contract SP-34 Non-Restrictive Clauses.

TS 2. Definitions

Ackerman Geometry: A geometric arrangement of linkages in the steering of a vehicle designed to solve the problem of wheels on the inside and outside of a turn needing to trace out circles of different radii. The intention of Ackermann geometry is to avoid the need for tires to slip sideways when following the path around a curve.

Alternative: An alternative specification condition to the default bus configuration. LACMTA may define alternatives to the default configuration to satisfy local operating requirements. Alternatives for the default configuration will be clearly identified.

Ambient Temperature: The temperature of the surrounding air. For testing purposes, ambient temperature must be between 16°C (50°F) and 38°C (100°F).

Analog Signals: A continuously variable signal that is solely dependent upon magnitude to express information content.

Aspect Ratio: The ratio of height to width of a character.

Audible Discrete Frequency: An audible discrete frequency is determined to exist if the sound power level in any 1/3-octave band exceeds the average of the sound power levels of the two adjacent 1/3-octave bands by four decibels (dB) or more.

Auxiliary Power System: Provides single or three phase power for functions other than propulsion.

Battery: One or more electrochemical cells that convert stored chemical energy into electricity.

Battery Compartment: Low-voltage energy storage, i.e. 12/24 VDC batteries.

Battery Management System (BMS): Monitors energy, as well as temperature, cell or module voltages, and total pack voltage. The BMS adjusts the control strategy algorithms to maintain the batteries at uniform state of charge and optimal temperatures.

Braking Resistor: Device that converts electrical energy into heat, typically used as a retarder to supplement or replace the regenerative braking.

Burst Pressure: The highest pressure reached in a container during a burst test.

Capacity (fuel container): The water volume of a container in gallons (liters).

Cells: Individual components (i.e., battery or capacitor cells).

Code: A legal requirement.

Combination Gas Relief Device: A relief device that is activated by a combination of high pressures or high temperatures, acting either independently or together.

Composite Container for Compressed Gas: A container fabricated of two or more materials that interact to facilitate the container design criteria.

Compressed Natural Gas (CNG): Mixtures of hydrocarbon gases and vapors consisting principally of methane in gaseous form that has been compressed for use as a vehicular fuel.

Container: A pressure vessel, cylinder or cylinders permanently manifold together, used to store compressed gas.

Container Appurtenances: Devices connected to container openings for safety, control or operating purposes.

Container Valve: A valve connected directly to a container outlet.

Curb Weight: Weight of vehicle, including maximum fuel, oil and coolant; and all equipment required for operation and required by this Specification, but without passengers or driver.

dBA: Decibels with reference to 0.0002 microbar as measured on the “A” scale.

DC to DC Converter: A module that converts a source of direct current from one voltage level to another.

Default Configuration Bus: The bus described if no alternatives are selected. Signing, colors, the destination sign reading list and other information must be provided by the LACMTA.

Defueling: The process of removing fuel from a tank or container.

Defueling Port: Device that allows for vehicle defueling, or the point at which this occurs

Design Operating Profile: The anticipated design requirements are based on LACMTA's operating environment for LACMTA's service area and as designed in TS 5.7. Specific characteristics include; "CBD type" urban heavy-duty duty-cycle, high passenger loading, five to 100 percent relative humidity, temperature range of -10°F to 120°F, and elevation range of 200 feet below sea level to 3,000 feet above sea level.

Destroyed: Physically made permanently unusable.

Discrete Signal: A signal that can take only pre-defined values, usually of a binary 0 or 1 nature, where 0 is battery ground potential and 1 is a defined battery positive potential.

Driver's Eye Range: The 95th-percentile ellipse defined in SAE Recommended Practice J941, except that the height of the ellipse shall be determined from the seat at its reference height.

Duty Cycle: A service cycle that utilizes only the CBD portion of the FTA ADB heavy-duty transit Vehicle cycle. The CBD portion shall be further modified to add 20 minutes of idle time.

Electric: A vehicle that uses one distinct power sources to propel the vehicle.

Electric System Controller (ESC): Regulates energy flow throughout electric system components in order to provide motive performance and accessory loads, as applicable, while maintaining critical system parameters (voltages, currents, temperatures, etc.) within specified operating ranges.

Electric Drive System (EDS): The mechanical and/or electromechanical components, including traction motors and energy storage system, which comprise the traction drive portion of the electric propulsion system.

Electronic Parts Catalog (EPC): Digital versions of the illustrated parts catalog that can upload into Metro's Enterprise Asset Management (EAM) or Enterprise Resource Planning (ERP) systems.

Energy Density: The relationship between the weight of an energy storage device and its power output in units of watt-hours per kilogram (Wh/kg).

Energy Storage System (ESS): A component or system of components that stores energy and for which its supply of energy is rechargeable by the on-vehicle system (engine/regenerative braking/ generator) or an off-vehicle energy source.

Engine Package: Complete engine assembly incorporating accessories necessary for operation as applicable. Package shall include at a minimum; turbocharger(s), supercharger(s), electronic control modules, manifolds, throttle body, starter, air compressor, hydraulic pump and engine mounted filters.

Extended Warranty: Warranties that extend past the minimum warranty periods defined in the warranty requirements.

Failures Classifications are listed below**.**

- **Class 1 Failure (Physical Safety):** A failure that could lead directly to passenger, bus operator or other injury and/or results in a crash.
- **Class 2 Failure (Road Call):** A failure resulting in an interruption of service. Passengers are removed from the bus at the point of failure; the bus is unable to continue in revenue service. Service is discontinued until the bus is replaced or repaired at the point of failure.
- **Class 3 Failure (Bus Change):** A failure that requires removal of the bus from service during its assignments. The bus is operable to a rendezvous point but cannot be used in passenger service until repairs are made.
- **Class 4 Failure (Bad Order):** A failure not related to safety that degrades the operation of the bus but does not require the bus's removal from service.

Fill Pressure for Compressed Gas: The pressure attained at the actual time of filling. Fill pressure varies according to the gas temperatures in the container, which are dependent on the charging parameters and the ambient conditions. The maximum dispensed pressure shall not exceed 125 percent of service pressure.

Fireproof: Materials that will not burn or melt at temperatures less than 2000 °F.

Fire Resistant: Materials that have a flame spread index less than 150 as measured in a radiant panel flame test per ASTM-E 162.

Firewall: A fire resistant barrier designed to slow the spread of fire for a prescribed period of time.

Flow Capacity: For natural gas flow, this is the capacity in volume per unit time (normal cubic meters/minute or standard cubic feet per minute) discharged at the required flow rating pressure.

Free Floor Space: Floor area available to standees, excluding the area under seats, area occupied by feet of seated passengers, the vestibule area forward of the standee line, and any floor space indicated by manufacturer as non-standee areas such as, the floor space "swept" by passenger doors during operation. Floor area of 1.5 sq. ft. shall be allocated for the feet of each seated passenger that protrudes into the standee area.

Fuel Cell: A device that converts the chemical energy from a fuel into electricity through a chemical reaction with oxygen and another oxidizing agent.

Fuel Line: The pipe, tubing or hose on a vehicle, including all related fittings, through which natural gas passes.

Fuel Management System: Fuel system components that control or contribute to engine air fuel mixing and metering, and the ignition and combustion of a given air-fuel mixture. The fuel management system would include, but is not limited to, reducer/regulator valves, fuel metering equipment (e.g. carburetor, injectors), sensors (e.g., main throttle, waste gate).

Fusible Material: A metal, alloy or other material capable of being melted by heat.

Gross Axle Weight Rating (GAWR): The maximum total weight as determined by the axle manufacturer, at which the axle can be safely and reliably operated for its intended purpose.

Gross Load: 150 pounds for every designed passenger seating position, for the driver, and for each 1.5 sq.-ft. of free floor space.

Gross Vehicle Weight (GVW): Curb weight plus gross load.

Gross Vehicle Weight Rating (GVWR): The maximum total weight as determined by the vehicle manufacturer, at which the vehicle can be safely and reliably operated for its intended purpose.

Hazardous Voltage: Greater than 50 volts (AC and DC).

Head Injury Criteria (HIC): The following equation presents the definition of head injury criteria:

$$\left[\frac{1}{t_1 - t_2}\int_{-t1}^{t_2}(a)dt\right]^{2.5}(t_2 - t_1)$$

Where a = the resultant acceleration at the center of gravity of the head form expressed as a multiple of g, the acceleration of gravity. t_1 and t_2 = any two points in time during the impact.

High Pressure: Those portions of the CNG fuel system exposed to full container or cylinder pressure.

High Voltage (HV): Greater than 600 volts (AC and DC).

High Voltage Charger: Regulated DC supply used to charge the propulsion battery pack.

Hose: Flexible line.

Illustrated Parts Catalog (IPC): A series of assemblies and sub-assemblies that combine into a parts manual with sections. Metro recognizes that a complete illustrated part catalog includes component breakdown in a disassembly sequence and their illustrations.

Intermediate Pressure: The portion of a CNG system after the first pressure regulator, but before the engine pressure regulator. Intermediate pressure on a CNG vehicle is generally from 3.5 to 0.5 MPa (510 to 70 psi).

Inverter: A module that converts DC to and from AC.

Jerk: The rate of change of acceleration shall be minimized throughout the acceleration/deceleration range and shall not be greater than 15.5 mph/sec/sec (0.3g/sec).

Labeled: Equipment or materials to which has been attached a label, symbol or other identifying mark of an organization, which is acceptable to the authority having jurisdiction and concerned with product evaluation, which maintains periodic inspection of production labeled equipment or materials, and by labeling, the manufacturer indicates compliance with appropriate standards or performance in a specified manner.

Leakage: Release of contents through a Defect or a crack. See *Rupture*.

Line: All tubes, flexible and hard, that carry fluids.

Liner: Inner gas-tight container or gas container to which the overwrap is applied.

Local Regulations: Regulations below the state level.

Low-Floor Bus: A bus that, between at least the front (entrance) and rear (exit) doors, has a floor sufficiently low and level so as to remove the need for steps in the aisle between the doors and in the vicinity of these doors.

Low Voltage (LV): 50 volts or less (AC and DC).

Low Voltage Generation: Provides 12 or 24 volt DC to properly charge and maintain the charge on low voltage batteries as well as provide power for a variety of bus systems including; lighting, multiplex and other control modules.

Lower Explosive Limit: The lowest concentration of gas where, given an ignition source, combustion is possible.

Maintenance Personnel Skill Levels: Defined below are the LACMTA's maintenance personnel skill levels:

- **3M:** LACMTA Mechanic
- **2M:** Bus Service Attendant

Master Run Switch: Rotary four-position switch controlling the following functions:

- **Off:** All systems off
- **Day Run:** All electrical systems and engine on except; headlights, parking lights, and marker lights
- **Night Run:** All electrical systems and engine on including; headlights, parking lights, marker lights, and interior light system
- **Night Park**: Same as “Off” except that marker lights, destination signs, parking lights, curbside interior lights, and instrument panel lights are on

Maximum Service Temperature: The maximum temperature to which a container/cylinder will be subjected in normal service.

Metallic Hose: A hose whose strength depends primarily on the strength of its metallic parts; it can have metallic liners or covers, or both.

Metering Valve: A valve intended to control the rate of flow of natural gas.

Module: An assembly of individual components.

Motor (Electric): A device that converts electrical energy into mechanical energy.

Motor (Traction): An electric motor used to power the driving wheels of the bus.

Operating Pressure: The varying pressure developed in a container during service.

Physical Layer: The first layer of the seven-layer International Standards Organization (ISO) Open Systems Interconnect (OSI) reference model. This provides the mechanical, electrical, functional and procedural characteristics required to gain access to the transmission medium (e.g., cable) and is responsible for transporting binary information between computerized systems.

Pipe: Nonflexible line.

Power: Work or energy divided by time.

Power Density: Power divided by mass, volume or area.

Pressure Relief Device (PRD): A pressure and/or temperature activated device used to vent the container/cylinder contents and thereby prevent rupture of an NGV fuel container/cylinder, when subjected to a standard fire test as required by fuel container/cylinder standards.

Propulsion Power Assembly (PPA): System that provides propulsion for the vehicle proportional to operator commands. Includes; engine, transmission, cooling and other applicable systems (See SP-01).

Primary Power Unit (PPU): System that provides propulsion power for the vehicle proportional to operator commands. Includes; controllers, energy conversion, electric drive, cooling and other applicable systems (See SP-01).

Radiator Package: Complete system with accessories necessary for operation. Package shall include at a minimum; heat exchanger(s), cooling fan(s), electronic controller(s) with diagnostic communications and alternator if applicable.

Real-Time Clock (RTC): Computer clock that keeps track of the current time.

Regenerative Braking: Deceleration of the bus by switching motors to act as generators, which return vehicle kinetic energy to the energy storage system.

Rejectable Damage: In terms of NGV fuel containers/cylinders, this is damage as outlined in CGA C-6.4, "Methods for External Visual Inspection of Natural Gas Vehicle Fuel Containers and Their Installations," and in agreement with the manufacturer's recommendations.

Response Time: Response times shall be measured from the activation or deactivation of the accelerator or brake pedal to the initial response of an on-board accelerometer measuring longitudinal Bus acceleration. Response times for power to brake, brake to power, coast to power and coast to brake shall be no greater than 0.20 seconds.

Retarder: Device used to augment or replace some of the functions of primary friction based braking systems of the bus.

Rupture: Sudden and unstable damage propagation in the structural components of the container resulting in a loss of contents. See *Leakage*.

Seated Load: 150 pounds for every designed passenger seating position and for the driver.

SLW (Seated Load Weight): Curb weight plus seated load.

Serial Data Signals: A current loop based representation of ASCII or alphanumeric data used for transferring information between devices by transmitting a sequence of individual bits in a prearranged order of significance.

Service Life: The Bus shall be designed to operate in transit service at least 40,000 miles per year for 12 years or 500,000 miles.

Service Pressure: The settled pressure at a uniform gas temperature of 21°C (70°F) and full gas content. It is the pressure for which the equipment has been constructed, under normal conditions. Also referred to as the nominal service pressure or working pressure.

Settled Pressure: The gas pressure when a given settled temperature, usually 21°C (70°F), is reached.

Settled Temperature: The uniform gas temperature after any change in temperature caused by filling has dissipated.

Simplified Technical English (STE): A set of writings rules that guide non-English speaking technician writers. Four steps are used to establish a simplified technical dictionary:

- Keyword
- Approved meaning
- Approved example
- What is not approved (sample sentences)

Solid State Alternator: A module that converts high-voltage DC to low-voltage DC (typically 12/24 volt systems).

Sources of Ignition: Devices or equipment that because of their modes of use or operation, are capable of providing sufficient thermal energy to ignite flammable compressed natural gas-air mixtures when introduced into such a mixture, or when such a mixture comes into contact with them.

Special Tools: Tools not normally stocked by the LACMTA.

Specification: A particular or detailed statement, account or listing of the various elements, materials, dimensions, etc. involved in the manufacturing and construction of a product.

Standard: A firm guideline from a consensus group.

Standards: Standards referenced in "Technical Specifications" are the latest revisions unless otherwise stated.

Standee Line: A line marked across the bus aisle to designate the areas that passengers may not occupy when the bus is moving.

State of Charge (SOC): Quantity of electric energy remaining in the battery relative to the maximum rated amp-hour (Ah) capacity of the battery expressed in a percentage. This is a dynamic measurement used for the energy storage system. A full SOC indicates that the energy storage system cannot accept further charging from charging device or the regenerative braking system.

Stress Loops: The "pigtails" commonly used to absorb flexing in piping.

Structure: The basic body, including floor deck material and installation, load-bearing external panels, structural components, axle mounting provisions and suspension beams and attachment points.

Tamper Resistant: Fasteners or components that cannot be easily removed or modified using pocket knives, coins, or other similar items commonly carried by passengers.

Thermally Activated Gas Relief Device: A relief device that is activated by high temperatures and generally contains a fusible material.

Vestibule: Area in front of the standee line, including Operator's area.

Wheelchair: A mobility aid belonging to any class of three- or four-wheeled devices, usable indoors, designed for and used by individuals with mobility impairments, whether operated manually or powered. A "common wheelchair" is such a device that does not exceed 30 inches in width and 48 inches in length measured two inches above the ground, and does not weigh more than 600 pounds. when occupied.

Wheelchair Ramp: A device for allowing ingress and egress of persons or wheelchairs between ground or curb level and the floor level of the bus. The terms "wheelchair ramp" and "ramp" are used interchangeably in this specification.

Zero Emission Bus, (ZEB): A bus meeting California Air Resources Board zero emission standard.

TS 2.1 Abbreviations

Abbreviation and Acronyms

A/C	air conditioning
ABS	anti-lock braking system
AC	alternating current
ACQ	alkaline copper quaternary
ADA	Americans with Disabilities Act
AFSS	automatic fire suppression system

Ah	amp hour
ALR	auto-locking retractor
ANSI	American National Standards Institute
APA	The Engineered Wood Association, formerly the American Plywood Association
APC	Automatic Passenger Counter
APTA	American Public Transportation Association
ASHRAE	American Society of Heating, Refrigerating, and Air Conditioning Engineers
ASTM	ASTM International, formerly the American Society for Testing and Materials
ATC	Automatic Traction Control
ATMS	Advanced Transportation Management System
AVA	Automated Voice Annunciation
AVL	Automatic Vehicle Location
AWG	American Wire Gauge
AWS	American Welding Society
BAFO	Best and Final Offer
BMCS	Bureau of Motor Carrier Safety
BMS	Battery Management System
BRT	Bus Rapid Transit
CALOSHA	California Occupational Safety and Health Administration
CAL TITLE 13	California Code of Regulations, Title 13, Motor Vehicle Code
CAN	Controller Area Network
CARB	California Air Resources Board
CBD	Central Business District
CCS	climate control system
CCTV	closed-circuit television
cfm	cubic feet per minute
CGA	Compressed Gas Association
CNG	compressed natural gas
CSA	Canadian Standards Association
dB	decibel
DBE	disadvantaged business enterprise
DC	direct current
DDU	driver display unit
DEF	diesel exhaust fluid
DOT	Department of Transportation
DPF	diesel particulate filter
ECM	engine control and monitoring
ECS	emission control system
ELR	emergency locking retractor
EMI	electromagnetic interference
EPA	Environmental Protection Agency
ESS	energy storage system
FEA	finite element analysis
FEMA	failure mode effects analysis
FM	Factory Mutual
FMCSA	Federal Motor Carrier Safety Administration
FMCSR	Federal Motor Carrier Safety Regulations
FMVSS	Federal Motor Vehicle Safety Standards
Ft.	foot or feet
FTA	Federal Transit Administration
GAWR	gross axle weight rating
GPS	global positioning system
GVW	gross vehicle weight
GVWR	gross vehicle weight rating

H-point	hip-point
EDS	electric drive system
HMI	human-machine interface
ESC	electric system controller
HV	high voltage
HVAC	heating, ventilation and air conditioning
IBSS	Incident Based Surveillance System
I/O	input/output
IEEE	Institute of Electrical and Electronics Engineers
In.	inch or inches
ISO	International Standards Organization
LAN	local area network
lb.	pound
lbs.	pounds
LCD	liquid crystal display
LED	light emitting diode
LEL	lower explosive limit
LV	low voltage
mA	milliampere
MDT	mobile data terminal
MPa	mega-Pascal
MTTF	mean time to fix
NC	normally closed
NFPA	National Fire Protection Association
NGV	natural gas vehicle
NOx	nitrogen oxide
NO	normally open
NTP	notice to proceed
OCU	operator control unit
OEM	original equipment manufacturer
OSI	Open Systems Interconnect
PA	public address system
PMO	project management oversight
PPA	propulsion power assembly
PPU	primary propulsion unit or prime power unit
PPV	price per vehicle
PRD	pressure relief device
psia	**pounds per square inch absolute**
psi	pounds per square inch
RF	radio frequency
RFI	radio frequency interference
rms	**root mean square**
RTC	real-time clock
SAE	SAE International, formerly the Society of Automotive Engineers
SAS	silent alarm system
scf	standard cubic feet
scfm	**standard cubic feet a minute**
SLW	seated load weight
SOC	state of charge
SPI	Society of the Plastics Industry
UFS	Universal Fare System
UL	Underwriters Laboratories
UNECE	United Nations Economic Commission for Europe
USDHEW	United State Department of Health, Education, and Welfare

V	volt or volts
VAC	volt or volts AC
VDC	volts of direct current
Wh	watt-hours
VIN	vehicle information number
ZEB	zero emission bus

TS 3. Referenced Publications

The documents or portions thereof referenced within this specification shall be considered part of the requirements of the specification. The edition indicated for each referenced document is the current edition, as of the date of the LACMTA issuance of this specification.

TS 4. Legal Requirements

The Contractor shall comply with all applicable federal, state and local regulations. These shall include but not be limited to ADA, as well as state and local accessibility, emissions, safety and security requirements. Local regulations are defined as those below the state level.

Buses shall meet all applicable FMVSS and shall accommodate all applicable FMCSR regulations in effect at location of the LACMTA and the date of manufacture.

In the event of any conflict between the requirements of these specifications and any applicable legal requirement, the legal requirement shall prevail. Technical requirements that exceed the legal requirements are not considered to conflict.

TS 5. Overall Requirements

The Contractor shall ensure that the application and installation of major bus subcomponents and systems are compliant with all such subcomponent vendors' requirements and recommendations. Contractor and LACMTA shall identify subcomponent vendors that shall submit installation/application approval documents, (including necessary documents and/or diagrams to verify configuration), with the completion of the Pilot and First Article Bus. Components used in the vehicle shall be of heavy-duty design and proven in transit service.

The Contractor shall submit to LACMTA the life expectancy of specified components in LACMTA's revenue service and duty cycle per the attached list I Life Cycle Cost Submittal Form. The projected life expectancy shall be based upon actual in-service experience wherever practical. If in-service data is not available, the projected life expectancy shall be based upon durability testing utilizing the best applicable industry practices as may be promulgated by such organizations as SAE, ANSI, ASTM or other acknowledged industry organizations.

Without exception, all technical information, drawings, nameplates, etc. shall be written in the English language. For all means of communications, i.e., letters, cables, telephone conversations, meetings, etc., the English language shall be used. The English System of units shall be used in connection with this Contract.

TS 5.1 Weight

It shall be a design goal to construct each bus as light in weight as possible without degradation of safety, appearance, comfort, traction or performance.

Buses at a capacity load shall not exceed the tire factor limits, brake test criteria or structural design criteria.

The Contractor shall submit a certified weight slip for the curb weight of each axle as well as the total curb weight of each bus upon delivery.

TS 5.2 Capacity

The vehicle shall be designed to carry the gross vehicle weight, which shall not exceed the bus GVWR.

TS 5.3 Service Life

The minimum useful design life of the bus in transit service shall be at least 12 years or 500,000 miles. It shall be capable of operating at least 40,000 miles per year, including the 12th year.

TS 5.4 Maintenance and Inspection

Scheduled maintenance tasks shall be related and shall be grouped in maximum mileage intervals. Scheduled maintenance actions such as filter or belt replacements and other adjustments shall not be required at intervals of less than 6,000 miles except for routine daily service performed during fueling operations. Higher levels of scheduled maintenance tasks shall occur at even multiples of not less than 6,000 miles.

Test ports, as required, shall be provided for commonly checked functions on the bus, such as air intake, exhaust, hydraulic, pneumatic, brakes, charge-air and engine cooling systems.

The bus manufacturer shall give prime consideration to the routine problems of maintaining the vehicle. All bus components and systems, both mechanical and electrical, which will require periodic physical work or inspection processes, shall be installed so that a minimum of time is consumed in gaining access to the critical repair areas. To the extent practical, disconnection or removal of components unrelated to a specific maintenance and/or repair task shall be unnecessary. It shall not be necessary to disassemble portions of the Bus structure and/or equipment such as seats and flooring under seats in order to gain access to these areas. Relative accessibility of components, measure in time to gain access, shall be prioritized for items requiring more frequent service.

Bus shall be designed to facilitate the disassembly, reassembly, servicing or maintenance, using tools and equipment that are normally available as standard commercial items. Bus design shall include features that maximize the intervals between scheduled service requirements for major bus systems while minimizing service time needed to perform the preventative maintenance work. Design goal shall be to minimize diagnostic time required for major bus systems repair.

Requirements for the use of unique specialized tools will be minimized. The body and structure of the Bus shall be designed for ease of maintenance and repair. Individual panels or other equipment that may be damaged in normal service shall be repairable or replaceable. Ease of repair shall be related to the vulnerability of the item to damage in service.

Contractor shall provide a list of all special tools and pricing required for maintaining this equipment. Said list shall be submitted as a supplement to Form PF-3-Schedule B of Prices Special Tools.

> **NOTE:** Tools such as compartment door keys, bellows gauges and other tools that are required for daily maintenance and inspections shall not be included in the special tool list and shall be furnished for each bus.

TS 5.5 Interchangeability

Unless otherwise agreed, all units and components procured under this Contract, whether provided by Suppliers or manufactured by the Contractor, shall be duplicates in design, manufacture and installation to ensure interchangeability among buses in each order group in this procurement. This interchangeability shall extend to the individual components as well as to their locations in the buses. These components shall include, but are not limited to, passenger window hardware, interior trim, lamps, lamp lenses and seat assemblies. Components with non-identical functions shall not be, or appear to be, interchangeable.

Any one component or unit used in the construction of these buses shall be an exact duplicate in design, manufacture and assembly for each bus in each order group in this Contract. Contractor shall identify and secure approval for any changes in components or unit construction provided within a Contract.

In the event that the Contractor is unable to comply with the interchangeability requirement, the Contractor must notify the LACMTA and obtain the LACMTA's prior written approval, including any changes in pricing.

LACMTA shall review proposed product changes on a case-by-case basis and shall have the right to require extended warranties to ensure that product changes perform at least as well as the originally supplied products.

TS 5.6 Training

The Contractor shall have one or more qualified instructors who shall be available at the LACMTA between the hours of 7:00 a.m. and 5:00 p.m. during the period immediately after acceptance of the Pilot Bus. Contractor provided Instructor(s) shall conduct regular and "train the trainer" type classes, for various size groups, to advise LACMTA trainers and mechanics on the proper operation and maintenance of equipment. Training shall be provided throughout the Contract period up to the conclusion of the initial Warranty period for the Option Buses, one (1) year following receipt of the final bus.

Base Order Buses

The Contractor shall provide pricing for up to 1,000 Instructor class-room hours with the bus order. The LACMTA shall approve the proposed trainers and their qualifications, proposed subjects and scheduling of the classes conducted by the Contractor at the time of Pilot Bus review. Training shall be provided throughout the Contract period up to the conclusion of the initial Warranty period following receipt of the final Bus.

Option Order Buses

For each Option order, Contractor shall also be required to provide Instructor training. The quantity of training hours shall be determined by the quantity of Option Buses ordered and shall be equal to five hours of training per Option Bus up to a maximum of 500 instructor class-room hours for each Option order. The LACMTA may elect to reduce the amount of training required for the Option orders. The LACMTA shall approve the proposed trainers and their qualifications, proposed subjects and scheduling of the classes conducted by the Contractor.

TS 5.6.1 Training Curriculum

The Contractor shall develop and submit a training curriculum using the most current version Microsoft Office Word and/or Power Point, subject to LACMTA approval. The curriculum will be discussed during Pre-Production meetings and submitted to the LACMTA no later than 30 days prior to delivery of the Pilot Bus. The curriculum shall be designed specifically for the LACMTA Bus order and shall cover all major systems ordered on the buses including, but not limited to:

- Engine/Propulsion System
- Transmission/Electric Drive
- HVAC System
- Electrical Systems
- Electronic Controls and Sub-systems
- Special Equipment (Fire and Gas Detection, Operator's seats etc.)
- ABS Brake System
- Steering and Suspension
- Pneumatic System
- Passenger Door/Wheelchair ramp system
- Fuel/Battery system and delivery
- Maintenance Bus Orientation
- Operator Bus Orientation
- Security Camera System

- Bus Defueling Procedures
- Engine/Propulsion Cooling System
- Electronic Cooling System
- PPU
- Energy Storage System (including BMS)
- Automatic Passenger Counter

TS 5.6.2 Teaching Materials

The Contractor shall provide to the LACMTA Maintenance Instruction Department visual and other teaching materials as needed during classroom instruction. Teaching materials shall be subject to LACMTA approval. Typical teaching materials include items such as; printed technical literature, training modules, service training and operating manuals, slides, DVD presentations, overhead presentations, etc.

TS 5.6.3 Optional Training Aids

The items in this section are discretionary and may be purchased through this contract, subject to LACMTA approval.

Special Training Aids

The Contractor shall supply pricing for items a through k, special training aids, as listed below for use by LACMTA training staff. Pricing for these aids is to be provided to the LACMTA on Form PF-5-Schedule D of Prices Training Aids. The Special Training aids are to be provided not later than the delivery date for the first production Bus.

System Simulation Training Boards must be designed to imitate a described bus system and shall be mounted vertically on a sturdy roll around frame. Simulation Boards can be approximately three- foot by six foot and in no case larger than four feet by eight feet. Boards shall not be taller than 7 feet to enable the training boards to pass through doors. Simulation boards shall be provided with a 120 VAC power cord. The use of actual Bus components for simulation is desired; however, extremely bulky or heavy items such as large fan motors, A/C compressor, starter, alternators, engine controls, transmission controls, doors, and other similar devices may be smaller or modeled.

a) **One complete running engine and transmission assembly -** Including cooling and fueling systems, mounted on a suitable roll around stand.
b) **One complete static transmission assembly** - For visual purposes, mounted on a roll around stand with considerable cut-away sections that improve visibility and insight into the operation of the transmission.
c) **One complete static front axle assembly** - For visual purposes, mounted on a roll around stand with considerable cut-away sections that improve visibility and insight into the operation of the front axle assembly.
d) **One complete static rear axle assembly** - For visual purposes, mounted on a roll around stand with considerable cut-away sections that improve visibility and insight into the operation of the rear axle assembly.
e) **ATECH Electrical Training Board Kits** - General electrical training. Kit to include GM Specialized Electronic Trainer, Guide Book, four resistors, dual filament light, blank board and horn.

System Simulation Training Boards:

f) **Anti-Lock Brake / Air Brake Board -** Fully functional ABS training board. Bendix design bus disc brake air system training board with all air valve and electrical instrumentation.
g) **Electric Air Conditioning Training Simulator Module -** A/C system training board to highlight new system products. Board must be fully functional and shall be made to give mechanics a general

perspective of A/C and heating components. Module should be similar to what is used during APTA bus Roadeo competitions.

h) **Fire Suppression -** One complete bus set of equipment on display board of fire and gas detection system
i) **Video Security System** – One complete bus set of equipment for training simulator including all cameras, DVR and the monitor system.
j) **Destination Sign –** One complete bus set of equipment for training simulator including all signs, cables and controller.
k) **Multiplex Electrical Training Board -** A mock-up board, where key components including all functioning switches, modules, lights, diagnostic ports, and diagnostic switches are replicated on a functional model, shall be provided as a tool for diagnostic, design verification and training purposes.

E-Learning/Interactive Training Media

The Contractor shall provide pricing for 25 hours of CNG/Electric Bus interactive learning seat time to LACMTA on Form PF-5 Schedule D of Prices, Training Aids. The media shall provide a high level of student interactivity, including but not limited to: questions review, component identification, tool use, circuit building, component testing. The 25 hours shall be broken down as follows:

TABLE 1
E-Learning Media Hours

CNG Bus			Electric Bus		
Module #	System	Hrs.	Module #	System	Hrs.
Module 1	Engine and Transmission	6	Module 1	Safety Procedures	1
Module 2	Electrical System	3	Module 2	Powertrain	4
Module 3	Vehicle Multiplex System	3	Module 3	Electrical System	4
Module 4	HVAC System	2	Module 4	Vehicle Multiplex System	3
Module 5	Brake, Axles, and Air System	4	Module 5	HVAC System	2
Module 6	CNG Fuel System	2	Module 6	Brake, Axles, and Air System	4
Module 7	Entrance/Exit Doors	2	Module 7	PM Procedures	2
Module 8	Cooling System	1	Module 8	Entrance/Exit Doors	2
Module 9	Wheelchair Ramp	1	Module 9	Cooling System	1
Module 10	Towing and Recovery	1	Module 10	Wheelchair Ramp	1
			Module 11	Towing and Recovery	1

Each module shall include: introduction, component operation, component testing, system diagnosis, and diagnostic software/tool use. The content in each module shall be presented with the following breakdown: video content (5-10 percent), slide content with V/O (40-45 percent), student interactivity (45 percent), skills assessment (5 percent). All modules shall have LA Metro branding and a full electronic text student handout. All handouts shall be in MS Word and editable.

The content shall be delivered via DVD, ready for installation and operational on any platform including Microsoft, MAC and Android. All content shall be developed using HTML5 programming and optimized for web browsing. All content shall be navigated through an industry standard e-learning programs graphical user interface (GUI) subject to LACMTA approval.

TS 5.6.4 Manuals

Manual Review and Approval

The Contractor shall be solely responsible for the accuracy and completeness of the manuals and the conversion of the Parts manual into Electronic Parts Catalog (EPC). The LACMTA will assemble a technical review committee to define acceptance criteria of the manuals deliverables, quality standards, file formats, expected results and the testing methods to be used. The Contractor shall put together a team with the technical capabilities to successfully complete these deliverables to LACMTA's satisfaction.

The Contractor will be required to participate in Manual Review and Approval process and attend one service manual review meeting held at the LACMTA shortly following LACMTA Notice to Proceed. Except for the Parts Index, the draft manuals shall be shipped simultaneously with the first Pilot Bus. The final meeting will be scheduled after receipt of draft manuals but prior to the ship date of the first Production Bus.

Draft Manuals

Except for the Parts Index, the Contractor shall provide the LACMTA with draft manuals simultaneously with the Pilot Bus: Draft manuals shall include:

- Ten draft hardcopies each of the Service, Parts and Operator's manuals plus a list of all proposed OEM Component Repair manuals, simultaneously to the shipping of the first Pilot Bus.
- Draft Parts manuals are further defined to include a minimum of 95 percent of all part numbers with an error rate of less than 5 percent. It will be the responsibility of the Contractor to ensure the accuracy of all part numbers.
- Hard copy manuals shall be provided in suitable 3-post binders clearly identified with the Bus manufacturer and model number, LACMTA Bus series number, revision date, and table of contents.
- A part number index shall be submitted for review at least 60 days prior to the scheduled ship date of the first production Bus.

Final Manuals

Final DVD editions of Service, Parts and Operator's manuals must be delivered within 90 days after the start date for production Buses. Following the 90 day period after start of production the LACMTA may withhold $10,000 per Bus delivered until all maintenance and parts manuals are received.

- Ten final hardcopy sets of Service and Parts manuals shall be provided for each 100 Buses and 12 total sets for Subsystem OEM manuals.
- For any Option Buses, four hardcopy sets of Service manuals shall be provided for each 100 Option Buses.
- Twenty final edition Service and Parts manuals excluding subsystem OEM component manuals shall be provided on DVD
- The Contractor shall supply two final hardcopy Operator's manuals per every 10 buses and five total final electronic copies on DVD.
- Contractor shall supply a listing of diagnostic codes with final service manuals delivered that covers trouble shooting fault trees/codes related to the PPU.

If separate subsystem OEM component supplier manuals are provided for preventative maintenance, diagnostics, parts and repair, then the number of manuals provided shall correspond with the quantities described above.

Manuals on DVD

Final edition Service and Parts manuals shall include an index and search function to locate items by subject, part name, or system. Updates shall be delivered to the Maintenance Instruction Department as they occur. Updates must be identified with effected system and with update revision dates.

The DVD versions shall be provided with licenses which permit the MTA to load the manuals on an unlimited number of MTA computers and/or server units. Neither generic nor poor quality reproductions shall be acceptable. Manuals must be in English. The DVD version may consist of multiple DVDs.

The Contractor must be able to work with the 3rd party EPC provider (Digabit, Inc., 850 Englewood Pkwy. #200, Englewood, CO 80110 (Phone # 303 957-2822)) directly to convert their Parts manual into an EPC format suitable for use with LACMTA's current ERP/EAM systems. EPC integration shall include the ability of the contractor to provide information in the current format for initial EPC publishing needs and continue working with the EPC publishing provider using current data formatting standards over the life cycle of the bus.

Manual - Updates

Updates to the manuals covering revisions, corrections or additions shall be grouped and released to the LACMTA as discovered or disclosed by LACMTA at a minimum of once per year but not to exceed three times per year for 12 years. Updates shall be provided in electronic and hardcopy format and shall be delivered to the LACMTA Maintenance Instruction Department. Updates must be identified with defected system and with update revision dates.

Service Manuals

Service manuals shall be divided into separate sections as listed below:

a) Preventative Maintenance Procedures (PMP) by component or system **-** Specifically for use at LACMTA Operating Divisions. Procedures must identify what inspection criteria procedures are needed for each component or system at intervals by time or mileage. Daily inspection is not acceptable criteria for preventative maintenance.
b) Diagnostic Procedures - Include troubleshooting guides for all air, fluid, mechanical and electrical systems. Include schematics for fuel, air, hydraulic, coolant, HVAC, multiplex, braking and electrical with wiring harness drawings.
c) Component Repair/Service - The manuals must be organized to show every subsystem in the bus including all re-buildable components used. For example, the steering box, air compressor, power steering pump, differential, transmission/electric drive/electric drive and PPU must be included. Component Reference Diagrams must be specific and referenced by exact exploded view diagrams.

PMP Section

PMP manuals shall be specific for the LACMTA's bus order and shall include the manufactures inspection and maintenance requirements for buses covered by this procurement and shall not contain any unrelated or unnecessary requirements. All routine maintenance schedule requirements, including maintenance of major subsystems, shall be provided in one master PMP matrix. The master PMP matrix shall include; specific service task, service mileage, and PMP service manual section reference. The PMP manual shall also include remove-and replace instructions for all sub-system components including: PPA, engine, transmission, starter, alternator, A/C compressor, air compressor, etc.

Diagnostic Section

Diagnostic manuals which may be integrated with the maintenance manual shall include isometric, phantom, and schematic illustrations as necessary to completely describe each system including but not limited to location and routing of air, hydraulic, water, lines and electrical harnesses including all anchor and attachment points. Diagnostic manuals shall also include trouble shooting guides necessary to complete running repairs for all supplied Bus equipment.

All wiring schematics and wiring harness drawings required in Service Manuals shall be provided in a separate publication in 11 X 17 inch uniform format. OEM schematics and those provided by all subsystem manufacturers shall be uniform diagrams with an emphasis on readability by mechanics performing diagnostic functions. Drawings shall provide functional grouping, continuity and interfacing at all connection points to eliminate unnecessary interfacing between multiple drawings and subsystem supplier drawings. Electrical schematic drawings shall include diagrams to clearly and accurately show locations of all electrical connectors splice and ground points for the Bus wiring harnesses.

Component Repair/Service Section

Fourteen sets of Repair Manuals necessary to rebuild all Contractor supplied Units including: PPU, transmission/electric drive, HVAC system, starter, alternator, air compressor, etc., shall be provided. Each copy shall be the latest hardcopy edition issued by the OEM component manufacturer. Repair manuals shall be comprehensive and shall cover all aspects of repair from tear-down through final test as recommended by the Bus OEM. Repair manuals shall be grouped in sets and with a table of contents. Each set shall be organized and mounted onto a suitable table top holding rack subject to LACMTA approval. The LACMTA

requires fourteen sets of wall posters with the repair manuals showing subsystem, component and part assembly, parts numbers, torque values, installation notes, etc. A list of subsystem component repair manuals shall be submitted for LACMTA review at time of Pilot Bus delivery.

Parts Manuals

Must be specific and referenced by exact exploded-view diagrams and organized to coordinate with Service Manuals for ease of use. Parts manuals shall be specific to the LACMTA bus order including subsystem OEM PPU and transmission/electric drive parts listings. IPC and EPC manuals provided shall include illustrations with necessary exploded diagrams and data arranged so that part numbers can be readily found and identified in the illustration for each system and subsystem component, assembly, subassembly or piece part, from an orderly breakdown of the complete bus. An assembly or subassembly is an identifiable portion of a component of a system or subsystem.

Parts manuals shall contain a reference part number index, listed in numerical order with descriptions, and page numbers. The comprehensive number index shall include major subsystem parts numbers which includes the PPU, transmission/electric drive/, and air conditioning. A part number index shall be submitted for review at least 60 days prior to the scheduled ship date of the first production bus.

The parts list index shall also be provided to the LACMTA in a PC spreadsheet file on a DVD compatible with Microsoft Excel and include subsystem supplier part numbers, part description, and price. OEM component supplier part numbers are required.

Price List

Ten copies of the current price list shall be provided separately as a supplement to the final parts manuals. Price lists shall be updated at least annually and provided for the life of the bus as they are updated.

Operator's Manuals

The Operator manuals shall be specific to the LACMTA bus configuration and designed for a LACMTA Bus Operator target audience, without extraneous material or information. Manuals shall clearly outline the features and controls, indicators necessary for safe and proper operation of the buses including ADA equipment.

TS 5.6.5 Special Equipment

Option, Special Service Equipment

The items in this section are discretionary and may be purchased through this contract, subject to LACMTA approval.

The Contractor shall supply pricing for 30 sets of Special Service Equipment listed below for use by LACMTA training staff. Pricing for this special service equipment is to be provided to the LACMTA on Form PF-4-Schedule C of Prices Special Service Equipment.

The LACMTA is aware that diagnostic equipment and/or software has been developed or is being developed by many of the OEMs to assist in the maintenance of the Buses. Proposer is required to submit a list of recommended special equipment, software and/or diagnostic tools deemed necessary to provide state-of-the-art service for the bus systems. Depending on the type of available equipment and/or software, the LACMTA may wish to obtain complete sets of such Special Service Equipment and/or software, plus any additional tools identified by the OEM manufacturer required to diagnose, calibrate, or remove-and-replace, all equipment provided with this bus order. The purchase of any such Special Equipment and/or software is at the sole option of the LACMTA. Because of technological changes which may occur prior to and during the actual production of the buses, the LACMTA reserves the right to issue Change Orders for updated diagnostic equipment, tools and software, and other Special Service Equipment at any time prior to Contract closeout.

For the Base order or any Option order that is exercised the Contractor shall provide pricing for Diagnostic Tools and Equipment listed below. The quantities listed below are for 300 Base Vehicles. Quantities for

Diagnostic Tools and Equipment of Option Vehicles will be determined at the time the Option is exercised. At a minimum, Proposers shall provide a complete listing of such currently available equipment and/or software and the proposed pricing in the Price Forms.

Engine/Propulsion and Electric Drive/Transmission:

- Engine/Propulsion Diagnostic software, including necessary cables and connectors with one year software registration.
- Transmission/Electric Drive diagnostic software, including necessary cables and connectors.
- PPU diagnostic software, including necessary cables and adapters.
- Nexiq Technologies USB Link PC to Vehicle Interface.
- ABS/Regenerative Braking diagnostic software, including necessary cables and connectors.
- Engine/Propulsion cooling system diagnostic or programming software.
- Power Management diagnostic tools and software.
- Battery Management diagnostic tools and software.

Electrical/Vehicle Control System:

- Multiplex/Vehicle Control software and connection kit to include applicable cables, connectors and translator boxes, no registration or upgrade fees attached.
- Diagnostic laptop (to be defined) to include: applicable cables, connectors and translator boxes.
- Multiplex Module programmers, (if applicable).

Energy Storage and BMS

- Power management diagnostic software and connection kit to include applicable cables and adapters, including registration fees.

Doors

- Door System diagnostic or programming software.

Interior:

- ITS Diagnostic Kits including test fixture(s) and associated software application(s) that allows for installing components of each group, (Video Security, IBSS and Destination Sign) so that all the components of each group are easily accessible for programming, replacement, adjustment and troubleshooting including but not limited to all cables, DVR docking station, cameras, etc. Diagnostic kits should be integrated with the Training Aids to allow off-the-bus training and familiarization of the systems.
- Destination Sign Diagnostic Equipment (J1708 Protocol Boxes/software).

Heating Ventilation Air Conditioning (HVAC):

- A/C interface software and cable.

Diagnostic PC:

- Diagnostic laptops with necessary interface cables, power adapters.

TS 5.6.6 Diagnostic Laptop PC Specifications

Optional diagnostic laptop shall be Dell Latitude E6540 and at a minimum contain the following:

TABLE 2
Laptop Specifications

Category	Description
Processor	Intel Core i5-6300U (Dual Core, 2.4GHz, 3M cache)
Operating System	Windows 7 Professional English, French, Spanish 64-bit (Includes

	Windows 10 Pro License)
Memory	8GB (2x4GB) 2133MHz DDR4 Memory
Hard Drive	500GB 7200rmp 7.2krpm HD
Video Card	AMD Radeon RT M360, for I5-6300U (Vpro Capable)
Optical Drive	Dell External USB Slim DVD+/-RW Optical Drive
Battery	Primary 4-cell 62W/HR Battery
Adapter	65 Watt AC Adaptor
Power Cord	US Power Cord
LCD	15.6-inch HD (1366x768) Anti-Glare LCD
Wireless	Intel Dual-Band Wireless-AC 8260 Wi-Fi + BTW8260AC 4.1 Wireless Driver (2x2)
Keyboard	Internal Dual Pointing Keyboard, English
Security Hardware	Absolute Computrace Complete 5 Year - Education
System Management	No Out-of-Band System Management

System shall be compatible with all diagnostic software. Contractor shall provide a complete listing of all proposed software and hardware to the LACMTA Project Manager prior to purchasing.

Because of the time delay between the procurement process and receipt of computer equipment, the final laptop computer configuration shall be subject to approval by the LACMTA at delivery to ensure it has all of the appropriate and necessary software and is compatible with LACMTA's other existing laptop computers. All laptop PCs shall include a suitable protective carrying "soft" case and a Microsoft mouse.

TS 5.6.7 Recommended Spare Parts List

The Contractor shall attend at least one Parts Provisioning Meeting with the LACMTA's Inventory Planning staff to discuss recommended spare parts. The Parts Provisioning meeting shall occur at least 60 days prior to the first production Bus being delivered. At the meeting, the Contractor shall provide a bill of material and a list of recommended spare parts for the buses ordered. The recommended spare parts list shall include the quantity of each item per bus, the estimated normal lead time, and recommended minimum/maximum quantities. As changes are implemented and corrections are made, the recommended spare parts list shall be updated throughout the Contract period and life of the bus. The Contractor Parts subsequently ordered by LACMTA must be delivered within thirty (30) days after initial Bus delivery or within 30 days of placement of the order, whichever is later.

TS 5.6.8 In-Process and As-Built Drawings

The Contractor shall, no later than 30 days prior to commencing production, supply the LACMTA with two sets of hardcopy scale drawings suitable for conducting repairs on every area of the vehicle, including all major systems and sub-system installations. Electrical and air schematics shall also be provided. In addition, the Contractor shall provide a description of the electronic configuration, layout and functionality of the bus including communication paths and power distribution. Drawings shall be organized in a logical, easily searchable format consistent with parts and or maintenance manuals, and shall include a table of contents searchable by parts or systems descriptions.

Drawings shall also be supplied in electronic format compatible with AutoCAD, PRO-E or other LACMTA approved design software. Contractor shall update these specific drawing to conform to "as-built". Five sets of Conforming drawings shall be delivered to the LACMTA within 60 days after final bus delivery.

Drawings shall include at a minimum the following:

- Entire structure of the bus
- Interior body with dimensions
- Exterior body with dimensions
- Floor
- Glazing and frames

- Engine and Transmission mounts
- PPU installation and mounting
- Fuel containers and supporting structure
- Passenger assists layout
- Seat placement and dimensions
- Passenger door and window dimensions
- Wiring schematics and drawings
- Wiring harnesses and cables drawings
- Plumbing schematics (pneumatic/hydraulic) and drawings
- Suspension
- Any specialized bracketry or mounts
- Battery tray
- Paint Scheme
- Interior decal placement
- Exterior decal placement
- Destination Signs drawings and schematics
- Frame Drainage Plan
- AFSS installation and routing
- ADA device installation

TS 5.7 Operating Environment

The bus shall achieve normal operation in ambient temperature ranges of 0º F to 120º F, at relative humidity between 5 percent and 100 percent, and at altitudes up to 1,500 feet above sea level. Degradation of performance due to atmospheric conditions shall be minimized at temperatures below 0 °F, above 120° F or at altitudes above 1,500 feet. Altitude requirements above 1,500 feet will need separate discussions with the engine manufacturer to ensure that performance requirements are not compromised. Speed, grade-ability and acceleration performance requirements shall be met at, or corrected to, 77° F, 29.31 inches Hg, dry air per SAE J1995 with all accessories on including A/C.

TS 5.8 Noise

Noise Level Test Conditions

Instrumentation and other general requirements shall conform to SAE Standards; J336, J366 and J2805. The bus shall be empty except for test personnel, not to exceed four persons, and the test equipment. All openings shall be closed and all accessories shall be operating at maximum output during the test. The bus shall accelerate at full throttle from a standstill to 35 mph on level commercial asphalt or concrete pavement.

TS 5.8.1 Interior Noise

The combination of inner and outer panels and any material used between them shall provide sufficient sound insulation so that a sound source with a level of 80 dBA measured at the outside skin of the bus shall have a sound level of 65 dBA or less at any point inside the bus. These conditions shall prevail with all openings, including doors and windows, closed and with the engine and accessories switched off.

The bus-generated noise level experienced by a passenger at any seat location in the bus shall not exceed 78 dBA. The driver area shall not experience a noise level of more than 75 dBA. Measurements of interior noise levels shall be taken in accordance with SAEJ2805 for portion of testing under acceleration. The bus shall also be operated at various speeds to check for audible vibrations.

TS 5.8.2 Exterior Noise

Airborne noise generated by the bus and measured from either side shall not exceed 80 dBA under full power acceleration when operated at 0 to 35 mph at curb weight. The maximum noise level generated by the bus pulling away from a stop at full power shall not exceed 83 dBA. The bus-generated noise at curb idle shall not exceed 65dBA. If the noise contains an audible discrete frequency, a penalty of 5 dBA shall be added to the

sound level measured. The Contractor shall comply with the exterior noise requirements defined in local laws and ordinances identified by the LACMTA and SAEJ366.

The bus builder shall minimize all transient noises generated by the bus and/or by accessories. These efforts shall include the application of mufflers on exhaust air ports for the kneeling valve, dryer and brake exhaust if their sound levels exceed 78 dBA interior or 83 dBA exterior.

TS 5.9 Fire Safety

The bus shall be designed and manufactured in accordance with all applicable fire safety and smoke emission regulations. These provisions shall include the use of fire-retardant/low-smoke materials, fire detection systems, bulkheads and facilitation of passenger evacuation. A barrier shall separate the passenger and drive system compartments and shall incorporate fire resistant materials to create a firewall. Contractor must provide required certificates of compliance prior to manufacture of the Pilot Bus.

TS 5.9.1 Materials

All materials used in the construction of the passenger compartment of the bus shall be in accordance with the Recommended Fire Safety Practices defined in FTA Docket 90-A, most recent revision. Materials entirely enclosed from the passenger compartment, such as insulation within the sidewalls and sub-floor, need not comply. In addition, smaller components and items, such as seat grab rails, switch knobs, small light lenses, door seals, window seals, steering wheel, steering column and escape hatches shall be exempt from this requirement.

TS 5.10 Fire Suppression

The purpose of the suppression system is to ensure bus and passenger safety and survivability in the event of a fire. The AFSS system design shall include sensors and nozzles in all areas that are known to commonly have bus fires.

The AFSS system shall meet or exceed the environmental requirements of SAE J1211 and be approved by Underwriters Laboratory or Factory Mutual. At a minimum, the engine compartment, rear-mount HVAC compartment, exhaust area and high current electrical areas (except the battery compartment) at rear of bus shall be equipped with an automatic fire sensing and suppression (AFSS) system product, subject to LACMTA approval during proposal period.

AFSS Operation

The AFSS system shall be powered through the solenoid battery cutoff switch(es) and be activated automatically by the AFSS system sensors. The AFSS shall provide a programmable time-delayed signal to the engine shut-down controls following detection of a fire. The AFSS initiated engine shut-down shall include an integrated Engine Stop Over-Ride to permit the Operator more time, if required, to slow and stop the Bus (Refer to Section TS 46.5 Table 9).

The AFSS sensors shall detect fires in monitored areas and immediately activate the fire alarm signal in the Operator's compartment and fire warning light on the Operator's indicator panel. The AFSS system shall activate fast-acting extinguisher(s) which release suppression agent to all areas monitored. If water based, the distribution system shall utilize nozzles for high-pressure water mist, and shall deliver water droplets between 50-80µm (micrometer). After a system discharge, the AFSS shall be able to clear alarm condition and be ready for reactivation following a simple system reset. The only cost to prepare system for reuse will be for recharge of agent and clean up.

AFSS Monitor Panel

The system shall have a supervision monitoring panel located above the Operators' side console subject to LACMTA approval in Pre-Production meetings. Monitor panel shall include visual indicators for a) Operational Status, for sensors, harness, and extinguishers, b) Fire or system discharged, and c) Power Failure. Monitor

panel shall be capable of identifying each individual sensor (gas or fire) and location of each sensor. Monitor panel shall be capable of recording and storing system events in non-volatile memory. In the event of power loss, events shall still be retrievable after power is restored.

AFSS Sensor

Linear heat detectors shall be mechanically protected from abrasion with use of a spring wire external jacket. All heat sensors shall be installed per the manufacturer's recommendations to sensor fires, extreme temperatures or conditions that are sufficient to ignite combustible materials in the monitored areas. The AFSS/GDS control module shall provide a fault signal to the AFSS status indicator located in the Operator's area in the event of a sensor failure, and the fault shall be traceable to each fire and gas sensor for easy diagnostic purposes. Fault data shall be recorded and accessible even after loss of battery power.

AFSS Agent

The agent shall be approved by Underwriters Laboratory or Factory Mutual Research Corporation and have no ozone depleting property and no global warming potential per USA EPA guidelines.

AFSS Cylinder(s)

The AFSS agent cylinders shall use DOT shippable linear actuators or electric solenoid valves (squibs are prohibited) attached to DOT certified bottles which do not require hydrostatic retest for a minimum of twelve years. Cylinder(s) shall be compatible with suppression agents. Each cylinder shall have a pressure gauge with easy to read "Go-No-Go" type indicator which is visible when the cylinder(s) is installed on the bus. Each agent cylinder shall have a low pressure sensor to monitor agent cylinder pressure from the display panel. Low agent cylinder pressure shall indicate a fault condition on the display panel.

TS 5.11 Gas Detection System (GDS)

GDS system shall be provided to monitor the engine compartment and each separate fuel storage area(s) and shall automatically activate audible and visible alarms in the Operators' area at levels of the lower explosive limit (LEL), of natural gas (methane), subject to LACMTA approval during proposal period.

GDS Operation

The GDS system shall be powered through the solenoid battery cutoff switch(es) and be activated automatically by the GDS system sensors. The system shall be capable of detecting gas in concentrations from 20 percent to 100 percent of LEL and shall continue to indicate the presence of gas at concentrations above 100 percent LEL. A control button shall be provided to silence the GDS audible alarm. The GDS shall provide a programmable time-delayed signal to the engine shut-down controls following detection of methane 50 percent LEL of the gas selected for fuel as described in TS 46.5 Table 9. The GDS initiated engine shut-down shall include an integrated Engine Stop Over-Ride to permit the Operator more time, if required, to slow and stop the bus (Refer to Section TS 46.5 Table 9). The GDS shall be in full time sampling mode at all times.

GDS Monitor Panel

The system shall have a supervision monitoring panel located above the Operators' side console area subject to LACMTA approval in Pre-Production meetings. Monitor panel shall indicate operational status of the sensors, harness, and calibration with visual indicators provided on the Operators' indicator panel. Visual indicators shall include a) System OK (power on and calibrated), b) Gas Alarm, c) Service Required and d) Monitor each gas sensor for trace gas, significant gas, and trouble conditions for ease of system diagnostics..

GDS Calibration

System shall not require calibration. System diagnostics shall not require more than 20 minutes and shall provide traceability to individual sensor failures during diagnostic work.

TS 5.12 Respect for the Environment

In the design and manufacture of the bus, the Contractor shall make every effort to reduce the amount of potentially hazardous waste. In accordance with Section 6002 of the Resource Conservation and Recovery Act, the Contractor shall use, whenever possible and allowed by the specifications, recycled materials in the manufacture of the bus.

TS 5.13 Water Leak Testing

The roof, windows, windshields, and all doors of all Buses shall be water tested for a minimum of 30 continuous minutes in order that leaks may be detected and corrected. The HVAC shall be turned on only for the first 15 minutes of the test. The water test should replicate a sustained driving rain contacting all surfaces equally. Water spray nozzles shall be located to provide an overlapping pattern to effectively test the full length of the roof, sides, front and back of the bus at a flow rate of 0.04 gal/min/ft^2

TS 5.14 Fasteners and Securements

Unless otherwise specified all bolts, nuts and washers shall use Metric or English system dimensions. All bolts, nuts, washers shall be SAE Grade 5 or better and be designed to resist corrosion for the life of the bus. Stainless steel fasteners are required for the structure exterior, suspension system, fuel system, HVAC system, PPA area and mirror/camera attachments. Where the bus design requires high-strength fasteners, zinc plated, or phosphate coated (only if zinc is not available) fasteners shall be provided. Zinc plated fasteners may be used in areas requiring welding. Exceptions to the use of stainless steel or zinc plated fasteners shall be approved on a case-by-case basis.

The use of plastic tie wraps shall be limited to bundling small diameter lines (under one-inch diameter); they shall not be used as an attachment device unless approved by LACMTA during proposal period. The failure of any number of tie wraps over the life of the bus shall not result in a required repair action or service interruption.

All wire harnesses assemblies and wire bundles over 18 inches long shall be secured with suitable wire trays or fully wrapped PTFE or Nylon insulated P-clamps, or other suitable method approved by the LACMTA. P-clamps not used for wiring support shall be orange, fully wrapped silicone insulated. The use of plastic tie wraps shall be limited to bundling wires; they shall not be used as a primary attachment device unless approved by LACMTA during proposal period. The failure of any number of tie wraps shall not result in a required repair action or service interruption. Supports for wires, cables, or harnesses shall be insulated from contact with wire, cable or harness by a fully cushioned, non-conductive material. Supports for all electrical cables, harnesses and bundles will be subject to LACMTA approval during proposal period and shall be of premium quality.

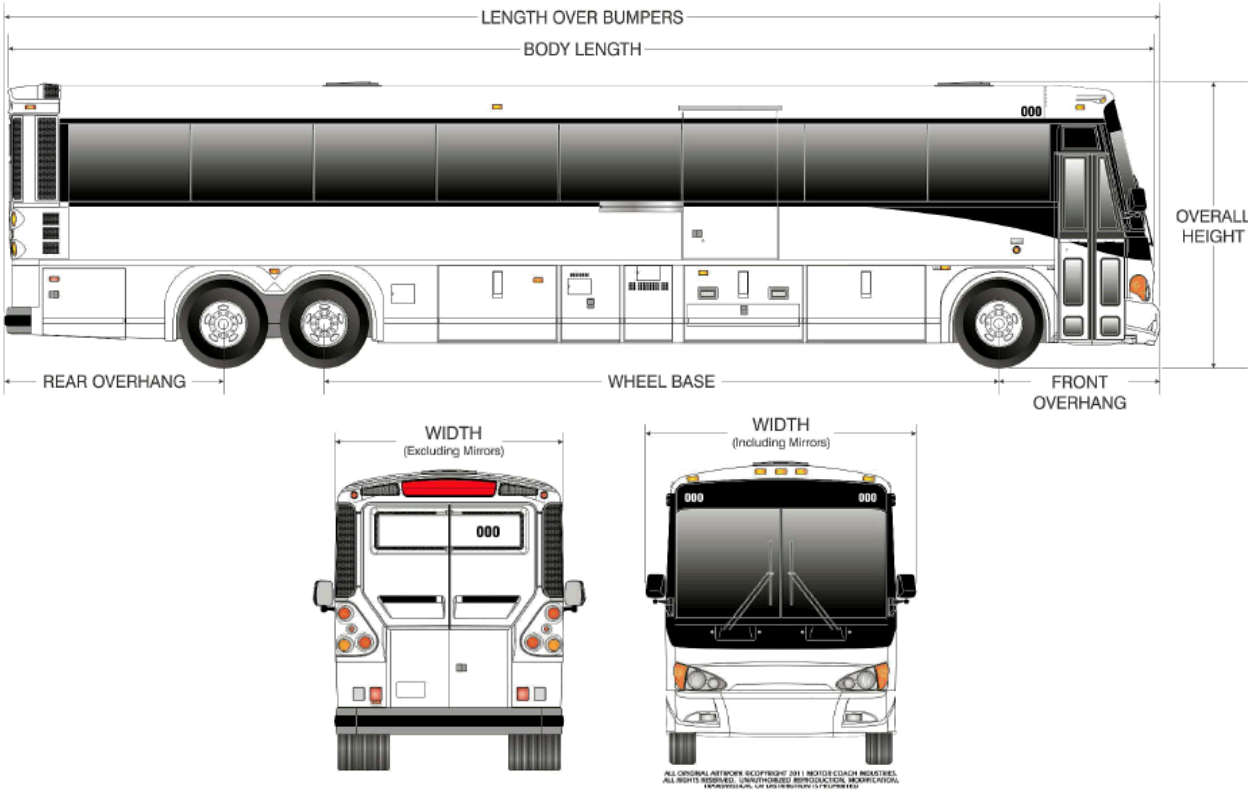
DIMENSIONS (TS 6)

TS 6. Physical Size

With exceptions such as exterior mirrors, marker and signal lights, bumpers, fender skirts, washers, wipers, ad frames, cameras, object detection systems, bicycle racks, feelers and rub-rails, the bus shall have the following overall dimensions as shown in Figure 1 at static conditions and design height.

FIGURE 1

Transit Bus Exterior Dimensions



TS 6.1 Bus Length

For ease of use, the following tolerances will be allowable for each given bus length.

Body Length - 40 feet
Length Over Bumpers –40-1/2 feet to 44 feet

TS 6.2 Bus Width

TS 6.2.1 Transit Bus

102 inches Width Bus

Body width shall be 102 inches (+0, -1 inch).

TS 6.2.2 Commuter Bus

Not applicable.

TS 6.3 Bus Height

Maximum Overall Height

Maximum overall height shall be 135 inches, including all rigid, roof-mounted items such as A/C, exhaust, fuel system and cover, etc.

TS 6.4 Step Height

TS 6.4.1 Transit Bus

The step height shall not exceed 16.0 inches at either doorway without kneeling. A maximum of two steps are allowed to accommodate a raised aisle floor in the rear of the bus.

TS 6.4.2 Commuter Bus

Not applicable.

TS 6.4.3 Articulated Bus

Not applicable.

TS 6.5 Underbody Clearance

The bus shall maintain the minimum clearance dimensions as defined and shown in Figure 2, regardless of load, up to the gross vehicle weight rating.

TS 6.6 Ramp Clearances

The approach angle is the angle measured between a line tangent to the front tire static loaded radius arc, (axle centerline), and the initial point of structural interference forward of the front tire to the ground.

The departure angle is the angle measured between a line tangent to the rear tire static loaded radius arc, (axle centerline), and the initial point of structural interference rearward of the rear tire to the ground.

The break over angle is the angle measured between two lines tangent to the front and rear tire static loaded radius arcs, (axle centerlines), and intersecting at a point on the underside of the vehicle that defines the largest ramp over which the vehicle can roll.

TABLE 3

Default Breakover Angle

Angle	30 to 45 ft. Bus
Approach	9 deg. (min.)
Front breakover	8 deg. (min.)
Departure	8.5 deg. (min.)

TS 6.7 Ground Clearance

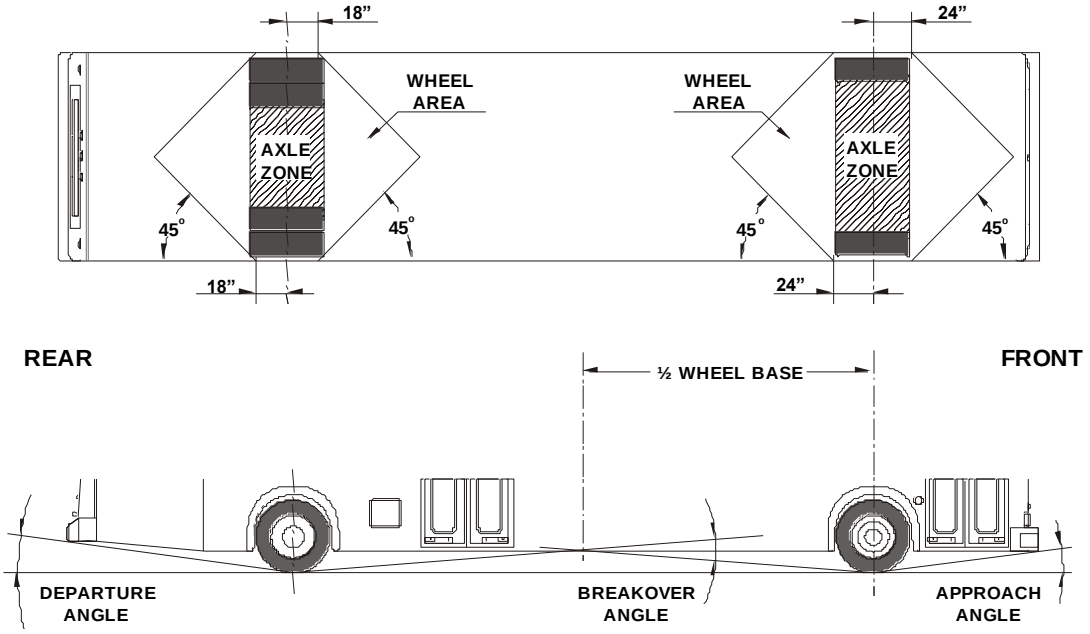
Ground clearance shall be no less than 8.5 inches, (eight inches at jacking pad) except within the axle zone and wheel area.

Axle zone clearance, which is the projected area between tires and wheels on the same axial centerline, shall be no less than 5.4 inches.

Wheel area clearance shall be no less than six inches for parts fixed to the bus body and five inches for parts that move vertically with the axles.

– **FIGURE 2**

Transit Bus Minimum Road Clearance



TS 6.8 Floor Height

TS 6.8.1 Transit Bus

Height of the step above the street shall be no more than 16 inches measured at the centerline of the front and rear doorway. All floor measurements shall be with the bus at the design running height and on a level surface and with the standard installed tires. A maximum of two steps are allowed to accommodate a raised aisle floor in the rear of the bus.

TS 6.8.2 Commuter Bus

Not applicable.

TS 6.9 Interior Headroom

Headroom above the aisle and at the centerline of the aisle seats shall be no less than 78 inches in the forward half of the bus tapering to no less than 74 inches forward of the rear settee. At the centerline of the window seats, headroom shall be no lower than 65 inches reducing to 60 inches at the side wall, except for parcel racks and reading lights, if specified. Headroom at the back of the rear bench seat may be reduced to a minimum of 56 inches, but it shall increase to the ceiling height at the front of the seat cushion. In any area of the bus directly over the head of a seated passenger and positioned where a passenger entering or leaving the seat is prone to strike his or her head, padding shall be provided on the overhead paneling.

TS 6.10 Aisle Width

The minimum clear aisle width between pairs of transverse seats with all attached hardware shall be at least 22 inches.

The aisle width between the front wheelhouses shall be at least 35.5 inches, and the entire area between the front wheelhouses shall be available for passengers and mobility aid devices.

VEHICLE PERFORMANCE (TS 7-TS 8)

TS 7. Power Requirements

The propulsion system shall be sized to provide sufficient power to enable the bus to meet the defined acceleration, top speed and grade-ability requirements, and operate all propulsion-driven accessories using actual road test or dynamometer results and computerized vehicle performance data.

TS 7.1 Top Speed

The bus shall be capable of achieving a top speed of 65 mph on a straight, level road at GVWR with all accessories operating. The bus shall be capable of safely maintaining the vehicle speed for the discrete bus range specified in proposed bus.

> **NOTE:** Values are assumed to be sustained. Manufacturer shall supply LACMTA with data, if there is a variance between peak performance and sustained vehicle performance.

TS 7.2 Grade-ability

Grade-ability requirements shall be met from a standing stop on grades with a dry commercial asphalt or concrete pavement at GVWR with all accessories operating.

The propulsion system shall enable the bus to achieve and maintain a speed of 40 mph on a 2.5 percent ascending grade and 15 mph on a 10 percent ascending grade for the discrete bus range specified in proposed bus.

> **NOTE:** Values are assumed to be sustained. Manufacturer shall supply LACMTA with data, if there is a variance between peak performance and sustained vehicle performance.

TS 7.3 Acceleration

TS 7.3.1 Acceleration (CNG)

The acceleration shall meet the requirements in Table 4 below and shall be sufficiently gradual and smooth to prevent throwing standing passengers off-balance. Acceleration measurement shall commence when the accelerator is depressed.

TABLE 4a

Maximum Start Acceleration Times on a Level Surface[1]

Speed (mph)	Maximum time (seconds)
10	5
20	10
30	18
40	30
50	60
Top speed	

1. Vehicle weight = GVWR

Jerk

The rate of change of acceleration shall be minimized throughout the acceleration/deceleration range and shall not be greater than 15.5 mph/sec/sec (0.3g/sec)

Response Time

Response times shall be measured from the activation or deactivation of the accelerator or brake pedal to the initial response of an on-board accelerometer measuring longitudinal Bus acceleration. Response times for power to brake, brake to power, coast to power and to brake shall be no greater than 0.20 seconds.

TS 7.3.2 Acceleration Electric or Zero Emission

The propulsion and braking systems shall meet the performance requirements of the Duty Cycle.

Braking application and performance shall remain consistent regardless of EV system State of Charge (SOC) or other variances related to regenerative braking.

The system shall be programmable to allow optimization of acceleration and deceleration rate. Performance may be affected when reprogramming.

TABLE 4b

Maximum Start Acceleration Times on a Level Surface[1]

Speed (mph)	Maximum time (seconds)
10	5
20	10
30	18
40	30
50	60
Top speed	

1. Vehicle weight = GVWR

Jerk

The rate of change of acceleration shall be minimized throughout the acceleration/deceleration range and shall not be greater than 15.5 mph/sec/sec (0.3g/sec)

Response Time

Response times shall be measured from the activation or deactivation of the accelerator or brake pedal to the initial response of an on-board accelerometer measuring longitudinal Bus acceleration. Response times for power to brake, brake to power, coast to power and to brake shall be no greater than 0.20 seconds.

TS 7.3.3 Acceleration (Commuter Bus)

Not applicable.

TS 7.4 Operating Range

The operating range of the Bus shall be designed to meet the operating profile as stated in the applicable section and performance requirements as stated below.

TS 7.4.1 Diesel (Transit Bus)

Not applicable.

TS 7.4.2 Diesel (Commuter Bus)

Not applicable.

TS 7.4.3 CNG

A compressed natural gas fuel system consisting of fuel cylinders, filler provisions, fuel lines, pressure reduction, and auxiliary equipment necessary to safely operate under all operating conditions shall be provided. The Contractor shall provide sufficient fuel capacity to give the Bus a 400-mile range before the low fuel warning light comes on. The 400-mile range shall be based on:

- A service cycle that utilizes only the CBD portion of the FTA ADB heavy-duty transit bus cycle as administered by The Altoona Bus Research and Testing Center.
- The CBD portion shall be further modified to add 20 minutes of idle time.

The Contractor shall provide the LACMTA with a technical analysis which supports the proposed CNG fuel system design compliance to the LACMTA's range of operation requirement including the proposed fuel capacity. The analysis shall contain at a minimum:

- Source of fuel economy information (pounds per mile or standard cubic feet per mile).
- Summary of the gas quality used in the calculations.
- Bus condition including weight.

The analysis shall use the natural gas data supplied below based on 70 ° F ambient temperature.

TABLE 5
LACMTA CNG Fuel Properties

Lower Heating Value Btu/lb.	Molecular Weight	Density @ 3,614.7 psia	Density @ 14.7 psia	Specific Gravity
21904	16.734	12.49 lb./cu ft.	0.044 lb./cu ft.	0.580

The analysis shall be provided with the Proposal.

The system shall be capable of refueling at a minimum rate of 5,000 scfm.

TS 7.4.4 Electric (Zero Emission)

The Contractor shall provide sufficient energy storage and changer charging systems to give the bus a cumulative 300-ile daily operating range before the low power warning light comes on. The 300-mile range shall be based on:

- A service cycle that utilizes only the CBD portion of the FTA ADB heavy-duty transit bus cycle with all accessories operating at full capacity.
- The CBD portion shall be further modified to add 20 minutes of idle time.

The Contractor shall provide the LACMTA with a technical analysis which supports the proposed energy storage and charger systems design compliance to the MTA's range of operation requirement including the proposed energy storage system capacity. The analysis shall contain at a minimum:

- Source of energy storage and charger systems information (kilowatt-hour per mile).
- Bus condition including weight.

TS 8. Fuel Economy

Test results from the Altoona fuel economy tests or other applicable test procedures shall be provided to the LACMTA. Results shall include vehicle configuration and test environment information.

POWERPLANT (TS 9-TS 19)

TS 9. Engine

The Propulsion Power Assembly (PPA) shall consist of an engine and transmission, and support equipment mounted in a compartment in the rear of the bus in T-drive configuration. . The propulsion system shall be designed to minimize exhaust emissions and maximize fuel economy while meeting the specified performance requirements.

Prior to manufacturing the Pilot Bus, the Contractor shall coordinate a technical review with the LACMTA and engine and transmission suppliers covering integration and installation design. As part of the technical review, the Contractor shall advise the LACMTA concerning engine and transmission features and control system options, and accessories, and shall conform, to the degree possible, to those already in use at the LACMTA in an effort to increase component and system commonality.

Prior to start of production, the Contractor shall provide documentation from the Sub-suppliers, which supports their approval, that the engine and transmission installation, support system design, and components used specifically for the LACMTA's contract meet the OEM requirements and recommendations.

The engine shall comply with applicable local, state, and/or federal emissions and useful life requirements. Components of the fuel management and/or control system shall have a design life of not less than 150,000 miles without replacement or major service. The lifetime estimate shall be based on the defined design operating profile while operating under conditions in TS 5.7.

The engine shall be equipped with an electronically controlled management system (ECM), compatible with either 12- or 24-volt power distribution. The engine control system shall be capable of transmitting and receiving electronic inputs and data from other drivetrain components and broadcasting that data to other vehicle systems. Communication between electronic drivetrain components and other vehicle systems shall be made using the communications networks. The engine's electronic management system shall monitor operating conditions and provide instantaneous adjustments to optimize both engine and bus performance. The system shall be programmable to allow optimization of parameters or adjustable features.

The engine starting system shall be protected by an interlock that prevents its engagement when the engine is running. Special equipment or procedures may be employed to start the bus when exposed to temperatures less than 30° F for a minimum of four hours without the engine in operation. The integration of all systems on the vehicle relative to engine idle speed shall be the responsibility of the vehicle manufacturer to meet the requirements of LACMTA.

The engine control system shall protect the engine against progressive damage. The system shall monitor conditions critical for safe operation and automatically de-rate power and/or speed and initiate engine shutdown as needed.

The engine shall be designed for city transit bus application. The engine shall be designed to operate without failure for 300,000 miles in LACMTA revenue service without major failure or significant deterioration. Electronic controls, supplied by the OEM engine manufacturer, such as throttle control, programmable control module(s), and engine protection system, shall be provided and integrated with other bus electronic systems.

Automatic Engine Protection/Shutdown Override Feature

A control shall be available to the Operator that when depressed and released will delay the engine shutdown for 30 seconds to allow the bus to be moved. Override action shall be recorded. This data shall be retrievable by the LACMTA.

TS 9.1 Engine (CNG)

The engine shall meet all regulatory requirements when operating on fuel equal to CARB Specifications for Compressed Natural Gas #2292.5. The four predominant characteristics that must be met are Methane, Ethane, Butane, and Propane.

Standard Requirements for a Fast Idle Device

The engine shall be equipped with an operator-controlled fast idle device. The fast idle control shall be a two-way switch mounted on the dash or side console and shall activate only with the transmission in neutral and the parking brake applied. The fast idle device may be activated and controlled automatically by the control system for heavy loads, e.g. air conditioning.

Oil filtration systems shall be approved by the engine and transmission OEM and be designed with by-pass circuits, as needed, in the event that a filter becomes plugged.

TS 9.1.1 Engine Compartment Control Panel

A rear control panel shall be provided for the convenience and safety of LACMTA mechanics. The control panel shall be located in the engine compartment located in an area where it shall not be damaged during repairs. The control panel wiring, switches, and gauges shall be water proof with IP 65 and IP 67 ratings to withstand steam cleaning.

Control Panel Gauges and Indicators

The following mechanical, electrical dial gauges, or digital display, subject to LACMTA approval during proposal period, shall be mounted on, or adjacent to, the engine compartment control panel:

- **Oil Pressure Gauge:** 0-100 psi - Accuracy ± 2, psi, shall indicate oil pressure at a main oil galley.
- **Temperature Gauge:** 0-250° F - Accuracy ± 2° F, shall indicate engine block coolant temperature.
- **Air Filter Restriction Gauge:** 0-20 inches H_20- Accuracy ± 1 inch. H_20, shall indicate air filter restriction.
- **Voltage Gauge(s):** Battery voltage gauge to monitor both 12 and 24-volt electrical systems with a range of 0-48-Volt.

Engine Panel Controls

The following controls shall be located on the engine compartment control panel:

a) **Rear Run Switch:** Three-position toggle switch, marked REAR, OFF, and FRONT positions.
b) **Light Switch:** Two-position toggle switch with waterproof cover labeled "Compartment" for control of the minimum of five LED lamps.
c) **Engine Start:** Starter switch marked "START" shall operate the starter motor only when the rear run switch is in the "REAR" position and transmission is in neutral, and fuel fill door is closed. The Operators start button shall be deactivated when the Rear Run Switch is in “REAR” Position.
d) **Engine Speed Control:** A spring-return control knob or toggle switch marked "ENGINE SPEED" shall be provided that will increase engine RPM from idle to maximum controlled free speed. The switch shall be activated only when the Rear Run Switch is in the "REAR" position, the transmission is in neutral and parking brake set.
e) **Diagnostic Test Ports:** Additional to the ports required in the Operators’ area per Specification Section TS 46.5 and Table 9.

TS 9.2 Propulsion System Electric (Zero Emission)

TS 9.2.1 Propulsion System Description

The bus shall be powered by an electric propulsion system. Function and operation of the bus shall be transparent to the bus operator and passengers. The OEM shall ensure that the bus structure can successfully accept the installation of the propulsion system and be operated on the stated duty-cycle for a period of 12 years without a structural failure. At a minimum, the propulsion system shall comply with applicable local, state and/or federal emissions and useful life requirements. The propulsion system shall comply with local, state and federal (maintenance) and other applicable sections.

The electric drive system shall be rated for the GVWR or greater of the bus.

TS 9.2.2 Propulsion System Service

The propulsion system shall be arranged so that accessibility for all routine maintenance is ensured. No special tools, other than dollies and hoists, shall be required to remove the propulsion system or any subsystems. However, LACMTA shall recognize that properly rated equipment and safety electrical work practices are essential when servicing high-voltage electric components. The air compressor, radiator, all propulsion accessories, and any other component requiring service or replacement shall be easily re moveable. The Contractor shall provide all specialty tools and diagnostic equipment required for maintaining the propulsion system in accordance with the Special Tools List.

All compartments and areas that include components using hazardous or higher voltages, shall incorporate safety warning labels to provide appropriate warning for service personnel. A secondary label shall be included to list the voltages in use within the compartment or area. Labels shall be visible when approaching the area. Labels shall include pictograph symbols for easy recognition.

TS 9.2.3 Primary Propulsion Unit and Traction Motor

The propulsion system may be configured in a variety of methods depending upon type of driver, series and/or parallel. The definition of motor in the context of this specification assumes that the device can provide or consume energy as well as provide or retard mechanical motion.

TS 9.2.4 Energy Storage, Controller and Charging Systems

Design and performance shall be provided to LACMTA. Energy storage shall be of a commercial design capable of operating in the LACMTA transit environment. The primary charging of the energy storage system shall be accomplished by the on-board electric system controller and regenerative braking.

Thermal management will be provided to ensure optimal life and performance of the ESS over the environmental operating range.

Energy storage system SOC correction methods stated in SAE J2711 shall be utilized.

Master Disconnect Switch

A single master switch shall be provided near the battery compartment or other appropriate area for disconnecting of all battery positives in the event of an emergency. The location of the master battery switch shall be clearly identified on the exterior access panel, be accessible in less than 10 seconds for deactivation and prevent corrosion when the batteries are washed off or are in normal service.

In the event of an emergency, turning the master battery switch “Off” with the PPU operating shall shut off the PPU and shall not damage any component of the electrical system. The master battery switch shall be capable of carrying and interrupting the total circuit load. Master battery switch shall be capable of being locked in the “Open” or “Off” position or suitable alternative to prevent accidental turn on.

Shop Charging System

The Contractor shall supply and install battery charger either on the bus or at MTA operating facility capable of recharging the electric/hybrid bus propulsion batteries to a state necessary for the bus to complete a cumulative 300 miles per day according to the route profile as stated in the "Design Operating Profile", and section TS 5.7.

On-Route Charging System

If required to meet daily operating range requirement in Section TS 7.4, battery electric buses will be outfitted with suitable on-route charging systems. The charging system shall be an overhead contact system or an in-ground inductive charging system. All charging systems shall allow driver to easily connect without the need of a complex bus guidance system. Connecting to charging system shall not require the driver to leave his/her seat. Safety protocols shall not energize the charging system until the bus is parked in designated charging position, and the charging system is properly interfaced with the bus. Brake and drive interlock shall prevent inadvertent movement of the bus while charging.

TS 9.2.5 Electric System Controller (ESC)

The ESC regulates energy flow throughout electric system components in order to provide motive performance and accessory loads, as applicable, while maintaining critical system parameters, (e.g., voltages, currents, temperatures, etc.) within specified operating ranges.

The controller shall monitor the process inputs and execute outputs as appropriate to control the operation of all propulsion system components.

Primary Power Unit (PPU)

The PPU and related emission system shall meet California Air Resources Board (CARB) standards for zero emissions.

Contractor shall provide LACMTA with expected durability of the PPU and related emissions systems. The PPU shall be equipped with an electrically controlled management system, compatible with multiplex wiring system and either 12- or 24-volt electrical systems.

The PPU shall have on-board diagnostic capabilities, able to monitor vital functions, store out-of-parameter conditions in memory, and communicate faults and vital conditions to service personnel. Diagnostic reader device connector ports, suitably protected against dirt and moisture, shall be provided in Operator's area and inside PPU compartment. The on-board diagnostic system shall inform the Operator via visual and audible alarms when out-of-parameter conditions exist for vital PPU functions.

Fuel Cell

The fuel cell power assembly shall consist of fuel cell, electric motor, transmission and support equipment (fuel cell driven bus) or fuel cell, battery, transmission and support equipment (battery dominant fuel cell bus). In both cases, the fuel cell can be of any type (characterized by the electrolyte used), however the fuel is limited to hydrogen, only. The fuel cell and its embedded electronics should have a design life of 300,000 miles without failure, significant deterioration, replacement or major service.

TS 9.2.6 Engine

Refer to Section TS 9.1 Engine (CNG).

TS 10. Cooling Systems

The cooling systems shall be of sufficient size and designed to maintain fluids and engine intake air at safe, continuous operating temperatures during the most severe operations possible with the bus loaded to GVWR and with ambient conditions as listed in Section TS 5.7 with a 10 percent minimum reserve capacity in accordance with engine and transmission manufacturers' cooling system requirements. The cooling system fan

controls should sense the temperatures of the operating fluids and the intake air, and if either is above safe operating conditions the cooling fan should be engaged. The fan control system shall be designed with a fail-safe mode of “fan on.” The cooling system shall provide functional service while operating in the design operating profile environment.

The cooling system shall be equipped with ethylene glycol base engine coolant approved by the engine manufacturer and compatible with the LACMTA’s existing coolant product. Use of LACMTA’s standard coolant shall not adversely affect the cooling system’s performance. Coolant shall meet the propulsion system manufacturer’s most stringent requirements for coolant properties.

The cooling system shall be self-purging requiring no special procedures to remove air from the system when coolant is installed or added. Quarter-turn ball valves shall permit complete shut-off of both lines for the heating and defroster units. All low points in the cooling system shall be equipped with drain cocks. The radiator drain plug provided at the radiator shall be a minimum ½-inch dry break type (Refer to TS 88.1 for approved products). The drain plug shall be protected from damage and have a provision for attaching a drain adapter for directing the draining fluid into a container. This shall be accomplished without having the coolant drain onto or through any structure of body parts.

The radiator and charge air cooler unit(s) shall be mounted in such a manner to be replaceable by one LACMTA mechanic within the MTTF specified in TS 88.2. The units shall be easily accessible for cleaning and maintenance by one LACMTA mechanic in less than one hour. Mounting shall be designed so that a LACMTA mechanic can gain full access to the fan side of the units for cleaning without the use of tools. This may be accomplished by swing out design, removable fan shroud section, or suitable inspection door.

For CNG applications, radiator piping shall be stainless steel or brass tubing, if practicable, hoses shall be eliminated. Necessary hoses shall be impervious to all bus fluids. All hoses shall be secured with stainless steel clamps that provide a complete 360-degree seal. The clamps shall maintain a constant tension at all times, expanding and contracting with the hose in response to temperature changes and aging of the hose material. All coolant hoses shall have appropriate sized, constant torque, hose clamps.

TS 10.1 Engine Cooling

A heavy-duty stainless steel radiator surge tank shall provide sufficient draw down capacity as required by the engine manufacturer. A heavy-duty single glass tube, (non-plastic), shall be provided to determine satisfactory engine coolant level accessible by opening the surge tank access door. A spring-loaded, push-button type valve or lever shall be provided to safely release pressure or vacuum in the cooling system no more than 65 inches above the ground. Surge tank filler cap shall have a safety lock. A ¼-inch NPT port shall be provided in a convenient location in the surge tank for the LACMTA's pressure testing equipment, subject to LACMTA approval in Pre-Production meetings. The system shall be designed to allow coolant to be added while the cooling system is at full operating temperature incorporating an un-pressurized coolant overflow reservoir.

The radiator shall be of durable corrosion-resistant construction with metal header tanks for CNG bus only. No heat producing components, such as intake charge-air-coolers, or climate control system components shall be mounted between the engine cooling air intake aperture and the radiator. Sensor port fittings (1/8-inch NPTF) shall be provided in the upper and lower sections of the radiator to allow the use of thermocouple for diagnostics. Louvered fins are not acceptable.

Self-Cleaning

Radiator and charge air cooler fan(s) shall be electrically driven and capable of reverse operations for periodic self-cleaning of the radiator and charge air cooler. For multiple fans, system shall be designed to prevent air recirculation in the event of individual fan failure.

A cooling system pressure gauge with an operating range of 0-30 psi, easily readable through the surge tank access door, shall be installed to monitor static and operating pressures.

TS 10.1.1 Radiator Screen

Screen in Front of Radiator

The radiator input shall be protected by an easily cleanable screen designed to collect large debris. Radiators with a fin density greater than 12 fins per inch or a louvered slit design shall not be used. No heat-producing components or climate-control system components shall be mounted between the engine cooling air intake aperture and the radiator. The radiator and charge air cooler shall be designed to withstand thermal fatigue and vibration associated with the installed configuration. The radiator and charge air cooler cores shall be easily cleaned (to include engine side core surface) with standard pressure-washing equipment.

TS 10.1.2 Coolant

Standard Requirement for Coolant Filtration

The engine cooling system shall be equipped with a properly sized water filter with a spin-on element. When replacing the water filter, only the water in the filter will be lost.

TS 10.1.3 Fan Drive Design

Electric Fans

The bus shall be equipped with an electric fan drive cooling system. A screen guard must be installed on electric motor fans per SAE J1308. (Refer to Section TS 10.1 Engine Cooling). The cooling system shall be equipped with a master controller with the following capabilities:

a) Multiple electric DC brushless pusher type variable speed fans with electronic feedback controls.
b) Communicate on the J1939 CAN data link with system diagnostic reporting via DM1 messaging
c) Review and download data via a laptop with service tool software
d) Capable of software and calibration up-dates, receiving commands from the engine/PPU
e) Sense engine compartment temperature and activate fans if maximum temperature is exceeded.
f) Report fault codes by lighting an engine compartment LED flashing light.
g) Collect and store cooling system and vehicle performance histogram data.
h) If system controller loses communication with the engine/PPU or sensors, it shall direct all fans to go into a default speed mode to avoid vehicle shutdown.
i) If fans lose communication with system controller, they shall go into a default mode to avoid vehicle shutdown.

TS 10.1.4 Mounting

Standard Mounting Design

Mounting location of radiator and charge air cooler shall be the Contractor's standard design. (Refer to Section TS 10 Cooling Systems).

TS 10.2 Charge Air Cooling

The charge air cooling system shall provide maximum air intake temperature reduction with minimal pressure loss. The charge air radiator shall be sized and positioned to meet engine manufacturer's requirements. Air ducting and fittings shall be protected against heat sources and shall be configured to minimize restrictions and maintain sealing integrity.

Charge air piping and fittings shall be designed to minimize air restrictions and leaks.

TS 10.3 Transmission Cooling

The transmission shall be cooled by a dedicated heat exchanger sized to maintain operating fluid within the transmission manufacturer's recommended parameters of flow, pressure and temperature. The transmission cooling system shall be matched to retarder and engine cooling systems to ensure that all operating fluids remain within recommended temperature limits established by each component manufacturer. The engine

cooling system should provide coolant bypass flow to the transmission cooling system with the engine thermostats closed. The heat exchanger will have provisions to drain transmission oil during routine servicing.

TS 10.4 Electric Drive System Cooling

The thermal management system shall maintain electric system components within their design operating temperature limits. Refer to Section TS 10.1 inclusive for additional requirements.

TS 11. Transmission (Conventional Powertrain)

The transmission shall be designed for city transit bus application. The transmission shall be multiple speeds, automatic shift with torque converter, retarder, electronic controls, and have integrated oil cooler. Gross input power, gross input torque and rated input speed shall be compatible with the engine. The transmission shall be designed to operate for not less than 300,000 miles on the design operating profile without replacement or major service. The transmission should be easily removable without disturbing the engine and accessible for service.

The electronic controls shall be capable of transmitting and receiving electronic inputs and data from other drivetrain components and broadcasting that data to other vehicle systems. Communication between electronic drivetrain components and other vehicle systems shall be made using the communications networks. Electronic controls shall provide consistent shift quality and compensate for changing conditions such as variations in vehicle weight and engine power.

The transmission shall be flushed of any non-synthetic transmission oil and filled with an OEM approved synthetic fluid designed for extended drain intervals. Unless otherwise agreed to in writing, the synthetic transmission oil provided by the Contractor shall be compatible with the LACMTA's existing synthetic transmission oil.

A brake pedal application of nominal 6 psi shall be required by the driver to engage forward or reverse range from the neutral position to prevent sudden acceleration of the bus from a parked position.

The electronically controlled transmission shall have on-board diagnostic capabilities, be able to monitor functions, store and time stamp out-of-parameter conditions in memory, and communicate faults and vital conditions to service personnel. The transmission shall contain built-in protection software to guard against severe damage. The on-board diagnostic system shall trigger a visual alarm to the driver when the electronic control unit detects a malfunction.

An electronic transmission fluid level monitoring and protection system shall be provided.

TS 12. Retarder (Transit Bus)

The powertrain shall be equipped with a retarder designed to extend brake lining service life. The application of the retarder shall cause a smooth blending of both retarder and service brake function and shall activate the brake lights.

The retarder application shall be controlled by the throttle pedal and shall be integrated with the ABS system controls so that actuation of ABS shall override the operation of the brake retarder.

Throttle Pedal Activation of the Retarder

The retarder shall apply approximately 1/3 of its total application with a resulting deceleration of no greater than 0.077g when the throttle pedal is completely released. The retarder shall apply approximately 2/3) of its total application with a resulting deceleration of no greater than 0.14g with light brake application. Maximum retarder shall be achieved when brake pedal is fully depressed to engage service brakes, with a maximum resulting deceleration of approximately 0.20g in an empty bus. The resulting decelerations specified include the effects of engine braking, wind resistance and rolling resistance.

The thermostatically controlled cooling fan shall be activated when the retarder is engaged and the coolant temperature reaches the maximum operating temperature established by the engine and transmission manufacturers.

Retarder Disable Switch

The retarder disable switch shall be located behind the destination sign door, subject to LACMTA approval in Pre-Production meetings.

Regenerative Braking

The electric propulsion system shall be equipped with a regenerative braking system designed to extend brake lining service life, and capture braking energy to recharge the Energy Storage System. The application of the regenerative braking shall cause a smooth blending of both regenerative brake and service brake function and shall not activate the brake lights independent of the service brake.

Regenerative Braking Disable Switch

The regenerative braking disable switch shall be located behind the destination sign door, subject to LACMTA approval in preproduction meetings.

TS 13. Engine Brake (Commuter Bus)

Not applicable.

TS 14. Mounting

All PPA/PPU mounting shall be mechanically isolated to minimize transfer of vibration to the body structure and provide a minimum clearance of 0.75 inches Mounts shall control the movement of the PPA/PPU so as not to affect performance of belt-driven accessories or cause strain in piping and wiring connections to the PPA/PPU

PPA/PPU mounts shall be manufactured from high grade rubber material and shall last for three years or 150,000 miles, whichever comes first. PPA/PPU mounts shall not deteriorate from contact with oil, heat, and ozone present in the engine compartment.

All air, fuel, fluid, electrical, and other cabling connecting the cradle assembly to the bus, shall have "bulkhead" connections in the proximity of the fire wall to facilitate the replacement of powertrain assemblies. Hoses, cables, and harnesses shall not require unclamping in order to remove the PPA.

TS 14.1 Service

The propulsion system shall be arranged for ease of access and maintenance. The Contractor shall list all special tools, fixtures or facility requirements recommended for servicing. The muffler, exhaust system, air cleaner, air compressor, starter, alternator, radiator, all accessories and any other component requiring service or replacement shall be easily removable and independent of the engine and transmission removal.

No special tools, other than dollies and hoists, shall be required to remove the PPA/PPU. Two LACMTA mechanics shall be able to remove, replace, and prepare the complete PPA/PPU assembly for service within a MTTF of 12-man hours. The MTTF does not include miscellaneous preparation such as placing the bus on stands and removing the bumper, if necessary.

Engine tune-up, PPA/PPU removal and replacement, cylinder heads, and accessories, including, but not limited to muffler, exhaust system, air compressor, alternator(s), starter, and A/C compressor, shall be serviceable from a flat floor and with the use of a pit or hoist.

The Contractor shall provide two suitable dollies for each spare PPA/PPU purchased under this Contract. The Contractor shall mount and ship any spare PPA/PPUs purchased and delivered under this contract onto these

dollies. The PPA/PPU dollies shall be designed, subject to LACMTA approval in Pre-Production meetings, for long term storage of spare PPA/PPUs and also aid the LACMTA in PPA/PPU replacement to meet the specified MTTF. Use of the PPA/PPU dollies shall be included in the Service manual. The dolly wheels shall be heavy-duty, approximately six inch diameter, with solid steel wheels. The Contractor shall provide the LACMTA with sufficient fabrication drawings needed to manufacture additional dollies.

PPA/PPU driven accessories shall be unit mounted for quick removal and repair. Accessory drive systems including belts shall operate without failure or unscheduled adjustment for 50,000 miles in LACMTA service. Accessories shall be driven at speeds sufficient to assure adequate system performance during extended periods of idle and low route speed operation. To the maximum extent possible, belt drive systems shall be self-adjusting after initial installation adjustment. Belt drives that require manual tensioning shall be designed to facilitate easy service/maintenance, subject to LACMTA approval at the Pre-Production Meeting. Accessory drive belts shall be guarded in accordance with CAL OSHA article 45, Belt and Pulley Drives, Section 4070 "Guarding."

All fillers shall be easily accessible with standard funnels, pour spouts and automatic dispensing equipment.

All fluid fill locations shall be color coded to ensure correct fluid is added: red for transmission fluid, yellow for engine oil. Fill points shall include easy to read labels prominently displayed at the fill point indicating the type and specification of fluid to be added. The engine oil filler cap shall be a spring loaded with sufficient force to retain the cap in a closed position after servicing with no additional action by a service attendant.

All lubricant sumps, including engine, transmission, transmission cooler and hydraulic reservoir, shall be fitted with magnetic type, external, dry break drain plugs of standard size. Any fluid intended to be used on the bus requires a Maintenance Safety Data Sheet (MSDS) to be submitted for LACMTA approval. These fluids shall also be compatible and mixable with the respective LACMTA approved fluids used for the same application.

No engine bypass oil filter.

Engine Oil Pressure and Coolant Temperature Gauges

Engine oil pressure and coolant temperature gauges required in engine compartment.

Engine Air Cleaner

An air cleaner with a dry filter element and a graduated air filter restriction indicator shall be provided. The location of the air intake system shall be designed to minimize the entry of dust and debris and to maximize the life of the air filter. The engine air duct shall be designed to minimize the entry of water into the air intake system. Drainage provisions shall be included to allow any water/moisture to drain prior to entry into air filter.

The engine air inlet system shall be provided which meets the requirements of the OEM engine manufacturer. The air inlet system shall include a heavy-duty, high dust capacity, dry paper air filter with outside-to-inside air flow with an initial efficiency of 99 percent when tested per SAE Standard J726C, latest edition. The air filter shall be positioned for easy access and service, subject to LACMTA approval during proposal period.

Air inlet piping from the air filter to engine inlet shall use T-bolt type heavy duty, minimum ¾ inch wide, band clamps at all joints. One 1/4 inch NPTF test port, with brass plug, shall be provided near the air filter. The test port shall be positioned for easy accessibility with the engine door open.

TS 15. Hydraulic Systems

Hydraulic system service tasks shall be minimized and scheduled no more frequently than those of other major bus systems. All elements of the hydraulic system shall be easily accessible for service or unit replacement. Critical points in the hydraulic system shall be fitted with service ports so that portable diagnostic equipment may be connected or sensors for an off-board diagnostic system permanently attached to monitor system operation when applicable. A tamper-proof priority system shall prevent the loss of power steering during operation of the Bus if other devices are also powered by the hydraulic system.

The hydraulic system shall operate within the allowable temperature range as specified by the lubricant manufacturer. Any hydraulically driven system shall be subject to LACMTA approval at the Pilot Bus. The hydraulic system shall be filled with premium approved synthetic oil that will demonstrate a mean time between fluid replacements in excess of 50,000 miles. A system shall be provided to easily determine the level of hydraulic fluid in the reservoir.

The system shall be configured and/or shielded so that failure of any line shall not allow hydraulic fluid to spray or drain onto any component operating above the auto ignition temperature of the fluid.

The hydraulic system (steering) shall be located to accommodate easy service. The hydraulic system filter shall be located in the return, low pressure, circuit to the oil reservoir, or internal to the oil reservoir, subject to LACMTA approval at the Pilot Bus. Sufficient pump cleanable strainers shall be installed to keep the hydraulic pump and system free of contamination. The strainers shall be located for easy access and service.

TS 15.1 Fluid Lines

All lines shall be rigidly supported to prevent chafing damage, fatigue failures, degradation and tension strain. Lines should be sufficiently flexible to minimize mechanical loads on the components. Lines passing through a panel, frame or bulkhead shall be protected by grommets (or similar devices) that fit snugly to both the line and the perimeter of the hole that the line passes through to prevent chafing and wear. Pipes and fluid hoses shall not be bundled with or used to support electrical wire harnesses.

Lines shall be as short as practicable and shall be routed or shielded so that failure of a line shall not allow the contents to spray or drain onto any component operable above the auto-ignition temperature of the fluid.

All hoses, pipes, lines and fittings shall be specified and installed per the manufacturer's recommendations. All straight couplings and elbows shall be braided silicone hose with polyester reinforced flame red silicone liner and royal blue cover. The straight couplings and elbows shall meet SAE J20R3 Class A rating with a temperature range of -65°F to 500°F. All hoses shall be protected from engine exhaust heat which may cause premature failure.

Unless otherwise specified, all hydraulic, fuel, oil, and air lines shall be made with steel tubing. When rigid lines are not practical, flexible fluid lines shall be kept as short as practical. Flexible lines shall be rubber hoses with braided stainless steel jackets except in applications where premium hoses compatible with the fluid type are required. Standard SAE or JIC end fittings shall be used.

Rigid and flexible lines shall be individually supported and readily accessible for inspection and service, including interior lines inside the bus, subject to LACMTA approval in Pre-Production meetings, and shall not touch one another or any part of the bus. Each individual line or hose shall be identified with a steel tag which includes a line number or designator and OEM part number for easy identification.

TS 15.2 Fittings and Clamps

All clamps shall maintain a constant tension at all times, expanding and contracting with the line in response to temperature changes and aging of the line material. The lines shall be designed for use in the environment where they are installed. For example, high-temperature resistant in the engine compartment, resistant to road salts near the road surface, and so on.

All hose clamps shall be stainless steel. All hoses shall have appropriately sized, constant torque, hose clamps.

All fluid lines shall be secured using anchor blocks or suitable securement devices.

Compression fittings shall be standardized to prevent the intermixing of components. Compression fitting components from more than one manufacturer shall not be mixed, even if the components are known to be interchangeable.

TS 15.3 Charge Air Piping

Refer to Section TS 10.2 Charge Air Cooling.

TS 16. Radiator

Refer to Section TS 10.1 Engine Cooling.

TS 17. Oil and Hydraulic Lines

Oil and hydraulic lines shall be compatible with the substances they carry. The lines shall be designed and intended for use in the environment where they are installed. For example, high–temperature resistant in the engine compartment, resistant to road salts near the road surface, and so on. Lines within the engine compartment shall be composed of steel tubing where practicable, except in locations where flexible lines are required. Flexible lines shall include hose guard shielding with a 450-degree operating range within the engine compartment. High pressure hose ends shall be clamped and secured to prevent movement of line in event of failure of the line or fitting.

Hydraulic lines of the same size and with the same fittings as those on other piping systems of the bus, but not interchangeable, shall be tagged or marked for use on the hydraulic system only.

TS 18. Fuel

TS 18.1 Fuel Lines

Fuel lines shall be securely mounted, braced and supported as designed by the bus manufacturer to minimize vibration and chafing and shall be protected against damage, corrosion or breakage due to strain or wear.

Manifolds connecting fuel containers shall be designed and fabricated to minimize vibration and shall be installed in protected locations to prevent line or manifold damage from unsecured objects or road debris.

Fuel hose and hose connections, where permitted, shall be made from materials resistant to corrosion and fuel and protected from fretting and high heat. Fuel hoses shall be accessible for ease of serviceability.

TS 18.1.1 Fuel Lines, Diesel

Not applicable.

TS 18.1.2 Fuel Lines, CNG

Fuel lines shall comply with NFPA-52. All tubing shall be a minimum of seamless Type 304 stainless steel (ASTM A269 or equivalent). Fuel lines and fittings shall not be fabricated from cast iron, galvanized pipe, aluminum, plastic, or copper alloy with content exceeding 70 percent copper. Lines, fittings, and hoses shall be clear and free from cuttings, burrs or scale. Thread joining material that is impervious to CNG shall be utilized as required. Fuel lines shall be identifiable as fuel lines only. Fuel lines shall be bent using computer numeric machines (CNC) to assure consistency, no hand bending will be permitted.

The bus manufacturer shall have a documented procedure for testing the high pressure line assembly in accordance with NFPA 52 requirements.

Fuel lines shall be securely mounted braced and supported using “split-block” type or stainless steel P clamps; all mounting clamps shall be mounted to a rigid structure to minimize vibration and shall be protected against damage, corrosion or breakage due to strain, rubbing, or wear. “Floating clamps” (not mounted to a rigid

structure) shall not be permitted. Fuel lines shall not be used to secure other components (wires, air lines, etc.).

Manifolds connecting fuel containers shall be designed and fabricated to minimize vibration and shall be installed in protected location(s) to prevent line or manifold damage from unsecured objects or road debris.

Fuel hose connections, where permitted, shall be less than 48 inches in length, made from materials resistant to corrosion and action of natural gas, and protected from fretting and high heat and shall be supported approximately every 12 inches Hose support in-between the bus frame and the engine that exceed 12 inches is subject to LACMTA approval during the Pre-Production meeting.

TS 18.2 Design and Construction

TS 18.2.1 Design and Construction, Diesel

Fuel Tank(s)

Not applicable.

TS 18.2.2 Design and Construction, CNG

Fuel Containers/Cylinders

CNG fuel containers/cylinders shall have a minimum service life of 20 years and must be designed, constructed, manufactured, and tested in accordance with the latest revision of at least one of the following:

U.S. Applications:

- NFPA 52-Standard for Compressed Natural Gas (CNG) Vehicular Fuel Systems.
- FMVSS 304.
- Any local standard(s) specifically intended for CNG fuel containers.

The design and construction of the fuel system supplied by the OEM shall comply with federal and local regulations.

The fuel cylinders shall have a 3,600 psi service pressure and a working pressure of 125 percent the service pressure. The fuel cylinders shall be mounted on the roof in such a manner that replacement of one cylinder shall not require the removal of additional cylinders. The fuel cylinders shall also be clearly marked with serial numbers that shall be easily visible to mechanics when installed on the bus. Each cylinder shall have a purchased date no more than six months from the date of released for shipment to the LACMTA.

Fuel cylinder construction shall be in accordance with DOT Standard 304, ANSI NGV2, latest revision design and test criteria. Cylinder shall be designed for the lightest weight possible which does not require a hydrostatic re-qualification. Cylinders shall be certified for refueling pressures to 125 percent of working pressure during temperature compensated fueling.

Installation

Fuel cylinders shall be installed and tested in accordance with ANSI/IAS NGV2, latest revision, Basic Requirements for Compressed Natural Gas Vehicles (NGV) Fuel Containers and NFPA 52, Compressed Natural Gas (CNG) Vehicular Fuel Systems Code, latest revision, Section 303. In the case of a low floor transit bus, the placement of containers shall be limited to the roof of the vehicle or in the compartment above the engine of the vehicle.

Fuel cylinders, attached valves, pressure relief devices, and mounting brackets should be installed and protected so that their operation is not affected by bus washers and environmental agents such as rain, snow, ice or mud. These components should be protected from significant damage caused by road debris or collision.

The roof and above the engine mounted containers shall be contained within a skeletal structure resembling a roll cage and contained within an enclosure. The enclosure shall incorporate a hinged clamshell type access. The access panels shall be designed to offer protection from weather and to be sacrificial as a means of providing an escape path to atmosphere upon rapid enclosure pressure rise. The latching method shall utilize quick release captive hardware that can be demonstrated to last the life of the bus. Additional shielding shall be provided surrounding end fittings and valves as needed. Shields shall be attached to the bus structure hinged in a manner that permits one mechanic to unlatch and swing the shield open for routine inspections. As practical, electrical components shall not be located within the roof enclosure and if unavoidable, they shall be intrinsically safe.

The cover(s) shall be hinged along the axis of the bus and open to either side providing complete access to the cylinders with mechanic(s) standing on the roof. A safety latch system shall be provided so that the doors when opened cannot inadvertently close during servicing. Failure of the safety latch(es) shall not result in the cover opening while the bus is in operation. The bus roof shall be coated with “anti-slip” paint applied to areas that will accommodate safe access for routine inspections of the fuel cylinders.

Labeling

CNG fuel systems shall be labeled in accordance with NFPA 52, “Compressed Natural Gas (CNG) Vehicular Fuel Systems Code,” latest revision. System expiration dates posted shall match individual cylinder dates. This shall include required labelling in driver area and inspection record labels at fueling area. Each cylinder shall have a purchased date no more than six (6) months from the date of released for shipment to the LACMTA.

Pressure Relief Devices (PRDs)

PRDs must be designed, constructed, manufactured and tested in accordance with ANIS/IAS PRD1, latest revision, “Pressure Relief Devices for Natural Gas Vehicle (NGV) Fuel Containers” and ANSI/IAS NGV2, latest revision, “Basic Requirements for Compressed Natural Gas Vehicle (NGV) Fuel Containers.” All natural gas fuel system piping, including the PRD vent line shall be stainless steel. PRDs shall be vented to the roof area of the Bus with minimum protrusion above the roof line and shall be protected with a suitable cap which shall withstand daily bus wash activity, subject to LACMTA approval during proposal period.

Valves

Valves must be installed in accordance with ANIS/IAS NGV2, latest revision, “Basic Requirements for Compressed Natural Gas Vehicle (NGV) Fuel Containers” and NFPA 52, “Standard for Compressed Natural Gas (CNG) Vehicular Fuel Systems.” Manual valves shall not require the use of a tool to operate.

A quarter turn valve, easily accessible through the fuel door shall isolate the high pressure manifold and fuel storage system from the rest of the engine fuel system. The valve function and open and closed positions shall be clearly marked. An additional minimum ½ inch valve shall be provided for draining the high pressure manifold and any fuel cylinder(s) through a service port. Type and location of the service port shall be subject to LACMTA approval during proposal period.

A primary fuel pressure regulator shall be supplied and mounted in an accessible location for servicing. Coolant lines shall be routed in a manner to prevent trapping air or draining coolant when the regulator is removed for service.

One flow control solenoid operated shut-off valve shall be installed for the system. A control over-ride system shall be provided to operate (open or close) the solenoid valve for defueling. The flow control solenoid valve shall remain in normally closed position until energized, and shall open when the engine is running.

All valves, including solenoid type, shall be designed to operate properly under all possible system flow rates and conditions.

One manually operated shut-off valve and one solenoid valve shall be installed on each individual fuel cylinder or each combined fuel cylinders.

Gauges

Glycerin filled gauges which meets NFPA 52 requirements shall be located in the high and low pressure manifolds which shall indicate fuel system pressure. The high pressure fuel gauge shall have maximum 100 psi increments, 0-5,000 psi, and shall be visible during fueling operations and rated for the maximum system pressure, have welded (not soldered) fittings and have a restrictive orifice. A pressure transducer shall be incorporated into the high pressure fuel manifold which shall provide the Operators' low fuel warning light which shall activate at between 300 and 650 psi.

Fuel Filter

Filters, rated for the system working pressure, shall be provided that meet the engine manufacturer's requirements and are effective for use in LACMTA's CNG compressor environment. Primary and secondary filters shall be coalescing and equipped with a drain valve or plug to periodically drain coalesced contaminants.

Fuel Filler

The fuel filler shall be located 30 to 38 feet measure behind the centerline of the front door, subject to LACMTA approval during proposal period. The filler cap shall be retained to prevent loss and shall be recessed into the body.

The fill and vent receptacles shall be located within an enclosure on the right side of the bus. The access door shall be sized to allow full viewing of gauges, ease of hookups and maneuver of fuel nozzle.

The fuel fill receptacle and vent receptacle attachment shall be robust and capable of routine fueling connects/disconnects without deflection or metal fatigue, and capable of withstanding mechanical loads induced by a fueling drive-away incident without attachment failure. Existing LACMTA fueling system break-away device requires an applied force of 150 lb.-F to cause separation.

A dual fuel filler receptacle shall be located on the right side, rear corner, of the bus, 36 to 50 inches from the street surface. The fill receptacles shall be ANSI/AGA NGV1 or NGV2 certified and shall accept an OPW CT5000 nozzle or approved equal and an OPW CT1000 nozzle or approved equal and shall incorporate dust caps permanently affixed to the receptacles.

A static ground connecting point shall be installed near the fueling receptacles for grounding during fueling/defueling operations.

Fueling System

The fueling port receptacle shall be an ANSI/AGA NGV1 or NGV2 certified receptacle as designated by the LACMTA. The bus shall be capable of being fueled by a LACMTA fuel system nozzle. The fueling port receptacle location shall be such that connection by fueling personnel can be performed without physical strain or interference. A dust cap shall be permanently "tethered" to the fueling port receptacle. To prevent drive-away events, the fueling system shall incorporate a proximity sensor at the fast fill fuel receptacle to detect if a fuel nozzle is connected to it and apply an interlock. A separate sensor shall be incorporated on the fuel fill door. (Refer to Section TS 38.4) The fueling system must be sized to accommodate a minimum fuel flow of 5,000 scfm at 4,250 psi.

Defueling System

The CNG defueling port shall be an NGV-3.1/CGA-12.3 certified receptacle subject to LACMTA approval during proposal period. The CNG defueling port shall be located on the curbside of the bus, in a location that is compatible with the LACMTA's defueling station operation. The defueling system shall incorporate the following characteristics:

- Dust cap permanently "tethered" to the defueling port.
- Device(s) to prevent inadvertent defueling.
- Components compatible with LACMTA's defueling operation.

- The piping and fittings onboard the bus shall be sized to allow the fueling station to meet the following operating parameters:
- Fuel system sized to allow a bus with 20,000 scf on-board to defuel within six hours.
- The atmospheric-vent system shall allow a bus with 20,000 scf of on-board CNG storage to defuel to atmospheric pressure within 80 minutes.
- Location/method of attaching CNG fuel system to earth ground.

TS 19. Emissions and Exhaust

TS 19.1 Exhaust Emissions

The engine and related systems shall meet all applicable emission and engine design guidelines and standards.

The electric vehicle propulsion system shall comply with CARB's zero emissions standard.

TS 19.2 Exhaust System

Exhaust gases and waste heat shall be discharged from the roadside rear corner of the roof. The exhaust pipe shall be of sufficient height to prevent exhaust gases and waste heat from re-entering the bus, discoloring or causing heat deformation to the roof of the bus. The entire exhaust system shall be adequately shielded to prevent heat damage to any bus component, including the exhaust after-treatment compartment area. Heat shield shall be installed between Catalytic Converter and HVAC unit to protect the HVAC unit and wire harnesses in the area from radiant heat emanating from the Catalytic Converter after engine shut down, subject to LACMTA approval. The exhaust outlet shall be designed to minimize rain, snow or water generated from high-pressure washing systems from entering into the exhaust pipe and causing damage to the after-treatment.

Exhaust system shall incorporate joints as necessary to facilitate removal and replacement of individual components including exhaust muffler or, if required to meet emissions requirements, catalyst units. Mounting cushions, if provided, must last the life of the engine and shall not deteriorate when exposed to high exhaust system temperatures. Exhaust piping joints shall be machined V-band clamp design. Flexible exhaust lines necessary to accommodate engine movement shall be constructed from stainless steel bellows. Exhaust piping in the engine enclosure shall include reusable metal jacket that is easy to replace.

TS 19.3 Exhaust After-treatment

An exhaust after-treatment system will be provided to ensure compliance to all applicable EPA regulations in effect.

Diesel Exhaust Fluid Injection

Not applicable.

TS 19.4 Particulate After-treatment

Not applicable.

STRUCTURE (TS 20-TS 30)

TS 20. General

TS 20.1 Design

The structure of the bus shall be designed to withstand the transit service conditions typical of an urban duty cycle throughout its service life. The vehicle structural frame shall be designed to operate with minimal maintenance throughout the 12-year or 500,000-mile design operating profile. The design operating profile specified by the LACMTA shall be considered for this purpose.

TS 21. Altoona Testing

Prior to acceptance of first bus, the vehicle must have completed any FTA-required Altoona testing. Any items that required repeated repairs or replacement must undergo the corrective action with supporting test and analysis. A report clearly describing and explaining the failures and corrective actions taken to ensure any and all such failures will not occur shall be submitted to the LACMTA.

If available, the Altoona Test Report shall be provided to the LACMTA with the Proposal submittal. If not available, then the report shall be provided prior to First Article Bus acceptance.

TS 21.1 Structural Validation

Baseline Structural Analysis

The structure of the bus shall have undergone appropriate structural testing and/or analysis. At minimum, appropriate structural testing and analysis shall include Altoona testing or finite element analysis (FEA).

TS 22. Distortion

The bus, loaded to GVWR and under static conditions, shall not exhibit deflection or deformation that impairs the operation of the steering mechanism, doors, windows, passenger escape mechanisms or service doors. Static conditions shall include the vehicle at rest with any one wheel or dual set of wheels on a six inch curb or in a six-inch deep hole.

TS 23. Resonance and Vibration

All structure, body and panel-bending mode frequencies, including vertical, lateral and torsional modes, shall be sufficiently removed from all primary excitation frequencies to minimize audible, visible or sensible resonant vibrations during normal service.

TS 23.1 Engine Compartment Bulkheads

The passenger and engine compartment shall be separated by fire-resistant bulkheads. The engine compartment shall include areas where the engine and exhaust system are housed. This bulkhead shall preclude or retard propagation of an engine compartment fire into the passenger compartment and shall be in accordance with the Recommended Fire Safety Practices defined in FTA Docket 90A, latest revision. Only necessary openings shall be allowed in the bulkhead, and these shall be fire-proof. Any passageways for the climate control system air shall be separated from the engine compartment by fireproof material. Piping through the bulkhead shall have copper, brass, or fireproof fittings sealed at the bulkhead with copper or steel piping on the forward side. Wiring may pass through the bulkhead only if connectors or other means are provided to prevent or retard fire propagation through the bulkhead. The conduit and bulkhead connector shall be sealed with fireproof material at the fire wall. Engine access panel in the bulkhead shall be fabricated of fireproof material and hinged to the bulkhead with fireproof fasteners. These panels, their fasteners and the bulkhead shall be constructed and reinforced to minimize warping of the panels during a fire that will compromise the integrity of the bulkhead. Access panels shall be constructed to prevent vapors and fumes from entering the passenger compartment.

TS 23.2 Crashworthiness (Transit Bus)

Contractor shall be required to provide FEA software analysis or other evidence of compliance with this section during the pre-award audit. The bus body and roof structure shall withstand a static load equal to 150 percent of the curb weight evenly distributed on the roof with no more than a six inches reduction in any interior dimension. Windows shall remain in place and shall not open under such a load. These requirements must be met without the roof-mounted equipment installed.

The bus shall withstand a 25 mph impact by a 4,000-pound automobile at any side, excluding doorways, along either side of the bus with no more than three inches of permanent structural deformation at seated passenger hip height. This impact shall not result in sharp edges or protrusions in the bus interior.

Exterior panels below 35 inches from ground level shall withstand a static load of 2,000 pounds applied perpendicular to the bus by a pad no larger than five sq. inches. This load shall not result in deformation that prevents installation of new exterior panels to restore the original appearance of the bus.

The bus, at GVWR and under static conditions, shall not exhibit deformation or deflection that impairs operation of doors, windows, or other mechanical elements. Static conditions include the bus at rest with any one wheel or dual set of wheels on a 6-inch curb or in a six-inch deep hole.

All structure, body, and panel-bending mode frequencies, including vertical, lateral, and torsional modes, shall be sufficiently removed from all primary excitation frequencies to minimize audible, visible, or sensible resonant vibrations during normal service.

TS 24. Corrosion

The bus flooring, sides, roof, understructure and axle suspension components shall be designed to resist corrosion or deterioration from atmospheric conditions and de-icing materials for a period of 12 years or 500,000 miles, whichever comes first. It shall maintain structural integrity and nearly maintain original appearance throughout its service life, with the LACMTA's use of proper cleaning and neutralizing agents.

All materials that are not inherently corrosion resistant shall be protected with corrosion-resistant coatings. All joints and connections of dissimilar metals shall be corrosion resistant and shall be protected from galvanic corrosion. All body joints and seams shall be protected by application of polyurethane based sealer, or approved equal, at assembly. Representative samples of all materials and connections shall withstand a two-week (336-hour) salt spray test in accordance with ASTM Procedure B-117 with no structural detrimental effects to normally visible surfaces and no weight loss of over one percent.

The entire bus understructure, including wheel housings, shall be spray-coated prior to installation of sub-assemblies with suitable corrosion preventative undercoating which meets the bus manufacturer's corrosion protection specifications. The Contractor shall provide a copy of its proposed undercoating system program at the first Pre-Production meeting.

Corrosion Resistance Requirements for Exposed and Interior Surfaces of Tubing throughout Entire Vehicle

All exposed surfaces and the interior surfaces of tubing and other enclosed members shall be corrosion resistant through incorporation of intrinsically corrosion-resistant materials or through the application of a corrosion protection system.

Additional Corrosion Resistance Requirements

Alternatively the vehicle may be constructed using only inherently corrosion-resistant materials and fasteners such as stainless steel or composites to minimize deterioration

TS 25. Towing

Towing attachment points shall be provided on the front of the bus. Each towing device, when used with a load equalizing sling, shall withstand, without permanent deformation, tension loads up to 1.2 times the curb weight of the bus within 20 degrees of the longitudinal axis of the bus. If applicable, the rear towing device(s) shall not provide a toehold for unauthorized riders. The method of attaching the LACMTA's towing bar shall require the specific approval of the LACMTA in Pre-Production meetings and shall not require the removal, or disconnection, of front suspension or steering components. Removal of the bike rack is permitted for attachment of towing devices. Contractor shall provide 15 sets of any special towing equipment adapters, if required, so that the LACMTA is able to flat tow the bus. Contractor shall demonstrate compliance with these provisions using the Pilot Bus.

Provision of Connectors for Towing

Shop air connectors shall be provided at the front and rear of the bus and shall be capable of supplying all pneumatic systems of the bus with externally sourced compressed air. The location of these shop air connectors shall facilitate towing operations. A second air supply should be provided to allow the rear service brakes to be applied using the tow truck brake signal air pressure to apply the rear primary service brakes.

All male fittings shall have an additional quarter turn manual shut off valve provided near the front bumper for use only during towing, subject to LACMTA approval in Pre-Production meetings. Fittings shall be protected against dirt and moisture when not in use. Air connectors shall be LACMTA standard air chucks conveniently located in the engine compartment. Air lines leading to the external air shall include hand shut-off valves.

Lifted (Unsupported) Front Axle and Flat Towing Capability

The front towing attachment points shall allow attachment of the LACMTA's standard tow bar. The front towing attachment points shall permit towing of the bus at curb weight by the towing device(s) and the LACMTA tow bar without damage to anybody panel or component. These devices shall permit common flat towing.

Two rear recovery devices/tie downs shall permit lifting and towing of the bus for a short distance, such as in cases of an emergency, to allow access to provisions for front towing of bus. The method of attaching the tow bar or adapter shall require the specific approval of the LACMTA in pre-production meetings. Any tow bar or adapter exceeding 50 pounds should have means to maneuver or allow for ease of use and application. Each towing device shall accommodate a crane hook with a one-inch throat.

TS 26. Jacking

It shall be possible to safely jack up the bus, at curb weight, with a common 10-ton floor jack with or without special adapter, when a tire or dual set is completely flat and the bus is on a level, hard surface, without crawling under any portion of the bus. Jacking from a single point shall permit raising the bus sufficiently high to remove and reinstall a wheel and tire assembly. Jacking pads located on the axle or suspension near the wheels shall permit easy and safe jacking with scissors or bottle jack with the flat tire or dual set on a six inches high run-up block not wider than a single tire. The bus shall withstand such jacking at any one or any combination of wheel locations without permanent deformation or damage.

Jacking and changing any one tire/wheel assembly shall be completed by one LACMTA mechanic. The bus shall withstand such jacking at any one or any combination of wheel locations without permanent deformation or damage.

Yellow Pads

Jacking pads shall be painted safety yellow.

Decals

Apply decals to identify location of jacking pads. The location of the jacking pad shall be identified with a label on the exterior of the bus, directly over the jack pad.

TS 27. Hoisting

The bus axles or jacking plates shall accommodate the lifting pads of a two-post hoist system. Jacking plates, if used as hoisting pads, shall be 5-1/4 square inches, with a turned-down flange not less than ½-inch deep on each side (if applicable) to prevent the bus from falling off the hoist. A model or sample jacking plate shall be provided during Pre-Production meetings for approval by LACMTA. Other pads or the bus structure shall support the bus on jack stands independent of the hoist. The manufacturer may be required to demonstrate compatibility with LACMTA hoists as part of the towing demonstration for TS 25.

TS 28. Floor

TS 28.1 Design (Transit Bus)

The floor shall be essentially a continuous plane, except at the wheel housings and platforms. Where the floor meets the walls of the bus, as well as other vertical surfaces such as platform risers, the surface edges shall be blended with a circular section of radius not less than 3/8 inch or installed in a fully sealed butt joint. Similarly, a molding or cover shall prevent debris accumulation between the floor and wheel housings. The vehicle floor in the area of the entrance and exit doors shall have a lateral slope not exceeding two degrees to allow for drainage.

Floor installation, repair, and replacement method shall be subject to LACMTA approval during proposal period.

Bi-level Floor Design

The floor design shall consist of two levels (bi-level construction). Aft of the rear door extending to the rear settee riser, the floor height may be raised to a height no more than 21 inches above the lower level, with equally spaced steps. An increase slope shall be allowed on the upper level, not to exceed 3.5 degrees off the horizontal.

TS 28.2 Design (Commuter Bus)

Not applicable.

TS 28.3 Design (Articulated Transit Bus)

Not applicable.

TS 28.4 Strength

The floor deck may be integral with the basic structure or mounted on the structure securely to prevent chafing or horizontal movement and designed to last the life of the bus. Sheet metal screws shall not be used to retain the floor, and all floor fasteners shall be serviceable from one side only. Any adhesives, bolts or screws used to secure the floor to the structure shall last and remain effective throughout the life of the bus. Tapping plates, if used for the floor fasteners, shall be no less than the same thickness as a standard nut, and all floor fasteners shall be secured and protected from corrosion for the service life of the bus.

The floor deck shall be reinforced as needed to support passenger loads. At GVWR, the floor shall have an elastic deflection of no more than 0.60 inch from the normal plane. The floor shall withstand the application of 2.5 times gross load weight without permanent detrimental deformation. The floor, with coverings applied, shall withstand a static load of at least 150 pounds applied through the flat end of a ½-inch diameter rod, with 1/32-inch radius, without permanent visible deformation.

TS 28.5 Construction

The floor shall consist of the subfloor and the floor covering that will last the life of the bus. The floor as assembled, including the sealer, attachments and covering shall be waterproof, non-hygroscopic and resistant to mold growth. The subfloor shall be resistant to the effects of moisture, including decay (dry rot). It shall be impervious to wood-destroying insects such as termites.

The floor shall be constructed using composite flooring material approved by the LACMTA during proposal period. All floor surfaces, including edges shall be water proofed, non-hygroscopic, resistant to wet and dry rot, mold growth, and impervious to insects. Floor panels shall be attached to the substructure in such a manner as to be water tight and free from squeaks. Fasteners shall be rust proof.

TS 28.6 Construction (Commuter Bus)

Not applicable.

TS 29. Platforms

TS 29.1 Driver's Area

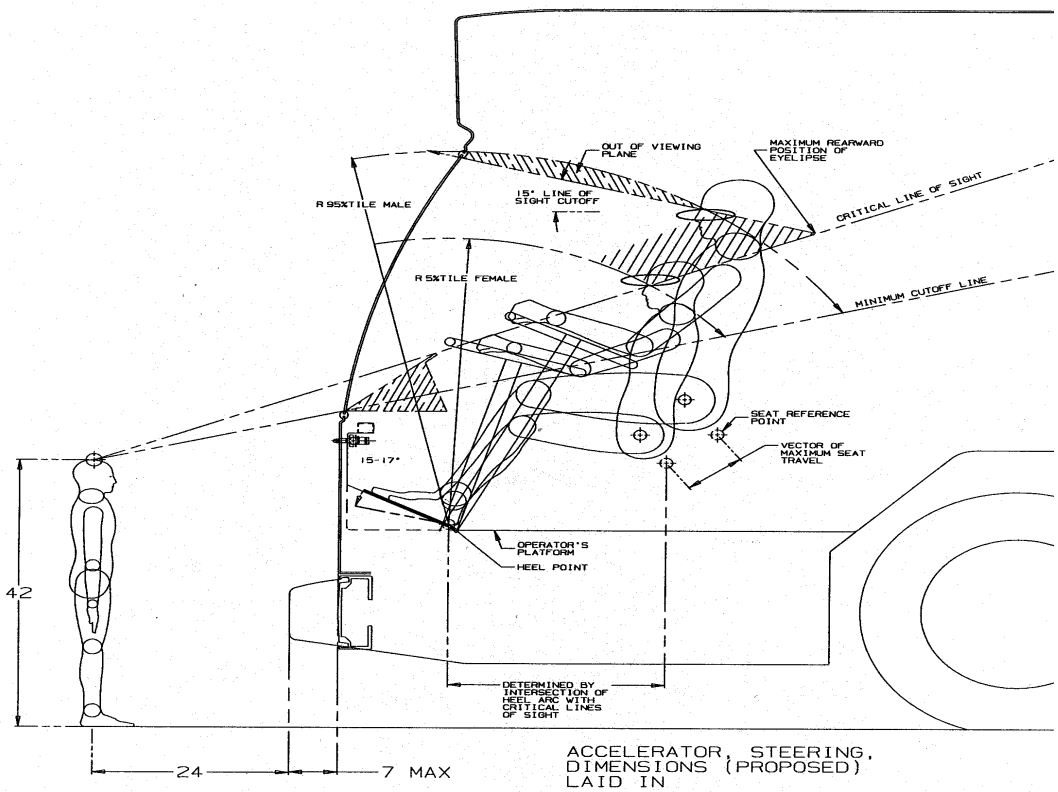
The covering of platform surfaces and risers, except where otherwise indicated, shall be the same material as specified for floor covering Non-corroding metal trim shall be provided and installed with stainless steel hardware along top edges of platforms unless integral nosing is provided.

TS 29.2 Driver's Platform

The driver's platform shall be of a height such that, in a seated position, the driver can see an object located at an elevation of 42 inches above the road surface, 24 inches from the leading edge of the bumper. Notwithstanding this requirement, the platform height shall not position the driver such that the driver's vertical upward view is less than 15 degrees. A warning decal or sign shall be provided to alert the driver to the change in floor level. Figure 3 illustrates a means by which the platform height can be determined, using the critical line of sight.

FIGURE 3

Determining Platform Height



TS 29.3 Farebox

Farebox placement should minimize impact to passenger access and minimize interference with the driver's line of sight.

Driver Interface Required; Platform Needed to Bring Height to Driver Access

If the driver's platform is higher than 12 inches, then the farebox is to be mounted on a platform of suitable height to provide accessibility for the driver without compromising passengers' access. A maximum of two steps shall be allowed for access to the Operator's seat pedestal. Farebox stanchion shall be placed to also provide assistance to Operator when entering/exiting driver's seat.

Stanchions

Stanchions shall be located around the farebox in accordance with ADA requirements. and subject to LACMTA approval during proposal period.

TS 29.4 Rear Step Area to Rear Area (Transit Bus)

If the vehicle is of a bi-level floor design, then a rear step area shall be provided along the center aisle of the bus to facilitate passenger traffic between the upper and lower floor levels. This step area shall be cut into the rear platform and shall be approximately the aisle width, a minimum 12 inches deep and approximately half the height of the upper level relative to the lower level. The horizontal surface of this platform shall be covered with skid-resistant material with a visually contrasting nosing and shall be sloped slightly for drainage. A warning decal or sign shall be provided at the immediate platform area to alert passengers to the change in floor level.

If there is an interior raised floor area, a maximum of two steps shall be allowed for access to the raised floor area behind the rear door. All step riser heights shall be the same. Risers shall be continuous, flat planes across the entire width. Step risers may be inclined, not to exceed 10 degrees from the vertical (nosing edge lower). All corners shall have radii no less than ¼-inch to facilitate cleaning.

Each step shall simultaneously support a 300-pound load evenly distributed over the center half of each step-tread without permanent deformation and with elastic deflection of no more than 1/8-inch. Each step tread shall support a load of 500 pounds evenly distributed over the center half of the tread without permanent deformation. The steps shall be sloped only sufficient to preclude water accumulation.

TS 30. Wheel Housing

TS 30.1 Design and Construction

Sufficient clearance and air circulation shall be provided around the tires, wheels and brakes to preclude overheating when the bus is operating on the design operating profile. Wheel housings shall be constructed of corrosion-resistant and fire-resistant material. Sufficient clearance and air circulation shall be provided around the tires, wheels and brakes to prevent overheating when the bus is operated in revenue service.

Wheel housings, as installed and trimmed, shall withstand impacts of a two- inch steel ball with at least 200 foot-pounds of energy without penetration.

TS 30.2 Design and Construction (Transit Bus)

Interference between the tires and any portion of the bus shall not be possible in maneuvers up to the limit of tire adhesion with weights from curb weight to GVWR. Wheel housings shall be adequately reinforced where seat pedestals are installed. Wheel housings shall have sufficient sound insulation to minimize tire and road noise and meet all noise requirements of this specification.

Design and construction of front wheel housings shall allow for the installation of a radio or electronic equipment storage compartment on the interior top surface.

The finish of the front wheel housings shall be scratch-resistant and complement interior finishes of the bus to minimize the visual impact of the wheel housing. If fiberglass, or other composite material, wheel housings are provided, then they shall be color-impregnated to match interior finishes. The lower portion extending to approximately 10 to 12 inches above the floor shall be equipped with stainless steel trim.

Wheel housings not equipped with seats or equipment enclosure shall have a horizontal assist mounted on the top portion of the housing no more than seven inches higher than the wheel well housing. If required for access to suspension components, installation of access panels in the wheel housing must meet all requirements listed including fastening devices, strength and mounting.

TS 30.3 Articulated Joint (Articulated Transit Bus)

Not applicable.

TS 30.4 Raceway (Articulated Transit Bus)

Not applicable.

TS 30.5 Bellows

Not applicable.

CHASSIS (TS 31-TS 38)

TS 31. Suspension

TS 31.1 General Requirements

The front and rear suspensions shall be pneumatic type. The basic suspension system shall last the service life of the bus without major overhaul or replacement. Adjustment points shall be minimized and shall not be subject to a loss of adjustment in service. Routine adjustments shall be easily accomplished by limiting the removal or disconnecting the components. Heavy-duty height control valves shall be provided to keep the bus body in relatively level position and shall contain a dampening or compensating feature to prevent excessive consumption of air resulting from high-frequency axle movements over rough streets. The height control valves will retain the height of the body in relation to the axles under all loading conditions. Regardless of load, the bus relative height to the centerline of the wheels shall not change more than ± 0.5 inches

TS 31.2 Alignment

All axles should be properly aligned so the vehicle tracks accurately within the size and geometry of the vehicle.

TS 31.3 Springs and Shock Absorbers

TS 31.3.1 Suspension Travel

The suspension system shall permit a minimum wheel travel of three inches jounce-upward travel of a wheel when the bus hits a bump (higher than street surface), and three inches rebound-downward travel when the bus comes off a bump and the wheels fall relative to the body. Elastomeric bumpers shall be provided at the limit of jounce travel. Rebound travel may be limited by elastomeric bumpers or hydraulically within the shock absorbers. Suspensions shall incorporate appropriate devices for automatic height control so that regardless of load the bus height relative to the centerline of the wheels does not change more than ½ inch at any point from the height required. The safe operation of a bus cannot be impacted by ride height up to one inch from design normal ride height.

TS 31.3.2 Damping

Vertical damping of the suspension system shall be accomplished by hydraulic shock absorbers mounted to the suspension arms or axles and attached to an appropriate location on the chassis. Damping shall be sufficient to control bus motion to three cycles or less after hitting road perturbations. The shock absorber bushing shall be made of elastomeric material that will last the life of the shock absorber. The damper shall incorporate a secondary hydraulic rebound stop. Shock absorber travel shall be centered on suspension travel to equalize travel to stops in jounce and rebound.

TS 31.3.3 Lubrication

Standard Grease Fittings

Components that do not require regular greasing are desired. A review of all components available that do not require greasing shall be provided with proposal. All elements of steering, suspension and drive systems

requiring scheduled lubrication shall be provided with grease fittings conforming to SAE Standard J534. These fittings shall be located for ease of inspection and shall be accessible with a standard grease gun from a pit or with the bus on a hoist. Each element, requiring lubrication, shall have its own grease fitting with a relief path. The lubricant specified shall be standard for all elements on the bus serviced by standard fittings and shall be required no less than every 6,000 miles.

TS 31.3.4 Kneeling/Raising

Kneeling

A kneeling system shall lower the entrance of the bus a minimum of 2.75 inches during loading or unloading operations regardless of load up to GVWR, measured at the longitudinal centerline of the entrance door by the driver. The kneeling control shall provide the following functions:

- Downward control must be held to allow downward kneeling movement.
- Release of the control during downward movement must completely stop the lowering motion and hold the height of the bus at that position.
- Upward control actuation must allow the bus to return to normal floor height without the driver having to hold the control.

The brake and throttle interlock shall prevent movement when the bus is kneeled. The kneeling control shall be disabled when the bus is in motion. The bus shall kneel at a maximum rate of 1.25 inches per second at essentially a constant rate reaching fully kneeled position within 4.5 seconds. After kneeling, the bus shall rise within 3 seconds to a height permitting the bus to resume service and shall rise to the correct operating height within 7 seconds regardless of load up to GVWR. During the lowering and raising operation, the maximum vertical acceleration shall not exceed 0.2g, and the jerk shall not exceed 0.3g/second.

An indicator visible to the Operator shall be illuminated until the bus is raised to a height adequate for safe street travel. An audible warning alarm will sound simultaneously with the operation of the kneeler to alert boarding passengers and minimize the sound directed to other areas. The audible alarm sound level shall be automatically adjustable to compensate for ambient sound levels. A warning light mounted near the curbside of the front door, a minimum 2.5 inches diameter amber lens, shall be provided that will blink when the kneel feature is activated. Kneeling shall not be operational while the wheelchair ramp is deployed or in operation.

Raising

The bus shall incorporate a system controlled by the Operator that permits the bus to raise (to account for high curbs) 2.75 inches, measured from normal ride height at the center of the bottom front step regardless of passenger load up to GVWR. Brake and throttle interlock shall be activated to prevent movement when the Bus is raised. The bus shall rise at a maximum rate of 1.25 inches per second at essentially a constant rate reaching fully raised position within 4.5 seconds. After rising the bus shall recover (lower) within 3.5 seconds to a ride height permitting the bus to resume service and shall fully recover to the correct operating ride height within 10 seconds. During the lowering operation, the maximum acceleration shall not exceed 0.2g and the jerk shall not exceed 0.3g/sec. measured on the front door step tread.

An indicator visible to the Operator shall be illuminated until the bus has recovered to a height adequate for safe operation. The indicator lights shall be clearly labeled. Warning devices that operate with the high curb system which are visible and audible to passengers near the curbside of the front door shall be provided.

TS 32. Wheels and Tires

TS 32.1 Wheels

All wheels shall be interchangeable and shall be removable without a puller. Wheels shall be compatible with tires in size and load-carrying capacity. Front wheels and tires shall be balanced and counter weighted as an assembly per SAE J1986. Wheel stud nut(s) shall be 1.50-inch in size, (or metric equivalent), and shall be finished with rust preventative in natural steel with no paint.

Wheels and tires shall be removable without disturbing the fender skirts.

Aluminum Wheel

Wheels shall be Alcoa Durabrite polished aluminum. Wheels must be sized to accommodate disc brakes at all wheel locations.

TS 32.2 Tires

Tires shall be suitable for the conditions of transit service and sustained operation at the maximum speed capability of the bus. Load on any tire at GVWR shall not exceed the tire Supplier's rating.

The tires shall be provided under a lease agreement between LACMTA and the tire Supplier. Tires are to be furnished to the Contractor by the LACMTA or authorized representative. Contractor shall provide the LACMTA with a record listing tires installed for each bus delivered. The information shall include the LACMTA brand serial number and mounting location on the bus. Contractor shall conform to tire manufacturer specifications for maximum road speed and duty cycle during bus delivery.

TS 33. Steering

Electrically driven hydraulic assisted or electrically assisted steering shall be provided. The steering gear shall be an integral type with the number and length of flexible lines minimized or eliminated. Steering torque applied by the Operator shall not exceed 10 foot-pounds with the front wheels straight ahead. Steering torque may increase to 70 foot-pounds when the wheels are approaching the steering stops. Steering effort shall be measured with the Bus at Seated Load Weight (SLW), stopped with the brakes released and the engine at normal idling speed on clean, dry, level, commercial asphalt pavement with the tires inflated to recommended pressure. Power steering failure shall not result in loss of steering control. While the bus is in operation, the steering effort shall not exceed 55 pounds at the steering wheel rim and perceived free play in the steering system shall not materially increase as a result of power assist failure. Gearing shall require no more than seven turns of the steering wheel lock-to-lock.

TS 33.1 Steering Axle (Transit Bus)

Solid Beam Axle and Grease-Type Front Bearings and Seals

The front axle shall be solid beam, non-driving with a load rating sufficient for the bus loaded to GVWR and shall be equipped with preferred unitized grease type front wheel bearings and seals.

All friction points on the front axle shall be equipped with replaceable bushings or inserts and, if needed, lubrication fittings easily accessible from a pit or hoist.

The steering geometry of the outside wheel shall be within two degrees of true Ackerman up to 50 percent lock measured at the inside wheel. The steering geometry shall be within three degrees of true Ackerman for the remaining 100 percent lock measured at the inside wheel.

TS 33.2 Steering and Tag Axles (Commuter Bus)

Not applicable.

TS 33.3 Steering Wheel

TS 33.3.1 Turning Effort

Steering effort shall be measured with the bus at GVWR, stopped with the brakes released and the engine at normal idling speed on clean, dry, level, commercial asphalt pavement and the tires inflated to recommended pressure.

Under these conditions, the torque required to turn the steering wheel 10 degrees shall be no less than 5 foot-pounds and no more than 10 foot-pounds. Steering torque may increase to 70 foot.-pounds when the wheels are approaching the steering stops, as the relief valve activates.

Power steering failure shall not result in loss of steering control. With the bus in operation, the steering effort shall not exceed 55 pounds at the steering wheel rim, and perceived free play in the steering system shall not materially increase as a result of power assist failure. Gearing shall require no more than seven turns of the steering wheel lock-to-lock.

Caster angle shall be selected to provide a tendency for the return of the front wheels to the straight position with minimal assistance from the driver.

TS 33.3.2 Steering Wheel, General

The steering wheel diameter shall be approximately 18 to 20 inches; the rim diameter shall be ⅞ to 1¼ inches and shaped for firm grip with comfort for long periods of time.

Steering wheel spokes and wheel thickness shall ensure visibility of the dashboard so that vital instrumentation is clearly visible at center neutral position (within the range of a 95th-percentile male, as described in SAE 1050a, Sections 4.2.2 and 4.2.3). Placement of steering column must be as far forward as possible, but either in-line with or behind the instrument cluster.

Foam-covered steering wheel is not acceptable. The steering wheel shall be removable with a standard or universal puller.

TS 33.3.3 Steering Column Tilt

The steering column shall have full tilt capability with an adjustment range of no less than 35 degrees and easily adjustable by the driver.

Steering column shall be a tilt and telescopic model. Column shall be easily adjustable while driver is seated in the driver's seat. The mechanism for adjustments shall be designed for ease of use, durability, utilize detents to position and lock the steering column and not require tightening by hand to apply a clamping force.

TS 33.3.4 Steering Wheel Telescopic Adjustment

The steering wheel shall have full telescoping capability and have a minimum telescopic range of two inches (but no more than 5 inches) and a minimum low-end adjustment of 32 inches, measured from the top of the steering wheel rim in the horizontal position, (0 degrees slope), to the cab floor at the heel point.

TABLE 6

Steering Wheel Height[1] Relative to Angle of Slope

At Minimum Telescopic Height Adjustment (+0 in.)		At Maximum Telescopic Height Adjustment (+5 in.)	
Angle of Slope	**Height**	**Angle of Slope**	**Height**
0 degrees	32 inches	0 degrees	34 inches
15 degrees	26.2 inches	15 degrees	31.2 inches
25 degrees	24.6 inches	25 degrees	29.6 inches
35 degrees	22.5 inches	35 degrees	27.5 inches

1. Measured from bottom portion closest to driver.

TS 34. Drive Axle

The bus shall be driven by a heavy-duty axle with a load rating sufficient for the bus loaded to GVWR. The drive axle shall have a design life to operate for not less than 300,000 miles on the design operating profile without replacement or major repairs. The lubricant drain plug shall be magnetic type. If a planetary gear

design is employed, the oil level in the planetary gears shall be easily checked through the plug or sight gauge. The axle and driveshaft components shall be rated for both propulsion and retardation modes with respect to duty cycle.

NOTE: The retardation duty cycle can be more aggressive than propulsion.

The drive shaft shall be guarded to prevent hitting any critical systems, including brake lines, bus floor or the ground, in the event of a tube or universal joint failure.

End tubes shall be threaded to allow for adjustment of wheel bearing nuts.

Wheel bearings shall be sealed, unitized construction.

Rear axle shall use full synthetic oil meeting axle manufacturer's specifications.

NOTE: Trip recorder to be used in place of hub odometer. (Refer to Section TS 43.1.3)

TS 34.1 Non-Drive Axle

The non-drive axle is the drive axle without the drive gear with a load rating sufficient for the load to GVWR.

TS 35. Tag Axles (Commuter Coach)

Not applicable.

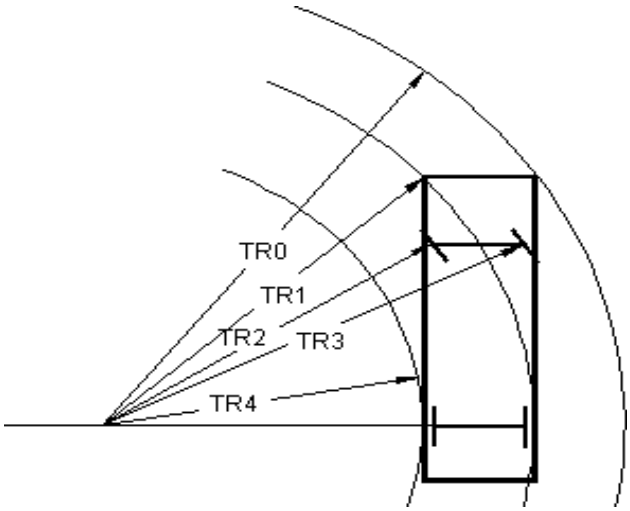
TS 36. Turning Radius

Outside body corner turning radius shall not exceed the maximum at SLW. The front tires shall not rub or interfere in any manner with the bus body parts when turned in either direction under all operating conditions. The turning radius shall be consistent from bus to bus and left to right with no more than six inch difference in measured radius.

TABLE 7
Maximum Turning Radius

Bus Length (approximate)	Maximum Turning Radius (see Figure 4)
40 ft.	44 ft. (TR0)

FIGURE 4
Turning Radius



TS 37. Brakes

TS 37.1 Service Brake

The entire service brake system, including ABS controls, friction material, shall meet applicable FMVSS standards. The entire brake system, including friction material, shall have overhaul or replacement life goal of at least 45,000 miles when operated under LACMTA service.

Brakes shall be self-adjusting. Mechanical Brake Wear indicators, (visible brake sensors), shall utilize stainless steel exposed push rods.

TS 37.2 Actuation

Air-Actuated Brakes

Service brakes shall be controlled and actuated by a compressed air system. Force to activate the brake pedal control shall be an essentially linear function of the bus deceleration rate and shall not exceed 70 pounds at a point seven inches above the heel point of the pedal to achieve maximum braking. The heel point is the location of the driver's heel when his or her foot is rested flat on the pedal and the heel is touching the floor or heel pad of the pedal. The ECU for the ABS system shall be protected, yet in an accessible location to allow for ease of service.

The total braking effort shall be distributed between all wheels in such a ratio as to ensure equal friction material wear rate at all wheel locations. Manufacturer shall demonstrate compliance by providing a copy of a thermodynamic brake balance test upon request.

TS 37.3 Friction Material

The brake linings shall be made of non-asbestos material. In order to aid maintenance personnel in determining extent of wear, a provision such as a scribe line or chamfer indicating the thickness at which replacement becomes necessary shall be provided on each brake lining. No bolts or rivets shall be used to retain the brake lining.

TS 37.4 Hubs and Drums/Discs

Replaceable unitized wheel bearing seals shall run on replaceable wear surfaces. Wheel bearings and hub seals and unitized hub assemblies shall not leak or weep lubricant when operating on the design operating profile for the duration of the initial manufacturer's warranty or 100,000 miles, whichever is longer.

Axle hubs shall be HUB pilot wheel mounting. Hubs shall be painted semi-gloss (50 percent) black with no paint on mating surfaces.

Disc Brakes on All Axles

The bus shall be equipped with disc brakes on all axles, and the brake discs shall allow machining of each side of the disc to obtain smooth surfaces per manufacturer's specifications.

The brake system material and design shall be selected to absorb and dissipate heat quickly so that the heat generated during braking operation does not glaze brake linings.

TS 37.5 Hubs and Drums (Commuter Bus)

Not applicable

TS 37.6 Parking/Emergency Brake

Air Brakes

The parking brake shall be a spring-operated system, actuated by a valve that exhausts compressed air to apply the brakes. The parking brake may be manually enabled when the air pressure is at the operating level per FMVSS 121.

The parking brake shall be actuated by a valve mounted convenient to the Operator, subject to LACMTA approval in Pre-Production meetings. In the event of total loss of air pressure, spring brakes shall be applied automatically.

An audible warning alarm shall be activated when the Master Run switch is in "Off" position or transmission is in neutral and parking brake is not actuated.

Emergency Brake

An emergency brake release shall be provided to release the brakes in the event of automatic emergency brake application. The driver shall be able to manually depress and hold down the emergency brake release valve to release the brakes and maneuver the bus to safety. Once the driver releases the emergency brake release valve, the brakes shall engage to hold the bus in place.

Parking and Emergency brake controls shall be equipped with powder coated metal knobs (no plastic knobs). Colored "yellow" for Parking, and "green" for Emergency release functions.

TS 38. Interlocks (Transit Bus)

TS 38.1 Passenger Door Interlocks

To prevent opening mid and rear passenger doors while the bus is in motion, a speed sensor shall be integrated with the door controls to prevent the mid/rear doors from being enabled or opened unless the bus speed is less than 3 mph.

To preclude movement of the bus, an accelerator interlock shall lock the accelerator in the closed position, and a brake interlock shall engage the service brake system to stop movement of the bus when the driver's door control is moved to a mid/rear door enable or open position, or a mid or rear door panel is opened more than three inches from the fully closed position (as measured at the leading edge of the door panel). This interlock shall also be applied when the emergency release system for the doors is activated.

The interlock engagement shall bring the bus to a smooth stop and shall be capable of holding a fully loaded bus on a six percent grade, with the engine at idle and the transmission in gear, until the interlocks are released. These interlock functions shall be active whenever the vehicle master run switch is in any run position.

All door systems employing brake and accelerator interlocks shall be supplied with supporting failure mode effects analysis (FEMA) documentation, which demonstrates that failure modes are of a failsafe type, thereby never allowing the possibility of release of interlock while an interlocked door is in an unsecured condition, unless the Master Door Interlock switch has been actuated to intentionally release the interlocks. Built in redundancy shall prevent the system from becoming unsafe while a single point failure exists anywhere in the system.

Brake interlock regulator shall be non-adjustable.

Once activated the brake interlock shall not release until the operator makes a 6 psi service brake application.

Accelerator and brake interlock shall not be applied when front door is opened.

TS 38.2 Lift Interlocks

When front ramp/kneel enable switch is activated an accelerator interlock shall disable the accelerator and a brake interlock shall engage the service brake system to stop movement of the bus. Interlocks shall not be released until ramp is fully stowed and the operator makes a 6 psi service brake application.

TS 38.3 Kneel Interlocks

When front ramp/kneel enable switch is activated an accelerator interlock shall disable the accelerator and a brake interlock shall engage the service brake system to stop movement of the bus. Interlocks shall not be released until bus returns to normal operating height and the Operator makes a 6 psi service brake application.

TS 38.4 Fuel/Charging System Interlocks

CNG

The bus shall be designed to remove ignition power from the engine, prevent the transmission from going into gear and disable the engine starter when the sensor detects a fuel nozzle connected to the fast fill receptacle. The interlock shall be of the type such that if the sensor fails, the bus will not start. The system shall provide a separate interlock preventing starting of the engine when fuel fill door is in open position. Both sensing systems shall be a high-reliability design with minimum 95 percent availability for correct operation and function. This interlock shall also be of the type such that if the sensor fails, the bus will not start.

The fuel nozzle proximity sensor prohibits the engagement of the starting circuit and engages the “Fueling in Progress” indication on the dash monitor.

Zero Emission

The bus shall be designed to remove ignition power from the PPU and prevent the drive system from engaging when the sensor detects a charger connected to the charge port. The interlock shall be of the type such that if the sensor fails, the bus will not run. The sensing systems shall be a high-reliability design with minimum 95 percent availability for correct operation and function. This interlock shall also be of the type such that if the sensor fails, the bus will not run.

PNEUMATIC SYSTEM (TS39)

TS 39. Pneumatic System

TS 39.1 General

The bus air system shall operate the air-powered accessories and the braking system with reserve capacity. The bus air system shall meet requirements of California Code 13 CCR 1245 for air leakage and shall not leak as defined by the following tests:

a) The air pressure in new buses shall not decrease by more than 10 psi over the first 10-minute period of time immediately following initial air build up, as indicated on the brake reservoir dash gauges, (as per TP-FMVSS121).
b) With the air system fully charged, cooled off and stabilized for 10 minutes, the brake interlock applied, and no other accessories in use (i.e., opening/closing the doors, air actuated wipers), a new bus shall not leak more than 1 psi over the following 15 minutes as indicated on the brake reservoir dash gauges.

Provision shall be made to apply shop air to the bus air systems. A quarter turn manual shut-off valve with quick disconnect fitting shall be easily accessible and located in the engine compartment and shall supply air prior to the air dryer, subject to LACMTA approval in Pre-Production meetings.

Air for the compressor shall be filtered. The air system shall be protected per FMVSS 121 (S5.1.2.3).

Air System Design Operating Profile

The bus air system shall operate the air-powered accessories and the braking system with reserve capacity, as defined by using the following test(s):

With bus loaded to GVWR and operating under normal conditions, the air system and its major components (air compressors, air dryers) shall be designed to operate under the Manhattan Operating Profile as defined per SAE J2711 or an equivalent, without exceeding the technical specifications of the major components. Operating under normal conditions implies –

- All air actuated accessories on.
- Retarders/regenerative brakes in use.
- Ambient temperatures between 32°F and 100°.F;
- One kneel operation on every 4th bus stop as defined per SAE J2711.
- Interlock shall be set at each stop.

TABLE 8
Air System Test Profiles

Operating profile (Extract from SAE J2711)	Speed [mph]		Stops [#]	Distance [miles]	Stops [#/miles]
	Top	Average			
UDDS (high speed bus operation)	58.00	19	28.00	11.10	2.53
Orange County (intermediate speed bus operation)	40.63	12.7	31.00	6.54	4.75
Manhattan (low speed bus operation)	25.30	6.8	40.00	4.13	9.69

Kneeling operation shall be achieved as per TS 31.3.4 and implies:

- Bus brought to a complete stop;
- Open all doors (implies activation of brake interlock(s))
- Kneel to meet TS 31.3.4 requirements;
- Wait 10 seconds;
- Close all doors;
- Apply service brakes to release brake interlock(s);
- Raise the bus to safe operation of suspension systems

TS 39.2 Air Compressor

The electrically-driven air compressor shall be sized (designed) to charge the entire air system on new buses from 0 psi to 120 psi in less than five minutes for a single unit bus not exceeding the fast idle speed (~1000 rpm) setting of the engine.

Charge time procedure and conditions: with air spring inflated and the bus at curb weight, all air tanks except emergency tank(s) fully drained, brake interlock, service brakes and air system accessories (i.e., doors, wipers, kneeling device or leveling), must not be activated or engaged during charge up procedure.

The electrically-driven air compressor shall be designed to supply air operating under the Air System Design Operating Profile while remaining within the manufactures air compressor specifications. The discharge temperature (measured at the compressor outlet using a probe thermocouple) shall not exceed 360º F, (410º F for oil-less compressors) excluding temperature spikes of durations less than two seconds and two percent of compressor charge time. Air compressor duty-cycle shall not exceed the compressor manufacturers rating in any 10-minute period under the Manhattan Operating Profile.

Air Compressor Governor

Air governor shall be adjustable with a cap and a red stripe from the cap to the governor body using tamper resistant paint and be mounted in a suitable location which will be easily accessible for maintenance.

TS 39.3 Air Lines and Fittings

Air lines, except necessary flexible lines, shall conform to the installation and material requirements of SAE Standard J1149 for copper tubing with standard, brass, flared or ball sleeve fittings, or SAE Standard J844 for nylon tubing if not subject to temperatures over 200 ° F. The air on the delivery side of the compressor where it enters nylon housing shall not be above the maximum limits as stated in SAE J844. Nylon tubing shall be installed in accordance with the following color-coding standards:

- **Green:** Indicates primary brakes and supply.
- **Red:** Indicates secondary brakes.
- **Brown:** Indicates parking brake.
- **Yellow:** Indicates compressor governor signal.
- **Black:** Indicates accessories.

Line supports shall prevent movement, flexing, tension, strain and vibration. Copper lines shall be supported to prevent the lines from touching one another or any component of the bus. To the extent practicable and before installation, the lines shall be pre-bent on a fixture that prevents tube flattening or excessive local strain. Copper lines shall be bent only once at any point, including pre-bending and installation. Bends shall be provided with large radius, (sweeps), to minimize restrictions to lines. Rigid lines shall be supported at no more than 5-ft. intervals. Nylon lines may be grouped and shall be supported at 30-inch intervals or less. Nylon lines shall incorporate press-to-connect type fittings allowing rapid replacement of lines.

The compressor discharge line between PPA/PPU and body-mounted equipment shall be flexible Teflon hose with a braided stainless steel jacket. Other lines necessary to maintain system reliability shall be flexible Teflon hose with a braided stainless steel jacket. End fittings shall be standard SAE or JIC brass or steel, flared, swivel-type fittings. Flexible hoses shall be as short as practicable and individually supported. They shall not touch one another or any part of the bus except for the supporting grommets. Flexible lines shall be supported at 2-ft. intervals or less.

Air lines shall be clean before installation and shall be installed to minimize air leaks. All air lines shall be routed to prevent water traps to the extent possible. Grommets or insulated clamps shall protect the air lines at all points where they pass through understructure components.

TS 39.4 Air Reservoirs

All air reservoirs shall meet the requirements of FMVSS Standard 121 and SAE Standard J10 and shall be equipped with guarded or flush type drain valves below floor level. Major structural members shall protect these valves and any automatic moisture ejector valves from road hazards. Reservoirs shall be sloped toward the drain valve. All air reservoirs shall have drain valves mounted below floor level with lines routed to eliminate the possibility of water traps. All air tanks shall have check valves at the inlet side for isolation.

TS 39.5 Air System Dryer

The air system shall be equipped with an air dryer located before the first (supply system) air tank. The air dryer system shall operate automatically and be sized to eliminate moisture and oil in the air system at maximum air compressor discharge volume when engine is at full rated speed and load. The air dryer system shall require minimum routine maintenance. Desiccant shall be replaceable by spin-on filter in 15 minutes or less.

Air system dryer components shall be readily accessible for service and inspection. To the extent practical, disconnection or removal of components unrelated to a specific maintenance and/or repair task shall be unnecessary. Alternating tower air dryers will not be permitted. The air system air dryer shall be located as far from the compressor as possible and in ambient air flow to allow air to cool prior to entering the air dryer. Inlet air temperature to the dryer shall not exceed 150 degrees F.

Requirement for Additional Oil Separator Provision

A provision shall be included to collect/remove oil from the air system to prevent affecting function and/or damaging pneumatic system components. The oil separator shall operate automatically and be sized to eliminate moisture and oil in the air system at maximum air compressor discharge volume when engine is at full rated speed and load.

ELECTRICAL, ELECTRONIC AND DATA COMMUNICATION SYSTEMS (TS 40-TS 45)

TS 40. Overview

The Contractor shall coordinate a technical review with the LACMTA covering control system integration, installation, and design. As part of the technical review, the Contractor shall advise the LACMTA concerning control system features, options, and accessories, and shall conform, to the degree possible, to those already in use at the LACMTA in an effort to increase component and system commonality. The Contractor shall provide documentation including a description of control system operation and system schematics.

A listing of the software part number and revision number and procedure for obtaining new releases shall be identified for each component which is software controlled.

The electrical system will consist of vehicle battery systems and components that generate, distribute and store power throughout the vehicle (i.e., generator, voltage regulator, wiring, relays and connectors).

Electronic devices are individual systems and components that process and store data, integrate electronic information or perform other specific functions.

The data communication system consists of the bi-directional communications networks that electronic devices use to share data with other electronic devices and systems. Communication networks are essential to integrating electronic functions, both onboard the vehicle and off.

Information level systems that require vehicle information for their operations or provide information shall adhere to J1939 data standard.

Data communications systems are typically divided into three levels to reflect the use of multiple data networks:

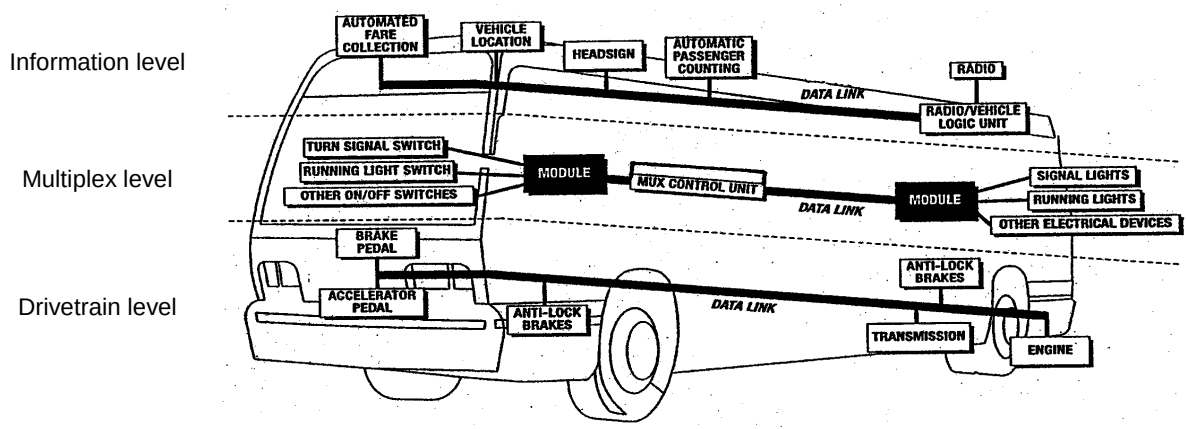
- **Drivetrain level:** Components related to the drivetrain including the propulsion system components (engine and transmission), and anti-lock braking system (ABS), which may include traction control.
- **Information level:** Components whose primary function is the collection, control or display of data that is not necessary to the safe drivability of the vehicle (i.e., the vehicle will continue to operate when those functions are inoperable). These components typically consist of those required for automatic

vehicle location (AVL) systems, destination signs, fare boxes, passenger counters, radio systems, automated voice and signage systems, video surveillance and similar components.

- **Multiplex level:** Electrical or electronic devices controlled through input/output signals such as discrete, analog and serial data information (i.e., on/off switch inputs, relay or relay control outputs). Multiplexing is used to control components not typically found on the drivetrain or information levels, such as lights; wheelchair lifts; doors; heating, ventilation and air conditioning (HVAC) systems; and gateway devices.

FIGURE 5

Data Communications Systems Levels



TS 40.1 Modular Design

Design of the electrical, electronic and data communication systems shall be modular so that each electronic device, apparatus panel, or wiring bundle is easily separable from its interconnect by means of connectors.

Propulsion system wiring shall incorporate an independent wiring harness(es). Replacement of the engine/propulsion compartment wiring harness(es) shall not require pulling wires through any bulkhead or removing any terminals from the wires.

TS 41. Environmental and Mounting Requirements

The electrical system and its electronic components shall be capable of operating in the area of the vehicle in which they will be installed, as recommended in SAE J1455.

Electrical and electronic equipment shall not be located in an environment that will reduce the performance or shorten the life of the component or electrical system when operating within the design operating profile. No vehicle component shall generate, or be affected by, electromagnetic interference or radio frequency interference (EMI/RFI) that can disturb the performance of electrical/electronic equipment as defined in SAE J1113 and UNECE Council Directive 95/54 (R 10).

The LACMTA shall follow recommendations from bus manufacturers and subsystem Suppliers regarding methods to prevent damage from voltage spikes generated from welding, jump starts, shorts, etc.

TS 41.1 Hardware Mounting

The mounting of the hardware shall not be used to provide the sole source ground, and all hardware shall be isolated from potential EMI/RFI, as referenced in SAE J1113.

All electrical/electronic hardware mounted in the interior of the vehicle shall be inaccessible to passengers and hidden from view unless intended to be viewed. The hardware shall be mounted in such a manner as to protect it from splash or spray.

All electrical/electronic hardware mounted on the exterior of the vehicle that is not designed to be installed in an exposed environment shall be mounted in a sealed enclosure.

All electrical/electronic hardware and its mounting shall comply with the shock and vibration requirements of SAE J1455.

All system components shall be easily accessible without requiring any special tools.

TS 42. General Electrical Requirements

TS 42.1 Batteries

TS 42.1.1 Low-Voltage Batteries (24V)

Four Group 31 Maintenance-Free Batteries

Batteries shall be a minimum of four absorbed glass mat thin plate pure lead technology group 31 series, heavy-duty, lead-acid, sealed top battery units for: a) engine starting (including fuel controls, electronic control units and ignition system), and b) other bus loads as needed, subject to LACMTA approval during proposal period. Each battery shall have a purchase date no more than six months from the date of release for shipment to the LACMTA. Positive and negative terminal ends shall be the same size.

Each battery shall have a minimum of 1,000 cold cranking amps and a reserve capacity of no less than 200 minutes. Warranty shall begin at the date of bus acceptance and shall cover an unconditional 48 months.

Starting Batteries

Batteries used for starting the engine shall be located as close to the starter as possible. Starting batteries shall be protected from power loss in the event that lights or other loads are inadvertently left on, up to two hours, which would normally drain the batteries when the engine is not running. Starting with a full charge, starting batteries shall have sufficient energy to provide adequate power after a minimum of five continuous days (Master Run switch “Off”, Master Battery switch “On”, all lights off, LACMTA installed ITS equipment operating) without charging or engine operation to then properly start the bus.

TS 42.1.2 Battery Cables

The battery terminal ends and cables shall be color-coded with red for the primary positive, black for negative and another color for any intermediate voltage cables. Positive and negative battery cables shall not cross each other if at all possible, be flexible and sufficiently long to reach the batteries with the tray in the extended position without stretching or pulling on any connection and shall not lie directly on top of the batteries. Except as interrupted by the master battery switch, battery and starter wiring shall be continuous cables with connections secured by bolted terminals and shall conform to specification requirements of SAE Standard J1127 – Type SGT, SGX or GXL and SAE Recommended Practice J541.

2100 strand 4/0 cable or greater recommended. Battery cables shall be flexible and of sufficient length to reach the batteries when the battery tray is in the extended position without stretching or pulling on any connection or resting on top of the batteries or on the compartment floor when the tray is stowed. A diagram showing proper cable connections and interconnections shall be located in the battery enclosure. Cables shall be arranged to prevent incorrect installation. Except as interrupted by the master battery disconnect switch(s), solenoid battery cutoff and necessary bus bar(s), battery wiring shall be continuous cables with connections secured by bolted terminals. Heavy-duty battery cables shall not be bent in a radius which stresses insulation and promotes propagation of cracking.

TS 42.1.3 Jump Start

Jump-Start Connector

Independently wired quick connect-disconnect receptacles (one for systems which use a battery equalizer) shall be provided. Connections to jump start connector assembly(s) shall be made through 4/0 cables to the

respective battery circuit. Female receptacles equipped with approximately one- foot 2/0 pigtail cables shall be provided, which are spliced with 4/0 cables that lead to the battery circuit. One 12-volt (if not an equalizer equipped system), and one 24-volt, female labeled receptacles shall be provided to boost start the bus. The receptacles shall be designed to prevent incorrect connection of the LACMTA's jumper cable(s) and shall be provided with protective cover attached with a lanyard. The receptacle(s) shall be located on the curbside rear corner of the bus for convenient jumper cable connection, subject to LACMTA approval in Pre-Production meetings. The receptacle(s) must be labeled. Cables used shall not be bent is such a manner that the radius places stresses on the cable insulation, promoting propagation of cracks.

TS 42.1.4 Battery Compartment

The battery compartment shall prevent accumulation of water and debris on top of the batteries and shall be vented and self-draining. It shall be accessible only from the outside of the vehicle. All components within the battery compartment, and the compartment itself, shall be protected from damage or corrosion from the electrolyte. The inside surface of the battery compartment's access door shall be electrically insulated, as required, to prevent the battery terminals from shorting on the door if the door is damaged in an accident or if a battery comes loose. Battery enclosure, including access door or cover, shall be constructed of fiberglass, suitable plastic material, or stainless steel.

The battery quick disconnect access door shall be identified with a decal.

The battery hold-down bracket shall be constructed of a non-metallic material (plastic or fiberglass).

This access door shall not require any special locking devices to gain access to the switch. The door shall be flush-fitting and incorporate a spring tensioner or equal to retain the door in a closed position when not in use.

The batteries shall be securely mounted on a self-draining stainless steel or other non-corrosive material tray that can accommodate the size and weight of the batteries without deformation. The battery tray shall pull out easily and properly support the batteries while they are being serviced. The tray shall allow each battery cell to be easily serviced and filled. A locking device shall retain the battery tray to the stowed position. A maximum of four batteries shall be securely mounted on each heavy-duty battery tray which shall accommodate the battery system. Tray(s) shall pull out on heavy-duty rollers or swing out easily from outside the bus for service, inspection, and replacement.

If not located in the engine compartment, the same fire-resistant properties must apply to the battery compartment. Sparking devices shall not be located within the battery box.

TS 42.1.5 Auxiliary Electronic Power Supply

If required, gel-pack, or any form of sealed (non-venting) batteries used for auxiliary power are allowed to be mounted on the interior of the vehicle if they are contained in an enclosed, non-airtight compartment and accessible only to maintenance personnel. This compartment shall contain a warning label prohibiting the use of vented lead-acid batteries.

TS 42.1.6 Master Battery Switch

A single master switch shall be provided near the battery compartment for disconnecting of all battery positives (12- and 24 volts), except for safety devices such as the fire suppression system and other systems as specified. The location of the master battery switch shall be clearly identified on the exterior access panel, be accessible in less than 10 seconds for deactivation and prevent corrosion from fumes and battery acid when the batteries are washed off or are in normal service.

Turning the master switch "Off" with the PPA/PPU operating shall shut off the engine/PPU and shall not damage any component of the electrical system. The master battery switch shall be capable of carrying and interrupting the total circuit load. Master battery switch shall be capable of being locked in the Open or Off position.

Single Switch

The batteries shall be equipped with a single switch for disconnecting both 12- and 24 volt power.

Solenoid Battery Cutoff

A low voltage disconnect(s) shall be provided to monitor the battery bank voltage. When the voltage drops below the disconnect voltage, the device(s) opens the solenoid(s), removing power from all parasitic 12- and 24 volts loads that cannot be disconnected through the Master Battery Switch, ensuring that the batteries will maintain the ability to start the bus after being parked for extended periods of up to two months. A toggle switch for overriding automatic operation of Solenoid Battery Cutoff shall be provided.

TS 42.1.7 Low-Voltage Generation and Distribution

The low-voltage generating system shall properly charge batteries with a low state of charge and maintain the state of charge on fully charged batteries. When the vehicle is at standard idle the total low voltage generator load shall not exceed 60 percent of the low voltage generator nameplate rating. The Contractor shall estimate the parasitic loads during the initial stage of the bus design and shall submit a draft report to LACMTA at the Pre-Production meetings. A final report shall be submitted during the Pilot Bus configuration audit. The report shall include:

- Nominal current draw of each 12- and 24 volt system and subsystem
- Calculations of parasitic loads in sleep mode, including LACMTA installed equipment
- The estimated battery discharge time before Low Voltage Disconnect is activated

Voltage monitoring and over-voltage output protection (recommended at 32 volt) shall be provided.

Dedicated power and ground shall be provided as specified by the component or system manufacturer. Cabling to the equipment must be sized to supply the current requirements of heavy-duty systems with no greater than a five percent voltage drop across the length of the cable. Cables with bolted connections shall also meet requirements of SAE J541 for heavy-duty applications.

TS 42.1.8 Circuit Protection

All branch circuits, except battery-to-starting motor and battery-to-generator/alternator circuits, shall be protected by current-limiting devices such as circuit breakers, fuses or solid state devices sized to the requirements of the circuit. Electronic circuit protection for the cranking motor shall be provided to prevent engaging of the motor for more than 30 seconds at a time to prevent overheating. The circuit breakers or fuses shall be easily accessible for authorized personnel.

Fuses shall be used only where it can be demonstrated that circuit breakers are not practical. This requirement applies to in-line fuses supplied by either the Contractor or a Supplier. Fuse holders shall be constructed to be rugged and waterproof. All manual reset circuit breakers critical to the operation of the bus shall be mounted in a location convenient to the LACMTA mechanic with visible indication of open circuits. LACMTA shall consider the application of automatic reset circuit breakers on a case-by-case basis. The Contractor shall show all in-line fuses in the final harness drawings. Any manually resettable circuit breakers shall provide a visible indication of open circuits.

Circuit breakers or fuses shall be sized to a minimum of 15 percent larger than the total circuit load. The current rating for the wire used for each circuit must exceed the size of the circuit protection being used.

TS 42.2 Grounds

The battery shall be grounded to the vehicle chassis/frame at one location only, as close to the batteries as possible. When using a chassis ground system, the chassis shall be grounded to the frame in multiple locations, evenly distributed throughout the vehicle to eliminate ground loops. No more than three ground ring/spade terminal connections shall be made per ground stud. Electronic equipment requiring an isolated

ground to the battery (i.e., electronic ground) shall not be grounded through the chassis. Redundant grounds shall be provided for all electrical equipment except where it can be demonstrated that they are not feasible or practical. Grounds shall not be carried through hinges, bolted joints (unless they are specifically designed as electrical connectors), or power plant mountings. Ground shall be installed in accordance with SAE J1908, Electrical Grounding Practice.

Buses shall include grounding straps mounted under the bus near both front and rear axle areas to dissipate any static electric charge that may accumulate on the buses during use.

TS 42.3 Low Voltage/Low Current Wiring and Terminals

All power and ground wiring shall conform to specification requirements of SAE Recommended Practice J1127, J1128 and J1292 for type GXL and SXL wiring. Double insulation shall be maintained as close to the junction box, electrical compartment or terminals as possible. The requirement for double insulation shall be met by wrapping the harness with plastic electrical tape or by sheathing all wires and harnesses with non-conductive, rigid or flexible conduit. All wires for electrical components and terminations, either at the harness level or individual wires, including bus controls, A/C, engine, transmission, and door systems, with the exception of battery cables, shall be labeled, stamped or color-coded in a fashion that allows unique identification at a spacing not exceeding four inches. All exposed wiring connections for power and ground shall be protected against corrosion by application of an anti-corrosive paste.

Wiring harnesses shall not contain wires of different voltage classes unless all wires within the harness are insulated for the highest voltage present in the harness. Kinking, grounding at multiple points, stretching, and exceeding minimum bend radius shall be prevented.

Strain-relief fittings shall be provided at all points where wiring enters electrical compartments. Grommets or other protective material shall be installed at points where wiring penetrates metal structures outside of electrical enclosures. Wiring supports shall be protective and non-conductive at areas of wire contact and shall not be damaged by heat, water, solvents or chafing.

To the extent practicable, wiring shall not be located in environmentally exposed locations under the vehicle. Wiring and electrical equipment necessarily located under the vehicle shall be insulated from water, heat, corrosion and mechanical damage. Where feasible, front to rear electrical harnesses should be installed above the window line of the vehicle.

All Bus OEM attributed wiring harnesses over five feet long and containing at least five wires shall include 10 percent (minimum one wire) excess wires for spares. This requirement for spare wires does not apply to data links and communication cables. A minimum of 50 percent of the spare wire shall be the same size as the largest wire in the harness excluding the battery cables. Wiring harness length shall allow a minimum of four inches service loop to permit end terminals to be replaced twice without pulling, stretching or replacing the wire.

Crimp on terminals shall use a clear heat shrinkable sleeve that seals the connection and improves the pull out resistance of the termination. Terminals shall be crimped to the wiring according to the connector manufacturer's recommendations for techniques and tools. All cable connectors shall be locking type, keyed and sealed, unless enclosed in watertight cabinets or vehicle interior. Pins shall be removable, crimp contact type, of the correct size and rating for the wire being terminated. Unused pin positions shall be sealed with sealing plugs. Adjacent connectors shall either use different inserts or different insert orientations to prevent incorrect connections.

Terminals shall be crimped, corrosion-resistant and full ring type or interlocking lugs with insulating ferrules. When using pressure type screw terminal strips, only stranded wire shall be used. Insulation clearance shall ensure that wires have a minimum of "visible clearance" and a maximum of two times the conductor diameter or 1/16 inch, whichever is less. When using shielded or coaxial cable, upon stripping of the insulation, the

metallic braid shall be free from frayed strands that can penetrate the insulation of the inner wires. Individual slip-on “spade” or “blade” type connectors are acceptable on a case-by-case basis.

Ultra-sonic and T-splices may be used with 7 AWG or smaller wire. When a T-splice is used, it shall meet these additional requirements:

- It shall include a mechanical clamp in addition to solder on the splice.
- The wire shall support no mechanical load in the area of the splice.
- The wire shall be supported to prevent flexing.

All splicing shall be staggered in the harness so that no two splices are positioned in the same location within the harness. Wiring harnesses shall include labeling for harness part number, connector identification and splice locations.

Wiring located in the engine compartment shall be routed away from high-heat sources or shielded and/or insulated from temperatures exceeding the wiring and connector operating requirements.

The instrument panel and wiring shall be easily accessible for service from the driver’s seat or top of the panel. The instrument panel shall be separately removable and replaceable without damaging the instrument panel or gauges. Wiring shall have sufficient length and be routed to permit service without stretching or chafing the wires.

TS 42.4 Electrical Components

All electrical components, including switches, relays, flashers and circuit breakers, shall be heavy-duty designs with either a successful history of application in heavy-duty vehicles or design specifications for an equivalent environment. To the extent practical, these components shall be designed to last the service life of the Bus and shall be replaceable in less than 5 minutes by an LACMTA mechanic. Sockets for plug-in components, such as relays and circuit breakers, shall be keyed for proper installation and alignment. Plug-in components shall be positively retained in sockets.

All electric motors shall be heavy-duty brushless type where practical, and have a continuous duty rating of no less than 40,000 hours (except cranking motors, washer pumps and wiper motors). Electric motors shall be located for easy replacement and shall be replaceable in less than 30 minutes by an LACMTA mechanic.

Location of electronic modules shall be reviewed for environmental suitability such as heat, water, vibrations, contamination from dust and debris, and other electrical equipment. The system including modules, external wire, connectors, and data bus wiring shall be designed to operate under LACMTA’s Design Operating Profile. All electrical components including relays and circuit breakers must remain unaffected while bus is operated in up to 15 inches of standing water.

TS 42.5 Electrical Compartments

All relays, controllers, flashers, circuit breakers and other electrical components shall be mounted in easily accessible electrical compartments. All compartments exposed to the outside environment shall be corrosion-resistant and sealed to prevent moisture from normal sources, including engine compartment cleaning, reaching the electrical components and circuits in each box. The components and their functions in each electrical compartment shall be identified and their location recorded on a schematic drawing permanently attached to the inside of the access panel or door. The drawing shall be protected from oil, grease, fuel and abrasion. Electrical compartment fires shall not propagate outside the box.

The front compartment shall be completely serviceable from the driver’s seat, vestibule or from the outside. “Rear start and run” controls shall be mounted in an accessible location in the engine compartment and shall be protected from the environment.

TS 43. General Electronic Requirements

If an electronic component has an internal real-time clock, it shall provide its own battery backup to monitor time when battery power is disconnected, and/or it may be updated by a network component. If an electronic component has an hour meter, it shall record accumulated service time without relying on battery backup.

Suppliers shall ensure that their electronic equipment is self-protecting in the event of shorts in the cabling, and also in over-voltage (over 32V DC on a 24V DC nominal voltage rating with a maximum of 50V DC) and reverse polarity conditions. If an electronic component is required to interface with other components, it shall not require external pull-up and/or pull-down resistors. Where this is not possible, the use of a pull-up or pull-down resistor shall be limited as much as possible and easily accessible, shielded, and labeled.

TS 43.1 Wiring and Terminals

Kinking, grounding at multiple points, stretching and reducing the bend radius below the manufacturer's recommended minimum shall not be permitted. The load side shall have a minimum of 18 gage load transfer wire.

Individual slip-on "spade" or "blade" type connectors are acceptable on a case-by-case basis during Pre-Production meeting review.

TS 43.1.1 Discrete I/O (Inputs/Outputs)

All wiring to I/O devices, either at the harness level or individual wires, shall be labeled, stamped or color-coded in a fashion that allows unique identification at a spacing not exceeding four inches. Wiring for each I/O device shall be bundled together. If the I/O terminals are the same voltages, then jumpers may be used to connect the common nodes of each I/O terminal.

TS 43.1.2 Shielding

All wiring that requires shielding shall meet the following minimum requirements. A shield shall be generated by connecting to a ground, which is sourced from a power distribution bus bar or chassis. A shield shall be connected at one location only, typically at one end of the cable. However certain standards or special requirements, such as SAE J1939 or RF applications, have separate shielding techniques that also shall be used as applicable.

When using shielded or coaxial cable, upon stripping of the insulation, the metallic braid shall be free from frayed strands, which can penetrate the insulation of the inner wires. To prevent the introduction of noise, the shield shall not be connected to the common side of a logic circuit.

TS 43.1.3 Communications

The data network cabling shall be selected and installed according to the selected protocol requirements. The physical layer of all network communication systems shall not be used for any purpose other than communication between the system components, unless provided for in the network specifications.

Communications networks that use power line carriers (e.g., data modulated on a 24 volt-power line) shall meet the most stringent applicable wiring and terminal specifications.

Mounting and electrical provisions shall be provided to allow LACMTA installation of existing Fleetwatch JX-55 Vehicle Interface Module in the Operator's area, subject to LACMTA approval during proposal period. A separate J1708 and J1939 interface connector shall be provided inside the ITS enclosure for connection to the existing LACMTA's JX-55 device.

TS 43.1.4 Radio Frequency (RF)

RF components, such as radios, video devices, cameras, global positioning systems (GPS), etc; shall use coaxial or approved cable to carry the signal. All RF systems require special design consideration for losses along the cable. Connectors shall be minimized, since each connector and crimp has a loss that will attribute to attenuation of the signal. Cabling should allow for the removal of antennas or attached electronics without removing the installed cable between them. If this cannot be done, then a conduit of sufficient size shall be provided for ease of attachment of antenna and cable assembly. The corresponding component vendors shall be consulted for proper application of equipment, including installation of cables.

TS 43.1.5 Audio

Cabling used for microphone level and line level signals shall be 22 AWG minimum with shielded twisted pair. Cabling used for amplifier level signals shall be 18 AWG minimum.

TS 44. Multiplexing

TS 44.1 General

The primary purpose of the multiplexing system is control of components necessary to operate the vehicle. This is accomplished by processing information from input devices and controlling output devices through the use of an internal logic program.

Versatility and future expansion shall be provided for by expandable system architecture. The multiplex system shall be capable of accepting new inputs and outputs through the addition of new modules and/or the utilization of existing spare inputs and outputs. All like components in the multiplex system shall be modular and interchangeable with self-diagnostic capabilities. The modules shall be easily accessible for troubleshooting electrical failures and performing system maintenance. Multiplex input/output modules shall use solid-state devices to provide extended service life and individual circuit protection.

Ten percent of the total number of inputs and outputs, or at least one each for each voltage type utilized (0V, 12V, and 24V), at each module location shall be designated as spares.

TS 44.2 System Configuration

Multiplexing may either be distributed or centralized. A distributed system shall process information on multiple control modules within the network. A centralized system shall process the information on a single control module. Either system shall consist of several modules connected to form a control network.

TS 44.2.1 I/O Signals

The input/output for the multiplex system may contain three types of electrical signals: discrete, analog or serial data.

Discrete signals shall reflect the on/off status of switches, levers, limit switches, lights, etc. Analog signals shall reflect numerical data as represented by a voltage signal (0-12V, 10-24V, etc.) or current signal (4-20 mA). Both types of analog signals shall represent the status of variable devices such as rheostats, potentiometers, temperature probes, etc. Serial data signals shall reflect ASCII or alphanumeric data used in the communication between other on-board components.

TS 45. Data Communications

TS 45.1 General

All data communication networks shall be either in accordance with a nationally recognized interface standard, such as those published by SAE, IEEE or ISO, or shall be published to the LACMTA with the following minimum information:

- Protocol requirements for all timing issues (bit, byte, packet, inter-packet timing, idle line timing, etc.) packet sizes, error checking and transport (bulk transfer of data to/from the device).
- Data definition requirements that ensure access to diagnostic information and performance characteristics.
- The capability and procedures for uploading new application or configuration data.
- Access to revision levels of data, application software and firmware.
- The capability and procedures for uploading new firmware or application software.
- Evidence that applicable data shall be broadcast to the network in an efficient manner such that the overall network integrity is not compromised.

Any electronic vehicle components used on a network shall be conformance tested to the corresponding network standard.

TS 45.2 Drivetrain Level

Drivetrain components, consisting of the engine, transmission, retarder, anti-lock braking system and all other related components, shall be integrated and communicate fully with respect to vehicle operation with data using SAE Recommended Communications Protocols such as J1939 and/or J1708/J1587 with forward and backward compatibilities or other open protocols.

TS 45.2.1 Diagnostics, Fault Detection and Data Access

Drivetrain performance, maintenance and diagnostic data, and other electronic messages shall be formatted and transmitted on the communications networks.

The drivetrain level shall have the ability to record abnormal events in memory and provide diagnostic codes and other information to service personnel. At a minimum, this network level shall provide live/fail status, current hardware serial number, software/data revisions and uninterrupted timing functions. The communication port(s) shall be located in the Operator's area, Engine Compartment Control Panel, and ITS Enclosure area, subject to LACMTA approval in Pre-Production meetings.

TS 45.2.2 Programmability (Software)

The drivetrain level components shall be programmable by LACMTA with limitations as specified by the sub-system Supplier.

TS 45.3 Multiplex Level

TS 45.3.1 Data Access

Diagnostic and status information shall be made available via a communication port on the multiplex system. The location of the communication port shall be easily accessible inside or adjacent to the ITS Enclosure subject to LACMTA approval in Pre-Production meetings.

A J1708 hardware gateway shall be included to interface with the ATMS wireless communications system for transmittal of diagnostic fault codes from multiplex and drivetrain systems.

TS 45.3.2 Diagnostics and Fault Detection

The multiplex system shall have a proven method of determining its status (system health and input/output status) and detecting either active (online) or inactive (offline) faults through the use of on-board visual/audible indicators.

In addition to the indicators, the system shall employ an advanced diagnostic and fault detection system, which shall be accessible via either a personal computer or a handheld unit. Either unit shall have the ability to check logic function. The diagnostic data can be incorporated into the information level network or the central data access system.

TS 45.3.3 Programmability (Software)

The multiplex system shall have security provisions to protect its software from unwanted changes. This shall be achieved through any or all of the following procedures:

- Password protection.
- Limited distribution of the configuration software.
- Limited access to the programming tools required to change the software.
- Hardware protection that prevents undesired changes to the software.

Provisions for programming the multiplex system shall be possible through a PC or laptop. The multiplex system shall have proper revision control to ensure that the hardware and software are identical on each vehicle equipped with the system. Revision control shall be provided by all of the following:

- Hardware component identification where labels are included on all multiplex hardware to identify components.
- Hardware series identification where all multiplex hardware displays the current hardware serial number and firmware revision employed by the module.
- Software revision identification where all copies of the software in service displays the most recent revision number.
- A method of determining which version of the software is currently in use in the multiplex system.

Revision control labels shall be electronic.

TS 45.4 Electronic Noise Control

Electrical and electronic sub-systems and components on all buses shall not emit electromagnetic radiation that will interfere with on-board systems, components or equipment, telephone service, radio or TV reception or violate regulations of the Federal Communications Commission.

Electrical and electronic sub-systems on the Buses shall not be affected by external sources of RFI/EMI. This includes, but is not limited to, radio and TV transmission, portable electronic devices including computers in the vicinity of/or on board the buses, AC or DC power lines, and RFI/EMI emissions from other vehicles.

DRIVER PROVISIONS, CONTROLS AND INSTRUMENTATION (TS 46-TS 49)

TS 46. Driver’s Area Controls

TS 46.1 General

In general, when designing the driver’s area, it is recommended that SAE J833, “Human Physical Dimensions,” be used.

Switches and controls shall be divided into basic groups and assigned to specific areas, (Refer to Table 9), in conformance with SAE Recommended Practice J680, Revised 1988, “Location and Operation of Instruments and Controls in Motor Truck Cabs,” and be essentially within the hand reach envelope described in SAE Recommended Practice J287, “Driver Hand Control Reach”.

All controls (switches, pushbuttons, knobs, etc.) and indicators shall be labeled and lighted for optimum visibility in all operating conditions. Switches and controls shall be ergonomically placed in a manner which prevents accidental operation. Knobs shall be securely mounted and affixed to preclude loosening. The side console shall be insulated to IP56 level of protection to prevent ingress of water into the components of the panel.

All controls, indicators, and signals necessary for the operation of the bus shall be conveniently positioned in the Operator's area in one of the following locations.

- Front Console Panel.
- Side Console (located on left side of the Operator).
- Floor Mounted.

TS 46.2 Glare

The driver's work area shall be designed to minimize glare to the extent possible. Objects within and adjacent to this area shall be matte black or dark gray in color wherever possible to reduce the reflection of light onto the windshield. The use of polished metal and light-colored surfaces within and adjacent to the driver's area shall be avoided.

TS 46.3 Visors/Sun Shades

A sun visor and scissor type sun shade/screen shall be provided to maximize driver's visibility.

Front and Side Window Sun Shade/Visor

An adjustable scissor type pull down solid band sun shade shall be provided for the driver's windshield.

Driver's side window shall have both sun visor and scissor type sun screen.

The sun shade/screen shall be provided in accordance with the California Vehicle Code §26708.2 and must have a sticker or label indicating that the shade/screen should only be used by operators who possess a letter or other document signed by a licensed optometrist certifying that the person must be shaded from the sun due to a physical condition.

Sun shades/screens or visors shall be shaped or positioned to minimize light leakage between the device and windshield pillars. Sun shades/screens or visors shall store out of the way and shall not obstruct airflow from the climate control system or interfere with other equipment, such as the radio handset or the destination control. Deployment of the sun shades/screens or visors shall not restrict vision of the rearview mirrors. Sun shade/screen or visor construction and materials shall be strong enough to resist breakage during adjustments. Sun shades/screens or visors, when deployed, shall be effective in the driver's field of view at angles more than five degrees above the horizontal. Sun shades and visors shall not be transparent.

Visor adjustments shall be made easily by hand with positive locking and releasing devices and shall not be subject to damage by over-tightening. Visors used on driver's window shall extend across the entire width of window and cover a minimum of six inches when flipped down.

For driver's window, scissor type sun shades/screens shall have minimum 35 percent light transmittance and shall be capable of being lowered to the midpoint of the driver's window. When deployed, the shade/screen shall be secure, stable and shall not rattle, sway or intrude into the driver's field-of-view due to the motion of the Bus or as a result of air movement. Once lowered, the shade/screen shall remain in the lowered position until returned to the stowed position by the driver.

TS 46.4 Driver's Controls

Frequently used controls must be in easily accessible locations. These include the door control, kneel control, windshield wiper/washer controls, ramp, and lift and run switch. Any switches and controls necessary for the safe operation of the bus shall be conveniently located and shall provide for ease of operation. They shall be identifiable by shape, touch and permanent markings. Controls also shall be located so that passengers may not easily tamper with control settings.

All panel-mounted switches and controls shall be marked with easily read identifiers. Graphic symbols shall conform to SAE Recommended Practice J2402, "Road Vehicles – Symbols For Controls, Indicators, and Tell Tales," where available and applicable. Color of switches and controls shall be dark, or red for emergency use, with contrasting typography or symbols.

Mechanical switches and controls shall be replaceable, and the wiring at these controls shall be serviceable from a convenient location. Switches, controls and instruments shall be dust- and water-resistant.

TS 46.5 Normal Bus Operation Instrumentation and Controls

The following list identifies bus controls used to operate the bus. These controls are either frequently used or critical to the operation of the bus. They shall be located within easy reach of the Operator. The Operator shall not be required to stand or turn to view or actuate these controls unless specified otherwise.

Systems or components monitored by onboard diagnostics system shall be displayed in clear view of the Operator and provide visual and/or audible indicators. The intensity of indicators shall permit easy determination of on/off status in bright sunlight but shall not cause a distraction or visibility problem at night. All indicators shall be illuminated using backlighting.

The instrument display monitor shall be LCD color touch screen that displays safety related information in a large easy to read gauge or graphic format. LACMTA prefers a system which incorporates the instruments, and diagnostics.

Wherever possible, sensors shall be of the closed circuit type so that failure of the circuit and/or sensor shall activate the malfunction indicator.

The indicator panel shall be located in Area 1 or Area 5, within easy view of the operator instrument panel. All indicators shall have a method of momentarily testing their operation. The audible alarm shall be tamper-resistant and shall have an outlet level between 80 and 83 dBA when measured at the location of the Operator's ear.

On-board displays visible to the Operator shall be limited to indicating the status of those functions described herein that are necessary for the operation of the bus. All other indicators needed for diagnostics and their related interface hardware shall be concealed and protected from unauthorized access. Table 9 represents instruments and alarms. The intent of the overall physical layout of the indicators shall be in a logical grouping of systems and severity nature of the fault.

Gauges shall be readable in all direct or reflected sunlight conditions. All lighting in the dash area shall be a red, orange or blue color, clear incandescent, or an approved equal. No unlit dash markings shall be permitted.

Space shall be provided on the panel for future additions of no less than five spare indicators as the capability of onboard diagnostic systems improves.

TABLE 9 (Transit Bus)
Transit Bus Instruments and Alarms

No.	Device	Description	Location	Function	Visual/ Audible
Instruments					
1.	Air pressure gauge	Air Brake Reservoir gauge(s) 0-150 psi range- Accuracy ± 3.5% at cut-out pressure, 10 psi increments, 2-inch minimum. Green needle for Primary system and Red needle for Secondary system	Dash zone 2	Visual indication of primary and secondary air systems	Red Light and buzzer
2.	Destination sign interface	Destination sign interface panel	In approved location on head sign door	Facilitates driver interaction with destination sign system, manual entry	LCD display

TABLE 9 (Transit Bus)

Transit Bus Instruments and Alarms

No.	Device	Description	Location	Function	Visual/ Audible
3.	Farebox interface/ OCU	Farebox Bus operator interface panel	Near farebox	Facilitates driver interaction with farebox system	LCD display
4.	Mobile data terminal/ATMS	Mobile data terminal Bus operator interface panel	Above operators left	Facilitates driver interaction with communication system and master log-on	LCD display with visual status and text messages
5.	Speedometer	Speedometer 0-75 mph range - with odometer, and diagnostic capability, 5-mile increments. Accuracy ± 2 mph. Unit shall be installed so as to be easily readable by the operator.	Dash zone 2	Visual indication of speed and distance traveled, accumulated vehicle mileage, fault condition display	Visual
Controls					
1.	Automatic Fire Suppression System (AFSS) Manual Discharge	Red push button with protective cover	Side console or dash zone 1	Permits driver to override and manually discharge fire suppression system	Red light
2.	AFSS Shutdown over ride	Momentary push button	Over operator's left	Restarts the engine shutdown timer each time the switch is pressed	
3.	Auxiliary power	12-volt power receptacle	Radio Compartment	Power diagnostic equipment	
4.	Dash panel lights	Rotary rheostat or stepping switch	Side Console or Dash zone 1	Provides adjustment for light intensity in night run position	
5.	Defroster fan	Rotary, minimum three-position with detent	Side console or Dash zone 1	Permits defroster fan: off, low, medium or high	
6.	Defroster temperature	Variable position	Side console or Dash zone 1	Adjusts defroster water flow and temperature	
7.	Diagnostic test port- front	SAE data port	Operator's area subject to approval	J1708 and J1939 communications ports	
8.	Drive selector	Touch panel switch	Side console or right front dash	Provides selection of propulsion: forward, reverse and neutral	Gear selection
9.	Driver's ventilation	Infinitely variable speed	Side console or Dash zone 1	Permits supplemental ventilation with infinitely variable speed fan	
10.	Engine run, rear	Three-position switch	Engine compartment control panel	Permits running engine from rear start, normal front run position and off	Amber light on dash
11.	Engine shutdown override	Momentary switch with operation protection	Side console	Permits driver to override auto engine shutdown	
12.	Engine start, front	Approved momentary switch	Side console	Activates engine starter motor	

TABLE 9 (Transit Bus)

Transit Bus Instruments and Alarms

No.	Device	Description	Location	Function	Visual/ Audible
13.	Engine start, rear	Approved momentary switch	Engine compartment control panel	Activates engine starter motor Starter switch marked "START" shall operate the starter motor only when the rear run switch is in the "REAR" position and transmission is in neutral, and fuel fill door is closed. The Operators start button shall be deactivated when the Rear Run Switch is in “REAR” Position	
14.	Exterior Door Switch	Key Switch	Switch shall be located behind an exterior access door near the front curb side of the Bus a minimum of 45 inches above the ground.	Allows operator to close/open, and lock/unlock the front door from outside the bus	
15.	Farebox Lighting Bypass Switch	Switch, ON-OFF	Side console	Controls farebox light	
16.	Fast idle	Two-position switch	Side console	Selects high idle speed of engine	
17.	Front door ramp	Three-position momentary switch	Dash zone 3 or 5	Permits deploy and stow of front ramp	Red light
18.	Front door ramp/kneel enable	Two-position switch	Dash zone 5	Permits ramp and kneel activation from front door area, key required	Red dash indicator Exterior alarm and Amber light
19.	Front kneel	Three-position momentary switch	Dash zone 3 or 5	Permits kneeling activation and raise and normal at front door remote location	Amber or red dash indicator. Ext alarm and Amber light
20.	Gas Detection System (GDS) Shutdown over ride	Momentary push button	Over operator’s left	Restarts the engine shutdown timer each time the switch is pressed	
21.	Hazard flashers	Two-position switch	Side console	Activates emergency flashers	Two green lights and Click
22.	High beam	Push button with detent	Left foot panel	Permits driver to go between low and high beam	Blue light
23.	Horn Button	Push button	Button in steering wheel	Activates horn	Dual Horn sound 410 and 500 Hz at 110 dB
24.	HVAC	Switch or switches to control HVAC	Side console	Permits selection of passenger ventilation: off, cool, heat, low fan, high fan or full auto with on/off only	
25.	Indicator/ alarm test button	Momentary switch or programming[1]		Permits driver to activate test of sentry, indicators and audible alarms	All visuals and audible

TABLE 9 (Transit Bus)

Transit Bus Instruments and Alarms

No.	Device	Description	Location	Function	Visual/ Audible
26.	Interior lights	Three-position switch	Side console	Selects mode of passenger compartment lighting: off, on, normal	
27.	Left remote mirror	Four-position type	Side console	Permits two-axis adjustment of left exterior mirror	
28.	Master door/ interlock	Two position	Out of operator's reach behind the destination sign door	Permits driver override to disable door and brake/throttle interlock	Red light/Buzzer
29.	Master run switch	Rotary, four-position detent	Side console	Master control for bus with; "off," "Day" run, "Night" run and "Night Park" lights positions	
30.	Microphone	Flexible mounting	Subject to LACMTA approval	Permits driver to make announcements with both hands on the wheel and focusing on road conditions	
31.	Operator's area light switch	Switch	Side console	Controls operator light	
32.	Operator's Heater Control	Rotary knob	Dash zone 3 or 5	Controls operator heater	
33.	PA manual switch	Slide switch	In approved location	Permits driver to manually activate public address microphone	
34.	Park brake release	Pneumatic PPV – Green knob	Side console	Permits driver to push and hold to release brakes	Green knob
35.	Parking brake	Pneumatic PPV –Yellow knob	Side console or Dash zone 1	Permits driver to apply and release parking brake	Red light
36.	Passenger Chime Switch	Switch, ON-OFF	Side console	Controls chime sound	
37.	Passenger door control	Five-position handle type detent	Side console, forward	Permits open/close control of front and rear passenger doors	
38.	Public Address System, Speaker Selector	Switch INTERIOR-BOTH-EXTERIOR	Side console	Select speaker location	
39.	Public Address System, Volume Control	Pushbutton	DCM	Select speaker volume	
40.	Remote Engine Speed Control	Rotary rheostat or spring-loaded toggle switch	Engine compartment control panel	Permits technician to raise and lower engine RPM from engine compartment A spring return control Knob marked "ENGINE SPEED" shall be provided which will increase engine RPM from idle to maximum controlled free speed. The control shall be activated only when the Rear Run Switch is in the "REAR" position, the transmission is in neutral and parking brake set.	

TABLE 9 (Transit Bus)

Transit Bus Instruments and Alarms

No.	Device	Description	Location	Function	Visual/ Audible
41.	Retarder disable	Single-pole with detent	Behind the destination sign door	Permits driver override to disable brake retardation/regeneration	Red light
42.	Right remote mirror	Four-position toggle type	Side console	Permits two-axis adjustment of right exterior mirror	
43.	Silent alarm	Guarded toggle switch, NO and NC contacts	Side console	Activates emergency radio alarm at dispatch and permits covert microphone and/or enables destination sign emergency message	
44.	Turn signals	Momentary push button (two required) raised from other switches	Left foot panel	Activates left and right turn signals	Two green lights and audible indicator
45.	Windshield washer	Push button	Side console or Dash zone 1	Activates windshield washers	
46.	Windshield wiper	One-variable rotary position operating both wipers	Side console or Dash zone 1	Variable speed control of left and right windshield wipers	
Alarms/Indicators					
1.	ABS indicator	Detects system status	Dash zone 2	Displays system failure	Amber light
2.	AFSS Fire detection	Bus operator display	Above operators left	Indication of fire detection activation	Buzzer and red light fire bell
3.	AFSS Status	Okay	Above operators left		Green light
4.	Back-Up	Intermittent sonic alarm	Rear of bus	Reverse gear activated alarm	Beep
5.	Bike rack deployed indicator	Detects bike rack position	Dash zone 2	Indication of bike rack not being in fully stowed position	Amber or red light. Mirror or direct visual allowed.
6.	Charging system indicator (12/24 V)	Detect charging system status	Dash zone 2	Detects no charge condition	Solid red light and buzzer
7.	Check Engine	Engine Check	Dash zone 2		Amber light
8.	Check Transmission	Transmission Check	Dash zone 2		Amber light
9.	Door obstruction	Sensing of door obstruction	Dash zone 2	Indication of rear door sensitive edge activation	Red light and buzzer
10.	GDS Methane detection	Indication of 20% LEL	Above operators left	Detects levels of methane	Flashing red at 20% LEL
11.	GDS Methane detection	Indication of 50% LEL	Above operators left	Detects levels of methane	Solid red at 50% LEL sonic horn
12.	GDS Methane detection function	Detection of system integrity	Above operators left	Detects system failure	No start condition, amber light
13.	HVAC indicator	Detects system status	Dash zone 2	Displays system failure	Amber or red light

TABLE 9 (Transit Bus)
Transit Bus Instruments and Alarms

No.	Device	Description	Location	Function	Visual/ Audible
14.	Low fuel indicator	Amber light	Dash zone 2	Indication of low fuel system level	Amber light
15.	Low system air pressure	Sensing low primary and secondary air tank pressure	Dash zone 2	Indication of low air system pressure	Buzzer and red light
16.	SCR gauge	Level Indicator	Dash zone 2	Displays level of SCR tank and indicates with warning light when low	Red light
17.	Seat Belt Warning	Switch on seat belt latch. Audible alarm and red light	Dash zone 2	Indicates when seat belt is not latched as required	Buzzer and red light
18.	Security Camera System	Camera Fail	Dash zone 2	Indicates system readiness including hard drive installed and system functionality.	Amber light
19.	Speed	Speed	Dash zone 2	Indicates bus speed is less than or equal to 3 mph	Amber light
20.	Stop Engine	Stop Engine	Dash zone 2		Buzzer and red light
21.	Stop Request	Stop Requested	Dash zone 2		Green light, chime
22.	Warning interlocks deactivated	Red indicator light	Dash panel center	Illuminates to warn driver that interlocks have been deactivated.	Red light, sonic alarm
23.	Wheelchair Stop Request	Stop Requested	Wheelchair Chime		Amber light, chime

TS 46.6 Driver Foot Controls

Accelerator and brake pedals shall be designed for ankle motion. Foot surfaces of the pedals and the floor adjacent to pedals shall be faced with wear-resistant, nonskid, replaceable material. Heel rests shall be provided. All foot controls must be installed in a manner that removal can be accomplished by one mechanic working inside the bus.

TS 46.6.1 Pedal Angle

The vertical angle of the accelerator and brake pedals shall be determined from a horizontal plane regardless of the slope of the cab floor. The accelerator and brake pedals shall be positioned at an angle of 37 to 50 degrees at the point of initiation of contact and extend downward to an angle of 10 to 18 degrees at full throttle.

The location of the brake and accelerator pedals shall be determined by the manufacturer, based on space needs, visibility, lower edge of windshield, and vertical H-point.

TS 46.6.2 Pedal Dimensions and Position

The floor-mounted accelerator pedal shall be 10 to 12 inches long and three to four inches wide. Clearance around the pedal must allow for no interference precluding operation.

Pedal travel shall be limited by stops under the pedals. Contractor must provide proof that the ergonomics are appropriate before the Pilot Bus is accepted.

1 to 2 inches Between Brake and Accelerator Pedals

The accelerator and brake pedals shall be positioned such that the spacing between them, measured at the heel of the pedals, is between one and two inches. Both pedals should be located approximately on the same plane coincident to the surface of the pedals.

TS 46.7 Brake and Accelerator Pedals

Brake Pedal

Non-adjustable brake pedal

TS 46.8 Driver Foot Switches

Floor-Mounted Foot Control Platform

The angle of the turn signal platform shall be determined from a horizontal plane, regardless of the slope of the cab floor. The turn signal platform shall be angled at a minimum of 10 degrees and a maximum of 37 degrees. It shall be located no closer to the seat front than the heel point of the accelerator pedal.

Contractor must provide proof that the ergonomics are appropriate before the Pilot Bus is accepted.

Turn Signal Controls

Turn signal controls shall be floor-mounted, foot-controlled, water-resistant, heavy-duty, momentary contact switches.

Foot Switch Control

The control switches for the turn signals shall be mounted on an inclined, floor-mounted stainless steel enclosure or metal plate mounted to an incline integrated into the driver's platform, located to the left of the steering column. The location and design of this enclosure shall be such that foot room for the operator is not impeded. The inclined mounting surface shall be skid-resistant. All other controls, including high beam shall be in a location approved in Pre-Production meetings.

The foot switches shall be UL-listed, heavy-duty type, of a rugged, corrosion-resistant metal construction. The directional foot switches shall be momentary type, while those for the high beam shall be latching type. The spacing of the switches shall be such that inadvertent simultaneous deflection of switches is prevented.

TS 47. Driver's Amenities

TS 47.1 Coat Hanger

Coat Hook

A stainless steel, aluminum, or approved equal, coat hook shall be furnished and installed, subject to LACMTA approval in Pre-Production meetings.

TS 47.2 Drink Holder

No drink holder.

TS 47.3 Storage Box

Storage Box

An enclosed driver storage area shall be provided with a positive latching door and/or lock. The minimum size shall be 2,100 cubic inches.

TS 47.4 Repair Card Holder

A card holder shall be provided in the Operators' area at a location accessible to mechanics standing in the front entry area with the passenger door open, subject to LACMTA approval in Pre-Production meetings, (Refer to Section TS 88.6for Reference). Sample card holder shall be provided by the LACMTA upon request.

TS 47.5 Safety Equipment

The following items shall be provided and installed within seven feet of the Operator's seat in a location that is easy reach, subject to LACMTA approval in Pre-Production meetings.

- DOT approved heavy-duty emergency reflector kit stored in a storage box.
- Five-pound multipurpose fire extinguisher mounted with universal bracket.

TS 47.6 Bus Registration Holders

A Bus registration holder shall be installed above the Operator near the ceiling, subject to LACMTA approval in Pre-Production meetings.

TS 47.7 Trash Hooks

The Contractor shall provide two interior metal hooks in the area near the farebox for LACMTA supplied plastic trash bags (see attachment). Placement and selection of the hooks shall be reviewed on the Pilot Bus and are subject to LACMTA approval.

TS 48. Windshield Wipers and Washers

TS 48.1 Windshield Wipers

The bus shall be equipped with either a single-control or dual-control, electric, variable speed intermittent windshield wiper(s). At 65 mph, no more than 10 percent of the wiped area shall be lost due to windshield wiper lift. For two-piece windshields, both wipers shall park along the center edges of the windshield glass. Windshield wiper motors and mechanisms shall be easily accessible for repairs or service. The fastener that secures the wiper arm to the drive mechanism shall be corrosion-resistant. After each stroke, the wiper arm shall return to the parked position.

No part of the windshield wiper mechanism shall be damaged by manual manipulation of the arms for cleaning. Windshield wiper motors and mechanism shall be easily accessible for repairs or service from inside or outside the bus and shall be removable as complete units.

Intermittent Wiper with Variable Control

A variable-speed feature shall be provided to allow adjustment of wiper speed for both sides of the windshield between approximately 5 to 16 or 5 to 30 cycles per minute.

An intermittent wiper control shall be provided. The unit shall provide an Operator 5 to 30 second's variance in dwell time of the wiper arms.

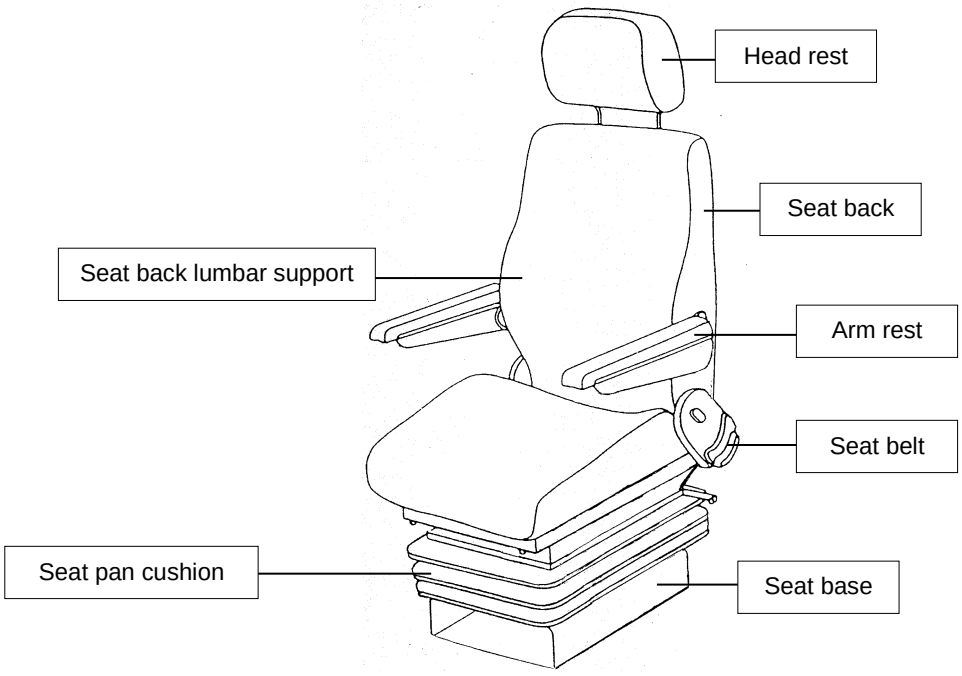
TS 48.2 Windshield Washers

The windshield washer system, when used with the wipers, shall deposit washing fluid evenly and completely wet the entire wiped area.

The windshield washer system shall have a minimum three-gallon reservoir, located for easy refilling from outside of the bus. Reservoir pumps, lines and fittings shall be corrosion-resistant. The reservoir shall be translucent for easy determination of fluid level, if visible, or a fluid level indicator shall be provided.

TS 49. Driver's Seat

FIGURE 6
Driver's Seat



TS 49.1 Dimensions

The driver's seat shall be comfortable and adjustable so that people ranging in size from a 95th-percentile male to a 5th-percentile female may operate the bus.

The heavy-duty Operator's seat shall support Operators' in the orthopedically correct seating position.

TS 49.1.1 Seat Pan Cushion Length

Measurement shall be from the front edge of the seat pan to the rear at its intersection with the seat back. The adjustment of the seat pan length shall be no less than 16.5 inches at its minimum length and no more than 20.5 inches at its maximum length.

TS 49.1.2 Seat Pan Cushion Height

Measurement shall be from the cab floor to the top of the level seat at its center midpoint. The seat shall adjust in height from a minimum of 14 inches, with a minimum six- inch vertical range of adjustment.

TS 49.1.3 Seat Pan Cushion Slope

Measurement is the slope of the plane created by connecting the two high points of the seat, one at the rear of the seat at its intersection with the seat back and the other at the front of the seat just before it waterfalls downward at the edge. The slope can be measured using an inclinometer and shall be stated in degrees of incline relative to the horizontal plane (0 degrees). The seat pan shall adjust in its slope from no less than plus 12 degrees (rearward "bucket seat" incline), to no less than minus five degrees (forward slope).

TS 49.1.4 Seat Base Fore/Aft Adjustment

Measurement is the horizontal distance from the heel point to the front edge of the seat. The minimum and maximum distances shall be measured from the front edge of the seat when it is adjusted to its minimum seat pan depth (approximately 15 inches). On all low-floor buses, the seat-base shall travel horizontally a minimum of 11 inches. It shall adjust no closer to the heel point than six inches.

TS 49.1.5 Seat Pan Cushion Width

The driver's seat shall be appropriately dampened to support a minimum weight of 380 pounds. The suspension shall be capable of dampening adjustment in both directions.

Rubber snubbers shall be provided to prevent metal-to-metal contact. Seat suspension shall incorporate a primary and secondary system to minimize bottoming during travel when driving over uneven street surfaces and potholes.

TS 49.1.6 Seat Suspension

The driver's seat shall be appropriately dampened to support a minimum weight of 380 pounds. The suspension shall be capable of dampening adjustment in both directions.

Rubber bumpers shall be provided to prevent metal-to-metal contact.

TS 49.1.7 Seat Back

Width

Measurement is the distance between the outermost points of the front of the seat back, at or near its midpoint in height. The seat back width shall be no less than 19 inches Seat back will include dual recliner gears on both sides of the seat.

Height

Standard height seat back

TS 49.1.8 Headrests

Four-way adjustable headrest

TS 49.1.9 Seat Back Lumbar Support

Measurement is from the bottom of the seat back at its intersection with the seat pan to the top of the lumbar cushioning. The seat back shall provide adjustable depth lumbar back support with three individual operating lumbar cells within a minimum range of seven to 11 inches.

TS 49.1.10 Seat Back Angle Adjustment

The seat back angle shall be measured relative to a level seat pan, where 90 degrees is the upright position and 90 degrees-plus represents the amount of recline.

The seat back shall adjust in angle from a minimum of no more than 90 degrees (upright) to at least 110 degrees (reclined), with infinite adjustment in between.

TS 49.2 Seat Belt

The belt assembly should include a dual sensitive FMVSS209 emergency-locking retractor (ELR) with maximum inertia tolerance within the lock mechanism. All seat belts should be stored in automatic retractors. The belts shall be mounted to the seat frame so that the driver may adjust the seat without resetting the seat belt. Seat belt shall latch on the operator's right side and include a standard 4.7-inch receptor with seat belt alarm. Seat belt shall include orange three-point webbing and shall have an adjustable shoulder strap D-loop capable of accommodating a 95th-percentile male to a 5th-percentile female. The design of seat belt retraction and driver's area shall incorporate features to prevent damage to the bus or switches and controls when seat belt is released.

The seat and seat belt assemblies as installed in the bus shall withstand static horizontal forces as required in FMVSS 207 and 210. An audible alarm and warning light shall be installed to alert the driver when the seat belt is not in use and the parking brake is released and the master run switch is in "Day Run" or "Night Run".

Belt Length

The lap/shoulder belt assembly shall accommodate all drivers ranging in size from a 95th-percentile male to a 5th-percentile female and shall extend a minimum of 74 inches in length from the retractor.

TS 49.3 Adjustable Armrest

No armrests.

TS 49.4 Seat Control Locations

While seated, the driver shall be able to make seat adjustments by hand without complexity, excessive effort or being pinched. Heavy-duty adjustment mechanisms and controls shall hold the adjustments and shall not be subject to inadvertent changes.

TS 49.5 Seat Structure and Materials

Cushions

The seat bottom shall be at least 4.5 inches of molded silicone foam material in the seating area. The seat back shall be at least three inches of molded polyurethane foam material.

Cushion Materials

Solid black vinyl upholstery (non-perforated vinyl - pleather)

TS 49.6 Pedestal

Four-inch powder coated steel riser with internal tethers.

TS 49.7 Seat Options

Not applicable.

TS 49.8 Mirrors

TS 49.8.1 Exterior Mirrors

The bus shall be equipped with a corrosion-resistant, outside rearview mirrors mounted with stable supports to minimize vibration. Mirrors shall be firmly attached to the bus to minimize vibration and to prevent loss of adjustment with a breakaway or snap/spring-back mounting system. Mirrors shall permit the driver to view the roadway along the sides of the bus, including the rear wheels. Mirrors shall be positioned in a way that will minimize blind spots and high enough to avoid contact with pedestrians and bicyclists. Mirrors shall have integrated turn signals on both sides. Mirrors shall retract or fold sufficiently to allow bus washing operations but avoid contact with windshield. Mechanical stops shall prevent the mirror from contacting the windshield. Detents or friction plates shall be provided to allow positive positioning of mirror arms at pre-determined angles along their adjustment range.

Mirror head assemblies shall be replaceable with simple hand tools in less than 5 minutes. Mirrors shall be made of tempered plate glass or have safety backing to prevent shattering subject to approval during proposal period. Convex mirrors shall be provided, located below the exterior mirrors, on the curb and street side. The convex mirrors shall be integral to the main mirror arm in a similar manner to prevent damage to the exterior mirrors if the convex mirror is hit during operation.

Electrical connection shall be water proof, and located in area protected from bus wash action, and accessible for maintenance to replace mirrors and electrical connections. Adjustment of the mirrors shall be provided by two nubbin switches located to the left of the Operator, subject to LACMTA approval during proposal period. Mirror control wires shall terminate at the bus body adjacent to the mirror bracket attachment point with break-away connector plugs designed to prevent damage to bus wiring in the event the mirror head is damaged due to impact.

Curbside Mirrors

The mirror shall be mounted such that its lower edge is as high as possible but at least 76 inches above the street surface and is visible through the right side portion of the windshield that is cleaned by the windshield wiper. Front door operation shall not affect the view provided by the right side mirror.

Street Side Mirrors

The street side mirror shall be accessible through the Operator's side window. Mirror control wires shall terminate at the bus body adjacent to the mirror bracket attachment point with break-away connector plugs designed to prevent damage to bus wiring in the event the mirror head is damaged due to impact. Street side mirror shall be overhead mounted in a position to minimize potential contact with vehicles or cyclists, subject to LACMTA approval during proposal period.

Remote Adjustment of Curbside Mirror

The driver shall be able to adjust the curbside mirror remotely while seated in the driving position. The control for remote positioning of the mirror shall be a single switch or device.

Remote Adjustment of Street Side Mirror

The driver shall be able to adjust the street-side mirror remotely while seated in the driving position. The control for remote positioning of the mirror shall be a single switch or device.

TS 49.8.2 Interior Mirrors

Mirrors shall be provided to permit the Operator to observe passengers throughout the bus, including entrances and exits, and directly in front of the bus during bicycle loading and unloading activities without leaving his seat and without shoulder movement, subject to LACMTA approval in Pre-Production meetings. Inside mirrors shall not be in the line of sight and obstruct the view of the right outside mirror. Mirror installations shall be placed such that there is no obstruction of the view in other mirrors.

- A convex mirror shall be provided above the front door for use by the Operator in determining that the front door is clear of passengers.
- Mirror(s) shall be provided so that with a full standee load, including standees in the entry area, the Operator will be able to observe passengers in the front and rear door, anywhere in the aisle, and in the rear seats.

Mirror Dimensions

TABLE 10
Mirror Dimensions

SIZE	DESCRIPTION
8"X15" or 8"x16 "	Convex, Operator's Rearview
12" Diameter	Convex, Exit Door
6" Diameter	Relay Mirror
7"x10"	Convex, Front Entrance

WINDOWS (TS 50-TS 53)

TS 50. General

A minimum of 10,000 sq. inches of window area, including operator and door windows, shall be required on each side of the standard configuration bus.

TS 51. Windshield

The windshield shall permit an Operator's field-of-view as referenced in SAE Recommended Practice J1050. The vertically upward view shall be a minimum of 15 degrees, measured above the horizontal and excluding any shaded band. The vertically downward view shall permit detection of an object 3.5 ft. high no more than two feet. in front of the bus. The horizontal view shall be a minimum of 90 degrees above the line of sight. Any binocular obscuration due to a center divider may be ignored when determining the 90-degree requirement, provided that the divider does not exceed a three-degree angle in the Operator's field-of-view. Windshield pillars shall not exceed 10 degrees of binocular obscuration. The windshield shall be designed and installed to minimize external glare as well as reflections from inside the bus.

The windshield shall be easily replaceable by removing zip-locks from the windshield retaining moldings. Bonded-in-place windshields shall not be used. Winglets may be bonded.

TS 51.1 Glazing

The windshield glazing material shall have a ¼ inch nominal thickness laminated safety glass conforming to the requirements of ANSI Z26.1 Test Grouping 1A and the Recommended Practices defined in SAE J673.

Glazing shall be solar management glass (SMG) tinted green. The hue shall be consistent throughout the procurement.

Shaded Band

The upper portion of the windshield above the driver's field-of-view shall have a blue or green, shaded band with a luminous transmittance of six to 10 percent when tested in accordance to ASTM D-1003.

TS 52. Driver's Side Window

The driver's side window shall be a high-visibility sliding type, that minimizes window frame or other obstructions to driver's visibility, requiring only the front half of sash to open and latch upon closing, and shall open sufficiently to permit the seated Operator to easily adjust the street-side outside rearview mirror. When in an open position, the window shall not rattle or close during braking. This window section shall slide in tracks or channels designed to last the service life of the bus. The Operator's side window shall not be bonded in place and shall be easily replaceable. The glazing material shall have a single-density tint.

The driver's view, perpendicular through Operator's side window glazing, should extend a minimum of 29 inches (736 mm) to the rear of the heel point on the accelerator, and in any case must accommodate a 95th percentile male operator. The view through the glazing at the front of the assembly should begin not more than 26 inches (560 mm) above the Operator's floor to ensure visibility of an under-mounted convex mirror. Driver's window construction shall maximize ability for full opening of the window.

The driver's side window glazing material shall have a ¼ inch nominal thickness laminated safety glass conforming to the requirements of ANSI Z26.1-1996 Test Grouping 2 and the Recommended Practices defined in SAE J673.

Light transmittance shall be a maximum of 75 percent on the glass area below 53 inches from the Operator platform floor. On the top fixed over bottom slider configuration, the top fixed area above 53 inches may have a maximum one percent light transmittance.

The window frame shall not block the view of the street side mirror when in the fully closed or fully open positions. Operator's side window upper portion above the sunshade shall be shaded dark. Glazing shall be solar management glass tinted blue or green to match the windshield. The hue shall be consistent throughout the procurement.

TS 53. Side Windows

TS 53.1 Configuration

Side window assemblies shall be constructed of heavy-duty aluminum shall be easily replaceable without disturbing adjacent windows and shall be mounted so that flexing or vibration from engine operation or normal road excitation is not apparent. Window assemblies shall incorporate "change in place" design to permit replacement (removal and installation) of each glazing (transparent glass piece less any framing) from windows installed on the bus. This requirement shall permit one mechanic to enter the bus and remove and install each glazing using common hand tools in 60 minutes, or less. The window shall be fully serviceable immediately following replacement of glazing. Change in place method shall be tamper resistant. An additional six minutes will be added for each glazing replacement, if necessary, for replacement of the associated anti-vandalism sacrificial film.

All frame surfaces and components (except the emergency escape handles) shall be finished with black anodizing. Emergency escape latches shall be red, and labeled to indicate their purpose and function. Miscellaneous hardware, such as fasteners and latches, shall be the window manufacturer’s standard hardware.

Transom style side windows shall extend from the shoulder height of a seated 5th-percentile female passenger to the eye level of a standing 95th-percentile male passenger in the front section; the rear section window upper edge shall be approximately 56 inches above the floor at the start of the raised deck and no less than 51 inches at the rearmost window’s upper edge. Each individual window glazing shall be easily replaceable without removing the entire window assembly or disturbing adjacent window assemblies and shall be mounted so that flexing or vibration from engine operation or normal road excitation is not apparent. To the extent practical, the number of different sizes of windows should be minimized.

Quick Change Passenger Side Windows

Glazing in the window assembly shall be capable of being replaced without removing the window from its installed position on the bus using simple hand tools. The glazing shall be held in place mechanically by a system constructed to last the life of the vehicle.

Traditional Frame

- Fully fixed.
- Openable windows with inward-opening transom panels

TS 53.2 Emergency Exit (Egress) Configuration

Minimum Egress

All side windows shall be fixed in position, except as necessary to meet the emergency escape requirements.

TS 53.3 Configuration

Operable Windows with Inward-Opening Transom Panels (Fixed Bottom, Tip-In Top)

Each side window shall incorporate an upper transom portion. The transom shall be between 20 and 35 percent of the total window area. The lower portion of the window shall be fixed. The transom portion shall be hinged along the lower edge and open inward.

Side windows shall have an upper section that can be opened inward a minimum of four inches to provide maximum interior ventilation. When opened the upper window section shall not interfere with access to the

passenger signal pull cable. The operable section shall be a minimum of eight inches and a maximum of 10 inches in height, hinged at the bottom, and shall be the full width of all windows. In the event of a latch failure the upper window section shall remain in the closed position, and shall latch in the closed position by means of a gas filled cylinder or mechanical spring. Rearmost windows which are lower than shoulder height for seated passengers shall not be opened or equipped with emergency escape provisions, subject to LACMTA approval in Pre-Production meeting.

TS 53.4 Materials

Safety Glass Glazing Panels

Side windows glazing material shall have a minimum of 3/16-inch nominal thickness tempered safety glass. The material shall conform to the requirements of ANSI Z26.1-1996 Test Grouping 2 Safety Glazing Materials and the Recommended Practices defined in SAE J673. Windows on the bus sides and in the rear door shall be grey tint (13 percent) luminous transmittance as measured by ASTM D-1003), complementary to the bus exterior. The maximum solar energy transmittance shall not exceed 20 percent, as measured by ASTM E-424. Luminous transmittance shall be measured by ASTM D-1003. Windows over the destination signs shall not be tinted. To the extent practical, side window glazing for fixed and emergency egress windows shall be interchangeable.

Anti-Vandalism Sacrificial Film

All glazing material that is aft of the front standee line, and in front of the exit door, shall be equipped with an interior single layer 6 mil minimum laminated film. All glazing material that is aft of, and including, the exit door shall be equipped with an interior four layer laminated film. Both types of window film installations are subject to LACMTA approval during proposal period. This material shall be easily installed and removed without the use of specialized tools. Film shall adhere to the window and be resistant to peeling, curling and discoloration by ultraviolet rays. The film shall withstand normal cleaning operations.

TS 53.5 Rear Window

No requirement for rear window.

HEATING, VENTILATING AND AIR CONDITIONING (TS 54-TS 61)

TS 54. Capacity and Performance

The HVAC climate control system shall be modular design and capable of controlling the temperature and maintaining the humidity levels of the interior of the bus as defined in the following paragraphs. Contractor shall supply an all-electric driven A/C system with full hermetic or semi-hermetic sealed compressor (no open drive compressor). System shall include - brushless; AC compressor, condenser fan, and evaporator blower motors. High voltage alternator/generator shall be brushless.

With the bus running at the design operating profile with corresponding door opening cycle, and carrying a number of passengers equal to 150 percent of the seated load, the HVAC system shall control the average passenger compartment temperature within a range between 65 º to 80°F, while maintaining the relative humidity to a value of 50 percent or less. The system shall maintain these conditions while subjected to any outside ambient temperatures within a range of 10º to 95°F and at any ambient relative humidity levels between five and 50 percent.

When the bus is operated in outside ambient temperatures of 95º to 115°F, the interior temperature of the bus shall be permitted to rise 0.5° for each degree of exterior temperature in excess of 95°F.

System capacity testing, including pull-down/warm-up, stabilization and profile, shall be conducted in accordance to the APTA's "Recommended Instrumentation and Performance Testing for Transit Bus Air Conditioning System."

The recommended locations of temperature probes are only guidelines and may require slight modifications to address actual bus design. Care must be taken to avoid placement of sensing devices in the immediate path of an air duct outlet. In general, the locations are intended to accurately represent the interior passenger area.

To the extent practical, self-sealing couplings shall be used to break and seal the refrigerant lines during removal of major components such as the refrigerant compressor or condenser.

The condenser shall be located to efficiently transfer heat to the atmosphere, and shall not ingest air warmed by the bus mechanical equipment above the ambient temperature or discharge air into any other system of the bus. The condenser and evaporator fan motors shall be brushless and shall be easy to replace in a maximum of one man-hour using simple hand tools. Fan motor replacement shall not require removal of fan housing or air ducting.

The air conditioning system shall employ an accumulator or other strategy in the low pressure circuit to prevent liquid refrigerant from entering the compressor during operation.

Additional testing shall be performed as necessary to ensure compliance to performance requirements stated herein.

Capacity and Performance Requirements

The air-conditioning portion of the HVAC system shall be capable of reducing the passenger compartment temperature from 110 º to 90 °F in less than 20 minutes after engine start-up. Engine temperature shall be within the normal operating range at the time of start-up of the cool-down test, and the engine speed shall be limited to fast idle, which may be activated by a driver-controlled device. During the cool-down period, the refrigerant pressure shall not exceed safe high-side pressures, and the condenser discharge air temperature, measured 6 inches from the surface of the coil, shall be less than 45 °F above the condenser inlet air temperature. The appropriate solar load as recommended in the APTA “Recommended Instrumentation and Performance Testing for Transit Bus Air Conditioning System,” shall be used. There shall be no passengers on board, and the doors and windows shall be closed. The air conditioning system shall meet these performance requirements using R134a or 407c.

TS 55. Controls and Temperature Uniformity

The HVAC system excluding the driver’s heater/defroster shall be centrally controlled with an advanced electronic/diagnostic control system with provisions for extracting/reading data. The system shall be compliant with J1939 Communication Protocol for receiving and broadcasting of data.

Hot engine coolant water shall be delivered to the HVAC system driver’s defroster/heater and other heater cores by means of an auxiliary coolant pump, sized for the required flow, which is brushless and seal-less having a minimum maintenance free service life for both the brushless motor and the pump of at least 40,000 hours at full power.

If provided, outside openings for air intake shall be located to ensure cleanliness of air entering the climate control system, particularly with respect to exhaust emissions from the bus and adjacent traffic. All intake openings shall be baffled to prevent entry of water.

Manual Mode Selection of Climate Control System

After manual selection and/or activation of climate control system operation mode, all interior climate control system requirements for the selected mode shall be attained automatically to within ± (2)°F of specified temperature control set-point.

Manually Adjustable Temperature Control Set Point

The climate control system shall have the provision to allow the driver to adjust the temperature control set-point at a minimum of between 68 and 72°F. From then on, all interior climate control system requirements shall be attained automatically, unless re-adjusted by driver.

The driver shall have full control over the defroster and driver's heater. The driver shall be able to adjust the temperature in the driver's area through air distribution and fans. The interior climate control system shall switch automatically to the ventilating mode if the refrigerant compressor or condenser fan fails.

Interior temperature distribution shall be uniform to the extent practicable to prevent hot and/or cold spots. After stabilization with doors closed, the temperatures between any two points in the passenger compartment in the same vertical plane, and six to 72 inches above the floor, shall not vary by more than five (5) °F with doors closed. The interior temperatures, measured at the same height above the floor, shall not vary more than ± five (5) °F from the front to the rear from the average temperature determined in accordance with APTA's "Recommended Instrumentation and Performance Testing for Transit Bus Air Conditioning System." Variations of greater than ± five (5) °F will be allowed for limited, localized areas provided the majority of the measured temperatures fall within the specified requirement.

TS 55.1 Auxiliary Heater

No auxiliary heater.

TS 56. Air Flow

TS 56.1 Passenger Area

The cooling mode of the interior climate control system shall introduce air into the bus at or near the ceiling height at a minimum rate of 25 cubic feet per minute (cfm) per passenger based on the standard configuration bus carrying a number of passengers equal to 150 percent of the seated load. Airflow shall be evenly distributed throughout the bus, with air velocity not exceeding 100 feet per minute on any passenger. The ventilating mode shall provide air at a minimum flow rate of 20 cfm per passenger. Air vents shall direct air flow away from open windows, if provided.

Airflow may be reduced to 15 cfm per passenger (150 percent of seated load), when operating in the heating mode. The fans shall not activate until the heating element has warmed sufficiently to ensure at least 70 °F air outlet temperature. The heating air outlet temperature shall not exceed 120 °F under any normal operating conditions.

Heater circulating pump shall be brushless and seal-less.

The climate control blower motors and fan shall be designed such that their operation complies with the interior noise level requirements.

TS 56.2 Driver's Area

The bus interior climate control system shall deliver at least 100 cfm of air to the driver's area when operating in the ventilating and cooling modes. Adjustable nozzles shall permit variable distribution or shutdown of the airflow. Airflow in the heating mode shall be reduced proportionally to the reduction of airflow into the passenger area. The windshield defroster unit shall meet the requirements of SAE Recommended Practice J381, "Windshield Defrosting Systems Performance Requirements," and shall have the capability of diverting heated air to the driver's feet and legs. The defroster or interior climate control system shall maintain visibility through the driver's side window.

TS 56.3 Controls for the Climate Control System (CCS)

The controls for the driver's compartment for heating, ventilation and cooling systems shall be integrated and shall meet the following requirements:

- The heat/defrost system fan shall be controlled by a separate switch that has an “Off” position and at least two positions for speed control.
- A manually operated or electronically modulated control valve shall control the coolant flow through the heater core.
- If a cable-operated manual control valve is used, the cable length shall be kept to a minimum to reduce cable seizing. Heater water control valves shall be “positive” type, when closed. The method of operating remote valves shall be subject to LACMTA approval during proposal period.

TS 56.4 Driver’s Compartment Requirements

A separate heating, ventilation and defroster system for the driver’s area shall be provided and shall be controlled by the driver. The system shall meet the following requirements:

- The heater and defroster system shall provide heating for the driver and heated air to completely defrost and defog the windshield, driver’s side window, and the front door glasses in all operating conditions. Fan(s) shall be able to draw air from the bus body interior and/or the exterior through a control device and pass it through the heater core to the defroster system and over the driver’s feet. A minimum capacity of 100 cfm shall be provided. The driver shall have complete control of the heat and fresh airflow for the driver’s area.
- The defroster supply outlets shall be located at the lower edge of the windshield. These outlets shall be durable and shall be free of sharp edges that can catch clothes during normal daily cleaning. The system shall be such that foreign objects such as coins or tickets cannot fall into the defroster air outlets. Adjustable ball vents or louvers shall be provided at the left of the driver’s position to allow direction of air onto the side window in order to maintain visibility.

A ventilation system shall be provided to ensure driver comfort and shall be capable of providing fresh air. Vents shall be controllable by the driver from the normal driving position. Decals shall be provided, indicating “operating instructions” and “fresh air” and “recirculating air” positions. When closed, vents shall be sealed to prevent the migration of water or air into the bus.

TS 56.5 Driver’s Cooling

A separate booster fan unit shall provide 100 cfm of air to the driver’s area through directionally adjustable nozzles and an infinitely variable fan control, both of which shall be located above the driver.

TS 57. Air Filtration

Air shall be filtered before discharge into the passenger compartment. The filter shall meet the ANSI/ASHRAE 52.2 requirement for five percent or better atmospheric dust spot efficiency, 50 percent weight arrestance, and a minimum dust holding capacity of 120 g per 1000 cfm cell. Air filters shall be easily removable for service.

More efficient air filtration may be provided to maintain efficient heater and/or evaporator operation. Moisture drains from air intake openings shall be located so that they will not be subject to clogging from road dirt.

TS 58. Roof Ventilators

At least one roof ventilator shall be provided in the roof of the bus.

Each ventilator shall be easily opened and closed manually. Ventilators with lever type release handles are not permitted. When open with the bus in motion, this ventilator shall provide fresh air inside the bus. The ventilator shall cover an opening area no less than 425 sq. inches and shall be capable of being positioned as a scoop with either the leading or trailing edge open no less than four inches, or with all four edges raised simultaneously to a height of no less than 3.5 inches. An escape hatch shall be incorporated into the roof ventilator. Roof ventilator(s) shall be sealed to prevent entry of water when closed.

TS 59. Maintainability

Manually controlled shut-off valves in the refrigerant lines shall allow isolation of the compressor and dehydrator filter for service. To the extent practicable, self-sealing couplings utilizing O-ring seals shall be used to break and seal the refrigerant lines during removal of major components, such as the refrigerant compressor.

The condenser shall be located to efficiently transfer heat to the atmosphere and shall not ingest air warmed above the ambient temperature by the bus mechanical equipment, or to discharge air into any other system of the bus. The location of the condenser shall preclude its obstruction by wheel splash, road dirt or debris. HVAC components located within six inches of floor level shall be constructed to resist damage and corrosion. The condenser and evaporator fan motors shall be easy to replace in a maximum of one man-hour using simple hand tools. Fan motor replacement shall not require removal of fan housing or air ducting.

TS 60. Entrance/Exit Area Heating

No requirements for entrance/exit area heating.

TS 61. Floor-Level Heating

TS 61.1 Transit Bus

No requirements for floor-level heating.

TS 61.2 Commuter Bus

Not applicable

EXTERIOR PANELS, FINISHES AND EXTERIOR LIGHTING (TS 62-TS 73)

TS 62. Design

The bus shall have a clean, smooth, simple design, primarily derived from bus performance requirements and passenger service criteria. With the exception of required VIN information, exterior manufacturer's emblem plate or decals shall not be installed unless approved by the LACMTA. The exterior and body features, including grilles and louvers, shall be shaped to facilitate cleaning by automatic bus washers without snagging washer brushes. Water and dirt shall not be retained in or on any bus body feature to freeze or bleed out onto the bus after leaving the washer. The body and windows shall be sealed to prevent leaking of air, dust or water under normal operating conditions and during cleaning in automatic bus washers for the service life of the bus.

Exterior panels shall be sufficiently stiff to minimize vibration, drumming or flexing while the bus is in service. When panels are lapped, the upper and forward panels shall act as a watershed. However, if entry of moisture into the interior of the vehicle is prevented by other means, then rear cap panels may be lapped otherwise. The windows, hatches and doors shall be able to be sealed. Accumulation of spray and splash generated by the bus's wheels shall be minimized on windows and mirrors.

TS 62.1 Materials

Body materials shall be selected and the body fabricated to reduce maintenance, extend durability and provide consistency of appearance throughout the service life of the bus. Detailing shall be kept simple, and add-on devices and trim shall be minimized and integrated into the basic design.

The total structure shall be designed for maximum; strength, reliability, and durability, while maintaining minimum weight. The overall structure shall be designed to prevent the penetration of fluids, including lubricants, into the structure of the bus. All exposed surfaces shall be uniform in appearance with no unevenness or random irregularities in finish, including seam areas.

TS 62.2 Roof-Mounted Equipment (Transit Bus)

The bus roof shall be coated with “anti-slip” paint applied to areas that will accommodate safe access for routine inspections of the fuel cylinders.

TS 62.3 Curb Feelers

The bus shall be equipped with one curb feeler located at front door area. Curb feeler sample shall be provided by the LACMTA upon request. Installation of curb feeler shall be subject to LACMTA approval at the Pilot Bus.

TS 63. Pedestrian Safety

Exterior protrusions along the side and front of the bus greater than ½ inch and within 80 inches of the ground shall have a radius no less than the amount of the protrusion. The exterior rearview mirrors, cameras and required lights and reflectors are exempt from the protrusion requirement. Grilles, doors, bumpers and other features on the sides and rear of the bus shall be designed to minimize toeholds or handholds.

Exterior protrusions shall not cause a line-of-sight blockage for the driver.

TS 64. Repair and Replacement

TS 64.1 Side Body Panels (Transit Bus)

Structural elements supporting exterior body panels shall allow side body panels below the windows to be repaired in lengths not greater than 12.5 feet. Exterior panels shall not be installed or retained with visible rivets or fasteners unless specifically approved by LACMTA. Exterior panels that function as service and access doors shall be similar in construction, being made of aluminum, fiberglass, or stainless steel. All body panels, including those with louvers or ventilation openings, shall be designed to prevent persons from gaining a hand or foot hold if attempting to climb the exterior of the bus.

TS 64.2 Side Body Panels (Commuter Bus)

Not applicable.

TS 65. Rain Gutters

Rain gutters shall be provided to prevent water flowing from the roof onto the full length of both curb and street sides of the bus. When the bus is decelerated, the gutters shall not drain onto the windshield, driver’s side window, passenger windows or door boarding area. Gutter cross section shall be no less than 0.25 square inches.

TS 66. License Plate Provisions

Provisions shall be made to mount standard-size U.S. license plates per SAE J686 on the front and rear of the bus. These provisions shall direct-mount or recess the license plates so that they can be cleaned by automatic bus-washing equipment without being caught by the brushes, subject to LACMTA approval in Pre-Production meetings. The rear license plate provision shall be illuminated per SAE J587. License plates shall be mounted on the center or to the left of center and shall not allow a toehold or handhold for unauthorized riders. Front license plate shall be mounted sufficiently to the left of the center to allow clearance for Metro installed bicycle rack banners.

TS 66.1 Rub Rails

No requirement for rub rails.

TS 67. Fender Skirts

Features to minimize water spray from the bus in wet conditions shall be included in wheel housing design. Any fender skirts shall be easily replaceable. They shall be flexible if they extend beyond the allowable body width. Wheels and tires shall be removable with the fender skirts in place.

TS 68. Wheel Covers (Transit Bus)

Wheel covers not required.

TS 68.1 Splash Aprons

Standard Splash Aprons

Splash aprons, composed of ¼ inch minimum composition or rubberized fabric, shall be installed behind and/or in front of wheels as needed to reduce road splash and protect underfloor components. The splash aprons shall extend downward to within six inches off the road surface at static conditions. Apron widths shall be no less than tire widths. Splash aprons shall be bolted to the bus understructure. Splash aprons and their attachments shall be inherently weaker than the structure to which they are attached. The flexible portions of the splash aprons shall not be included in the road clearance measurements. Splash apron shall be installed as necessary to protect the wheelchair loading device from road splash. Other splash aprons shall be installed where necessary to protect bus equipment.

TS 69. Service Compartments and Access Doors

TS 69.1 Access Doors (Transit Bus)

Hinged doors shall be used for the engine compartment and for all auxiliary equipment compartments. Access openings shall be sized for easy performance of tasks within the compartment, including tool operating space. Access doors shall be provided at the front of the bus, only if needed, to service and/or replace the front windshield defroster unit, windshield wiper units, brake application valve, steering gear box, throttle pedal assembly, and associated pressure and electrical switches, airline fittings, and electrical connections. Access doors shall be of rugged construction and shall maintain mechanical integrity and function under normal operations throughout the service life of the bus.

The use of expanded metal for side and rear service doors is prohibited. All access doors shall be aluminum, fiberglass, or stainless steel. They shall close flush with the body surface. All doors shall be hinged at the top or on the forward edge and shall be prevented from coming loose or opening during transit service or in bus washing operations. All access doors shall be retained in the open position by props or counterbalancing with over-center or gas-filled springs with safety props and shall be easily operable by one person. Springs and hinges shall be corrosion resistant. Latch handles shall be flush with, or recessed behind, the body contour and shall be sized to provide an adequate grip for opening. Access doors, when opened, shall not restrict access for servicing other components or systems. Gas springs used for the engine access door shall be designed to operate in temperatures encountered within the engine compartment. In the event of a spring failure, an adequate mechanical locking device shall be provided at a minimum for the engine and air conditioner access doors which is capable of retaining a minimum of 200 percent of the door weight when in the open position. The locking device shall be identified by a distinctive yellow or orange color and be simple to operate by one person when closing the door. Access doors shall hinge up and out of the way to within 30 to 45 degrees of the side of the bus. The fuel fill/charge port door shall be hinged at the top and shall open fully up against the side of the bus subject to LACMTA approval in Pre-Production meetings. Pantographic door mechanisms and barn type doors for engine and A/C system access doors are not acceptable. Large access doors shall be opened and closed by one person including the 5th-percentile female. These doors, when opened, shall not restrict access for servicing other components or systems.

If precluded by design, the manufacturer shall provide door design information specifying how the requirements are met.

TS 69.2 Access Doors (Commuter Bus)

Not applicable.

TS 69.3 Access Door Latch/Locks

Requirement for Latches on Access Doors

Access doors larger than 100 sq. inches in area shall be equipped with corrosion-resistant flush-mounted latches or locks except for coolant and fuel fill or battery-switch access doors. All such access doors that require a tool to open shall be standardized throughout the vehicle and will require a nominal 5/16-inch square male tool to open or lock. The locks shall be standardized so that only one tool is required to open all major access doors on the bus. It is required that locking devices lock clockwise and unlock counter clockwise.

Other Locks and Latches

A key switch shall be provided to lock the front door. The switch shall be located behind an exterior access door near the front curb side of the bus a minimum of 45 inches above the ground. The access door shall be hinged to allow the door to open completely to view and aid inserting the switch key. Access to the switch shall not be obstructed by the bicycle rack in the stowed position. The switch shall use a LACMTA standard key. A sample key will be provided by the LACMTA following the Pre-Production meetings.

The Door Lock system shall be controlled by the bus multiplex system. When the Master Run Switch is in the "Off" position and the Park Brake is applied, the door key switch shall close and lock the front door. If left unattended with the front door locked, the front door lock system shall go to sleep with the bus multiplex system and door shall remain locked. If there is a loss of battery power when the door is locked the door shall remain in the closed unpowered position. When the Operator unlocks the front door with the key, the door shall automatically open and the bus multiplex system shall wake up.

TS 70. Bumpers

TS 70.1 Location

Bumpers shall provide impact protection for the front and rear of the bus with the top of the bumper being 27 inches, ±2 inches, above the ground. Bumper height shall be such that when one bus is parked behind another, a portion of the bumper faces will contact each other.

TS 70.2 Front Bumper

No part of the bus, including the bumper, shall be damaged as a result of a 5mph impact of the bus at curb weight with a fixed, flat barrier perpendicular to the bus's longitudinal centerline. The bumper shall return to its pre-impact shape within 10 minutes of the impact. The bumper shall protect the bus from damage as a result of 6.5 mph impacts at any point by the common carriage with contoured impact surface defined in Figure 2 of FMVSS 301 loaded to 4,000 pounds parallel to the longitudinal centerline of the bus. It shall protect the bus from damage as a result of 5.5 mph impacts into the corners at a 30-degree angle to the longitudinal centerline of the bus. The energy absorption system of the bumper shall be independent of every power system of the bus and shall not require service or maintenance in normal operation during the service life of the bus. The bumper may increase the overall bus length specified by no more than seven inches.

TS 70.3 Rear Bumper

No part of the bus, including the bumper, shall be damaged as a result of a two mph impact with a fixed, flat barrier perpendicular to the longitudinal centerline of the bus. The bumper shall return to its pre-impact shape within 10 minutes of the impact. When using a yard tug with a smooth, flat plate bumper two feet wide contacting the horizontal centerline of the rear bumper, the bumper shall provide protection at speeds up to five mph, over pavement discontinuities up to one inch high, and at accelerations up to two mph/sec. The rear bumper shall protect the bus, when impacted anywhere along its width by the common carriage with contoured impact surface defined in Figure 2 of FMVSS 301 loaded to 4,000 pounds, at four mph parallel to or up to a 30-degree angle to, the longitudinal centerline of the bus. The rear bumper shall be shaped to preclude

unauthorized riders standing on the bumper. The bumper shall not require service or maintenance in normal operation during the service life of the bus. The bumper may increase the overall bus length specified by no more than six inches.

TS 70.4 Bumper Material

Bumper material shall be corrosion-resistant black polyurethane type material and withstand repeated impacts of the specified loads without sustaining damage. Visible surfaces shall be semi-gloss black. These bumper qualities shall be sustained throughout the service life of the bus.

TS 70.5 Bicycle Rack

A front mounted fold-up three-position black bicycle rack shall be provided to conform to amended Section 35400 of California Vehicle Code that took effect in September 2014. The installed bicycle rack shall not interfere with towing the bus. California Code Title 13 requires that bike racks be installed with a way for the Operator to determine whenever the bike rack is deployed.

TS 71. Finish and Color

TS 71.1 Appearance

Contractor shall utilize the LACMTA's existing local color scheme in its exterior paint design, (see Technical Specification Attachment 1-Metro Local Exterior and Interior Fleet Standards for reference). Exterior colors shall be applied over a white base color. The manufacturer shall submit for LACMTA's approval, a drawing showing painting layout including striping bends and breaks during Pre-Production meetings. Drawing shall show location of bends as dimensioned from a convenient reference point. The Pilot Bus shall be painted according to this color scheme for approval by the LACMTA prior to application to the remainder of the buses.

Contractor shall submit to LACMTA all material safety data sheet (MSDS) for all exterior and interior finishing, coatings, adhesives, sealants and paints. Paints and coatings including finishes and sealants shall not contain lead or asbestos.

All exterior surfaces shall be smooth and free of wrinkles and dents. Exterior surfaces to be painted shall be properly prepared as required by the paint system supplier prior to application of paint to assure a proper bond between the basic surface and successive coats of original paint for the service life of the bus. Drilled holes and cutouts in exterior surfaces shall be made prior to cleaning, priming and painting, where possible, to prevent corrosion. The bus shall be completely painted in such a manner that replacement of exterior lights, windows, mirrors and other items that are applied to the exterior of the bus shall not leave paint outline. Body filler materials may be used for surface dressing, but not for repair of damaged or improperly fitted panels.

Paint shall be applied smoothly and evenly with the finished surface free of visible dirt and the following other imperfections:

- Blisters or bubbles appearing in the topcoat film.
- Chips, scratches, or gouges of the surface finish.
- Cracks in the paint film.
- Craters where paint failed to cover due to surface contamination.
- Overspray.
- Peeling.
- Runs or sags from excessive flow and failure to adhere uniformly to the surface.
- Chemical stains and water spots.
- Dry patch due to incorrect mixing of paint activators.
- Buffing swirls.

All exterior finished surfaces shall be impervious to diesel fuel, gasoline and commercial cleaning agents. Finished surfaces shall resist damage by controlled applications of commonly used graffiti-removing chemicals. The interior of both passenger doors shall be primed with suitable acid-resistant paint.

Proper adhesion between the basic surface and successive coats of the original paint shall be measured using an Elcometer adhesion tester as outlined in ASTM D4541-85. Adhesion shall be a minimum 300 foot.-pounds. The bus manufacturer shall supply test samples of the exterior surface for each step of the painting process that may be subject to adhesion testing per ASTM G4541-87 and ASTM D4145-85. ASTM D4541-93 may be used for inspection testing during assembly of the vehicle.

High Gloss External Paint Finish Quality

Painted surfaces shall have an average 90 gloss as measured in ASTM E97-92, “Standard Test Method For Directional Reflectance” and an orange peel rating of five or more on the Advanced Coating Technologies, Inc., orange peel standard panels set #APR 14941 or LACMTA accepted wave scan equipment Exterior painted surfaces shall have a minimum of 0.5-mil thick primer coat and a minimum 2.5-mil thick finish coat. Mil thickness shall conform to paint manufacturer's specifications.

TS 72. Decals, Numbering and Signing

Contractor shall furnish and apply all decals. Final size and locations shall be approved by LACMTA. Signs shall be durable and fade, chip, and peel-resistant. All “screened” markings shall be coated with a protective abrasion resistant film that resists damage from cleaning chemicals, graffiti, and sunlight. The Contractor shall provide LACMTA with scaled electronic format drawings of the bus interior and exterior on DVD, compatible with AutoCAD, Adobe Illustrator or other LACMTA approved file format. LACMTA shall utilize these drawings to illustrate the locations of all exterior and interior bus decals to be available at the first Pre-Production meeting or upon request. Contractor shall furnish any other markings necessary for identification of windows, hatches, etc., in both English and Spanish. Roof decals should be applied so that the bottom of the numbers point toward the street side. (Refer to Section TS 88.4 for Tables 18-19.)

TS 72.1 Passenger Information

A total of two information "Take One" boxes and one minimum “Take Twelve” unit shall be supplied (Refer to Section TS 88.1 for Approved Products). “Take One” boxes shall be mounted at both the front and rear doors in convenient locations for passengers and the minimum “Take Twelve” unit shall be located in a convenient location towards the front of the bus, subject to LACMTA approval in Pre-Production meetings.

TS 73. Exterior Lighting

Exterior lighting and reflectors shall comply, as applicable, with Part 393, Subpart B of the FMCSA and FMVSS 108. All exterior lights shall be designed to prevent entry and accumulation of moisture or dust. Commercially available LED-type lamps shall be utilized at all exterior lamp locations. Lamps, lenses and fixtures shall be interchangeable to the extent practicable. Two hazard lamps at the rear of the bus shall be visible from behind when the engine service doors are opened. Light lenses shall be designed and located to prevent damage when running the vehicle through an automatic bus washer. Front marker (clearance) lights along with lights located on the roof and sides of the bus shall have protective shields or be of the flush mount type to protect the lens against minor impacts, and be installed in such a manner to prevent water leakage through the roof or side panels. Separate from any marker lights required by FMVSS, LED clearance lamps shall be provided on the roof surface at each bus corner to delineate bus height in accordance with Title 13 of the California Administrative Code Section 641. These four corner clearance lamps shall be lighted when the master switch is in the “Night Run” position.

Standard Lamps

All LED lamps shall be standard installation of the OEM. The entire assembly shall be specifically coated to protect the light from chemical and abrasion degradation.

Potted Lamps

LED lamps shall be potted type and designed to last the life of the bus.

Lamp Size

LED lamps used for tail, brake and turn signal lamps shall be a minimum of seven inches in diameter.

TS 73.1 Backup Light/Alarm

Visible and audible warnings shall inform following vehicles or pedestrians of reverse operation. Visible reverse operation warning shall conform to SAE Standard J593. Audible reverse operation warning shall conform to SAE Recommended Practice J994 Type C or D.

TS 73.2 Doorway Lighting

Lamps at the front and rear passenger doorways shall comply with ADA requirements and shall activate only when the doors open. These lamps shall illuminate the street surface to a level of no less than one foot-candle for a distance of three feet outward from the outboard edge of the door threshold with a passenger standing in the threshold. The lights must be positioned overhead and shall be shielded to protect passengers' eyes from glare.

Lighting for the ramp areas shall be designed to meet Title 13 and ADA and FMVSS 404 standards. Lighting shall be provided to effectively illuminate the ramp area. Light shall be controlled by the ramp master switch on the driver's dash and shall automatically illuminate when this switch is in the "On" position. The lighting design shall minimize the effect of glare on passengers entering the bus through the wheelchair ramp door. During ramp operation, the street surface shall be illuminated to a minimum of six candlepower a distance of three feet beyond the external dimensions of the ramp platform once deployed.

TS 73.3 Turn Signals

Standard Turn Signals

Turn-signal lights shall be provided on the front, rear, curb and street sides of the bus in accordance with FMVSS 108 and Part 393, Subpart B of the FMCSA as applicable. Two LED seven-inch diameter amber turn/hazard warning lights, one on each side of engine compartment, shall be furnished.

Forward and rear facing supplemental LED cornering lights shall be provided on the curb side of bus only. With the master switch in the "Night Run" position, the cornering lights shall illuminate the street surfaces no less than three feet outward of the body only when activated by right-hand turn signal at 15 mph or less.

Cornering lights shall illuminate the street surfaces for 15 seconds when the doors close and the master switch is in "Night Run" position to assist an operator determine whether or not the areas by the doors are clear of people.

Wraparound Front Turn Signals

Front turn signals shall be of wrap-around design or shall be designed to be visible from the front and the near side of the bus.

TS 73.4 Headlights

Headlamps shall be designed for replacement of bulb without removing the headlamp bezel.

Standard Installation

Standard OEM headlight installation shall be provided in accordance with FMVSS 108 and Part 393, Subpart B of the FMCSA as applicable.

Daytime Running Lights

Headlamps shall not incorporate a daytime running light feature.

LED/Halogen

Low beam headlamps shall be LED. High beam headlamps shall be halogen or LED. Lenses shall be resistant to hazing and yellowing, and have proper hardness to resist surface scratches and stone chips, subject to LACMTA approval during proposal period.

TS 73.5 Brake Lights

TS 73.5.1 Transit Bus

Brake lights shall be provided in accordance with FMVSS 108 and Part 393, Subpart B of the FMCSA as applicable.

High and Center Mount Red Brake Lamp

Bus shall include red, high and center mount brake lamp(s) along the backside of the bus in addition to the lower brake lamps required under FMVSS 108. The high and center mount brake lamp(s) shall illuminate steady with brake application. Two LED seven-inch diameter sealed tail lights or 2-inch by eighteen-inch LED strip lights shall be mounted on each side of the engine closure door or rear end panels, so that the lights are not affected by engine heat (Refer to Section TS 88.1 for Approved Products). The (red) stop/tail lights shall be mounted directly above the (amber) directional signal lights. Two additional LED (red) stop lights shall be located above the engine compartment door on the centerline of the bus. If stop and tail lights are not visible from the rear when engine door is in the open position, two LED four-inch diameter amber hazard warning lights, one on each side of engine compartment, shall be furnished and activated by the turn signals. Each light shall be replaceable as an individual unit. Plastic lenses shall be protected with a high performance scratch and chemical resistant coating to prevent deterioration.

TS 73.5.2 Commuter Bus

Not applicable.

TS 73.6 Service Area Lighting (Interior and Exterior)

LED lamps with a minimum 264 lumens each shall be provided in the engine and all other compartments where service may be required to generally illuminate the area for night emergency repairs or adjustments. These service areas shall include, but not be limited to, PLC compartment(s), battery box(es), the engine compartment, the communication box, junction/apparatus panels and passenger door operator compartments. Lighting shall be adequate to light the space of the service areas to levels needed to complete typical emergency repairs and adjustments. The service area lamps shall be suitable for the environment in which they are mounted. A minimum of five lamps shall be provided for engine compartment illumination. A common automotive electric lighter accessory socket shall be provided on, or adjacent to, the rear control panel to power 12-volt portable service lights and diagnostic computers, subject to LACMTA approval in Pre-Production meetings.

Engine compartment lamps shall be controlled by a switch mounted near the rear start controls. All other service area lamps shall be controlled by switches mounted on or convenient to the lamp assemblies. Power to the service area lighting shall be programmable. Power shall latch on with activation of the switch and shall be automatically discontinued (timed out) after 60 minutes to prevent damage caused by inadvertently leaving the service area lighting switch in the “On” position after repairs are made.

INTERIOR PANELS AND FINISHES (TS 74-TS 77)

TS 74. General Requirements

Materials shall be selected on the basis of maintenance, durability, appearance, safety, flammability and tactile qualities. Materials shall be strong enough to resist everyday abuse and be vandalism and corrosion resistant. The interior shall be light colored, well lighted, simple, modern, and free from superficial design motifs. There shall be no sharp depressions or inaccessible areas, and it shall be easy to clean and maintain. Trim and attachment details shall be kept simple and unobtrusive. Interior trim shall be secured to avoid resonant vibrations under normal operational conditions.

Interior surfaces more than 10 inches below the lower edge of the side windows or windshield shall be shaped so that objects placed on them fall to the floor when the bus is parked on a level surface. With the exception of the Operators' area and dash, the entire interior shall be cleanable with a hose that utilizes a liquid soap attachment. Interior shall accommodate periodic usage of commercially available cleaning agents, solvents and other chemicals for graffiti cleaning and pest control. Any components and other electrical components within close proximity to these surfaces shall also be resistant to this cleaning method.

Additional anti-graffiti/vandalism treatments shall be applied to interior surfaces, subject to LACMTA approval during proposal period, to allow easy cleaning and removal of markings, adhesives, paint, scribing and etching on surfaces.

Interior surfaces, where possible, to be stainless steel or other vandalism resistant material.

TS 75. Interior Panels

Panels shall be easily replaceable and tamper-resistant. They shall be reinforced, as necessary, to resist vibration, denting, vandalism and other rigors of transit bus service. Individual trim panels and parts shall be interchangeable to the extent practicable.

Interior panel required to meet FMVSS 302.

Interior panels installed behind the exit door, (except for ceiling), shall be textured stainless steel only. Panels in other areas of the bus shall be stainless or other material as determined to best match appearance with the rear section of the bus subject to LACMTA approval during proposal period.

Fire Resistance

Materials shall comply with the Recommended Fire Safety Practices defined in FTA Docket 90-A, most recent revision.

TS 75.1 Driver Area Barrier

TS 75.1.1 Transit Bus

A barrier or bulkhead between the driver and the street-side front passenger seat shall be provided. The barrier shall minimize glare and reflections in the windshield directly in front of the barrier from interior lighting during night operation. Location and shape must permit full seat travel and reclining possibilities that can accommodate the shoulders of a 95th-percentile male. The partition shall have a side return and stanchion to prevent passenger from reaching the driver by standing behind the driver's seat. The lower area between the seat and enclosure must be accessible to the driver. The partition must be strong enough in conjunction with entire partition assembly for mounting of such equipment as flare kits, fire extinguishers (1.2 kg), microcomputer, public address amplifier, etc. Dark or black enclosures are preferred behind the driver's head. The enclosure should be isolated for noise control.

Wheel-Well-to-Ceiling Configuration of Driver's Barrier

The driver's barrier shall extend from the top of the wheel well to the ceiling the level of the seated driver and shall fit close to the bus side windows and wall to prevent passengers from reaching the driver or the driver's personal effects.

Driver's Area Barrier Door

A driver door of a ruggedized design intended for use in a transit bus environment shall be provided. It shall be a split door design. Upper and lower doors shall be opened or closed independently of each other. LACMTA may consider a single door with sliding glass. Each door, when closed, shall have a mechanism to latch from inside the operator compartment. Provision shall be made for emergency responders to gain access to a latched operator compartment. Door panels shall be standardized so that they are interchangeable from bus to bus. The door must allow access to all panels, dash and destination sign without requiring removal of the door.

The clear see-through AS2 polycarbonate panel or laminated safety glass in the driver door shall have no speaker holes. The clear panel shall resist clouding and discoloration by ultraviolet rays and by use of the cleaners currently in use at LACMTA.

The driver door shall minimize glare and reflections in the windshield directly in front of the barrier from interior lighting during night operation. It shall be installed in compliance with Driver Provisions, Controls and Instrumentation specified in TS 46 and any applicable ADA or safety standards.

The driver door shall not block boarding passengers from viewing the live display video monitor that is mounted above the driver's seat.

The driver door shall be supported by tapping plates in bus frame structure in order for the door to blend in with bus interior decor.

The farebox handrail and driver's paddle clipboard shall be designed and positioned so that the driver door will automatically latch upon closing without interfering with full farebox function while allowing mounting the farebox OCU, RAM dual pivot arm and driver's paddle clipboard in a manner that is ergonomic to an operator in the driver's seat.

With the bus on level ground, upper and lower doors, when open but not secured to the side, shall stay put where they are left, neither opening nor closing, without application of an external force. When closed, these doors shall not adversely impact the ingress and egress of passengers including those in a wheelchair or other mobility assistive device (i.e. fully ADA compliant). When fully open and secured, these doors shall be designed to minimize the impact on the ingress and egress of passengers including those in a wheelchair or other mobility assistive device.

The entire drive door assembly shall be replaceable in 30 minutes or less. The see-through panel in the barrier shall be replaced in 15 minutes or less using simple hand tools. Door hinges shall be a quick-release type to allow easy, rapid removal of the door panels.

TS 75.1.2 Commuter Bus

Not applicable.

TS 75.2 Modesty Panels

Sturdy divider panels constructed of durable, unpainted, stainless steel complementing the interior shall be provided to act as both a physical and visual barrier for seated passengers in front of each leading row of forward facing seats.

Design and installation of modesty panels located in front of forward-facing seats shall include a handhold or grab handle along its top edge. These dividers shall be mounted on the sidewall and shall project toward the

aisle no farther than passenger knee projection in longitudinal seats or the aisle side of the transverse seats. Modesty panels shall extend from at least the window opening of the side windows, and those forward of transverse seats shall extend downward to one and 1.5 inches above the floor. Panels forward of longitudinal seats shall extend to below the level of the seat cushion. Dividers positioned at the doorways shall provide no less than a 2.5 inches clearance between the modesty panel and a fully open, inward opening door, or the path of a deploying flip-out ramp to protect passengers from being pinched. Modesty panels installed at doorways shall be equipped with grab rails if passengers assist are not provided by other means.

The modesty panel and its mounting shall withstand a static force of 250 pounds applied to a four × four inch area in the center of the panel without permanent visible deformation.

At the rear door area a clear non-glass panel, with multiple layer protective film installed on both sides, from above the modesty panel to the top of the daylight opening and attached to the stanchion.

Modesty panels shall be bolted or riveted to handrails or installed in U-channels with self-locking nuts and securely attached to stanchion and body side. Modesty panels located at the forward edge of the upper floor area shall be attached along the top to handrails for added stiffness. Panels shall be attached to bottom extruded anodized aluminum rails for stiffness.

TS 75.3 Front End

The entire front end of the bus shall be sealed to prevent debris accumulation behind the dash and to prevent the driver's feet from kicking or fouling wiring and other equipment. The front end shall be free of protrusions that are hazardous to passengers standing at the front of the standee line area of the bus during rapid decelerations. Paneling across the front of the bus and any trim around the driver's compartment shall be formed metal or composite material. Composite dash panels shall be reinforced as necessary, vandal-resistant and replaceable. All colored, painted and plated parts forward of the driver's barrier shall be finished with a surface that reduces glare. Any mounted equipment must have provision to support the weight of equipment.

TS 75.4 Rear Bulkhead

The rear bulkhead and all rear interior surfaces, including air return grille, access doors and covers, with the exception of bus ceiling and enclosures adjacent to ceiling, shall be embossed stainless steel with "leather grain" finish. Ceiling and enclosures adjacent to ceiling shall be made of durable, corrosion resistant, easily cleanable material subject to LACMTA approval. Surfaces, other than ceiling, not made of stainless material shall be uniform in color and match lighting panels to the extent possible. Finish shall permit easy removal of paint, grease, fingerprints, and ink. They shall be designed and reinforced, as necessary, to resist vibration, denting, vandalism, and other rigors encountered in LACMTA service. The rear bulkhead paneling shall be contoured to fit the ceiling, side walls and seat backs so that any litter or trash will tend to fall to the floor or seating surface when the bus is on a level surface. Any air vents in this area shall be louvered to reduce airflow noise and to reduce the probability of trash or litter being thrown or drawn through the grille. If it is necessary to remove the panel to service components located on the rear bulkhead, the panel shall be hinged or shall be able to be easily removed and replaced. Grilles where access to or adjustment of equipment is required shall be heavy-duty and designed to minimize damage and limit unauthorized access. Unless otherwise specified, all wiring harnesses in the engine compartment shall terminate there for ease of replacement. Wire harnesses going through the bulkhead shall have a junction at the bulkhead.

TS 75.5 Headlining

Ceiling panels shall be made of durable, corrosion resistant, easily cleanable material subject to LACMTA approval during proposal period. Headlining shall be supported to prevent buckling, drumming or flexing and shall be secured without loose edges. Headlining materials shall be treated or insulated to prevent marks due to condensation where panels are in contact with metal members. Moldings and trim strips, as required to make the edges tamperproof, shall be stainless steel, aluminum or plastic, colored to complement the ceiling material. Headlining panels covering operational equipment mounted above the ceiling shall have an access panel installed to permit access to the equipment. Antenna access panel may be hinged or removable using

captive tamper proof screws. Individual head lining panels shall be easily replaceable by one mechanic using simple hand tools in a maximum of 30 minutes not including stanchion removal.

TS 75.6 Fastening

Interior panels shall be attached so that there are no exposed unfinished or rough edges or rough surfaces. Fasteners should be corrosion resistant. Panels and fasteners shall not be easily removable by passengers. Exposed interior fasteners should be minimized, and where required shall be tamper-resistant.

TS 75.7 Insulation

Any insulation material used between the inner and outer panels shall minimize the entry and/or retention of moisture. Insulation properties shall be unimpaired during the service life of the bus. The insulation material shall be non-hygroscopic, non-asbestos, and resistant to fungus and breeding of insects. Any insulation material used shall not absorb or retain oils or water and shall be designed to prevent casual damage that may occur during maintenance operations.

The combination of inner and outer panels on the sides, roof, wheel wells and ends of the bus, and any material used between these panels, shall provide a thermal insulation sufficient to meet the interior temperature requirements. The bus body shall be thoroughly sealed so that the driver or passengers cannot feel drafts during normal operations with the passenger doors closed.

FTA Docket 90-A

All insulation materials, except for insulation entirely enclosed from the passenger compartment, shall comply with the Recommended Fire Safety Practices defined in FTA Docket 90-A, most recent revision.

TS 75.8 Floor Covering

All interior floor areas shall be covered with a combination of gray colored smooth and ribbed slip resistant rubber or equivalent floor covering bonded to the subfloor that remains effective in all weather conditions with 12-year unconditional warranty, subject to LACMTA approval. The floor covering, as well as transitions of flooring materials from the main floor area and to the step areas shall be smooth and present no tripping hazards. The floor covering shall closely fit the sidewall cove or extend to the top of the cove. Floor covering applied to wheel housing may be separate pieces. To the extent practical, the center strip may be two-piece and shall extend from the rear seat between the aisle seats to the front standee line.

The floor covering in the entry area shall be ribs aligned transversely (perpendicular to the entrance door), and longitudinally (in line with the aisle), and shall be joined together smoothly. The integrally molded yellow standee line shall be integrally molded yellow at least two inches (± 1/8 inch) wide and shall have a consistent dimension across the bus aisle in line with the operator's barrier.

The floor covering in the passenger area shall match the flooring in the entry area. The center strip shall be ribs aligned with the aisle. At the rear door a separate ribbed strip as wide as the door opening shall extend from the center strip to the door with ribs aligned transversely (perpendicular to the door). The floor under the seats shall be covered with smooth surface flooring material. The floor covering shall closely fit the sidewall cove or extend to the top of the cove. The wheel housings may be separate pieces. The wheelchair parking area floor shall be covered with blue smooth flooring material that extends into adjacent senior seating areas.

Interior step treads (if required) shall be covered with ribbed flooring material or other non-slip flooring material. The first step shall be yellow, and the second (if needed) shall have two inches wide yellow nosing the full width of the tread, which is fully blended, into the tread material. Sides of the steps shall be the same color as the yellow nosing or rest of the floor, and fully sealed to prevent peeling, tripping hazards, and water intrusion. The edge of any interior steps shall have minimal overhang. Special coating for the step tread section may be acceptable subject to LACMTA approval during the Pre-Production meeting.

TS 75.9 Interior Lighting

Commercially available LED-type lamps shall be utilized at all interior lamp locations. The light source shall be located to minimize windshield glare, with distribution of the light focused primarily on the passengers' reading plane while casting sufficient light onto the advertising display. The lighting system may be designed to form part of or the entire air distribution duct. The lighting system shall meet FCC Part 18; Class A regulation for EMI conducted and radiated emissions.

TS 75.10 Passenger

An overhead LED lighting system shall provide general illumination in the passenger compartment. The lens material shall be translucent polycarbonate. Lenses shall be designed to effectively "mask" the light source. Lenses shall be sealed to inhibit incursion of dust and insects yet be easily removable for service. Access panels shall be provided to allow servicing of components located behind light panels. The entire light fixture shall be hinged to provide easy access to bus wiring and equipment mounted behind the light fixture. The fixture lens cover shall be easy to remove and clean and shall be retained by vandal resistant threaded screws.

Automatically Dimming First Row Lights

The first light on each side (behind the driver and the front door) is normally turned on only when the front door is opened, in "Night Run" and "Night Park" As soon as the door closes, these lights shall go out. These lights shall be turned on at any time if the switch is in the "On" position. Access to the wiring interconnects shall not require removing the fixture from the bus structure.

Dimming Second Row Lights

To help eliminate windshield reflection on suburban roads where street lighting is at a low level, the second light on each side, when "Night Run" or "Night Park" is selected, shall be controlled by the switch; off in "Off" and dimmed in "Normal." These lights shall be turned fully on at any time if the switch is in the "On" position.

The interior lighting design shall be subject to LACMTA approval during proposal period.

TS 75.11 Driver's Area

The driver's area shall have a light to provide general illumination, and it shall illuminate the half of the steering wheel nearest the driver to a minimum level of five foot-candles. This light shall be controlled by a switch that is convenient to the operator. The Operator's light shall be off when the Master Run Switch is in the "Off" position.

TS 75.12 Seating Areas (Transit Bus)

The interior lighting system shall provide a minimum 15 foot-candle illumination on a one square foot plane at an angle of 45 degrees from horizontal, centered 33 inches above the floor and 24 inches in front of the seat back at each seat position. Allowable average light level for the rear bench seats shall be seven-foot-candles.

TS 75.13 Seating Areas (Commuter Bus)

Not applicable.

TS 75.14 Vestibules/Doors (Transit Bus)

Floor surface in the aisles shall be a minimum of 10 foot-candles, and the vestibule area a minimum of four foot-candles with the front doors open and a minimum of two foot-candles with the front doors closed. The front entrance area and curb lights (if needed) shall illuminate when the front door is open and master run switch is in the "lights" positions. Rear exit area and curb lights shall illuminate when the rear door is unlocked.

TS 75.15 Vestibules/Doors (Commuter Bus)

Not applicable.

TS 75.16 Step Lighting

Step lighting for the intermediate steps between lower and upper floor levels shall be a minimum of four (4) foot-candles and shall illuminate in all engine run positions. The step lighting shall be low-profile to minimize tripping and snagging hazards for passengers and shall be shielded as necessary to protect passengers' eyes from glare.

Front and rear passenger door areas shall be lighted to meet ADA requirements.

When the Master Switch is in the "Night Run" position, the front and rear door area lights shall be on when the doors are open and off when the doors are closed.

TS 75.17 Ramp Lighting (Transit Bus)

Exterior and interior ramp lighting shall comply with CFR Part 49, Section 38.31.

Lights shall be provided at the doorway equipped with the wheelchair access system to floodlight the loading area.

Lighting for the ramp areas shall be designed to meet Title 13 and ADA and FMVSS 404 standards. Lighting shall be provided to effectively illuminate the ramp area. The light shall be wired through the ramp master toggle switch on the driver's dash and shall automatically illuminate when this switch is in the "On" position. The lighting design shall minimize the effect of glare on passengers entering the bus through the wheelchair ramp door. During ramp operation, the street surface shall be illuminated to a minimum of six candlepower a distance of three feet beyond the external dimensions of the ramp platform once deployed.

TS 75.18 Turntable Lighting (Articulated Bus)

Not applicable.

TS 75.19 Farebox Lighting

TS 75.19.1 Transit Bus

A light fixture shall be mounted in the ceiling above the farebox location. The fixture shall be capable of projecting a concentrated beam of light on the farebox. The light shall illuminate the top of the fare box and the surrounding floor area to a minimum of 15 foot-candles. This light will automatically come on whenever the front doors are opened and the run switch is in the "Night Run" or "Night Park" position. A by-pass switch shall be provided on the Operator's side console to keep the fare box light on when activated.

TS 75.19.2 Commuter Bus

Not applicable.

TS 76. Fare Collection

Space and structural provisions shall be made for installation of 41-inch GFI Genfare Odyssey Validation farebox and shall be as far forward as practicable. Location of the fare collection device shall not restrict traffic in the vestibule, including wheelchairs if a front door loading device is used, and shall allow the driver to easily reach the farebox controls and to view the fare register. The farebox shall not restrict access to the driver area, shall not restrict operation of driver controls and shall not — either by itself or in combination with stanchions, transfer mounting, cutting and punching equipment, or route destination signs — restrict the driver's field-of-view per SAE Recommended Practice J1050. The location and mounting of the fare collection device shall allow use, without restriction, by passengers. The farebox location shall permit accessibility to the vault for easy manual removal or attachment of suction devices. Meters and counters on the farebox shall be readable on a daily basis. The floor under the farebox shall be reinforced as necessary to provide a sturdy mounting platform and to prevent shaking of the farebox.

Adjacent to the farebox area and within easy reach of the Operator, Contractor shall provide a small clipboard approximately 4.5 inches by 5.5 inches to hold the operator schedule, (paddle).

The Contractor shall provide and install GFI Genfare Odyssey Validation farebox base plate, power leads and ITS interface cable, subject to LACMTA approval in Pre-Production meetings.

> **Note:** Proposers are to contact GFI Genfare directly to determine correct part numbers, harness length requirements, etc. The under floor reinforcement shall be of adequate strength to anchor the farebox using GFI installation kit D22581-0005 or equivalent. Reinforcement plate shall include permanently attached nuts to secure the farebox base plate to the floor.

A circuit breaker protected, 20-amp, 24-Volt DC battery circuit, shall be provided and powered through the battery connect switches. This power circuit shall include a grounded lead. A one-inch inside diameter waterproof conduit shall be provided from the ITS enclosure to the farebox base plate mounting location, through the bus floor, to protect the power leads and ITS interface cable, subject to LACMTA approval in Pre-Production meetings. Farebox end of conduit shall protrude above the floor at a minimum 1/2 inch to prevent moisture from entering the conduit.

TS 77. Interior Access Panels and Doors (Transit Bus)

Access for maintenance and replacement of equipment shall be provided by panels and doors that appear to be an integral part of the interior. Removal of fixtures or equipment unrelated to the repair task to gain access shall be precluded or used only subject to LACMTA approval in Pre-Production meetings. Access doors shall be hinged with gas props or over-center springs, where practical, to hold the doors out of the mechanic's way, subject to LACMTA approval during pre-production meetings. All overhead doors shall be hinged at the top and shall be prevented from coming loose or opening during transit service or in bus cleaning operations. Access doors, when opened, shall not restrict access for servicing other components or systems Retention of all interior access panels shall be with tamper proof screws. Panel fasteners shall be standardized so that only one tool is required to service all special fasteners within the Bus subject to LACMTA approval in Pre-Production meetings. All fasteners that retain access panels, excluding wheel well housing, and floor access panels, shall be captive in the cover. Removable light panels are not considered access panels unless specifically approved by LACMTA. Access doors in the Operators' area forward of the standee line (including the front door actuator compartment) shall be secured with hand screws or latches and shall prevent entry of mechanism lubricant into the Bus interior.

TS 77.1 Floor Panels

Access openings in the floor shall be sealed to prevent entry of fumes and water into the bus interior. Flooring material at or around access openings shall be flush with the floor and shall be edge-bound with stainless steel or another material that is acceptable to the LACMTA to prevent the edges from coming loose. Access openings shall be asymmetrical so that reinstalled flooring shall be properly aligned. Fasteners shall tighten flush with the floor.

The number of special fastener tools required for panel and access door fasteners shall be minimized.

PASSENGER ACCOMMODATIONS (TS 78-TS 82)

TS 78. Passenger Seating

TS 78.1 Arrangements and Seat Style (Transit Bus)

The passenger seating arrangement in the bus shall be such that seating capacity is maximized with a minimum of 38 seats, and in compliance to the following requirements:

> **Note:** The LACMTA recognizes that ramp location, foot room, hip-to-knee room, doorway type, width, seat construction, floor level type, seat spacing requirements, ramp or lift, number of wheelchair positions, etc. ultimately affect seating capacity and layout.

Forward-Facing Seat Configuration

Passenger seats shall be arranged in a transverse, forward-facing configuration, except at the wheel housings and turntable, if applicable, where aisle-facing seats may be arranged as appropriate with due regard for passenger access and comfort. Other areas where aisle-facing seats may be provided are at wheelchair securement areas and platforms (such as for fuel tank storage space). The first forward facing seats at the curbside and street side shall be designated as reserved seating for the senior, the blind and a person on a cane or crutch. All reserved seating shall use seat inserts covered with Blue Chips fabric.

Rear Seats

The rear seat assembly shall accommodate four or five passengers as needed to meet the minimum seating requirement. A maximum of three of the rear seat(s) shall be hinged to fully open for easy access to the engine compartment. The hinged seats shall latch in the closed position and be supported by a convenient prop in the open position.

USB Ports

The Type A USB device charging ports shall be provided for all seat locations. For transverse seats there shall be a dual port USB connector at double passenger seat locations, and a single port USB connector at the single passenger seat locations, mounted along the seat rails. At the rear settee there shall be a dual USB connector on each end of the settee positions along the seat rails. At the wheelchair flip up seat locations, a dual USB connector shall be positioned such that it is easily accessible with the seat in either wheelchair or seating position. On any fixed longitudinal seats, a single port USB connector per seat shall be located on the seat rail adjacent to the seat. The exact locations of the charging ports shall be reviewed and approved by LACMTA during Proposal period. The USB connectors shall include spring loaded access doors that provide dust and water resistance to IP 64 rating. The ports shall be powered only when engine is running and shall provide five volts at two amps minimum power.

TS 78.2 Rearward Facing Seats (Transit Bus)

Rearward facing seats not allowed.

TS 78.3 Turntable Seating (Articulated Bus)

Not applicable.

TS 78.4 Padded Inserts/Cushioned Seats (Transit Bus)

Non-Padded Inserts

The passenger seats shall be equipped with vandal-resistant non-padded inserts throughout the bus.

Non-Padded Seat Configuration

Seats inserts shall be securely attached and shall be detachable by means of a simple release mechanism so that they are easily removable by the maintenance staff but not by passengers. To the extent practicable, seat inserts shall be interchangeable throughout the bus. Materials shall have high resistance to tearing, flexing and wetting.

TS 78.5 Seat Back Fitness

Back Insert Seat Configuration

The seat back insert thickness shall not exceed one inch in the knee room area.

TS 78.6 Drain Hole in Seats

The bottom insert shall be fitted with a riveted drain hole.

TS 78.7 Arrangements and Seat Style (Commuter Bus)

Not applicable.

TS 78.8 Hip-to-Knee Room

Hip-to-knee room measured from the center of the seating position, from the front of one seat back horizontally across the highest part of the seat to vertical surface immediately in front, shall be a minimum of 26 inches. At all seating positions in paired transverse seats immediately behind other seating positions, hip-to-knee room shall be no less than 26 inches.

TS 78.9 Foot Room

Foot room, measured at the floor forward from a point vertically below the front of the seat cushion, shall be no less than 14 inches. Seats immediately behind the wheel housings and modesty panels may have foot room reduced.

TS 78.10 Aisles (Transit Bus)

The aisle between the seats shall be no less than 20 inches wide at seated passenger hip height. Seat backs shall be shaped to increase this dimension to no less than 24 inches at 32 inches above the floor (standing passenger hip height).

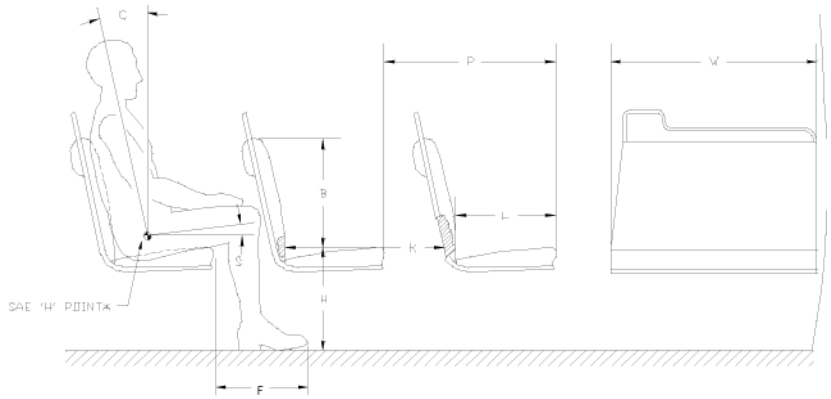
TS 78.11 Aisles (Commuter Bus)

Not applicable.

TS 78.12 Dimensions (Transit Bus)

FIGURE 7

Seating Dimensions and Standard Configuration



Seat dimensions for the various seating arrangements shall have the dimensions as follows (Refer to Figure 7):

- The width, W, of the two-passenger transverse seat shall be a minimum 35 inches.
- The length, L, shall be 17 inches, ±1 inch.
- The seat back height, B, shall be a minimum of 15 inches.
- The seat height, H, shall be 17 inches, ± one inch for the rear lounge (or settee) and longitudinal seats, and seats located above raised areas for storage of under-floor components, a cushion height of up to 18 inches, ± two inches, will be allowed. This shall also be allowed for limited transverse seats, but only with the expressed approval of the LACMTA during proposal period.
- Foot room = F.
- The seat cushion slope, S, shall be between five and 11 degrees.

- The seat back slope, C, shall be between eight and 17 degrees.
- Hip to knee room = K.
- The pitch, P, is shown as reference only.

TS 78.13 Structure and Design (Transit Bus)

The passenger seat frame and its supporting structure shall be constructed and mounted so that space under the seat is maximized and is completely free of obstructions to facilitate cleaning.

Seats, structures and restraints around the securement area should not infringe into the mobility device envelope or maneuverability.

The transverse seat structure shall be fully cantilevered from the sidewall with sufficient strength for the intended service. The lowest part of the seat assembly that is within 12 inches of the aisle shall be at least 10 inches above the floor.

In locations at which cantilevered installation is precluded by design and/or structure, other seat mounting may be allowed.

All transverse objects — including seat backs, modesty panels, and longitudinal seats — in front of forward-facing seats shall not impart a compressive load in excess of 1,000 pounds onto the femur of passengers ranging in size from a 5th-percentile female to a 95th-percentile male during a 10g deceleration of the bus. This deceleration shall peak at 0.05 to 0.015 seconds from initiation. Permanent deformation of the seat resulting from two 95th-percentile males striking the seat back during this 10g deceleration shall not exceed two inches, measured at the aisle side of the seat frame at height H. The seat back should not deflect more than 14 inches, measured at the top of the seat back, in a controlled manner to minimize passenger injury. Structural failure of any part of the seat or sidewall shall not introduce a laceration hazard.

The seat assembly shall withstand static vertical forces of 500 pounds applied to the top of the seat cushion in each seating position with less than ¼-inch permanent deformation in the seat or its mountings. The seat assembly shall withstand static horizontal forces of 500 pounds evenly distributed along the top of the seat back with less than ¼-inch permanent deformation in the seat or its mountings. The seat backs at the aisle position and at the window position shall withstand repeated impacts of two 40-pound sandbags without visible deterioration. One sandbag shall strike the front 40,000 times and the other sandbag shall strike the rear 40,000 times. Each sandbag shall be suspended on a 36-inch pendulum and shall strike the seat back 10,000 times each from distances of 6, 8, 10, and 12 inches Seats at both seating positions shall withstand 4,000 vertical drops of a 40-pound sandbag without visible deterioration. The sandbag shall be dropped 1,000 times each from heights of 6, 8, 10 and 12 inches. Seat cushions shall withstand 100,000 randomly positioned 3.5-inch drops of a squirming, 150 pounds, smooth-surfaced, buttocks-shaped striker with only minimal wear on the seat covering and no failures to seat structure or cushion suspension components.

The back of each transverse seat shall incorporate a handhold no less than ⅞ inch in diameter for standees and seat access/egress. The handhold shall not be a safety hazard during severe decelerations. The handhold shall extend above the seat back near the aisle so that standees shall have a convenient vertical assist, no less than four inches long that may be grasped with the full hand. This handhold shall not cause a standee using this assist to interfere with a seated 50th-percentile male passenger. The handhold shall also be usable by a 5th-percentile female, as well as by larger passengers, to assist with seat access/egress for either transverse seating position. The upper rear portion of the seat back and the seat back handhold immediately forward of transverse seats shall be padded and/or constructed of energy absorbing materials. During a 10g deceleration of the bus, the HIC number (as defined by SAE Standard J211a) shall not exceed 400 for passengers ranging in size from a 5th percentile female through a 95th percentile male.

The seat back handhold may be deleted from seats that do not have another transverse seat directly behind and where a vertical assist is provided.

Longitudinal seats shall be the same general design as transverse seats but without seat back handholds. Longitudinal seats may be mounted on the wheelhouses. Armrests shall be included on the ends of each set of longitudinal seats except on the forward end of a seat set that is immediately to the rear of a transverse seat, the driver's barrier, or a modesty panel, when these fixtures perform the function of restraining passengers from sliding forward off the seat. Armrests are not required on longitudinal seats located in the wheelchair parking area that fold up when the armrest on the adjacent fixed longitudinal seat is within 3.5 inches of the end of the seat cushion. Soft padded arm rests shall not be utilized. Armrests shall not be included in the design of forward facing seats. Armrests shall be located from seven to nine inches above the seat cushion surface. The area between the armrest and the seat cushion shall be closed by a barrier or panel. The top and sides of the armrests shall have a minimum width of one inch and shall be free from sharp protrusions that form a safety hazard.

Seat back handhold and armrests shall withstand static horizontal and vertical forces of 250 pounds applied anywhere along their length with less than ¼-inch permanent deformation. Seat back handhold and armrests shall withstand 25,000 impacts in each direction of a horizontal force of 125 pounds with less than ¼-inch permanent deformation and without visible deterioration.

TS 78.14 Structure and Design (Commuter Bus)

Not applicable.

TS 78.15 Construction and Materials (Transit Bus)

Passenger seats and supporting structure shall be stainless steel. Complete seat assemblies shall be interchangeable to the extent practical. Seats panels shall be brushed (180 grit polish) stainless steel and shall be attached to the seat frame with tamperproof fasteners. Surface texture shall be consistent throughout the seat material, with no visually exposed portion painted. All visually exposed metal of the standard seat structure including mounting brackets and other components shall be stainless steel.

The seats shall be contoured for individuality, lateral support, and maximum comfort and shall fit the framework to reduce exposed edges. Objects within any portion of the head or chest impact zone such as handholds and seat backs shall not have sharp corners or edges less than ¼-inch radius.

Selected materials shall minimize damage from vandalism and shall reduce cleaning time. The seats shall be attached to the frame with tamper-resistant fasteners and is subject to LACMTA approval in Pre-Production meetings. To the extent practical, seat inserts shall be interchangeable throughout the bus. Each seat insert shall be easily replaceable in less than one minute using simple hand tools and shall be demonstrated not to fail for a minimum of ten insert changes. The fabric material shall have high resistance to tearing, flexing, and wetting and the coloring shall be consistent throughout the seat material, with no visually exposed portion painted. Any exposed metal touching the sides or the floor of the bus shall be stainless steel. The seat, pads and cushions shall be contoured for individuality, lateral support and maximum comfort and shall fit the framework to reduce exposed edges.

The minimum radius of any part of the seat back, handhold or modesty panel in the head or chest impact zone shall be a nominal ¼-inch. The seat back and seat back handhold immediately forward of transverse seats shall be constructed of energy-absorbing materials to provide passenger protection and, in a severe crash, allow the passenger to deform the seating materials in the impact areas. Complete seat assemblies shall be interchangeable to the extent practicable.

Refer to Section TS 88.1 for seat fabric.

TS 78.16 Construction and Materials (Commuter Bus)

Not applicable.

TS 79. Passenger Assists (Transit Bus)

Passenger assists in the form of full grip, vertical stanchions or handholds shall be provided for the safety of standees and for ingress/egress. Passenger assists shall be convenient in location, shape, and size for both the 95th-percentile male and the 5th-percentile female standee. Starting from the entrance door and moving anywhere in the bus and out the exit door, a vertical assist shall be provided on the aisle side of each forward facing aisle seating position. The vertical assists on the first forward facing reserved seats at the curbside and street side shall include an easily cleaned tactile feedback surface for passengers, such as knurling. All handholds and stanchions at front doorway, around farebox, and at interior steps for bi-level designs shall be yellow PVC coated, yellow powder coated or yellow nylon coated. Coating shall be 3-mil minimum thickness. Six overhead grey grab straps are to be provided on each side of the wheelchair areas. Vertical assists shall additionally be provided toward the center of three and four passenger aisle facing seats attached to seat frame and overhead assist. Wheel housings not equipped with seats or equipment enclosure shall have a horizontal assist mounted on the top portion of the housing no more than seven inches higher than the wheel well housing.

The forward-most vertical stanchions on either side of the aisle immediately behind the driver's area shall be stainless steel finish.

TS 79.1 Assists (Transit Bus)

Excluding those mounted on the seats and doors, the assists shall have a cross-sectional diameter between 1¼ and 1.5 inches or shall provide an equivalent gripping surface with no corner radii less than ¼ inch. Assists shall extend from near the leading edge of the seat and shall be functionally continuous with the overhead assist. All passenger assists shall permit a full hand grip with no less than 1.5 inches of knuckle clearance around the assist. Passenger assists shall be designed to minimize catching or snagging of clothes or personal items and shall be capable of passing the NHTSA Drawstring Test.

A crash resulting in a one- foot intrusion shall not produce sharp edges, loose rails, or other potentially dangerous conditions associated with a lack of structural integrity of the assists.

Any joints in the assist structure shall be underneath supporting brackets and securely clamped to prevent passengers from moving or twisting the assists. Seat handholds may be of the same construction and finish as the seat frame. Door mounted passenger assists shall be of anodized aluminum, stainless steel or powder-coated metal. Connecting tees and angles may be powder-coated metal castings or molded plastic. Assists shall withstand a force of 300 pounds applied over a 12-inch lineal dimension in any direction normal to the assist without permanent visible deformation. Assists shall be provided on both sides of passenger doors to provide safe ingress and egress. All passenger assist components, including brackets, clamps, screw heads and other fasteners used on the passenger assists shall be designed to eliminate pinching, snagging and cutting hazards and shall be free from burrs or rough edges.

TS 79.2 Front Doorway

Front doors, or the entry area, shall be fitted with ADA-compliant assists and shall be no less than 0.75 inch in width. Assists shall be as far outward as practicable, but shall be located no farther inboard than six inches from the outside edge of the entrance step and shall be easily grasped by a 5th-percentile female boarding from street level. Door assists shall be functionally continuous with the horizontal front passenger assist and the vertical assist and the assists on the wheel housing or on the front modesty panel.

TS 79.3 Vestibule (Transit Bus)

The aisle side of the driver's barrier, the wheel housings, and when applicable the modesty panels shall be fitted with vertical passenger assists that are functionally continuous with the overhead assist and that extend to within 36 inches of the floor. These assists shall have sufficient clearance from the barrier to prevent inadvertent wedging of a passenger's arm.

A horizontal passenger assist shall be located across the front of the bus and shall prevent passengers from sustaining injuries on the fare collection device or windshield in the event of a sudden deceleration. Without restricting the vestibule space, the assist shall provide support for a boarding passenger from the front door through the fare collection procedure. Passengers shall be able to lean against the assist for security while paying fares. The assist shall be no less than 36 inches above the floor. The assists at the front of the bus shall be arranged to permit a 5th-percentile female passenger to easily reach from the door assist, to the front assist, to vertical assists on the driver's barrier, wheel housings or front modesty panel. The front assist should not impede wheelchair boarding and provide adequate clearance and access to the farebox during vaulting and maintenance.

TS 79.4 Rear Doorway(s) (Transit Bus)

Vertical assists that are functionally continuous with the overhead assist shall be provided at the aisle side of the transverse seat immediately forward of the rear door and on the aisle side of the rear door modesty panel(s). Passenger assists shall be provided on modesty panels that are functionally continuous with the rear door assists. Rear doors, or the exit area, shall be fitted with assists having a cross-sectional diameter between 1¼ and 1.5 inches or providing an equivalent gripping surface with no corner radii less than ¼ inch, and shall provide at least 1.5 inches of knuckle clearance between the assists and their mounting. The assists shall be designed to permit a 5th-percentile female to easily move from one assist to another during the entire exiting process. The assists shall be located no farther inboard than six inches from the outside edge of the rear doorway step.

TS 79.5 Overhead (Transit Bus)

Except forward of the standee line and at the rear door, a continuous, full grip, overhead assist shall be provided. The assist shall be convenient to standees anywhere in the Bus and shall be located over the center of the aisle seating position of the forward facing seats. The assist shall be no less than 70 inches above the floor and shall terminate at the rear bulkhead or curve up to the ceiling with a minimum six-inch radius.

Grab straps shall be vinyl fabric. A minimum of six grab straps or other extensions as necessary shall be provided for overhead sections above each wheelchair securement area for the use by passengers that cannot reach to 70 inches.

Overhead assists shall simultaneously support 150 pounds on any 12-inch length. No more than five percent of the full grip feature shall be lost due to assist supports.

TS 79.6 Longitudinal Seat Assists (Transit Bus)

Longitudinal seats shall have vertical assists located between every other designated seating position, except for seats that fold/flip up to accommodate wheelchair securement. Assists shall extend from near the leading edge of the seat and shall be functionally continuous with the overhead assist. Assists shall be staggered across the aisle from each other where practicable and shall be no more than 52 inches apart or functionally continuous for a 5th percentile female passenger. A vertical assist or grab rail shall be provided convenient to the outer rear settee seats if they are immediately behind an aisle facing seat subject to LACMTA approval in Pre-Production meetings.

TS 79.7 Wheel Housing Barriers/Assists (Transit Bus)

Unless passenger seating is provided on top of wheel housing, passenger assists shall be mounted around the exposed sides of the wheel housings no more than seven inches higher than the wheel well housing, (and propulsion compartments if applicable), which shall also be designed to prevent passengers from sitting on wheel housings. Such passenger assists shall also effectively retain items, such as bags and luggage, placed on top of wheel housing.

TS 80. Passenger Doors

TS 80.1 Transit Bus

Doors shall be fully electrically powered.

Doorways will be provided in the locations and styles as follows. Passenger doors and doorways shall comply with ADA requirements.

All passenger door components, except door panels and glazing, must come from one single manufacture, subject to LACMTA approval during proposal period.

TABLE 11
Door Locations and Styles

Front Door				
Location	Slide Glide	Double (Two-Piece Pantograph	Single (One-Piece Pantograph)	Outside Sliding Plug
Forward of the front wheels and under direct observation of the driver.	X			

Rear Doors(s)						
Location	Slide Glide	Outward Opening Swing With Manual Emergency Reset	Outward Opening Swing With Auto Emergency Reset	Double (Two-Piece Pantograph	Single (One-Piece Pantograph)	Outside Sliding Plug
Alternative 1: Curbside doorway centerline located rearward of the point midway between the front door centerline and the rearmost seat back.	X					X

TS 80.1.1 Front Door

Door shall be forward of the front wheels and under direct observation of the driver.

TS 80.1.2 Rear Door(s)

Curbside doorway centerline located rearward of the point midway between the front door centerline and the rearmost seat back.

TS 80.2 Commuter Bus

TS 80.2.1 Front door

Not applicable.

TS 80.3 Materials and Construction

Structure of the doors, their attachments, inside and outside trim panels and any mechanism exposed to the elements shall be durable and corrosion-resistant. Pantographic type passenger rear doors are not acceptable. Door panel construction shall be of corrosion-resistant metal or reinforced non-metallic composite materials. When fully opened, the doors shall provide a firm support and shall not be damaged if used as an assist by passengers during ingress or egress. Door edges shall be sealed to prevent infiltration of exterior moisture,

noise, dirt and air elements from entering the passenger compartment, to the maximum extent possible based on door types.

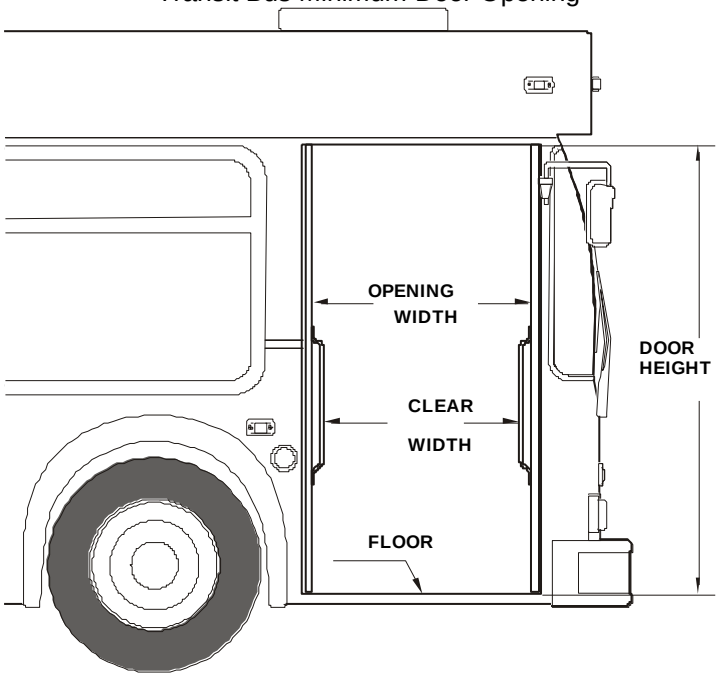
The closing edge of each door panel shall have no less than two inches of soft weather stripping. The doors, when closed, shall be effectively sealed, and the hard surfaces of the doors shall be at least four inches apart. The combined weather seal and window glazing elements of the front door shall not exceed 10 degrees of binocular obstruction of the driver's view through the closed door. The lower section of the rear door shall be solid and constructed of the same material as the door. The interior rear door surface below the door glass shall be protected by a replaceable stainless steel or aluminum "Kick Panel" that is easily replaceable with simple hand tools.

TS 80.4 Dimensions

TS 80.4.1 Transit Bus

FIGURE 8

Transit Bus Minimum Door Opening



When open, the doors shall leave an opening no less than 76 inches in height.

31¾-inch Minimum Doorway Clear Width

Front door clear width shall be a minimum of 31¾ inches with the doors fully opened.

Rear door opening clear width shall be a minimum of 24 inches with the doors fully opened.

TS 80.4.2 Commuter Bus

Not applicable.

TS 80.5 Door Glazing

The upper section of both front and rear doors shall be glazed for no less than 45 percent of the respective door opening area of each section. The lower section of the front door shall be glazed for no less than 25 percent of the door opening area of the section.

Door glazing shall be easily replaceable.

Zip type glazing rubber or quick change glazing exterior frame.

The front door glazing material shall have a minimum of 3/16-inch nominal thickness tempered safety glass. The material shall conform to the requirements of ANSI Z26.1-1996 Test Grouping 2 Safety Glazing Materials and the Recommended Practices defined in SAE J673. Tinting shall be blue or green to match the windshield.

The rear door panel glazing material shall have a nominal ¼-inch thick tempered glass conforming to the requirements of ANSI Z26.1 Test Grouping 2 and the Recommended Practices defined in SAE J673.

TS 80.6 Door Projection (Transit Bus)

TS 80.6.1 Exterior

The exterior projection of the front doors beyond the side of the bus shall be minimized and shall not block the line of sight of the rear exit door via the curb side mirror when the doors are fully open. The exterior projection of both doors shall be minimized and shall not exceed 13 inches during the opening or closing cycles or when doors are fully opened.

TS 80.6.2 Interior

Projection inside the bus shall not exceed 21 inches, cause an obstruction of the rear door mirror, or cause a hazard for standees.

TS 80.7 Door Height Above Pavement

It shall be possible to open and close either passenger door when the bus loaded to gross vehicle weight rating is not knelt and parked with the tires touching an eight-inch high curb on a street sloping toward the curb so that the street side wheels are five inches higher than the right side wheels.

When the bus is at operating level, opened doors shall be 14 to 16 inches above the ground.

TS 80.8 Closing Force

Closing door edge speed shall not exceed 12 inches per second, and opening door speed shall not exceed 19 inches per second. Power doors shall not slam closed under any circumstance, even if the door is obstructed during the closing cycle. If a door is obstructed during the closing cycle, the pressure exerted on the obstruction shall not increase once initial contact has been made.

Doors closed by a return spring or counterweight-type device shall be equipped with an obstruction-sensing device that, at a minimum, alerts the driver if an obstruction is detected between the closing doors. Doors closed by a return spring or counterweight type device, when unlocked, shall be capable of being pushed to the point where the door starts to open with a force not to exceed 25 pounds applied to the center edge of the forward door panel.

Whether or not the obstruction sensing system is present or functional, it shall be possible to withdraw a 1.5 inches diameter cylinder from between the center edges of a closed and locked door with an outward force not greater than 35 pounds.

The door system shall be designed in accordance with Title 13 of the California Administrative Code Section 1267.

TS 80.8.1 Rear Door Closing Force (Transit Bus)

Power-close rear doors shall be equipped with an obstruction-sensing system such that if an obstruction is within the path of the closing doors, the doors will stop and/or reverse direction prior to imparting a 10-pound

force on one sq. inch of that obstruction. A contactless obstruction sensing system shall also be employed, and it shall be capable of discriminating between the normal doorway environment and passengers or other obstructions within the doorway, and of altering the zones of detection based upon the operating state of the door system.

TS 80.9 Actuators

Doors shall open or close completely in 1.5 to 3 seconds from the time of control actuation and shall be subject to the closing force requirements.

Door actuators shall be adjustable so that the door opening and closing speeds can be independently adjustable to satisfy the above requirements. Actuators and the complex door mechanism shall be concealed from passengers but shall be easily accessible for servicing.

Door actuators and associated linkages shall maximize door holding forces in the fully open and fully closed positions to provide firm, non-rattling, non-fluttering door panels while minimizing the force exerted by the doors on an obstruction midway between the fully open and closed positions.

The rear door actuator(s) shall be under the control of the vehicle operator and shall open and close in response to the position of the driver's door control.

Doors that employ a "swing" or pantograph geometry and/or are closed by a return spring or counterweight-type device shall be equipped with a positive mechanical holding device that automatically engages and prevents the actuation mechanism from being back-driven from the fully closed position. The holding device shall be overcome only when the driver's door control is moved to an "Exit Door Enable" position and the vehicle is moving at a speed of less than 2 mph, or in the event of actuation of the emergency door release.

Locked doors shall require a force of more than 300 pounds to open manually. When the locked doors are manually forced to open, damage shall be limited to the bending of minor door linkage with no resulting damage to the doors, actuators or complex mechanism.

TS 80.9.1 Actuator (Commuter Bus)

Not applicable.

TS 80.9.2 Rear Door Interlocks (Transit Bus)

Refer to Section TS 38 "Interlocks" for door system interlock requirements.

TS 80.10 Emergency Operation

In the event of an emergency, it shall be possible to manually open doors designated as emergency exits from inside the bus using a force of no more than 25 pounds after actuating an unlocking device at the door. The unlocking device shall be clearly marked as an emergency-only device and shall require two distinct actions to actuate. The respective door emergency unlocking device shall be accessible from the doorway area. Activation of the emergency unlocking device shall cause the concurrent application of an interlock to stop the bus. The unlocking device shall be easily reset by the Operator without special tools or opening the door mechanism enclosure. Doors that are required to be classified as "Emergency Exits" shall meet the requirements of FMVSS 217.

In the event of power failure, the doors shall include a means of activating an unlocking device to allow entry from the outside of the bus using a special tool or key.

TS 80.11 Door Control

The door control shall be located in the Operator's area within the hand reach envelope described in SAE Recommended Practice J287, "Driver Hand Control Reach." The driver's door control shall provide tactile

feedback to indicate commanded door position and resist inadvertent door actuation. Door control shall be located on street side

TS 80.12 Door Controller

TS 80.12.1 Transit Bus

Five-Position Driver's Door Controller

The control device shall be protected from moisture. Mounting and location of the door control device handle shall be designed so that it is within comfortable, easy arm's reach of the seated driver. The door control device handle shall be free from interference by other equipment and have adequate clearance so as not to create a pinching hazard.

Position of the door control handle shall result in the following operation of the front and rear doors:

- **Center position:** Front door closed, rear door(s) closed or set to lock.
- **First position forward:** Front door open, rear door(s) closed or set to lock.
- **Second position forward:** Front door open, rear door(s) open or set to open.
- **First position back:** Front door closed, rear door(s) open or set to open.
- **Second position back:** Front door open, rear door(s) open or set to open.

TS 80.12.2 Commuter Bus

Not applicable.

TS 80.13 Door Open/Close

Operator-Controlled Front and Rear Doors

Operation of, and power to, the passenger doors shall be completely controlled by the Operator.

When the Master Control Switch is turned to the "Off" position and the bus is stopped with the parking brake applied the front door shall automatically open. When the Operator reenters the bus and turns the Master Control Switch to any position other than "Off", the door shall remain open until the door control handle is cycled back in the "Close" position and the parking brake is released. The front and rear doors shall remain in commanded state position even if power is removed or lost.

TS 81. Accessibility Provisions

Space and body structural provisions shall be provided at the front door of the bus to accommodate a wheelchair loading system for the widest spectrum of passengers including children, adults, the elderly, and the physically disabled. Buses shall conform to all applicable ADA regulations.

TS 81.1 Loading Systems

Bus shall utilize a low-floor fully-electrically operated preferably self-leveling wheelchair ramp system subject to LACMTA approval during proposal period.

TS 81.2 Lift

Heavy-Duty Ramp System

The wheelchair ramp control system must be capable of communicating with, and receiving commands from, vehicle multiplex system.

TS 81.3 Loading System for 30- to 60-foot Low-Floor Bus

Front Door Location of Loading System, Flip-Out Design Ramp with 1: 6 Slopes

The wheelchair loading system shall be located at the front door, with the preferably self-leveling ramp being of a simple hinged, flip-out type design being capable of deploying to the ground at a maximum 1:6 continuous slope.

An automatically-controlled, power-operated, ramp system designed to maintain minimum slope possible and compliant to requirements defined in 49 CFR Part 38, Subpart B, §38.23c shall provide ingress and egress quickly, safely and comfortably, both in forward and rearward directions, for a passenger in a wheelchair from a level street or curb.

In the stored position of the ramp, no tripping hazards shall be present, and any resulting gaps shall be minimized. The controls shall be simple to operate with no complex phasing operations required, and the loading system operation shall be under the surveillance and complete control of the driver. The bus shall be prevented from moving during the loading or unloading cycle by a throttle and brake interlock system. The loading system shall be inhibited from stowing/deploying when a passenger is on the ramp. A passenger departing or boarding via the ramp shall be able to easily obtain support by grasping the passenger assist located on the doors or other assists provided for this purpose. The system shall be designed to protect the ramp from damage and people on the sidewalk from injury during the lowering/raising phases of operation.

The loading platform shall be covered with a replaceable or renewable nonskid material and shall be fitted with devices to prevent the wheelchair from rolling off the sides during loading or unloading.

Deployment or storage of the ramp shall require no more than 15 seconds. The deployment function shall be capable of providing the minimum possible continuous slope by automatically aligning the inner and outer ramp surfaces. Each operation shall require continuous manual pressure to the momentary switch by the operator and shall not allow unintentional improper access system operation. The device shall function without failure or adjustment for 500 cycles or 5,000 miles in all-weather conditions on the design operating profile when activated once during the idle phase. A manual override system shall permit unloading a wheelchair and storing the device in the event of a primary power failure. The manual operation of the ramp shall not require more than 35 pounds of force. When manually activated the ramp shall not create a hazard for user through unintended movement of the ramp.

TS 81.4 Loading System for Level Boarding on a 45- to 60-foot Low-Floor BRT

Not applicable.

TS 81.5 Wheelchair Accommodations

General

Two wheelchair passenger parking spaces shall be provided, per applicable ADA regulations. Location of spaces shall be as close to the wheelchair ramp or system as practical. Two securement devices or systems shall secure the wheelchair or mobility aids facing toward the front of the vehicle. Two mobility aids shall face rearward.

Forward Facing

Forward facing wheelchair securement and occupant restraint systems shall be the QPod or approved equal, subject to LACMTA approval during proposal period, consisting of the self-tensioning, self- locking features on retractors, without tightening knobs. The retractors shall have the maximum amount of 7,000 pound red webbing attached to the large Transit “J” hooks.

> **Note:** If knobs are required for operation of the system being offered, it shall be indicated at time of bid submission.

Additional equipment, including passenger restraint seat belts and wheelchair securement devices complying with all applicable provisions of 49 CFR part 571, shall be provided for the two forward facing wheelchair passengers per ADA requirements, subject to LACMTA approval during proposal period.

Rear Facing

Additional wheelchair securement devices and seat belts complying with all applicable provisions of 49 CFR Part 571; shall be provided for the two rearward facing wheelchair passengers.

Optional Third and Fourth Wheelchair Accommodations

Pricing shall be submitted for optional additional third and fourth wheelchair parking spaces. The additional spaces shall be provided per applicable ADA regulations. Location of spaces shall be as close to the wheelchair ramp or system as practical. The additional securement devices or systems shall secure the wheelchair or mobility aids facing toward the front of the vehicle.

Forward facing wheelchair securement and occupant restraint systems shall be the QPod or approved equal, subject to LACMTA approval during proposal period, consisting of the self-tensioning, self- locking features on retractors, without tightening knobs. The retractors shall have the maximum amount of 7,000 pound red webbing attached to the large Transit “J” hooks.

> **Note:** If knobs are required for operation of the system being offered, it shall be indicated at time of bid submission.

Additional equipment, including passenger restraint seat belts and wheelchair securement devices complying with all applicable provisions of 49 CFR Part 571, shall be provided for the two forward facing wheelchair passengers per ADA requirements, subject to LACMTA approval during proposal period.

TS 81.5.1 Forward Facing Accommodations

The occupant restraints shall consist of the aisle side female retractor to be Automatic Locking Retractor [ALR] and the male or wall side retractor shall be Emergency Locking Retractor [ELR], equipped with a pin connector mounted on the tongue for attachment of the shoulder belt female fitting. The shoulder belt retractor shall be Emergency Locking Retractor [ELR], and equipped with a female pin connector, to attach to the male lap belt pin connector to form a Type 2-A lap and shoulder belt combination.

The securement system shall comply with the requirements of the Americans with Disabilities Act [ADA]. The system components shall be certified as being in compliance with the Society of Automotive Engineers, SAE J2249, Wheelchair Tie-Downs and Occupant Restraint Systems for use in Motor Vehicles.

Front Tie-Downs

The front retractors shall include a ratcheting mechanism. The retractors should be sized to accommodate large wheelchairs and be able to stabilize chairs of all types.

Rear Tie-Downs

The two rear retractors shall be equipped with a remote release, which operates both retractors simultaneously.

The retractors shall be mounted to the barrier. The spacing between the two retractors should be sized to accommodate all common wheelchairs, regardless of size.

Remote Release, Paddle Handle

The paddle handle remote release shall be mounted in either the front face of the barrier assembly, near the aisle side or in the forward facing flip-up seat bottom, near the aisle side, depending on the seating configuration.

Retractor Guards

Kick plates or retractor guards shall be installed to guard the retractors from being damaged or depressed by passengers seated behind or adjacent to the wheelchair area.

Guards must be of adequate strength to prevent bending or distortion when used as passenger footrests.

The system shall incorporate storage positions for the wheelchair tie-downs that allow easy access by users and keep the belts clear of the floor.

Occupant Restraints

The aisle side female lap belt retractor of ALR type should be mounted adjacent to or preferable on the same mounting bolt as the aisle side tie-down retractor. The red release lever should be accessible to the operator if release is necessary.

The wall side, male retractor of ELR type, should be mounted adjacent to or preferable on the same mounting bolt as the wall side tie-down retractor. This will ensure that the occupant lap belts may pass through the space between the wheelchair arms and backrest or between the backrest and seat bottom and be allowed to bear directly on the bony structure of the occupant's body or pelvic area.

Occupant restraints shall NOT be mounted in such a manner that belts must pass over wheelchair armrests, side panels, seat backs, barriers, through "D" rings, or other devices that will prevent the belts from following the proper path from the retractor to the occupant.

Male Lap Belt Stowage

A stowage device for the male lap belt Anchorage Adaptor should be mounted on the bottom of the side facing flip-up seat, to attach the male lap belt buckle or tongue when not in use. It should be mounted so it is easily accessible to the wheelchair occupant and/or the Operator.

Shoulder Belt

The shoulder belt retractor of ELR type should be mounted directly to the restraint assembly.

User Instructions

A durable metal instruction plate, describing the operation of the wheelchair securement and occupant restraint systems, shall be placed in an obvious location within the wheelchair securement area.

TS 81.5.2 Rear Facing Accommodations

The securement system shall be placed as near to the accessible entrance as practicable and shall have a clear floor area of 30 inches by 48 inches. Such space shall adjoin, and may overlap, an access path. Not more than six inches of the required clear floor space may be accommodated for footrests under another seat provided there is a minimum of nine inches from the floor to the lowest part of the seat overhanging the space. Fold down seats may be incorporated to accommodate other passengers when a wheelchair or mobility device is not occupying the area.

The securement system shall secure common wheelchairs and mobility aids and shall either be automatic or easily deployed by a person familiar with the system and mobility aid and having average dexterity.

The padded barrier shall extend from a height of 38 inches from the vehicle floor to a height of 56 inches from the vehicle floor with a width of 18 inches, laterally centered immediately in back of the seated individual. Fabric covering on the padded barrier shall be blue, subject to LACMTA approval. The barrier need not be solid provided equivalent protection is afforded.

TS 81.6 Interior Circulation

Maneuvering room inside the bus shall accommodate easy travel for a passenger in a wheelchair from the loading device and from the designated securement area. It shall be designed so that no portion of the wheelchair protrudes into the aisle of the bus when parked in the designated parking space(s). When the positions are fully utilized, an aisle space of no less than 14 inches shall be maintained. As a guide, no width dimension should be less than 34 inches. Areas requiring 90-degree turns of wheelchairs should have a clearance arc dimension no less than 45 inches, and in the parking area where 180-degree turns are expected, space should be clear in a full 60-inches diameter circle. A vertical clearance of 12 inches above the floor surface should be provided on the outside of turning areas for wheelchair footrest.

TS 82. Wheelchair Lifts (Commuter Bus)

TS 82.1 Lift

Not applicable.

TS 82.2 Lift Door

Not applicable.

TS 82.3 Lift Width

Not applicable.

TS 82.4 Lighting Requirements

Not applicable.

TS 82.5 Securement System

Not applicable.

TS 82.6 Roof Ventilation/Escape Hatches

One roof ventilator with lanyard / tether shall be provided and designed to perform as escape hatches in the roof of the bus. The ventilator shall be easily opened and closed manually. Ventilator with lever type release handle is not permitted. When open with the bus in motion, this ventilator shall provide fresh air inside the bus. The ventilator shall cover an opening area no less than 425 sq. inches. and shall be capable of being positioned as a scoop with either the leading or trailing edge open no less than four) inches, or with all four edges raised simultaneously to a height of no less than 3.5 inches. An escape hatch shall be incorporated into the roof ventilator. Roof ventilator shall be sealed to prevent entry of water when closed.

SIGNAGE AND COMMUNICATION (TS 83-TS 87)

TS 83. Destination Signs

An automatic electronic bright white LED destination sign system shall be furnished on the front, on the curbside near the front door, on the right-front windshield area and on the rear of the bus. The destination signs on the front and front curbside shall be bright white high definition. Display areas of destination signs shall be clearly visible in direct sunlight and/or at night. Sign system shall provide optimum visibility of the message display units for passengers and shall meet applicable ADA requirements.

The destination sign compartments shall meet the following minimum requirements:

- Compartments shall be designed to prevent condensation and entry of moisture and dirt.
- Compartments shall be designed to prevent fogging of both compartment window and glazing on unit itself.

- Access shall be provided to allow cleaning of inside compartment window and unit glazing, subject to LACMTA approval in Pre-Production meetings.
- Front window exterior display area shall be sized to allow full visibility of the front destination sign.

Destination signs shall be installed in such a manner as to facilitate easy access and replacement of the entire sign assembly, or components. Components such as electronic control modules shall be replaceable from inside the Bus. Where possible, parts shall be commercially available.

All signs shall be controlled via a single human-machine interface (HMI). In the absence of a single mobile data terminal (MDT), the HMI shall be conveniently located for the bus driver within reach of the seated driver.

The HMI shall include an Ethernet port. Alternatively, the designation sign devices shall be 802.11 Wi-Fi compliant.

Optional Full Color Destination Signs

Pricing for optional full color signs in; Front, Side, Rear and Run Number locations, shall be submitted on Price Form PF-1, Schedule of Optional Vehicle Configuration. The signs shall be capable of utilizing the full color spectrum for displaying characters and background with adjustable resolution to provide optimum clarity for passengers reading the messages. The color signs shall meet all sections of TS 83 requirements for white signs where applicable.

Front Destination Sign

The front destination sign shall have no less than 4,800 pixels, 24 rows by 200 columns, with a message display area of not less than 8.01 inches high by not less than 64.6 inches wide.

Side Destination Sign

Side display area shall have no less than 1,568 pixels, 14 rows by 112 columns with a message display area of not less than 4.3 inches high by not less than 41.6 inches wide. The sign located near the front door shall not block the driver’s critical horizontal line of sight.

Rear Route Number Sign

The route number display area shall have no less than 768 pixels, 16 rows by 48 columns with a message display area of not less than 6.1 inches high by not less than 17.0 inches wide. The rear route number sign shall be located a minimum of 90 inches above ground on the curb side rear corner of the Bus.

Destination Sign Control

Power to the sign system shall be controlled by the Bus "Master Run" switch. Sign system shall be operable in all switch positions except "Off".

Destination messages, route designations, and public relations messages shall be independently selectable via the Operator's Control Unit (OCU) which shall include a display monitor. The OCU shall communicate to the main processor board via a standard RS 485 serial bus and SAE J1708. Software shall be capable of programming 10,000 message lines. The number of public relations messages shall be limited only by the remaining number of message lines not used for destination purposes. The three-digit destination code shall accept all hexadecimal numbers (i.e. 0-9, A, B, C, D, E, & F).

The rear route number sign shall be controlled by the same OCU that operates the destination signs. The OCU display monitor readout shall show the exact information displayed on the destination signs and route number sign.

Sign displays shall have alternating message capability with programmable blanking time between message lines as may be required. Variable blanking times shall be programmable between 0.5 to 25 seconds in duration. Each line message or blanking time for each message shall be individually programmable. The

message display units shall incorporate an automatic blanking feature that will cause the display area to blank within 30 seconds of the bus master power switch being turned “Off”.

An emergency message shall be initiated by the closure, or opening, of a dry contact switch or relay. The emergency message shall be displayed on the exterior of the bus only. The OCU shall not display the emergency message. The destination sign shall automatically resume normal operation only after battery power to the destination sign system is removed and restored through the battery disconnect switch.

Destination Sign Programming

The electronic sign system shall be programmable via an integral connector located in the front destination sign area. Software shall be furnished for programming the sign system via an IBM compatible lap-top computer. Software shall be capable of providing a high degree of flexibility to create, or select preprogrammed, fonts and graphic displays. The sign shall have the capability of being programmed in the field using a PC or field programmer. Message program information shall be transferable to and/or from the field programmer device, via a USB 2.0 or better.

The LACMTA shall provide the Contractor with a complete listing of destination sign readings for initial sign programming by the manufacturer.

Run Number Sign

A three-character electronic run number display shall be provided at a LACMTA approved location in the right front windshield. All three character spaces shall have the capability to display 0, 1, 2, 3, 4, 5, 6, 7, 8, 9 and X readings.

TS 84. Passenger Information and Advertising (Transit Bus)

TS 84.1 Interior Displays

Provisions shall be made on the rear of the driver’s barrier or equipment box located on the wheel well for a frame to retain information such as routes and schedules.

A total of two information "Take One" boxes and one minimum “Take Twelve” unit shall be supplied. The “Take One” boxes shall be mounted at both the front and rear doors in convenient locations for passengers and the “Take Twelve” unit shall be located in a convenient location towards the front of the bus, subject to LACMTA approval in Pre-Production meetings.

Advertising media 11 inches high and 0.09 inch thick shall be retained near the juncture of the bus ceiling and sidewall. The retainers may be concave and shall support the media without adhesives. The media shall be illuminated by the interior light system.

TS 84.2 Exterior Displays

Not applicable.

TS 85. Passenger Stop Request/Exit Signal

TS 85.1 Transit Bus

A "Stop Requested" message shall be displayed on AVA message sign in yellow or amber LED when the passenger "Stop Requested" signal system is activated. The "Stop Requested" message shall remain visible until one or both passenger doors are opened. The message shall be visible to the seated passengers. A switch to deactivate the signal system shall be provided on the Operator’s control panel.

A minimum of 12 wireless stop request signal buttons utilizing a yellow housing shall be evenly distributed in the passenger cabin to be functionally accessible to all seated passengers subject to LACMTA approval in Pre-Production meetings. The buttons shall not incorporate internal battery power to operate and shall include, as part of the system, a means to easily troubleshoot failures. Of those, one each stop request button shall be

located after the standee line above the front wheel wells on the vertical stanchion and on the ITS enclosure. Stop Request buttons in the ADA and senior seating areas shall be located 45 inches above the floor. Two additional Stop Request buttons shall be placed in senior seating area.

TS 85.2 Commuter Bus

Not applicable.

TS 85.3 Signal Chime

TS 85.3.1 Transit Bus

A single “Stop Requested” chime shall sound when the system is first activated. A double chime shall sound anytime the system is activated from wheelchair passenger areas.

Buttons for exit signals located in the wheelchair and senior passenger areas shall be no higher than four feet above the floor. Instructions shall be provided to clearly indicate function and operation of the exit signals.

TS 85.3.2 Commuter Bus

Not applicable.

TS 86. Communications

An equipment enclosure shall be provided to accommodate installation of LACMTA provided equipment, such as the LACMTA’s radio system and future ITS equipment. The ITS enclosure shall include a minimum of four modular slide out trays which are easily removable and can be repositioned to accommodate changes in equipment position as needed. The existing ATMS radio requires a clear space above the bottom slide out tray with a minimum of 15 inches high, 19.5 inches wide, and 25 inches deep. The clear space above the second and third slide out trays shall be sized to accommodate Contractor supplied DVR and other equipment. Unless otherwise specified, additional ITS equipment provided and installed by the Contractor shall also be installed within the ITS enclosure. The enclosure shall be located directly behind the Operator's area on the street side wheel housing.

The ITS enclosure shall be as large as practical to facilitate future expansion of ITS equipment. The ITS enclosure shall be splash-proof and properly ventilated when the service door is secured. Slide out trays shall incorporate heavy-duty slide or roller mechanism to support a minimum of 150 pounds of loading and shall be able to withstand the normal shock and vibration, (under full load) experienced in LACMTA revenue service, without damage to the locks, slide or roller mechanisms. Slide out trays shall have locking mechanisms which automatically lock the trays in the stored and extended positions. Once a tray is locked, slides shall not have any horizontal play. L-shaped aluminum plate shall be mounted on the bottom tray to secure ITS equipment. LACMTA shall provide sample slide out trays with L-shaped plate during Pre-Production meetings.

Service light(s) with suitable switch shall be provided within the enclosure, subject to LACMTA approval in Pre-Production meetings. The Contractor shall provide 12-volt power outlet in the ITS Compartment.

Communication System Integration

All bus subsystems shall be integrated to the maximum extent feasible with Metro’s existing on-board communication systems. This may include using J1708 and J1939 CAN-Bus vehicle network, Wi-Fi and cell modem(s), Bluetooth, or Metro’s ATMS voice and data radio VHF communication system. Sub-systems should avoid using designs that require the use of new, stand alone, dedicated and/or proprietary communication networks. Sub-systems should also avoid using fee based subscription services for communication or data processing. Other factors being equal, preference will be given to subsystems that take advantage of existing Metro vehicle communication infrastructure and management systems.

All on-board systems that use a date/time stamp for incident or fault code tracking should be designed to automatically synchronize with other on-board systems through a recognized communication standard such as

SAE J1939, and/or be synchronized to the recognized standard for time synchronization (such as “GPS” time). To the extent practical, when a GPS reference is used, the various systems shall share a common antenna or signal.

TS 86.1 Camera Surveillance System

An automatic digital video recording system shall be provided powered directly from batteries, bypassing the Master Battery Disconnect Switch(es), to operate (record images) at all times with the Master Control Switch in any position except "Off”. The system shall operate up to one hour (independently programmable) after the Master Switch is turned off. The system shall be self-initiating and operate at any time, with the Master switch in any position, including “Off”, if triggered by the activation of the Bus SAS. When triggered, the system shall tag images (write protect) to prevent overwrite.

All cameras must automatically adjust to light changes to capture images that have sufficient clarity at night, with bus lights on and off. A day-to-night demonstration shall be required to establish camera performance and final placement for optimum views and clarity. The LACMTA shall witness the demonstration and approve the final placement of the cameras. This demonstration must be successfully completed prior to approval of the Pilot Bus(es).

The types (part numbers), of cameras shall be minimized with a single camera type for interior, and a single camera type for exterior of Bus. Exceptions to this requirement shall be considered on a case-by-case basis during Pre-Production meetings.

Interior Cameras

The camera housing shall be vandal resistant but allow access for routine servicing. Field of view of the cameras shall be adjusted with a 60 degree vertical and 60 degree horizontal without relocating the camera. Each camera shall be IP type color images. Front interior camera(s) at front door passenger boarding area shall record audio subject to LACMTA approval during Pre-Production meetings.

Cameras shall be placed for best recording of the following five areas:

a) Forward 1/3 of passenger area, view of front vestibule, farebox transactions and field-of-view to include Operator and image of bus number located on Operator’s barrier.
b) Front door, passenger boarding.
c) Rear door, passenger exiting.
d) Middle 1/3 passenger area.
e) Rear 1/3 passenger seating area starting from behind rear door with a primary emphasis on the rearmost seats.

Interior Camera Monitors

A video monitoring system including two, color, LCD video monitors with a minimum 15 inch diagonal dimension and all necessary brackets, cabling and other equipment needed for installation shall be provided to allow passengers easy viewing of video images captured by existing interior bus cameras. Monitors and equipment shall be installed in compliance with Driver Provisions, Controls and Instrumentation (Refer to Sections TS 46 -TS 48) and any applicable ADA or safety standards.

The first monitor shall be mounted above the driver’s area facing the entrance door and display a live video feed of the passengers boarding the bus.

The second monitor shall be mounted in passenger area of the bus facing the rear of the bus and display a live video feed of the passengers riding on the bus including those in wheelchair securement areas.

The monitors shall be of a ruggedized design intended for use in a transit bus environment including suitable protection from overvoltage and spikes generated from jump starts, shorts, etc. Monitors and equipment shall

not be installed in a manner or located such that the performance or life of the components or system will be shortened when operating within the design operating profile.

Monitors shall include a replaceable shield or durable film over the monitor screens to protect them from vandalism. This sacrificial layer shall be replaceable in 5e minutes or less using simple hand tools.

Monitor enclosures and screens shall not be affected by periodic cleaning using commercially available cleaning agents, solvents and other chemicals used for removal of graffiti.

Exterior Cameras

Cameras shall be IP type, rated for water spray and submersion, (IP65 and IP67), housed in impact resistant, moisture resistant, low profile housings which do not protrude more than 2.5 inches from the bus body. If used, a cover placed over the camera lens shall be glass. Curbside camera housings shall be ruggedized to protect from impacts with trees and other objects encountered during routine service. This shall include a supplemental metal shield if necessary to meet this requirement. The camera circuitry and lens shall be easily replaceable from inside the bus or by removing the housing from outside the bus using common hand tools. Camera positions and adjustment are subject to LACMTA approval at Pilot Bus. Reusable waterproof seals to prevent water damage to the camera and circuitry shall be provided which will not require the use of additional sealant such as silicon after servicing the camera. The system shall be designed or configured such that the failure of any individual camera will not affect operation of the remaining cameras.

Cameras shall be placed for best recording of the following four areas:

a) Forward looking through windshield (Accident Surveillance)
b) The curb side area of the bus, (including exit door), and street from 10 feet beyond front bumper to 10 feet beyond rear bumper
c) Street side area of the bus and street from ten feet beyond the front bumper to 10 feet beyond the rear bumper
d) Rear camera shall view the ground behind the bus from the bumper to approximately 25 feet back when gear select is placed in “Reverse” position.

Forward Accident Surveillance Camera

The forward looking surveillance camera shall be positioned to obtain images of the exterior front of the bus and forward approximately 100 feet of roadway to record images in the event of an accident.

Camera Monitor

Dash mounted monitor for viewing of selected camera images when; gear selector is placed in “Reverse” or passenger doors are open. Monitor shall be user configurable and capable of simultaneous display of images from multiple cameras. Final monitor configuration is subject to LACMTA approval during Pre-Production meetings

Central Processor

The video security system central processor shall be packaged in a suitable ventilated, shock mounted and splash resistant enclosure keyed to LACMTA standards, located within the ITS enclosure, subject to LACMTA approval in Pre-Production meetings. Images shall be stored by the system on a removable mobile rated hard drive provided with a security lock typical to the existing LACMTA base station.

Images stored on the hard drive shall be organized for automatic transmittal via a digital modem. The hard drive shall have capacity to store a minimum of 240 images per second for 30 continuous days (18 hours per day) before automatic overwrite occurs.

The DVR shall be capable of recording in multiple formats including JPEG and in H.264 compression with up to D1 resolution to avoid loss of detail on zoomed images. The DVR must be able to switch record rate,

compression and resolution seamlessly without loss of video during transition. System shall be capable of accepting both analog NTSC and high definition wide dynamic range IP cameras.

All image requests and subsequent downloaded files shall have the capability to be stored on a hard drive. The hard drive shall be easily removed and video files viewed at a separate location equipped with the same drive mechanism.

System Management Tool

Central Processor shall utilize GPS data to synchronize system time and tag video files with location coordinates allowing files to be searched on a geographic location basis using the System Management Tool. Camera Surveillance System shall utilize a WLAN compatible with wireless networks in use at LACMTA divisions and shall incorporate a system management tool for; wireless download of video files in a timely manner, software upgrades, camera checks, configuration changes and health reports as required. Final configuration is subject to LACMTA approval in Pre-Production meetings.

System management tool shall be a virtual implementation and provide expansion capability including compatibility with existing video management applications at LACMTA.

In addition, System Management Tool shall**:**

- Be configured to run in Master-Slave mode under Virtual Box.
- Provide the ability to replicate user accounts and passwords from Master to Slave.
- Include provisions for future application authentication to Metro Microsoft Active Directory.
- Allow user management at Master server and all Slave servers with inherent accounts from Master.
- Backup the restore virtual image via the host operating system to last backup state.
- Support Metro Enterprise backup and archive management tools such as IBM Tivoli.
- Support use of Metro's MS Windows 2008 R2 approval image on host servers with Metro domain and security policies.
- Allow NAS storage at remote sites.
- Include OS and application security and patch management process.
- Be optimized for hardware utilization in shared computing resources with Orbital DIS.

Given the current Metro wireless specification, Camera Surveillance System shall be able to wirelessly download 30 minutes of video in less than 30 minutes.

WLAN shall also be capable of transmitting encrypted video images or files on a real-time basis to a laptop PC held by law enforcement personal adjacent to or behind the bus. DVR status and event data shall also be made available through J1708/1587 interface to ATMS VAN. DVR shall be individually programmable to record each camera sequentially.

The system management tool for use at up to 13 LACMTA operating divisions shall be provided, subject to LACMTA approval in Pre-production meetings.

Enhanced Video Recording System Option

Pricing for optional features to enhance the video recording system shall be provided on Price Form PF-1, Schedule of Optional Vehicle Configuration. The features shall include items listed below along with any other enhancements that Contractor believes would improve functionality and ease of use for the video recording system.

- Ability of video system to analyze and discern events such as wheelchair passengers and generate report information with summary data such as wheelchair passenger count and boarding/alighting locations, subject to LACMTA approval.
- The ability to utilize the dash mounted display for diagnostic work or configuration changes on the DVR.
- Incorporation of a 360 degree camera(s) for better surveillance of bus interior.

TS 86.2 Public Address System

Contractor shall install a public address (PA) system which enables the Operator to perform audible announcements. A switch shall be provided to allow the Operator to select announcements either inside, outside, or both. The location of the gooseneck microphone is subject to LACMTA approval in Pre-Production meetings.

PA Amplifier

The PA amplifier shall be supplied in the ITS compartment convenient for adjustments (Refer to Section TS 88.1 Approved Equals). The amplifier shall be supplied with a 12-volt DC switched service. The amplifying system shall be balanced such that no adjustment of volume is necessary when switching from inside to outside. The system shall automatically mute when not in use.

Gooseneck Microphone

A microphone shall be mounted on a heavy-duty black anti-glare gooseneck with quick release input jack. The gooseneck microphone shall be mounted in a position to allow the operators' to comfortably speak without using their hands. The microphone, when deployed, shall remain stable in its' position and be easily adjusted by the Operator to reach approximately four inches from their mouth, in all normal seat adjustment positions. A strain relief (p-clip or equal) shall be installed near the base as needed to prevent a gooseneck failure when the microphone is pulled to its adjustment limit. A padded bracket shall be provided to support the gooseneck when not in use.

TS 86.2.1 Speakers

Interior and exterior speakers shall be of sufficient capacity to ensure that they are not damaged when full amplified power is applied. Inside speakers shall broadcast, in a clear tone, announcements that are clearly perceived from all seat positions at approximately the same volume level. Speakers shall be located in the light panel/HVAC duct to deter vandalism. The speakers shall not be mounted directly on the surface of the ceiling panels. A weather-proof speaker(s) shall be provided outside the bus so that announcements can be clearly heard by passengers standing near the door equipped with the wheelchair access. Interior loudspeakers shall be installed with proper phasing. Total impedance seen at the input connecting end shall be 4 to 8 Ohms. Mounting shall be accomplished with riv-nuts and machine screws.

Speaker wires from each individual speaker (inside and outside) shall terminate in the ITS enclosure.

TS 86.3 Automatic Passenger Counter (APC)

Provisions and necessary cables for installation of door sensors and analyzer(s) for IRMA-Matrix with J1708 infrared APC system; including software integration, testing, first article acceptance and any other items necessary for proper operation shall be provided, subject to LACMTA approval in Pre-Production meetings.

TS 86.4 Radio Handset and Control System

Make Ready Provisions

The Contractor shall provide "Make Ready Provisions" that will accommodate post-delivery installation of LACMTA provided equipment such as radio and future Intelligent Transportation System (ITS) equipment. Detail design of the ITS Make Ready Provisions shall be finalized during Pre-Production meetings and Pilot Bus build. Make Ready Provisions shall be approved by the LACMTA prior to start of production. The provisions shall include specified equipment, (such as antennas and preinstalled cabling), space for LACMTA provided ITS equipment, power supply circuits, conduit system, and structural mounting provisions.

The following devices are to be included in the LACMTA's ITS system for installation by the LACMTA after delivery of the bus:

a) Voice Radio.
b) Data Radio.

~~c)~~ AVA System Processor (Part of In Vehicle Unit (IVU)).
d) Automatic Passenger Counting (APC) Processor.
e) Automatic Passenger Counting (APC) Door Sensors.
f) J1708 Vehicle Area Network Controller (Part of IVU)
g) Driver Control Module (DCM).
h) Automatic Vehicle Locator (AVL) Processor (Part of IVU).

TS 86.4.1 Drivers Speaker

Not applicable.

TS 86.4.2 Handset

Contractor will supply and install a handset for driver use. (Refer to Section TS 88.1 Approved Equals).

TS 86.4.3 Driver Control Module (DCM)

Space and mounting provisions shall be provided for an ATMS Driver Control Module (DCM) (Orbital Sciences 111240-1DCM). The DCM installation provisions shall appear as an integral part of the operator area design. The location of the DCM shall provide the Operator with a free and unobstructed view of the DCM controls/display and be within easy reach of the Operator. The DCM shall be positioned to minimize glare and maximize readability in all lighting conditions and Operator seat positions.

Provisions for the DCM shall accommodate the following specifications:

TABLE 12
DCM Specifications

Property	Specification
Maximum height:	8 inches
Maximum width:	8.7 inches
Maximum depth:	3.1 inches
Housing:	Splash proof and UV resistant
Shock tolerance:	18g for 3 ms
Vibration tolerance:	4g peak rms @ 5 to 150 Hz

Contractor shall install a driver display unit as close to the driver's instrument panel as possible.

TS 86.4.4 Emergency Alarm

Contractor shall install an emergency alarm that is accessible to the driver but hidden from view. The guarded Silent Alarm System (SAS) switch shall be mounted on control panel located to the left of seated Operator, (Refer to Section TS 88.1 Approved Equals). The four-corner clearance lamps shall flash when the SAS is activated. Two 16ga leads, (color to be determined during Pre-Production meetings), shall be wired to the normally closed SAS switch terminals and routed to the ITS Equipment enclosure. SAS switch location and lead wire routing is subject to LACMTA approval in Pre-Production meetings.

TS 86.5 ITS Provisions Power Supply

The ITS enclosure shall be provided with protected power buss circuits for the future LACMTA installed ITS equipment. These power requirements are in addition to Contractor provided equipment power requirements. Each power buss will include mounting provisions for up to six individual manual resetting circuit breakers for branch circuits feeding equipment located within the enclosure.

TABLE 13
ITS Power Provisions

Source	Volt	Circuit	Quantity
Through Battery Disconnect Switch(es)	12	20-amp, DC	1
	24	20-amp, DC	1
	Gnd	Return for 20 amp circuits	1
Ignition	12	10-amp, DC multiplex controlled circuit.	2
	24	10-amp, DC multiplex controlled circuit.	2
	Gnd	Return for switched circuits	2

TS 86.6 ITS Provisions Conduits

A system of pre-installed "ITS conduits" will be provided to assist with future installation and replacement of wiring and cabling associated with the LACMTA's ITS equipment listed in TS 86.4. ITS Conduits, in conjunction with existing bus wire ways, will be required where future LACMTA installation and replacement of cabling is not practical due to obstructions from items such as interior paneling, bus structure or other assemblies. In general, conduits exposed to the interior of the bus shall be water tight and have a minimum 1.5 inch inside diameter and be routed to permit pulling cables, including connectors, through the conduits using a preinstalled "pull wire". Conduits will be terminated at the ITS enclosure using suitable reusable water tight fittings. Conduit installation shall follow best commercial practices with regard to drip loops and routing to avoid moisture problems.

Conduits, in conjunction with existing bus wire ways, shall permit interconnection of ITS sub-systems and devices as follows:

TABLE 14
ITS Conduits

From	Termination
Antenna, Data Radio Transceiver	ITS Enclosure
Antenna, GPS Receiver	ITS Enclosure
Antenna, Voice Radio Transceiver	ITS Enclosure
Antenna, Wireless LAN	ITS Enclosure
Antenna, Two spare positions	ITS Enclosure
APC Door Sensors, Front Door	ITS Enclosure
APC Door Sensors, Rear Door	ITS Enclosure
Engine Control Processor	ITS Enclosure
Exterior Speaker	ITS Enclosure
Farebox	ITS Enclosure, 1" ID
Front Dash	ITS Enclosure
Head sign Compartment	Front Dash
Interior Information Sign, Front	ITS Enclosure
Interior Information Sign, Rear	ITS Enclosure
Interior Speakers	ITS Enclosure

Operator Control Unit, Operator Dash	ITS Enclosure
PLC Compartment	ITS Enclosure
Radio Control Head	ITS Enclosure, 2 ¼ “ ID
Security System Processor	ITS Enclosure
Transmission Control Processor	ITS Enclosure
Upper Center Windshield	ITS Enclosure, 1-1/2” ID

TS 86.7 Provisions, Automated Vehicle Announcement (AVA) System

Structural provisions and necessary cables shall be provided in the ceiling to install two AVA signs constructed to withstand the heavy-duty environmental and service conditions found in transit operations. The front sign shall be located near the standee line. The rear double-sided sign shall be positioned adjacent to the exit door and forward of the interior steps.

Both the front and rear double-sided signs shall be installed by Contractor.

TS 86.8 ITS Provisions, Wireless Local Area Network (WLAN)

WLAN antenna, including five leads; two Cellular, two Wi-Fi and one GPS and an additional Wi-Fi antenna inside the bus for passenger. Sierra Wireless, InMotion MG90 or an approved equal wireless router/switch and feedline shall be installed, subject to LACMTA approval in Pre-Production meetings. (Refer to Section TS 88.1 Approved Equals). Router shall include gateway activation and client license fees as well as preferred AS, AMM with 3-year and group 2 per gateway. Power for wireless router/switch shall be independently timed by the router to allow automatic turn-off one hour or more after bus is parked as a configurable feature of the router.

TS 86.9 ITS Provisions, Radio Antennas

Provide two Antenna Specialists (508 MHz and 900 MHz) radio antennas for voice and data radios. The antennas should have a feedline of RG-142 signal loss and physical quality specifications or better. The antennas shall be attached to the roof with antenna leads routed through 3/4-inch inside diameter conduits to the ITS enclosure. Antenna leads shall be type RG142 coaxial cable connected at the antenna by a soldered type N connector and 90-degree type N adapter with a minimum four-inch service loop. A type N soldered connector and a RG142 reducer shall be supplied for the radio connections in the ITS enclosure. The antenna mounting and lead termination shall be accessible from the Bus interior, subject to LACMTA approval in Pre-Production meetings. Antennas shall not be painted. (Refer to Section TS 88.1 Approved Equals).

TS 86.10 ITS Provisions, Global Positioning System (GPS)

A Global Positioning Satellite (GPS) Antenna and feedline shall be provided. The GPS Antenna shall be mounted on the centerline of the roof of the bus near the front, with a quick connector, within two feet from the antenna, for future replacement, subject to LACMTA approval in Pre-Production meetings. Refer to Section TS 88.1 Approved Equals.

TS 86.11 ITS Provisions, Incident Based Surveillance System (IBSS)

Complete mounting provisions, modules and necessary cables for the most current LACMTA IBSS, (SmartDrive), shall be provided running from the center windshield area to the ITS enclosure, permitting installation of EDR and completion of system by the bus manufacturer**.** All modules including SmartDrive SR3 for EDR shall be supplied by Contractor through existing SmartDrive Contract for installation by Bus manufacturer. Battery and ignition power and a separate J1939 communication connection shall be supplied in the ITS enclosure, subject to LACMTA approval in Pre-Production meetings.

TS 87. Event Data Recorder (EDR)

EDR shall be installed on the bus. The unit shall be installed as low as possible. The EDR shall be able to communicate over the Jl939 CAN line and shall be equipped with three-axis accelerometer. The system shall be capable of recording available fault codes including DM1 messages. Settings are to be finalized with the LACMTA during Pre-Production. The EDR shall broadcast via the Jl939 data communication link severe impact events to the vehicle monitoring system and also trigger an event in the camera system. The EDR shall also tag an event from a signal received over the Jl939 CAN line from the silent alarm switch signal and the camera event button and in turn broadcast these events to the vehicle monitoring system. The EDR shall also record the following operational data:

- Head lights on or off.
- Turn signals and hazard lights on or off.
- Ignition on or off.
- Low air pressure warning.
- Whether moving in forward or reverse or idling.
- Parking brake is on or off.
- Retarder switch on or off
- Brakes – Stopping Distance
- Vehicle Acceleration/Deceleration
- HVAC operating information
- Entrance and Exit Doors operating information.

TS 88. Appendix

TS 88.1 Approved Equals

The following table lists products which have been approved for the bus procurement. The list only contains products which are of interest to the LACMTA and is not intended to be a comprehensive listing of every product which is required for the manufacture of the subject buses. Product categories not listed are left to the discretion of the Contractor so long as the product complies with the specifications. Product specification information is for reference only and may not reflect the latest or future improvements by manufacturers. Any change, revision, or substitution of specified products requires approval of the LACMTA. To add to or revise this list, Contractor must submit a written request per the Specification by the due date found in the RFP for approved equals.

TABLE 15
Approved Products

PRODUCT	MANUFACTURER	PRODUCT SPECIFICATION
Air Coupling	AMFLO	CP1, CP2, C1, C2
Air Coupling	Tru Flate	12-124, 13-124, 12-134, 13-134
Air Coupling	Parker	2C, 3C, B12, B13
Amplifier, PA	Motorola Solutions Inc.	120039-2
Antenna, Data Radio	Antenna Specialty Co.	ASPRC-572MOT, 508 MHz
Antenna, GPS	ACS Transport	120076-4
Antenna, Voice Radio	Antenna Specialty Co.	ASPG931MOT, 900 MHz
Antenna, WLAN	Mobile Mark	RM3-2400
Drain Plug, Dry Brake	FEMCO	As needed
Farebox – Reference only	GFI Odyssey	C24003-0501FB
Farebox Baseplate	GFI Odyssey	D22581-0003

PRODUCT	MANUFACTURER	PRODUCT SPECIFICATION
Fluid, Rear Axle		Full Synthetic
Fluid, Transmission		Full Synthetic
Fuel Receptacle, fast fill	OPW	CL50
Fuel Receptacle, slow fill	OPW	LB36
Jumper Receptacle-24 Volt	Whitaker	3298
Microphone	REI	
Radio Handset	Motorola	P/N12004-8
Registration Holder	Truck-Lite	97960
Seat Insert Fabric	Holdsworth	Sunrise/Sunset
Seat Insert Fabric	LaFranch King's Plus Fabric	Sunrise/Sunset
Seat Insert Fabric		Blue
Silent Alarm Switch	Microswitch	Part No. 4TL 1-3 with spring loaded black
Take-One Box	Beemak Plastic	BP-750-CT
Minimum Take-Twelve Box	**Transit Information Products**	407160
Trip Recorder (Replaces Hubodometer)	FleetWatch	JX55
Wireless Router (Wi-Fi System)	Sierra Wireless	InMotion, MG90
Wireless Router AMM	Sierra Wireless	9010230
Wireless Router Gateway activation	Sierra Wireless	IMTSER524
Wireless Router Client License	Sierra Wireless	9010208

TS 88.2 Maintainability Requirements

Mean Time to Fix

Maintenance requirements stated in mean time to fix (MTTF) are established below in Table 16. Unless otherwise indicated, these figures represent the total elapsed labor time (hours/minutes) required to complete the maintenance task by one mechanic. The figures do not include time required to prepare the bus such as bringing the bus to the hoist, raising it, etc.

The Contractor shall be required to demonstrate these maintenance tasks using the information as contained in the Service and Parts manuals. The demonstrations shall be conducted on the Pilot Bus and may occur at LACMTA facilities. Should a failure of a demonstration occur, the Manufacturer may be required to modify its bus design or service manual information as necessary and re-demonstrate the procedure on the Pilot Bus. The purpose of these demonstrations is to validate the maintenance manual, special tool requirements, and MTTF.

TABLE 16
MTTF

SERVICE TASK	MTTF (hrs./min.)
INSPECTION:	
6,000 Mile Inspection	7.5 hr.
Daily Inspections	10 min.
Brake Inspection	15 min.

SERVICE TASK	MTTF (hrs./min.)
REMOVE AND REPLACE:	
A/C Blower Motor	1 hr.
A/C Condenser Motor	1 hr.
Alternator	2 hr.
Access for Door Motor Adjustment	< 2 min.
Air Compressor	2 hr.
Air Dryer Desiccant	15 min.
Batteries Set	45 min.
Brake Application Valve	1 hr.
Engine/Transmission PPA (2 mechanics)	6 hr.
Engine ECM	2 hr.
Exterior Mirror Glass	< 5 min.
Headlining Panels, Interior individual (less handrails)	< 30 min.
Power Steering Gear Box Assembly	2 hr.
PPA mounts, complete set	2 hr.
Radiator (2 mechanics)	3 hr.
Seat Insert	< 1 min.
Shocks, Each	45 min.
Starter	1.5 hr
Transmission unit	8 hr.
Wheel Change, Front	45 min.
Wheel Change, Rear Dual	60 min.
Window glazing, Passenger	60 min.
Window guard, Passenger and Door	6 min.
Wiper Motor	20 min.
Operators Seat	30 min.
Electronic Unit (Regulator, PLC Module, Relay, Fuse, etc.)	15 min.
Lamps, Passenger Lights	15 min.

Mean Miles Between Failures

Table 17 lists minimum design goals for mean miles between failures (MMBF) on critical areas of bus.

TABLE 17
MMBF Goals

Type	Description	Design Goal
Class 1:	Physical Safety	Mean distance greater than 1,000,000 miles
Class 2:	Road Call	Mean distance greater than 10,000 miles
Class 2:	Stalling Interlock, F/R Doors	Mean distance greater than 50,000 miles

	No Start	
	SEL/CEL	
	Diagnostic Light	
	Electrical failure	
	Stalling	
	Low Air	
	Suspension	
	HVAC	
	Charging System	
	Pneumatic System	
Class 2:	ADA- Ramp, Securement	Mean distance greater than 75,000 miles

TS 88.3 Technical Contract Deliverables

Contractor shall provide a table of contract deliverables, documentation and/or demonstrations as scheduled in the Contract documents during the proposal period. See Table 20 attachment for reference on technical submittal items.

Test Procedures

Contractor shall submit an overall test procedure for each design qualification and conformance/acceptance testing for approval to LACMTA at least 30 days prior to the scheduled date of the test. The Contractor shall provide all equipment and instrumentation required to conduct the tests. Along with the title referencing the specification requirement, the test procedure shall include at a minimum the following:

- Test objective
- Description of the type of report to be submitted
- Success/failure criteria
- Sequence of testing
- Equipment/instrumentation list with calibration dates
- Description of test setup including necessary diagrams
- Test methodology
- Procedure for data evaluation

The report shall be submitted within 30 days after completion of testing and shall follow industry standard format for submittal of technical papers. The reports shall include analysis along with necessary; photographs, charts and measured/accumulated data to support conclusions. Reports shall include a statement certifying compliance to specification requirements along with a list of any deficiencies.

TS 88.4 Decals/Signs

TABLE 18a

Exterior – Metro Local (Poppy)

DRAWING REFERENCE	QTY	DESCRIPTION	CS CATALOG #	DIMENSION
A	3	Vehicle ID_4.5” White	CS0130	N/A
B	1	CNG Large_7.75”	CS0140	1-11/16” x 7-3/4”

DRAWING REFERENCE	QTY	DESCRIPTION	CS CATALOG #	DIMENSION
C	1	SHUT OFF VALVE_1”(H)	CS0144	N/A
D	2	Battery Disconnect	CS55486	6-1/2” x 6-1/2”
E	4	Jack Points_3.75”(H)	CS5489	2” x 3-3/4”
F	2	Metro Local_7”(H)	CS0204	N/A
G	2	Nation’s Largest Clean-Air Fleet_ 3.5” (H)	CS0131	N/A
H	2	Metro_17. 5”(H)	CS0185	N/A
I	2	Local_16.25”(H)	CS0196	N/A
J	2	CA LICENSE ID_1.5”(H)	CS0129	N/A
K	2	Metro Local_5.5” (H)	CS0202	N/A
L	1	Circle M_7.5”(H)	CS0133	N/A
M	1	Welcome Aboard_1”,3/4”(H) Bienvenidos Exact Fare Please Tenga Pasaje Exacto Per Favor	CS0127	N/A
N	3	323.GO.METRO_7/8”(H) metro.net_11/16”(H)	CS0148	N/A
O	1	American Flag_Boarding	CS0125	6-3/4” x 3-1/2”
P	1	ISA Wheelchair	CS1000	6” x 6”
Q	1	ADA Kneeling Bus	CS0143	5-1/2” x 7”
R	2	Local_12”(H)	CS0198	N/A
S	1	Metro Local_1.5”(H)	CS0135	N/A
T	2	Circle M_4.5”(H)	CS0132	4-1/2” Dia.
U	1	Vehicle ID_2.625”(H)_White	CS0351	N/A
V	1	American Flag_Driver	CS0126	6-3/4” x 3-1/2”
W	1	Circle M_10”(H)	CS0134	10” Dia.
X	1	Danger-Do Not Turn In Front Of Bus_8.5”(H)	CS0146	N/A
Y	1	CNG Small_4”(H)	CS0141	6-1/2” x 4”

TABLE 18b

Exterior - Metro Rapid (Red)

DRAWING REFERENCE	QTY	DESCRIPTION	CS CATALOG #	DIMENSION
A	3	Vehicle ID_4.5” White	CS0130	N/A
B	1	CNG Large_7.75”	CS0140	1-11/16” x 7-3/4”
C	1	SHUT OFF VALVE_1”(H)	CS0144	N/A
D	1	Battery Disconnect	CS55486	6-1/2” x 6-1/2”
E	4	Jack Points_3.75”(H)	CS5489	2” x 3-3/4”
F	2	Metro Rapid_7”(H)	CS0210	N/A
G	2	Nation’s Largest Clean-Air Fleet_ 3.5” (H)	CS0131	N/A

DRAWING REFERENCE	QTY	DESCRIPTION	CS CATALOG #	DIMENSION
H	2	Metro_17.5”(H)	CS0185	N/A
I	2	Rapid_16.25”(H)	CS0197	N/A
J	2	CA LICENSE ID_1.5”(H)	CS0129	N/A
K	2	Metro Rapid_5.5” (H)	CS0208	N/A
L	1	Circle M_7.5”(H)	CS0133	N/A
M	1	Welcome Aboard_1”,3/4”(H) Bienvenidos Exact Fare Please Tenga Pasaje Exacto Per Favor	CS0127	N/A
N	3	323.GO.METRO_7/8”(H) metro.net_11/16”(H)	CS0148	N/A
O	1	American Flag Boarding	CS0125	6-3/4” x 3-1/2”
P	1	ISA Wheelchair	CS1000	6” x 6”
Q	1	ADA Kneeling Bus	CS0143	5-1/2” x 7”
R	2	Rapid_12”(H)	CS0199	N/A
S	1	Metro Rapid_1.5”(H)	CS0157	N/A
T	2	Circle M_4.5”(H)	CS0132	4-1/2” Dia.
U	1	Vehicle ID_2.625”(H)_White	CS0351	N/A
V	1	American Flag Driver	CS0126	6-3/4” x 3-1/2”
W	1	Circle M_10”(H)	CS0134	10” Dia.
X	1	Danger-Do Not Turn In Front Of Bus_8.5”(H)	CS0146	N/A
Y	1	CNG Small_4”(H)	CS0141	6-1/2” x 4”

TABLE 19a
Interior – Metro All

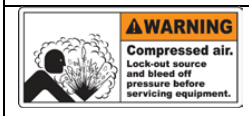
DRAWING REFERENCE	QTY	DESCRIPTION	CS CATALOG #	DIMENSION
A	4	Security Camera in Operation	CS5382	1’-0”x3-1/4”
B	2	Reserved for Seniors	CS5382	1’-7”x4”
C	3	Reserved for Mobility Devices	CS5401	1’-7”x4”
D	2	Please Remain in Securement	CS0230	10”x5-1/4”
E	3	Watch Your Step	CS5421	1’-4-1/4”x3”
F	1	Bus Maximum Height	CS0234	4-1/4”x2-1/8”
G	1	Bus Drivers Carry No Cash	CS5508	1’-1/4”x4-1/4”
H	1	PC640	CS5814	1’-4-3/4”x4-1/4”
I	1	Unnecessary Conversation	CS0155	4-1/4”x4-1/4”
J	1	Financial Responsibility	CS0162	3-3/4”x3-3/4”
K	1	Welcome to Metro	CS0152	5/8”x3-1/2”
L	1	Exit Rear Door	CS5505	11”x3-1/4”

DRAWING REFERENCE	QTY	DESCRIPTION	CS CATALOG #	DIMENSION
M	1	Reserved for Mobility Devices	CS5505	11”x3-1/4”
N	2	Caution Door Opens Automatically	CS5511	3-3/8”x7”

TABLE 19b

High Voltage – Metro ZE Bus

Note: Table 19b applies to zero emission bus decals. Location and quantity of these decals will vary depending on the individual bus configuration. Final layout will be determined during Pre-Production meetings.

Area	Description	Size - Inches	Location	Qty	Total
1. Lock Out Compartment		4 x 6	Inside the compartment - Next to the switch	1	AR
		4 x 6	Inside the compartment - Next to the switch	1	AR
2. Battery Compartment(s)		6 x 4	Inside the compartment - On the battery box	1	AR
		4 x 6	Inside the compartment - On the battery box	1	AR
	XXX VOLTS	1 x 4	Inside the compartment - On the battery box	1	AR
		2 x 3	On the battery enclosure door, visible from outside	1	AR
3. Automatic Start Equipment		2 x 4	On the equipment	1	AR
		2 x 4	On the compressor	1	AR
	XXX VOLTS AC 3 PHASE	1 x 6	On the equipment and control boxes	1	AR
	XXX VOLTS	1 x 4	On the equipment and control boxes	1	AR
4. Auxiliary Motor Controller(s)	XXX VOLTS AC 3 PHASE	1 x 6	On the control box(es) and motor(s)	1	AR
5. PPU and Hazardous Voltage Area(s)		2 x 3	On the enclosure door, visible from outside	1	AR

Area	Description	Size - Inches	Location	Qty	Total
		6 x 4	On the enclosure door, visible from inside	1	AR
	XXX VOLTS	1 x 4	Inside the compartment	1	AR
		4 x 6	On the enclosure door, visible from inside	1	AR
6. Charging Connector (Bus Side)		2 x 3	On the enclosure door, visible from inside	1	AR
7. Charging Connector (Station Side)		2 x 3	Next to each charging connector	1	AR

TS 88.5 References

SAE #	Title	Date Published
J10	Air Brake Reservoir Performance and Identification Requirements.	Dec 04, 2013
J211	Instrumentation for Impact Test—Part 2: Photographic Instrumentation	June 16, 2014
J287	Driver Hand Control Reach	March 11, 2016
J366	Exterior Sound Level for Heavy Trucks and Buses	Sept 12, 2011
J381	Windshield Defrosting Systems Test Procedure and Performance Requirements - Trucks, Buses, and Multipurpose Vehicles.	Jan 27, 2009
J534	Lubrication Fittings	Aug 11, 2015
J537	Storage Batteries	May 23, 2011
J541	Voltage Drop for Starting Motor Circuits	July 16, 2013
J587	License Plate Illumination Devices (Rear Registration Plate Illumination Devices)	Aug 21, 2012
J593	Backup Lamps (Reversing Lamps)	Aug 26, 2010
J673	Automotive Safety Glasses	July 6, 2015
J680	Location and Operation of Instruments and Controls in Motor Truck Cabs, Recommended Practice	Sep 1, 1988
J686	Motor Vehicle License Plates	Aug 7, 2012
J689	Curbstone Clearance, Approach, Departure, and Ramp Break over Angles—Passenger Car and Light Truck	Aug 26, 2009
J726	Air Cleaner Test Code	June 27, 2002
J833	Human Physical Dimensions	May 29, 2003
J844	Nonmetallic Air Brake System Tubing	Dec 19, 2012
J941	Motor Vehicle Drivers' Eye Locations	Mar 3, 2010
J994	Alarm—Backup—Electric Laboratory Performance Testing	Sept 17, 2014
J1050	Describing and Measuring the Driver's Field of View	Feb 13, 2009
J1113	Electromagnetic Compatibility Component Test Procedure Part 42, Conducted Transient Emissions	Dec 8, 2010
J1127	Low Voltage Battery Cable	Dec 3, 2015
J1128	Low Voltage Primary Cable	Dec 3, 2015
J1149	Metallic Air Brake System Tubing and Pipe	Oct 21, 2015
J1211	Handbook for Robustness Validation of Automotive Electronic Modules	Nov 19, 2012
J1292	Automobile and Motor Bus Wiring	Jan 1, 2008

J1308	Fan Guard for Off-Road Machines	Dec 17, 2013
J1455	Recommended Environmental Practices for Electronic Equipment Design in Heavy-Duty Vehicle Applications	Aug 24, 2012
J1587	Electronic Data Interchange Between Microcomputer Systems in Heavy-Duty Vehicle Applications, Recommended Practice	Jan 4, 2013
J1708	Serial Data Communications Between Microcomputer Systems in Heavy-Duty Vehicle Applications	Dec 12, 2010
J1908	Electrical Grounding Practice	Jan 1, 1996
J1986	Balance Weight and Rim Flange Design Specifications, Test Procedures, and Performance Recommendations	March 18, 2016
J1939	Data Link Layer	March 3, 2016
J1995	Engine Power Test Code - Spark Ignition and Compression Ignition - Gross Power Rating, Standard;	Jan 10, 2014
J2249	Wheelchair Tiedown and Occupant Restraint Systems for Use in Motor Vehicles	Jan 29, 1999
J2402	Road Vehicles—Symbols for Controls, Indicators, and Tell-tales	Jan 7, 2010
J2711	Recommended Practice for Measuring Fuel Economy and Emissions of Hybrid-Electric and Conventional Heavy-Duty Vehicles	Sept 20, 2002
J2805	Measurement of Noise Emitted by Accelerating Road Vehicle	Nov 10, 2015
J2808	Lane Departure Warning Systems Minimum Performance Requirements	March 9, 2015

TS 88.6 Holders

FIGURE 9

Bad Order (B.O.) Card Holder

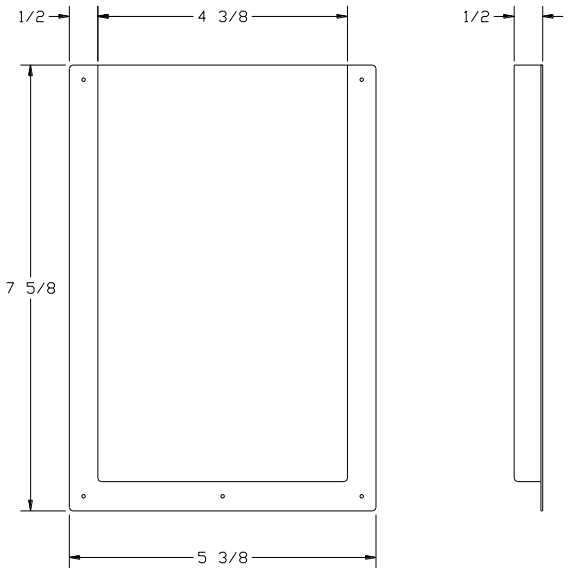
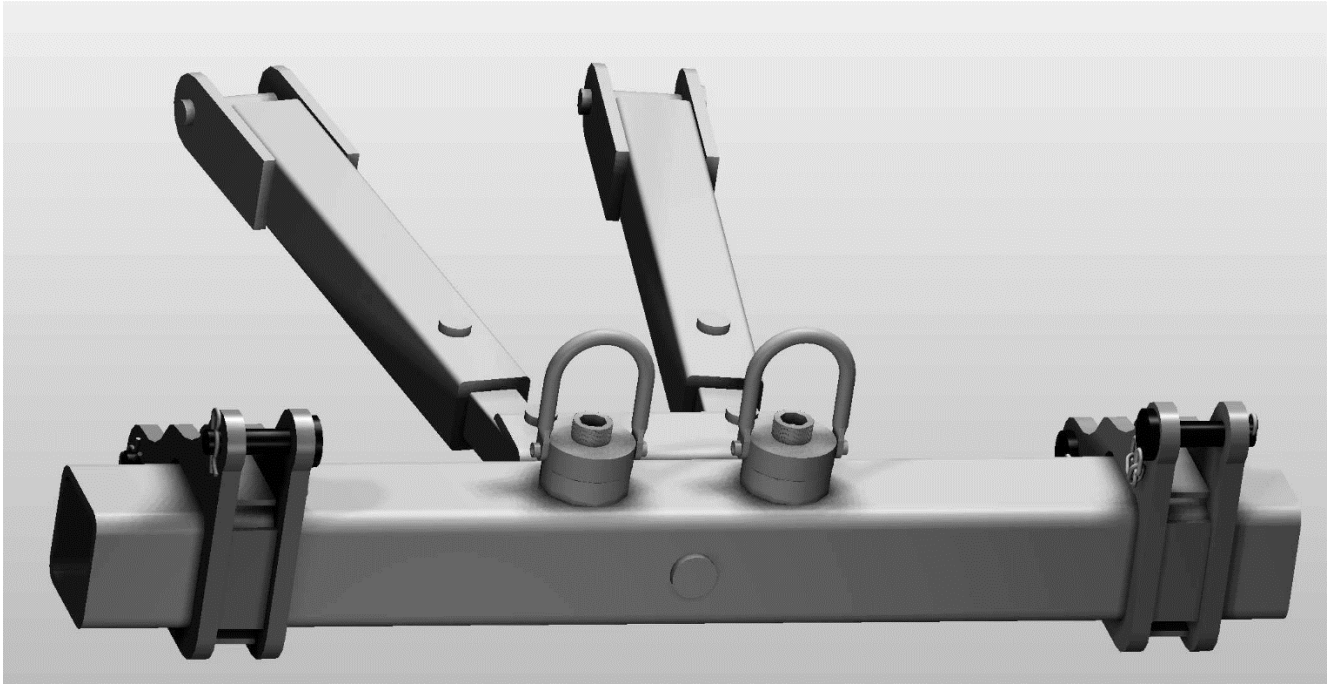


FIGURE 10

Typical Trash Bag Hooks

FIGURE 11
Metro Tow Device



Technical Contract Deliverables

Contractor shall provide a table of contract deliverables, documentation, samples and/or demonstrations as scheduled in the Contract documents. Table 20, provided as reference for Technical submittal items, is representative and not intended to be all inclusive.

TABLE 20

Contract Deliverable Items

Item	Section	Title	Deliverable	Schedule	Requirement
1	TS 4	Legal Requirements	Certification	Pre-production Meetings	The Contractor shall comply with all applicable federal, state and local regulations. These shall include but not be limited to ADA, as well as state and local accessibility, safety and security requirements. Local regulations are defined as those below the state level.
2	TS 5	Overall Requirements	Documentation	With Pilot Bus and First Article Bus	Contractor and LACMTA shall identify subcomponent vendors that shall submit installation/application approval documents , (including necessary documents and/or diagrams to verify configuration),with the completion of a Pilot Bus and First Article Bus.
3	TS 5.4	Maintenance and Inspection	Documents	Proposal Period	Contractor shall provide a list of all special tools and pricing required for maintaining this equipment. Said list shall be submitted as a supplement to Form PF-3 Schedule B of Prices Special Tools.
4	TS 5.6	Training	Documents	Proposal Period	The Contractor shall provide pricing for up to 1,000 Instructor class-room hours with the Bus order. For each Option order, Contractor shall also be required to provide Instructor training. The quantity of training hours shall be determined by the quantity of Option Buses ordered and shall be equal to five hours of training per Option bus up to a maximum of 500 instructor class-room hours for each Option order.
5	TS 5.6	Training, Base Order Buses	Documentation	30 days after pilot bus delivery	The LACMTA shall approve the proposed trainers and their qualifications, proposed subjects and scheduling of the classes conducted by the Contractor at the time of pilot bus review.
6	TS 5.6	Training, Option Order Buses	Documentation	30 days prior to delivery of Option pilot bus	The LACMTA shall approve the proposed trainers and their qualifications, proposed subjects and scheduling of the classes conducted by the Contractor.
7	TS 5.6.1	Training Curriculum	Documents	30 days prior to delivery of pilot bus	The Contractor shall develop and submit a training curriculum using the most current version Microsoft Office Word and/or Power Point, subject to LACMTA approval.

Item	Section	Title	Deliverable	Schedule	Requirement
8	TS 5.6.2	Teaching Materials	Documents, materials	30 days prior to training	The Contractor shall provide to the LACMTA Maintenance Instruction Department visual and other teaching materials as needed during classroom instruction.
9	TS 5.6.3	Optional Training Aids	Documents	Proposal Period	The Contractor shall supply pricing for items a – k, special training aids, as listed below for use by LACMTA training staff. Pricing for these aids is to be provided to the LACMTA on Form PF-5-Schedule D of Prices Training Aids.
10	TS 5.6.3	Optional Training Aids, E-Learning/Interactive Training Media	Documents	Proposal Period	The Contractor shall provide pricing for 25 hours of CNG/Electric Bus interactive learning seat time on Form PF-5-Schedule D of Prices Training Aids. The media shall provide a high level of student interactivity, including but not limited to: questions review, component identification, tool use, circuit building, component testing. All content shall be navigated through an industry standard e-learning programs graphical user interface (GUI) subject to LACMTA approval.
11	TS 5.6.4	Manuals, Manual Review and Approval	Documents	After NTP	The Contractor will be required to participate in Manual Review and Approval process and attend one service manual review meeting held at the LACMTA shortly following LACMTA Notice to Proceed.
12	TS 5.6.4	Manuals, Draft Manuals, Manual Review and Approval	Documents	With pilot bus	The Contractor shall provide the LACMTA with: Ten draft hardcopies each of the Service, Parts and Operator's manuals plus a list of all proposed OEM Component Repair manuals, simultaneously to the shipping of the first Pilot Bus.
13	TS 5.6.4	Manuals, Draft Manuals, Parts Index	Hardcopy, Spreadsheet	60 days prior to production 60	A part number index shall be submitted for review at least 60 days prior to the scheduled ship date of the first production Bus.
14	TS 5.6.4	Manuals, Final Manuals	Documents	90 days after start of production	Ten final hardcopy sets of Service and Parts manuals, shall be provided for each 100 Buses and twelve 12 total sets of Subsystem OEM manuals.
15	TS 5.6.4	Manuals, Final Manuals	Documents	90 days after start of production	Contractor shall supply a listing of diagnostic codes with final service manuals delivered that covers trouble shooting fault trees/codes related to the PPU.
16	TS 5.6.4	Manuals, Final Manuals	Documents	90 days after start of production	Final DVD editions of Service, Parts and Operator's manuals must be delivered within 90 days after the start date for production Buses.

Item	Section	Title	Deliverable	Schedule	Requirement
17	TS 5.6.4	Manuals, Component Repair/Service Section	Documents	90 days after start of production	Fourteen sets of Repair Manuals necessary to rebuild all Contractor supplied Units including: PPU, transmission/electric drive, HVAC system, starter, alternator, air compressor, etc., shall be provided.
18	TS 5.6.4	Manuals, Component Repair/Service Section	Hardware	90 days after start of production	Each set shall be organized and mounted onto a suitable table top holding rack subject to LACMTA approval
19	TS 5.6.4	Manuals, Price List	Hardcopy, Spreadsheet	90 days after start of production and updated annually	Ten copies of the current price list shall be provided separately as a supplement to the final parts manuals. Price lists shall be updated at least annually and provided for the life of the Bus as they are updated.
20	5.6.5	Special Equipment, Option, Special Service Equipment	Documents	Proposal Period	The LACMTA is aware that diagnostic equipment and/or software has been developed or is being developed by many of the OEMs to assist in the maintenance of the Buses. Proposer is required to submit a list of recommended special equipment, software and/or diagnostic tools deemed necessary to provide state-of-the-art service for the bus systems. Depending on the type of available equipment and/or software, the LACMTA may wish to obtain complete sets of such Special Service Equipment and/or software, plus any additional tools identified by the OEM manufacturer required to diagnose, calibrate, or remove-and-replace, all equipment provided with this Bus order.
21	TS 5.6.6	Diagnostic Laptop PC Specifications	Laptops	Delivery of first production bus	Because of the time delay between the procurement process and receipt of computer equipment, the final laptop computer configuration shall be subject to approval by the LACMTA at delivery…
22	TS 5.6.8	In-Process and As-Built Drawings	Scale Drawings	30 days prior to production	The Contractor shall, no later than 30 days prior to commencing production, supply the LACMTA with two sets of harcopy scale drawings suitable for conducting repairs on every area of the vehicle, including all major systems and sub-system installations. Electrical and air schematics shall also be provided. In addition, the Contractor shall provide a description of the electronic configuration, layout and functionality of the Bus including communication paths and power distribution.
23	TS 5.6.8	In-Process and As-Built Drawings	Scale Drawings	60 days after final bus delivery	Five sets of Conforming drawings shall be delivered to the LACMTA within 60 days after final Bus delivery.

Item	Section	Title	Deliverable	Schedule	Requirement
24	TS 5.7	Operating Environment	Test Documentation	Pre-Production Meetings	The bus shall achieve normal operation in ambient temperature ranges of 0º F to 120º F, at relative humidity between 5 percent and 100 percent, and at altitudes up to 3,000 feet above sea level. Degradation of performance due to atmospheric conditions shall be minimized at temperatures below 0 °F, above 120° F or at altitudes above 3,000 feet.
25	TS 5.8	Noise	Demonstration	Pilot Vehicle at Factory	The Contractor shall be required to demonstrate that vehicle-generated sound levels do not exceed the maximum interior and exterior values.
26	TS 5.8.1	Interior Noise	Test Documentation	Pilot Vehicle Prior to Production	The Contractor shall provide test documentation that vehicle has sufficient sound insulation to achieve 65 dBA or lower at any point inside the bus with an 80 dBA sound source at outside skin of the bus.
27	TS 5.9	Fire Safety	Certification	Pre-Production Meetings	Contractor must provide required certificates of compliance prior to manufacture of the Pilot Bus.
28	TS 5.10	Fire Suppression	Documentation	Proposal Period	The AFSS system shall meet or exceed the environmental requirements of SAE J1211.
29	TS 5.10	Fire Suppression	Documents	Proposal Period	At a minimum, the engine compartment, HVAC compartment, exhaust area and high current electrical areas (except the battery compartment) at rear of bus shall be equipped with an automatic fire sensing and suppression (AFSS) system product, subject to LACMTA approval during proposal period.
30	TS 5.10	Fire Suppression, AFSS Monitor Panel	Documenst	Pre-Production Meetings	The system shall have a supervision monitoring panel located above the operators' side console subject to LACMTA approval…
31	TS 5.10	Fire Suppression System, AFSS Agent	Documentation	Pre-Production Meetings	The agent shall be approved by Underwriters Laboratory or Factory Mutual Research Corporation and have no ozone depleting property and no global warming potential per USA EPA guidelines.
32	TS 5.10	Fire Suppression System (AFSS Cylinders)	Documentation	Pre-Production Meetings	The AFSS agent cylinders shall use DOT shippable linear actuators or electric solenoid valves (squibs are prohibited) attached to DOT certified bottles which do not require hydrostatic retest for a minimum of twelve (12) years. Cylinder(s) shall be compatible with suppression agents. Each cylinder shall have a pressure gauge with easy to read "Go-NoGo" type indicator which is visible when the cylinder(s) is installed on the Bus.

Item	Section	Title	Deliverable	Schedule	Requirement
33	TS 5.11	Gas Detection System (GDS)	Documents	Proposal Period	GDS system shall be provided to monitor the engine compartment and each separate fuel storage area(s) and shall automatically activate…
34	TS 5.11	Gas Detection System (GDS), GDS Monitor Panel	Documents	Pre-production Meetings	The system shall have a supervision monitoring panel located above the operators' side console area subject to LACMTA approval
35	TS 5.13	Water Leak Testing	Test	All buses	The roof, windows, windshields, and all doors of all Vehicles shall be water tested for a minimum of 30 continuous minutes in order that leaks may be detected and corrected. The HVAC shall be turned on only for the first 15 minutes of the test.
36	TS 5.14	Fasteners and Securements	Documentation, Samples	Proposal Period	Supports for all electrical cables, harnesses and bundles will be subject to LACMTA approval and shall be of premium quality.
37	TS 6	Physical Size	Test Documentation	Pilot Vehicle at Factory	Vehicles furnished under these specifications shall comply with physical size.
38	TS 7.	Vehicle Performance, Power Requirements	Documentation	Proposal Period	The propulsion system shall be sized to provide sufficient power to enable the bus to meet the defined acceleration, top speed, and gradability requirements, and operate all propulsion-driven accessories using actual road test or dynamometer results and computerized vehicle performance data.
39	TS 7	Vehicle Performance	Demonstration	Pilot Vehicle at Factory	The Contractor shall be required to demonstrate acceleration, top speed, and grad**e**ability requirements.
40	TS 7.4.3	Operating Range, CNG	Documentation	Proposal Period	The Contractor shall provide sufficient fuel capacity to give the bus a 400 mile range before the low fuel warning light comes on. The Contractor shall provide the LACMTA with a technical analysis which supports the proposed CNG fuel system design compliance to the LACMTA's range of operation requirement including the proposed fuel capacity.
41	TS 7.4.4	Operation Range, Electric (Zero Emission)	Documenation	Proposal Period	The Contractor shall provide sufficient energy storage and changer charging systems to give the bus a cumulative 300 mile daily operating range before the low energy warning light comes on. The Contractor shall provide the LACMTA with a technical analysis which supports the proposed energy storage and charger systems design compliance to the MTA's range of operation requirement including the proposed energy storage system capacity.

Item	Section	Title	Deliverable	Schedule	Requirement
42	TS 9.	Engine	Meeting and Documentation	Pre-production Meetings	Prior to manufacturing the Pilot bus, the Contractor shall coordinate a technical review with the LACMTA and engine and transmission suppliers covering integration and installation design. As part of the technical review, the Contractor shall advise the LACMTA concerning engine and transmission features and control system options, and accessories, and shall conform, to the degree possible, to those already in use at the LACMTA in an effort to increase component and system commonality.
43	TS 9	Engine	Certificate	Prior to start of production	Prior to start of production, the Contractor shall provide documentation from the Subsuppliers, which supports their approval, that the engine and transmission installation, support system design, and components used specifically for the LACMTA's contract meet the OEM requirements and recommendations.
44	TS 9.1	Engine (CNG	Documentation	Pre-production Meetings	Oil filtration systems shall be approved by the engine and transmission OEM and be designed with by-pass circuits, as needed, in the event that a filter becomes plugged.
45	TS 9.1.1	Engine, Compartment Control Panel Gauges and Indicators	Documents	Proposal Period	The following mechanical, electrical dial gauges, or digital display, subject to LACMTA approval during proposal period, shall be mounted on, or adjacent to, the engine compartment control panel: • Oil Pressure Gauge, • Temperature Gauge, • Air Filter Restriction Gauge, • Voltage Gauge(s).
46	TS 9.2.2	Propulsion System Service	Documents, Drawings	Proposal Period	The propulsion system shall be arranged so that accessibility for all routine maintenance is ensured. No special tools, other than dollies and hoists, shall be required to remove the propulsion system or any subsystems.
47	TS 9.2.4	Energy Storage, Controller and Charging Systems	Documents, Drawings	Proposal Period	Energy storage shall be of a commercial design capable of operating in the LACMTA transit environment.
48	TS 9.2.5	Electric System Controller (ESC), Primary Power Unit (PPU)	Documents, Drawings	Proposal Period	The PPU shall have on-board diagnostic capabilities, able to monitor vital functions, store out-of-parameter conditions in memory, and communicate faults and vital conditions to service personnel. Diagnostic reader device connector ports, suitably protected against dirt and moisture, shall be provided in operator's area and inside PPU compartment.

Item	Section	Title	Deliverable	Schedule	Requirement
49	TS 10.	Cooling Systems	Test or Certification	Pre-Production Meetings	The cooling systems shall be of sufficient size and designed to maintain fluids and engine intake air at safe, continuous operating temperatures during the most severe operations possible with the bus loaded to GVWR and with conditions as listed in Section TS 5.7 with a 10 percent minimum reserve capacity in accordance with engine and transmission manufacturer's cooling system requirements. The cooling system fan controls should sense the temperatures of the operating fluids and the intake air, and if either is above safe operating conditions the cooling fan should be engaged. The fan control system shall be designed with a fail-safe mode of "fan on." The cooling system shall provide functional service while operating in the design operating profile environment.
50	TS 10	Cooling Systems	Demonstration	Pilot Vehicle Delivery in LA	The cooling system shall be self purging requiring no special procedures to remove air from the system when coolant is installed or added.
51	TS 10.1	Engine Cooling	Documents	Pre-Production Meetings	Surge tank filler cap shall have a safety lock. A 1/4 inch NPT port shall be provided in a convenient location in the surge tank for the LACMTA's pressure testing equipment, subject to LACMTA approval..
52	TS 12	Retarder (Transit Bus), Retarder Disable Switch	Documents, Drawings	Pre-Production Meetings	The retarder disable switch shall be located behind the destination sign door, subject to LACMTA approval
53	TS 14.1	Service	Documents, Drawings	Proposal Period	No special tools, other than dollies and hoists, shall be required to remove the PPA/PPU Two LACMTA mechanics shall be able to remove, replace, and prepare the complete PPA/PPU assembly for service within a MTTF of 12-man hours.
54	TS 14.1	Service	Approval	Within 60 days after final bus delivery	The Contractor shall provide two suitable PPA/PPU dollies for each spare PPA/PPU purchased under this Contract.
55	TS 14.1	Service	Documents. Drawings	Pre-production Meetings	The PPA/PPU dollies shall be designed, subject to LACMTA approval in pre-production meetings…
56	TS 14.1	Service	Drawings	Last Vehicle Delivery	The Contractor shall provide the LACMTA with sufficient fabrication drawings needed to manufacture additional dollies.
57	TS 14.1	Service	Documents, Drawings	Pre-production Meetings	Belt drives that require manual tensioning shall be designed to facilitate easy service/maintenance, subject to LACMTA approval

Item	Section	Title	Deliverable	Schedule	Requirement
58	TS 14.1	Service	Certificate	Pre-production Meetings	Accessory drive belts shall be guarded in accordance with CAL OSHA article 45, Belt and Pulley Drives, Section 4070 "Guarding".
59	TS 14.1	Service, Engine Air Cleaner	Drawings	Proposal Period	The air filter shall be positioned for easy access and service, subject to LACMTA approval…
60	TS 15	Hydraulic Systems	Demonstration	Pilot Vehicle at Factory	Any hydraulically driven system shall be subject to LACMTA approval at the Pilot Bus.
61	TS 15	Hydraulic Systems	Demonstration	Pilot Vehicle at Factory	The hydraulic system (steering) shall be located to accommodate easy service. The hydraulic system filter shall be located in the return, low pressure, circuit to the oil reservoir, or internal to the oil reservoir, subject to LACMTA approval at the Pilot Bus.
62	TS 15.1	Fluid Lines	Documents, Drawings	Pre-production Meetings	Rigid and flexible lines shall be individually supported and readily accessible for inspection and service, including interior lines inside the bus,…
63	TS 18.1.2	Fuel Lines, CNG	Documentation	Pre-production Meetings	Fuel lines shall comply with NFPA-52. All tubing shall be a minimum of seamless Type 304 stainless steel (ASTM A269 or equivalent). Fuel lines shall be identifiable as fuel lines only. Fuel lines shall be bent using computer numeric machines (CNC) to assure consistency, no hand bending will be permitted. The bus manufacturer shall have a documented procedure for testing the high pressure line assembly
64	TS 18.1.2	Fuel Lines, CNG	Documentation	Pre-production Meetings	Hose support in-between the bus frame and the engine that exceed 12 inches is subject to LACMTA approval…
65	TS 18.2.2	Design and Construction, CNG, Fuel Containers/Cylinders	Documentation	Pre-production Meetings	Fuel cylinder construction shall be in accordance with DOT Standard 304, ANSI NGV2, latest revision, design and test criteria. Cylinder shall be designed for the lightest weight possible which does not require a hydrostatic re-qualification. Cylinders shall be certified for refueling pressures to 125 percent of working pressure during temperature compensated fueling.
66	TS 18.2.2	Design and Construction, CNG, Pressure Relief Devices (PRDs)	Documents, Drawings	Proposal Period	PRDs shall be vented to the roof area of the Bus with minimum protrusion above the roof line and shall be protected with a suitable cap which shall withstand daily bus wash activity, subject to LACMTA approval…

Item	Section	Title	Deliverable	Schedule	Requirement
67	TS 18.2.2	Design and Construction, CNG, Valves	Documents, Drawings	Proposal Period	An additional minimum 1/2 inch valve shall be provided for draining the high pressure manifold and any fuel cylinder(s) through a service port. Type and location of the service port shall be subject to LACMTA approval…
68	TS 18.2.2	Design and Construction, CNG, Gauges	Documentation	Pre-production Meetings	Glycerin filled gauges which meet NFPA 52 requirements shall be located in the high and low pressure manifolds which shall indicate fuel system pressure.
69	TS 18.2.2	Design and Construction, CNG, Fuel Filler	Documents, Drawings	Proposal Period	The fuel filler shall be located 30 to 38 feet measure behind the centerline of the front door, subject to LACMTA approval…
70	TS 18.2.2	Design and Construction, CNG, Defueling System	Documents, Drawings	Proposal Period	The CNG defueling port shall be an NGV-3.1/CGA-12.3 certified receptacle subject to LACMTA approval…
71	TS 21	Altoona Testing	Documentation	Proposal or First Article Bus	A report clearly describing and explaining the failures and corrective actions taken to ensure any and all such failures will not occur shall be submitted to the LACMTA.
72	TS 23.2	Crashworthiness, (Transit Bus)	Certification	Pre-Award Audit	Contractor shall be required to provide FEA software analysis or other evidence of compliance with this section during the Pre-Award Audit.
73	TS 24.	Corrosion	Certification	Pre-production Meetings	Representative samples of all materials and connections shall withstand a two-week (336-hour) salt spray test in accordance with ASTM Procedure B-117 with no structural detrimental effects to normally visible surfaces and no weight loss of over 1 percent.
74	TS 24.	Corrosion	Documentation	Pre-production Meetings	The Contractor shall provide a copy of its proposed undercoating system program…
75	TS 25.	Towing	Demonstration	Pilot Vehicle Delivery in LA	Contractor shall provide fifteen (15) sets of any special towing equipment adapters, if required, so that the LACMTA is able to flat tow the Bus.
76	TS 25	Towing	Demonstration	Pilot Vehicle Delivery in LA	Contractor shall demonstrate compliance with these provisions using the Pilot Vehicle.
77	TS 25	Towing	Documents, Samples	Pre-production Meetings	All male fittings shall have an additional quarter turn manual shut off valve provided near the front bumper for use only during towing, subject to LACMTA approval
78	TS 25.	Towing	Demonstration	Pilot Vehicle Delivery in LA	Two rear recovery devices/tie downs shall permit lifting and towing of the bus for a short distance, such as in cases of an emergency, to allow access to provisions for front towing of bus.
79	TS 26.	Jacking	Demonstration	Pilot Vehicle Delivery in LA	Jacking and changing any one tire/wheel assembly shall be completed by one LACMTA mechanic.

Item	Section	Title	Deliverable	Schedule	Requirement
80	TS 27.	Hoisting	Demonstration	Pilot Vehicle Delivery in LA	The Contractor may be required to demonstrate compatibility with LACMTA hoists as part of the towing demonstration...
81	TS 27	Hoisting	Samples	Pre-production Meetings	A model or sample jacking plate shall be provided during Pre-Production meetings for approval by LACMTA.
82	TS 28.1	Floor, Design (Transit Bus)	Documents, Drawings	Proposal Period	Floor installation, repair, and replacement method shall be subject to LACMTA approval…
83	TS 28.5	Floor, Construction	Documentation	Proposal Period	The floor shall be constructed using composite flooring material approved by the LACMTA during proposal period.
84	TS 29.3	Farebox, Stanchions	Documents, Drawings	Proposal Period	Stanchions shall be located around the farebox in accordance with ADA requirements and subject to LACMTA approval…
85	TS 30.1	Wheel Housing, Design & Construction	Certification Documentation	Pre-production Meetings	Wheel housings shall be constructed of corrosion-resistant and fire-resistant material. Sufficient clearance and air circulation shall be provided around the tires, wheels and brakes to prevent overheating when the bus is operated in revenue service. Wheel housings, as installed and trimmed, shall withstand impacts of a two- inch steel ball with at least 200 foot-pounds of energy without penetration.
86	TS 31.3.3	Suspension, Lubrication, Standard Grease Fittings	Demonstration	Pilot Vehicle at Factory	All elements of steering, suspension and drive systems requiring scheduled lubrication shall be provided with grease fittings conforming to SAE Standard J534 (Zerk Fitting).
87	TS 31.3.4	Suspension, Springs and Shock Absorbers, Kneeling	Demonstration	Pilot Vehicle at Factory	A kneeling system shall lower the entrance(s) of the bus a minimum of 2.75 in. during loading or unloading operations regardless of load up to GVWR, measured at the longitudinal centerline of the entrance door(s) by the driver. The bus shall kneel at a maximum rate of 1.25 inches per second at essentially a constant rate reaching fully kneeled position within 4.5 seconds. After kneeling, the bus shall rise within 3 seconds to a height permitting the bus to resume service and shall rise to the correct operating height within 7 seconds regardless of load up to GVWR. During the lowering and raising operation, the maximum vertical acceleration shall not exceed 0.2g, and the jerk shall not exceed 0.3g/second.

Item	Section	Title	Deliverable	Schedule	Requirement
88	TS 31.3.4	Suspension, Springs and Shock Absorbers, Raising	Demonstration	Pilot Vehicle at Factory	The Bus shall incorporate a system controlled by the operator that permits the Bus to raise (to account for high curbs) 2.75 inches, measured from normal ride height at the center of the bottom front step regardless of passenger load up to GVWR. The Bus shall raise at a maximum rate of 1.25 inches per second at essentially a constant rate reaching fully raised position within 4.5 seconds. After rising the Bus shall recover (lower) within 3.5 seconds to a ride height permitting the Bus to resume service and shall fully recover to the correct operating ride height within 10 seconds. During the lowering operation, the maximum acceleration shall not exceed 0.2g and the jerk shall not exceed 0.3g/sec. measured on the front door step tread.
89	TS 32.2	Tires	Documentation	With Each Vehicle	Contractor shall provide the LACMTA with a record listing tires installed for each Bus delivered. The information shall include the LACMTA brand serial number and mounting location on the Bus. Contractor shall conform to tire manufacturer specifications for maximum road speed and duty cycle during Bus delivery.
90	TS 33.	Steering	Test Documentation, or Demonstration	Pilot Vehicle at Factory	Electrically driven hydraulic assisted, or electrically assisted steering shall be provided. The steering gear shall be an integral type with the number and length of flexible lines minimized or eliminated. Steering torque applied by the operator shall not exceed 10 foot-pounds with the front wheels straight ahead. Steering torque may increase to 70 foot-pounds when the wheels are approaching the steering stops. Steering effort shall be measured with the Bus at Seated Load Weight (SLW), stopped with the brakes released and the engine at normal idling speed on clean, dry, level, commercial asphalt pavement with the tires inflated to recommended pressure. Power steering failure shall not result in loss of steering control. While the Bus is in operation, the steering effort shall not exceed 55 pounds at the steering wheel rim and perceived free play in the steering system shall not materially increase as a result of power assist failure. Gearing shall require no more than seven turns of the steering wheel lock-to-lock.

Item	Section	Title	Deliverable	Schedule	Requirement
91	TS 33.3.3	Steering Wheel, Steering Column Tilt	Demonstration	Pilot Vehicle at Factory	Steering column shall be a tilt and telescopic model. The steering column shall have full tilt capability with an adjustment range of no less than 35 degrees and be easily adjustable by the driver. The mechanism for adjustments shall be designed for ease of use, durability, utilize detents to position and lock the steering column and not require tightening by hand to apply a clamping force.
92	TS 33.3.4	Steering Wheel Telescopic Adjustment	Demonstration	Pilot Vehicle at Factory	The steering wheel shall have full telescoping capability and have a minimum telescopic range of 2 inches but no more than 5 inches and a minimum low-end adjustment of 32 in., measured from the top of the steering wheel rim in the horizontal position, (zero degrees' slope), to the cab floor at the heel point.
93	TS 37.1	Service Brake	Certification, Test Documentation	Pre-Production Meetings	The entire service brake system, including ABS controls, friction material, shall meet applicable FMVSS standards. The entire brake system, including friction material, shall have overhaul or replacement life goal of at least 45,000 miles when operated under LACMTA service. Brakes shall be self-adjusting. Mechanical brake wear indicators, (visible brake sensors), shall utilize stainless steel exposed push rods.
94	TS 37.6	Parking/Emergency Brake, Air Brakes	Documents, Drawings	Pre-Poduction Meetings	The parking brake shall be actuated by a valve mounted convenient to the operator, subject to LACMTA approval…
95	TS 39.1	Pneumatic System, General	Documents, Samples	Pre-Production Meetings	A quarter turn manual shut-off valve with quick disconnect fitting shall be easily accessible and located in the engine compartment and shall supply air prior to the air dryer, subject to LACMTA approval…
96	TS 39.2	Pnuematic System, Air Compressor	Demonstration	Pilot Vehicle at Factory	The electrically-driven air compressor shall be sized (designed) to charge the entire air system on new buses from 0 psi to 120 psi in less than five minutes for a single unit and bus not exceeding the fast idle speed (~1000 rpm) setting of the engine.

Item	Section	Title	Deliverable	Schedule	Requirement
97	TS 39.2	Pnuematic System, Air Compressor	Documention	Pilot Vehicle Prior To Production	The electrically-driven air compressor shall be designed to supply air operating under the Air System Design Operating Profile while remaining within the manufactures air compressor specifications. The discharge temperature (measured at the compressor outlet using a probe thermocouple) shall not exceed 360ºF, excluding temperature spikes of durations less than two seconds and two percent of compressor charge time. Air compressor duty-cycle shall not exceed 30 percent in any 10 minute period under the Manhattan Operating Profile.
98	TS 39.4	Pneumatic System, Air Reservoirs	Documentation	Pre-proPuction Meetings & Pilot Vehicle at Factory	All air reservoirs shall meet the requirements of FMVSS Standard 121 and SAE Standard J10 and shall be equipped with drain plugs and guarded or flush type drain valves below floor level. Major structural members shall protect these valves and any automatic moisture ejector valves from road hazards. Reservoirs shall be sloped toward the drain valve. All air reservoirs shall have drain valves mounted below floor level with lines routed to eliminate the possibility of water traps and/or freezing in the drain line. All air tanks shall have check valves at the inlet side for isolation.
99	TS 40	Electrical, Electronic and Data Communications, Overview	Approval	Prior to Pilot Bus completion	The Contractor shall coordinate a technical review with the LACMTA covering control system integration, installation, and design. As part of the technical review, the Contractor shall advise the LACMTA concerning control system features, options, and accessories, and shall conform, to the degree possible, to those already in use at the LACMTA in an effort to increase component and system commonality. The Contractor shall provide documentation including a description of control system operation and system schematics.
100	TS 40	Electrical, Electronic and Data Communications, Overview	Deliverable	Pilot Vehicle at Factory	A listing of the software part number and revision number and procedure for obtaining new releases shall be identified for each component which is software controlled.
101	TS 40.1	Electrical, Electronic and Data Communications, Modular Design	Demonstration	Pilot Vehicle at Factory	Replacement of the engine/propulsion compartment wiring harness(es) shall not require pulling wires through any bulkhead or removing any terminals from the wires.
102	TS 41	Environmental and Mounting Requirements	Test Documentation	Pilot Vehicle Prior To Production	The electrical system and its electronic components shall be capable of operating in the area of the vehicle in which they will be installed, as recommended in SAE J1455.

Item	Section	Title	Deliverable	Schedule	Requirement
103	TS 41	Environmental and Mounting Requirements	Certification	Pilot Vehicle Prior To Production	No vehicle component shall generate, or be affected by, electromagnetic interference or radio frequency interference (EMI/RFI) that can disturb the performance of electrical/electronic equipment as defined in SAE J1113 and UNECE Council Directive 95/54 (R 10).
104	TS 42.1.1	General Electrical Requirements, Low Voltage Batteries (24V)	Documents	Proposal Period	Batteries shall be a minimum of four absorbed glass mat thin plate pure lead technology group 31 series, heavy-duty, lead-acid, sealed top battery units for: a) engine starting (including fuel controls, electronic control units and ignition system), and b) other bus loads as needed, subject to LACMTA approval…
105	TS 42.1.1	General Electrical Requirements, Low-Voltage Batteries	Demonstration Test	Pilot Vehicle Prior To Production	Starting with a full charge, starting batteries shall have sufficient energy to provide adequate power after a minimum of five continuous days (Master Run switch "Off", Master Battery switch "On", all lights off, LACMTA installed ITS equipment operating) without charging or engine operation to then properly start the bus.
106	TS 42.1.3	General Electrical Requirements, Jump Start	Documents, Samples	Pre-Production Meetings	Female receptacles equipped with approximately one-foot 2/0 pigtail cables shall be provided. The receptacle(s) shall be located on the curbside rear corner of the Bus for convenient jumper cable connection, subject to LACMTA approval…
107	TS 42.1.7	General Electrical Requirements, Low-Voltage Generation and Distribution	Documentation	Pre-Production Meetings	The Contractor shall estimate the parasitic loads during the initial stage of the bus design and shall submit a draft report to LACMTA at the Pre-Production meetings.
108	TS 42.1.7	General Electrical Requirements, Low-Voltage Generation and Distribution	Documentation	Pilot Vehicle Prior To Production	The Contractor shall estimate the parasitic loads during the initial stage of the bus design and shall submit a draft report to LACMTA at the Pre-Production meetings. A final report shall be submitted during the Pilot Bus configuration audit.
109	TS 42.4	General Electrical Requirements, Electrical Components	Certification	Pre-Production Meetings	Location of electronic modules shall be reviewed for environmental suitability such as heat, water, vibrations, contamination from dust and debris, and other electrical equipment. The system including modules, external wire, connectors, and data Bus wiring shall be designed to operate under LACMTA's Design Operating Profile. All electrical components including relays and circuit breakers must remain unaffected while bus is operated in up to 15 inches of standing water.

Item	Section	Title	Deliverable	Schedule	Requirement
110	TS 43.1.3	General Electronic Requirements, Communications	Documents, Drawings	Proposal Period	Mounting and electrical provisions shall be provided to allow LACMTA installation of existing Fleetwatch JX-55 Vehicle Interface Module in the Operator's area, subject to LACMTA approval…
111	TS 45.2.1	Data Communications, Diagnostics, Fault Detection and Data Access	Documents, Drawings	Pre-Production Meetings	The communication port(s) shall be located in the Operator's area, Engine Compartment Control Panel, and ITS Enclosure area, subject to LACMTA approval…
112	TS 45.3.1	Multiplex Level, Data Access	Documents, Drawings	Pre-Production Meetings	Diagnostic and status information shall be made available via a communication port on the multiplex system. The location of the communication port shall be easily accessible inside or adjacent to the ITS Enclosure subject to LACMTA approval…
113	TS 46.1	Driver's Area Controls, General	Documentation	Pre-Production Meetings	Switches and controls shall be divided into basic groups and assigned to specific areas, (Refer to Table 9) in conformance with SAE Recommended Practice J680, Revised 1988, "Location and Operation of Instruments and Controls in Motor Truck Cabs," and be essentially within the hand reach envelope described in SAE Recommended Practice J287, "Driver Hand Control Reach.
114	TS 46.2	Driver's Area Controls, Glare	Inspection	Pilot Vehicle at Factory	The driver's work area shall be designed to minimize glare to the extent possible. Objects within and adjacent to this area shall be matte black or dark gray in color wherever possible to reduce the reflection of light onto the windshield. The use of polished metal and light-colored surfaces within and adjacent to the driver's area shall be avoided.
115	TS 46.8	Driver Foot Switches, Solid state Foot Switch Control	Documents, Drawings	Pre-Production Meetings	The inclined mounting surface shall be skid-resistant. All other controls, including high beam shall be in a location approved…
116	TS 47.1	Driver's Amenities, Coat Hanger	Documents, Samples	Pre-Production Meetings	A stainless steel, aluminum, or approved equal, coat hook shall be furnished and installed, subject to LACMTA approval.
117	TS 47.4	Repair Card Holder	Documents, Drawings	Pre-Production Meetings	A card holder shall be provided in the operators' area at a location accessible to mechanics standing in the front entry area with the passenger door open, subject to LACMTA approval…

Item	Section	Title	Deliverable	Schedule	Requirement
118	TS 47.5	Safety Equipment	Documents, Drawings	Pre-Production Meetings	The following items shall be provided and installed within seven feet of the Operator's seat in a location that is easy reach, subject to LACMTA approval… a) DOT approved heavy-duty emergency reflector kit stored in a storage box. b) 5-pound (5 lb.) multipurpose fire extinguisher mounted with universal bracket.
119	TS 47.6	Bus Registration Holders	Documents, Drawings	Pre-Production Meetings	A Bus registration holder shall be installed above the operator near the ceiling, subject to LACMTA approval…
120	TS 47.7	Trash Hooks	Demonstration	Pilot Vehicle at Factory	Placement and selection of the hooks shall be reviewed on the Pilot Bus and are subject to LACMTA approval.
121	TS 49.1	Driver's Seat, Dimensions	Certification	Pre-pPoduction Meetings	The driver's seat shall be comfortable and adjustable so that people ranging in size from a 95th-percentile male to a 5th-percentile female may operate the bus. The heavy-duty Operator's seat shall support Operators' in the orthopedically correct seating position.
122	TS 49.8.1	Exterior Mirrors	Documents, Drawings	Proposal Period	Mirrors shall be made of tempered plate glass or have safety backing to prevent shattering subject to approval…
123	TS 49.8.1	Exterior Mirrors	Documents, Drawings	Proposal Period	Adjustment of the mirrors shall be provided by two nubbin switches located to the left of the Operator, subject to LACMTA approval…
124	TS 49.8.1	Exterior Mirrors, Street Side Mirrors	Documents, Drawings	Proposal Period	Street side mirror shall be overhead mounted in a position to minimize potential contact with vehicles or cyclists, subject to LACMTA approval…
125	TS 49.8.2	Interior Mirrors	Documents, Drawings	Pre-Production Meetings	Mirrors shall be provided to permit the operator to observe passengers throughout the Bus, including entrances and exits, and directly in front of the bus during bicycle loading and unloading activities without leaving his seat and without shoulder movement, subject to LACMTA approval…

Item	Section	Title	Deliverable	Schedule	Requirement
126	TS 51.	Windshield	Certification	Pre-Production Meetings	The windshield shall permit an operator's field of view as referenced in SAE Recommended Practice J1050. The vertically upward view shall be a minimum of 15 degrees, measured above the horizontal and excluding any shaded band. The vertically downward view shall permit detection of an object 3.5 feet high no more than two) feet in front of the bus. The horizontal view shall be a minimum of 90 degrees above the line of sight. Any binocular obscuration due to a center divider may be ignored when determining the 90-degree requirement, provided that the divider does not exceed a three-- degree angle in the operator's field of view. Windshield pillars shall not exceed 10 degrees of binocular obscuration.
127	TS 51.	Windshield	Inspection	Prior to Pilot Vehicle Acceptance	The windshield shall be designed and installed to minimize external glare as well as reflections from inside the bus. Windshield shall be two-piece design
128	TS 52.	Driver's Side Window	Certification	Pre-production Meetings	The driver's side window glazing material shall have a ¼ in. nominal thickness laminated safety glass conforming with the requirements of ANSI Z26.1-1996 Test Grouping 2 and the Recommended Practices defined in SAE J673. Light transmittance shall be maximum 75 percent on the glass area below 53 in. from the operator platform floor. On the top fixed over bottom slider configuration, the top fixed area above 53 inches may have a maximum one percent light transmittance.
129	TS 53.3	Side Windows, Configuration	Documents, Drawings	Proposal Period	Rearmost windows which are lower than shoulder height for seated passengers shall not be opened or equipped with emergency escape provisions, subject to LACMTA approval…
130	TS 53.4	Side Windows, Materials, Safety Glass Glazing Panels	Certification	Pre-production Meetings	Side windows glazing material shall have a minimum of 3/16 in. nominal thickness tempered safety glass. The material shall conform to the requirements of ANSI Z26.1-1996 Test Grouping 2 and the Recommended Practices defined in SAE J673. Windows on the bus sides and in the rear door shall be grey tint (13-50 percent) luminous transmittance as measured by ASTM D-1003), complementary to the bus exterior. The maximum solar energy transmittance shall not exceed 37 percent, as measured by ASTM E-424.

Item	Section	Title	Deliverable	Schedule	Requirement
131	TS 53.4	Side Windows, Materials, Anti-Vandalism Sacrificial Film	Certification	Proposal Period	All glazing material that is aft of the front standee line, and in front of the exit door, shall be equipped with an interior single layer 6 mil minimum laminated film. All glazing material that is aft of, and including, the exit door shall be equipped with an interior four layer laminated film. Both types of window film installations are subject to LACMTA approval…
132	TS 54	HVAC, Capacity and Performance	Test Documentation	Prior to Pilot Vehicle Acceptance	The HVAC climate control system shall be modular design and capable of controlling the temperature and maintaining the humidity levels of the interior of the bus as defined in the following paragraphs. With the bus running at the design operating profile with corresponding door opening cycle, and carrying a number of passengers equal to 150 percent of the seated load, the HVAC system shall control the average passenger compartment temperature within a range between 65 º and 80°F, while maintaining the relative humidity to a value of 50 percent or less. The system shall maintain these conditions while subjected to any outside ambient temperatures within a range of 10 º to 95 °F and at any ambient relative humidity levels between 5 and 50 percent. System capacity testing, including pull-down/warm-up, stabilization and profile, shall be conducted in accordance to the APTA's "Recommended Instrumentation and Performance Testing for Transit Bus Air Conditioning System.
133	TS 56.2	HVAC, Driver's Area	Test Documentation	Prior to Pilot Vehicle Acceptance	The windshield defroster unit shall meet the requirements of SAE Recommended Practice J381, "Windshield Defrosting Systems Performance Requirements," and shall have the capability of diverting heated air to the driver's feet and legs. The defroster or interior climate control system shall maintain visibility through the driver's side window.
134	TS 56.3	HVAC, Controls for the Climate Control System	Documents, Drawings	Proposal Period	Heater water control valves shall be "positive" type, when closed. The method of operating remote valves shall be subject to LACMTA approval…
135	TS 57	HVAC, Air Filtration	Certification	Pre-production Meetings	Air shall be filtered before discharge into the passenger compartment. The filter shall meet the ANSI/ASHRAE 52.2 requirement for 5 percent or better atmospheric dust spot efficiency, 50 percent weight arrestance, and a minimum dust holding capacity of 120 g per 1000 cfm cell. Air filters shall be easily removable for service.

Item	Section	Title	Deliverable	Schedule	Requirement
136	TS 62.3	Design, Curb Feelers	Sample	Upon Request	Curb feeler sample shall be provided to Contractor upon request.
137	TS 62.3	Design, Curb Feelers	Demonstration	Pilot Vehicle at Factory	Installation of curb feeler shall be subject to LACMTA approval…
138	TS 66	License Plate Provisions	Documents, Drawings	Pre-production Meetings	These provisions shall direct-mount or recess the license plates so that they can be cleaned by automatic bus-washing equipment without being caught by the brushes, subject to LACMTA approval…
139	TS 69.1	Service Compartments & Access Doors, Access Doors	Documents, Drawings	Pre-production Meetings	The fuel fill/charge port door shall be hinged at the top and shall open fully up against the side of the Bus subject to LACMTA approval…
140	TS 70.2	Bumpers, Front Bumper	Certification	Pre-production Meetings	No part of the bus, including the bumper, shall be damaged as a result of a five (5) mph impact of the bus at curb weight with a fixed, flat barrier perpendicular to the bus's longitudinal centerline. The bumper shall return to its pre-impact shape within ten minutes of the impact. The bumper shall protect the bus from damage as a result of 6.5 mph impacts at any point by the common carriage with contoured impact surface defined in Figure 2 of FMVSS 310 loaded to 4,000 lbs parallel to the longitudinal centerline of the bus. It shall protect the bus from damage as a result of 5.5 mph impacts into the corners at a 30-degree angle to the longitudinal centerline of the bus.
141	TS 70.3	Bumpers, Rear Bumper	Certification	Pre-Production Meetings	No part of the bus, including the bumper, shall be damaged as a result of a two mph impact with a fixed, flat barrier perpendicular to the longitudinal centerline of the bus. The bumper shall return to its pre-impact shape within ten minutes of the impact. When using a yard tug with a smooth, flat plate bumper two feet wide contacting the horizontal centerline of the rear bumper, the bumper shall provide protection at speeds up to five mph, over pavement discontinuities up to one inch high, and at accelerations up to two mph/sec. The rear bumper shall protect the bus, when impacted anywhere along its width by the common carriage with contoured impact surface defined in Figure 2 of FMVSS 301 loaded to 4000 lbs, at four mph parallel to or up to a 30-degree angle to, the longitudinal centerline of the bus.
142	TS 70.5	Bicycle Rack	Documents, Drawings	Pre-Production Meetings	The installed bicycle rack shall not interfere with towing the Bus. California Code Title 13 requires that bike racks be installed with a way for the Operator to determine whenever the bike rack is deployed.

Item	Section	Title	Deliverable	Schedule	Requirement
143	TS 71.1	Finish and Color, Appearance	Documentation	Pre-production Meetings/Pilot Vehicle	Contractor shall utilize the LACMTA's existing local color scheme in its exterior paint design, (see Technical Specification Attachment 1-Metro Local Exterior and Interior Fleet Standards for reference). Exterior colors shall be applied over a white base color. The manufacturer shall submit for MTA's approval, a drawing showing painting layout including striping bends and breaks, during Pre-Production meetings. The Pilot Bus shall be painted according to this color scheme for approval by the LACMTA prior to application to the remainder of the buses..
144	TS 71.1	Finish and Color, Appearance	Documentation	With Each Vehicle	Exterior painted surfaces shall have a minimum of 0.5-mil thick primer coat and a minimum 2.5-mil thick finish coat. Mil thickness shall conform to paint manufacturer's specifications.
145	TS 72.1	Decals, Numbering and Signing, Passenger Information	Documents, Drawings	Pre-production Meetings	“Take One” boxes shall be mounted at both the front and rear doors in convenient locations for passengers and the minimum “Take Twelve” unit shall be located in a convenient location towards the front of the bus, subject to LACMTA approval...
146	TS 73.2	Exterior Lighting, Doorway Lighting	Test Documentation	Pilot Vehicle Prior to Production	Lamps at the front and rear passenger doorways shall comply with ADA requirements and shall activate only when the doors open. These lamps shall illuminate the street surface to a level of no less than one foot-candle for a distance of threefeet outward from the outboard edge of the door threshold with a passenger standing in the threshold. The lights must be positioned overhead and shall be shielded to protect passengers’ eyes from glare.
147	TS 73.4	Exterior, Lighting, Headlights	Documents, Drawings	Proposal Period	Lenses shall be resistant to hazing and yellowing, and have proper hardness to resist surface scratches and stone chips, subject to LACMTA approval…
148	TS 74	Interior Panels & Finishes, General Requirements	Documents, Drawings	Proposal Period	Additional anti-graffiti/vandalism treatments shall be applied to interior surfaces, subject to LACMTA approval…
149	TS 75.	Interior Panels	Certification	Preproduction Meetings	Interior panel required to meet FMVSS 302. Materials shall comply with the Recommended Fire Safety Practices defined in FTA Docket 90-A, most recent revision.
150	TS 75	Interior Panels	Documents, Drawings	Proposal Period	Panels in other areas of the bus shall be stainless or other material as determined to best match appearance with the rear section of the bus subject to LACMTA approval…
151	TS 75.2	Interior Panels, Modesty Panel	Certification	Pilot Vehicle Prior To Production	The modesty panel and its mounting shall withstand a static force of 250 lbs applied to a four inch × four inch area in the center of the panel without permanent visible deformation.

Item	Section	Title	Deliverable	Schedule	Requirement
152	TS 75.2	Interior Panels, Modesty Panel	Inspection	Pilot Vehicle at Factory	At the rear door area a clear non-glass panel from above the modesty panel to the top of the daylight opening and attached to the stanchion.
153	TS 75.4	Interior Panels, Rear Bulkhead	Documents, Drawings	Proposal Period	Ceiling and enclosures adjacent to ceiling shall be made of durable, corrosion resistant, easily cleanable material subject to LACMTA approval…
154	TS 75.8	Interior Panels, Floor Covering	Certification	Preproduction Meetings & Pilot Vehicle at Factory	All interior floor areas shall be covered with a combination of gray color smooth and ribbed slip resistant rubber or equivalent floor covering that remains effective in all weather conditions with 12-year unconditional warranty, subject to LACMTA approval.
155	TS 75.8	Interior Panels, Floor Covering	Documents, Drawings	Proposal Period	The edge of any interior steps shall have minimal overhang. Special coating for the step tread section may be acceptable subject to LACMTA approval…
156	TS 75.9	Interior Panels, Interior Lighting	Documents, Drawings	Proposal Period	The lighting system shall meet FCC Part 18; Class A regulation for EMI conducted and radiated emissions. The interior lighting design shall be subject to LACMTA approval.
157	TS 75.12	Interior Panels, Seating Area(s) (Transit Bus)	Test Documentation	Pilot Vehicle Prior to Production	The interior lighting system shall provide a minimum 15 foot-candle illumination on a one square- foot plane at an angle of 45 degrees from horizontal, centered 33 inches above the floor and 24 inches in front of the seat back at each seat position. Allowable average light level for the rear bench seats shall be seven foot-candles.
158	TS 75.14	Interior Panels, Vestibules/Doors (Transit Bus)	Test Documentation	Pilot Vehicle Prior to Production	Floor surface in the aisles shall be a minimum of 10 foot-candles, and the vestibule area a minimum of four foot-candles with the front doors open and a minimum of two foot-candles with the front doors closed. The front entrance area and curb lights (if needed) shall illuminate when the front door is open and master run switch is in the “lights” positions. Rear exit area and curb lights shall illuminate when the rear door is unlocked
159	TS 75.16	Interior Panels, Step Lighting	Test Documentation	Pilot Vehicle Prior to Production	Step lighting for the intermediate steps between lower and upper floor levels shall be a minimum of four foot-candles and shall illuminate in all engine run positions.

Item	Section	Title	Deliverable	Schedule	Requirement
160	TS 75.17	Interior Panels, Ramp Lighting (Transit Bus)	Test Documentation	Pilot Vehicle Prior to Production	Exterior and interior ramp lighting shall comply with CFR Part 49, Section 38.31. Lights shall be provided at the doorway equipped with the wheelchair access system to floodlight the loading area. The light shall be wired through the ramp master toggle switch on the driver's dash and shall automatically illuminate when this switch is in the "On" position. During ramp operation, the street surface shall be illuminated to a minimum of six candlepower a distance of three (3) feet beyond the external dimensions of the ramp platform once deployed.
161	TS 75.19.1	Farebox Lighting, Transit Bus	Test Documentation	Pilot Vehicle Prior to Production	A light fixture shall be mounted in the ceiling above the farebox location. The fixture shall be capable of projecting a concentrated beam of light on the farebox. The light shall illuminate the top of the fare box and the surrounding floor area to a minimum of 15 foot-candles.
162	TS 76	Fare Collection	Documents, Drawings	Pre-Production Meetings	The Contractor shall provide and install GFI Genfare Odyssey Validation farebox base plate, power leads and ITS interface cable, subject to LACMTA approval…
163	TS 76	Fare Collection	Documents, Drawings	Pre-Production Meetings	A one-inch inside diameter waterproof conduit shall be provided from the ITS enclosure to the farebox base plate mounting location, through the Bus floor, to protect the power leads and ITS interface cable, subject to LACMTA approval…
164	TS 77	Interior Access Panels and Doors (Transit Bus)	Documents, Drawings	Pre-Production Meetings	Removal of fixtures or equipment unrelated to the repair task to gain access shall be precluded or used only subject to LACMTA approval…
165	TS 77	Interior Access Panels and Doors (Transit Bus)	Documents, Drawings	Pre-Production Meetings	Access doors shall be hinged with gas props or nover-center springs, where practical, to hold the doors out of the mechanic's way subject to LACMTA approval during pre-production meetings. All overhead doors shall be hinged at the top and shall be prevented from coming loose or opening during transit service or in bus cleaning operations. Panel fasteners shall be standardized so that only one tool is required to service all special fasteners within the Bus subject to LACMTA approval…

Item	Section	Title	Deliverable	Schedule	Requirement
166	TS 78.13	Passenger Seating, Structure and Design	Test Documentation	Pre-Production Meetings	Seat back handhold and armrests shall withstand static horizontal and vertical forces of 250 lbs applied anywhere along their length with less than ¼-inch permanent deformation. Seat back handhold and armrests shall withstand 25,000 impacts in each direction of a horizontal force of 125 lbs with less than ¼-inch permanent deformation and without visible deterioration.
167	TS 78.15	Passenger Seating, Construction and Materials	Documents, Drawings	Pre-Production Meetings	Selected materials shall minimize damage from vandalism and shall reduce cleaning time. The seats shall be attached to the frame with tamper-resistant fasteners and is subject to LACMTA approval…
168	TS 79.	Passenger Assists, (Transit Bus)	Demonstration	Pilot Vehicle at Factory	Passenger assists shall be convenient in location, shape, and size for both the 95th-percentile male and the 5th-percentile female standee.
169	TS 79.1	Assists (Transit Bus)	Certification & Test Documentation	Pre-Production Meetings	Passenger assists shall be capable of passing the NHTSA Drawstring Test. A crash resulting in a one- foot intrusion shall not produce sharp edges, loose rails, or other potentially dangerous conditions associated with a lack of structural integrity of the assists.
170	TS 79.1	Assists, (Transit Bus)	Test Documentation	Pre-Production Meetings	Assists shall withstand a force of 300 lbs applied over a 12-inch lineal dimension in any direction normal to the assist without permanent visible deformation.
171	TS 79.1	Assists, (Transit Bus)	Inspection	Pilot Vehicle at Factory	All passenger assists shall permit a full hand grip with no less than 1½ inches of knuckle clearance around the assist.
172	TS 79.3	Vestibule (Transit Bus)	Demonstration	Pilot Vehicle at Factory	The front assist should not impede wheelchair boarding and provide adequate clearance and access to the farebox during vaulting and maintenance.
173	TS 79.6	Longitudinal Seat Assists (Transit Bus)	Documents, Drawings	Pre-Production Meetings	A vertical assist or grabrail shall be provided convenient to the outer rear settee seats if they are immediately behind an aisle facing seat subject to LACMTA approval…
174	TS 80.1	Passenger Doors, Transit Bus	Documents, Drawings	Proposal Period	All passenger door components, except door panels and glazing, must come from one single manufacture, subject to LACMTA approval…
175	TS 81.1	Accessibility Provisions, Loading Systems	Documents, Drawings	Proposal Period	Bus shall utilize a low-floor fully electrically operated, preferably self-leveling wheelchair ramp system subject to LACMTA approval…

Item	Section	Title	Deliverable	Schedule	Requirement
176	TS 81.3	Accessibility Provisions, Lift	Test Documentation	Pre-Production & Pilot Vehicle Prior To Production	The loading platform shall be covered with a replaceable or renewable nonskid material and shall be fitted with devices to prevent the wheelchair from rolling off the sides during loading or unloading. Deployment or storage of the ramp shall require no more than 15 seconds. Each operation shall require continues manual pressure to the momentary switch by the operator and shall not allow unintentional improper access system operation. The device shall function without failure or adjustment for 500 cycles or 5,000 miles in all-weather conditions on the design operating profile when activated once during the idle phase. A manual override system shall permit unloading a wheelchair and storing the device in the event of a primary power failure. The manual operation of the ramp shall not require more than 35 lbs of force.
177	TS 81.5	Wheelchair Accommodations	Documents, Drawings	Proposal Period	Forward facing wheelchair securement and occupant restraint systems shall be the QPod or approved equal, subject to LACMTA approval…
178	TS 81.5.2	Wheelchair Accommodations, Rear Facing	Documents, Drawings	Pre-Production Meetings	Fabric covering on the padded barrier shall be blue, subject to LACMTA approval.
179	TS 83	Signage and Communication, Destination Signs	Documents, Drawings	Pre-Production Meetings	The destination sign compartments shall meet the following minimum requirements. Compartments shall be designed to prevent condensation and entry of moisture and dirt. Compartments shall be designed to prevent fogging of both compartment window and glazing on unit itself. Access shall be provided to allow cleaning of inside compartment window and unit glazing, subject to LACMTA approval in Pre-Production meetings. Front window exterior display area shall be sized to allow full visibility of the front destination sign.
180	TS 83.	Destination Signs, (Programming)	Deliverable	Pilot Vehicle Delivery in L.A.	Software shall be furnished for programming the sign system via an IBM compatible lap-top computer.

Item	Section	Title	Deliverable	Schedule	Requirement
181	TS 84.1	Passenger Information, Interior Displays	Documents, Drawings	Pre-Production Meetings	“Take one” boxes shall be mounted at both the front and rear doors in convenient locations for passengers and the minimum “take twelve” unit shall be located in a convenient location towards the front of the bus, subject to LACMTA approval...
182	TS 85.1	Passenger Stop Request/Exit Signal	Documents, Drawings	Pre-Production Meetings	A minimum of twelve stop request signal buttons utilizing a yellow housing shall be evenly distributed in the passenger cabin to be functionally accessible to all seated passengers subject to LACMTA approval...
183	TS 85.1	Passenger Stop Request/Exit Signal	Documents, Drawings	Proposal Period	Pricing for the installation of a wireless pushbutton switch system shall be provided on PF-1 Form, Schedule of Optional Vehicle Configuration.
184	TS 86	Communications	Documents, Drawings	Pre-Production Meetings	Service light(s) with suitable switch shall be provided within the enclosure, subject to LACMTA approval.
185	TS 86.1	Camera Surveillance System	Demonstration	Pilot Vehicle at Factory	A day-to-night demonstration shall be required to establish camera performance and final placement for optimum views and clarity. The LACMTA shall witness the demonstration and approve the final placement of the cameras. This demonstration must be successfully completed prior to approval of the pilot bus(s).
186	TS 86.1	Camera Surveillance System, Interior Cameras	Documents, Drawings	Pre-Production Meetings	Front interior camera(s) at front door passenger boarding area shall record audio subject to LACMTA approval...

Item	Section	Title	Deliverable	Schedule	Requirement
187	TS 86.1	Camera Surveillance System, Interior Cameras, Exterior Cameras	Documentation	Pilot Vehicle at Factory	Cameras shall be placed for best recording of the following five (5) areas: a) Forward 1/3 of passenger area, view of front vestibule, farebox transactions and field of view to include operator and image of bus number located on operator's barrier b) Front door, passenger boarding c) Rear door, passenger exiting d) Middle 1/3 passenger area e) Rear 1/3 passenger seating area starting from behind rear door with a primary emphasis on the rearmost seats. Cameras shall be placed for best recording of the following four (4) areas: a) Forward looking through windshield (Accident Surveillance) b) The curb side area of the Bus, (including exit door), and street from ten feet beyond front bumper to ten feet beyond rear bumper c) Street side area of the Bus and street from ten feet beyond the front bumper to ten feet beyond the rear bumper d) Rear camera shall view the ground behind the Bus from the bumper to approximately 25 feet back
188	TS 86.1	Exterior Cameras	Demonstration	Pilot Vehicle at Factory	Camera positions and adjustment are subject to LACMTA approval…
189	TS 86.1	Camera Monitor	Documentation	Pre-Production Meetings	Final monitor configuration is subject to LACMTA approval during pre-production meetings.
190	TS 86.1	Camera Surveillance System, Central Processor	Inspection	Pilot Vehicle at Factory	The video security system central processor shall be packaged in a suitable ventilated shock mounted and splash resistant enclosure keyed to LACMTA standards, located within the ITS enclosure, subject to LACMTA approval…

Item	Section	Title	Deliverable	Schedule	Requirement
191	TS 86.1	System Management Tool	Documentation	Pre-Production Meetings	shall incorporate a system management tool for; wireless download of video files in a timely manner, software upgrades, camera checks, configuration changes and health reports as required. Final configuration is subject to LACMTA approval.
192	TS 86.1	System Management Tool	Documentation	Proposal Period	Pricing of the system management tool for use at up to 13 LACMTA operating divisions shall be provided to the LACMTA on Price Form PF-4, Schedule C of Prices of Diagnostic Test Equipment.
193	TS 86.1	Enhanced Video Recording System Option	Documentation	Proposal Period	Pricing for optional features to enhance the video recording system shall be provide d on Price Form PF-1, Schedule of Optional Vehicle Configuration. Ability of video system to analyze and discern events such as wheelchair passengers and generate report information with summary data such as wheelchair passenger count and boarding/alighting locations. The ability to utilize the dash mounted display for diagnostic work or configuration changes on the DVR. Incorporation of a 360 degree camera(s) for better surveillance of bus interior.
194	TS 86.2	Public Address System	Documentation	Pre-Production Meetings	The location of the gooseneck microphone is subject to LACMTA approval in pre-production meetings.
195	TS 86.3	Automatic Passenger Counter (APC)	Documentation	Pre-Production Meetings	Provisions and necessary cables for installation of door sensors and analyzer(s) for IRMA-3 infrared APC system shall be provided subject to LACMTA approval.
196	TS 86.3	Automatic Passenger Counter (APC)	Documentation	Proposal Period	As an option, LACMTA may consider incorporating an installation of IRMA-Matrix infrared APC System. Pricing to include; installation, cabling, door sensors, analyzer(s), software, integration testing, first article acceptance and any other items necessary for proper operation shall be submitted on form PF-1, Schedule of Optional Vehicle Configuration.
197	TS 86.4.4	Emergency Alarm	Documentation	Pre-Production Meetings	SAS switch location and lead wire routing is subject to LACMTA approval...
198	TS 86.8	ITS Provisions, WLAN	Documentation	Pre Production Meetings	Sierra Wireless InMotion MG90 or an approved equal wireless router/switch and feedline shall be installed, subject to LACMTA approva**l…**

Item	Section	Title	Deliverable	Schedule	Requirement
199	TS 86.9	ITS Provisions, Radio Antennas	Documentation	Pre-Production Meetings	The antenna mounting and lead termination shall be accessible from the Bus interior, subject to LACMTA approval**…**
200	TS 86.10	ITS Provisions, Global Positioning System (GPS)	Documentation	Pre-Production Meetings	The GPS Antenna shall be mounted on the centerline of the roof of the bus near the front, with a quick disconnect, within two feet from the antenna, for future replacement subject to LACMTA approval… See TS 88.1 Approved Equals.
201	TS 86.11	ITS Provisions, IBSS	Documentation	Pre-Production Meetings	Battery and ignition power and a separate J1939 communication connection shall be supplied in the ITS enclosure, subject to LACMTA approval…
202	TS 88.2	Maintainability Requirements	Demonstration	Pilot Vehicle at Factory and in LA	The Contractor shall be required to demonstrate these maintenance tasks using the information contained in the service and parts manuals.

Los Angeles County
Metropolitan Transportation Authority

One Gateway Plaza
Los Angeles, CA 90012-2952

213.922.2000 Tel
metro.net

Metro

MAEL-048 **Response Required: No**

Date: March 14, 2019

File Nos.:

Action Item(s):

CDRL: n/a

Richard Himes
Contract Administration Manager
Eldorado National (California), Inc. (ENC)
9670 Galena Street
Riverside, CA 92509

SUBJECT: **OP28367-000 40' LOW FLOOR CNG TRANSIT BUSES**
EXECUTED CONTRACT MODIFICATION NO.: 13
PROCURE LINE ITEMS - SPECIAL TOOLS (PF-3); DIAGNOSTIC TEST EQUIPMENT (PF-4); UPDATED PRICING FORMS

Reference: ELMA-055, 057

Dear Mr. Himes:

Enclosed is your executed original of the subject modification.

Please call me at 213.922.7334 or e-mail at hernandezel@metro.net if you have any questions.

Sincerely,

Elizabeth Hernandez
Principal Contract Administrator

Enclosure: Fully executed Contract Modification No. 13

cc: Kwesi Annan

LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY

CONTRACT NO. OP28367-000, CONTRACT MODIFICATION NO.: 13

FOR: FORTY FOOT (40') LOW FLOOR CNG TRANSIT BUSES

This Contract Modification No. 13 to Contract No.: OP28367-000 is made effective on the 8th day of February 2019 by and between the LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY, hereinafter referred to as "MTA", and EL DORADO NATIONAL (CALIFORNIA), INC., hereinafter referred to as "CONTRACTOR".

WHEREAS, CONTRACTOR and MTA entered into Contract No.: OP28367-000 effective August 15, 2017, as amended by Contract Modification No. 1, dated November 6, 2017, Contract Modification No. 2, dated December 6, 2017, Contract Modification No. 3 dated December 27, 2017, Contract Modification No. 4 dated January 19, 2018, Contract Modification No. 5 dated February 12, 2018, Contract Modification No. 6 dated April 23, 2018, Contract Modification No. 7 dated October 3, 2018, Contract Modification No. 8 dated October 26, 2018, Contract Modification No. 9 dated November 5, 2018, Contract Modification No. 10 dated January 9, 2019, Contract Modification No. 11 dated January 15, 2019, and Contract Modification No. 12 dated January 17, 2019, (the "Existing Contract") and;

WHEREAS, CONTRACTOR and MTA desire to modify the Existing Contract as provided herein;

Now, therefore, it is mutually agreed, by and between the parties as follows:

1. MTA to procure specific line items under the Pricing Form PF-3 Special Tools and PF-4 Diagnostic Test Equipment.

2. Update the Pricing Forms PF1 to PF 5, as attached.

Modify Article IV COMPENSATION to read as follows:

ARTICLE IV: COMPENSATION

A. Contract Price

1. In consideration of the Contractor's full performance of the Work, and in accordance with the terms of the Contract, Metro will pay the Contractor the Contract Price of $199,324,170, inclusive of tax and delivery as provided in this Article and in the Contract Document entitled Compensation and Payment Provisions.

Contract Options may be exercised unilaterally by LACMTA in accordance with Special Provisions Article SP-28, Options.

2. Training Aids - Additionally, in consideration of the Contractor's full performance of the Work, and in accordance with the terms of the Contract, Metro will pay the Contractor for line items under Pricing Form PF-5 Training Aids in the amount of $349,646 inclusive of tax and delivery as provided in this Article and in the Contract Document entitled Compensation and Payment Provisions, CP- 2 (H).

a. Ea. One complete running engine and transmission assembly, including cooling and fueling systems, mounted on a suitable roll around stand (TS 5.6.3.a)
b. Ea. Anti-Lock Brake Board (TS 5.6.3.f)
c. Ea. Electric Air Conditioning Training Simulator Module (TS 5.6. 3.g)
d. Ea. Video Security System (TS 5.6.3.i)
e. Ea. Multiplex Electrical Training Board (TS 5.6.3.k)
f. Ea. Voith DIWA.6 transmission training cutaway (TS 5.6.3.b)

3. Special Tools (PF-3) - In consideration of the Contractor's full performance of the Work, and in accordance with the terms of the Contract, Contractor will provide two (2) Complete Voith Special Service Tool Kits (P/N 3040093309) under Pricing Form PF-3. Contractor is providing this line item at no cost to Metro.

4. Diagnostic Test Equipment (PF-4) - In consideration of the Contractor's full performance of the Work, and in accordance with the terms of the Contract, Metro will pay the Contractor for the following line items under Pricing Form PF-4 Diagnostic Test Equipment in the amount of $104,586, inclusive of tax and delivery as provided in this Article and in the Contract Document entitled Compensation and Payment Provisions, CP- 2 (G).

NO.	UNIT	DESCRIPTION	QTY.	UNIT PRICE	TOTAL PRICE
a.	Ea.	Engine Diagnostic software, including necessary cables and connectors (TS 5.6.5)	20	$1,170.00	$23,400.00
b.	Ea.	Voith Transmission Diagnostic Tooling Kit (P/N 151.00400712) (TS 5.6.5)*	20	$805.50	$8,055.00*
c.	Ea.	ABS Diagnostic software, including necessary cables and connectors (TS 5.6.5)	20	$1,370.00	$27,400.00
d.	Ea.	Multiplex System PC software and connection kit	20	$332.00	$6,640.00
e.	Ea.	A/C Interface Software and Cable (TS 5.6.5)	20	$585.00	$11,700.00
f.	Ea.	Door System Diagnostic/ Programming Software, Tools & Equipment (TS 5.6.5)	20	$905.00	$18,100.00
		Total			$95,295.00
		Tax (9.75%)			$ 9,291.26
		Total Amount, including tax			**$104,586.00**

* Ten (10) Voith Transmission Diagnostic Tool kits are being provided at no cost to MTA

Except as expressly amended hereby, the Existing Contract remains in full force and effect as originally executed.

IN WITNESS WHEREOF, the parties have caused this Contract Modification No. 13 to the Existing Contract to be executed by their respective officers duly authorized on the date first written above.

EL DORADO NATIONAL (CALIFORNIA), INC.

By: _____
Signature

TONY WAYNE
Type or Print Name

2/14/19
Date

LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY
Philip A. Washington
Chief Executive Officer

By: _____
Wayne Okubo
Director, Contract Administration

3/13/19
Date

GROUP A - UP TO 600 40' CNG BUSES
FORM PF-1 (CNG - 40') - CONTRACT PRICE SUMMARY
Contract Modification No.: 13

Proposer: ELDORADO NATIONAL (CALIFORNIA), INC.

Contract No.: OP28367-000

Contract Title: FORTY FOOT (40') LOW FLOOR CNG BUS PROCUREMENT

1.0 CONTRACT FOR 295 BUSES (BASE BUY)

No.	Qty.	Description of Item	Taxable Unit Price	Unit Price	Total Price
1	229	40' Low Floor CNG Buses (Base Buy) from PF-1A Values derived from PF-1A*:	$596,199.46	$615,939.30	$141,050,100
	66	[1] 40' Low Floor CNG Buses (Base Buy) from PF-1A	$595,805.53	$615,545.53	$40,626,005
1a	Lot	Manuals (Base Buy) (TS 5.6.4)	$2,281.50	Lump Sum	$23,400.00
1b	295	Vehicle Delivery Charge for Base Buy Value of all taxable delivery charges per bus**:		$275.00	$81,125.00
1c	229	Tax (Base Buy Production Bus 67 - 295)	9.75%	$58,129.45	$13,313,925
1d	66	Tax (Base Buy Production Bus 1-66)	9.75%	$58,091.04	$3,834,009
2	2	Pilot Buses Retrofit with Rear Axle Upgrade		$8,600	$17,201
2a		Tax	9.75%	$838.55	$1,677
3	Lot	Reserved			
4	Lot	Reserved			
5	Lot	Reserved			
6	Lot	Reserved			
7	Lot	Performance Bond (Base Buy)		Lump Sum	$119,336.00
8	1,000	Total Training Hours for Base Buy***		$175,000.00	
8a	900	Contractor (Proposer/Prime) Base Buy		$175.00	$157,500.00
8b	100	Subcontractor/Supplier Base Buy		$175.00	$17,500.00
9	1	System Management Tool for use at up to (13) MTA Operating Divisions per TS 86.1		$74,930.00	$74,930.00
10a	15	Special Towing Equipment (TS 25)		$386.00	$5,790.00
10b		Tax	9.75%	$37.64	$564.53
11a	2	Rear Recovery Devices/Tie Downs (TS 25)		$505.00	$1,010.00
11b		Tax	9.75%	$49.24	$98.48

1.0 Total Price for CONTRACT for 295 Base Buy Buses (Sum of Items "1" through "11b") to be the BASIS for Price Proposal evaluation

In U.S. Dollars Using Words: ONE HUNDRED NINETY NINE MILLION THREE HUNDRED TWENTY FOUR THOUSAND ONE HUNDRED SEVENTY DOLLARS

In U.S. Dollars Using Figures: $199,324,170

GROUP A - UP TO 600 40' CNG BUSES
FORM PF-1 (CNG - 40') - CONTRACT PRICE SUMMARY
Contract Modification No.: 13

Proposer: ELDORADO NATIONAL (CALIFORNIA), INC.

Contract No.: OP28367-000

Contract Title: FORTY FOOT (40') LOW FLOOR CNG BUS PROCUREMENT

NOTE [1] Unit Prices from Mod. No. 7 for Production Buses 1 - 65

* Taxable Unit Price is the Unit Price less 1.14 Accessibility Provisions on PF-1A

** Input the taxable portion of the Delivery Charge under the Taxable Unit Price column and the total Delivery Charge under the Unit Price column

*** Training Hours for Base Buy are only estimates and not a guaranteed level of effort. The total for this Line is a Not-to-Exceed provisional amount.

2.0 CONTRACT FOR 150 UP TO 305 BUSES (OPTION BUY)

No.	Qty.	Description of Item		Taxable Unit Price	Unit Price	Total Price
10	305	40' Low Floor CNG Buses (Option Buy) from PF-1A for 150 to 305 vehicles*		$596,199.46	$615,939.30	$187,861,486.50
10a	Lot	Manuals (Option Buy) (TS 5.6.4)***		$2,281.50	Lump Sum	$23,400.00
10b	305	Vehicle Delivery Charge for Option Buy	Value of all taxable delivery charges per bus**:	$0.00	$275.00	$83,875.00
10c		Tax (Option Buy)		9.75%	$58,129.45	$17,731,762.94
11		Reserved			$	$
12	Lot	Performance Bond for Option Buy***			Lump Sum	$123,421.00
13	500	Total Training Hours for Option Buy****			$87,500.00	
13a	450	Contractor (Proposer/Prime) Option Buy			$175.00	$78,750.00
13b	50	Subcontractor/Supplier Option Buy			$175.00	$8,750.00
14		Reserved			$	$

2.0 Total Price for CONTRACT for 150 Up to 305 Option Buy Buses (Sum of Items "10" through "14") to be the BASIS for Price Proposal evaluation

In U.S. Dollars Using Words: TWO-HUNDRED FIVE MILLION NINE HUNDRED ELEVEN THOUSAND FOUR HUNDRED FORTY FIVE DOLLARS

In U.S. Dollars Using Figures: **$205,911,445**

NOTE * Taxable Unit Price is the Unit Price less 1.14 Accessibility Provisions on PF-1A

** Input the taxable portion of the Delivery Charge under the Taxable Unit Price column and the total Delivery Charge under the Unit Price column

*** For proposal purposes only, Manuals and Bond prices are for all 305 bus Options exercised. Actual cost will depend on Option quantity ordered.

**** Training Hours for Option Buy are only estimates and not a guaranteed level of effort. The total for this Line is a Not-to-Exceed provisional amount.

GROUP A - UP TO 600 40' CNG BUSES
FORM PF-1 (CNG - 40') - CONTRACT PRICE SUMMARY
Contract Modification No.: 13

Proposer: ELDORADO NATIONAL (CALIFORNIA), INC.

Contract No.: OP28367-000

Contract Title: FORTY FOOT (40') LOW FLOOR CNG BUS PROCUREMENT

3.0 OPTIONAL VEHICLE CONFIGURATION

No.	Qty.	Description of Item		Unit Price	Total Price
15	1	3 ADA Securement Configuration TS 81.5 (Total 15a - 15d)			$6,370.00
15a		Direct Materials/Equipment		$5,750.00	
15b		Labor Installation Costs		$620.00	
15c		Non Recurring Cost		$0.00	
15d		Other Costs (Identify)		$0.00	
16	1	4 ADA Securement Configuration TS 81.5 (Total 16a - 16d)			$10,170.00
16a		Direct Materials/Equipment		$9,150.00	
16b		Labor Installation Costs		$1,020.00	
16c		Non Recurring Cost		$0.00	
16d		Other Costs (Identify)		$0.00	
17	600	Reserved****			
17a	295	Reserved			
17b	305	Reserved			
18	600	25-Year Certified CNG Tanks			$522,000.00
18a	295	25 Yr Certified CNG Tanks for Base Buy	$256,650.00	$870.00	
18b	305	25 Yr Certified CNG Tanks for Option Buy for 150 up to 305 vehicles	$265,350.00	$870.00	
19	600	Complete Automatic Passenger Counter System TS 86.3 (Total 19a - 19h)			$2,757,600.00
19a	295	Direct Materials/Equipment for Base Buy APC		$4,136.00	
19b	295	Labor Installation Costs for Base Buy APC		$460.00	
19c	295	Non Recurring Cost for Base Buy APC		$	

GROUP A - UP TO 600 40' CNG BUSES
FORM PF-1 (CNG - 40') - CONTRACT PRICE SUMMARY
Contract Modification No.: 13

Proposer: ELDORADO NATIONAL (CALIFORNIA), INC.

Contract No.: OP28367-000

Contract Title: FORTY FOOT (40') LOW FLOOR CNG BUS PROCUREMENT

19d	295	Other Costs (Identify) for Base Buy APC		$	
		Total for Base Buy APC	$1,355,820.00	$4,596.00	
19e	305	Direct Materials/Equipment for Option Buy APC for 150 up to 305 vehicles		$4,136.00	
19f	305	Labor Installation Costs for Option Buy APC for 150 up to 305 vehicles		$460.00	
19g	305	Non Recurring Cost for Option Buy APC for 150 up to 305 vehicles		$	
19h	305	Other Costs (Identify) for Option Buy APC for 150 up to 305 vehicles		$	
		Total for Option Buy APC for 150 up to 305 vehicles	$1,401,780.00	$4,596.00	
20	600	Enhanced 360 degree Camera System TS 86.1 (Total 20a - 20h)			$579,000.00
20a	295	Direct Materials/Equipment for Base Buy Enhanced Camera System		$869.00	
20b	295	Labor Installation Costs for Base Buy Enhanced Camera System		$96.00	
20c	295	Non Recurring Cost for Base Buy Enhanced Camera System		$	
20d	295	Other Costs (Identify) for Base Buy Enhanced Camera System		$	
		Total for Base Buy Enhanced Camera System	$284,675.00	$965.00	
20e	305	Direct Materials/Equipment for Option Buy Enhanced Camera System for 150 up to 305 vehicles		$869.00	
20f	305	Labor Installation Costs for Option Buy Enhanced Camera System for 150 up to 305 vehicles		$96.00	
20g	305	Non Recurring Cost for Option Buy Enhanced Camera System for 150 up to 305 vehicles		$	
20h	305	Other Costs (Identify) for Option Buy Enhanced Camera System for 150 up to 305 vehicles		$	
		Total for Option Buy Enhanced Camera System for 150 up to 305 vehicles	$294,325.00	$965.00	
21	600	USB Ports for Passenger Charging Only			$288,000.00
21a	295	USB Ports for Passenger Charging Only for Base Buy	$141,600.00	$480.00	
21b	305	USB Ports for Passenger Charging Only for Option Buy for 150 up to 305 vehicles	$146,400.00	$480.00	
22	600	Optional Wireless Stop Request Switches (Bus set)			$291,000.00
22a	295	Optional Wireless Stop Request Switches (Bus set) for Base Buy	$143,075.00	$485.00	

GROUP A - UP TO 600 40' CNG BUSES

FORM PF-1 (CNG - 40') - CONTRACT PRICE SUMMARY

Contract Modification No.: 13

Proposer: **ELDORADO NATIONAL (CALIFORNIA), INC.**

Contract No.: **OP28367-000**

Contract Title: **FORTY FOOT (40') LOW FLOOR CNG BUS PROCUREMENT**

22b	305	Optional Wireless Stop Request Switches (Bus set) for Option Buy for 150 up to 305 vehicles	$147,925.00	$485.00	
23	600	Optional Full Color Destination Sign Sets (TS 86.3)			$2,070,000.00
23a	295	Optional Full Color Destination Sign Sets (TS 86.3) for Base Buy	$1,017,750.00	$3,450.00	
23b	305	Optional Full Color Destination Sign Sets (TS 86.3) for Option Buy for 150 up to 305 vehicles	$1,052,250.00	$3,450.00	
24	Lot	Spare Parts (From Schedule A, Form PF-2)			$2,261,788.13
25	Lot	Special Tools (Schedule B Form PF-3)			$16,731.60
26	Lot	Diagnostic Test Equipment (Schedule C, Form PF-4)			$336,020.00
27	Lot	Training Aids (Schedule D, Form PF-5)			$989,385.00

3.0 Total Price for OPTIONAL VEHICLE CONFIGURATION (Sum of Items "15 through 27") for OPTIONAL EQUIPMENT to be BASIS for Price Proposal evaluation.

In U.S. Dollars Using Words: **TEN-MILLION ONE HUNDRED TWENTY EIGHT THOUSAND SIXTY FIVE DOLLARS**

In U.S. Dollars Using Figures: **$10,128,065**

**** Proposer shall provide base Low Nox Engine for each bus with the following Emission Levels:
ISLG engine is not the base engine requirement. Low Nox engine is the base requirement and therefore no longer an option.

Oxides of Nitrogen (NOx) Grams per brake horsepower-hour	Particulate Matter (PM) grams per brake horsepower hour
0.02	0.01

GROUP A - UP TO 600 40' CNG BUSES

FORM PF-1 (CNG - 40') - CONTRACT PRICE SUMMARY

Contract Modification No.: 13

Proposer: ELDORADO NATIONAL (CALIFORNIA), INC.

Contract No.: OP28367-000

Contract Title: FORTY FOOT (40') LOW FLOOR CNG BUS PROCUREMENT

4.0 CONTRACT FOR BASE BUY, OPTION BUY, AND OPTIONALVEHICLE CONFIGURATION

No.	Qty.	Description of Item	Total Price
1.0		Total Price for CONTRACT for 295 Base Buy Buses to be the BASIS for Price Proposal evaluation	$199,324,170
2.0		Total Price for CONTRACT for 150 Up to 305 Option Buy Buses to be the BASIS for Price Proposal evaluation	$205,911,445
3.0		Total Price for OPTIONAL VEHICLE CONFIGURATION for OPTIONAL EQUIPMENT to be BASIS for Price Proposal evaluation	$10,128,065
4.0		Total Price for CONTRACT for 295 Base Buy Buses, for 150 up to 305 Option Buy Buses, and Optional Vehicle Configuration for Optional Equipment combined to be the overall BASIS for Price Proposal evaluation	

In U.S. Dollars Using Words: FOUR-HUNDRED FIFTEEN MILLION THREE HUNDRED SIXTY THREE THOUSAND SIX HUNDRED EIGHTY DOLLARS

In U.S. Dollars Using Figures: $415,363,680

(Signature of Person Executing Proposal) Date

TONY WAYNE VICE PRESIDENT & GENERAL MANAGER

Type Name, Title

GROUP A - UP TO 600 40' CNG BUSES
FORM PF-1A (CNG - 40') SUBSYSTEM EQUIPMENT
CONTRACT MODIFICATION NO.: 13

Contractor: ELDORADO NATIONAL (CALIFORNIA), INC
Contract No.: OP28367-000

NO.	DESCRIPTION	BASE BUY OF ITEM		
1	Purchased Subsystem Equipment (Items 1.1 through 1.99) **			
1.1	TS 9.	Propulsion Power Assembly (PPA)***		$18,372
1.2	TS 9.	Engine		$60,324
1.3	TS 10.	Cooling System		$12,650
1.4	TS 18.	Fuel System		$68,300
1.5	TS 19.2	Heat shield between catalytic converter and HVAC unit		$332.55
1.6	TS 23.1	Hinge Rear Cross Seat Access to the bulkhead		$65.66
1.7	TS 31.	Suspension		$19,950
1.8	TS 33.	Steering System		$4,950
1.9	TS 37.	Brakes		$3,260
1.10	TS 39.	Pneumatic System		$6,850
1.11	TS 42.	Charging System		$36,800
1.12	TS 44.	Multiplex Control System		$24,200
1.13	TS 54.	HVAC Climate Control System		$29,450
1.14	TS 75.2	Protective film on modesty panels		$116.94
1.15	TS 76	Ethernet Cable to Farebox		$38.38
1.16	TS 78.	Passenger Seats		$28,955
1.17	TS 80.	Doors		$14,830
1.18	TS 81.	Accessibility Provisions		$19,740
1.19	TS 86.	Communications		$3,244
1.20	TS 86.3	Ethernet Cables in ITS enclosue		$310.91
1.21	TS 11	Transmission		$14,261
1.22	TS 78.1	USB Passenger Charging Port		$480
1.23	TS85.1	Wirelesss Stop Request Button		$485
1.24	TS 86.3	Matrix APC		$4,596
1.99	TS 34	Meritor Rear Axle Upgrade		$1,040
		All other bus subsystem equipment not included above		$241,944

TOTAL CNG BUS PRICE

Production Bus 1 - 66	* $615,545.53
Add Altro Flooring (Bus 67 - 295)	$393.80
Production Bus 67 - 295	$615,939.30

* Transfer Total CNG Bus Price to Contract Price Summary Form (PF-1 - Unit Price column, line Item 1 **- Base Buy**

Notes: 1. ** Price shall include design, engineering, manufacturing/assembly, testing, shipping, profit and other associated costs. Price for each subsystem equipment shall include all applicable apparatus.

2. Price for line Item Nos. 1a-27 in the CONTRACT PRICE SUMMARY(Form PF-1) shall not be included in computing price of any of the line items

3. *** PPA unit price for line item 1.1 excludes prices for items 1.2 through 1.99

GROUP A - UP TO 600 40' CNG BUSES
FORM PF-1A (CNG - 40') SUBSYSTEM EQUIPMENT
CONTRACT MODIFICATION NO.: 13

NO.	DESCRIPTION	OPTION BUY OF ITEM		
2	Purchased Subsystem Equipment (Items 2.1 through 2.99) **			
2.1	TS 9.	Propulsion Power Assembly (PPA)***		$18,372
2.2	TS 9.	Engine		$60,324
2.3	TS 10.	Cooling System		$12,650
2.4	TS 18.	Fuel System		$68,300
2.5	TS 19.2	Heat shield between catalytic converter and HVAC unit		$332.55
2.6	TS 23.1	Hinge Rear Cross Seat Access to the bulkhead		$65.66
2.7	TS 31.	Suspension		$19,950
2.8	TS 33.	Steering System		$4,950
2.9	TS 37.	Brakes		$3,260
2.10	TS 39.	Pneumatic System		$6,850
2.11	TS 42.	Charging System		$36,800
2.12	TS 44.	Multiplex Control System		$24,200
2.13	TS 54.	HVAC Climate Control System		$29,450
2.14	TS 75.2	Protective film on modesty panels		$116.94
2.15	TS 76	Ethernet Cable to Farebox		$38.38
2.16	TS 78.	Passenger Seats		$28,955
2.17	TS 80.	Doors		$14,830
2.18	TS 81.	Accessibility Provisions		$19,740
2.19	TS 86.	Communications		$3,244
2.20	TS 86.3	Ethernet Cables in ITS enclosue		$310.91
2.21	TS 11	Transmission		$14,261
2.22	TS 78.1	USB Passenger Charging Port		$480
2.23	TS85.1	Wirelesss Stop Request Button		$485
2.24	TS 86.3	Matrix APC		$4,596
2.99	TS 34	Meritor Rear Axle Upgrade		$1,040
		All other bus subsystem equipment not included above including flooring		$242,338
	TOTAL CNG BUS PRICE OPTION QUANTITY			* $615,939.30

* Transfer Total CNG Bus Price to Contract Price Summary Form (PF-1 - Unit Price column, -line item 10 - Option Buy)

Notes: 1. ** Price shall include design, engineering, manufacturing/assembly, testing, shipping, profit and other associated costs. Price for each subsystem equipment shall include all applicable apparatus.

2. Price for line Item Nos. 1-9 and 10a-27 in the CONTRACT PRICE SUMMARY(Form PF-1) shall not be included in computing price of any of the li

3. *** PPA unit price for line item 2.1 excludes prices for items 2.2 through 2.99

(Signature of Person Executing Proposal) Date

TONY WAYNE /VICE PRESIDENT & GENERAL MANAGER

Type Name, Title

GROUP A - UP TO 600 40' CNG BUSES
FORM PF-2 (CNG- 40') - SCHEDULE A OF PRICES SPARE PARTS (OPTIONAL)
CONTRACT MODIFICATION NO. 13

CONTRACTOR: ELDORADO NATIONAL (CALIFORNIA), INC.
Contract No.: **OP28367-000**
Contract Title: **FORTY FOOT (40') LOW FLOOR CNG BUS PROCUREMENT**

NO.	UNIT	DESCRIPTION OF ITEM	QTY	UNIT PRICE	TOTAL PRICE
LOW NOX ENGINE					
1	Ea.	Propulsion Power Assembly (See Definition in SP-1)	3	$86,270.00	$258,810.00
2	Ea.	Air Compresser	5	$6,760.00	$33,800.00
3	Ea.	Turbo	3	$1,982.00	$5,946.00
4	Ea.	EGR Cooler	20	$1,110.47	$22,209.40
5	Ea.	EGR Valve	10	$610.68	$6,106.80
6	Ea.	Delta P Sensor	10	$347.66	$3,476.60
7	Ea.	Mass. Air Flow Sensor	10	$1,067.56	$10,675.60
8	Ea.	Oxygen Sensor	20	$223.61	$4,472.20
9	Ea.	Catalyst	5	$3,574.95	$17,874.75
10	Ea.	Cylinder Head	5	$4,513.81	$22,569.05
11	Ea.	Pistons Kits	60	$325.00	$19,500.00
12	Bus Set	Rod Bearings	10	$64.00	$640.00
13	Bus Set	Main Bearing	10	$219.27	$2,192.70
14	Ea.	Liners	60	$191.87	$11,512.20
15	Ea.	Head Gasket	5	$428.75	$2,143.75
16	Ea.	Upper Gasket Set	5	$844.99	$4,224.95
17	Ea.	Oil Pan Gasket	20	$133.60	$2,672.00
18	Ea.	Stiffener Plate Gasket	20	$92.85	$1,857.00
19	Ea.	Oil Pan	5	$505.51	$2,527.55
20	Ea.	Throttle Actuator	5	$574.16	$2,870.80
21	Ea.	Fuel Control Valve	10	$1,429.19	$14,291.90
22	Ea.	Ignition Control Module	10	$1,648.45	$16,484.50
23	Ea.	Ignition Coils	120	$175.23	$21,027.60
24	Ea.	Engine Harness	5	$1,493.62	$7,468.10
25	Ea.	Ignition Harness	10	$167.53	$1,675.30
26	Ea.	Oil Cooler	5	$179.73	$898.65
27	Ea.	Lube Pump	5	$275.51	$1,377.55
28	Ea.	Front Crank Seal	10	$30.54	$305.40
29	Ea.	Rear Seal	10	$28.65	$286.50
30	Ea.	Water Pump	10	$175.03	$1,750.30
31	Ea.	Vibration Damper	10	$344.21	$3,442.10
32	Ea.	Belt Tensioner (If applicable)	20	$145.47	$2,909.40
33	Ea.	CoolantTermperature Sensor	20	$11.21	$224.20
34	Ea.	Oil Pressure Sensor	10	$98.10	$981.00
35	Ea.	Fuel Pressure Sensor	10	$144.34	$1,443.40
36	Ea.	Low Fuel Pressure Regulator	10	$1,222.22	$12,222.20
37	Ea.	Engine Cradle	5	$1,420.00	$7,100.00
38	Ea.	Belt Guard	5	$358.80	$1,794.00
39	Ea.	Complete Engine Package (See definition in TS-2)	4	$66,430.00	$265,720.00
40	Bus Set	Spark Plugs	15	$42.02	$630.30
41	Bus Set	Adaptation Kit (Eng to Trans)	3	$1,066.00	$3,198.00
42	Ea.	PPA Dollies	8	$685.00	$5,480.00

GROUP A - UP TO 600 40' CNG BUSES
FORM PF-2 (CNG- 40') - SCHEDULE A OF PRICES SPARE PARTS (OPTIONAL)
CONTRACT MODIFICATION NO. 13

CONTRACTOR: ELDORADO NATIONAL (CALIFORNIA), INC.
Contract No.: **OP28367-000**
Contract Title: **FORTY FOOT (40') LOW FLOOR CNG BUS PROCUREMENT**

NO.	UNIT	DESCRIPTION OF ITEM	QTY	UNIT PRICE	TOTAL PRICE
COOLING SYSTEM					
1	Ea.	Radiator Packages (See definition in TS-2)	5	$7,715.00	$38,575.00
2	Ea.	Thermal Management Controllers	5	$598.32	$2,991.60
3	Bus Set	Fan Resistors	20	$48.60	$972.00
4	Bus Set	CAN Interface Cables	5	$101.25	$506.25
5	Ea.	Fan Reversal LED Panel	5	$593.39	$2,966.95
6	Ea.	Fan Assembly	30	$40.66	$1,219.80
7	Ea.	Coolant Reservoir	10	$556.20	$5,562.00
8	Ea.	Transmission Cooler	10	$648.00	$6,480.00
9	Bus Set	Pressure Relief Valve	20	$23.85	$477.00
10	Ea.	Radiator Cap	30	$5.27	$158.10
11	Ea.	Coolant Overflow Tank	10	$36.29	$362.90
CHARGING SYSTEM					
1	Ea.	Alternator	10	$9,750.00	$97,500.00
2	Ea.	Voltage Regulators	10	$351.00	$3,510.00
3	Ea.	Batteries	40	$203.77	$8,150.80
4	Ea.	Battery Equilizer	20	$418.50	$8,370.00
5	Ea.	Battery Disconnect	10	$31.82	$318.20
6	Ea.	Battery Separator	5	$297.00	$1,485.00
7	Ea.	Power Distribution Panel in Battery Compartment	5	$267.30	$1,336.50
8	Ea.	Low Voltage Disconnect	10	$44.55	$445.50
9	Ea.	Circuit Breaker 80A	20	$31.59	$631.80
10	Ea.	Circuit Breaker 100A	20	$39.15	$783.00
11	Ea.	Circuit Breaker 120A or 130A, whichever applies	20	$49.95	$999.00
12	Bus Set	Fuse and Circuit Breaker Panels	5	$310.50	$1,552.50
SUSPENSION					
1	Bus Set	Air Ride Beams	10	$2,310.00	$23,100.00
2	Bus Set	Air Bags	20	$672.00	$13,440.00
3	Ea.	Front Axle	10	$4,879.85	$48,798.50
4	Ea.	Rear Axle	10	$9,721.86	$97,218.60
5	Bus Set	Radius Rods	5	$412.80	$2,064.00
6	Bus Set	Shocks	10	$383.68	$3,836.80
7	Bus Set	Leveling Valve Front	10	$191.81	$1,918.10
8	Bus Set	Leveling Valve Rear	10	$191.81	$1,918.10
DRIVE TRAIN					
1	Ea.	Transmission	5	$14,261.00	$71,305.00
2	Ea.	TCM Programmed	5	$611.00	$3,055.00

GROUP A - UP TO 600 40' CNG BUSES
FORM PF-2 (CNG- 40') - SCHEDULE A OF PRICES SPARE PARTS (OPTIONAL)
CONTRACT MODIFICATION NO. 13

CONTRACTOR: ELDORADO NATIONAL (CALIFORNIA), INC.
Contract No.: **OP28367-000**
Contract Title: **FORTY FOOT (40') LOW FLOOR CNG BUS PROCUREMENT**

NO.	UNIT	DESCRIPTION OF ITEM	QTY	UNIT PRICE	TOTAL PRICE
3	Ea.	Adaptation Kit (Trans to Eng)	2	$1,066.00	$2,132.00
4	Ea.	Drive Shaft	10	$544.00	$5,440.00
5	Ea.	Differential	15	$6,972.00	$104,580.00
STEERING SYSTEM					
1	Bus Set	Steering Gear and Linkage	10	$1,172.50	$11,725.00
2	Ea.	Steering Column	10	$596.77	$5,967.70
3	Ea.	Steering Shaft	10	$135.30	$1,353.00
4	Ea.	Steering Box Assembly	10	$277.78	$2,777.80
5	Ea.	Power Steering Gear Assembly	10	$893.97	$8,939.70
PNEUMATIC SYSTEM					
1	Bus Set	Air Tanks (Complete Sets)	10	$352.00	$3,520.00
2	Ea.	Air Dryer	10	$400.66	$4,006.60
3	Ea.	Air Governor	10	$68.80	$688.00
4	Bus Set	Pressure Reducing Valves	10	$28.80	$288.00
5	Bus Set	Check Valves	10	$57.60	$576.00
6	Bus Set	Brake Control Valve	10	$46.40	$464.00
7	Bus Set	Brake Pedal Valve	10	$134.54	$1,345.40
8	Bus Set	Quick Release Valve	10	$17.60	$176.00
9	Bus Set	Parking Relay Valve	10	$57.60	$576.00
10	Bus Set	Parking Control Valve	10	$46.40	$464.00
11	Bus Set	Air Brake Tubing	10	$134.54	$1,345.40
12	Bus Set	Solenoid Valve Assembly	10	$17.60	$176.00
FUEL SYSTEM					
1	Bus Set	Fuel Cylinder Assembly	2	$68,300.00	$136,600.00
2	Ea.	Fill Manifold	2	$592.00	$1,184.00
3	Bus Set	Shut Off Valve Assembly	5	$440.00	$2,200.00
4	Bus Set	PRD'S	10	$134.40	$1,344.00
5	Ea.	High Fuel Pressure Regulator	20	$600.00	$12,000.00
6	Bus Set	Defueling Valves	5	$1,560.00	$7,800.00
7	Ea.	Low/High Pressure Filer Assembly	5	$704.00	$3,520.00
8	Bus Set	Fuel Pressure Gauges	10	$88.00	$880.00
9	Bus Set	Defueling Switches	5	$41.60	$208.00
10	Bus Set	Manifold Shut Off Valve Assembly	10	$325.00	$3,250.00
11	Bus Set	Solenoid Valve Assembly	10	$376.00	$3,760.00
12	Bus Set	Fuel Line Assembly	10	$576.00	$5,760.00
13	Ea.	Low Pressure Sensor	20	$144.00	$2,880.00
14	Ea.	Proximity Switch @ the Fuel Fill Door	20	$7.94	$158.80
15	Bus Set	Fuel Line Assembly	5	$576.00	$2,880.00
16	Bus Set	Vent Tubes	5	$137.60	$688.00

GROUP A - UP TO 600 40' CNG BUSES
FORM PF-2 (CNG- 40') - SCHEDULE A OF PRICES SPARE PARTS (OPTIONAL)
CONTRACT MODIFICATION NO. 13

CONTRACTOR: ELDORADO NATIONAL (CALIFORNIA), INC.
Contract No.: **OP28367-000**
Contract Title: **FORTY FOOT (40') LOW FLOOR CNG BUS PROCUREMENT**

NO.	UNIT	DESCRIPTION OF ITEM	QTY	UNIT PRICE	TOTAL PRICE
17	Ea.	Control Harness	5	$240.00	$1,200.00
18	Ea.	Proximity Switch @ the Fast Fill Recepticle	20	$7.94	$158.80
DOORS					
1	Bus Set	Complete Base Plate and Operator Assembly	5	$1,920.00	$9,600.00
2	Bus Set	Front/Rear Turning Shaft Assembly	5	$1,864.00	$9,320.00
3	Bus Set	Door Panels	5	$6,387.00	$31,935.00
4	Bus Set	Door Glass	2	$1,816.00	$3,632.00
BODY INTERIOR					
1	Bus Set	Interior AVA Sign Assembly	5	$1,580.00	$7,900.00
2	Ea.	Destination Sign Controller	2	$512.00	$1,024.00
3	Ea.	Next Stop Sign	5	$256.00	$1,280.00
4	Bus Set	Interior Speaker Assembly	10	$192.00	$1,920.00
5	Ea.	Microphone Hand Set	5	$92.80	$464.00
6	Ea.	Visor/Sun Shade(s) Front & Side	10	$316.80	$3,168.00
7	Bus Set	Access Panels	5	$960.00	$4,800.00
8	Bus Set	Light Covers	5	$916.80	$4,584.00
9	Bus Set	Modesty Panels	10	$880.00	$8,800.00
10	Bus Set	Ceiling Panels	10	$1,472.00	$14,720.00
11	Bus Set	Side Wall Trim Panel	10	$480.00	$4,800.00
12	Bus Set	Floor Covering	5	$2,637.58	$13,187.90
13	Bus Set	Wheelchair Securement Devices	5	$1,248.00	$6,240.00
14	Bus Set	Passenger Seat	4	$34,087.00	$136,348.00
15	Bus Set	Seat Track	2	$388.00	$776.00
16	Ea.	Operator Seat	5	$2,680.00	$13,400.00
17	Ea.	Farebox Grabrail	4	$248.00	$992.00
18	Bus Set	Manual Release Mechanism	6	$47.00	$282.00
19	Bus Set	Passenger Hand Strap	10	$496.00	$4,960.00
20	Ea.	HVAC Return Grill	5	$390.00	$1,950.00
BODY EXTERIOR					
1	Bus Set	Passenger Windows	2	$14,186.40	$28,372.80
2	Bus Set	Replacement Pass Side Window Glass (if not bonded)	2	$4,560.00	$9,120.00
3	Bus Set	Side Window Film or Guards	5	$1,847.00	$9,235.00
4	Bus Set	Windshield	3	$680.00	$2,040.00
5	Bus Set	Operator Window	2	$1,139.68	$2,279.36
6	Bus Set	Access Door Set (excluding engine door and HVAC access door)	3	$2,180.00	$6,540.00
7	Ea.	Engine Door	2	$623.00	$1,246.00
8	Ea.	HVAC Rear Attic Door	2	$428.80	$857.60
9	Ea.	Bike Rack	2	$1,148.34	$2,296.68
10	Ea.	Emergency Roof Hatch	2	$249.20	$498.40
11	Bus Set	Windshield Wiper Assy.	3	$766.96	$2,300.88
12	Ea.	Windsheild Washer Reservoir	2	$52.80	$105.60

GROUP A - UP TO 600 40' CNG BUSES
FORM PF-2 (CNG- 40') - SCHEDULE A OF PRICES SPARE PARTS (OPTIONAL)
CONTRACT MODIFICATION NO. 13

CONTRACTOR: ELDORADO NATIONAL (CALIFORNIA), INC.
Contract No.: **OP28367-000**
Contract Title: **FORTY FOOT (40') LOW FLOOR CNG BUS PROCUREMENT**

NO.	UNIT	DESCRIPTION OF ITEM	QTY	UNIT PRICE	TOTAL PRICE
13	Bus Set	Mirrors	4	$971.28	$3,885.12
14	Bus Set	Bumper	3	$2,208.00	$6,624.00
15	Bus Set	Mud Guards	3	$104.00	$312.00
16	Ea.	Head Lights	10	$742.00	$7,420.00
17	Bus Set	Front Turn Signal	10	$54.40	$544.00
18	Bus Set	Side Marker Lights	10	$128.00	$1,280.00
19	Bus Set	Rear Door Lights	10	$64.00	$640.00
20	Bus Set	Under Hood Hazard Lights	10	$115.20	$1,152.00
21	Ea.	License Plate Installation	5	$20.80	$104.00
22	Bus Set	CNG Tank Cover Installation	4	$3,800.00	$15,200.00
23	Bus Set	Exterior Trim (including fender skirts, exit door trim and trim pieces covering joints between body panels)	4	$1,387.00	$5,548.00
CLIMATE CONTROL SYSTEM					
1	Ea.	Compressor	2	$6,800.00	$13,600.00
2	Ea.	Controller	2	$300.00	$600.00
3	Ea.	Evaporator	2	$6,300.00	$12,600.00
4	Ea.	Condensor	2	$410.25	$820.50
5	Ea.	Blower Assembly	4	$555.00	$2,220.00
6	Ea.	Thermostat	2	$55.79	$111.58
7	Ea.	Marine Pump	3	$603.00	$1,809.00
WHEELCHAIR					
1	Bus Set	Ramp Assembly	3	$7,995.00	$23,985.00
2	Bus Set	Valve Assembly	2	$87.00	$174.00
3	Bus Set	Electrical Harness	2	$348.40	$696.80
4	Ea.	Ramp	2	$7,995.00	$15,990.00
5	Ea.	Controller	2	$707.38	$1,414.76
6	Ea.	Motor	3	$819.00	$2,457.00
BRAKES					
1	Bus Set	Pressure Switches (include all for each Bus Set)	10	$585.00	$5,850.00
2	Bus Set	Protection Valve	10	$84.00	$840.00
3	Bus Set	Brake Air Chamber	10	$269.70	$2,697.00
4	Bus Set	Brake Wear Indicator	5	$390.00	$1,950.00
5	Ea.	ABS Electronic Control Unit	5	$388.50	$1,942.50
6	Ea.	ABS Harness	2	$367.50	$735.00
7	Bus Set	ABS Sensor	5	$295.50	$1,477.50
MULTIPLEX CONTROLS SYSTEM					
1	Ea.	Event Data Recorder	2	$2,200.00	$4,400.00
2	Ea.	DVR	2	$5,535.40	$11,070.80
3	Bus Set	Complete Bus Wiring Harnesses	2	$21,071.15	$42,142.30
4	Bus Set	Communication Module (Gateway Module)	10	$3,630.00	$36,300.00
5	Bus Set	Multiplex Module	10	$6,610.81	$66,108.10

GROUP A - UP TO 600 40' CNG BUSES
FORM PF-2 (CNG- 40') - SCHEDULE A OF PRICES SPARE PARTS (OPTIONAL)
CONTRACT MODIFICATION NO. 13

CONTRACTOR: ELDORADO NATIONAL (CALIFORNIA), INC.
Contract No.: **OP28367-000**
Contract Title: **FORTY FOOT (40') LOW FLOOR CNG BUS PROCUREMENT**

NO.	UNIT	DESCRIPTION OF ITEM	QTY	UNIT PRICE	TOTAL PRICE
6	Bus Set	Wheels	5	$2,860.00	$14,300.00
			Total Unit Price	$507,667.92	
				TOTAL PARTS BUY	$2,261,788

In U.S. Dollars Using Words:

TWO-MILLION TWO-HUNDRED SIXTY ONE THOUSAND SEVEN HUNDREDEIGHTY EIGHT DOLLARS

Authorized Signature

Date

TONY WAYNE
Print Name

GROUP A - UP TO 600 40' CNG BUSES
FORM PF-3 (CNG -40') - SCHEDULE B OF PRICES SPECIAL TOOLS (OPTIONAL)
CONTRACT MODIFICATION NO. 13

Contractor ELDORADO NATIONAL(CALIFORNIA), INC.

Contract No.: **OP28367-000**

Contract Title: **FORTY FOOT (40') LOW FLOOR CNG BUS PROCUREMENT**

NO.	UNIT	DESCRIPTION OF ITEM	QTY	UNIT PRICE	TOTAL PRICE
TOWING					
1	Set	Special Towing Equipment Adapters (TS 25) Note: Make sure towing equipment can do front lift and flat towing	15	$386.00	$5,790.00
1	Set	Rear recovery devices / tie downs (TS 25)	2	$505.00	$1,010.00
DOLLIES					
1	Ea.	PPA Dollies	2	$455.00	$910.00
OTHER SPECIAL TOOLS					
1	Set	Complete Voith Special Service Tool Kit (P/N 3040093309)	2	$4,510.80	$9,021.60
				$0.00	$0.00
				$0.00	$0.00
				$0.00	$0.00
				$0.00	$0.00
				$0.00	$0.00
				$0.00	$0.00
				$0.00	$0.00
				$0.00	$0.00
				$0.00	$0.00
			Total Unit Price	$5,856.80	
				TOTAL BUY	$16,731.60

In U.S. Dollars Using Words:

SIXTEEN THOUSAND ONE HUNDRED TEN DOLLARS

Authorized Signature

Date

TONY WAYNE

Print Name

GROUP A - UP TO 600 40' CNG BUSES
FORM PF-4 (CNG-40') - SCHEDULE C OF PRICES DIAGNOSTIC TEST EQUIPMENT (OPTIONAL)
CONTRACT MODIFICATION NO. 13

Contractor ELDORADO NATIONAL (CALIFOORNIA), INC.
Contract No.: **OP28367-000**
Contract Title: **FORTY FOOT (40') LOW FLOOR CNG BUS PROCUREMENT**

NO.	UNIT	DESCRIPTION OF ITEM	QTY	UNIT PRICE	TOTAL PRICE
ENGINE/TRANSMISSION (TS 5.6.5)					
1	Ea.	Engine Diagnostic software, including necessary cables and connectors	30	$1,170.00	$35,100.00
2	Ea.	Transmission diagnostic software, including necessary cables and connectors (Voth P/N 151.00400712)	20	$805.50	$16,110.00
3	Ea.	Nexiq Technologies USB Link PC to Vehicle Interface	30	$774.00	$23,220.00
4	Ea.	ABS diagnostic software, including necessary cables and connectors	30	$1,370.00	$41,100.00
5	Ea.	Engine Cooling Diagnostic or Programming Software	30	$0.00	$0.00
ELECTRICAL SYSTEM (TS 5.6.5)					
1	Ea.	Multiplex System PC software and connection kit	30	$332.00	$9,960.00
INTERIOR (TS 5.6.5)					
1	Ea.	Video Security Diagnostic Kits	30	$105.00	$3,150.00
2	Ea.	Destination Sign Diagnostic Equipment	30	$0.00	$0.00
HEATING VENTILATION/AIR CONDITIONING (HVAC) (TS 5.6.5.)					
1	Ea.	A/C Interface Software and cable	30	$585.00	$17,550.00
DIAGNOSTIC PCs SPECIFICATIONS (TS 5.6.5)					
1	Ea.	Diagnostic Laptop PC (See TS 5.6.6 for Specifications)	30	$2,925.00	$87,750.00
DOOR DIAGNOSTIC TOOLS AND EQUIPMENT (TS 5.6.5)					
1	Ea.	Door System Diagnostic/Programming Software, tools and equipment	30	$905.00	$27,150.00
COMMUNICATIONS (TS 86.1)					
1	Ea.	System Management Tool for use at up to **(13)** MTA Operating Divisions per TS 86.1	1	$74,930.00	$74,930.00
			Total Unit Price	$83,901.50	
				TOTAL BUY	$336,020.00

In U.S. Dollars Using Words:

THREE-HUNDRED FIFTY-FIVE THOUSAND & TEN THREE HUNDRED THIRTY SIX THOUSAND & TWENTY DOLLAR

Authorized Signature

Date

TONY WAYNE
Print Name

Contractor ELDORADO NATIONAL (CALIFORNIA), INC.
Contract No.: **OP28367-000**
Contract Title: **FORTY FOOT (40') LOW FLOOR CNG BUS PROCUREMENT**

NO.	UNIT	DESCRIPTION OF ITEM	QTY	UNIT PRICE	TOTAL PRICE
1	Ea.	One complete running engine and transmission assembly, including cooling and fueling systems, mounted ona suitable roll around stand (TS 5.6.3 a.)	1	$193,200.00	$193,200.00
2	Ea.	Static Transmission Assembly ~~Note: If the Contractor is offering an Allison B400 transmission, a visual transmission is not required~~ Voith DIWA .6 transmission (TS 5.6.3 b)	1	$30,925.00	$30,925.00
3	Ea.	Complete Static Front Axle Assembly TS 5.6.3.c.	1	$16,400.00	$16,400.00
4	Ea.	Complete Static Rear Axle Assembly TS 5.6.3.d.	1	$18,500.00	$18,500.00
ATECH ELECTRICAL TRAINING BOARDS - General Electrical Training (TS 5.6.3 e.)					
1	Kit	GM Specialized Electronic Trainer	10	$2,100.00	$21,000.00
2	Kit	GM Electronic Instructor's Guide (Books Only - Stages 1, 2, & 3)	10	$95.00	$950.00
3	Kit	4 Resistors	10	$35.00	$350.00
4	Kit	Dual Filament Light	10	$46.00	$460.00
5	Kit	Horn	10	$121.00	$1,210.00
6	Kit	Blank Board	10	$24.00	$240.00
SYSTEM SIMULATION TRAINING BOARDS					
1	Ea.	Anti-Lock Brake/Air Brake Board (TS 5.6.3.f.)	1	$32,000.00	$32,000.00
2	Ea.	Electric Air Conditioning Training Simulator Module (TS 5.6.3.g.)	1	$29,700.00	$29,700.00
3	Ea.	Fire Suppression (TS 5.6.3.h.)	1	$7,200.00	$7,200.00
4	Ea.	Video Security System (TS 5.6.3.i.)	1	$9,250.00	$9,250.00
5	Ea.	Destination Sign (TS 5.6.3.j.)	1	$6,000.00	$6,000.00
6	Ea.	Multiplex Electrical Training Board (TS 5.6.3.k.)	2	$23,500.00	$47,000.00
E-LARNING INTERACTIVE TRAINING MEDIA (TS 5.6.3)					
1	Hr.	Module 1	6	$23,000.00	$138,000.00
2	Hr.	Module 2	3	$23,000.00	$69,000.00
3	Hr.	Module 3	3	$23,000.00	$69,000.00
4	Hr.	Module 4	2	$23,000.00	$46,000.00
5	Hr.	Module 5	4	$23,000.00	$92,000.00
6	Hr.	Module 6	2	$23,000.00	$46,000.00
7	Hr.	Module 7	2	$23,000.00	$46,000.00
8	Hr.	Module 8	1	$23,000.00	$23,000.00
9	Hr.	Module 9	1	$23,000.00	$23,000.00
10	Hr.	Module 10	1	$23,000.00	$23,000.00
				TOTAL BUY	$989,385.00

In U.S. Dollars Using Words:

NINE-HUNDRED EIGHTY NINE THOUSAND THREE HUNDRED EIGHTY FIVE DOLLARS

Authorized Signature

Date

TONY WAYNE

Print Name

Los Angeles County
Metropolitan Transportation Authority

One Gateway Plaza
Los Angeles, CA 90012-2952

213.922.2000 Tel
metro.net

MAEL-050 **Response Required: No**

Date: November 19, 2019

File Nos.:

Action Item(s):

Richard Himes
Contract Administration Manager
Eldorado National (California), Inc. (ENC)
9670 Galena Street
Riverside, CA 92509

SUBJECT: **OP28367-000 40' LOW FLOOR CNG TRANSIT BUSES**
CONTRACT MODIFICATION NO.: 14
EXERCISE OF OPTION BUY

Reference:

Dear Mr. Himes:

Enclosed is one (1) copy of the subject unilateral modification based on the negotiated option buy bus unit price and the terms and conditions agreed upon between Metro and ENC.

Please call me at 213.922.7334 or e-mail at hernandezel@metro.net if you have any questions.

Sincerely,

Elizabeth Hernandez
Principal Contract Administrator

Enclosure: Contract Modification No. 14

cc: Kwesi Annan
Marc Manning
Wayne Okubo
Joe Marzano
Victor Ramirez

LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY

CONTRACT NO. OP28367-000, CONTRACT MODIFICATION NO.: 14
(EXERCISE OF OPTION BUS BUY)

FOR: FORTY FOOT (40') LOW FLOOR CNG TRANSIT BUSES

This Contract Modification No. 14 to Contract No.: OP28367-000 is made effective on the 19th day of November 2019 by and between the LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY, hereinafter referred to as "MTA", and EL DORADO NATIONAL (CALIFORNIA), INC., hereinafter referred to as "CONTRACTOR".

WHEREAS, CONTRACTOR and MTA entered into Contract No.: OP28367-000 effective August 15, 2017, as amended by Contract Modification No. 1, dated November 6, 2017, Contract Modification No. 2, dated December 6, 2017, Contract Modification No. 3 dated December 27, 2017, Contract Modification No. 4 dated January 19, 2018, Contract Modification No. 5 dated February 12, 2018, Contract Modification No. 6 dated April 23, 2018, Contract Modification No. 7 dated October 3, 2018, Contract Modification No. 8 dated October 26, 2018, Contract Modification No. 9 dated November 5, 2018, Contract Modification No. 10 dated January 9, 2019, Contract Modification No. 11 dated January 15, 2019, Contract Modification No. 12 dated January 17, 2019, and Contract Modification No. 13 dated February 8, 2019, (the "Existing Contract") and;

WHEREAS, CONTRACTOR and MTA desire to modify the Existing Contract as provided herein;

Now, therefore, it is mutually agreed, by and between the parties as follows:

1. In accordance with the Board of Directors approval on September 26, 2019, MTA to exercise Option 1 to procure 259 buses at a per bus unit price of $653,388 plus $60,196.62 in taxes, and $275 delivery charge.

2. The Period of Performance for the Base Buy bus order is up to and including February 28, 2020.

3. The Period of Performance for Option Buy bus order is 21 calendar months from the date set forth in the Notice to Proceed.

4. The Pricing Form for the Option Buy is set forth in the attached PF-1 (2.0 Option Buy).

   The following Articles of the Contract are modified as follows:

ARTICLE IV: COMPENSATION

A. Contract Price

1. Base Buy Order (295 buses)

In consideration of the Contractor's full performance of the Work, and in accordance with the terms of the Contract, Metro will pay the Contractor the Contract Price of $199,067,748, inclusive of tax and delivery as provided in this

Article and in the Contract Document entitled Compensation and Payment Provisions.

2. Option Buy (259 Buses)

Contract Option for 259 bus order is hereby exercised unilaterally by LACMTA in accordance with Special Provisions Article SP-28, Options.

In consideration of the Contractor's full performance of the Work for Contract Option Buy, and in accordance with the terms of the Contract, LACMTA will pay the Contractor the Contract Price of $185,000,742, inclusive of tax and delivery as provided in this Article and in the Contract Document entitled Compensation and Payment Provisions.

ARTICLE V: CONTRACT TERM AND PERIOD OF PERFORMANCE

The Effective Date of this Contract is **August 15, 2017.**

1. Base Buy

. The Period of Performance of this Contract shall begin on September 1, 2017 (hereinafter "Commencement Date"). Contractor shall complete delivery of the Base quantity of 295 vehicles no later than February 28, 2020, 130 weeks (911 calendar days) after the Commencement Date, unless this Contract is terminated earlier or extended by LACMTA, in writing, as provided in the Contract~~. Said complete delivery date of November 29, 2019 for Group A buses shall be automatically extended on a day-for-day basis if the Contract for the Base Buy is not executed by LACMTA on or before September 1, 2017.~~

The Base quantity for Group A is 295 Vehicles. The Base quantity delivery schedule is for a minimum of five (5) and a maximum of ten (10) vehicles per week. Any Group A vehicles delivered beyond that February 28, 2020 date may be subject to Liquidated Damages in accordance with Special Provisions SP – 10. ~~If any Option for Group A vehicles is exercised, the Group A Option Vehicles shall be delivered in accordance with the schedule contained in the Modification to exercise the Option~~.

2. Option Buy

The Period of Performance for the Option Buy for this Contract shall begin on **the date set forth in the Notice to Proceed** (hereinafter "Commencement Date"). Contractor shall complete all Work, excluding Warranty, under the Contract within 21 months (640 calendar days) after the Commencement Date for the Option Buy, unless this Contract is terminated earlier or extended by LACMTA, in writing, as provided in the Contract.

The Option Buy quantity is 259 Vehicles. The Option bus scheduled delivery dates are as follows:

SCHEDULE DELIVERY DATES

Start Dates	Scheduled Delivery Dates	No. of Buses Delivered (Qtr.)	No. of Buses (Total)
7/1/2020	9/30/2020	30	30
10/1/2020	12/31/2020	55	85
1/1/2021	3/31/2021	70	155
4/1/2021	6/30/2021	78	233
7/1/2021	8/19/2021	26	259

Any Option vehicles delivered beyond the scheduled delivery dates specified above may be subject to Liquidated Damages in accordance with Special Provisions SP – 10.

Except as expressly amended hereby, the Existing Contract remains in full force and effect as originally executed.

IN WITNESS WHEREOF, the parties have caused this Contract Modification No. 14 to the Existing Contract to be executed by their respective officers duly authorized on the date first written above.

LOS ANGELES COUNTY
METROPOLITAN TRANSPORTATION AUTHORITY
Philip A. Washington
Chief Executive Officer

By: _____
Elizabeth Hernandez
Principal Contract Administrator

11/19/19
Date

CONTRACT MODIFICATION NO.: 14
Option Bus Buy

Proposer: ELDORADO NATIONAL (CALIFORNIA), INC.

Contract No.: OP28367-000

Contract Title: FORTY FOOT (40') LOW FLOOR CNG BUS PROCUREMENT

2.0 CONTRACT FOR 259 BUSES (OPTION BUY)

No.	Qty.	Description of Item		Taxable Unit Price	Unit Price	Total Price
10	259	40' Low Floor CNG Buses (Option Buy) for 259 vehicles*		$ 633,648.64	$ 653,388.64	$ 169,227,657.76
10a	Lot	Manuals (Option Buy) (TS 5.6.4)***		$ -	$ -	$ -
10b	259	Vehicle Delivery Charge for Option Buy	Value of all taxable delivery charges per bus**:		$ 275.00	$ 71,225.00
10c	259	Tax (Option Buy)		9.50%	$ 60,196.62	$ 15,590,924.79
11		Reserved			$	$
12	Lot	Performance Bond for Option Buy***			Lump Sum	$ 110,934.00
13	0	Total Training Hours for Option Buy****				$ -
13a	0	Contractor (Proposer/Prime) Option Buy				$ -
13b	0	Subcontractor/Supplier Option Buy				$ -
14		Reserved			$	$

2.0 Total Price for CONTRACT for 150 Up to 305 Option Buy Buses (Sum of Items "10" through "14") to be the BASIS for Price Proposal evaluation

In U.S. Dollars Using Words: ONE-HUNDRED EIGHTY FIVE MILLION SEVEN HUNDRED FORTY TWO DOLLARS

In U.S. Dollars Using Figures: $ 185,000,742.00

NOTE

* **Taxable Unit Price is the Unit Price less 1.14 Accessibility Provisions on PF-1A**

** **Input the taxable portion of the Delivery Charge under the Taxable Unit Price column and the total Delivery Charge under the Unit Price column**

*** Actual cost of the **Bond are for all 259 bus Options exercised.**

**** **Training Hours for Option Buy are only estimates and not a guaranteed level of effort. The total for this Line is a Not-to-Exceed provisional amount.**

Los Angeles County
Metropolitan Transportation Authority

One Gateway Plaza
Los Angeles, CA 90012-2952

213.922.2000 Tel
metro.net

Metro

MAEL-060

Response Required: No

Date: March 2, 2020

Richard Himes
Contract Administration Manager
Eldorado National (California), Inc. (ENC)
9670 Galena Street
Riverside, CA 92509

SUBJECT: **OP28367-000 40' LOW FLOOR CNG TRANSIT BUSES**
EXECUTED CONTRACT MODIFICATION NO.: 15
CHANGE ORDERS ON OPTION BUS BUY; UPDATED PRICING FORMS

Reference: ELMA-76, 77

Dear Mr. Himes:

Enclosed is your executed original of the subject modification.

Please call me at 213.922.7334 or e-mail at hernandezel@metro.net if you have any questions.

Sincerely,

Elizabeth Hernandez
Principal Contract Administrator

Enclosure: Fully executed Contract Modification No. 15

cc: Kwesi Annan

LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY

CONTRACT NO. OP28367-000, CONTRACT MODIFICATION NO.: 15 (EXERCISE OF OPTION BUS BUY)

FOR: FORTY FOOT (40') LOW FLOOR CNG TRANSIT BUSES

This Contract Modification No. 15 to Contract No.: OP28367-000 is made effective on the 21st day of February 2020 by and between the LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY, hereinafter referred to as "MTA", and EL DORADO NATIONAL (CALIFORNIA), INC., hereinafter referred to as "CONTRACTOR".

WHEREAS, CONTRACTOR and MTA entered into Contract No.: OP28367-000 effective August 15, 2017, as amended by Contract Modification No. 1, dated November 6, 2017, Contract Modification No. 2, dated December 6, 2017, Contract Modification No. 3 dated December 27, 2017, Contract Modification No. 4 dated January 19, 2018, Contract Modification No. 5 dated February 12, 2018, Contract Modification No. 6 dated April 23, 2018, Contract Modification No. 7 dated October 3, 2018, Contract Modification No. 8 dated October 26, 2018, Contract Modification No. 9 dated November 5, 2018, Contract Modification No. 10 dated January 9, 2019, Contract Modification No. 11 dated January 15, 2019, Contract Modification No. 12 dated January 17, 2019, Contract Modification No. 13 dated February 8, 2019, and Contract Modification No. 14 dated November 19, 2019, (the "Existing Contract") and;

WHEREAS, CONTRACTOR and MTA desire to modify the Existing Contract as provided herein;

Now, therefore, it is mutually agreed, by and between the parties as follows:

1. Modify the Contract to include change orders and associated costs on the bus configuration for the:
   a. Option Bus Buy Order;
   b. Retrofit change order on the Base Buy Order

   consistent with Attachment I – Summary of Change Orders.

2. Exercise Optional Configuration to procure additional service manuals for the Option Bus Buy Order.

3. Modify Volume II - Technical Specifications consistent with Attachment II

4. Modify Article IV – Compensation, section A (2) and update Pricing Forms PF-1 and PF1-A (attached) as follows:

ARTICLE IV: COMPENSATION

2. Option Buy (259 Buses)

Contract Option for 259 bus order is hereby exercised unilaterally by LACMTA in accordance with Special Provisions Article SP-28, Options.

In consideration of the Contractor's full performance of the Work for Contract Option Buy, and in accordance with the terms of the Contract, LACMTA will pay the Contractor the Contract Price of ~~$185,000,742~~ $184,973,963, inclusive of tax and delivery as provided in this Article and in the Contract Document entitled Compensation and Payment Provisions.
(Reference modified Pricing Forms PF-1 and PF1A as attached)

Except as expressly amended hereby, the Existing Contract remains in full force and effect as originally executed.

IN WITNESS WHEREOF, the parties have caused this Contract Modification No. 15 to the Existing Contract to be executed by their respective officers duly authorized on the date first written above.

EL DORADO NATIONAL (CALIFORNIA), INC.

By: _____
Signature

TONY WAYNE
Type and Print Name

2/24/2020
Date

LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY
Philip A. Washington
Chief Executive Officer

By: _____
Elizabeth Hernandez
Principal Contract Administrator

3/2/20
Date

CONTRACT NO.: OP28367-000
MODIFICATION NO.: 15 - Option Bus Buy

ATTACHMENT I - SUMMARY OF CHANGE ORDERS

A. CHANGE ORDERS FOR THE OPTION BUS BUY

RFC NO.	DESCRIPTION	OPTION QTY	UNIT PRICE	TOTAL PRICE
10	Transom Type Windows to Full Fixed Glazing (TS 53)	259	($481.86)	($124,801.74)
11	Aries Stainless Steel with Camira fabric inserts to Gemini Composite Seats with Printed Vinyl inserts (TS 78.15)	243	($378.05)	($91,866.15)
13	Provisions for All Doors Boarding (Tap Card Readers) (TS 86.12)	259	$32.22	$8,344.98
14B	Single Red Belt W/C Securement Upgrade for Option Bus Order (TS 81.5.2)	259	$199.79	$51,745.61
			TOTAL	($156,577.30)

BUS PRICING SUMMARY:

Approved Changes	OPTION BUY QTY	Per Bus	Total
RFC 10, 13, 14B	16	($249.85)	($3,997.60)
RFC 10, 11 13, 14B	243	($627.90)	($152,579.70)
			($156,577.30)

B. CHANGE ORDERS FOR THE BASE BUY ORDER

RFC NO.	DESCRIPTION	BASE BUY QTY	UNIT PRICE	TOTAL PRICE
14A	Single Red Belt W/C Securement Upgrade for Base Bus Order (TS 81.5.2)	295	$410.85	$121,200.75

C. Manuals for Option Bus Buy

RFC 15	Manuals for Option Bus Order	10	Lot	$23,400.00

CONTRACT NO.: OP28367-000
Modification No. 15, Attachment II
Volume II Technical Specification Changes

Ref #	Reference #	Paragraph number, Paragraph title, and Paragraph changes. Additions are in bolded Red and deletions are in crossed out bolded Blue
24	Contract Mod. No.: 15	**TS 53. Side Windows** **TS 53.1 Configuration** Side window assemblies shall be constructed of heavy-duty aluminum shall be easily replaceable without disturbing adjacent windows and shall be mounted so that flexing or vibration from engine operation or normal road excitation is not apparent. Window assemblies shall incorporate "change in place" design to permit replacement (removal and installation) of each glazing (transparent glass piece less any framing) from windows installed on the bus. This requirement shall permit one mechanic to enter the bus and remove and install each glazing using common hand tools in 60 minutes, or less. The window shall be fully serviceable immediately following replacement of glazing. Change in place method shall be tamper resistant. An additional six minutes will be added for each glazing replacement, if necessary, for replacement of the associated anti-vandalism sacrificial film. All frame surfaces and components (except the emergency escape handles) shall be finished with black anodizing. Emergency escape latches shall be red and labeled to indicate their purpose and function. Miscellaneous hardware, such as fasteners and latches, shall be the window manufacturer's standard hardware. ~~**Transom style side windows shall extend from the shoulder height of a seated 5th percentile female passenger to the eye level of a standing 95th percentile male passenger in the front section**~~; The rear section window upper edge shall be approximately 56 inches above the floor at the start of the raised deck and no less than 51 inches at the rearmost window's upper edge. Each individual window glazing shall be easily replaceable without removing the entire window assembly or disturbing adjacent window assemblies and shall be mounted so that flexing or vibration from engine operation or normal road excitation is not apparent. To the extent practical, the number of different sizes of windows should be minimized. **Quick Change Passenger Side Windows** Glazing in the window assembly shall be capable of being replaced without removing the window from its installed position on the bus using simple hand tools. The glazing shall be held in place mechanically by a system constructed to last the life of the vehicle. **Traditional Frame** • Fully fixed. • ~~**Openable windows with inward-opening transom panels**~~

CONTRACT NO.: OP28367-000
Modification No. 15, Attachment II
Volume II Technical Specification Changes

Ref #	Reference #	Paragraph number, Paragraph title, and Paragraph changes. Additions are in bolded Red and deletions are in crossed out bolded Blue
		TS 53.2 Emergency Exit (Egress) Configuration **Minimum Egress** All side windows shall be fixed in position, except as necessary to meet the emergency escape requirements. **TS 53.3 Configuration** ~~**Operable Windows with Inward-Opening Transom Panels (Fixed Bottom, Tip-In Top)**~~ ~~**Each side window shall incorporate an upper transom portion. The transom shall be between 20 and 35 percent of the total window area. The lower portion of the window shall be fixed. The transom portion shall be hinged along the lower edge and open inward. Side windows shall have an upper section that can be opened inward a minimum of four inches to provide maximum interior ventilation. When opened the upper window section shall not interfere with access to the passenger signal pull cable. The operable section shall be a minimum of eight inches and a maximum of 10 inches in height, hinged at the bottom, and shall be the full width of all windows. In the event of a latch failure the upper window section shall remain in the closed position and shall latch in the closed position by means of a gas filled cylinder or mechanical spring. Rearmost windows which are lower than shoulder height for seated passengers shall not be opened or equipped with emergency escape provisions, subject to LACMTA approval in Pre-Production meeting.**~~ **All side windows shall be fixed in position, except as necessary to meet the emergency escape requirements**

End of Attachment I I

CONTRACT NO.: OP28367-000
MODIFICATION NO.: 15 - Option Bus Buy

Proposer: ELDORADO NATIONAL (CALIFORNIA), INC.
Contract No.: OP28367-000
Contract Title: FORTY FOOT (40') LOW FLOOR CNG BUS PROCUREMENT

2.0 CONTRACT FOR 259 BUSES (OPTION BUY)

No.	Qty.	Description of item		Taxable Unit Price	Unit Price	Total Price
10	16	40' Low Floor CNG Buses (Option Buy) for 16 vehicles*		$633,399.00	$653,139.00	$ 10,450,224.00
	243	40' Low Floor CNG Buses (Option Buy) for 243 vehicles*		$633,021.00	$652,761.00	$ 158,620,923.00
10a	Lot	Manuals (Option Buy) (TS 5.6.4)***		$ -	$ -	$ 23,400.00
10b	259	Vehicle Delivery Charge for Option Buy	Value of all taxable delivery charges per bus**:		$ 275.00	$ 71,225.00
10c	16	Tax (Bus Option Buy)		9.50%	$ 60,172.91	$ 962,766.48
	243	Tax (Bus Option Buy)		9.50%	$ 60,137.00	$ 14,613,289.79
11a	295	Base Buy Bus Order Securement Retrofit			$ 410.85	$ 121,200.75
11b	295	Base Buy Order Securement Retrofit Tax		9.50%	$ -	$ -
12	Lot	Performance Bond for Option Buy***			Lump Sum	$ 110,934.00
13	0	Total Training Hours for Option Buy****				$ -
13a	0	Contractor (Proposer/Prime) Option Buy				$ -
13b	0	Subcontractor/Supplier Option Buy				$ -
14		Reserved			$	$

2.0 Total Price for CONTRACT for 150 Up to 305 Option Buy Buses (Sum of Items "10" through "14") to be the BASIS for Price Proposal evaluation

In U.S. Dollars Using Words: ONE-HUNDRED EIGHTY FOUR MILLION NINE HUNDRED SEVENTY THREE THOUSAND NINE HUNDRED SIXTY THREE DOLLARS

In U.S. Dollars Using Figures: $ 184,973,963.00

NOTE
* Taxable Unit Price is the Unit Price less 1.14 Accessibility Provisions on PF-1A (Unit prices are rounded up to the dollar)
** Input the taxable portion of the Delivery Charge under the Taxable Unit Price column and the total Delivery Charge under the Unit Price column
*** Actual cost of the Bond are for all 259 bus Options exercised.
**** Training Hours for Option Buy are only estimates and not a guaranteed level of effort. The total for this Line is a Not-to-Exceed provisional amount.

CONTRACT NO.: OP28367-000
MODIFICATION NO.: 15 - Option Bus Buy

Contractor: ELDORADO NATIONAL (CALIFORNIA), INC
Contract No.: OP28367-000

NO.	DESCRIPTION	OPTION BUY OF ITEM		
2	Purchased Subsystem Equipment (Items 2.1 through 2.99) **			
2.1	TS 9.	Propulsion Power Assembly (PPA)***		$18,372
2.2	TS 9.	Engine		$60,324
2.3	TS 10.	Cooling System		$12,650
2.4	TS 18.	Fuel System		$68,300
2.5	TS 19.2	Heat shield between catalytic converter and HVAC unit		$332.55
2.6	TS 23.1	Hinge Rear Cross Seat Access to the bulkhead		$65.66
2.7	TS 31.	Suspension		$19,950
2.8	TS 33.	Steering System		$4,950
2.9	TS 37.	Brakes		$3,260
2.10	TS 39.	Pneumatic System		$6,850
2.11	TS 42.	Charging System		$36,800
2.12	TS 44.	Multiplex Control System		$24,200
2.13	TS 54.	HVAC Climate Control System		$29,450
2.14	TS 75.2	Protective film on modesty panels		$116.94
2.15	TS 76	Ethernet Cable to Farebox		$38.38
2.16	TS 78.	Passenger Seats		$28,955
2.17	TS 80.	Doors		$14,830
2.18	TS 81.	Accessibility Provisions		$19,740
2.19	TS 86.	Communications		$3,244
2.20	TS 86.3	Ethernet Cables in ITS enclosue		$310.91
2.21	TS 11	Transmission		$14,261
2.22	TS 78.1	USB Passenger Charging Port		$480
2.23	TS85.1	Wirelesss Stop Request Button		$485
2.24	TS 86.3	Matrix APC		$4,596
2.99	TS 34	Meritor Rear Axle Upgrade		$1,040
		All other bus subsystem equipment not included above including flooring		$242,338

TOTAL CNG BUS PRICE OPTION QUANTITY	$615,939.46
PPI ADJUSTMENT (AS NEGOTIATED)	$37,449.18
OPTION BUS BUY PRICE PER UNIT	$653,388.64

QTY		CHANGES	
16	Option Bus No. 296 to 311 (Change Orders)	($249.85)	* $653,139.00
243	Option Bus No. 312 to 554 (Change Orders)	($627.90)	* $652,761.00

* Rounded Off; Transfer Total CNG Bus Price to Contract Price Summary Form (PF-1 - Unit Price column, -line ite \

Notes: 1. ** Price shall include design, engineering, manufacturing/assembly, testing, shipping, profit and other associated costs. Price for each subsystem equipment shall include all applicable apparatus.

2. Price for line Item Nos. 1-9 and 10a-27 in the CONTRACT PRICE SUMMARY(Form PF-1) shall not be included in computing price of any of the line items above.

3. *** PPA unit price for line item 2.1 excludes prices for items 2.2 through 2.99

(Signature of Person Executing Proposal) — Date: 2/24/20

TONY WAYNE /VICE PRESIDENT & GENERAL MANAGER

Los Angeles County
Metropolitan Transportation Authority

One Gateway Plaza
Los Angeles, CA 90012-2952

213.922.2000 Tel
metro.net

Metro

MAEL-069 **Response Required: No**

Date: July 24, 2020

Richard Himes
Contract Administration Manager
Eldorado National (California), Inc. (ENC)
9670 Galena Street
Riverside, CA 92509

SUBJECT: **OP28367-000 40' LOW FLOOR CNG TRANSIT BUSES**
EXECUTED CONTRACT MODIFICATION NO.: 16
COVID MITIGATION CHANGE FOR ETHERNET FOR ALL DOOR TAP READERS - OPTION BUS BUY

Reference: ELMA-086

Dear Mr. Himes:

Enclosed is your executed original of the subject modification.

Please call me at 213.922.7334 or e-mail at hernandezel@metro.net if you have any questions.

Sincerely,

Elizabeth Hernandez
Principal Contract Administrator

Enclosure: Fully executed Contract Modification No. 16

cc: Kwesi Annan

LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY

CONTRACT NO. OP28367-000, CONTRACT MODIFICATION NO.: 16
(COVID MITIGATION CHANGE FOR ETHERNET FOR ALL DOOR TAP READERS)

FOR: FORTY FOOT (40') LOW FLOOR CNG TRANSIT BUSES

This Contract Modification No. 16 to Contract No.: OP28367-000 is made effective on the 8th day of July 2020 by and between the LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY, hereinafter referred to as "MTA", and EL DORADO NATIONAL (CALIFORNIA), INC., hereinafter referred to as "CONTRACTOR".

WHEREAS, CONTRACTOR and MTA entered into Contract No.: OP28367-000 effective August 15, 2017, as amended by Contract Modification No. 1, dated November 6, 2017, Contract Modification No. 2, dated December 6, 2017, Contract Modification No. 3 dated December 27, 2017, Contract Modification No. 4 dated January 19, 2018, Contract Modification No. 5 dated February 12, 2018, Contract Modification No. 6 dated April 23, 2018, Contract Modification No. 7 dated October 3, 2018, Contract Modification No. 8 dated October 26, 2018, Contract Modification No. 9 dated November 5, 2018, Contract Modification No. 10 dated January 9, 2019, Contract Modification No. 11 dated January 15, 2019, Contract Modification No. 12 dated January 17, 2019, Contract Modification No. 13 dated February 8, 2019, Contract Modification No. 14 dated November 19, 2019, and Contract Modification No. 15 dated February 21, 2020, (the "Existing Contract") and;

WHEREAS, CONTRACTOR and MTA desire to modify the Existing Contract as provided herein;

Now, therefore, it is mutually agreed, by and between the parties as follows:

1. Modify the Contract to add ethernet cable in the ITS enclosure for data transfer on the all door TAP reader for an increase in the total contract price of $52,183. The total Contract price is increased from $184,973,963.00 to $185,026,146.00.

2. Modify Volume II - Technical Specifications TS 86.12 consistent with Attachment I to this Modification.

ARTICLE IV: COMPENSATION

2. Option Buy (259 Buses)

Contract Option for 259 bus order is hereby exercised unilaterally by LACMTA in accordance with Special Provisions Article SP-28, Options.

In consideration of the Contractor's full performance of the Work for Contract Option Buy, and in accordance with the terms of the Contract, LACMTA will pay the Contractor the Contract Price of ~~$184,973,963~~ $185,026,146, inclusive of tax and delivery as provided in this Article and in the Contract Document entitled Compensation and Payment Provisions.

(Reference modified Pricing Forms PF-1 and PF1A as attached)

Except as expressly amended hereby, the Existing Contract remains in full force and effect as originally executed.

IN WITNESS WHEREOF, the parties have caused this Contract Modification No. 16 to the Existing Contract to be executed by their respective officers duly authorized on the date first written above.

EL DORADO NATIONAL (CALIFORNIA), INC.

By: _____
Signature

TONY WAYNE
Type and Print Name

7/9/20
Date

LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY
Philip A. Washington

By: _____
Elizabeth Hernandez
Principal Contract Administrator

7/24/20
Date

CONTRACT NO.: OP28367-000

MODIFICATION NO.: 16 - Option Bus Buy

COVID Mitigation Change for Ethernet for All Door TAP Readers

Proposer: ELDORADO NATIONAL (CALIFORNIA), INC.

Contract No.: OP28367-000

Contract Title: FORTY FOOT (40') LOW FLOOR CNG BUS PROCUREMENT

2.0 CONTRACT FOR 259 BUSES (OPTION BUY)

No.	Qty.	Description of Item		Taxable Unit Price	Unit Price	Total Price
10	16	40' Low Floor CNG Buses (Option Buy) for 16 vehicles*		$633,583.00	$653,323.00	$ 10,453,168.00
	243	40' Low Floor CNG Buses (Option Buy) for 243 vehicles*		$633,205.00	$652,945.00	$ 158,665,635.00
10a	Lot	Manuals (Option Buy) (TS 5.6.4)***		$ -	$ -	$ 23,400.00
10b	259	Vehicle Delivery Charge for Option Buy	Value of all taxable delivery charges per bus**:		$ 275.00	$ 71,225.00
10c	16	Tax (Bus Option Buy)		9.50%	$ 60,190.39	$ 963,046.16
	243	Tax (Bus Option Buy)		9.50%	$ 60,154.48	$ 14,617,537.43
11a	295	Base Buy Bus Order Securement Retrofit			$ 410.85	$ 121,200.75
11b	295	Base Buy Order Securement Retrofit Tax		9.50%	$ -	$ -
12	Lot	Performance Bond for Option Buy***			Lump Sum	$ 110,934.00
13	0	Total Training Hours for Option Buy****				$ -
13a	0	Contractor (Proposer/Prime) Option Buy				$ -
13b	0	Subcontractor/Supplier Option Buy				$ -
14		Reserved			$	$

2.0 Total Price for CONTRACT for 150 Up to 305 Option Buy Buses (Sum of Items "10" through "14") to be the BASIS for Price Proposal evaluation

In U.S. Dollars Using Words: ONE-HUNDRED EIGHTY FIVE MILLION TWENTY SIX THOUSAND ONE HUNDRED FORTY SIX DOLLARS

In U.S. Dollars Using Figures: $ 185,026,146.00

NOTE

* Taxable Unit Price is the Unit Price less 1.14 Accessibility Provisions on PF-1A (Unit prices are rounded up to the dollar)

** Input the taxable portion of the Delivery Charge under the Taxable Unit Price column and the total Delivery Charge under the Unit Price column

*** Actual cost of the Bond are for all 259 bus Options exercised.

**** Training Hours for Option Buy are only estimates and not a guaranteed level of effort. The total for this Line is a Not-to-Exceed provisional amount.

CONTRACT NO.: OP28367-000
MODIFICATION NO.: 16
COVID Mitigation Change for Ethernet for All Door TAP Readers

Contractor: ELDORADO NATIONAL (CALIFORNIA), INC
Contract No.: OP28367-000

NO.	DESCRIPTION	OPTION BUY OF ITEM		
2	Purchased Subsystem Equipment (Items 2.1 through 2.99) **			
2.1	TS 9.	Propulsion Power Assembly (PPA)***		$18,372
2.2	TS 9.	Engine		$60,324
2.3	TS 10.	Cooling System		$12,650
2.4	TS 18.	Fuel System		$68,300
2.5	TS 19.2	Heat shield between catalytic converter and HVAC unit		$332.55
2.6	TS 23.1	Hinge Rear Cross Seat Access to the bulkhead		$65.66
2.7	TS 31.	Suspension		$19,950
2.8	TS 33.	Steering System		$4,950
2.9	TS 37.	Brakes		$3,260
2.10	TS 39.	Pneumatic System		$6,850
2.11	TS 42.	Charging System		$36,800
2.12	TS 44.	Multiplex Control System		$24,200
2.13	TS 54.	HVAC Climate Control System		$29,450
2.14	TS 75.2	Protective film on modesty panels		$116.94
2.15	TS 76	Ethernet Cable to Farebox		$38.38
2.16	TS 78.	Passenger Seats		$28,955
2.17	TS 80.	Doors		$14,830
2.18	TS 81.	Accessibility Provisions		$19,740
2.19	TS 86.	Communications		$3,244
2.20	TS 86.3	Ethernet Cables in ITS enclosure (APC)		$310.91
2.21	TS 11	Transmission		$14,261
2.22	TS 78.1	USB Passenger Charging Port		$480
2.23	TS85.1	Wirelesss Stop Request Button		$485
2.24	TS 86.3	Matrix APC		$4,596
2.99	TS 34	Meritor Rear Axle Upgrade		$1,040
		All other bus subsystem equipment not included above including flooring		$242,338

TOTAL CNG BUS PRICE OPTION QUANTITY	$615,939.46
PPI ADJUSTMENT (AS NEGOTIATED)	$37,449.18
OPTION BUS BUY PRICE PER UNIT	$653,388.64

QTY		CHANGES	
16	**Option Bus No. 296 to 311 (Mod 16 - Change)**	($66.00)	* $653,323.00
243	**Option Bus No. 312 to 554 (Mod 16 - Change)**	($444.00)	* $652,945.00

* Rounded Off; Transfer Total CNG Bus Price to Contract Price Summary Form (PF-1 - Unit Price column, -line ite \

Notes: 1. ** Price shall include design, engineering, manufacturing/assembly, testing, shipping, profit and other associated costs. *Price for each subsystem equipment shall include all applicable apparatus.*

2. Price for line Item Nos. 1-9 and 10a-27 in the CONTRACT PRICE SUMMARY(Form PF-1) shall not be included in computing price of any of the line items above.

3. *** PPA unit price for line item 2.1 excludes prices for items 2.2 through 2.99

(Signature of Person Executing Proposal) 7/5/20 Date

TONY WAYNE /VICE PRESIDENT & GENERAL MANAGER

Los Angeles County
Metropolitan Transportation Authority

One Gateway Plaza
Los Angeles, CA 90012-2952

213.922.2000 Tel
metro.net

MAEL-070 **Response Required: No**

Date: July 24, 2020

Richard Himes
Contract Administration Manager
Eldorado National (California), Inc. (ENC)
9670 Galena Street
Riverside, CA 92509

SUBJECT: **OP28367-000 40' LOW FLOOR CNG TRANSIT BUSES**
EXECUTED CONTRACT MODIFICATION NO.: 17
REVISED PROJECT DELIVERY SCHEDULE - OPTION BUS BUY

Reference: ELMA-084

Dear Mr. Himes:

Enclosed is your executed original of the subject modification.

Please call me at 213.922.7334 or e-mail at hernandezel@metro.net if you have any questions.

Sincerely,

Elizabeth Hernandez
Principal Contract Administrator

Enclosure: Fully executed Contract Modification No. 17

cc: Kwesi Annan

LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY

CONTRACT NO. OP28367-000, CONTRACT MODIFICATION NO.: 17
(REVISED DELIVERY SCHEDULE - OPTION BUS BUY)

FOR: FORTY FOOT (40') LOW FLOOR CNG TRANSIT BUSES

This Contract Modification No. 17 to Contract No.: OP28367-000 is made effective on the 9th day of July 2020 by and between the LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY, hereinafter referred to as "MTA", and EL DORADO NATIONAL (CALIFORNIA), INC., hereinafter referred to as "CONTRACTOR".

WHEREAS, CONTRACTOR and MTA entered into Contract No.: OP28367-000 effective August 15, 2017, as amended by Contract Modification No. 1, dated November 6, 2017, Contract Modification No. 2, dated December 6, 2017, Contract Modification No. 3 dated December 27, 2017, Contract Modification No. 4 dated January 19, 2018, Contract Modification No. 5 dated February 12, 2018, Contract Modification No. 6 dated April 23, 2018, Contract Modification No. 7 dated October 3, 2018, Contract Modification No. 8 dated October 26, 2018, Contract Modification No. 9 dated November 5, 2018, Contract Modification No. 10 dated January 9, 2019, Contract Modification No. 11 dated January 15, 2019, Contract Modification No. 12 dated January 17, 2019, Contract Modification No. 13 dated February 8, 2019, Contract Modification No. 14 dated November 19, 2019, Contract Modification No. 15 dated February 21, 2020, and Contract Modification No. 16, dated July 8, 2020, (the "Existing Contract") and;

WHEREAS, CONTRACTOR and MTA desire to modify the Existing Contract as provided herein;
Now, therefore, it is mutually agreed, by and between the parties as follows:

The Period of Performance for Option Buy bus order is ~~21calendar months~~ 712 calendar days from the date set forth in the Notice to Proceed.

ARTICLE V: CONTRACT TERM AND PERIOD OF PERFORMANCE, Section 2. Option Buy is modified as follows:

1. Option Buy

The Period of Performance for the Option Buy for this Contract shall begin on **the date set forth in the Notice to Proceed** (hereinafter "Commencement Date"). Contractor shall complete all Work, excluding Warranty, under the Contract within ~~21 months 640~~ 712 calendar days after the Commencement Date for the Option Buy, unless this Contract is terminated earlier or extended by LACMTA, in writing, as provided in the Contract.

The Option Buy quantity is 259 Vehicles. The Option bus scheduled delivery dates are as follows:

SCHEDULE DELIVERY DATES

Start Dates	Scheduled Delivery Dates	No. of Buses Delivered (Qtr.)	No. of Buses (Total)
7/1/2020	9/30/2020	~~30~~ 34	~~30~~ 34
10/1/2020	12/31/2020	~~55~~ 48	~~85~~ 82
1/1/2021	3/31/2021	~~70~~ 48	~~155~~ 130
4/1/2021	6/30/2021	~~78~~ 48	~~233~~ 178
7/1/2021	~~8/19/2021~~ 9/30/2021	~~26~~ 60	~~259~~ 238
10/1/2021	10/31/2021	21	259

Any Option vehicle(s) delivered beyond the scheduled delivery dates specified above may be subject to Liquidated Damages in accordance with Contract Special Provisions SP–10.

Except as expressly amended hereby, the Existing Contract remains in full force and effect as originally executed.

IN WITNESS WHEREOF, the parties have caused this Contract Modification No. 17 to the Existing Contract to be executed by their respective officers duly authorized on the date first written above.

EL DORADO NATIONAL (CALIFORNIA), INC.

By: _____
Signature

TONY WAYNE
Type and Print Name

7/9/20
Date

LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY
Philip A. Washington

By: _____
Elizabeth Hernandez
Principal Contract Administrator

7/24/20
Date

Los Angeles County
Metropolitan Transportation Authority

One Gateway Plaza
Los Angeles, CA 90012-2952

213.922.2000 Tel
metro.net

Metro

MAEL-072 **Response Required: No**

Date: August 17, 2020

Richard Himes
Contract Administration Manager
Eldorado National (California), Inc. (ENC)
9670 Galena Street
Riverside, CA 92509

SUBJECT: **OP28367-000 40' LOW FLOOR CNG TRANSIT BUSES**
EXECUTED CONTRACT MODIFICATION NO.: 18
WAIVER OF METRO'S TRANSPORTATION CHARGES (295 BASE BUS ORDER)

Reference: ELMA-090

Dear Mr. Himes:

Enclosed is your executed original of the subject modification.

Please call me at 213.922.7334 or e-mail at hernandezel@metro.net if you have any questions.

Sincerely,

Elizabeth Hernandez
Principal Contract Administrator

Enclosure: Fully executed Contract Modification No. 18

cc: Kwesi Annan

LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY

CONTRACT NO. OP28367-000, CONTRACT MODIFICATION NO.: 18
(SP-40.12.5 Reimbursement for Labor And Other Related Costs)

FOR: FORTY FOOT (40') LOW FLOOR CNG TRANSIT BUSES

This Contract Modification No. 18 to Contract No.: OP28367-000 is made effective on the 4th day of August 2020 by and between the LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY, hereinafter referred to as "MTA", and EL DORADO NATIONAL (CALIFORNIA), INC., hereinafter referred to as "CONTRACTOR".

WHEREAS, CONTRACTOR and MTA entered into Contract No.: OP28367-000 effective August 15, 2017, as amended by Contract Modification No. 1, dated November 6, 2017, Contract Modification No. 2, dated December 6, 2017, Contract Modification No. 3 dated December 27, 2017, Contract Modification No. 4 dated January 19, 2018, Contract Modification No. 5 dated February 12, 2018, Contract Modification No. 6 dated April 23, 2018, Contract Modification No. 7 dated October 3, 2018, Contract Modification No. 8 dated October 26, 2018, Contract Modification No. 9 dated November 5, 2018, Contract Modification No. 10 dated January 9, 2019, Contract Modification No. 11 dated January 15, 2019, Contract Modification No. 12 dated January 17, 2019, Contract Modification No. 13 dated February 8, 2019, Contract Modification No. 14 dated November 19, 2019, Contract Modification No. 15 dated February 21, 2020, Contract Modification No. 16, dated July 8, 2020, and Contract Modification No. 17, dated July 9, 2020, (the "Existing Contract") and;

WHEREAS, CONTRACTOR and MTA desire to modify the Existing Contract as provided herein; Now, therefore, it is mutually agreed, by and between the parties as follows:

Modify Contract Special Provision40.12.5 as follows:

SP-40.12.5 Reimbursement for Labor And Other Related Costs

The LACMTA shall be reimbursed by the Contractor for labor. The amount shall be determined by LACMTA for a qualified "A Mechanic" at their standard wage rate per hour, plus 80 percent for fringe benefits and overhead. Should a Contractor request LACMTA to transport vehicles to a vendor/subcontractor for repairs, the Contractor shall reimburse LACMTA for all expenses incurred.

LACMTA hereby grants waiver of the requirement for reimbursement by the Contractor for labor for transporting vehicles to-and-from Riverside (El Dorado Facility) for retrofit work of the 295 base buy buses (bus numbers 1505 -1799) under this Contract. (Attachment 1 –Retrofit Matrix)

If required, Contractor shall reimburse LACMTA for costs associated with towing or moving a bus if such action was necessary and if the bus was in the normal service area. Also, the Contractor shall assume all liability for damage from the time the vehicle is released from LACMTA's custody until it is returned.

Except as expressly amended hereby, the Existing Contract remains in full force and effect as originally executed.

IN WITNESS WHEREOF, the parties have caused this Contract Modification No. 18 to the Existing Contract to be executed by their respective officers duly authorized on the date first written above.

EL DORADO NATIONAL (CALIFORNIA), INC.

By: _____
Signature

TONY WAYNE
Type and Print Name

8/7/20
Date

LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY
Philip A. Washington
Chief Executive Officer

By: _____
Elizabeth Hernandez
Principal Contract Administrator

August 14, 2020
Date

EACIIN A 1505-1799 Pending Re-Work

Highlighted Units = Re-Worked Units

	ENC #	Teeter Plate and Tensioner	Modine Fan Fuse Holder	Modine Fan Cables Relocation	Modine Program	Engine Oil Filler Cap Leak	Fuel Sender Pin	Remove 500 k Jumper	2 pc exhaust panel	Clean Insulation/ Low Disc	Jump Start P-Clamp	Fuel Fill Box Decals	CB Set To 16v and 32v	Shark Fin Antenna	Front and Rear Door ReWork	Ventura Door Module	APC Fastner	APC Jumper	Adjust Stop Request Sensitivity	Verify Stop Request Gasket	Steering column Cover	Steering column connection	Steering Angle	Rubber Mic Holder	Remove Hazard Switch Extension	Adjust Camera Angles	Low Voltage Ignition switch Diode	J-Box Electrical Cover	PA Re-Route	Hanover Call Police Harness	ADA Barriers	Rear seat prop rod	Window Latch (no screw)	Exterior Door Switch Label	MCC Labels	MCC Sim Card #	Ground Bar	Engraved tank labels	Hydrolic test port	Drag Link adjustment	Kneeling Switch Bracket	Coolant Pipe Insulation	4 Ply Hoses	Coolant By-Pass	Brake Wear Indicator	Suspension Re-Torque	Drainage Holes	Frame Cracks/ Welds	
1505	1505	6/18/20	6/18/20	6/17/20	4/13/20	6/15/20	6/16/20	6/16/20	6/16/20	6/16/20	6/17/20	6/16/20	6/16/20		6/19/20	6/15/20	6/15/20	6/15/20	6/16/20	6/16/20	########	6/15/20	6/15/20	########	6/16/20	6/15/20	6/15/20	6/16/20	6/17/20	6/15/20	6/15/20	6/16/20	6/16/20	6/15/20	6/15/20	6/15/20	6/17/20	6/17/20	6/17/20	6/17/20	6/17/20	6/17/20	6/17/20	6/17/20	6/17/20	6/17/20	6/17/20	6/17/20	1505
1506	1506		10/7/19						2/20/20												########	12/19/19		########						########		########						7/5/19										1506
1507	1507		10/7/19																		########			########						########		2/18/20	########					6/6/19										1507
1508	1508		11/8/19						2/20/20												########	11/8/19		########								########	2/20/20					6/6/19										1508
1509	1509		10/5/19						3/3/20												########			########						########		12/3/19						6/6/19										1509
1510	1510		########																		########			########						########		########						6/11/19										1510
1511	1511		10/5/19						3/3/20												########	12/19/19		########						########		12/3/19						2/20/20										1511
1512	1512		########		4/13/20																########			########						########		12/3/19						########										1512
1513	1513		10/9/19																		########			########						########		12/3/19						6/12/19										1513
1514	1514	7/6/20	6/23/20	7/1/20		6/23/20	7/1/20	6/30/20	6/23/20	7/1/20	7/1/20	7/1/20	7/6/20		7/6/20	7/6/20	7/6/20	7/1/20	6/30/20	6/30/20	6/23/20	6/23/20	6/23/20	6/23/20	6/23/20	7/8/20	7/1/20	7/1/20	7/8/20	7/8/20	6/23/20	7/6/20	6/23/20	6/23/20	6/23/20	6/23/20	7/2/20	7/6/20	7/8/20	7/6/20	7/2/20	7/2/20	7/2/20	7/2/20	7/2/20	7/6/20	7/2/20	7/2/20	7/6/20	1514
1515	1515		10/8/19																		########			########						########		########						7/3/19										1515
1516	1516		10/7/19						2/19/20												########			########						########		########						########										1516
1517	1517		10/5/19																		11/4/19	11/2/19		########								########						6/11/19										1517
1518	1518		10/8/19						2/20/20												########	12/19/19		########						########		########						########										1518
1519	1519		10/4/19						2/19/20												########	12/19/19		########						########		########	########					7/2/19										1519
1520	1520	6/2/20	6/1/20	6/1/20		6/1/20	6/1/20	6/1/20	6/1/20	6/1/20	6/1/20	6/1/20	6/1/20		6/2/20	6/1/20	6/1/20	6/2/20	6/1/20	6/1/20	6/1/20	6/2/20	6/1/20	6/1/20	6/1/20	6/2/20	6/1/20	6/1/20	6/1/20	6/1/20	6/1/20	6/1/20	6/1/20	6/1/20	6/1/20	6/1/20	6/2/20	6/2/20	6/2/20	6/2/20	6/2/20	6/2/20	6/2/20	6/2/20	6/2/20	6/2/20	6/2/20	6/2/20	1520
1521	1521		########																		########	10/31/19		########						########		########						6/10/19										1521
1522	1522		10/9/19																		12/7/19	12/7/19		########						8/27/19		12/7/19						12/7/19										1522
1523	1523		10/8/19						2/13/20												########			########						########		########						########										1523
1524	1524		10/8/19						2/19/20												11/6/19	11/6/19		########						9/3/19		11/6/19						11/6/19										1524
1525	1525	4/30/20	4/30/20	4/30/20	5/5/20	4/29/20	4/30/20	4/30/20	4/29/20	4/30/20	4/30/20	4/30/20		4/29/20	4/30/20		4/29/20		4/29/20	4/29/20	4/29/20	4/29/20	4/29/20	4/29/20	4/29/20	4/29/20	4/29/20		4/28/20	4/30/20	4/29/20	4/29/20	4/1/20	4/29/20	4/29/20	4/29/20	4/30/20	4/29/20	4/29/20	4/30/20	4/30/20	4/30/20	4/30/20		4/30/20	4/30/20		4/30/20	1525
1526	1526		########																		########		11/2/19							########		########	########					########										1526
1527	1527		########																		########	11/22/19	11/3/19							########		########						########										1527
1528	1528		10/8/19		4/13/20				2/18/20												########	11/22/19	11/4/19							########		12/3/19	1/14/20															1528
1529	1529		10/7/19						2/17/20												11/4/19	11/4/19	11/5/19							########		11/4/19						11/4/19										1529
1530	1530		########		4/13/20				3/3/20												########		11/6/19							########		########						########										1530
1531	1531	6/4/20	6/3/20	6/3/20		6/3/20	6/3/20	6/5/20	6/3/20	6/3/20	6/3/20	6/4/20	6/3/20		6/5/20	6/3/20	6/3/20	6/3/20	6/3/20	6/3/20	6/3/20	6/3/20	6/3/20	6/3/20	6/3/20	6/3/20	6/3/20	6/4/20	6/3/20	6/3/20	6/3/20	6/3/20	6/3/20	6/3/20	6/4/20	6/3/20	6/4/20	6/3/20	6/3/20	6/3/20	6/3/20	6/3/20	6/3/20	6/3/20	6/3/20	6/3/20	6/3/20	6/3/20	1531
1532	1532		10/7/19		4/13/20				2/20/20												########		11/8/19							########		########						6/11/19										1532

	ENC #	Teeter Plate and Tensioner	Modine Fan Fuse Holder	Modine Fan Cables Relocation	Modine Program	Engine Oil Filler Cap Leak	Fuel Sender Pin	Remove 500 k Jumper	2 pc exhaust panel	Clean Insulation/ Low Disc	Jump Start P-Clamp	Fuel Fill Box Decals	CB Set To 16v and 32v	Shark Fin Antenna	Front and Rear Door ReWork	Ventura Door Module	APC Fastner	APC Jumper	Adjust Stop Request Sensitivity	Verify Stop Request Gasket	Steering column Cover	Steering column connection	Steering Angle	Rubber Mic Holder	Remove Hazard Switch Extension	Adjust Camera Angles	Low Voltage Ignition switch Diode	J-Box Electrical Cover	PA Re-Route	Hanover Call Police Harness	ADA Barriers	Rear seat prop rod	Window Latch (no screw)	Exterior Door Switch Label	MCC Labels	MCC Sim Card #	Ground Bar	Engraved tank labels	Hydrolic test port	Drag Link adjustment	Kneeling Switch Bracket	Coolant Pipe Insulation	4 Ply Hoses	Coolant By-Pass	Brake Wear Indicator	Suspension Re-Torque	Drainage Holes	Frame Cracks/ Welds	
1533	46+05		########						2/18/20												########	11/23/19		11/9/19						########		########	1/13/20					########											1533
1534	46+05		########																		########	10/30/19		########						########		########	########					########											1534
1535	46+05								2/13/20												11/5/19	11/14/19		########								11/5/19	########					11/5/19											1535
1536	46+05		########																		########	10/30/19		########						########		########	########					2/20/20											1536
1537	46+05		########						2/21/20												########	12/18/19		########						########		########	########					########											1537
1538	46+05		10/5/19		4/13/20				2/21/20												########			########						########		12/3/19						########											1538
1539	46+05		10/9/19																		11/6/19	11/6/19		########						11/6/19		11/6/19						11/6/19											1539
1540	46+05	5/20/20	5/26/20	5/21/20	5/27/20	5/26/20	5/21/20	5/21/20	5/21/20	5/21/20	5/21/20	5/21/20	5/21/20		5/26/20	5/26/20	5/21/20	5/21/20	5/21/20	5/21/20	5/21/20	5/26/20	5/21/20	5/26/20	5/21/20	5/21/20	5/21/20	5/26/20	5/21/20	5/21/20	5/21/20	5/21/20	5/21/20	5/21/20	5/21/20	5/21/20	5/21/20	5/21/20	5/21/20	5/21/20	5/21/20	5/21/20	5/21/20		5/21/20	5/21/20	5/21/20	5/21/20	1540
1541	46+05		########																		########			########						########		12/3/19						########											1541
1542	46+05		########		4/13/20				3/3/20												########			########														########											1542
1543	46+05		10/8/19																		########			########								########																	1543
1544	46+05		10/7/19						2/17/20												########			########						10/7/19		########	########					2/20/20											1544
1545	46+05		10/9/19																		########	11/1/19		########						########		11/1/19						11/1/19											1545
1546	46+05																				11/1/19			########						########		11/1/19						11/1/19											1546
1547	46+05		########																		########			########						########		########						########											1547
1548	46+05		########		4/13/20																########	10/31/19		########						########		########	########					########											1548
1549	46+05								2/13/20												########			########						########		2/26/20	########					########											1549
1550	46+05		########																		########	12/19/19		########						########		########						########											1550
1551	46+05		10/4/19						3/4/20												########			########								########																	1551
1552	46+05		10/4/19						2/21/20												10/9/19			########						10/9/19		########						10/9/19											1552
1553	46+05		10/6/19																		12/9/19			########								12/9/19	########					12/9/19											1553
1554	46+05		########						2/17/20												11/1/19	11/1/19		########						11/1/19		11/1/19						11/1/19											1554
1555	46+05		10/8/19						2/18/20												########			12/1/19						########		########	1/13/20					11/1/19											1555
1556	46+05		########																		11/1/19	11/1/19		12/2/19						11/1/19		11/1/19						11/1/19											1556
1557	46+05		########						3/4/20												########	11/1/19		12/3/19						11/1/19		2/26/20	1/13/20					x											1557
1558	46+05		########		4/13/20																########	10/29/19		12/4/19								########	########					x											1558
1559	46+05		10/6/19																		########	11/20/19		12/5/19						########		########	########					x											1559
1560	46+05		10/4/19																		11/6/19	11/6/19		12/6/19						11/6/19		11/6/19						x											1560

	ENC #	Teeter Plate and Tensioner	Modine Fan Fuse Holder	Modine Fan Cables Relocation	Modine Program	Engine Oil Filler Cap Leak	Fuel Sender Pin	Remove 500 k Jumper	2 pc exhaust panel	Clean Insulation/ Low Disc	Jump Start P-Clamp	Fuel Fill Box Decals	CB Set To 16v and 32v	Shark Fin Antenna	Front and Rear Door ReWork	Ventura Door Module	APC Fastner	APC Jumper	Adjust Stop Request Sensitivity	Verify Stop Request Gasket	Steering column Cover	Steering column connection	Steering Angle	Rubber Mic Holder	Remove Hazard Switch Extension	Adjust Camera Angles	Low Voltage Ignition switch Diode	J-Box Electrical Cover	PA Re-Route	Hanover Call Police Harness	ADA Barriers	Rear seat prop rod	Window Latch (no screw)	Exterior Door Switch Label	MCC Labels	MCC Sim Card #	Ground Bar	Engraved tank labels	Hydrolic test port	Drag Link adjustment	Kneeling Switch Bracket	Coolant Pipe Insulation	4 Ply Hoses	Coolant By-Pass	Brake Wear Indicator	Suspension Re-Torque	Drainage Holes	Frame Cracks/ Welds	
1561	46+05		########		4/13/20																########	11/26/19		12/7/19						########		########	1/13/20					x											1561
1562	46+05																				########	11/26/19		12/8/19						########		12/3/19	1/13/20					x											1562
1563	46+05		########																		########	11/26/19		12/9/19						########		########						x											1563
1564	46+05		10/8/19						2/18/20												########	11/23/19		########						########		########						x											1564
1565	46+05	5/12/20	5/13/20	5/13/20	5/15/20	5/11/20	5/12/20	5/12/20	5/11/20	5/12/20	5/12/20	5/12/20	5/12/20		5/13/20		5/12/20	5/12/20	5/12/20	5/12/20	########	12/17/19	5/11/20	########	5/11/20	5/12/20	5/11/20		5/13/20	5/13/20	5/12/20	5/12/20	5/12/20	5/12/20	5/12/20	5/12/20	5/12/20	5/12/20	5/12/20	5/12/20	5/13/20	5/12/20			5/12/20	5/13/20		5/12/20	1565
1566	46+05		10/8/19																		########	12/17/19		########								########						x											1566
1567	46+05		10/8/19																		########	11/11/19		########						########		########						x											1567
1568	46+05		10/4/19																		11/4/19	11/4/19		########						########		11/4/19						x											1568
1569	46+05		10/4/19																		11/19/19	11/20/19		########						########		########	########					x											1569
1570	46+05		########						2/17/20												########	11/19/19		########						x		########	########					x											1570
1571	46+05								x																					x			x					x											1571
1572	46+05								x																					x			x					x											1572
1573	46+05		########						x																					x			x					x											1573
1574	46+05								x																					x			x					x											1574
1575	46+05								x																					x			x					x											1575
1576	46+05								x																					x			x					x											1576
1577	46+05								x																					x			x					x											1577
1578	46+05								x																					x			x					x											1578
1579	46+05								x																					x			x					x											1579
1580	46+05								x																					x			x					x											1580
1581	46+05	5/7/20	5/7/20	5/7/20		5/7/20	5/7/20	5/6/20	5/6/20	5/7/20	5/7/20	5/7/20		5/7/20	5/11/20		5/7/20		5/7/20	5/7/20	5/11/20	5/7/20	5/6/20	5/6/20	5/6/20	5/11/20	5/6/20		5/6/20	5/6/20	5/6/20	5/7/20	5/6/20	5/6/20	5/6/20	5/6/20	5/6/20	5/6/20	5/7/20	5/7/20	5/6/20	5/7/20			5/7/20	5/11/20		5/7/20	1581
1582	46+05			5/21/20	5/21/20				x				5/21/20					5/21/20												x			x					x											1582
1583	46+05			5/21/20	5/21/20				x				5/21/20					5/21/20												x			x					x		2/1/20										1583
1584	46+05								x																					x			x					x											1584
1585	46+05								x																					x			x					x											1585
1586	46+05	5/15/20	5/13/20	5/14/20		5/15/20	5/14/20	5/13/20	5/13/20	5/15/20	5/14/20	5/13/20	5/13/20	2/27/20	5/15/20		5/13/20		5/13/20	5/13/20	5/13/20	5/13/20	5/13/20	5/13/20	5/13/20	5/15/20	5/13/20		5/14/20	5/15/20	5/13/20	5/13/20	5/13/20	5/13/20	5/13/20	5/13/20	5/13/20	5/15/20	5/15/20	5/15/20	5/15/20	5/15/20	5/15/20		5/15/20	5/15/20	5/15/20	5/15/20	1586
1587	46+05	3/23/20	10/8/19			3/23/20	3/24/20	3/24/20	3/24/20	3/23/20	3/23/20	3/24/20		3/26/20	3/26/20		3/24/20		3/24/20	3/26/20	3/23/20	3/24/20		3/23/20	3/24/20	3/26/20	3/26/20		3/26/20	3/26/20	3/24/20	3/22/20	3/24/20	3/24/20	3/24/20	3/24/20	3/25/20	3/25/20	3/25/20	1/11/20	3/25/20	3/25/20			3/25/20	3/25/20	3/26/20	1587
1588	46+05								x																					x			x					x		02/01/20										1588

	ENC #	Teeter Plate and Tensioner	Modine Fan Fuse Holder	Modine Fan Cables Relocation	Modine Program	Engine Oil Filler Cap Leak	Fuel Sender Pin	Remove 500 k Jumper	2 pc exhaust panel	Clean Insulation/ Low Disc	Jump Start P-Clamp	Fuel Fill Box Decals	CB Set To 16v and 32v	Shark Fin Antenna	Front and Rear Door ReWork	Ventura Door Module	APC Fastner	APC Jumper	Adjust Stop Request Sensitivity	Verify Stop Request Gasket	Steering column Cover	Steering column connection	Steering Angle	Rubber Mic Holder	Remove Hazard Switch Extension	Adjust Camera Angles	Low Voltage Ignition switch Diode	J-Box Electrical Cover	PA Re-Route	Hanover Call Police Harness	ADA Barriers	Rear seat prop rod	Window Latch (no screw)	Exterior Door Switch Label	MCC Labels	MCC Sim Card #	Ground Bar	Engraved tank labels	Hydrolic test port	Drag Link adjustment	Kneeling Switch Bracket	Coolant Pipe Insulation	4 Ply Hoses	Coolant By-Pass	Brake Wear Indicator	Suspension Re-Torque	Drainage Holes	Frame Cracks/ Welds	
1589	46+05			5/15/20	5/15/20				x				5/15/20					5/15/20												x			x					x											1589
1590	46+05		########						x																					x			x					x		2/1/20									1590
1591	46+05	3/1/20	3/30/20			3/30/20	3/30/20	3/30/20	3/30/20	4/1/20	3/31/20	4/1/20		3/31/20	4/2/20		3/31/20		3/31/20	3/31/20	3/31/20	3/31/20		3/30/20	3/31/20	3/30/20	3/30/20		3/31/20	3/31/20	3/31/20	3/30/20	3/30/20	3/30/20	3/30/20	3/30/20	3/31/20	3/31/20	3/31/20	3/31/20	3/31/20	3/31/20			4/1/20	4/1/20		4/2/20	1591
1592	46+05								x																					x			x					x		2/22/20									1592
1593	46+05								x																					x			x					x											1593
1594	46+05								x																					x			x					x											1594
1595	46+05	4/7/20	4/6/20	5/28/20	5/28/20	4/7/20	4/6/20	4/7/20	4/6/20	4/6/20	4/6/20	4/6/20	5/28/20	4/8/20	4/7/20		4/6/20	5/28/20	4/7/20	4/7/20	4/8/20	4/6/20		4/6/20	4/6/20	4/8/20	4/7/20		4/6/20	4/6/20	4/6/20	4/6/20	4/6/20	4/6/20	4/7/20	4/7/20	4/7/20	4/7/20	4/7/20	4/7/20	4/7/20	4/7/20			4/7/20	4/7/20		4/7/20	1595
1596	46+05			5/12/20	5/12/20				x				5/12/20					5/12/20												x			x					x											1596
1597	46+05	3/18/20	3/18/20	6/1/20	6/1/20	3/18/20	3/18/20	3/18/20	3/18/20	3/18/20	3/18/20	3/18/20	6/1/20	2/27/20	3/18/20		3/18/20	6/1/20	3/18/20	3/18/20	3/18/20	3/18/20		3/18/20	3/18/20	3/18/20	3/18/20		3/18/20	3/18/20	3/18/20	3/18/20	3/18/20	3/18/20	3/18/20	3/18/20	3/18/20	3/18/20	3/18/20	3/18/20	3/18/20	3/18/20			3/18/20	3/18/20		3/19/20	1597
1598	46+05								x																					x			x					x											1598
1599	46+05	4/17/20	4/17/20			4/16/20	4/17/20	4/17/20	4/17/20	4/16/20	4/17/20	4/17/20		4/17/20	4/17/20		4/17/20		4/17/20	4/17/20	4/20/20	4/17/20	4/20/20	4/17/20	4/17/20	4/17/20	4/17/20		4/17/20	4/17/20	4/17/20	4/17/20	4/17/20	4/17/20	4/17/20	4/17/20	4/16/20	4/16/20	4/16/20	4/16/20	4/16/20	4/16/20			4/16/20	4/16/20		4/16/20	1599
1600	46+05								x																					x			x					x											1600
1601	46+05								x																					x			x					x											1601
1602	46+05								x																					x			x					x											1602
1603	46+05								x																					x			x					x		1/21/20									1603
1604	46+05								x																					x			x					x											1604
1605	46+05	4/14/20	4/13/20	4/15/20		4/14/20	4/13/20	4/13/20	4/13/20	4/13/20	4/13/20	4/13/20		4/13/20	4/14/20		4/13/20		4/13/20	4/13/20	4/14/20	4/14/20		4/13/20	4/13/20	4/13/20	4/13/20		4/13/20	4/13/20	4/13/20	4/13/20	4/13/20	4/13/20	4/13/20	4/13/20	4/13/20	4/13/20	4/13/20	4/13/20	4/13/20	4/13/20			4/13/20	4/13/20		4/13/20	1605
1606	46+05		########	6/1/20	6/1/20				x				6/1/20	2/27/20				6/1/20						x						x			x					x		1/18/20									1606
1607	46+05			5/17/20	5/17/20				x				5/17/20					5/17/20						x						x			x					x											1607
1608	46+05			5/17/20	5/17/20				x				5/17/20	2/25/20				5/17/20						x						x			x					x		10/23/19									1608
1609	46+05	4/22/20	4/20/20	5/17/20	5/17/20	4/21/20	4/20/20	4/20/20	4/20/20	4/20/20	4/20/20	4/20/20	5/17/20	4/21/20	4/22/20		4/20/20	5/17/20	4/20/20	4/20/20	4/21/20	4/20/20	4/20/20	4/20/20	4/20/20	4/21/20	4/20/20		4/20/20	4/21/20	4/20/20	4/20/20	4/20/20	4/20/20	4/20/20	4/20/20	4/21/20	4/21/20	4/21/20	4/21/20	4/21/20	4/21/20	4/22/20		4/21/20	4/22/20		4/21/20	1609
1610	46+05	5/6/20	5/4/20	5/4/20		5/4/20	5/4/20	5/4/20	5/6/20	5/4/20	5/4/20	5/4/20		5/4/20	5/6/20		5/6/20		5/4/20	5/4/20	5/4/20	5/4/20	5/4/20	5/4/20	5/4/20	5/5/20	5/4/20		5/4/20	5/5/20	5/4/20	5/4/20	5/4/20	5/4/20	5/4/20	5/4/20	5/5/20	5/5/20	5/5/20	5/5/20	5/5/20	5/5/20	5/5/20		5/5/20	5/5/20	5/5/20	5/5/20	1610
1611	46+05	4/22/20	4/22/20	4/23/20		4/22/20	4/22/20	4/22/20	4/22/20	4/22/20	4/22/20	4/22/20		4/22/20	4/23/20		4/22/20		4/22/20	4/22/20	4/22/20	4/22/20	4/22/20	4/22/20	4/22/20	4/22/20	4/23/20		4/22/20	4/22/20	4/22/20	4/23/20	4/22/20	4/22/20	4/22/20	4/22/20	4/22/20	4/22/20	4/22/20	4/22/20	4/22/20	4/22/20	4/22/20		4/22/20	4/22/20		4/22/20	1611
1612	46+05			6/1/20	6/1/20				x				6/1/20	2/25/20				6/1/20						x						x			x					x		1/21/20									1612
1613	46+05	4/27/20	4/27/20	4/27/20		4/27/20	4/24/20	4/24/20	4/24/20	4/24/20	4/24/20	4/24/20		4/24/20	4/27/20		4/24/20		4/24/20	4/24/20	4/24/20	4/24/20	4/24/20	4/24/20	4/24/20	4/27/20	4/24/20		4/24/20	4/27/20	4/24/20	4/24/20	4/24/20	4/24/20	4/24/20	4/24/20	4/27/20	4/24/20	4/24/20	4/27/20	4/27/20	4/27/20	4/27/20		4/27/20	4/27/20		4/27/20	1613
1614	46+05								x												x			x						x			x					x											1614
1615	46+05								x												x			x						x		x	x					x		12/26/19									1615
1616	46+05			6/4/20	6/4/20				x				6/4/20					6/4/20			x			x						x		x	x					x		12/20/19									1616

	ENC #	Teeter Plate and Tensioner	Modine Fan Fuse Holder	Modine Fan Cables Relocation	Modine Program	Engine Oil Filler Cap Leak	Fuel Sender Pin	Remove 500 k Jumper	2 pc exhaust panel	Clean Insulation/ Low Disc	Jump Start P-Clamp	Fuel Fill Box Decals	CB Set To 16v and 32v	Shark Fin Antenna	Front and Rear Door ReWork	Ventura Door Module	APC Fastner	APC Jumper	Adjust Stop Request Sensitivity	Verify Stop Request Gasket	Steering column Cover	Steering column connection	Steering Angle	Rubber Mic Holder	Remove Hazard Switch Extension	Adjust Camera Angles	Low Voltage Ignition switch Diode	J-Box Electrical Cover	PA Re-Route	Hanover Call Police Harness	ADA Barriers	Rear seat prop rod	Window Latch (no screw)	Exterior Door Switch Label	MCC Labels	MCC Sim Card #	Ground Bar	Engraved tank labels	Hydrolic test port	Drag Link adjustment	Kneeling Switch Bracket	Coolant Pipe Insulation	4 Ply Hoses	Coolant By-Pass	Brake Wear Indicator	Suspension Re-Torque	Drainage Holes	Frame Cracks/ Welds	
1517	46+05	5/4/20	5/1/20	5/1/20		5/1/20	5/1/20	5/1/20	5/1/20	5/1/20	5/1/20	5/1/20		5/1/20	5/4/20		5/1/20		5/1/20	5/1/20	5/1/20	5/1/20	5/1/20	5/1/20	5/1/20	5/1/20	5/1/20		5/1/20	5/4/20	5/1/20	5/1/20	5/1/20	5/1/20	5/1/20	5/1/20	5/4/20	5/1/20	5/4/20	5/4/20	5/4/20	5/4/20	5/4/20		5/4/20	5/4/20		5/4/20	1517
1518	46+05	6/11/20	6/10/20	6/10/20		6/10/20	6/10/20	6/10/20	6/10/20	6/10/20	6/10/20	6/11/20	6/10/20	6/10/20	6/11/20	6/10/20	6/10/20	6/10/20	6/10/20	6/10/20	6/10/20	6/10/20	6/10/20	6/10/20	6/10/20	6/11/20	6/10/20	6/10/20	6/10/20	6/10/20	6/10/20	6/10/20	6/10/20	6/10/20	6/10/20	6/10/20	6/11/20	6/11/20	6/11/20	6/11/20	6/11/20	6/11/20	6/11/20	6/11/20	6/11/20	6/11/20	6/11/20	6/11/20	1518
1519	46+05								x												x			x						x		x	x					x		12/4/19								1519
1520	46+05								x												x			x						x		x	x					x										1520
1521	46+05								x												x			x						x		x	x					x		1/11/20								1521
1522	46+05	5/20/20	5/20/20	5/20/20	6/2/20	5/20/20	5/20/20	5/21/20	5/19/20	5/20/20	5/20/20	5/20/20	5/20/20	5/20/20	5/21/20		5/20/20	5/21/20	5/20/20	5/20/20	5/19/20	5/19/20	5/20/20	5/19/20	5/19/20	5/21/20	5/20/20		5/20/20	5/20/20	5/20/20	5/20/20	5/20/20	5/19/20	5/19/20	5/20/20	5/20/20	5/20/20	5/20/20	5/20/20	5/20/20	5/20/20	5/20/20		5/20/20	5/20/20	5/20/20	5/20/20	1522
1523	46+05			5/29/20	5/29/20				x				5/29/20					5/29/20			x			x						x		x	x					x		12/31/19								1523
1524	46+05	4/10/20	4/9/20	6/2/20	6/2/20	4/10/20	4/9/20	4/8/20	4/9/20	4/9/20	4/10/20	4/10/20	6/2/20	4/8/20	4/10/20		4/9/20	6/2/20	4/8/20	4/8/20	4/9/20	4/8/20		4/8/20	4/8/20	4/9/20	4/8/20		4/8/20	4/8/20	4/10/20	4/9/20	4/8/20	4/8/20	4/8/20	4/8/20	4/10/20	4/8/20	4/10/20	4/10/20	4/10/20	4/10/20	4/10/20		4/10/20	4/10/20		4/10/20	1524
1525	46+05		########	6/9/20	6/9/20				x				6/9/20					6/9/20			x			x						x		x	x					x		11/9/19								1525
1526	46+05								x												x			x						x		x	x					x										1526
1527	46+05								x												x			x						x		x	x					x										1527
1528	46+05								x												x			x						x		x	x					x										1528
1529	46+05								x												x			x						x		x	x					x										1529
1530	46+05								x												x			x						x		x	x					x										1530
1531	46+05								x												x			x						x		x	x					x										1531
1532	46+05								x												x			x						x		x	x					x										1532
1533	46+05								x												x			x						x		x	x					x										1533
1534	46+05								x												x			x						x		x	x					x										1534
1535	46+05								x												x			x						x		x	x					x										1535
1536	46+05								x												x			x						x		x	x					x										1536
1537	46+05								x												x			x						x		x	x					x										1537
1538	46+05								x												x			x						x		x	x					x										1538
1539	46+05								x												x			x						x		x	x					x										1539
1540	46+05	4/3/20	4/2/20	6/2/20	6/2/20	4/3/20	4/2/20	4/1/20	4/1/20	4/3/20	4/2/20	4/2/20	6/2/20	4/3/20	4/3/20		4/2/20	6/2/20	4/3/20	4/3/20	4/2/20	4/2/20		4/2/20	4/2/20	4/3/20	4/2/20		4/2/20	4/3/20	4/2/20	4/2/20	4/2/20	4/2/20	4/2/20	4/2/20	4/2/20	4/2/20	4/2/20	4/2/20	4/2/20	4/2/20			4/2/20	4/2/20		4/2/20	1540
1541	46+05								x												x			x						x		x	x					x										1541
1542	46+05			6/9/20	6/9/20				x				6/9/20					6/9/20			x			x						x		x	x					x		11/12/19								1542
1543	46+05								x												x			x						x		x	x					x		2/29/20								1543
1544	46+05								x												x			x						x		x	x					x										1544

	ENC #	Teeter Plate and Tensioner	Modine Fan Fuse Holder	Modine Fan Cables Relocation	Modine Program	Engine Oil Filler Cap Leak	Fuel Sender Pin	Remove 500 k Jumper	2 pc exhaust panel	Clean Insulation/ Low Disc	Jump Start P-Clamp	Fuel Fill Box Decals	CB Set To 16v and 32v	Shark Fin Antenna	Front and Rear Door ReWork	Ventura Door Module	APC Fastner	APC Jumper	Adjust Stop Request Sensitivity	Verify Stop Request Gasket	Steering column Cover	Steering column connection	Steering Angle	Rubber Mic Holder	Remove Hazard Switch Extension	Adjust Camera Angles	Low Voltage Ignition switch Diode	J-Box Electrical Cover	PA Re-Route	Hanover Call Police Harness	ADA Barriers	Rear seat prop rod	Window Latch (no screw)	Exterior Door Switch Label	MCC Labels	MCC Sim Card #	Ground Bar	Engraved tank labels	Hydrolic test port	Drag Link adjustment	Kneeling Switch Bracket	Coolant Pipe Insulation	4 Ply Hoses	Coolant By-Pass	Brake Wear Indicator	Suspension Re-Torque	Drainage Holes	Frame Cracks/ Welds	
1545	46+05								x												x			x						x		x	x					x											1545
1546	46+05								x												x			x						x		x	x					x		2/1/20									1546
1547	46+05								x												x			x						x		x	x					x											1547
1548	46+05								x												x			x						x		x	x					x		2/1/20									1548
1549	46+05								x												x			x						x		x	x					x		2/22/20									1549
1550	46+05								x												x			x						x		x	x					x		2/29/20									1550
1551	46+05								x												x			x						x		x	x					x											1551
1552	46+05								x												x			x						x		x	x					x		1/11/20									1552
1553	46+05			6/2/20	6/2/20				x				6/2/20					6/2/20			x			x						x		x	x					x		12/6/19									1553
1554	46+05								x												x			x						x		x	x					x											1554
1555	46+05			5/26/20	5/26/20				x				5/26/20					5/26/20			x			x						x		x	x					x		1/11/20									1555
1556	46+05								x												x			x						x		x	x					x											1556
1557	46+05								x												x			x						x		x	x					x											1557
1558	46+05								x												x			x						x		x	x					x											1558
1559	46+05								x												x			x						x		x	x					x		1/2/20									1559
1560	46+05								x												x			x						x		x	x					x											1560
1561	46+05			5/13/20	5/13/20				x				5/13/20					5/13/20			x			x						x		x	x					x											1561
1562	46+05								x												x			x						x		x	x					x											1562
1563	46+05								x												x			x						x		x	x					x											1563
1564	46+05								x												x			x						x		x	x					x	x										1564
1565	46+05								x												x			x						x		x	x					x	x										1565
1566	46+05								x												x			x						x		x	x					x	x										1566
1567	46+05								x												x			x						x		x	x					x	x										1567
1568	46+05	6/15/20	6/15/20	6/15/20		6/12/20	6/15/20	6/11/20	6/11/20	6/12/20	6/15/20	6/15/20	6/12/20	6/12/20	6/15/20	6/15/20	6/12/20	6/15/20	6/11/20	6/11/20	6/12/20	6/12/20	6/12/20	6/12/20	6/11/20	6/15/20	6/12/20	6/11/20	6/12/20	6/12/20	6/11/20	6/11/20	6/11/20	6/12/20	6/11/20	6/11/20	6/15/20	6/15/20	6/15/20	6/15/20	6/15/20	6/15/20	6/15/20	6/15/20	6/15/20	6/15/20	6/15/20	6/15/20	1568
1569	46+05			5/14/20	5/14/20				x				5/14/20					5/14/20			x			x						x		x	x					x	x										1569
1570	46+05								x												x			x						x		x	x					x	x										1570
1571	46+05								x												x			x						x		x	x					x	x										1571
1572	46+05			5/14/20	5/14/20				x				5/14/20					5/14/20			x			x						x		x	x					x	x										1572

	ENC #	Teeter Plate and Tensioner	Modine Fan Fuse Holder	Modine Fan Cables Relocation	Modine Program	Engine Oil Filler Cap Leak	Fuel Sender Pin	Remove 500 k Jumper	2 pc exhaust panel	Clean Insulation/ Low Disc	Jump Start P-Clamp	Fuel Fill Box Decals	CB Set To 16v and 32v	Shark Fin Antenna	Front and Rear Door ReWork	Ventura Door Module	APC Fastner	APC Jumper	Adjust Stop Request Sensitivity	Verify Stop Request Gasket	Steering column Cover	Steering column connection	Steering Angle	Rubber Mic Holder	Remove Hazard Switch Extension	Adjust Camera Angles	Low Voltage Ignition switch Diode	J-Box Electrical Cover	PA Re-Route	Hanover Call Police Harness	ADA Barriers	Rear seat prop rod	Window Latch (no screw)	Exterior Door Switch Label	MCC Labels	MCC Sim Card #	Ground Bar	Engraved tank labels	Hydrolic test port	Drag Link adjustment	Kneeling Switch Bracket	Coolant Pipe Insulation	4 Ply Hoses	Coolant By-Pass	Brake Wear Indicator	Suspension Re-Torque	Drainage Holes	Frame Cracks/ Welds	
1573	46+05								x												x			x						x		x	x					x	x										1573
1574	46+05								x												x			x						x		x	x					x	x										1574
1575	46+05								x												x			x						x		x	x					x	x										1575
1576	46+05								x												x			x						x		x	x					x	x										1576
1577	46+05		x						x												x			x						x		x	x					x	x										1577
1578	46+05		x	5/14/20	5/14/20				x				5/14/20					5/14/20			x			x						x		x	x					x	x										1578
1579	46+05	4/30/20	4/29/20	4/29/20		4/28/20	4/28/20	4/28/20	4/28/20	4/28/20	4/28/20	4/28/20		4/29/20	4/30/20		4/29/20		4/28/20	4/28/20	4/28/20	4/28/20	4/28/20	4/28/20	4/28/20	4/29/20	4/28/20		4/29/20	4/29/20	4/28/20	4/28/20	4/28/20	4/28/20	4/29/20	4/28/20	4/29/20	4/29/20	4/29/20	4/29/20	4/29/20	4/29/20	4/29/20		4/29/20	4/29/20		4/29/20	1579
1580	46+05		x						x												x			x						x		x	x					x	x										1580
1581	46+05		x	5/18/20	5/18/20				x				5/18/20					5/18/20			x			x						x		x	x					x	x										1581
1582	46+05	4/20/20	4/16/20			4/17/20	4/16/20	4/16/20	4/16/20	4/16/20	4/16/20	4/16/20		4/15/20	4/16/20		4/16/20		4/16/20	4/16/20	4/17/20	4/17/20	4/18/20	4/15/20	4/15/20	4/16/20	4/15/20		4/16/20	4/20/20	4/16/20	4/15/20	4/16/20	4/16/20	4/16/20	4/16/20	4/16/20	4/16/20	4/18/20	4/17/20	4/16/20	4/17/20			4/17/20	4/17/20		4/17/20	1582
1583	46+05		x						x												x			x						x		x	x					x	x										1583
1584	46+05		x						x												x			x						x		x	x					x	x										1584
1585	46+05		x						x												x			x						x		x	x					x	x										1585
1586	46+05		x						x												x			x						x		x	x					x	x										1586
1587	46+05	6/20/20	6/22/20	5/18/20	5/18/20	6/20/20	6/20/20	6/18/20	6/18/20	6/19/20	6/23/20	6/18/20	5/18/20	6/20/20	6/23/20	6/18/20	6/18/20	5/18/20	6/18/20	6/18/20	6/18/20	6/18/20	6/18/20	6/18/20	6/18/20	6/20/20	6/18/20	6/19/20	6/18/20	6/18/20	6/19/20	6/18/20	6/18/20	6/18/20	6/18/20	6/18/20	6/22/20	6/22/20	6/22/20	6/22/20	6/22/20	6/22/20	6/22/20	6/22/20	6/22/20	6/22/20	6/22/20	6/22/20	1587
1588	46+05		x						x												x			x						x		x	x					x	x										1588
1589	46+05		x						x												x			x						x		x	x					x	x										1589
1590	46+05	5/28/20	5/28/20	5/28/20		5/28/20	5/28/20	5/28/20	5/27/20	5/28/20	5/28/20	5/28/20	5/28/20	5/28/20	5/29/20	5/29/20	5/28/20	5/29/20	5/29/20	5/29/20	5/28/20	5/28/20	5/29/20	5/27/20	5/28/20	5/28/20	5/28/20	5/28/20	5/28/20	5/28/20	5/28/20	5/28/20	5/28/20	5/27/20	5/29/20	5/28/20	5/29/20	5/29/20	5/29/20	5/29/20	5/29/20	5/29/20	5/29/20	5/29/20	5/29/20	5/29/20	5/29/20	5/29/20	1590
1591	46+05		x						x												x			x						x		x	x					x	x										1591
1592	46+05		x						x												x			x						x		x	x					x	x										1592
1593	46+05		x						x												x			x						x		x	x					x	x										1593
1594	46+05		x						x												x			x						x		x	x					x	x										1594
1595	46+05		x						x												x			x						x		x	x					x	x										1595
1596	46+05		x						x												x			x						x		x	x					x	x										1596
1597	46+05		x	5/18/20	5/18/20				x				5/18/20					5/18/20			x			x						x		x	x					x	x										1597
1598	46+05		x	5/22/20	5/22/20				x				5/22/20					5/22/20			x			x						x		x	x					x	x										1598
1599	46+05		x						x												x			x						x		x	x					x	x										1599
1600	46+05		x						x												x			x						x		x	x					x	x										1600

	ENC #	Teeter Plate and Tensioner	Modine Fan Fuse Holder	Modine Fan Cables Relocation	Modine Program	Engine Oil Filler Cap Leak	Fuel Sender Pin	Remove 500 k Jumper	2 pc exhaust panel	Clean Insulation/ Low Disc	Jump Start P-Clamp	Fuel Fill Box Decals	CB Set To 16v and 32v	Shark Fin Antenna	Front and Rear Door ReWork	Ventura Door Module	APC Fastner	APC Jumper	Adjust Stop Request Sensitivity	Verify Stop Request Gasket	Steering column Cover	Steering column connection	Steering Angle	Rubber Mic Holder	Remove Hazard Switch Extension	Adjust Camera Angles	Low Voltage Ignition switch Diode	J-Box Electrical Cover	PA Re-Route	Hanover Call Police Harness	ADA Barriers	Rear seat prop rod	Window Latch (no screw)	Exterior Door Switch Label	MCC Labels	MCC Sim Card #	Ground Bar	Engraved tank labels	Hydrolic test port	Drag Link adjustment	Kneeling Switch Bracket	Coolant Pipe Insulation	4 Ply Hoses	Coolant By-Pass	Brake Wear Indicator	Suspension Re-Torque	Drainage Holes	Frame Cracks/ Welds	
1301	46+05		x						x												x			x						x		x	x					x	x										1301
1303	46+05		x	5/21/20	5/21/20				x				5/21/20					5/21/20			x			x						x		x	x					x	x										1303
1305	46+05		x						x												x			x						x		x	x					x	x										1305
1347	46+05		x	5/27/20	5/27/20				x				5/27/20					5/27/20			x			x						x		x	x					x	x										1347
1361	46+05		x	5/15/20	5/15/20				x				5/15/20					5/15/20			x			x						x		x	x					x	x										1361
1363	46+05		x	5/28/20	5/28/20				x				5/28/20					5/28/20			x			x						x		x	x					x	x										1363
1207	46+05		x						x												x			x						x		x	x					x	x	2/1/20										1207
1209	46+05		x						x												x			x						x		x	x					x	x	2/1/20										1209
1309	46+05		x	5/13/20	5/13/20				x				5/13/20					5/13/20			x			x						x		x	x					x	x										1309
1317	46+05		x	5/12/20	5/12/20				x				5/12/20					5/12/20			x			x						x		x	x					x	x										1317
1111	46+05		x	5/13/20	5/13/20				x				5/13/20					5/13/20			x			x						x		x	x					x	x										1111
1221	46+05		x	5/29/20	5/29/20				x				5/29/20					5/29/20			x			x						x		x	x					x	x	1/20/20										1221
1313	46+05		x						x												x	x		x						x		x	x					x	x	1/20/20										1313
1341	46+05		x	5/18/20	5/18/20				x				5/18/20					5/18/20			x	x		x						x		x	x					x	x										1341
1315	46+05		x	6/1/20	6/1/20				x				6/1/20					6/1/20			x	x		x						x		x	x					x	x										1315
1325	46+05		x	5/14/20	5/14/20				x				5/14/20					5/14/20			x	x		x						x		x	x					x	x										1325
1327	46+05		x	5/13/20	5/13/20				x				5/13/20					5/13/20			x	x		x						x		x	x					x	x										1327
1347	46+05		x	5/12/20	5/12/20				x				5/12/20					5/12/20			x	x		x						x		x	x					x	x										1347
1343	46+05		x						x												x	x		x						x		x	x					x	x										1343
1061	46+05		x	5/12/20	5/12/20				x				5/12/20					5/12/20			x	x		x						x		x	x					x	x										1061
1221	46+05		x						x												x	x		x						x		x	x					x	x										1221
1223	46+05		x						x												x	x		x						x		x	x					x	x										1223
1323	46+05		x						x												x	x		x						x		x	x					x	x										1323
1427	46+05		x						x												x	x		x						x		x	x					x	x										1427
1547	46+05		x						x												x	x		x						x		x	x					x	x										1547
1363	46+05	6/9/20	6/5/20	6/5/20		6/8/20	6/5/20	6/8/20	6/5/20	6/8/20	6/8/20	6/8/20	6/8/20	6/8/20	6/9/20	6/8/20	6/5/20	6/8/20	6/5/20	6/5/20	6/5/20	6/5/20	6/5/20	6/5/20	6/5/20	6/9/20	6/8/20	6/8/20	6/8/20	6/5/20	6/5/20	6/5/20	6/5/20	6/5/20	6/5/20	6/5/20	6/9/20	6/8/20	6/8/20	6/8/20	6/8/20	6/9/20	6/9/20	6/9/20	6/9/20	6/9/20	6/9/20	6/8/20	1363
1227	46+05		x	6/10/20	6/10/20				x				6/10/20					6/10/20			x	x		x						x		x	x					x	x										1227
1324	46+05		x						x												x	x		x						x		x	x					x	x										1324

	ENC #	Teeter Plate and Tensioner	Modine Fan Fuse Holder	Modine Fan Cables Relocation	Modine Program	Engine Oil Filler Cap Leak	Fuel Sender Pin	Remove 500 k Jumper	2 pc exhaust panel	Clean Insulation/ Low Disc	Jump Start P-Clamp	Fuel Fill Box Decals	CB Set To 16v and 32v	Shark Fin Antenna	Front and Rear Door ReWork	Ventura Door Module	APC Fastner	APC Jumper	Adjust Stop Request Sensitivity	Verify Stop Request Gasket	Steering column Cover	Steering column connection	Steering Angle	Rubber Mic Holder	Remove Hazard Switch Extension	Adjust Camera Angles	Low Voltage Ignition switch Diode	J-Box Electrical Cover	PA Re-Route	Hanover Call Police Harness	ADA Barriers	Rear seat prop rod	Window Latch (no screw)	Exterior Door Switch Label	MCC Labels	MCC Sim Card #	Ground Bar	Engraved tank labels	Hydrolic test port	Drag Link adjustment	Kneeling Switch Bracket	Coolant Pipe Insulation	4 Ply Hoses	Coolant By-Pass	Brake Wear Indicator	Suspension Re-Torque	Drainage Holes	Frame Cracks/ Welds	
3336	46+05		x						x												x	x		x						x		x	x					x	x										3336
3338	46+05		x						x												x	x		x						x		x	x					x	x	1/17/20									3338
3339	46+05		x	5/28/20	5/28/20				x				5/28/20					5/28/20			x	x		x						x		x	x					x	x										3339
3342	46+05		x						x												x	x		x						x		x	x					x	x										3342
3343	46+05		x	6/3/20	6/3/20				x				6/3/20					6/3/20			x	x		x						x		x	x					x	x	1/21/20									3343
3344	46+05		x						x												x	x		x						x		x	x					x	x										3344
3345	46+05		x						x												x	x		x						x		x	x					x	x										3345
3346	46+05		x						x												x	x		x						x		x	x					x	x										3346
3347	46+05		x	5/13/20	5/13/20				x				5/13/20					5/13/20			x	x		x						x		x	x					x	x										3347
3348	46+05		x	5/26/20	5/26/20				x				5/26/20					5/26/20			x	x		x						x		x	x					x	x										3348
3349	46+05		x						x												x	x		x						x		x	x					x	x										3349
3350	46+05		x	5/21/20	5/21/20				x				5/21/20					5/21/20			x	x		x						x		x	x					x	x										3350
3351	46+05		x	5/13/20	5/13/20				x				5/13/20					5/13/20			x	x		x						x		x	x					x	x										3351
3352	46+05		x	5/13/20	5/13/20				x				5/13/20					5/13/20			x	x		x						x		x	x					x	x										3352
3353	46+05		x						x												x	x		x						x		x	x					x	x										3353
3354	46+05		x						x												x	x		x						x		x	x					x	x										3354
3355	46+05		x	5/27/20	5/27/20				x				5/27/20					5/27/20			x	x		x						x		x	x					x	x										3355
3356	46+05		x	5/15/20	5/15/20				x				5/15/20					5/15/20			x	x		x						x		x	x					x	x										3356
3357	46+05		x						x												x	x		x						x		x	x					x	x										3357
3358	46+05		x						x												x	x		x						x		x	x					x	x	2/22/20									3358
3359	46+05		x						x												x	x		x						x		x	x					x	x	2/8/20									3359
3360	46+05		x						x												x	x		x						x		x	x					x	x										3360
3361	46+05		x						x												x	x		x						x		x	x					x	x										3361
3362	46+05		x						x												x	x		x						x		x	x					x	x										3362
3363	46+05		x						x												x	x		x						x		x	x					x	x										3363
3364	46+05		x						x												x	x		x						x		x	x					x	x										3364
3365	46+05	X	x						x												x	x		x						x		x	x					x	x										3365
3366	46+05	X	x						x												x	x		x						x		x	x					x	x										3366

	ENC #	Teeter Plate and Tensioner	Modine Fan Fuse Holder	Modine Fan Cables Relocation	Modine Program	Engine Oil Filler Cap Leak	Fuel Sender Pin	Remove 500 k Jumper	2 pc exhaust panel	Clean Insulation/ Low Disc	Jump Start P-Clamp	Fuel Fill Box Decals	CB Set To 16v and 32v	Shark Fin Antenna	Front and Rear Door ReWork	Ventura Door Module	APC Fastner	APC Jumper	Adjust Stop Request Sensitivity	Verify Stop Request Gasket	Steering column Cover	Steering column connection	Steering Angle	Rubber Mic Holder	Remove Hazard Switch Extension	Adjust Camera Angles	Low Voltage Ignition switch Diode	J-Box Electrical Cover	PA Re-Route	Hanover Call Police Harness	ADA Barriers	Rear seat prop rod	Window Latch (no screw)	Exterior Door Switch Label	MCC Labels	MCC Sim Card #	Ground Bar	Engraved tank labels	Hydrolic test port	Drag Link adjustment	Kneeling Switch Bracket	Coolant Pipe Insulation	4 Ply Hoses	Coolant By-Pass	Brake Wear Indicator	Suspension Re-Torque	Drainage Holes	Frame Cracks/ Welds	
1957	46+05	X	x	5/14/20	5/14/20				x				5/14/20					5/14/20			x	x		x						x		x	x					x	x										1957
1958	46+05	X	x	5/12/20	5/12/20				x				5/12/20					5/12/20			x	x		x						x		x	x					x	x										1958
1959	46+05	X	x	5/27/20	5/27/20				x				5/27/20					5/27/20			x	x		x						x		x	x					x	x										1959
1960	46+05	X	x	5/13/20	5/13/20				x				5/13/20					5/13/20			x	x		x						x		x	x					x	x										1960
1961	46+05	X	x	5/22/20	5/22/20				x				5/22/20					5/22/20			x	x		x						x		x	x					x	x										1961
1962	46+05	X	x						x												x	x		x						x		x	x					x	x										1962
1963	46+05	X	x						x												x	x		x						x		x	x					x	x										1963
1964	46+05	X	x						x												x	x		x						x		x	x					x	x										1964
1965	46+05	X	x						x												x	x		x						x		x	x					x	x										1965
1966	46+05	X	x						x												x	x		x						x		x	x					x	x	2/22/20									1967
1967	46+05	X	x						x												x	x		x						x		x	x					x	x										1968
1968	46+05	X	x						x												x	x		x						x		x	x					x	x										1969
1969	46+05	X	x						x												x	x		x						x		x	x					x	x										1970
1970	46+05	X	x						x												x	x		x						x		x	x					x	x										1971
1971	46+05	X	x						x												x	x		x						x		x	x					x	x	2/29/20									1972
1972	46+05	X	x						x												x	x		x						x		x	x					x	x	2/22/20									1973
1973	46+05	X	x						x												x	x		x						x		x	x					x	x										1974
1974	46+05	X	x						x												x	x		x						x		x	x					x	x	2/22/20									1975
1975	46+05	X	x						x												x	x		x						x		x	x					x	x										1976
1976	46+05	X	x						x												x	x		x						x		x	x					x	x										1977
1977	46+05	X	x						x												x	x		x						x		x	x					x	x										1978
1978	46+05	X	x						x												x	x		x						x		x	x					x	x										1979
1979	46+05	X	x						x												x	x		x						x		x	x					x	x										1980
1980	46+05	X	x						x												x	x		x						x		x	x					x	x										1981
1981	46+05	X	x						x												x	x		x						x		x	x					x	x										1982
1982	46+05	X	x						x												x	x		x						x		x	x					x	x										1983
1983	46+05	X	x						x												x	x		x						x		x	x					x	x										1984
1984	46+05	X	x						x												x	x		x						x		x	x					x	x										1985

	ENC #	Teeter Plate and Tensioner	Modine Fan Fuse Holder	Modine Fan Cables Relocation	Modine Program	Engine Oil Filler Cap Leak	Fuel Sender Pin	Remove 500 k Jumper	2 pc exhaust panel	Clean Insulation/ Low Disc	Jump Start P-Clamp	Fuel Fill Box Decals	CB Set To 16v and 32v	Shark Fin Antenna	Front and Rear Door ReWork	Ventura Door Module	APC Fastner	APC Jumper	Adjust Stop Request Sensitivity	Verify Stop Request Gasket	Steering column Cover	Steering column connection	Steering Angle	Rubber Mic Holder	Remove Hazard Switch Extension	Adjust Camera Angles	Low Voltage Ignition switch Diode	J-Box Electrical Cover	PA Re-Route	Hanover Call Police Harness	ADA Barriers	Rear seat prop rod	Window Latch (no screw)	Exterior Door Switch Label	MCC Labels	MCC Sim Card #	Ground Bar	Engraved tank labels	Hydrolic test port	Drag Link adjustment	Kneeling Switch Bracket	Coolant Pipe Insulation	4 Ply Hoses	Coolant By-Pass	Brake Wear Indicator	Suspension Re-Torque	Drainage Holes	Frame Cracks/ Welds	
1395	46+05	X	x						x												x	x		x						x		x	x					x	x										1395
1396	46+05	X	x						x												x	x		x						x		x	x					x	x										1396
1397	46+05	X	x						x												x	x		x						x		x	x					x	x										1397
1398	46+05	X	x						x												x	x		x						x		x	x					x	x										1398
1399	46+05	X	x						x												x	x		x						x		x	x					x	x										1399
1390	46+05	X	x						x												x	x		x						x		x	x					x	x										1390
1391	46+05	X	x						x												x	x		x						x		x	x					x	x										1391
1392	46+05	X	x						x												x	x		x						x		x	x					x	x										1392
1393	46+05	X	x	5/14/20	5/14/20				x				5/14/20					5/14/20			x	x		x						x		x	x					x	x										1393
1394	46+05	5/18/20	5/18/20	5/19/20		5/18/20	5/18/20	5/18/20	5/18/20	5/18/20	5/18/20	5/18/20	5/19/20	5/18/20	5/19/20		5/18/20	5/19/20	5/18/20	5/18/20	5/18/20	5/18/20	5/18/20	5/18/20	5/18/20	5/18/20	5/18/20		5/18/20	5/18/20	5/18/20	5/18/20	5/18/20	5/18/20	5/18/20	5/18/20	5/19/20	5/19/20	5/19/20	5/19/20	5/19/20	5/19/20	5/19/20		5/19/20	5/19/20	5/19/20	5/19/20	1394
1395	46+05	X	x						x												x	x		x						x		x	x					x	x										1395
1396	46+05	4/6/20	4/3/20			4/3/20	4/3/20	4/3/20	4/3/20	4/3/20	4/3/20	4/3/20		4/3/20	4/6/20		4/3/20		4/6/20	4/3/20	4/3/20	4/3/20		4/3/20	4/3/20	4/3/20	4/6/20		4/6/20	4/3/20	4/3/20	4/3/20	4/3/20	4/3/20	4/3/20	4/3/20	4/3/20	4/3/20	4/3/20	4/3/20	4/3/20	4/3/20	4/3/20		4/3/20	4/3/20		4/3/20	1396
1397	46+05	7/6/20	7/6/20	7/7/20		7/6/20	7/6/20	7/6/20	7/6/20	7/8/20	7/7/20	7/8/20	7/8/20	7/7/20	7/8/20	7/8/20	7/6/20	7/8/20	7/6/20	7/6/20	7/6/20	7/6/20	7/8/20	7/6/20	7/6/20	7/7/20	7/6/20	7/8/20	7/6/20	7/9/20	7/6/20	7/6/20	7/6/20	7/6/20	7/6/20	7/6/20	7/7/20	7/7/20	7/7/20	7/7/20	7/7/20	7/7/20	7/7/20	7/7/20	7/7/20	7/7/20	7/7/20	7/7/20	1397
1398	46+05	X	x						x												x	x		x						x		x	x					x	x										1398
1399	46+05	X	x						x												x	x		x						x		x	x					x	x										1399

LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY

CONTRACT NO. OP28367-000, CONTRACT MODIFICATION NO.: 19
(ATTACHMENT D – RELEASE AGREEMENT)

FOR: FORTY FOOT (40') LOW FLOOR CNG TRANSIT BUSES

This Contract Modification No. 19 to Contract No.: OP28367-000 is made effective on the 26th day of October 2020 by and between the LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY, hereinafter referred to as "MTA", and EL DORADO NATIONAL (CALIFORNIA), INC., hereinafter referred to as "CONTRACTOR".

WHEREAS, CONTRACTOR and MTA entered into Contract No.: OP28367-000 effective August 15, 2017, as amended by Contract Modification No. 1, dated November 6, 2017, Contract Modification No. 2, dated December 6, 2017, Contract Modification No. 3 dated December 27, 2017, Contract Modification No. 4 dated January 19, 2018, Contract Modification No. 5 dated February 12, 2018, Contract Modification No. 6 dated April 23, 2018, Contract Modification No. 7 dated October 3, 2018, Contract Modification No. 8 dated October 26, 2018, Contract Modification No. 9 dated November 5, 2018, Contract Modification No. 10 dated January 9, 2019, Contract Modification No. 11 dated January 15, 2019, Contract Modification No. 12 dated January 17, 2019, Contract Modification No. 13 dated February 8, 2019, Contract Modification No. 14 dated November 19, 2019, Contract Modification No. 15 dated February 21, 2020, Contract Modification No. 16, dated July 8, 2020, Contract Modification No. 17, dated July 9, 2020, and Contract Modification No. 18, dated August 4, 2020 (the "Existing Contract") and;

WHEREAS, CONTRACTOR and MTA desire to modify the Existing Contract as provided herein;

Now, therefore, it is mutually agreed, by and between the parties as follows:

Modify Contract Volume No. 1 to incorporate the enclosed **ATTACHMENT D – RELEASE AGREEMENT RE: FIRE INCIDENT OF MAY 26, 2020.**

Except as expressly amended hereby, the Existing Contract remains in full force and effect as originally executed.

IN WITNESS WHEREOF, the parties have caused this Contract Modification No. 19 to the Existing Contract to be executed by their respective officers duly authorized on the date first written above.

EL DORADO NATIONAL (CALIFORNIA), INC.

By: Richard Himes
Signature

RICHARD HIMES
Type and Print Name

11/5/2020
Date

LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY
Philip A. Washington

By: Elizabeth Hernandez
Elizabeth Hernandez
Principal Contract Administrator

11/16/20
Date

DocuSign Envelope ID: BD630E16-FC1F-408E-B288-91F737F89046

RELEASE AGREEMENT

This Release Agreement (the "Release Agreement") is effective as of the date of the last signature below (the "Effective Date"), between: Los Angeles County Metropolitan Transportation Authority ("LACMTA"), with offices located at One Gateway Plaza, Los Angeles, CA 90012; MV Transportation, Inc.("MV"), with offices located at 2711 N. Haskell Avenue, Suite 1500, Dallas, TX, 75204; and El Dorado National (California), Inc. ("ENC") with offices located at 9670 Galena Street #3809, Riverside, CA 92509, collectively known as the "Parties," for resolution of a claim arising from a fire incident that occurred on May 26, 2020, at 21222 S. Wilmington Ave., Carson, CA 90810, (the "Incident").

WHEREAS, LACMTA and ENC entered into a contract agreement, OP28367-000 (the "Contract"), pursuant to which ENC manufactured and provided various transit buses to LACMTA pursuant to the terms and conditions and as more fully set forth in the Contract;

WHEREAS, MV leased certain buses from LACMTA to operate on certain LACMTA bus routes;

WHEREAS, three (3) buses owned by LACMTA bearing the bus numbers 1565, 1568, and 1569 with VINs 1N9APA9N2KC084103, 1N9APA9N8KC084106, 1N9APA9NXKC084107 ("the Destroyed Buses"), sustained total loss damages;

WHEREAS, a building sustained damages in the Incident ("the Building Damages");

WHEREAS, the Parties desire to fully and finally settle all property damages, costs, claims, and potential claims related to the Destroyed Buses;

WHEREAS, this Release Agreement is hereby incorporated into the Contract by this reference, but in the event of any conflict between the terms of the Contract and this Release Agreement, this Release Agreement shall control;

NOW THEREFORE, in order to resolve the Incident as it relates to the Destroyed Buses, and with the intention to be legally bound, the Parties agree as follows:

1. **Replacement of the Destroyed Buses.** ENC shall provide to LACTMA at no additional cost, including the cost of any applicable taxes, three (3) buses of the same design, with the same options and features as those currently being manufactured by ENC for LACMTA ("the Optional Configuration buses") to replace the destroyed buses. The three replacement buses shall be the first three Optional Configuration buses ENC manufactures after October 31, 2020 ("the Replacement Buses"), and shall be delivered to LACMTA as soon as reasonably possible thereafter. In exchange for the mutual consideration provided in this Release Agreement, LACMTA shall transfer ownership title of the Destroyed Buses to ENC. Upon title transfer, ENC shall issue a credit invoice for the purchase price, including the cost of any applicable taxes, of the Destroyed Buses. ENC shall then issue an offsetting new invoice for the Replacement Buses in the same dollar amount as the credit invoice issued for the Destroyed Buses when the Replacement Buses are shipped. The applicable warranty on the Replacement Buses shall be pursuant to the terms and conditions as fully set forth in Special Provisions Article SP-40 of the Contract. The effective date of the Replacement Bus warranty shall begin on the first date of revenue service but no later than 15 days after acceptance.

Release Agreement on behalf of that Party. LACMTA and MV reserve their rights to pursue claim(s) against other third parties not a Party to this Release for loss of use, loss of revenue, or any other loss incurred by the ~~fire~~ Incident.

6. **No Admission of Liability.** The Parties expressly agree and acknowledge that their entering into this Release Agreement shall not be construed in any manner as an admission of any liability, or wrongdoing on the part of any Party. Each Party expressly denies any and all liability or wronging with respect to the Incident.

7. **Cooperation between the Parties.** Each Party shall fully cooperate with each other with respect to the terms of this Release Agreement. Each Party will make its best efforts to provide or make available to any other Party any information and will execute, acknowledge and deliver such further documents that may reasonably be required in order to replace the Destroyed Buses described in this Release Agreement

8. **Governing Law and Venue.** This Release Agreement will be governed by and interpreted in accordance with the laws of the State of California, without giving effect to the principles of conflicts of law of such state. The Parties hereby agree that any action arising out of this Release Agreement will be brought solely in the appropriate Superior Court of the State of California. The Parties hereby submit to the exclusive jurisdiction and venue of any such court.

9. **Binding Agreement.** This Release Agreement shall be binding upon and inure to the benefit of the successors, assigns and legal representatives of the Parties. There are no third-party beneficiaries to this Release Agreement. Each Party acknowledges and agrees that it fully understands the provisions set forth in this Release Agreement and their effect, and that each Party is voluntarily entering into this Release Agreement.

10. **Severability.** If any provision or portion of this Release Agreement shall be held by a court of competent jurisdiction to be illegal, invalid, or unenforceable, the remaining provisions or portions shall remain in full force and effect.

11. **Construction.** The headings and captions appearing in this Release Agreement have been inserted for the purposes of convenience and ready reference, and do not purport to and shall not be deemed to define, limit or extend the scope or intent of the provisions to which they appertain. This Release Agreement shall not be construed more strongly against any Party regardless of which Party is more responsible for its preparation.

12. **Counterparts.** This Release Agreement may be executed in one or more counterparts, each of which will be deemed to be an original, but all of which together will constitute one and the same instrument, without necessity of production of the others. An executed signature page delivered via facsimile transmission or electronic signature shall be deemed as effective as an original executed signature page.

13. **Notices.** All notices or other communications required under this Release Agreement shall be in writing and shall be deemed effective when received, but in no case later than five business days after sending the correspondence. All such communications shall be made by either (i) hand delivery, (ii) registered mail, (iii) certified mail, return receipt requested, (iv) overnight mail, or (v) electronic mail (email) addressed to the Party to be notified at the addresses referenced above or email address as follows: Alberto Vazquez for LACMTA, vazquezal@metro.net; Mark Collins and Marie Graul for MV, mark.collins@mvtransit.com and marie.graul@mvtransit.com; and Tony Wayne for ENC, tony.wayne@eldorado-ca.com.

14. **Waiver.** No waiver of any term or right in this Release Agreement shall be effective unless in writing, signed by an authorized representative of the waiving Party. The failure of any Party to enforce any provision of this Release Agreement shall not be construed as a waiver or modification of such provision, or impairment of the right to enforce such provision or any other provision of this Release Agreement thereafter.

15. **Entire Agreement; Modification.** This Release Agreement is the entire agreement between the Parties with respect to the Destroyed Buses and the Replacement Buses and supersedes any prior agreement or communications between the Parties, whether written, oral, electronic or otherwise. No change, modification, amendment, or addition of or to this Release Agreement shall be valid unless in writing and signed by authorized representatives of the Parties. Each Party hereto has received or had the opportunity to receive independent legal advice regarding this Release Agreement and their respective rights and obligations set forth herein. The Parties acknowledge and agree that they are not relying upon any representations or statements made by the other Party or the other Party's employees, agents, representatives, or attorneys regarding this Release Agreement, except to the extent such representations are expressly set forth herein.

***** SIGNATURE PAGE TO FOLLOW*****

IN WITNESS WHEREOF, the Parties have signed this Release Agreement.

Los Angeles County Metropolitan Transportation Authority

By: _____
Name: Alberto Vazquez
Title: Sr. Risk Analyst
Date: 9/18/2020

MV Transportation, Inc.

By: _____
Name: Mark Collins
Title: President, Chief Operating Officer
Date:

MV Transportation, Inc.

By: _____
Name: Marie Graul
Title: Chief Financial Officer
Date:

El Dorado National (California), Inc.

By: _____
Name: Tony Wayne
Title: Vice President/General Manager
Date:

IN WITNESS WHEREOF, the Parties have signed this Release Agreement.

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By: _____
Name: Alberto Vazquez
Title: Sr. Risk Analyst
Date:

MV Transportation, Inc.

DocuSigned by:
Mark Collins
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By: _____
Name: Mark Collins
Title: President, Chief Operating Officer
Date: 9/21/2020

MV Transportation, Inc.

DocuSigned by:
Marie Meisenbach Graul
CC90F4517A6F42E...

By: _____
Name: Marie Graul
Title: Chief Financial Officer
Date: 9/22/2020

El Dorado National (California), Inc.

By: _____
Name: Tony Wayne
Title: Vice President/General Manager
Date: 9/22/2020

LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY

CONTRACT NO. OP28367-000, CONTRACT MODIFICATION NO.: 20

FOR: FORTY FOOT (40') LOW FLOOR CNG TRANSIT BUSES

This Contract Modification No. 20 to Contract No.: OP28367-000 is made effective on the 1st day of June 2021 by and between the LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY, hereinafter referred to as "MTA", and EL DORADO NATIONAL (CALIFORNIA), INC., hereinafter referred to as "CONTRACTOR".

WHEREAS, CONTRACTOR and MTA entered into Contract No.: OP28367-000 effective August 15, 2017, as amended by Contract Modification No. 1, dated November 6, 2017, Contract Modification No. 2, dated December 6, 2017, Contract Modification No. 3 dated December 27, 2017, Contract Modification No. 4 dated January 19, 2018, Contract Modification No. 5 dated February 12, 2018, Contract Modification No. 6 dated April 23, 2018, Contract Modification No. 7 dated October 3, 2018, Contract Modification No. 8 dated October 26, 2018, Contract Modification No. 9 dated November 5, 2018, Contract Modification No. 10 dated January 9, 2019, Contract Modification No. 11 dated January 15, 2019, Contract Modification No. 12 dated January 17, 2019, Contract Modification No. 13 dated February 8, 2019, Contract Modification No. 14 dated November 19, 2019, Contract Modification No. 15 dated February 21, 2020, Contract Modification No. 16, dated July 8, 2020, Contract Modification No. 17, dated July 9, 2020,Contract Modification No. 18, dated August 4, 2020, and Contract Modification No. 19, dated October 26, 2020 (the "Existing Contract") and;

WHEREAS, CONTRACTOR and MTA desire to modify the Existing Contract as provided herein;

Now, therefore, it is mutually agreed, by and between the parties, that the following articles of the Contract are modified as follows: (deletions are shown as bold ~~**blue strikeout**~~; added language indicated as **bold red** font)

1.Increase the total Contract Price to incorporate a Merv13 filter into the Base Buy ($84,821) and Option Buy ($73,665) Buses in an amount not to exceed $158,680.

ARTICLE IV: COMPENSATION is hereby amended as follows:

A. Contract Price

1. Base Buy Order (295 buses)

   In consideration of the Contractor's full performance of the Work, and in accordance with the terms of the Contract, Metro will pay the Contractor the Contract Price of **$199,408,991.00** ~~**$199,324,170.00**~~, inclusive of tax and delivery as provided in this Article and in the Contract Document entitled Compensation and Payment.

2. Option Buy (259 Buses)

Contract Option for 259 bus order is hereby exercised unilaterally by LACMTA in accordance with Special Provisions Article AP-2, Options.

In consideration of the Contractor's full performance of the Work for Contract Option Buy, and in accordance with the terms of the Contract, LACMTA will pay the Contractor the Contract Price of **$185,099,811.00** ~~$185,026,146.00~~ ,inclusive of tax and delivery as provided in this article and in the Contract Document entitled Compensation and Payment Provisions.

2. FORM PF – 1 CONTRACT PRICE SUMMARY (Second BAFO) Base Buy is hereby amended as follows:

1.0 CONTRACT FOR 295 BUSES (BASE BUY)					
No.	Qty.	Description of Item	Taxable Unit Price	Unit Price	Total Price
1	229	40' Low Floor CNG Buses (Base Buy) from PI Values derived from PF-1A*:	$596,199.46	$615,939.30	$141,050,100
	66	1 40' Low Floor CNG Buses (Base Buy) from PF-1A	$595,805.53	$615,545.53	$40,626,005
1a	Lot	Manuals (Base Buy) (TS 5.6.4)	$2,281.50	Lump Sum	$23,400.00
1b	295	Vehicle Delivery Charge for Base Buy Value of all taxable delivery charges per bus**:		$275.00	$81,125.00
1c	229	Tax (Base Buy Production Bus 67 - 295)	9.75%	$58,129.45	$13,313,925
1d	66	Tax (Base Buy Production Bus 1-66)	9.75%	$58,091.04	$3,834,009
1e	**295**	**MERV 13 Retrofit Kits (Mod 20)**		**$ 262.58**	**$77,461.87**
	295	**MERV 13 Retrofit Kits Tax (Mod 20)**	**9.50%**	**$ 24.95**	**$7,358.88**
2	2	Pilot Buses Retrofit with Rear Axle Upgrade		$8,600	$17,201
2a		Tax	9.75%	$838.55	$1,677
7	Lot	Performance Bond (Base Buy)		Lump Sum	$119,336.00
8	1,000	Total Training Hours for Base Buy***		$175,000.00	
8a	900	Contractor (Proposer/Prime) Base Buy		$175.00	$157,500.00
8b	100	Subcontractor/Supplier Base Buy		$175.00	$17,500.00
9	1	System Management Tool for use at up to (13) MTA Operating Divisions per TS 86.1		$74,930.00	$74,930.00
10a	15	Special Towing Equipment (TS 25)		$386.00	$5,790.00
10b		Tax	9.75%	$37.64	$564.53
11a	2	Rear Recovery Devices/Tie Downs (TS 25)		$505.00	$1,010.00
11b		Tax	9.75%	$49.24	$98.48
1.0 Total Price for CONTRACT for 295 Base Buy Buses (Sum of Items "1" through "11b") to be the BASIS for Price Proposal evaluation					
In U.S. Dollars Using Words:		ONE HUNDRED NINETY - NINE MILLION FOUR HUNDRED AND EIGHT THOUSAND NINE HUNDRED NINTY- ONE DOLLARS ~~ONE HUNDRED NINETY NINE MILLION THREE HUNDRED TWENTY FOUR THOUSAND ONE HUNDRED SEVENTY DOLLARS~~			
					~~$199,324,170~~
			In U.S. Dollars Using Figures:		$199,408,991

3. **FORM PF – 1 CONTRACT PRICE SUMMARY (Second BAFO) Option Bus Buy is hereby amended as follows:**

2.0 CONTRACT FOR 259 BUSES (OPTION BUY)					
No.	Qty.	Description of Item		Taxable Unit Price	Unit Price	Total Price
10	16	40' Low Floor CNG Buses (Option Buy) for 16 vehicles*		$633,583.00	$653,323.00	$ 10,453,168.00
	243	40' Low Floor CNG Buses (Option Buy) for 243 vehicles*		$633,205.00	$652,945.00	$ 158,665,635.00
10a	Lot	Manuals (Option Buy) (TS 5.6.4)***		$ -	$ -	$ 23,400.00
10b	259	Vehicle Delivery Charge for Option Buy	Value of all taxable delivery charges per bus**:		$ 275.00	$ 71,225.00
10c	16	Tax (Bus Option Buy)		9.50%	$ 60,190.39	$ 963,046.16
	243	Tax (Bus Option Buy)		9.50%	$ 60,154.48	$ 14,617,537.43
10d	196	MERV 13 Retrofit Kits (Mod 20)			$ 262.58	$ 51,466.19
	63	MERV 13 In-production (Mod 20)			$ 250.92	$ 15,807.87
10e	196	MERV 13 Retrofit Kits Tax (Mod 20)		9.50%	$ 24.95	$ 4,889.29
	63	MERV 13 Kits In-production Tax (Mod 20)		9.50%	$ 23.84	$ 1,501.75
11a	295	Base Buy Bus Order Securement Retrofit			$ 410.85	$ 121,200.75
11b	295	Base Buy Order Securement Retrofit Tax		9.50%	$ -	$ -
12	Lot	Performance Bond for Option Buy***			Lump Sum	$ 110,934.00
2.0 Total Price for CONTRACT for 150 Up to 305 Option Buy Buses (Sum of Items "10" through "14") to be the BASIS for Price Proposal evaluation						
In U.S. Dollars Using Words:			ONE-HUNDRED EIGHTY FIVE MILLION NINTY- NINE THOUSAND EIGHT HUNDRED ELEVEN DOLLARS ~~ONE-HUNDRED EIGHTY FIVE MILLION TWENTY SIX THOUSAND ONE HUNDRED FORTY SIX DOLLARS~~			
						~~$185,026,146.00~~
					In U.S. Dollars Using Figures:	$ 185,099,811.00

4. **TECHNICAL SPECIFICATIONS – VOLUME II is hereby amended as follows:**

TS 57 Air Filtration

Air shall be filtered before discharge into the passenger compartment. ~~The filter shall meet the ANSI/ASHRAE 52.2 requirement for five percent or better atmospheric dust spot efficiency, 50 percent weight arrestance, and a minimum dust holding capacity of 120 g per 1000 cfm cell.~~ Air filters shall be easily removable for service.

~~More efficient air filtration may be provided to maintain efficient heater and/or evaporator operation~~. **Minimum Efficiency Reporting Value (MERV) 13 filtration shall be provided for the passenger compartment.** Moisture drains from air intake openings shall be located so that they will not be subject to clogging from road dirt.

5. **COMPENSATON AND PAYMENT PROVISIONS, CP-02, ARTICLE E.4.D.1 is hereby amended as follows:**

CP-02 MILESTONE PAYMENTS

D. Milestone Payment for Production Vehicles (This payment shall

NOT apply to the Pilot Vehicle or First Article Vehicle.)

1. **<u>For 40' and 60' CNG Buses</u> - ~~Ninety percent (90%) of the Total Price of each production Vehicle including Option Vehicles will be paid within 30 days after acceptance of each Vehicle.~~ Fifty percent (50%) of the Total Price of each Vehicle will be paid upon completion of Line 5.**

   Forty- eight percent (48%) upon delivery to LACMTA's CMF and acceptance by LACMTA, within 30 days.

   Two percent (2%) of Vehicle invoice price will be held until vehicle has completed three (3) months or 10,000 miles of revenue service, whichever occurs first. Additionally, the vehicle must have all Vendor Failure Notices (VFN's) closed prior to the holdback payment. Regardless of status, LACMTA will pay any remaining holdback balance due to ENC within a period of six (6) months from the date of acceptance and/or in-service date, whichever occurs first.

   Note: Milestone Payments for Production Vehicles including the 2% retention will only apply to remaining Option Buses shipped beginning June 1, 2021.

IN WITNESS WHEREOF, the parties have caused this Contract Modification No. 20 to the Existing Contract to be executed by their respective officers duly authorized on the date first written above

EL DORADO NATIONAL (CALIFORNIA), INC.

By: _____
Signature

JASON MOORE
VP AND GM
Type and Print Name

06/23/21
Date

LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY
Philip A. Washington
Chief Executive Officer

By: _____
Joe Marzano
Director, Contract Administration

6/24/21
Date

City of Gardena

Gardena City Council Meeting
AGENDA REPORT SUMMARY

Agenda Item No. 18.A
Section: COUNCIL ITEMS
Meeting Date: July 26, 2022

TO: THE HONORABLE MAYOR AND MEMBERS OF THE GARDENA CITY COUNCIL

AGENDA TITLE: Discussion Regarding the Issuance of Cell Phones to Elected Officials

COUNCIL ACTION REQUIRED:
Discuss issuing cell phones to Elected Officials and provide staff direction regarding a Cell Phone Policy

RECOMMENDATION AND STAFF SUMMARY:
At the July 12, 2022 Council Meeting, Councilmember Wanda Love issued a directive, seconded by Councilmember Paulette Francis, to agendize a discussion regarding the issuance of cell phones to Elected Officials.

The recommendation is for Council to provide staff with direction as to whether or not Council would like to approve issuing cell phones for Elected Officials and if staff is to prepare and present a cell phone policy.

FINANCIAL IMPACT/COST:
The estimated City cost to provide cell phones to Elected Officials is $4,200 annually, for seven (7) Elected Officials.
The estimated plan breakdown is $50 per month per phone, which covers unlimited national calls.

ATTACHMENTS:

APPROVED:

_____
Clint Osorio, City Manager