Appendix 4.13-2: Local Transportation Assessment

Normandie Crossing Specific Plan

Local Transportation Assessment

Prepared for:
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FEHR PEERS

Table of Contents

List of Figures

List of Tables

Appendices

1. Introduction

This report presents the results of the non-CEQA Local Transportation Assessment (LTA) conducted by Fehr & Peers for the proposed Normandie Crossing Specific Plan ("Project") in the City of Gardena. The analysis identifies the effects of the proposed project on the surrounding transportation system. This LTA was conducted in accordance with the requirements of the City of Gardena's Senate Bill 743 Implementation Transportation Analysis Updates. While CEQA requirements have changed and level of service (LOS) no longer constitutes CEQA impacts, an LTA may inform decision makers on the overall effects of a project.

1.1 Project Description

The proposed Project is located at 16829, 16835, and 16907 Normandie Avenue, bound by Normandie Avenue to the east, 170th Street to the south, Brighton Way (alleyway) to the west, and 169th Street to the north. The Project will replace 106,100 square feet (sf) of active warehousing uses with 75 low-rise townhomes and 328 dwelling units within a single 7-story mid-rise apartment building. Access to the Project Site will be provided by the following four driveways:

- Driveway 1 serves the apartment building's parking garage from 169th Street, west of Normandie Avenue.
- Driveway 2 is a right-in/right-out only driveway that also serves the apartment building's parking garage from southbound Normandie Avenue. The Project will install a 125-foot median along Normandie Avenue surrounding the Union Pacific railroad tracks (north and south of the tracks) to prevent left-turns into and out of the Project from Normandie Avenue.
- Driveway 3 serves the townhomes from 170th Street.
- Driveway 4 also serves the townhomes from 169th Street.

Internal roadways link Driveways 3 and 4 to all townhomes, but do not connect to the apartment building garage. The Project will provide 399 parking spaces within an enclosed garage on the first two levels of the apartment building and 150 attached garage parking spaces, with 10 guest parking spaces for the townhomes. **Figure 1** shows the Project site plan.

1.2 Organization of the Report

This report is divided into five chapters, including this introduction. Chapter 2 presents the existing setting in which the Project is located. Chapter 3 presents the intersection operations analysis. Chapter 4 provides a residential street segment analysis. Chapter 5 summarizes the results of the study.

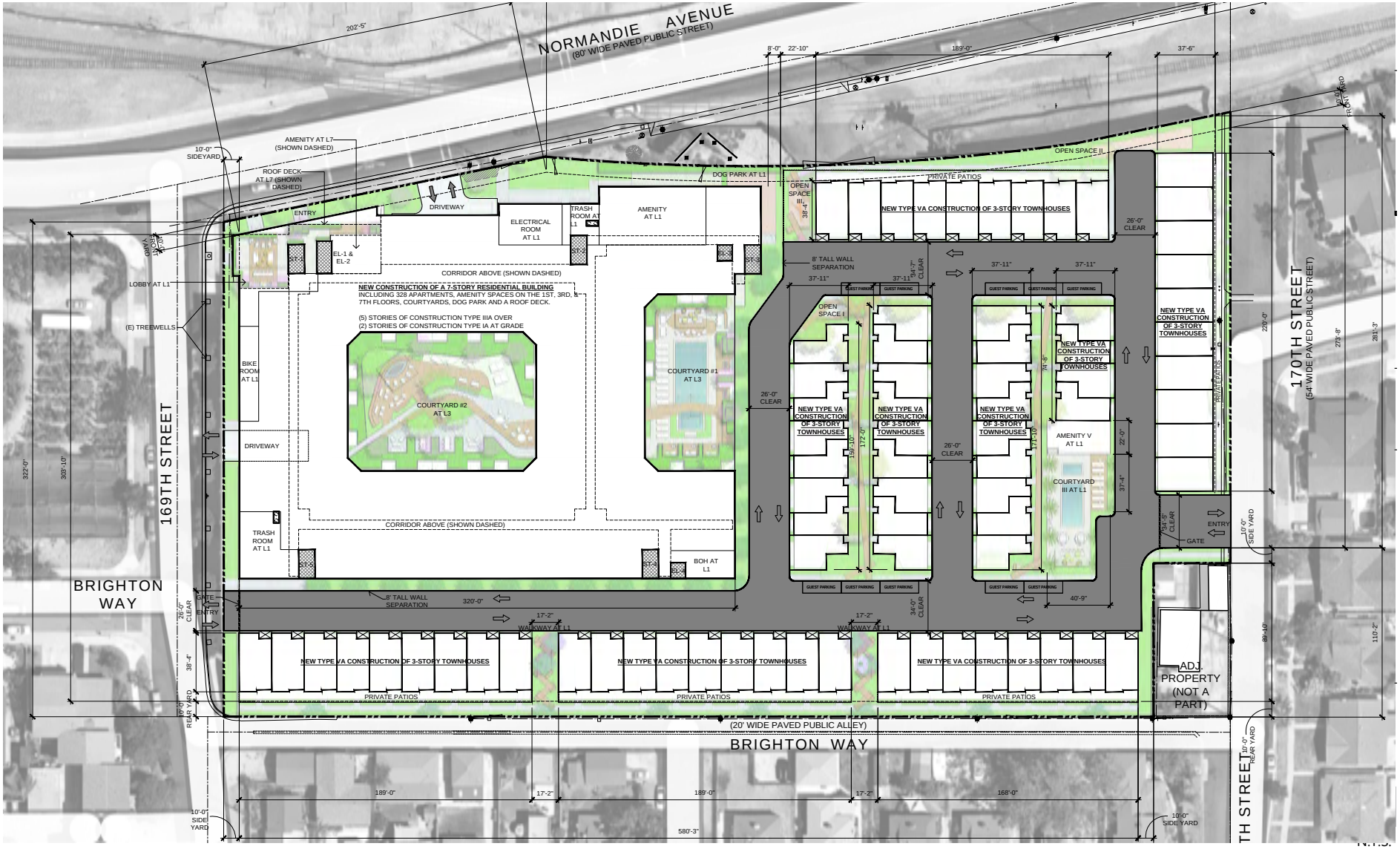


Figure 1

Project Site Plan
Normandie Apartments Project

CONCEPTUAL - NOT FOR CONSTRUCTION.

2. Existing Setting

This chapter describes the existing setting for transportation, including a discussion of existing roadways, bicycle and pedestrian facilities, transit service, and roadway safety conditions. The transportation system serving this area is a complex, built-out, multimodal network designed to carry both people and goods, consisting of roadways, bicycle facilities, sidewalks, and public transit (via bus). The roadway and sidewalk network in the vicinity of the Project site is generally well-developed and complete.

2.1 Existing Roadway Facilities

The street network in Gardena is primarily gridded with good connectivity. Arterial streets in the study area generally provide two to three vehicle travel lanes in each direction, with left-turn pockets at most signalized intersections and right-turn pockets at some intersections. Posted travel speeds in the study area range from 25 to 45 miles per hour (mph). As described in detail below and illustrated in **Figure 2**, regional access to the Project site is provided by Normandie Avenue and a network of arterial and collector streets. The arterial street network that serves the proposed project area includes Artesia Boulevard. The collector streets include Normandie Avenue, Gardena Boulevard, and 166th Street. The local streets include 169th Street and 170th Street. The following describes the key roadway facilities that serve the project site:

- Normandie Avenue – Normandie Avenue is a north/south Major Collector with two lanes in each direction that runs through the City of Gardena. Normandie Avenue is designated as a truck route within the City of Gardena. Left-turn lanes are provided at major intersections. The posted speed limit is 35 mph. On-street parking is prohibited on both sides of the street. The Union Pacific Torrance Branch right-of-way (ROW) crosses Normandie Avenue and runs along the eastern frontage of the Project Site.

- Artesia Boulevard – Artesia Boulevard is an east/west Arterial with three to four lanes in each direction that is under local jurisdiction. Artesia Boulevard transitions into SR-91 (Gardena Freeway) east of Vermont Avenue under Caltrans jurisdiction. Artesia Boulevard contains a raised median and the posted speed limit is 45 mph. There are left-turn pockets at all intersections. On-street parking is prohibited on both sides of Artesia Boulevard.

- Gardena Boulevard – Gardena Boulevard is an east-west Collector that runs through Gardena with a short jog at Normandie Avenue. Gardena Boulevard has one lane in each direction and a posted speed of 30 mph east of Normandie Avenue and 25 mph west of Normandie Avenue. On- street parking is permitted on both sides of the street, with angled parking provided east of Normandie Avenue.

- 166th Street – 166th Street is an east-west street that runs from Gramercy Place in Torrance to Berendo Avenue in Gardena. 166th Street is a local street except for the segment between Western

Avenue and Normandie Avenue, where it is a Collector. On- street parking is permitted on both sides of the street, and the posted speed limit is 30 mph west of Normandie Avenue and 25 mph east of Normandie Avenue. A raised median is provided east of Normandie Avenue that contains the right of way and double tracks for the Union Pacific Railroad Torrance Branch.

- 169th Street – 169th Street is an east/west local street that runs from Denker Avenue to Normandie Avenue with one lane in each direction. On-street parking is generally provided on both sides of 169th Street.
- 170th Street – 170th Street is an east/west local street that runs from Denker Avenue to Normandie Avenue where it dead ends and Normandie Avenue to Vermont Avenue with one lane in each direction. 170th Street west of Normandie Avenue does not connect to Normandie Avenue or the segment east of it. On-street parking is generally provided on both sides of 170th Street and the posted speed limit is 25 mph.
- Brighton Way – Brighton Way is a north/south alleyway that runs from 169th Street to 170th street with a shared lane for each direction. On-street parking is not provided.

2.2 Existing Pedestrian and Bicycle Facilities

Existing sidewalks are provided along the project frontage and within a continuous and complete pedestrian network in the surrounding area. Sidewalks along the south side of 169th Street are discontinuous for a short segment from just west of the project site to Halldale Avenue. Sidewalks are also not present on Brighton Way, which is a public alleyway. Marked crosswalks, curb ramps, and pedestrian signals are provided at the nearest signalized intersections along Normandie Avenue at 166th Street and 170th Street, which provides direct access to bus transit stops and surrounding land uses.

Separated or protected bicycle facilities are not currently provided along Normandie Avenue along the project site. According to the South Bay Bicycle Master Plan,[1] Normandie Avenue is designated as a bike route (Class III) from 182nd Street to 170th Street. Additionally, 166th Street, 170th Street and Gardena Boulevard are designated as bike routes (Class III), but not on segments directly adjacent to the project site.

The following future Bicycle Friendly Street segment is proposed in the South Bay Bicycle Master Plan as a prioritized project in Gardena that is directly adjacent to the project site and may be implemented by the City in the future:

- 170th Street from Denker Avenue to Vermont Avenue (0.8 miles)

[1] Alta Planning + Design, South Bay Bicycle Master Plan prepared for Los Angeles County Bicycle Coalition and South Bay Bicycle Coalition, available at https://southbaybicyclecoalition.org/sbbcplus-master-plan/.

2.3 Existing Public Transit Facilities

The project site is located within a ¼-mile of various bus stops and is served by transit service via the City of Gardena's Transit Service, GTrans. The Project is also located approximately 0.9 miles from the Harbor Gateway Transit Center. The following bus routes provide service within a ¼-mile walking distance of the project site:

- **Route 1X (GTrans)**: Connects the LA Metro C Line Redondo Beach Station and the City of Gardena to Downtown Los Angeles. This line runs express service between Rosecrans Avenue and Downtown Los Angeles. Bus stops within a ¼ mile include: 166th Street and Brighton Avenue (eastbound and westbound).
- **Route 4 (GTrans)**: Connects the Harbor Gateway Transit Center to various destinations in Gardena and Hawthorne via Normandie Avenue, 135th Street, Van Ness Avenue, and Marine Avenue. Bus stops within a ¼-mile include: Normandie Avenue and 170th Street (southbound and northbound). Service on this line was discontinued due to the COVID-19 Pandemic and it is not known at this time whether service would be restarted.

3. Intersection Operations Analysis

3.1 Traffic Analysis Methodology

3.1.1 Intersections

The analysis of roadway operations performed for this study is based on procedures presented in the *Highway Capacity Manual 6th Edition* (HCM 6), published by the Transportation Research Board in 2016. The operations of roadway facilities are described with the term level-of-service (LOS). LOS is a qualitative description of traffic flow based on such factors as speed, travel time, delay, and freedom to maneuver. Six levels are defined from LOS A, which is the least congested operating conditions, to LOS F, which is the most congested operating conditions. LOS E represents "at-capacity" operations. Operations are designated as LOS F when volumes exceed capacity, resulting in stop-and-go conditions. The methodologies for signalized and unsignalized intersections are described below. The City of Gardena no longer has CEQA significant impact thresholds according to intersection LOS in accordance with state law.

The method described in Chapter 19 of HCM 6 was used to prepare the LOS calculations for the signalized and unsignalized study intersections. This LOS method analyzes a signalized intersection's operation based on average control delay per vehicle. Control delay alone is used to characterize LOS for the entire intersection or an approach. Control delay includes the initial deceleration delay, queue move-up time, stopped delay, and final acceleration delay. The average control delay for intersections was calculated using the Synchro 11 analysis software and is correlated to a LOS designation as shown in **Table 1**. For unsignalized intersections, the control delay and LOS for the worst performing approach is used.

In addition, intersections can be evaluated by the Project's effects on queuing. Although not typically required by the City of Gardena, a turn lane queuing analysis was performed at the unsignalized intersection of Normandie Avenue and 169th Street.

3.1.2 Residential Street Segments

The analysis of residential street segments is required by the City of Gardena where projects have direct access to neighborhood residential streets. This assessment is conducted by estimating the number of project trips expected to travel on studied street segments on a daily basis and during the AM and PM peak hours. This assessment will allow the City to consider the need (if any) for relevant traffic calming projects.

3.2 Intersection Analysis Scenarios

The operations for the study intersections were evaluated during the weekday AM and PM peak hours for the following scenarios:

- Existing (2022) Conditions – The analysis of existing traffic conditions was based on 2022 intersection traffic counts collected while local schools were in session. Existing conditions are assumed to include the current warehouse use occupying the site. This analysis is intended to provide a basis for the remainder of the study. It also assumes that traffic levels around the Los Angeles region that were affected by the COVID-19 Pandemic have stabilized in 2022 since schools have resumed in-person instruction and remaining restrictions have been lifted.

- Opening Year (2027) No Project Conditions – Future traffic volumes for the anticipated opening year of the project were projected by increasing the Existing (2022) traffic volumes using an annual growth factor of one percent per year to account for ambient growth in the area, as well as the inclusion of traffic from specific related development projects. This scenario does not include any project-generated traffic.

- Opening Year (2027) Plus Project Conditions – Traffic projections from Opening Year (2027) No Project Conditions plus the addition of project-generated traffic.

3.2.1 Analysis Criteria

The analysis of future conditions compares the "no project" condition against conditions that include project-generated traffic assuming full build-out and occupancy. This approach determines whether the addition of project traffic is expected to worsen delay beyond the City's non-CEQA LOS requirements on local roadways. The City of Gardena's non-CEQA analysis criteria for signalized intersections is as follows:

- To the extent feasible, maintain traffic flows at non-residential, signalized intersections at LOS E during peak rush hours.
- To the extent feasible, maintain traffic flows at residential signalized intersections at LOS D during peak rush hours.

The City of Gardena does not have established criteria to evaluate unacceptable levels of traffic on residential street segments. Also, the City requires that projects be reviewed for potential conflicts with plans and policies related to active transportation modes (walking, biking, transit).

TABLE 1
HCM LEVEL OF SERVICE DEFINITIONS

LOS	Definition	Signalized Delay (Seconds)	Unsignalized Delay (Seconds)
A	Operations with very low delay occurring with favorable progression and/or short cycle length.	≤ 10.0	≤ 10.0
B	Operations with low delay occurring with good progression and/or short cycle lengths.	> 10.0 to 20.0	>10.0 to 15.0
C	Operations with average delays resulting from fair progression and/or longer cycle lengths. Individual cycle failures begin to appear.	> 20.0 to 35.0	>15.0 to 25.0
D	Operations with longer delays due to a combination of unfavorable progression, long cycle lengths, or high V/C ratios. Many vehicles stop and individual cycle failures are noticeable.	> 35.0 to 55.0	>25.0 to 35.0
E	Operations with high delay values indicating poor progression, long cycle lengths, and high V/C ratios. Individual cycle failures are frequent occurrences.	> 55.0 to 80.0	>35.0 to 50.0
F	Operation with delays unacceptable to most drivers occurring due to over saturation, poor progression, or very long cycle lengths.	> 80.0	>50.0

Source: Highway Capacity Manual (Transportation Research Board, 2016).

3.3 Study Locations

The scope and selection of study intersections and residential street segments was developed in conjunction with City staff and documented in the LTA Scoping Memorandum, dated February 7, 2022. Five (5) study intersections and two (2) residential street segments were selected to be analyzed, as shown in **Table 2** and illustrated in **Figure 2**. All study intersections except the intersection of Normandie Avenue and 170th Street are considered non-residential signalized intersections. The LTA Scoping Memorandum can be found in **Appendix A**.

3.3.1 Freeway Ramp & Intersection Queueing at State Facilities

As detailed below in section 3.7, based on the Project's estimates trip generation and distribution, few trips are expected at the I-405 off-ramps to Normandie/190th or the I-110 off-ramps to Redondo Beach Boulevard (<25 peak hour trips at each location). Therefore, the Project is not expected to add two or more car lengths to these off-ramp queues during peak hours, exacerbate potentially unsafe ramp conditions at these locations (if such conditions exist or are projected to occur in the opening year of the Project), and analysis is not needed. At the intersection of SR-91 and Vermont Avenue, Project traffic is expected to primarily be eastbound and westbound through movements since primary Project access is from Normandie Avenue, where most turning movements would occur. As such, the Project is not expected to add substantial traffic to any left or right-turning movements at the intersection of SR-91 and Vermont Avenue, and the Project is not expected to materially affect the utilization of turn pocket storage that would lead to an impedance of through traffic. Therefore, no further analysis is needed related to queueing at these locations.

3.3.2 Pedestrian & Bicycle Volumes at State Facilities

As detailed below in section 3.7, 5% of the Project's net new trips are expected to be walking or biking in nature, which may also include a subsequent trip on transit. This amounts to less than 10 trips during either peak hour in total. Most of these non-transit biking and walking trips are expected to be local in nature, accessing nearby schools and businesses within 0.5 miles of the Project Site. Substantial bicycle and pedestrian trips generated by the Project are not expected to occur at the SR-91 and Vermont Avenue, I-405 off-ramps at Normandie/190th, or I-110 off-ramps at Redondo Beach Boulevard intersections given how far away they are from the Project Site. SR-91 and Vermont Avenue is located 0.8 miles from the Project Site, while the other two intersections are located over one mile from the Project Site. Because these locations are outside of the Project Study Area, Multi-Modal Conflict Analyses and/or Complete Street Access considerations should not be necessary.

3.4 Traffic Counts and Field Observations

Intersection turning movement and street segment counts were collected in March 2022, while local schools were in session. Counts were collected during the AM and PM peak periods of 7-9 AM and 4-6 PM, respectively. Although the COVID-19 Pandemic resulted in both temporary and permanent shifts in traffic patterns, pandemic-related restrictions that could affect travel have largely expired and/or stabilized in 2022. Therefore, these newly collected traffic counts represent conditions that are as realistic and typical as possible. Traffic counts can be found in **Appendix B**.

Field observations were conducted at study locations in March 2022 at the same time counts were collected.

TABLE 2
LIST OF STUDY INTERSECTIONS AND STREET SEGMENTS

ID	North/South Street	East/West Street	Jurisdiction
1	Normandie Avenue	Gardena Boulevard	Gardena
2	Normandie Avenue	166th Street	Gardena
3	Normandie Avenue	169th Street	Gardena
4	Normandie Avenue	170th Street	Gardena
5	Normandie Avenue	Artesia Boulevard	Gardena

ID	Segment	Jurisdiction
1	169th Street west of Brighton Avenue	Gardena
2	170th Street west of Brighton Avenue	Gardena

Project Site
Study Intersections
Study Segments
Cities

Figure 2

Study Intersections and Study Segments
Normandie Apartments Project

3.5 Existing (2022) Intersections Level of Service

Existing lane configurations and signal controls were obtained through field observations and Google Street View imagery. They can be found in **Appendix C**.

The results of the existing LOS analysis are presented in **Table 3**. Corresponding LOS calculation sheets are included in **Appendix D**. The results of the LOS calculations indicate that all study intersections operate at LOS D or better during the weekday AM and PM peak hours.

TABLE 3
EXISTING (2022) CONDITIONS INTERSECTION LEVELS OF SERVICE

NO.	INTERSECTION	CONTROL TYPE	PEAK HOUR	EXISTING	
				DELAY (S)	LOS
1	Normandie Av & Gardena Bl	Signalized	AM	8.2	A
			PM	7.0	A
2	Normandie Av & 166th St	Signalized	AM	10.3	B
			PM	10.6	B
3	Normandie Av & 169th St	TWSC	AM	20.3	C
			PM	21.5	C
4	Normandie Av & 170th St	Signalized	AM	5.6	A
			PM	5.2	A
5	Normandie Av & Artesia Bl	Signalized	AM	40.8	D
			PM	39.3	D

[a] Intersections were analyzed using HCM methodologies per City of Gardena's *SB 743 Implementation, Transportation Analysis Updates.* LOS and delay for unsiganlized intersections were reported using the worst performing approach.

[b] TWSC=Two-Way Stop-Controlled Intersection

3.6 Opening Year (2027) Volumes and Intersections Level of Service

To evaluate the potential effects of the proposed Project on the local street system, it was necessary to develop estimates of Opening Year traffic conditions both with and without the Project. Opening Year traffic volumes without the Project are first estimated, representing the Opening Year conditions. The traffic generated by the proposed Project is then estimated and separately assigned to the surrounding street system. The sum of the Opening Year and Project-generated traffic represents Opening Year Plus Project traffic conditions.

The Opening Year traffic projections reflect changes in traffic from two primary sources: background or ambient growth in the existing traffic volumes to reflect the effects of overall regional growth both in and outside of the study area, and traffic generated by specific projects in, or in the vicinity of, the study area. These factors are described below.

3.6.1 Areawide Traffic Growth

To provide a conservative estimate, traffic volumes in the vicinity of the study area were projected to increase at a rate of about 0.4% per year to the Year 2027. With the assumed completion date of 2027, the existing 2022 traffic volumes were adjusted upward by a factor of 0.4% per year for five years to reflect areawide regional growth up to Year 2027. The growth factor was derived from the SCAG Travel Demand Model for the City of Gardena.

3.6.2 Related Projects Traffic Generation

The second major source of traffic growth in the study area is from specific cumulative development projects, also called related projects, expected to be built in the vicinity of the proposed Project Site prior to Project opening. Data describing cumulative projects in the area was developed based on information obtained from the City of Gardena. A total of 7 related projects were identified in the study area, within a mile of the project site, and are estimated to generate 169 trips during the AM peak hour and 203 trips during the PM peak hour, as summarized in **Table 4**. The application of these trips to the study intersections was made on top of the 1% ambient growth projections, for a further conservative estimate of future traffic conditions. It was assumed that all 7 related projects would be completed and occupied by the opening year of this Project. Trip generation estimates for each of the cumulative projects were developed according to ITE (11th Edition) rates. **Figure 3** displays the locations of the related projects. **Appendix C** shows the assignment of this traffic at each of the study intersections. Related projects traffic was distributed across study intersections using assumptions found in their respective transportation studies or the travel demand model.

3.6.3 Opening Year (2027) Intersections Level of Service

The results of the Opening Year (2027) LOS analysis are presented in **Table 5**. Corresponding LOS calculation sheets are included in **Appendix D**. The results of the LOS calculations indicate that all study intersections operate at LOS D or better during the weekday AM and PM peak hours.

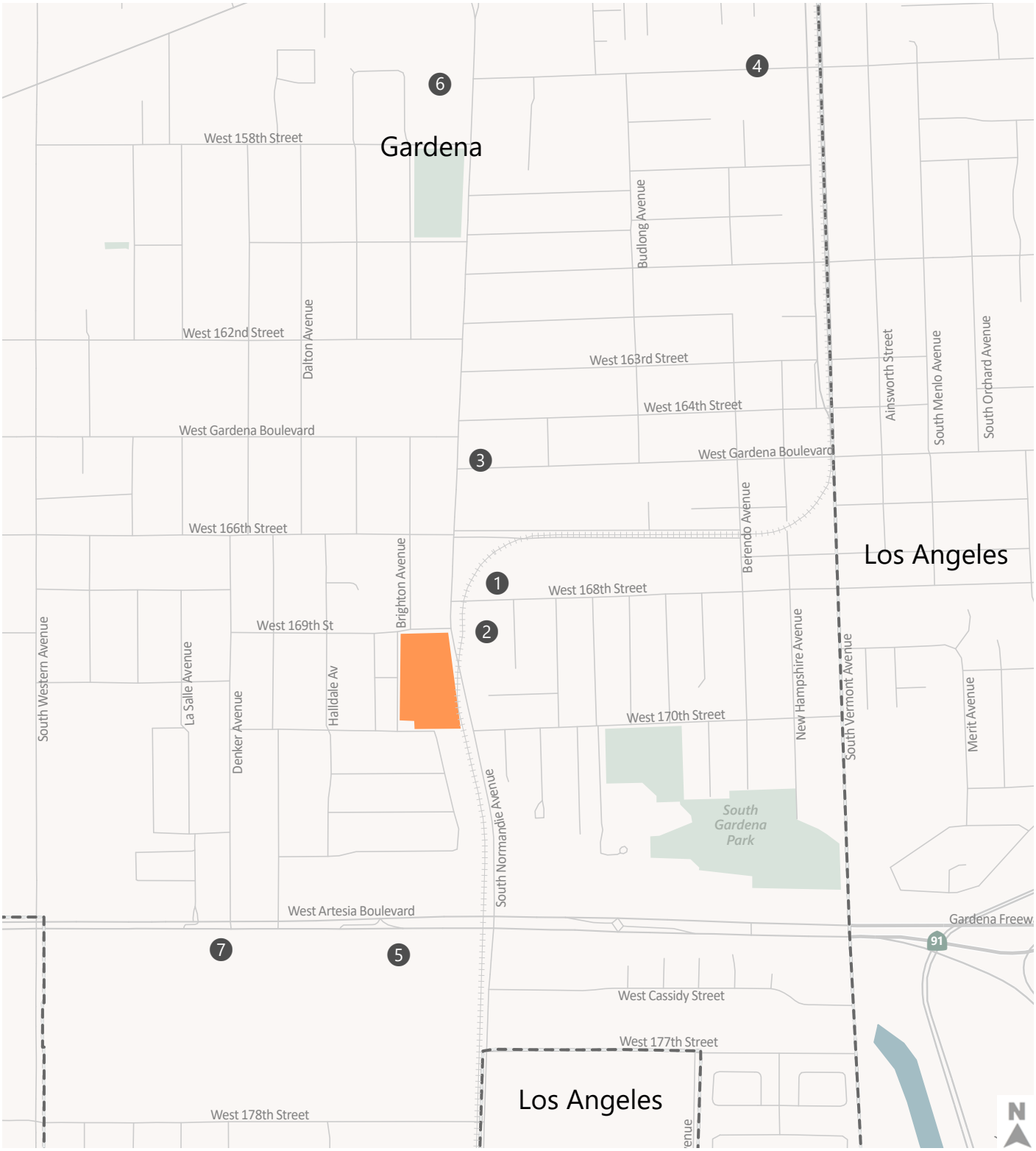
TABLE 4
16911 NORMANDIE PROJECT
RELATED PROJECTS

No.	Project Location	City	Land Use	Size		Trip Generation						
							AM			PM		
						Daily	IN	OUT	TOTAL	IN	OUT	TOTAL
1	1333 W 168th St	Gardena	Townhomes	3	du	22	0	1	1	1	1	2
2	1348 W 168th St	Gardena	Townhomes	9	du	65	1	3	4	3	2	5
3	1341 W Gardena Bl	Gardena	Apartments	14	du	205	7	6	13	10	10	20
			Commercial	3	ksf							
4	1031 Magnolia Av	Gardena	Townhomes	6	du	43	1	2	3	2	1	3
5	1450 W Artesia Bl	Gardena	Self Storage & Warehousing	258	ksf	374	14	9	23	18	21	39
6	15717 & 15725 Normandie Av	Gardena	Townhomes	30	du	216	4	10	14	10	7	17
7	1610 W Artersia Bl	Gardena	Apartments	300	du	1,362	26	85	111	71	46	117
				Total:		925	53	116	169	115	88	203

Notes:

du = dwelling unit; ksf = one-thousand square feet

Related projects list based on information provided by City of Gardena and City of Los Angeles dated June 2023.



Related Projects

Project Site

Cities

Figure 3

Related Projects
Normandie Apartments Project

TABLE 5
OPENING YEAR (2027) CONDITIONS INTERSECTION LEVELS OF SERVICE

NO.	INTERSECTION	CONTROL TYPE	PEAK HOUR	OPENING YEAR (2027)	
				DELAY (S)	LOS
1	Normandie Av & Gardena Bl	Signalized	AM	8.1	A
			PM	7.1	A
2	Normandie Av & 166th St	Signalized	AM	10.2	B
			PM	11.7	B
3	Normandie Av & 169th St	TWSC	AM	18.7	C
			PM	22.7	C
4	Normandie Av & 170th St	Signalized	AM	5.6	A
			PM	5.3	A
5	Normandie Av & Artesia Bl	Signalized	AM	41.5	D
			PM	40.5	D

[a] Intersections were analyzed using HCM methodologies per City of Gardena's *SB 743 Implementation, Transportation Analysis Updates.* LOS and delay for unsiganlized intersections were reported using the worst performing approach.

[b] TWSC=Two-Way Stop-Controlled Intersection

3.7 Project Traffic

The development of trip generation estimates for the Project was a 3-step process: trip generation, trip distribution, and traffic assignment.

3.7.1 Project Traffic Generation

As indicated previously, the Project would involve the demolition of approximately 106,100 sf of existing warehousing uses and its replacement with approximately 75 low-rise townhomes and 328 apartment dwelling units. **Table 6** presents the trip rates used to estimate trip generation for the Project. The ITE 11th Edition Trip Generation Manual was used to determine trip generation estimates for the proposed land uses. The ITE Multifamily Housing (Mid-Rise) rate (Land Use #221) was used for the proposed apartments, while the ITE Multifamily Housing (Low-Rise) rate (Land Use #220) was used for the proposed townhomes. The ITE Warehousing rate (Land Use #150) was used for the existing use as a credit. Based on the presence of transit routes near the site and the close proximity to other destinations, a combined 5% walking, biking, and transit credit was taken for the proposed land uses.

After including the credits for existing uses and non-automotive travel, the Project is estimated to generate 1,715 daily trips, 126 trips (20 inbound/106 outbound) in the AM peak hour, and 138 trips (92 inbound/46 trips outbound) in the PM peak hour.

3.7.2 Project Traffic Distribution and Assignment

The geographic distribution of trips generated by the Project is dependent on characteristics of the street system serving the Project site, the level of accessibility of routes to and from the proposed Project site, and the locations of employment and residential areas to which patrons of the Project would be drawn. The trip distribution is based on trip distribution information from the Southern California Association of Governments (SCAG) Regional Transportation Plan (RTP) travel demand model and finalized through conversations with city staff to ensure that the assumptions are realistic and vetted. The distribution of traffic is illustrated in **Figure 4**. Project traffic (depending on residential land use type) would enter the site from the four driveways as described in Chapter 1.

The traffic expected to be generated by the proposed Project was assigned to the street network using the distribution pattern shown in Figure 4. **Appendix C** shows the Project traffic assigned at the study intersections.

TABLE 6
16911 NORMANDIE APARTMENTS PROJECT
DAILY & PEAK HOUR VEHICLE TRIP GENERATION ESTIMATES

Land Use	ITE Land Use Code	Size	Trip Generation Rates [a]							Estimated Trip Generation						
			Daily	AM Peak Hour			PM Peak Hour			Daily	AM Peak Hour Trips			PM Peak Hour Trips		
				Rate	In%	Out%	Rate	In%	Out%		In	Out	Total	In	Out	Total
PROPOSED PROJECT																
Townhomes (Low-Rise)	220	75 du	6.74	0.4	24%	76%	0.51	63%	37%	506	7	23	30	24	14	38
Less: Walk/Bike/Transit Adjustment [b]			*5%*	*5%*			*5%*			*(25)*	*0*	*(1)*	*(1)*	*(1)*	*(1)*	*(2)*
Net External Vehicle Trips										481	7	22	29	23	13	36
Apartments (Mid-Rise)	221	328 du	4.54	0.37	23%	77%	0.39	61%	39%	1,489	28	93	121	78	50	128
Less: Walk/Bike/Transit Adjustment [b]			*5%*	*5%*			*5%*			*(74)*	*(1)*	*(5)*	*(6)*	*(4)*	*(3)*	*(7)*
Net External Vehicle Trips										1,415	27	88	115	74	47	121
TOTAL PROJECT EXTERNAL TRIPS		**403 du**								1,896	34	110	144	97	60	157
EXISTING USE ADJUSTMENT																
Warehousing	150	106.1 ksf	1.71	0.17	77%	23%	0.18	28%	72%	181	14	4	18	5	14	19
NET INCREMENTAL EXTERNAL TRIPS										1,715	20	106	126	92	46	138

Notes:

[a] Source: Institute of Transportation Engineers (ITE), Trip Generation, 11th Edition, 2021, unless otherwise noted.

[b] Although GTrans Line 4 is not currently providing service to/from the Harbor Gateway Transit Center due to the COVID-19 Pandemic, it is expected that this service would return in the future. Bus service provided by GTrans Lines 1X and 4 connect to major transit hubs and destinations, which informs the combined walking, biking, and transit trip generation credit. Base ITE rates do not take into account the usage of other modes of transportation.

Project Site
Study Intersections
Study Segments
Cities

Figure 4

Trip Distribution
Normandie Apartments Project

3.8 Opening Year Plus Project Intersections Level of Service

This section describes the analysis of potential effects on the roadway system due to future increases in traffic plus traffic generated by the project. The Opening Year (2027) Plus Project roadway network is the same network assumed under the Opening Year (2027) scenario.

The results of the Opening Year (2027) LOS analysis are presented in **Table 7**. Corresponding LOS calculation sheets are included in **Appendix D**. The results of the LOS calculations indicate that all study intersections operate at LOS D or better during the weekday AM and PM peak hours with the exception of the unsignalized intersection of Normandie Avenue and 169th Street, which is projected to operate at LOS E in the AM and PM peak hour due to the eastbound left-turn movement. The City of Gardena does not have non-CEQA analysis criteria for unsignalized intersections. It is generally typical for minor street stop-controlled approaches at unsignalized intersections to operate at LOS E/F (and higher amounts of delay) due to the nature and hierarchy of the street network, especially for drivers making left-turns.

3.9 Corrective Actions

Although there are no analysis criteria for unsignalized intersections in the City of Gardena, the City's guidance refers to the potential to install traffic signals at unsignalized intersections where traffic volumes are high enough to meet traffic signal warrants. A traffic signal warrant analysis for the unsignalized intersection of Normandie Avenue and 169th Street can be found in Section 3.11. Alternatively, the City of Gardena could consider restricting left-turn movements from 169th Street, which would reduce delay.

3.10 Queuing Analysis

A queuing analysis was performed for the unsignalized intersection of Normandie Avenue and 169th Street. **Table 8** presents AM and PM peak hour 95th percentile queues for non-free-flow turning movements. The queues are provided on the same sheets as the LOS and delay for this intersection in **Attachment D**. As shown in Table 8, Project traffic is not expected to cause any non-free-flow turning movements to exceed turn storage capacity.

TABLE 7
OPENING YEAR PLUS PROJECT CONDITIONS INTERSECTION LEVELS OF SERVICE

NO.	INTERSECTION	CONTROL TYPE	PEAK HOUR	OPENING YEAR (2027)		OPENING YEAR PLUS PROJECT		DELAY INCREASE
				DELAY (S)	LOS	DELAY (S)	LOS	
1	Normandie Av & Gardena Bl	Signalized	AM	8.1	A	8.2	A	0.1
			PM	7.1	A	7.5	A	0.4
2	Normandie Av & 166th St	Signalized	AM	10.2	B	10.3	B	0.1
			PM	11.7	B	11.8	B	0.1
3	Normandie Av & 169th St	TWSC	AM	18.7	C	**36.6**	**E**	17.9
			PM	22.7	C	**39.7**	**E**	17.0
4	Normandie Av & 170th St	Signalized	AM	5.6	A	5.6	A	0.0
			PM	5.3	A	5.3	A	0.0
5	Normandie Av & Artesia Bl	Signalized	AM	41.5	D	42.6	D	1.1
			PM	40.4	D	41.5	D	1.1

[a] Intersections were analyzed using HCM methodologies per City of Gardena's *SB 743 Implementation, Transportation Analysis Updates.* LOS and delay for unsignalized intersections were reported using the worst performing approach.

[b] TWSC=Two-Way Stop-Controlled Intersection

TABLE 8
PROJECT QUEUING ANALYSIS

NO.	INTERSECTION	CONTROL TYPE	MOVEMENT	STORAGE LENGTH (FT) [a]	PEAK HOUR	EXISTING 2022 (FT)	OPENING YEAR 2027 (FT)	OPENING YEAR PLUS PROJECT 2027 (FT)
3	Normandie Av & 169th	Unsignalized	NBL	100	AM	25	25	25
					PM	25	25	25
			EBLTR	210 [b]	AM	50	50	100
					PM	25	25	50

FT Feet

[a] An additional 60 to 90 feet of storage is typically provided in the taper area outside of the through lane, which is not reflected in the storage length above.

[b] Eastbound approach storage length measured from intersection to Project Driveway per site plans.

3.11 Traffic Signal Warrant Analysis

A traffic signal warrant analysis was conducted at the intersection of Normandie Avenue & 169th Street. Traffic volumes, as presented in **Appendix A**, were used to prepare signal warrant analyses under Existing (2022) conditions.

The traffic signal warrant analyses were conducted in accordance with the procedures described in Chapter 4C of the California Manual on Uniform Traffic Control Devices 2014 (CAMUTCD). The CAMUTCD contains nine (9) possible traffic signal warrants. Below is a summary of each traffic signal warrant, their applicability to the Project, and whether or not the applicable warrant is met under the Opening Year Plus Project scenario. In accordance with the CAMUTCD, the satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal. **Appendix E** provides the related worksheets for each traffic signal warrant.

Warrant 1, Eight-Hour Vehicular Volume

This warrant consists of meeting either Condition A or Condition B of Section 4C.02 of the CAMUTCD. Condition A is intended for application at locations where a large volume of intersecting traffic is the principal reason to consider installing a traffic control signal. Condition B is intended for application at locations where Condition A is not satisfied and where the traffic volume on a major street is so heavy that traffic on a minor intersecting street suffers excessive delay or conflict in entering or crossing the major street. Based on the worksheet calculations in Appendix E, Warrant 1 is not met under Existing (2022) conditions. This warrant is also not expected to be met under Opening Year Plus Project conditions. Minor street existing volumes would have to be more than double or triple for eight hours on a typical day in order to meet Warrant 1. Estimated peak hour minor street approach volumes under the Opening Year Plus Project scenario are also less than the minor street volume threshold to meet this warrant.

Warrant 2, Four-Hour Vehicular Volume

This signal warrant is intended to be applied where the volume of intersecting traffic is the principal reason to consider installing a traffic control signal. Based on the worksheet calculations in Appendix E, Warrant 2 is not met under Existing (2022) conditions. This warrant is also not expected to be met under Opening Year Plus Project conditions either due to minor street volumes not meeting thresholds for four hours on a typical day. While the minor street approach volumes do exceed Warrant 2 thresholds during 1-hour in the morning under Opening Year Plus Project conditions, existing volume data for this eastbound approach shows a substantial drop in volumes during other hours of the day. Even after accounting for ambient growth and Project traffic, the eastbound minor street approach volume is not expected to meet Warrant 2 thresholds for four hours on a typical day.

Warrant 3, Peak Hour

This signal warrant is intended for use at a location where traffic conditions are such that for a minimum of 1 hour of an average day, the minor-street traffic suffers undue delay when entering or crossing the major street. Based on the worksheet calculations in Appendix E, Warrant 3 is not met under Existing (2022) conditions. Although Category B (over 100 vehicles per hour on the minor street) of Warrant 3 is satisfied during the Opening Year Plus Project AM scenario, this warrant is still not met under Opening Year Plus Project due to the intent of Warrant 3. Warrant 3 shall be applied only in unusual cases, such as industrial and office complexes or manufacturing plants that attract and discharge large numbers of vehicles over a short period of time.

Warrant 4, Pedestrian Volume

This signal warrant is intended for application where the traffic volume on a major street is so heavy that pedestrians experience excessive delay in crossing the major street. Warrant 4 was not performed at this intersection due to low pedestrian crossing volumes during peak periods as shown in the intersection counts. Existing peak hour intersection counts show less than five (5) pedestrians crossing any roadway leg during either peak hour, which is substantially less than the 75-133 crossings per hour that are necessary to meet this warrant. The Project is not expected to generate sufficient pedestrian crossing volumes to satisfy this warrant.

Warrant 5, School Crossing

This signal warrant is intended for application when schoolchildren crossing the major street is the principal reason to consider installing a traffic control signal. This warrant is not applicable to this intersection because the Project and the intersection of Normandie Avenue and 169th Street is not located in close proximity to a school and the intersection is not an established school crossing.

Warrant 6, Coordinated Signal System

This signal warrant considers progressive movement in a coordinated signal system. This sometimes necessitates installing traffic control signals at intersections where they would not otherwise be needed in order to maintain proper platooning of vehicles. This warrant is not applicable to this intersection, as the intersection analysis shows intersections along Normandie Avenue operating at acceptable LOS and without heavy congestion.

Warrant 7, Crash Experience

This signal warrant is intended for application where the severity and frequency of crashes are the principal reasons to consider installing a traffic control signal. Traffic collision data was obtained for this intersection using the CHP's Statewide Integrated Traffic Records System (see Appendix Item E). Because

there were fewer than five (5) crashes at the intersection of Normandie Avenue and 169th Street in the prior five (5) years, this warrant is not met.

Warrant 8, Roadway Network

This signal warrant considers installing a traffic control signal to encourage concentration and organization of traffic flow on a roadway network. Although volumes entering this intersection are expected to exceed thresholds for Warrant 8 as shown in Appendix E, this warrant is not met due to the requirement that both streets be considered major routes. 169th Street is not considered a principal street or major route for through traffic.

Warrant 9, Intersection Near a Grade Crossing

This signal warrant is intended for use at a location where none of the conditions described in the other eight traffic signal warrants are met, but the proximity to the intersection of a grade crossing on an intersection approach controlled by a STOP or YIELD sign is the principal reason to consider installing a traffic control signal. Warrant 9 applies to situations where a grade crossing crosses the minor street and the minor street approach is controlled by a STOP or YIELD sign. At the intersection of Normandie Avenue and 169th Street, no traffic control is provided for Normandie Avenue. Near this intersection, the railroad tracks cross the major street (Normandie Avenue). Therefore, this warrant was not performed.

Summary

Based on the signal warrant analysis performed above, a traffic signal is not warranted under Existing (2022) conditions at the intersection of Normandie Avenue and 169th Street. Based on the Project's expected traffic and areawide traffic projections, a traffic signal is also not expected to meet warrants under the Opening Year Plus Project scenario. The City of Gardena should continue to monitor traffic conditions and safety after the Project is built.

The decision to install a signal should not be based solely upon the warrants, since the installation of signals can lead to increases in the frequency of collisions (especially rear-end collisions) according to the CAMUTCD. Should the City decide to install a traffic signal at Normandie Avenue and 169th Street, further study should be conducted to analyze the safety, coordination, and interactions between the at-grade railroad crossing and traffic flows on Normandie Avenue and 169th Street. The City of Gardena should undertake regular monitoring of actual traffic conditions and collision data, and timely re-evaluation of the full set of traffic signal warrants in order to prioritize and program intersections for signalization.

4. Residential Street Segment Analysis

Table 9 shows a summary of the residential street segment analysis. Twenty-four hour street segment counts were conducted in March 2022 at both analyzed street segments, 169th Street west of Brighton Avenue and 170th Street west of Brighton Avenue. Proposed Project driveways connect to both 169th Street and 170th Street. These street segment counts were then forecasted in a similar manner as the intersection turning movement counts, to which the Project's traffic was added to create Opening Year Plus Project volumes. The Project's percentage of Opening Year (2027) scenario volumes is also shown on Table 9. The Project is expected to add 97 daily trips to 169th Street and 113 daily trips to 170th Street, about 6.6% and 33.8% of their Opening Year (2027) volumes, respectively. While the City of Gardena does not have established criteria to evaluate unacceptable levels of traffic on residential streets, both streets are designated as Local Streets in the Gardena Circulation Plan. The Circulation Plan does not provide typical ADT for Local Streets, but the City defines the larger and wider Collector Roadways to carry less than 15,000 vehicles per day. Under Opening Year Plus Project conditions, the ADT on both Local Street segments is expected to be far less than typical ADT as shown in the Gardena Circulation Plan.

TABLE 9
RESIDENTIAL STREET SEGMENT ANALYSIS - DAILY TRAFFIC VOLUMES

Location	Weekday Bidirectional Daily Volume				Segment Analysis
	Existing (2022) ADT	Opening Year (2027) ADT	Project Only ADT	Opening Year Plus Project ADT	% of Opening Year ADT
169th Street w/o Brighton Avenue	1,343	1,370	97	1,467	6.6%
170th Street w/o Brighton Avenue	217	221	113	334	33.8%

Note: ADT = Average Daily Traffic

5. Non-Motorized Modes Analysis

5.1 Effects on Active Transportation

Pedestrian access to the Project's apartment building units will be provided on the ground floor with primary pedestrian access located at the building lobby located at the northeastern corner of the site, adjacent to the intersection of Normandie Avenue & 169th Street. Additional restricted pedestrian access will also be provided to other corners of the apartment building, which will lead to internal circulation serving the townhomes. Pedestrian access to the Project's townhomes will be provided via internal circulating roadways and sidewalks leading from 169th Street and 170th Street. Some townhome units will have direct pedestrian access to City streets. The project design provides for adequate pedestrian access to the existing sidewalks provided along the project frontage. There are several bus stops within a ¼-mile of the project site, including 166th Street & Brighton Avenue (eastbound and westbound) and Normandie Avenue & 170th Street (southbound and northbound). There are commercial land uses along Normandie Avenue and Artesia Boulevard. Project traffic and site design is not anticipated to deteriorate or effect existing pedestrian facilities in the study area.

The project includes amenities for bicyclists which could encourage the use of bicycles for certain trips. Long-term, enclosed bike storage will also be provided in the garage.

Separated or protected bicycle facilities are not currently provided along Normandie Avenue along the project site. According to the South Bay Bicycle Master Plan, Normandie Avenue is designated as a bike route (Class III) from 182nd Street to 170th Street. Additionally, 166th Street , 170th Street and Gardena Boulevard are designated as bike routes (Class III), but not on segments directly adjacent to the project site.

The following future Bicycle Friendly Street segment is proposed in the South Bay Bicycle Master Plan as a prioritized project in Gardena that is directly adjacent to the project site and may be implemented by the City in the future:

- 170th Street from Denker Avenue to Vermont Avenue (0.8 miles)

Implementation of the proposed project will not conflict with any existing bicycle facilities, and it will not preclude the implementation of any other potential enhancements to planned facilities. Similarly, bicycle trips will be generated by the project, but development of the project is not expected to conflict with any existing or planned bicycle facility.

The proposed project is expected to generate bicycle and pedestrian trips to and from the project site, with some of those trips including the use of transit. Nearby land uses with retail, service, and employment opportunities are close enough to where walking and bicycling would be feasible.

5.2 Effects on Transit

The project site is located within a quarter mile of various bus stops (166th Street & Brighton Avenue and Normandie Avenue & 170th Street) and is served by transit service via the City of Gardena's Transit Service, GTrans. Project traffic and the design of the project site is not expected to affect access to or the operation of these services.

6. Summary and Conclusions

This LTA was undertaken to analyze the potential transportation effects of the proposed Project. The following summarizes the results of this analysis:

- The Project would involve the demolition of 106,100 sf of existing warehousing space and its replacement with 75 townhomes and 328 apartment dwelling units. The apartment units would be served by one right-in/right-out only driveway on Normandie Avenue and one full access driveway on 169th Street west of Normandie Avenue. The townhomes would be served by one full access driveway on 169th Street and one full access driveway on 170th Street.
- The Project would install a median along Normandie Avenue surrounding the Union Pacific railroad tracks to prevent left-turns into and out of the Project from Normandie Avenue.
- The Project would generate an estimated 1,715 daily trips, 126 trips (20 inbound/106 outbound) in the morning peak hour, and 138 trips (92 inbound/46 trips outbound) in the evening peak hour.
- The LOS analysis for the Existing, Opening Year, and Opening Year Plus Project scenarios determined that the proposed Project would result in LOS D or better conditions at all study intersections with the exception of the unsignalized intersection of Normandie Avenue and 169th Street, which is projected to operate at LOS E in the AM and PM peak hour. The City of Gardena does not have analysis criteria for unsignalized intersections.
- The queuing analysis determined that the Project would not result in intersection queues that would exceed turn pocket storage capacity at the intersection of Normandie Avenue and 169th Street.
- A full traffic signal warrant analysis at Normandie Avenue and 169th Street found that a traffic signal would not meet any CAMUTCD signal warrants under Existing (2022) conditions. Although Category B under Warrant 3 is satisfied under the Opening Year Plus Project AM scenario, this warrant shall only be applied in unusual cases as described in the CAMUTCD. Therefore, this intersection is not expected to meet warrants under the Opening Year Plus Project scenario. The City should continue to monitor traffic conditions after the Project is built and potentially re-evaluate with the full set of traffic signal warrants. Alternatively, the City could consider restricting eastbound left-turns from 169th Street to northbound Normandie Avenue to reduce vehicular delay.
- The residential street segment analysis for the Opening Year plus Project scenario determined that the proposed Project would comprise of approximately 6.4% and 33.1% of Opening Year daily segment traffic along 169th Street and 170th Street, respectively. While the City of Gardena does not have thresholds or criteria for evaluating street segments, it is recommended that the City continue to monitor traffic conditions at these street segments after the Project is built and potentially explore traffic calming measures.
- The Project will generate bicycle, pedestrian, and transit trips, and is not expected to affect access to or the operations of these facilities.

Appendix A: LTA Scoping Memorandum

FEHR PEERS

Memorandum

Date: 7 February 2022

To: Amanda Acuna & Greg Tsujiuchi, City of Gardena

From: Ryan Liu, PE & Michael Kennedy, AICP

Subject: Local Transportation Assessment Scoping Memorandum for the 16911 S Normandie Avenue Apartments Project

LB21-0048

Fehr & Peers is preparing the transportation analyses as part of project entitlements for the Normandie Apartments Project ("Project"), located at 16911 S Normandie Avenue in the City of Gardena. The purpose of this memorandum is to document the methodologies and assumptions for the Project's non-CEQA Local Transportation Assessment (LTA) in accordance with the City's transportation analysis procedures. CEQA-related transportation analyses can be found in the Project's VMT Assessment Memorandum, which is part of the Project's CEQA documentation.

Project Description

The Project consists of the replacement of 105,000 square feet of warehousing uses with 76 low-rise townhomes and 273 apartments in a separate building. Access to the Project Site will be provided by the following five driveways:

- Driveway 1 serves the apartment building's parking garage from 169th Street west of Normandie Avenue.
- Driveway 2 also serves the apartment building's parking garage from Normandie Avenue.
- Driveway 3 serves the townhomes from Normandie Avenue and travels across Union Pacific railroad tracks, which border portions of the Project Site's eastern frontage.
- Driveway 4 serves the townhomes from 170th Street.
- Driveway 5 also serves the townhomes from 169th Street.

Internal roadways link Driveways 3-5 to all townhomes, but do not connect to the apartment building garage. **Figure 1** shows the Project site plan. The Project is expected to be completed in 2026.

Regulatory Framework

In 2020, the City of Gardena updated their transportation analysis guidelines for land use development projects in accordance with Senate Bill 743 (SB 743), which requires CEQA-related transportation analyses to use vehicle miles traveled (VMT) as the primary performance metric. Local agencies such as the City of Gardena chose to retain level-of-service (LOS) to provide an additional transportation-focused project review, prepared separately from the documentation required under CEQA. According to current City guidance, projects that generate 50 or more peak hour vehicle trips would require an LTA. Any intersection to which a proposed project is expected to add 50 peak hour trips in either AM or PM peak hour would be considered a study intersection.

Project Trip Generation

Trip generation rates from Trip Generation, 11th Edition (Institute of Transportation Engineers [ITE], 2021) were used to estimate the number of trips for most uses associated with the Project. The following trip generation land uses were used:

- ITE Land Use #220 (Low-Rise Multifamily Housing) was used for the proposed townhomes.
- ITE Land Use #221 (Mid-Rise Multifamily Housing) was used for the proposed apartments.
- ITE Land Use #150 (Warehousing) was used for the existing warehouses on the Project Site.

Project Trip Generation Estimates

Table 1 presents the estimated trip generation using trip generations for the fully built project, taking into account an existing use credit for the warehousing use. As presented in Table 1, the Project is expected to generate an estimated 1,483 net new daily vehicle trips, including 107 trips (15 inbound/ 92 outbound) during the AM peak hour and 119 trips (81 inbound/ 38 outbound) during the PM peak hour.

Because the Project is expected to generate more than 50 peak hour vehicle trips, an LTA is required. This LTA will provide an existing transportation conditions overview, LOS analysis, a residential street segment analysis, and an active transportation review.

LOS Analysis Assumptions

Study Intersections

The following study intersections were selected in consultation with City of Gardena staff, based on the expected number of vehicle trips to be added to nearby intersections. **Figure 2** identifies the five intersections that were approved by City staff for data collection:

1. Normandie Avenue & Gardena Boulevard (signalized)
2. Normandie Avenue & 166th Street (signalized)
3. Normandie Avenue & 169th Street (unsignalized)
4. Normandie Avenue & 170th Street (signalized)
5. Normandie Avenue & Artesia Boulevard (signalized)

Artesia Boulevard is an arterial street under local jurisdiction, which then transitions into SR-91 (Gardena Freeway) east of Vermont Avenue under Caltrans jurisdiction. Although the Project is located near freeway ramp intersections such as Vermont Avenue and the SR-91 terminus, none are proposed for analysis since the Project is not expected to add 50 or more trips at these locations.

Traffic Counts

Existing morning (7:00 to 9:00 AM) and evening (4:00 to 6:00 PM) peak period intersection counts will be conducted at the study intersections when local schools are in session, on good days of weather, on Tuesdays through Thursdays.

Fehr & Peers requests the following information from City of Gardena staff:

- Pending and approved development projects in Gardena that should be included in the forecasting effort. Pending and approved development projects will also be obtained from the City of Los Angeles.
- Signal timing information at the signalized study intersections

Trip Distribution and Assignment

The geographic distribution of trips generated by the Project is dependent on characteristics of the street system serving the Project site, the level of accessibility of routes to and from the proposed Project site, and the locations of employment and residential areas to which patrons of the Project would be drawn. The trip distribution is based on trip distribution information from the 2016 Southern California Association of Governments (SCAG) Regional Transportation Plan (RTP) travel demand model and finalized through conversations with city staff to ensure that the assumptions are realistic and vetted. The 2020 SCAG RTP model is an activity based model (ABM) rather than a trip model, and has not been validated for project level CEQA clearance at this time,

which is why Fehr & Peers proposes to use the 2016 RTP Model. The 2016 RTP Model was also used to prepare the City's CEQA VMT impact metrics. However, the choice of model is up to the lead agency's discretion. The distribution of Project trips is illustrated in **Figure 3**.

Analysis Methodology

Fehr & Peers will conduct capacity analysis at the study intersections during morning and evening peak hours. The Highway Capacity Manual 6th Edition (HCM) methodology using Synchro 11 will be used to evaluate LOS at both signalized and unsignalized study intersections. Heavy vehicle percentages and peak hour factors (PHF) for HCM intersection analysis for existing scenarios will be determined based on the traffic counts, while a PHF of 0.95 will be used for HCM intersection analysis for future conditions.

Analysis Scenarios

The following scenarios will be analyzed:

- Existing (2021 or 2022) Conditions – Traffic counts conducted for this study will be analyzed to develop an existing baseline scenario.
- Opening Year – Existing traffic conditions plus ambient growth and traffic from all the developments within the study area for which an application has been submitted ("pending projects), or that have been approved but not yet constructed.
    - Based on information from the SCAG travel demand model, the ambient growth rate for the City Gardena through 2040 would be 0.4% per year.
- Opening Year plus Project – Traffic conditions of existing plus ambient growth and approved and pending developments, plus traffic generated by the proposed project.

Residential Street Assessment Assumptions

The City recommends that a residential street assessment be conducted when projects have direct access or are located adjacent to a neighborhood residential street. Because the Project is located adjacent to other residential developments and provides driveway access onto residential streets, a residential street assessment will be conducted. 24-hour two-way street segment counts will be collected at the same time as counts are collected at study intersections. The street segments proposed for assessment are:

- 169th Street west of Brighton Way
- 170th Street west of Brighton Way

The assessment will estimate the number of project trips expected to travel on these residential street segments on a daily basis and during AM and PM peak hours under plus-project conditions. If necessary, the City will consider the need for relevant traffic calming solutions.

Active Transportation Assessment Assumptions

The Project will also be reviewed for potential conflicts with adopted plans and policies related to active transportation, such as the South Bay Bicycle Master Plan. Any planned active transportation improvements in the immediate vicinity of the Project Site will be noted and documented in the Project site plan as necessary.

Next Steps

Once the proposed assumptions and methodology are approved, Fehr & Peers will collect counts and begin the transportation analyses.

CADD FILE: \\fpib03\Data\Projects\Active\2021\0048_16911 S. Normandie Avenue\Graphics\CAD\0048_Site Plan.dwg
Nov 12, 2021

Figure 1
Project Site Plan
Normandie Apartments Project

CONCEPTUAL - NOT FOR CONSTRUCTION.

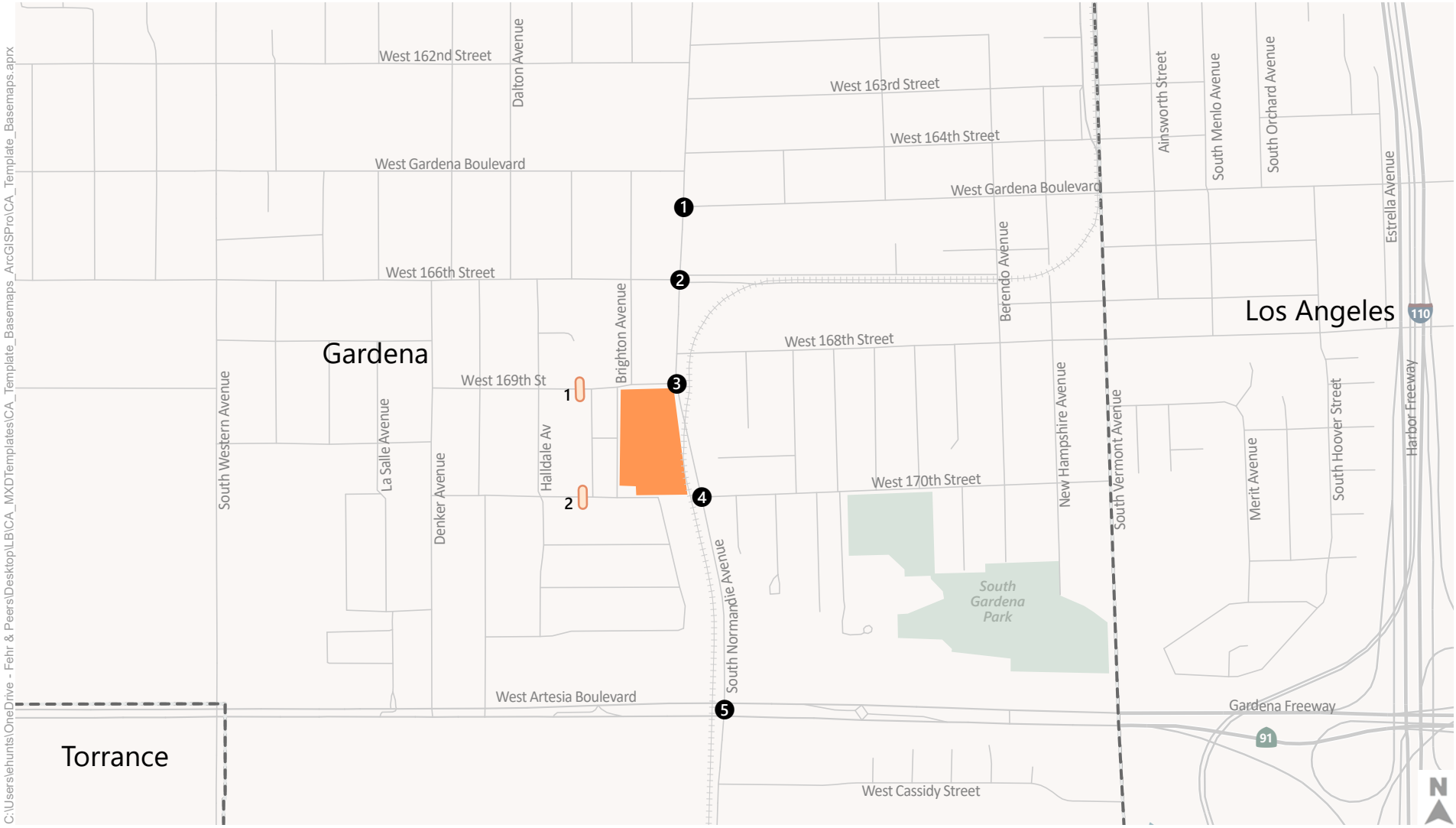
TABLE 1
NORMANDIE APARTMENTS PROJECT
DAILY & PEAK HOUR VEHICLE TRIP GENERATION ESTIMATES

Land Use	ITE Land Use Code	Size	Trip Generation Rates [a]							Estimated Trip Generation						
			Daily	AM Peak Hour			PM Peak Hour			Daily	AM Peak Hour Trips			PM Peak Hour Trips		
				Rate	In%	Out%	Rate	In%	Out%		In	Out	Total	In	Out	Total
PROPOSED PROJECT																
Townhomes (Low-Rise)	220	76 du	6.74	0.4	24%	76%	0.51	63%	37%	512	7	23	30	25	14	39
Less: Walk/Bike/Transit Adjustment [b]			*5%*	*5%*			*5%*			*(26)*	*0*	*(1)*	*(1)*	*(1)*	*(1)*	*(2)*
Net External Vehicle Trips										486	7	22	29	24	13	37
Apartments (Mid-Rise)	221	273 du	4.54	0.37	23%	77%	0.39	61%	39%	1,239	23	78	101	65	41	106
Less: Walk/Bike/Transit Adjustment [b]			*5%*	*5%*			*5%*			*(62)*	*(1)*	*(4)*	*(5)*	*(3)*	*(2)*	*(5)*
Net External Vehicle Trips										1,177	22	74	96	62	39	101
TOTAL PROJECT EXTERNAL TRIPS		**349 du**								1,663	29	96	125	86	52	138
EXISTING USE ADJUSTMENT																
Warehousing	150	105.00 ksf	1.71	0.17	77%	23%	0.18	28%	72%	180	14	4	18	5	14	19
NET INCREMENTAL EXTERNAL TRIPS										1,483	15	92	107	81	38	119

Notes:

[a] Source: Institute of Transportation Engineers (ITE), Trip Generation, 11th Edition, 2021, unless otherwise noted.

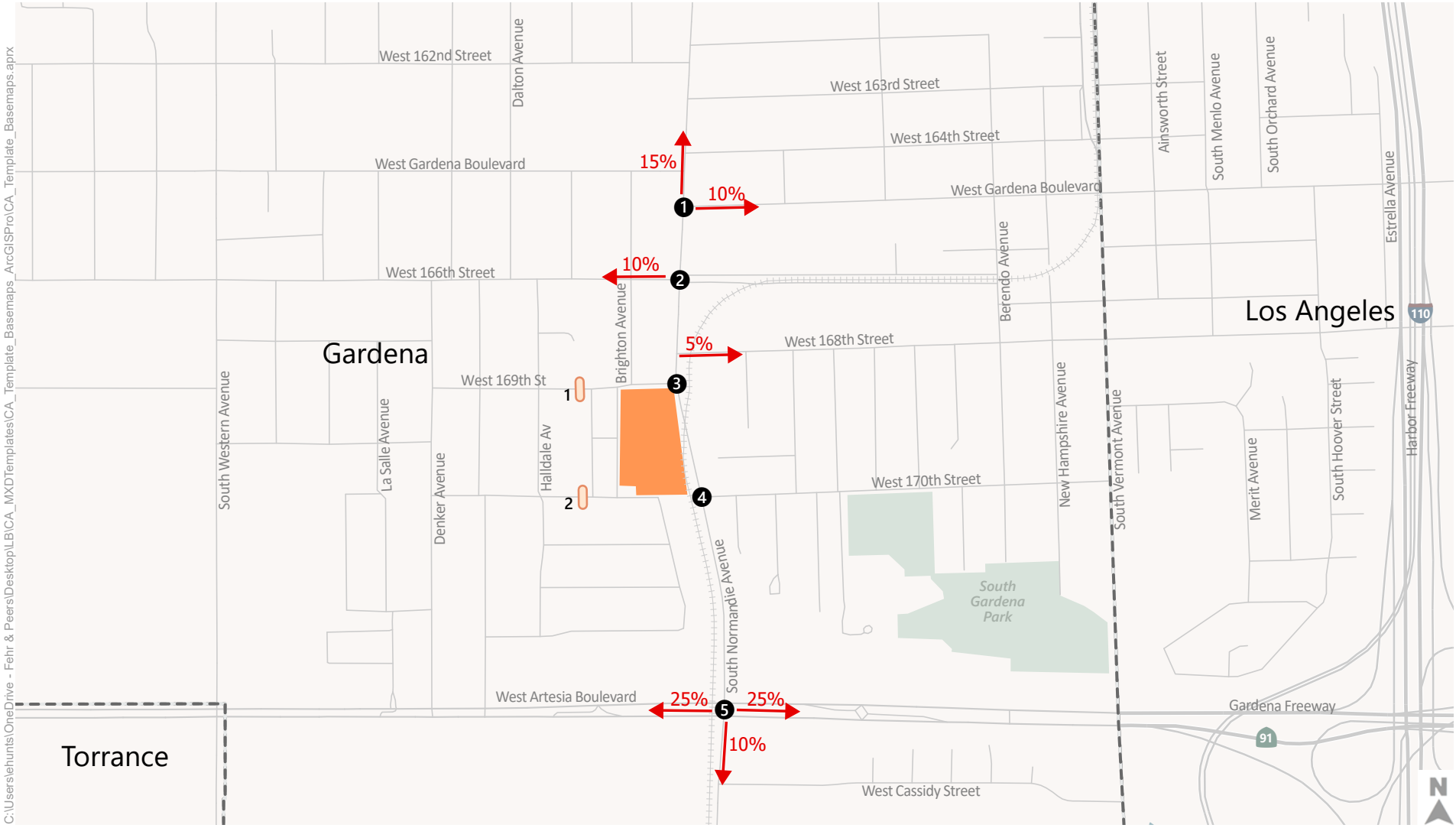
[b] Although GTrans Line 4 is not currently providing service to/from the Harbor Gateway Transit Center due to the COVID-19 Pandemic, it is expected that this service would return in the future. Bus service provided by GTrans Lines 1X and 4 connect to major transit hubs and destinations, which informs the combined walking, biking, and transit trip generation credit. Base ITE rates do not take into account the usage of other modes of transportation.



Project Site
Study Intersections
Study Segments
Cities

Figure 2

Study Intersections and Study Segments
Normandie Apartments Project



Project Site
Study Intersections
Study Segments
Cities

Figure 3

Trip Distribution
Normandie Apartments Project

Appendix B: Traffic Counts

Prepared by National Data & Surveying Services

Normandie Ave & Gardena blvd

Peak Hour Turning Movement Count

ID: 22-020099-001
City: Gardena

Day: Tuesday
Date: 3/29/2022

PEAK HOURS

AM: 07:45 AM - 08:45 AM
NOON: NONE
PM: 04:45 PM - 05:45 PM

COUNT PERIODS

AM: 7:00 AM - 09:00 AM
NOON: NONE
PM: 4:00 PM - 06:00 PM

SOUTHBOUND (Normandie Ave)

AM	2	782	110	0	1032	AM
NOON	0	0	0	0	0	NOON
PM	1	764	100	0	1250	PM
	0	2	1	0		

EASTBOUND (Gardena blvd)

AM	NOON	PM	
4	0	2	
0	0	0	0
1	0	0	0
0	0	0	1
0	0	5	0
AM	NOON	PM	

WESTBOUND (Gardena blvd)

	PM	NOON	AM
1	118	0	133
0	0	0	1
1	121	0	154
0	0	0	0
	263	0	221
	PM	NOON	AM

CONTROL

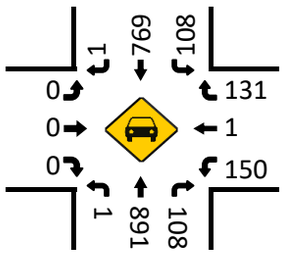
Signalized

TEV	2194 AM	0 NOON	2406 PM
PHF	0.93		0.98

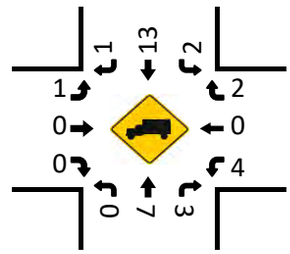
NORTHBOUND (Normandie Ave)

PM	891	1	1	1132	163	PM
NOON	0	0	0	0	0	NOON
AM	937	1	1	898	111	AM
		0	0.5	2.5	0	

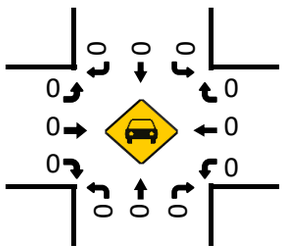
Cars (AM)



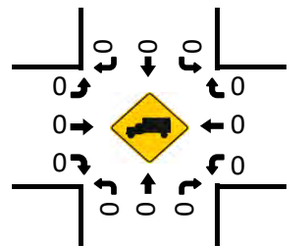
HT (AM)



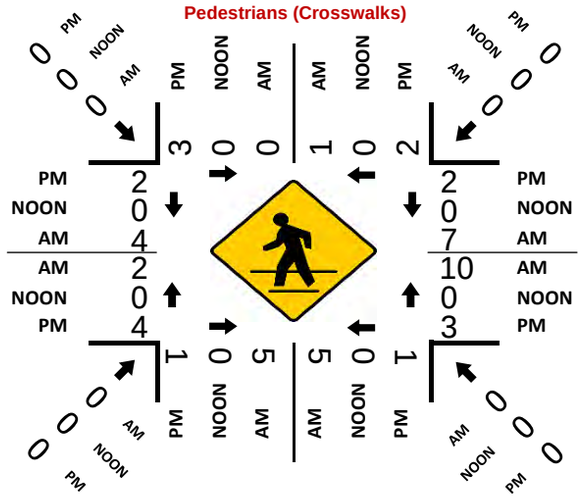
Cars (NOON)



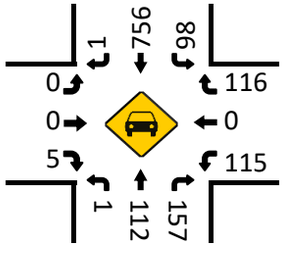
HT (NOON)



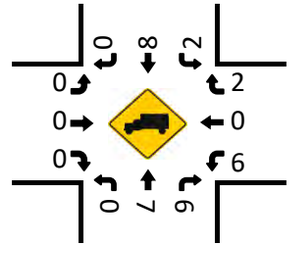
Pedestrians (Crosswalks)



Cars (PM)



HT (PM)



Prepared by National Data & Surveying Services

Normandie Ave & 166th st

Peak Hour Turning Movement Count

ID: 22-020099-002
City: Gardena

Day: Tuesday
Date: 3/29/2022

PEAK HOURS

AM: 07:45 AM - 08:45 AM
NOON: NONE
PM: 04:45 PM - 05:45 PM

COUNT PERIODS

AM: 7:00 AM - 09:00 AM
NOON: NONE
PM: 4:00 PM - 06:00 PM

SOUTHBOUND (Normandie Ave)

AM	109	820	10	1	1009	AM
NOON	0	0	0	0	0	NOON
PM	88	770	36	0	1300	PM

0 2 1 0

EASTBOUND (166th st)

AM	NOON	PM	
298	0	252	
0	0	0	0
103	0	139	0
60	0	108	1
200	0	144	0

WESTBOUND (166th st)

PM	NOON	AM	
29	0	21	1
54	0	66	1
19	0	29	1
11	0	5	0
209	0	105	

CONTROL

Signalized

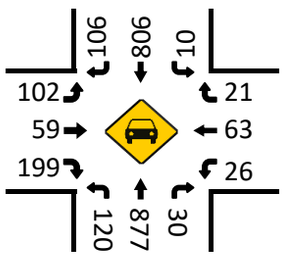
TEV	2461 AM	0 NOON	2694 PM
PHF	0.92		0.98

0 1 2 0

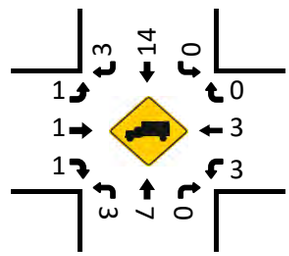
NORTHBOUND (Normandie Ave)

PM	933	0	110	1132	54	PM
NOON	0	0	0	0	0	NOON
AM	1049	0	123	884	30	AM

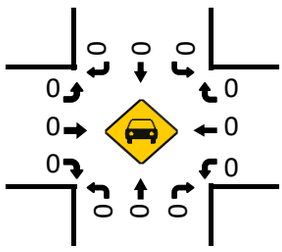
Cars (AM)



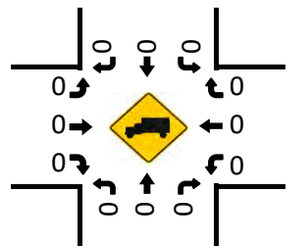
HT (AM)



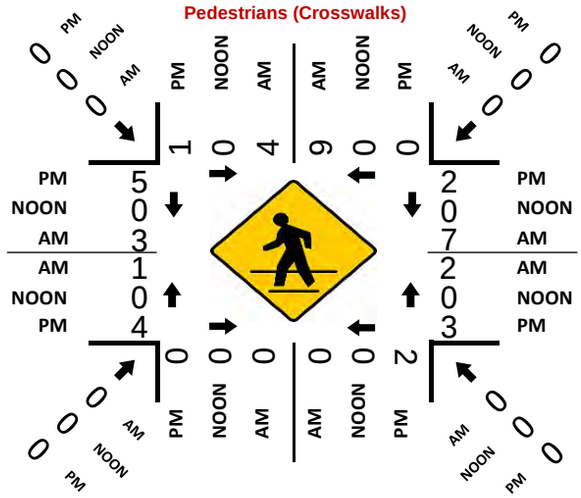
Cars (NOON)



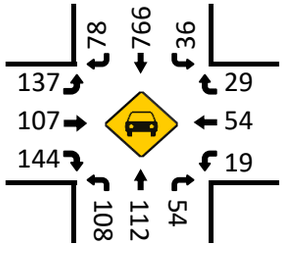
HT (NOON)



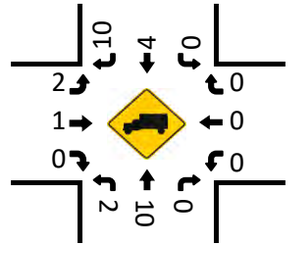
Pedestrians (Crosswalks)



Cars (PM)



HT (PM)



Prepared by National Data & Surveying Services

Normandie Ave & 169th st

Peak Hour Turning Movement Count

ID: 22-020099-003
City: Gardena

Day: Tuesday
Date: 4/5/2022

PEAK HOURS

AM: 07:45 AM - 08:45 AM
NOON: NONE
PM: 04:30 PM - 05:30 PM

COUNT PERIODS

AM: 7:00 AM - 09:00 AM
NOON: NONE
PM: 4:00 PM - 06:00 PM

SOUTHBOUND (Normandie Ave)

AM	17	980	0	0	1036	AM
NOON	0	0	0	0	0	NOON
PM	32	859	0	0	1212	PM

EASTBOUND (169th st)

AM	NOON	PM	
56	0	75	
0	0	0	0
6	0	8	0
0	0	0	1
84	0	30	0

WESTBOUND (169th st)

PM	NOON	AM	
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	

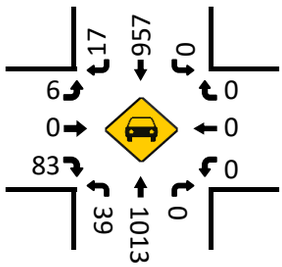
NORTHBOUND (Normandie Ave)

PM	889	0	43	1204	0	PM
NOON	0	0	0	0	0	NOON
AM	1064	0	39	1030	0	AM

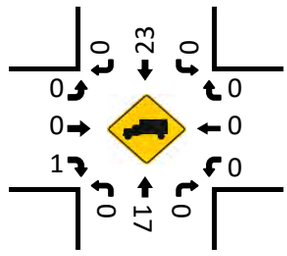
CONTROL: 1-Way Stop(EB)

TEV	2156 AM	0 NOON	2176 PM
PHF	0.89		0.96

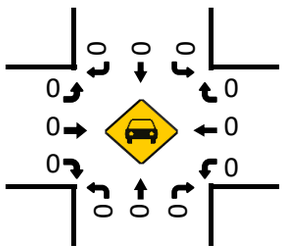
Cars (AM)



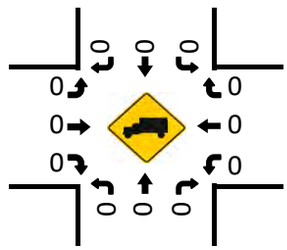
HT (AM)



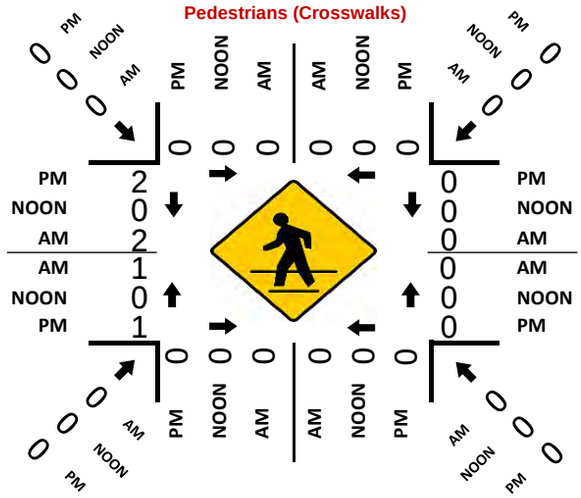
Cars (NOON)



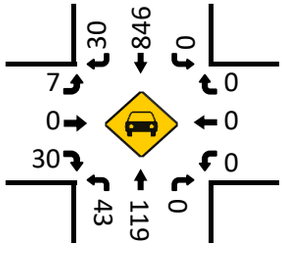
HT (NOON)



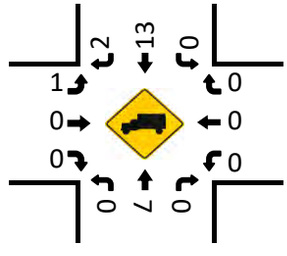
Pedestrians (Crosswalks)



Cars (PM)



HT (PM)



Prepared by National Data & Surveying Services

Normandie Ave & 170th st

Peak Hour Turning Movement Count

ID: 22-020099-004
City: Gardena

Day: Tuesday
Date: 3/29/2022

PEAK HOURS

AM: 07:45 AM - 08:45 AM
NOON: NONE
PM: 04:45 PM - 05:45 PM

COUNT PERIODS

AM: 7:00 AM - 09:00 AM
NOON: NONE
PM: 4:00 PM - 06:00 PM

SOUTHBOUND (Normandie Ave)

AM	0	1008	43	0	1054	AM
NOON	0	0	0	0	0	NOON
PM	0	809	65	0	1365	PM
	0	2	1	0		

EASTBOUND (170th st)

AM	NOON	PM	
0	0	0	
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
AM	NOON	PM	

WESTBOUND (170th st)

	PM	NOON	AM
0	58	0	59
1	0	0	0
0	70	0	100
0	0	0	0
	172	0	97
	PM	NOON	AM

CONTROL

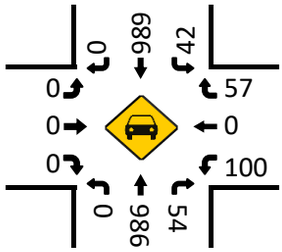
Signalized

TEV	2259 AM	0 NOON	2417 PM
PHF	0.92		0.94

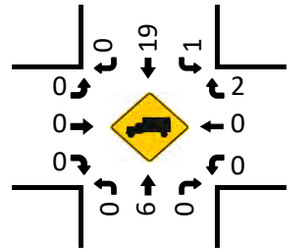
NORTHBOUND (Normandie Ave)

	0	0	2	0		
PM	880	1	0	1307	107	PM
NOON	0	0	0	0	0	NOON
AM	1108	0	0	995	54	AM

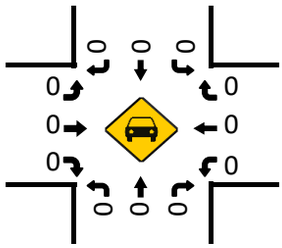
Cars (AM)



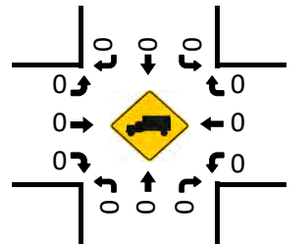
HT (AM)



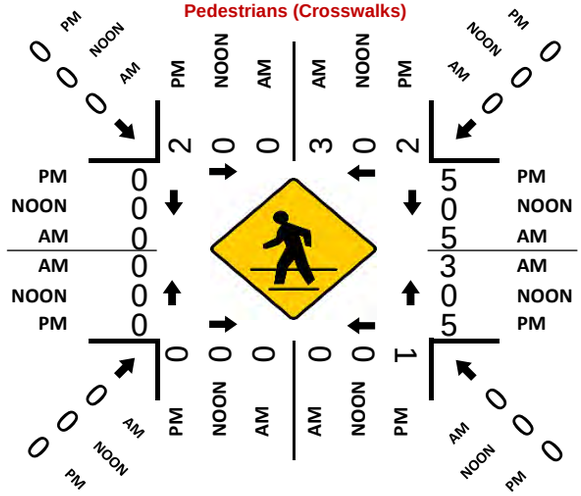
Cars (NOON)



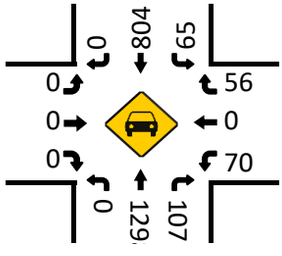
HT (NOON)



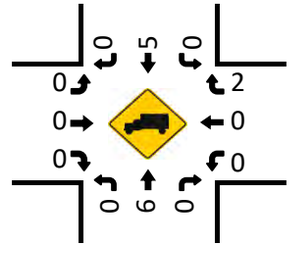
Pedestrians (Crosswalks)



Cars (PM)



HT (PM)



Prepared by National Data & Surveying Services

Normandie Ave & Artesia Blvd

Peak Hour Turning Movement Count

ID: 22-020099-005
City: Gardena

Day: Tuesday
Date: 3/29/2022

PEAK HOURS

AM: 07:45 AM - 08:45 AM
NOON: NONE
PM: 04:45 PM - 05:45 PM

COUNT PERIODS

AM: 7:00 AM - 09:00 AM
NOON: NONE
PM: 4:00 PM - 06:00 PM

CONTROL: Signalized

	AM	NOON	PM
TEV	5312	0	5669
PHF	0.95		0.96

SOUTHBOUND (Normandie Ave)

AM	120	716	249	0	1021	AM
NOON	0	0	0	0	0	NOON
PM	125	479	234	0	1341	PM
	0	2	2	0		

EASTBOUND (Artesia Blvd)

AM	NOON	PM		
1827	0	1548		
4	0	5	0	
76	0	208	2	
864	0	1467	4	
114	0	143	0	
AM	NOON	PM		

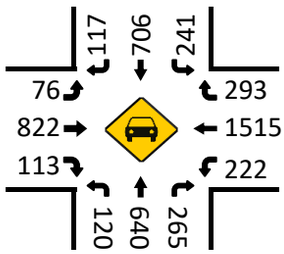
WESTBOUND (Artesia Blvd)

	PM	NOON	AM
0	379	0	300
4	1274	0	1580
2	144	0	235
0	17	0	15
	2013	0	1399
	PM	NOON	AM

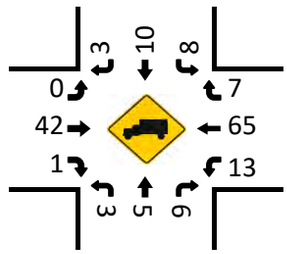
NORTHBOUND (Normandie Ave)

PM	767	1	144	754	295	PM
NOON	0	0	0	0	0	NOON
AM	1065	0	123	645	271	AM
		0	1	2	1	

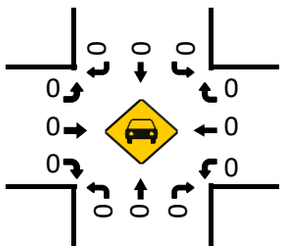
Cars (AM)



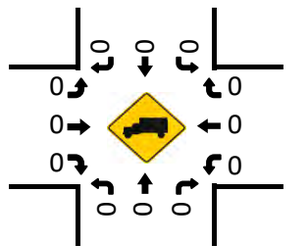
HT (AM)



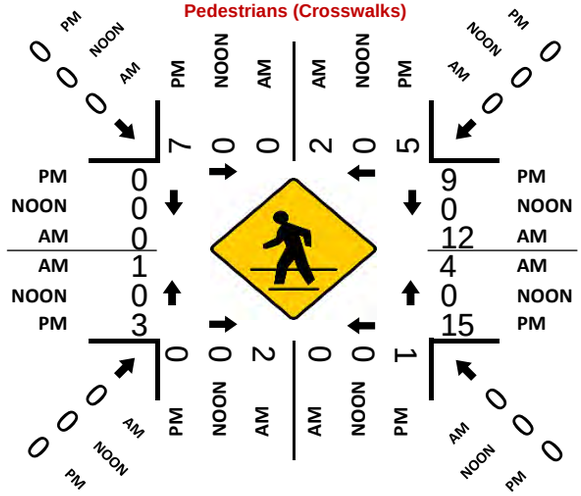
Cars (NOON)



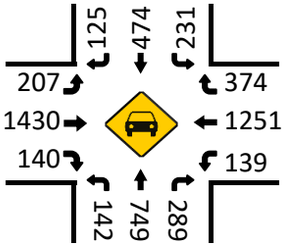
HT (NOON)



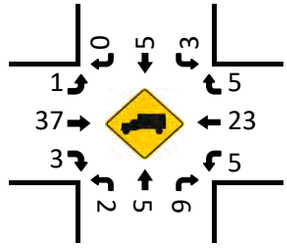
Pedestrians (Crosswalks)



Cars (PM)



HT (PM)



Prepared by National Data & Surveying Services

VOLUME

169th St W/O Brighton Way

Day: Tuesday
Date: 3/29/2022

City: Gardena
Project #: CA22_020100_001

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	637	706	1,343

AM Period	NB	SB	EB		WB		TOTAL		PM Period	NB	SB	EB		WB		TOTAL	
00:00			0		0		0		12:00			8		10		18	
00:15			0		2		2		12:15			8		8		16	
00:30			0		4		4		12:30			8		8		16	
00:45			1	1	0	6	1	7	12:45			11	35	11	37	22	72
01:00			0		0		0		13:00			8		15		23	
01:15			0		0		0		13:15			12		15		27	
01:30			0		1		1		13:30			8		11		19	
01:45			1	1	0	1	1	2	13:45			9	37	7	48	16	85
02:00			0		1		1		14:00			10		10		20	
02:15			0		0		0		14:15			7		12		19	
02:30			0		0		0		14:30			8		18		26	
02:45			0		0	1	0	1	14:45			14	39	13	53	27	92
03:00			0		1		1		15:00			8		22		30	
03:15			0		1		1		15:15			8		6		14	
03:30			2		0		2		15:30			16		15		31	
03:45			1	3	1	3	2	6	15:45			12	44	15	58	27	102
04:00			0		0		0		16:00			11		19		30	
04:15			0		1		1		16:15			12		15		27	
04:30			0		0		0		16:30			9		20		29	
04:45			4	4	1	2	5	6	16:45			8	40	11	65	19	105
05:00			5		2		7		17:00			15		20		35	
05:15			2		1		3		17:15			11		18		29	
05:30			4		3		7		17:30			11		19		30	
05:45			5	16	1	7	6	23	17:45			8	45	12	69	20	114
06:00			3		2		5		18:00			8		11		19	
06:15			3		2		5		18:15			10		12		22	
06:30			11		3		14		18:30			11		6		17	
06:45			14	31	5	12	19	43	18:45			5	34	8	37	13	71
07:00			12		7		19		19:00			9		15		24	
07:15			13		6		19		19:15			5		11		16	
07:30			15		12		27		19:30			8		13		21	
07:45			16	56	12	37	28	93	19:45			6	28	8	47	14	75
08:00			24		15		39		20:00			1		8		9	
08:15			22		8		30		20:15			5		5		10	
08:30			12		11		23		20:30			0		8		8	
08:45			13	71	10	44	23	115	20:45			5	11	2	23	7	34
09:00			9		7		16		21:00			6		7		13	
09:15			8		7		15		21:15			5		8		13	
09:30			14		11		25		21:30			5		7		12	
09:45			11	42	5	30	16	72	21:45			4	20	6	28	10	48
10:00			15		10		25		22:00			1		1		2	
10:15			8		7		15		22:15			1		5		6	
10:30			6		9		15		22:30			0		1		1	
10:45			4	33	8	34	12	67	22:45			0	2	3	10	3	12
11:00			2		9		11		23:00			0		3		3	
11:15			11		14		25		23:15			2		3		5	
11:30			14		7		21		23:30			1		1		2	
11:45			12	39	14	44	26	83	23:45			2	5	3	10	5	15
TOTALS				297		221		518	TOTALS				340		485		825
SPLIT %				57.3%		42.7%		38.6%	SPLIT %				41.2%		58.8%		61.4%

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	637	706	1,343

AM Peak Hour				07:30	07:30	07:30			PM Peak Hour				15:30	15:45	15:30		
AM Pk Volume				77	47	124			PM Pk Volume				51	69	115		
Pk Hr Factor				0.802	0.783	0.795			Pk Hr Factor				0.797	0.863	0.927		
7 - 9 Volume	0	0		127	81	208			4 - 6 Volume	0	0		85	134	219		
7 - 9 Peak Hour				07:30	07:30	07:30			4 - 6 Peak Hour				16:45	16:30	17:00		
7 - 9 Pk Volume	0	0		77	47	124			4 - 6 Pk Volume	0	0		45	69	114		
Pk Hr Factor	0.000	0.000		0.802	0.783	0.795			Pk Hr Factor	0.000	0.000		0.750	0.863	0.814		

Prepared by National Data & Surveying Services

VOLUME

170th St W/O Brighton Way

Day: Tuesday
Date: 3/29/2022

City: Gardena
Project #: CA22_020100_002

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	115	102	217

AM Period	NB	SB	EB		WB		TOTAL		PM Period	NB	SB	EB		WB		TOTAL	
00:00			0		0		0		12:00			1		1		2	
00:15			0		0		0		12:15			1		3		4	
00:30			1		0		1		12:30			3		2		5	
00:45			1	2	0		1	2	12:45			0	5	1	7	1	12
01:00			0		0		0		13:00			1		2		3	
01:15			0		0		0		13:15			3		1		4	
01:30			1		0		1		13:30			7		3		10	
01:45			0	1	0		0	1	13:45			1	12	2	8	3	20
02:00			0		0		0		14:00			1		1		2	
02:15			0		0		0		14:15			3		2		5	
02:30			0		0		0		14:30			1		2		3	
02:45			0		0		0		14:45			3	8	3	8	6	16
03:00			0		0		0		15:00			1		4		5	
03:15			0		0		0		15:15			0		1		1	
03:30			0		0		0		15:30			2		0		2	
03:45			0		0		0		15:45			1	4	0	5	1	9
04:00			1		0		1		16:00			3		2		5	
04:15			0		0		0		16:15			1		1		2	
04:30			0		0		0		16:30			2		3		5	
04:45			0	1	0		0	1	16:45			2	8	2	8	4	16
05:00			0		0		0		17:00			5		4		9	
05:15			0		0		0		17:15			4		5		9	
05:30			0		1		1		17:30			4		3		7	
05:45			0		0	1	0	1	17:45			3	16	0	12	3	28
06:00			0		0		0		18:00			5		1		6	
06:15			0		1		1		18:15			1		4		5	
06:30			0		0		0		18:30			1		1		2	
06:45			0		0	1	0	1	18:45			0	7	1	7	1	14
07:00			2		1		3		19:00			1		1		2	
07:15			2		2		4		19:15			0		1		1	
07:30			0		2		2		19:30			3		0		3	
07:45			4	8	3	8	7	16	19:45			1	5	1	3	2	8
08:00			2		2		4		20:00			3		2		5	
08:15			1		0		1		20:15			2		0		2	
08:30			1		0		1		20:30			0		0		0	
08:45			0	4	0	2	0	6	20:45			0	5	2	4	2	9
09:00			2		1		3		21:00			1		1		2	
09:15			1		1		2		21:15			1		1		2	
09:30			0		2		2		21:30			1		1		2	
09:45			0	3	2	6	2	9	21:45			2	5	0	3	2	8
10:00			2		3		5		22:00			0		2		2	
10:15			3		2		5		22:15			0		0		0	
10:30			2		2		4		22:30			0		0		0	
10:45			2	9	1	8	3	17	22:45			0		0	2	0	2
11:00			1		1		2		23:00			1		0		1	
11:15			4		4		8		23:15			0		2		2	
11:30			2		2		4		23:30			0		0		0	
11:45			4	11	0	7	4	18	23:45			0	1	0	2	0	3
TOTALS				39		33		72	TOTALS				76		69		145
SPLIT %				54.2%		45.8%		33.2%	SPLIT %				52.4%		47.6%		66.8%

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	115	102	217

AM Peak Hour				11:00		07:15		11:00	PM Peak Hour				17:00		16:30		16:45
AM Pk Volume				11		9		18	PM Pk Volume				16		14		29
Pk Hr Factor				0.688		0.750		0.563	Pk Hr Factor				0.800		0.700		0.806
7 - 9 Volume	0	0		12		10		22	4 - 6 Volume	0	0		24		20		44
7 - 9 Peak Hour				07:00		07:15		07:15	4 - 6 Peak Hour				17:00		16:30		16:45
7 - 9 Pk Volume	0	0		8		9		17	4 - 6 Pk Volume	0	0		16		14		29
Pk Hr Factor	0.000	0.000		0.500		0.750		0.607	Pk Hr Factor	0.000	0.000		0.800		0.700		0.806

Prepared by National Data & Surveying Services

VOLUME

Normandie Ave N/O 169th St

Day: Tuesday
Date: 5/10/2022

City: Gardena
Project #: CA22_020160_001

DAILY TOTALS	NB	SB	EB	WB	Total
	13,366	11,224	0	0	24,590

AM Period	NB		SB		EB		WB		TOTAL		PM Period	NB		SB		EB		WB		TOTAL	
0:00	36		11						47		**12:00**	206		175						381	
0:15	16		9						25		**12:15**	219		190						409	
0:30	17		3						20		**12:30**	202		159						361	
0:45	15	84	7	30					22	114	**12:45**	187	814	184	708					371	1522
1:00	9		7						16		**13:00**	185		191						376	
1:15	9		4						13		**13:15**	219		178						397	
1:30	6		8						14		**13:30**	210		217						427	
1:45	8	32	3	22					11	54	**13:45**	204	818	182	768					386	1586
2:00	9		2						11		**14:00**	216		171						387	
2:15	10		4						14		**14:15**	206		163						369	
2:30	8		6						14		**14:30**	211		185						396	
2:45	7	34	4	16					11	50	**14:45**	241	874	178	697					419	1571
3:00	12		4						16		**15:00**	216		238						454	
3:15	4		5						9		**15:15**	235		217						452	
3:30	4		4						8		**15:30**	282		232						514	
3:45	8	28	11	24					19	52	**15:45**	310	1043	222	909					532	1952
4:00	8		14						22		**16:00**	306		199						505	
4:15	20		16						36		**16:15**	274		208						482	
4:30	15		27						42		**16:30**	304		241						545	
4:45	21	64	30	87					51	151	**16:45**	322	1206	224	872					546	2078
5:00	19		24						43		**17:00**	282		218						500	
5:15	31		52						83		**17:15**	276		201						477	
5:30	44		65						109		**17:30**	322		246						568	
5:45	55	149	75	216					130	365	**17:45**	326	1206	207	872					533	2078
6:00	59		73						132		**18:00**	287		174						461	
6:15	73		83						156		**18:15**	273		154						427	
6:30	103		115						218		**18:30**	204		170						374	
6:45	103	338	140	411					243	749	**18:45**	216	980	143	641					359	1621
7:00	162		124						286		**19:00**	208		142						350	
7:15	171		175						346		**19:15**	164		135						299	
7:30	186		189						375		**19:30**	153		134						287	
7:45	225	744	281	769					506	1513	**19:45**	147	672	107	518					254	1190
8:00	248		304						552		**20:00**	135		91						226	
8:15	256		246						502		**20:15**	157		101						258	
8:30	250		187						437		**20:30**	117		86						203	
8:45	215	969	175	912					390	1881	**20:45**	96	505	59	337					155	842
9:00	176		136						312		**21:00**	71		53						124	
9:15	186		150						336		**21:15**	75		64						139	
9:30	170		166						336		**21:30**	73		70						143	
9:45	177	709	161	613					338	1322	**21:45**	77	296	71	258					148	554
10:00	162		152						314		**22:00**	62		61						123	
10:15	184		140						324		**22:15**	66		52						118	
10:30	197		166						363		**22:30**	60		40						100	
10:45	189	732	147	605					336	1337	**22:45**	41	229	43	196					84	425
11:00	175		159						334		**23:00**	40		26						66	
11:15	172		183						355		**23:15**	40		20						60	
11:30	169		160						329		**23:30**	31		16						47	
11:45	184	700	159	661					343	1361	**23:45**	29	140	20	82					49	222
TOTALS		4583		4366						**8949**	**TOTALS**		8783		6858						**15641**
SPLIT %		51.2%		48.8%						**36.4%**	**SPLIT %**		56.2%		43.8%						**63.6%**

DAILY TOTALS	NB	SB	EB	WB	Total
	13,366	11,224	0	0	24,590

AM Peak Hour	7:45	7:30			**7:45**	**PM Peak Hour**	17:15	15:00			**16:45**
AM Pk Volume	979	1020			**1997**	**PM Pk Volume**	1211	909			**2091**
Pk Hr Factor	0.956	0.839			**0.904**	**Pk Hr Factor**	0.929	0.955			**0.920**
7 - 9 Volume	1713	1681	0	0	**3394**	**4 - 6 Volume**	2412	1744	0	0	**4156**
7 - 9 Peak Hour	7:45	7:30			**7:45**	**4 - 6 Peak Hour**	16:00	16:15			**16:45**
7 - 9 Pk Volume	979	1020	0	0	**1997**	**4 - 6 Pk Volume**	1206	891	0	0	**2091**
Pk Hr Factor	0.956	0.839	0.000	0.000	**0.904**	**Pk Hr Factor**	0.936	0.924	0.000	0.000	**0.920**

Prepared by National Data & Surveying Services

VOLUME

Normandie Ave N/O 169th St

Day: Wednesday
Date: 5/11/2022

City: Gardena
Project #: CA22_020160_001

DAILY TOTALS	NB	SB	EB	WB	Total
	13,189	11,142	0	0	24,331

AM Period	NB		SB		EB		WB		TOTAL	
0:00	20		16						36	
0:15	24		5						29	
0:30	26		8						34	
0:45	22	92	10	39					32	131
1:00	17		5						22	
1:15	15		8						23	
1:30	8		7						15	
1:45	13	53	2	22					15	75
2:00	12		5						17	
2:15	8		9						17	
2:30	11		5						16	
2:45	12	43	6	25					18	68
3:00	8		3						11	
3:15	7		8						15	
3:30	4		9						13	
3:45	5	24	5	25					10	49
4:00	9		6						15	
4:15	11		18						29	
4:30	22		27						49	
4:45	20	62	16	67					36	129
5:00	26		39						65	
5:15	30		47						77	
5:30	32		62						94	
5:45	67	155	57	205					124	360
6:00	73		72						145	
6:15	79		77						156	
6:30	94		109						203	
6:45	116	362	112	370					228	732
7:00	157		125						282	
7:15	162		176						338	
7:30	204		195						399	
7:45	222	745	269	765					491	1510
8:00	255		320						575	
8:15	244		235						479	
8:30	253		191						444	
8:45	234	986	161	907					395	1893
9:00	178		162						340	
9:15	171		139						310	
9:30	145		139						284	
9:45	163	657	142	582					305	1239
10:00	147		137						284	
10:15	185		158						343	
10:30	167		140						307	
10:45	170	669	157	592					327	1261
11:00	169		173						342	
11:15	180		176						356	
11:30	164		167						331	
11:45	182	695	159	675					341	1370
TOTALS		4543		4274						8817
SPLIT %		51.5%		48.5%						36.2%

PM Period	NB		SB		EB		WB		TOTAL	
12:00	166		174						340	
12:15	201		184						385	
12:30	183		178						361	
12:45	198	748	181	717					379	1465
13:00	175		192						367	
13:15	173		168						341	
13:30	207		162						369	
13:45	222	777	171	693					393	1470
14:00	206		185						391	
14:15	201		174						375	
14:30	241		213						454	
14:45	244	892	189	761					433	1653
15:00	240		291						531	
15:15	233		229						462	
15:30	296		230						526	
15:45	309	1078	222	972					531	2050
16:00	279		203						482	
16:15	293		213						506	
16:30	260		230						490	
16:45	303	1135	233	879					536	2014
17:00	302		228						530	
17:15	314		196						510	
17:30	299		227						526	
17:45	270	1185	218	869					488	2054
18:00	271		175						446	
18:15	235		177						412	
18:30	224		167						391	
18:45	185	915	130	649					315	1564
19:00	178		144						322	
19:15	177		132						309	
19:30	148		108						256	
19:45	144	647	109	493					253	1140
20:00	131		106						237	
20:15	149		80						229	
20:30	122		81						203	
20:45	122	524	51	318					173	842
21:00	124		75						199	
21:15	82		68						150	
21:30	78		67						145	
21:45	74	358	58	268					132	626
22:00	69		49						118	
22:15	61		37						98	
22:30	52		34						86	
22:45	50	232	25	145					75	377
23:00	42		34						76	
23:15	46		32						78	
23:30	38		21						59	
23:45	29	155	17	104					46	259
TOTALS		8646		6868						15514
SPLIT %		55.7%		44.3%						63.8%

DAILY TOTALS	NB	SB	EB	WB	Total
	13,189	11,142	0	0	24,331

AM Peak Hour	8:00	7:30			7:45	PM Peak Hour	16:45	15:00			16:45
AM Pk Volume	986	1019			1989	PM Pk Volume	1218	972			2102
Pk Hr Factor	0.967	0.796			0.865	Pk Hr Factor	0.970	0.835			0.980
7 - 9 Volume	1731	1672	0	0	3403	4 - 6 Volume	2320	1748	0	0	4068
7 - 9 Peak Hour	8:00	7:30			7:45	4 - 6 Peak Hour	16:45	16:15			16:45
7 - 9 Pk Volume	986	1019	0	0	1989	4 - 6 Pk Volume	1218	904	0	0	2102
Pk Hr Factor	0.967	0.796	0.000	0.000	0.865	Pk Hr Factor	0.970	0.970	0.000	0.000	0.980

Prepared by National Data & Surveying Services

VOLUME

169th St W/O Normandie Ave

Day: Tuesday
Date: 5/10/2022

City: Gardena
Project #: CA22_020160_002

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	715	853	1,568

AM Period	NB	SB	EB		WB		TOTAL		PM Period	NB	SB	EB		WB		TOTAL	
0:00			0		1		1		12:00			14		17		31	
0:15			0		0		0		12:15			16		12		28	
0:30			2		0		2		12:30			7		10		17	
0:45			0	2	0	1	0	3	12:45			6	43	6	45	12	88
1:00			0		0		0		13:00			10		9		19	
1:15			0		1		1		13:15			11		6		17	
1:30			1		2		3		13:30			12		15		27	
1:45			1	2	0	3	1	5	13:45			9	42	12	42	21	84
2:00			0		1		1		14:00			12		8		20	
2:15			0		0		0		14:15			15		13		28	
2:30			0		1		1		14:30			11		18		29	
2:45			1	1	1	3	2	4	14:45			10	48	8	47	18	95
3:00			0		1		1		15:00			8		15		23	
3:15			0		2		2		15:15			14		18		32	
3:30			2		2		4		15:30			12		11		23	
3:45			2	4	2	7	4	11	15:45			10	44	12	56	22	100
4:00			1		2		3		16:00			17		18		35	
4:15			3		1		4		16:15			10		14		24	
4:30			3		2		5		16:30			13		17		30	
4:45			3	10	1	6	4	16	16:45			10	50	16	65	26	115
5:00			3		4		7		17:00			9		32		41	
5:15			12		4		16		17:15			5		23		28	
5:30			2		3		5		17:30			14		12		26	
5:45			7	24	3	14	10	38	17:45			16	44	19	86	35	130
6:00			5		3		8		18:00			10		15		25	
6:15			5		8		13		18:15			4		13		17	
6:30			6		8		14		18:30			12		13		25	
6:45			10	26	11	30	21	56	18:45			9	35	14	55	23	90
7:00			10		8		18		19:00			6		18		24	
7:15			11		7		18		19:15			4		14		18	
7:30			19		6		25		19:30			8		13		21	
7:45			22	62	18	39	40	101	19:45			7	25	12	57	19	82
8:00			27		19		46		20:00			6		10		16	
8:15			18		11		29		20:15			8		17		25	
8:30			17		14		31		20:30			10		13		23	
8:45			13	75	5	49	18	124	20:45			3	27	14	54	17	81
9:00			9		15		24		21:00			5		8		13	
9:15			4		9		13		21:15			2		10		12	
9:30			12		10		22		21:30			5		8		13	
9:45			7	32	11	45	18	77	21:45			6	18	6	32	12	50
10:00			11		11		22		22:00			5		5		10	
10:15			8		9		17		22:15			2		4		6	
10:30			8		10		18		22:30			1		5		6	
10:45			7	34	12	42	19	76	22:45			2	10	1	15	3	25
11:00			14		7		21		23:00			2		8		10	
11:15			12		17		29		23:15			5		1		6	
11:30			9		13		22		23:30			3		1		4	
11:45			10	45	11	48	21	93	23:45			2	12	2	12	4	24
TOTALS				317		287		604	TOTALS				398		566		964
SPLIT %				52.5%		47.5%		38.5%	SPLIT %				41.3%		58.7%		61.5%

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	715	853	1,568

AM Peak Hour				7:30	7:45	7:45		PM Peak Hour				15:15	16:30	17:00
AM Pk Volume				86	62	146		PM Pk Volume				53	88	130
Pk Hr Factor				0.796	0.816	0.793		Pk Hr Factor				0.779	0.688	0.793
7 - 9 Volume	0	0		137	88	225		4 - 6 Volume	0	0		94	151	245
7 - 9 Peak Hour				7:30	7:45	7:45		4 - 6 Peak Hour				16:00	16:30	17:00
7 - 9 Pk Volume	0	0		86	62	146		4 - 6 Pk Volume	0	0		50	88	130
Pk Hr Factor	0.000	0.000		0.796	0.816	0.793		Pk Hr Factor	0.000	0.000		0.735	0.688	0.793

Prepared by National Data & Surveying Services

VOLUME

169th St W/O Normandie Ave

Day: Wednesday
Date: 5/11/2022

City: Gardena
Project #: CA22_020160_002

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	706	850	1,556

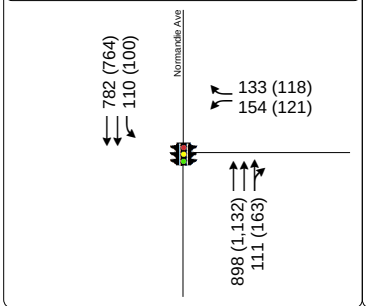
AM Period	NB	SB	EB		WB		TOTAL		PM Period	NB	SB	EB		WB		TOTAL	
0:00			1		2		3		12:00			9		9		18	
0:15			0		1		1		12:15			6		9		15	
0:30			1		1		2		12:30			6		12		18	
0:45			2	4	2	6	4	10	12:45			7	28	16	46	23	74
1:00			1		1		2		13:00			11		16		27	
1:15			0		1		1		13:15			14		11		25	
1:30			1		0		1		13:30			8		14		22	
1:45			2	4	1	3	3	7	13:45			9	42	9	50	18	92
2:00			1		1		2		14:00			11		20		31	
2:15			1		0		1		14:15			12		11		23	
2:30			0		0		0		14:30			14		16		30	
2:45			2	4	2	3	4	7	14:45			12	49	14	61	26	110
3:00			2		1		3		15:00			14		15		29	
3:15			1		0		1		15:15			10		11		21	
3:30			1		1		2		15:30			22		22		44	
3:45			0	4	2	4	2	8	15:45			7	53	12	60	19	113
4:00			0		2		2		16:00			11		21		32	
4:15			3		2		5		16:15			13		21		34	
4:30			1		0		1		16:30			16		16		32	
4:45			4	8	3	7	7	15	16:45			10	50	14	72	24	122
5:00			1		5		6		17:00			9		24		33	
5:15			7		2		9		17:15			9		17		26	
5:30			6		2		8		17:30			11		18		29	
5:45			7	21	4	13	11	34	17:45			12	41	13	72	25	113
6:00			4		3		7		18:00			17		14		31	
6:15			5		7		12		18:15			7		14		21	
6:30			15		7		22		18:30			4		15		19	
6:45			12	36	11	28	23	64	18:45			9	37	9	52	18	89
7:00			16		9		25		19:00			8		13		21	
7:15			11		9		20		19:15			11		12		23	
7:30			14		7		21		19:30			5		11		16	
7:45			21	62	21	46	42	108	19:45			11	35	13	49	24	84
8:00			29		16		45		20:00			5		5		10	
8:15			16		12		28		20:15			6		10		16	
8:30			17		13		30		20:30			4		11		15	
8:45			9	71	10	51	19	122	20:45			3	18	6	32	9	50
9:00			12		8		20		21:00			6		8		14	
9:15			10		8		18		21:15			1		8		9	
9:30			6		11		17		21:30			3		9		12	
9:45			4	32	9	36	13	68	21:45			6	16	8	33	14	49
10:00			7		12		19		22:00			2		3		5	
10:15			11		10		21		22:15			3		4		7	
10:30			9		13		22		22:30			4		7		11	
10:45			7	34	5	40	12	74	22:45			2	11	1	15	3	26
11:00			15		11		26		23:00			1		3		4	
11:15			10		18		28		23:15			2		4		6	
11:30			6		11		17		23:30			1		2		3	
11:45			10	41	18	58	28	99	23:45			1	5	4	13	5	18
TOTALS				321		295		616	TOTALS				385		555		940
SPLIT %				52.1%		47.9%		39.6%	SPLIT %				41.0%		59.0%		60.4%

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	706	850	1,556

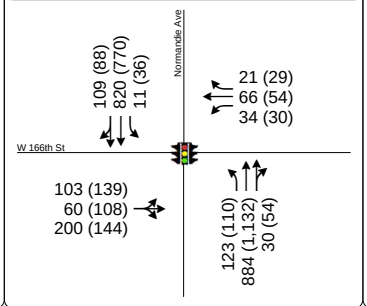
AM Peak Hour				7:45		7:45		7:45	PM Peak Hour				14:45		15:30		15:30
AM Pk Volume				83		62		145	PM Pk Volume				58		76		129
Pk Hr Factor				0.716		0.738		0.806	Pk Hr Factor				0.659		0.864		0.733
7 - 9 Volume	0	0		133		97		230	4 - 6 Volume	0	0		91		144		235
7 - 9 Peak Hour				7:45		7:45		7:45	4 - 6 Peak Hour				16:00		16:15		16:15
7 - 9 Pk Volume	0	0		83		62		145	4 - 6 Pk Volume	0	0		50		75		123
Pk Hr Factor	0.000	0.000		0.716		0.738		0.806	Pk Hr Factor	0.000	0.000		0.781		0.781		0.904

Appendix C: Traffic Volumes and Lane Configurations

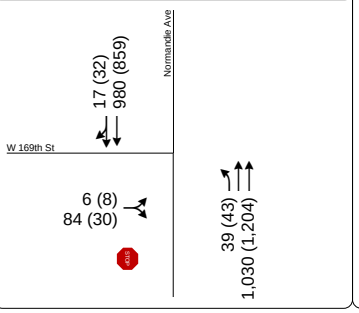
1. Normandie Ave/W Gardena Blvd



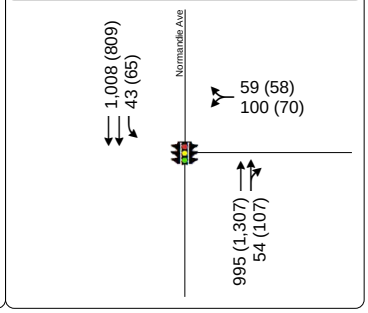
2. Normandie Ave/W 166th St



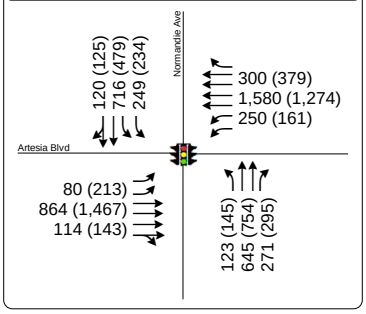
3. Normandie Ave/W 169th St



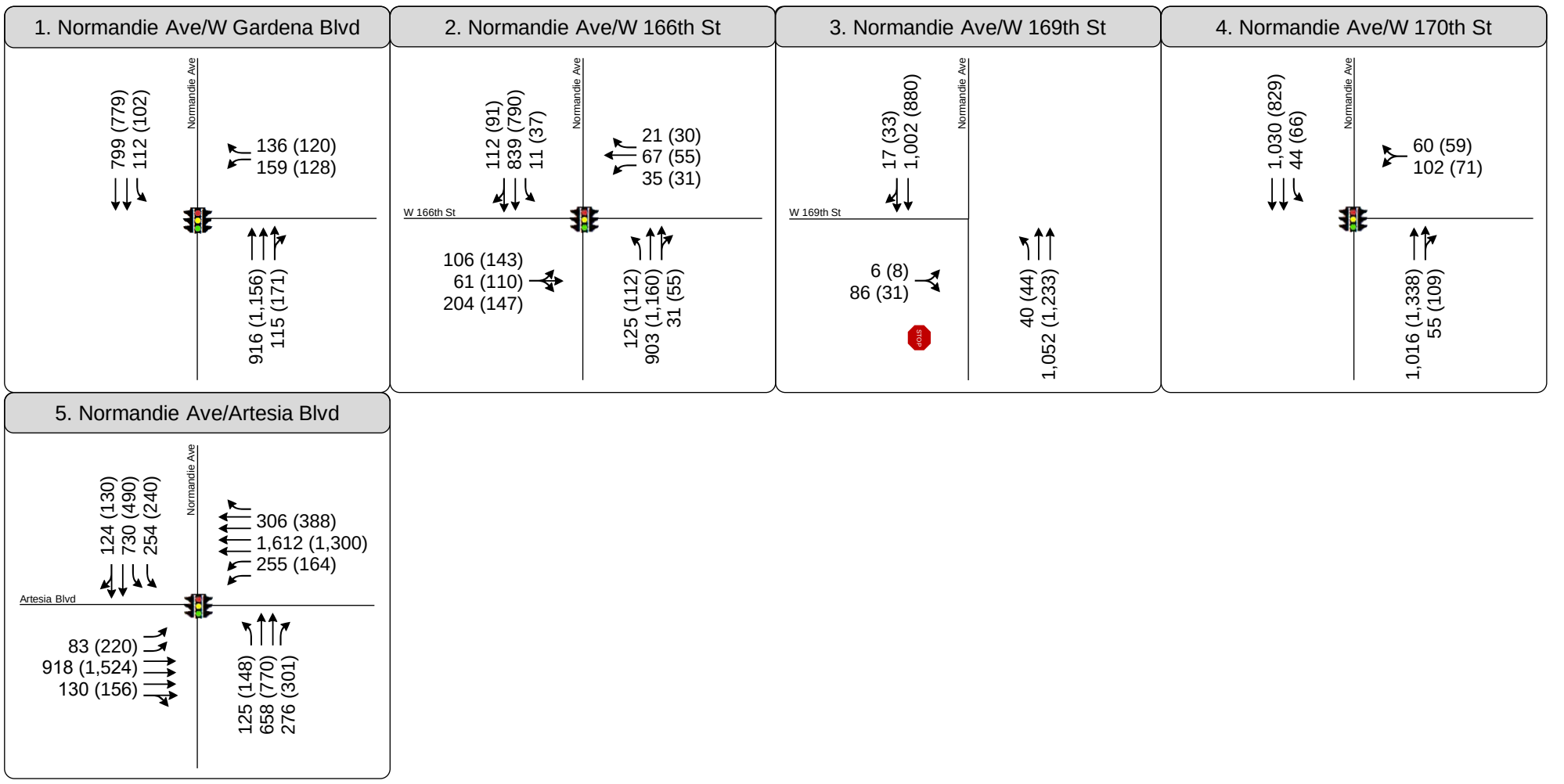
4. Normandie Ave/W 170th St

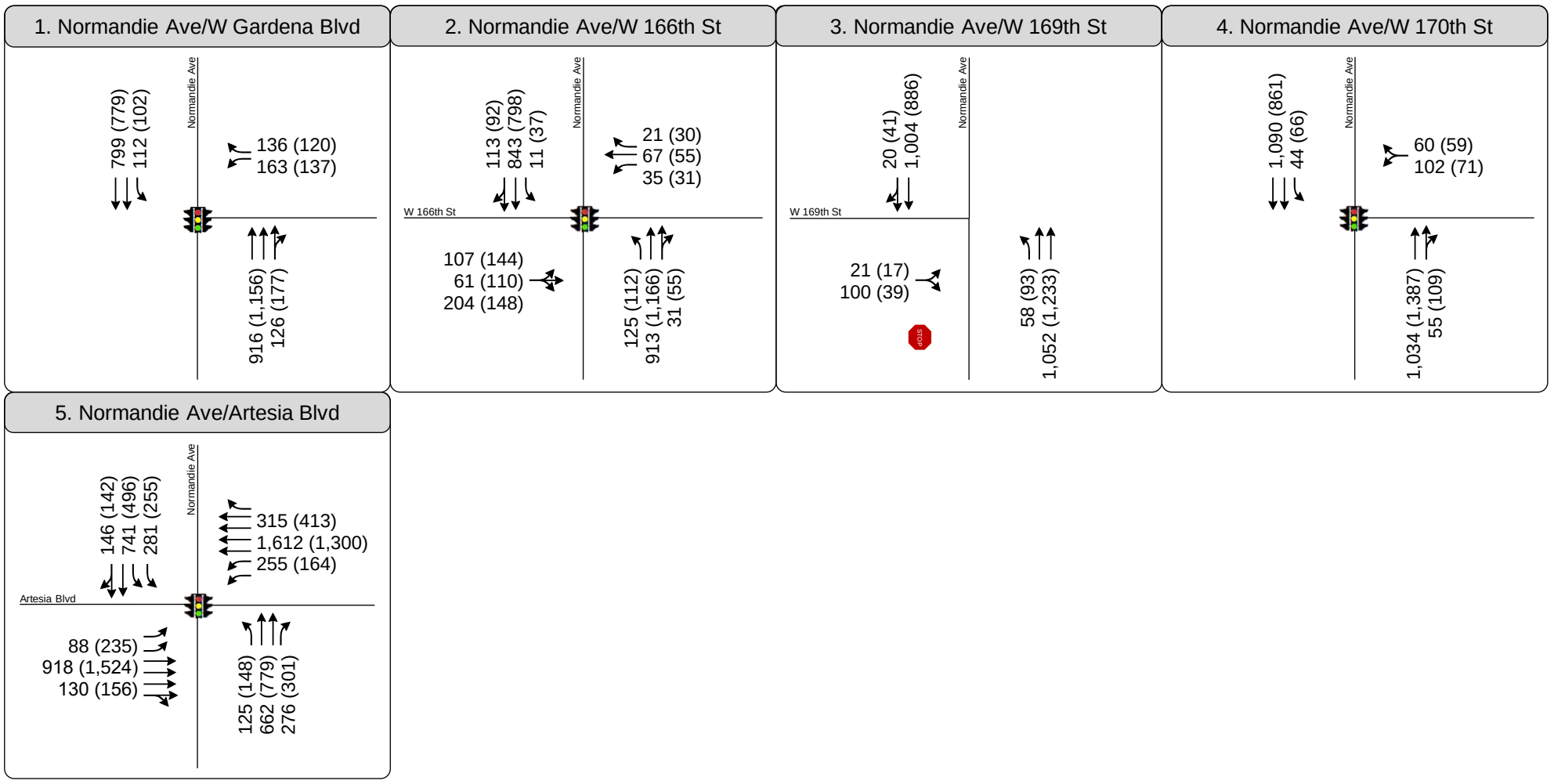


5. Normandie Ave/Artesia Blvd




West Gardena Boulevard
West Gardena Boulevard
West 166th Street
Gardena
West 169th St
West 168th Street
West 170th Street
West Artesia Boulevard
Brighton Avenue
Berendo Avenue
South Western Avenue
La Salle Avenue
Denker Avenue
Halldale Av
South Normandie Avenue
New Hampshire Avenue
South Vermont Avenue
South Gardena Park
1
2
3
4
5
N

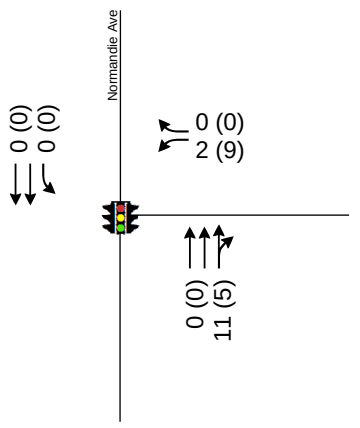

1. Normandie Ave/W Gardena Blvd
799 (779)
112 (102)
Normandie Ave
136 (120)
159 (128)
916 (1,156)
115 (171)
2. Normandie Ave/W 166th St
112 (91)
839 (790)
11 (37)
Normandie Ave
21 (30)
67 (55)
35 (31)
W 166th St
106 (143)
61 (110)
204 (147)
125 (112)
903 (1,160)
31 (55)
3. Normandie Ave/W 169th St
17 (33)
1,002 (880)
Normandie Ave
W 169th St
6 (8)
86 (31)
40 (44)
1,052 (1,233)
4. Normandie Ave/W 170th St
1,030 (829)
44 (66)
Normandie Ave
60 (59)
102 (71)
1,016 (1,338)
55 (109)
5. Normandie Ave/Artesia Blvd
124 (130)
730 (490)
254 (240)
Normandie Ave
306 (388)
1,612 (1,300)
255 (164)
Artesia Blvd
83 (220)
918 (1,524)
130 (156)
125 (148)
658 (770)
276 (301)



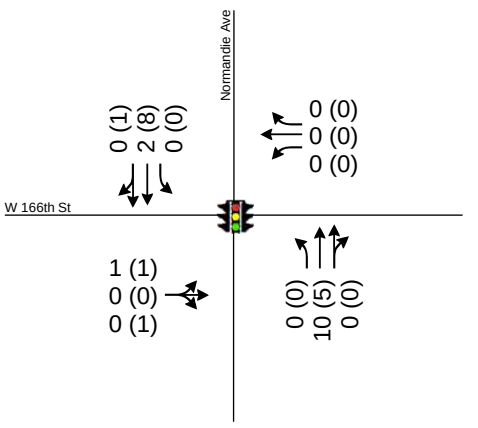
Appendix C

Peak Hour Traffic Volumes & Lane Configurations
Opening Year + Project AM (PM)

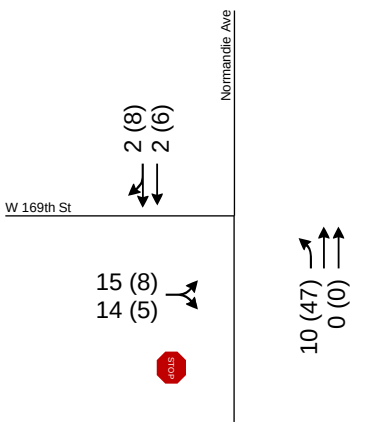
1. Normandie Ave/W Gardena Blvd



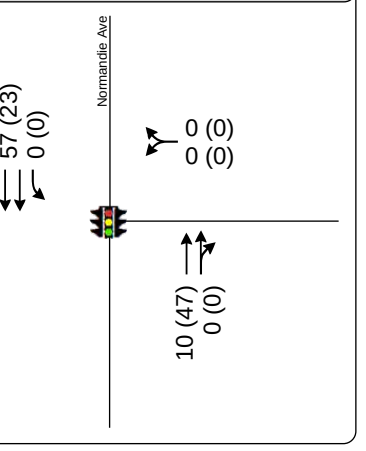
2. Normandie Ave/W 166th St



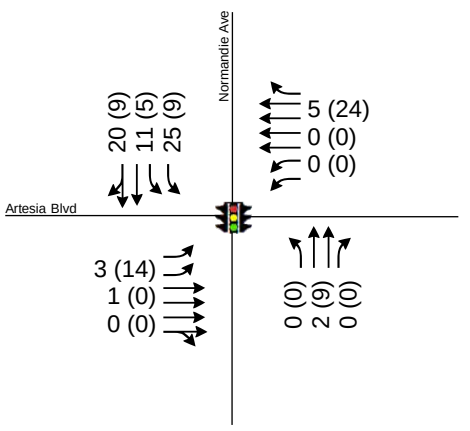
3. Normandie Ave/W 169th St



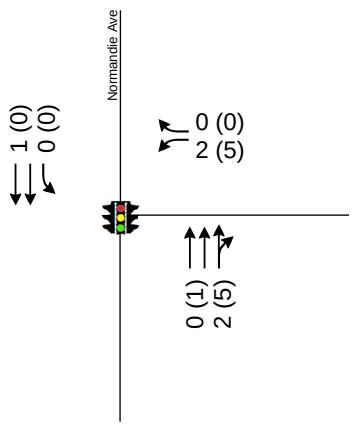
4. Normandie Ave/W 170th St



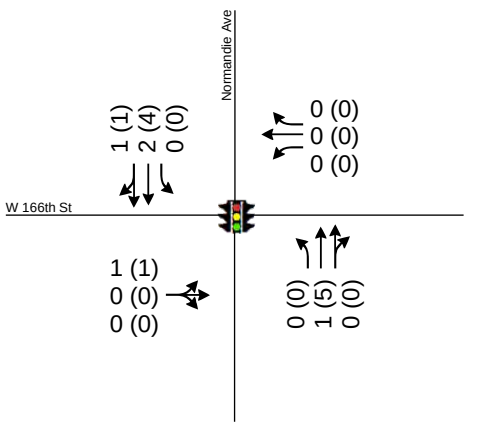
5. Normandie Ave/Artesia Blvd



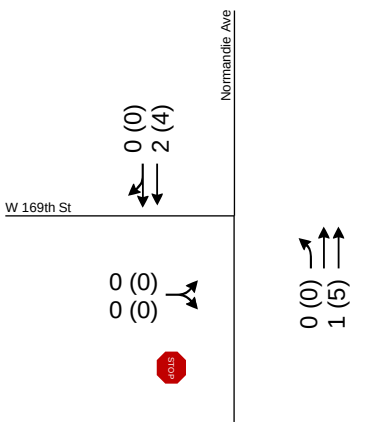
1. Normandie Ave/W Gardena Blvd



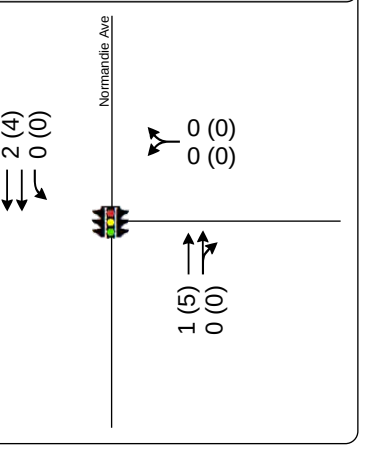
2. Normandie Ave/W 166th St



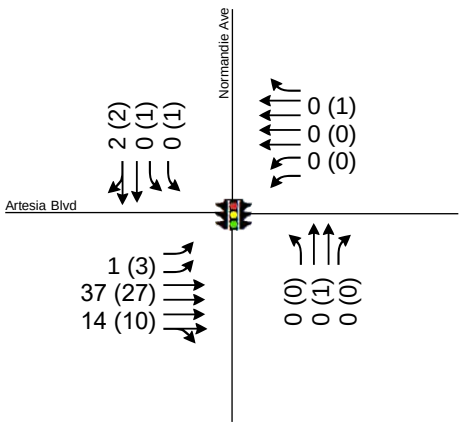
3. Normandie Ave/W 169th St



4. Normandie Ave/W 170th St



5. Normandie Ave/Artesia Blvd



Appendix D: LOS and Queuing Worksheets

Existing (2022) Conditions

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	154	133	898	111	110	782
Future Volume (veh/h)	154	133	898	111	110	782
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		0.97	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1870	1945	1870	1870	1870	1870
Adj Flow Rate, veh/h	166	28	966	102	118	841
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	207	192	3206	337	474	2745
Arrive On Green	0.12	0.12	0.69	0.69	0.04	0.77
Sat Flow, veh/h	1781	1648	4842	492	1781	3647
Grp Volume(v), veh/h	166	28	703	365	118	841
Grp Sat Flow(s),veh/h/ln	1781	1648	1702	1762	1781	1777
Q Serve(g_s), s	8.2	1.4	7.4	7.4	1.6	6.3
Cycle Q Clear(g_c), s	8.2	1.4	7.4	7.4	1.6	6.3
Prop In Lane	1.00	1.00		0.28	1.00	
Lane Grp Cap(c), veh/h	207	192	2335	1209	474	2745
V/C Ratio(X)	0.80	0.15	0.30	0.30	0.25	0.31
Avail Cap(c_a), veh/h	416	385	2335	1209	616	2745
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.79	0.79	1.00	1.00
Uniform Delay (d), s/veh	38.7	35.7	5.6	5.6	3.6	3.1
Incr Delay (d2), s/veh	7.0	0.3	0.3	0.5	0.1	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.9	0.6	2.2	2.4	0.4	1.5
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	45.7	36.1	5.9	6.1	3.7	3.3
LnGrp LOS	D	D	A	A	A	A
Approach Vol, veh/h	194		1068			959
Approach Delay, s/veh	44.3		5.9			3.4
Approach LOS	D		A			A

Timer - Assigned Phs	2	4	7	8
Phs Duration (G+Y+Rc), s	15.5	74.5	7.8	66.7
Change Period (Y+Rc), s	5.0	5.0	4.0	5.0
Max Green Setting (Gmax), s	21.0	59.0	11.0	44.0
Max Q Clear Time (g_c+I1), s	10.2	8.3	3.6	9.4
Green Ext Time (p_c), s	0.4	10.4	0.0	5.2

Intersection Summary	
HCM 6th Ctrl Delay	8.2
HCM 6th LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	103	60	200	34	66	21	123	884	30	11	820	109
Future Volume (veh/h)	103	60	200	34	66	21	123	884	30	11	820	109
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99		0.99	0.99		0.99	1.00		0.97	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1945	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	112	65	154	37	72	6	134	961	30	12	891	104
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	211	114	202	417	524	455	333	1850	58	337	1681	196
Arrive On Green	0.28	0.28	0.28	0.28	0.28	0.28	0.53	0.53	0.53	0.53	0.53	0.53
Sat Flow, veh/h	421	405	719	1154	1870	1625	565	3514	110	567	3193	373
Grp Volume(v), veh/h	331	0	0	37	72	6	134	486	505	12	496	499
Grp Sat Flow(s),veh/h/ln	1546	0	0	1154	1870	1625	565	1777	1847	567	1777	1789
Q Serve(g_s), s	7.5	0.0	0.0	0.0	1.5	0.1	10.6	9.2	9.2	0.7	9.5	9.5
Cycle Q Clear(g_c), s	10.0	0.0	0.0	1.6	1.5	0.1	20.0	9.2	9.2	9.9	9.5	9.5
Prop In Lane	0.34		0.47	1.00		1.00	1.00		0.06	1.00		0.21
Lane Grp Cap(c), veh/h	526	0	0	417	524	455	333	935	972	337	935	942
V/C Ratio(X)	0.63	0.00	0.00	0.09	0.14	0.01	0.40	0.52	0.52	0.04	0.53	0.53
Avail Cap(c_a), veh/h	892	0	0	697	977	849	386	1100	1143	389	1100	1108
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	16.9	0.0	0.0	14.0	13.9	13.4	14.6	8.0	8.0	11.2	8.0	8.0
Incr Delay (d2), s/veh	1.2	0.0	0.0	0.1	0.1	0.0	0.8	0.4	0.4	0.0	0.5	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.3	0.0	0.0	0.3	0.6	0.0	1.2	2.6	2.7	0.1	2.7	2.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	18.1	0.0	0.0	14.0	14.0	13.5	15.4	8.4	8.4	11.3	8.5	8.5
LnGrp LOS	B	A	A	B	B	B	B	A	A	B	A	A
Approach Vol, veh/h		331			115			1125			1007	
Approach Delay, s/veh		18.1			14.0			9.2			8.5	
Approach LOS		B			B			A			A	

Timer - Assigned Phs	2	4	6	8
Phs Duration (G+Y+Rc), s	19.5	32.2	19.5	32.2
Change Period (Y+Rc), s	5.0	5.0	5.0	5.0
Max Green Setting (Gmax), s	27.0	32.0	27.0	32.0
Max Q Clear Time (g_c+I1), s	3.6	11.9	12.0	22.0
Green Ext Time (p_c), s	0.5	6.5	1.8	5.2

Intersection Summary	
HCM 6th Ctrl Delay	10.3
HCM 6th LOS	B

Intersection	
Int Delay, s/veh	1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	6	84	39	1030	980	17
Future Vol, veh/h	6	84	39	1030	980	17
Conflicting Peds, #/hr	0	0	3	0	0	3
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	100	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	89	89	89	89	89	89
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	7	94	44	1157	1101	19

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1781	563	1123	0	-	0
Stage 1	1114	-	-	-	-	-
Stage 2	667	-	-	-	-	-
Critical Hdwy	6.84	6.94	4.14	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.22	-	-	-
Pot Cap-1 Maneuver	73	470	618	-	-	-
Stage 1	276	-	-	-	-	-
Stage 2	472	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	67	469	616	-	-	-
Mov Cap-2 Maneuver	67	-	-	-	-	-
Stage 1	256	-	-	-	-	-
Stage 2	471	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	20.3	0.4	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	616	-	335	-	-
HCM Lane V/C Ratio	0.071	-	0.302	-	-
HCM Control Delay (s)	11.3	-	20.3	-	-
HCM Lane LOS	B	-	C	-	-
HCM 95th %tile Q(veh)	0.2	-	1.2	-	-

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	100	59	995	54	43	1008
Future Volume (veh/h)	100	59	995	54	43	1008
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	0.99		0.99	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	109	35	1082	55	47	1096
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	155	50	2045	104	398	2113
Arrive On Green	0.12	0.12	0.59	0.59	0.59	0.59
Sat Flow, veh/h	1298	417	3533	175	494	3647
Grp Volume(v), veh/h	145	0	559	578	47	1096
Grp Sat Flow(s),veh/h/ln	1727	0	1777	1838	494	1777
Q Serve(g_s), s	3.0	0.0	6.8	6.8	2.3	6.6
Cycle Q Clear(g_c), s	3.0	0.0	6.8	6.8	9.1	6.6
Prop In Lane	0.75	0.24		0.10	1.00	
Lane Grp Cap(c), veh/h	206	0	1057	1093	398	2113
V/C Ratio(X)	0.70	0.00	0.53	0.53	0.12	0.52
Avail Cap(c_a), veh/h	1411	0	2394	2476	770	4789
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	15.5	0.0	4.4	4.4	7.1	4.4
Incr Delay (d2), s/veh	4.3	0.0	0.4	0.4	0.1	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	0.0	0.9	1.0	0.2	0.9
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	19.9	0.0	4.8	4.8	7.2	4.6
LnGrp LOS	B	A	A	A	A	A
Approach Vol, veh/h	145		1137			1143
Approach Delay, s/veh	19.9		4.8			4.7
Approach LOS	B		A			A

Timer - Assigned Phs	4	6	8
Phs Duration (G+Y+Rc), s	27.3	9.4	27.3
Change Period (Y+Rc), s	5.5	5.0	5.5
Max Green Setting (Gmax), s	49.5	30.0	49.5
Max Q Clear Time (g_c+I1), s	11.1	5.0	8.8
Green Ext Time (p_c), s	10.7	0.4	9.3

Intersection Summary	
HCM 6th Ctrl Delay	5.6
HCM 6th LOS	A

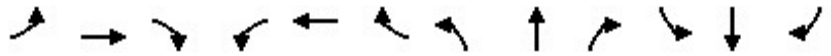
Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	80	864	114	250	1580	300	123	645	271	249	716	120
Future Volume (veh/h)	80	864	114	250	1580	300	123	645	271	249	716	120
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1945	1870	1870	1870
Adj Flow Rate, veh/h	84	909	99	263	1663	134	129	679	158	262	754	114
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	216	2151	231	302	2493	613	155	1007	459	316	889	134
Arrive On Green	0.06	0.36	0.36	0.09	0.39	0.39	0.09	0.28	0.28	0.09	0.29	0.29
Sat Flow, veh/h	3456	5932	638	3456	6434	1583	1781	3554	1621	3456	3088	467
Grp Volume(v), veh/h	84	737	271	263	1663	134	129	679	158	262	434	434
Grp Sat Flow(s),veh/h/ln	1728	1609	1745	1728	1609	1583	1781	1777	1621	1728	1777	1777
Q Serve(g_s), s	2.8	13.8	14.1	9.0	25.6	6.8	8.6	20.3	9.3	8.9	27.6	27.6
Cycle Q Clear(g_c), s	2.8	13.8	14.1	9.0	25.6	6.8	8.6	20.3	9.3	8.9	27.6	27.6
Prop In Lane	1.00		0.37	1.00		1.00	1.00		1.00	1.00		0.26
Lane Grp Cap(c), veh/h	216	1749	633	302	2493	613	155	1007	459	316	512	512
V/C Ratio(X)	0.39	0.42	0.43	0.87	0.67	0.22	0.83	0.67	0.34	0.83	0.85	0.85
Avail Cap(c_a), veh/h	302	1749	633	302	2493	613	171	1140	520	331	570	570
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.80	0.80	0.80
Uniform Delay (d), s/veh	54.0	28.8	28.9	54.1	30.4	24.6	53.9	38.1	34.1	53.6	40.2	40.2
Incr Delay (d2), s/veh	0.4	0.7	2.1	22.0	1.4	0.8	24.2	1.8	0.8	11.8	9.6	9.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	5.2	6.0	4.7	9.7	2.7	4.8	9.0	3.7	4.4	13.2	13.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	54.5	29.5	31.0	76.1	31.8	25.4	78.2	39.9	34.9	65.4	49.8	49.9
LnGrp LOS	D	C	C	E	C	C	E	D	C	E	D	D
Approach Vol, veh/h		1092			2060			966			1130	
Approach Delay, s/veh		31.8			37.0			44.2			53.4	
Approach LOS		C			D			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	16.0	49.0	14.9	40.1	13.0	52.0	15.5	39.5
Change Period (Y+Rc), s	5.5	5.5	4.5	5.5	5.5	5.5	4.5	5.5
Max Green Setting (Gmax), s	10.5	38.5	11.5	38.5	10.5	38.5	11.5	38.5
Max Q Clear Time (g_c+I1), s	11.0	16.1	10.6	29.6	4.8	27.6	10.9	22.3
Green Ext Time (p_c), s	0.0	10.1	0.0	5.0	0.0	9.3	0.0	7.0

Intersection Summary	
HCM 6th Ctrl Delay	40.8
HCM 6th LOS	D



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	80	864	114	250	1580	300	123	645	271	249	716	120
Future Volume (veh/h)	80	864	114	250	1580	300	123	645	271	249	716	120
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1945	1870	1870	1870
Adj Flow Rate, veh/h	87	939	102	272	1717	138	134	701	163	271	778	118
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	218	2101	226	302	2436	599	160	1029	469	324	906	137
Arrive On Green	0.06	0.35	0.35	0.09	0.38	0.38	0.09	0.29	0.29	0.09	0.29	0.29
Sat Flow, veh/h	3456	5933	637	3456	6434	1583	1781	3554	1621	3456	3086	468
Grp Volume(v), veh/h	87	762	279	272	1717	138	134	701	163	271	448	448
Grp Sat Flow(s),veh/h/ln	1728	1609	1745	1728	1609	1583	1781	1777	1621	1728	1777	1777
Q Serve(g_s), s	2.9	14.5	14.8	9.4	27.1	7.1	8.9	21.0	9.5	9.3	28.6	28.6
Cycle Q Clear(g_c), s	2.9	14.5	14.8	9.4	27.1	7.1	8.9	21.0	9.5	9.3	28.6	28.6
Prop In Lane	1.00		0.37	1.00		1.00	1.00		1.00	1.00		0.26
Lane Grp Cap(c), veh/h	218	1709	618	302	2436	599	160	1029	469	324	522	522
V/C Ratio(X)	0.40	0.45	0.45	0.90	0.70	0.23	0.84	0.68	0.35	0.84	0.86	0.86
Avail Cap(c_a), veh/h	302	1709	618	302	2436	599	171	1140	520	331	570	570
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.80	0.80	0.80
Uniform Delay (d), s/veh	54.0	29.7	29.8	54.2	31.6	25.4	53.8	37.7	33.7	53.5	40.0	40.0
Incr Delay (d2), s/veh	0.4	0.8	2.4	27.1	1.7	0.9	26.0	1.9	0.8	12.8	10.5	10.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	5.5	6.4	5.1	10.3	2.8	5.1	9.3	3.8	4.6	13.8	13.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	54.5	30.6	32.2	81.4	33.3	26.3	79.7	39.6	34.4	66.2	50.5	50.6
LnGrp LOS	D	C	C	F	C	C	E	D	C	E	D	D
Approach Vol, veh/h		1128			2127			998			1167	
Approach Delay, s/veh		32.8			39.0			44.2			54.2	
Approach LOS		C			D			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	16.0	48.0	15.3	40.7	13.1	50.9	15.8	40.2
Change Period (Y+Rc), s	5.5	5.5	4.5	5.5	5.5	5.5	4.5	5.5
Max Green Setting (Gmax), s	10.5	38.5	11.5	38.5	10.5	38.5	11.5	38.5
Max Q Clear Time (g_c+I1), s	11.4	16.8	10.9	30.6	4.9	29.1	11.3	23.0
Green Ext Time (p_c), s	0.0	10.3	0.0	4.7	0.0	8.2	0.0	7.1

Intersection Summary	
HCM 6th Ctrl Delay	41.9
HCM 6th LOS	D

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	121	118	1132	163	100	764
Future Volume (veh/h)	121	118	1132	163	100	764
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		0.98	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1885	1961	1885	1885	1885	1885
Adj Flow Rate, veh/h	123	23	1155	150	102	780
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	1	1	1	1	1	1
Cap, veh/h	159	147	3373	438	414	2907
Arrive On Green	0.09	0.09	0.73	0.73	0.04	0.81
Sat Flow, veh/h	1795	1662	4765	596	1795	3676
Grp Volume(v), veh/h	123	23	862	443	102	780
Grp Sat Flow(s),veh/h/ln	1795	1662	1716	1760	1795	1791
Q Serve(g_s), s	6.7	1.3	8.9	8.9	1.3	5.2
Cycle Q Clear(g_c), s	6.7	1.3	8.9	8.9	1.3	5.2
Prop In Lane	1.00	1.00		0.34	1.00	
Lane Grp Cap(c), veh/h	159	147	2518	1292	414	2907
V/C Ratio(X)	0.78	0.16	0.34	0.34	0.25	0.27
Avail Cap(c_a), veh/h	377	349	2518	1292	544	2907
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.59	0.59	1.00	1.00
Uniform Delay (d), s/veh	44.6	42.1	4.7	4.7	3.1	2.3
Incr Delay (d2), s/veh	7.9	0.5	0.2	0.4	0.1	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.3	0.5	2.5	2.7	0.3	1.2
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	52.5	42.6	4.9	5.2	3.2	2.5
LnGrp LOS	D	D	A	A	A	A
Approach Vol, veh/h	146		1305			882
Approach Delay, s/veh	50.9		5.0			2.6
Approach LOS	D		A			A

Timer - Assigned Phs	2	4	7	8
Phs Duration (G+Y+Rc), s	13.8	86.2	7.8	78.4
Change Period (Y+Rc), s	5.0	5.0	4.0	5.0
Max Green Setting (Gmax), s	21.0	69.0	11.0	54.0
Max Q Clear Time (g_c+I1), s	8.7	7.2	3.3	10.9
Green Ext Time (p_c), s	0.3	9.5	0.0	7.0

Intersection Summary	
HCM 6th Ctrl Delay	7.0
HCM 6th LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	139	108	144	30	54	29	110	1132	54	36	770	88
Future Volume (veh/h)	139	108	144	30	54	29	110	1132	54	36	770	88
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.97	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1961	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	142	110	113	31	55	10	112	1155	50	37	786	78
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	257	167	144	450	551	485	370	1749	76	267	1647	163
Arrive On Green	0.29	0.29	0.29	0.29	0.29	0.29	0.50	0.50	0.50	0.50	0.50	0.50
Sat Flow, veh/h	524	570	491	1166	1885	1658	644	3492	151	467	3288	326
Grp Volume(v), veh/h	365	0	0	31	55	10	112	592	613	37	428	436
Grp Sat Flow(s),veh/h/ln	1585	0	0	1166	1885	1658	644	1791	1853	467	1791	1823
Q Serve(g_s), s	8.3	0.0	0.0	0.0	1.0	0.2	6.7	11.9	11.9	3.1	7.6	7.6
Cycle Q Clear(g_c), s	10.1	0.0	0.0	1.1	1.0	0.2	14.3	11.9	11.9	15.1	7.6	7.6
Prop In Lane	0.39		0.31	1.00		1.00	1.00		0.08	1.00		0.18
Lane Grp Cap(c), veh/h	567	0	0	450	551	485	370	897	928	267	897	913
V/C Ratio(X)	0.64	0.00	0.00	0.07	0.10	0.02	0.30	0.66	0.66	0.14	0.48	0.48
Avail Cap(c_a), veh/h	979	0	0	759	1052	925	473	1184	1225	342	1184	1205
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	15.6	0.0	0.0	12.5	12.5	12.2	12.6	9.0	9.0	14.6	7.9	7.9
Incr Delay (d2), s/veh	1.2	0.0	0.0	0.1	0.1	0.0	0.5	0.8	0.8	0.2	0.4	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.3	0.0	0.0	0.2	0.4	0.1	0.8	3.4	3.5	0.3	2.1	2.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	16.8	0.0	0.0	12.6	12.6	12.2	13.1	9.8	9.8	14.9	8.3	8.3
LnGrp LOS	B	A	A	B	B	B	B	A	A	B	A	A
Approach Vol, veh/h		365			96			1317			901	
Approach Delay, s/veh		16.8			12.5			10.1			8.6	
Approach LOS		B			B			B			A	

Timer - Assigned Phs	2	4	6	8
Phs Duration (G+Y+Rc), s	19.2	29.2	19.2	29.2
Change Period (Y+Rc), s	5.0	5.0	5.0	5.0
Max Green Setting (Gmax), s	27.0	32.0	27.0	32.0
Max Q Clear Time (g_c+I1), s	3.1	17.1	12.1	16.3
Green Ext Time (p_c), s	0.4	5.1	2.0	8.0

Intersection Summary	
HCM 6th Ctrl Delay	10.6
HCM 6th LOS	B

Intersection	
Int Delay, s/veh	0.6

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	8	30	43	1204	859	32
Future Vol, veh/h	8	30	43	1204	859	32
Conflicting Peds, #/hr	0	0	3	0	0	3
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	100	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	1	1	1	1	1	1
Mvmt Flow	8	31	45	1254	895	33

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1632	467	931	0	-	0
Stage 1	915	-	-	-	-	-
Stage 2	717	-	-	-	-	-
Critical Hdwy	6.82	6.92	4.12	-	-	-
Critical Hdwy Stg 1	5.82	-	-	-	-	-
Critical Hdwy Stg 2	5.82	-	-	-	-	-
Follow-up Hdwy	3.51	3.31	2.21	-	-	-
Pot Cap-1 Maneuver	93	545	737	-	-	-
Stage 1	353	-	-	-	-	-
Stage 2	447	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	87	543	735	-	-	-
Mov Cap-2 Maneuver	87	-	-	-	-	-
Stage 1	330	-	-	-	-	-
Stage 2	446	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	21.5	0.4	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	735	-	258	-	-
HCM Lane V/C Ratio	0.061	-	0.153	-	-
HCM Control Delay (s)	10.2	-	21.5	-	-
HCM Lane LOS	B	-	C	-	-
HCM 95th %tile Q(veh)	0.2	-	0.5	-	-

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	70	58	1307	107	65	809
Future Volume (veh/h)	70	58	1307	107	65	809
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	0.99		0.99	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	74	29	1390	110	69	861
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	1	1	1	1	1	1
Cap, veh/h	116	45	2186	172	317	2330
Arrive On Green	0.09	0.09	0.65	0.65	0.65	0.65
Sat Flow, veh/h	1232	483	3456	265	353	3676
Grp Volume(v), veh/h	104	0	738	762	69	861
Grp Sat Flow(s),veh/h/ln	1731	0	1791	1836	353	1791
Q Serve(g_s), s	2.4	0.0	10.1	10.2	6.0	4.5
Cycle Q Clear(g_c), s	2.4	0.0	10.1	10.2	16.2	4.5
Prop In Lane	0.71	0.28		0.14	1.00	
Lane Grp Cap(c), veh/h	162	0	1165	1194	317	2330
V/C Ratio(X)	0.64	0.00	0.63	0.64	0.22	0.37
Avail Cap(c_a), veh/h	1265	0	2159	2213	513	4318
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	17.9	0.0	4.3	4.3	9.1	3.3
Incr Delay (d2), s/veh	4.2	0.0	0.6	0.6	0.3	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.0	0.0	1.3	1.3	0.3	0.5
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	22.1	0.0	4.8	4.9	9.5	3.4
LnGrp LOS	C	A	A	A	A	A
Approach Vol, veh/h	104		1500			930
Approach Delay, s/veh	22.1		4.9			3.9
Approach LOS	C		A			A

Timer - Assigned Phs	4	6	8
Phs Duration (G+Y+Rc), s	32.2	8.9	32.2
Change Period (Y+Rc), s	5.5	5.0	5.5
Max Green Setting (Gmax), s	49.5	30.0	49.5
Max Q Clear Time (g_c+I1), s	18.2	4.4	12.2
Green Ext Time (p_c), s	8.5	0.3	14.4

Intersection Summary	
HCM 6th Ctrl Delay	5.2
HCM 6th LOS	A

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	213	1467	143	161	1274	379	145	754	295	234	479	125
Future Volume (veh/h)	213	1467	143	161	1274	379	145	754	295	234	479	125
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.98	1.00		0.96	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1961	1885	1885	1885
Adj Flow Rate, veh/h	222	1528	135	168	1327	236	151	785	188	244	499	109
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	276	2341	207	231	2405	579	178	1036	463	298	806	175
Arrive On Green	0.08	0.38	0.38	0.07	0.37	0.37	0.10	0.29	0.29	0.09	0.28	0.28
Sat Flow, veh/h	3483	6104	539	3483	6485	1561	1795	3582	1599	3483	2924	635
Grp Volume(v), veh/h	222	1217	446	168	1327	236	151	785	188	244	305	303
Grp Sat Flow(s),veh/h/ln	1742	1621	1779	1742	1621	1561	1795	1791	1599	1742	1791	1768
Q Serve(g_s), s	7.5	24.7	24.7	5.7	19.4	13.4	9.9	23.9	11.4	8.3	17.8	18.0
Cycle Q Clear(g_c), s	7.5	24.7	24.7	5.7	19.4	13.4	9.9	23.9	11.4	8.3	17.8	18.0
Prop In Lane	1.00		0.30	1.00		1.00	1.00		1.00	1.00		0.36
Lane Grp Cap(c), veh/h	276	1866	682	231	2405	579	178	1036	463	298	494	488
V/C Ratio(X)	0.81	0.65	0.65	0.73	0.55	0.41	0.85	0.76	0.41	0.82	0.62	0.62
Avail Cap(c_a), veh/h	276	1866	682	276	2405	579	232	1149	513	305	500	494
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.94	0.94	0.94
Uniform Delay (d), s/veh	54.3	30.4	30.4	54.9	29.9	28.0	53.2	38.8	34.3	53.9	37.9	38.0
Incr Delay (d2), s/veh	14.8	1.8	4.8	5.6	0.9	2.1	16.3	3.2	1.0	13.8	2.8	2.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.8	9.5	11.0	2.6	7.4	5.3	5.2	10.8	4.5	4.2	8.1	8.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	69.1	32.2	35.2	60.5	30.8	30.1	69.4	42.0	35.3	67.8	40.7	40.9
LnGrp LOS	E	C	D	E	C	C	E	D	D	E	D	D
Approach Vol, veh/h		1885			1731			1124			852	
Approach Delay, s/veh		37.3			33.6			44.5			48.5	
Approach LOS		D			C			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	13.5	51.5	16.4	38.6	15.0	50.0	14.8	40.2
Change Period (Y+Rc), s	5.5	5.5	4.5	5.5	5.5	5.5	4.5	5.5
Max Green Setting (Gmax), s	8.0	40.5	15.5	33.5	9.5	40.5	10.5	38.5
Max Q Clear Time (g_c+I1), s	11.7	26.7	11.9	20.0	9.5	21.4	10.3	25.9
Green Ext Time (p_c), s	0.0	11.0	0.1	4.6	0.0	13.4	0.0	6.9

Intersection Summary	
HCM 6th Ctrl Delay	39.3
HCM 6th LOS	D

Opening Year (2027) Conditions

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	159	136	916	115	112	799
Future Volume (veh/h)	159	136	916	115	112	799
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		0.97	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1870	1945	1870	1870	1870	1870
Adj Flow Rate, veh/h	167	16	964	107	118	841
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	207	192	3188	353	473	2745
Arrive On Green	0.12	0.12	0.69	0.69	0.04	0.77
Sat Flow, veh/h	1781	1648	4815	514	1781	3647
Grp Volume(v), veh/h	167	16	705	366	118	841
Grp Sat Flow(s),veh/h/ln	1781	1648	1702	1757	1781	1777
Q Serve(g_s), s	8.2	0.8	7.4	7.4	1.6	6.3
Cycle Q Clear(g_c), s	8.2	0.8	7.4	7.4	1.6	6.3
Prop In Lane	1.00	1.00		0.29	1.00	
Lane Grp Cap(c), veh/h	207	192	2335	1205	473	2745
V/C Ratio(X)	0.81	0.08	0.30	0.30	0.25	0.31
Avail Cap(c_a), veh/h	416	385	2335	1205	615	2745
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.79	0.79	1.00	1.00
Uniform Delay (d), s/veh	38.8	35.5	5.6	5.6	3.6	3.1
Incr Delay (d2), s/veh	7.2	0.2	0.3	0.5	0.1	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.0	0.3	2.2	2.4	0.4	1.5
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	46.0	35.7	5.9	6.1	3.7	3.3
LnGrp LOS	D	D	A	A	A	A
Approach Vol, veh/h	183		1071			959
Approach Delay, s/veh	45.1		5.9			3.4
Approach LOS	D		A			A

Timer - Assigned Phs	2	4	7	8
Phs Duration (G+Y+Rc), s	15.5	74.5	7.8	66.7
Change Period (Y+Rc), s	5.0	5.0	4.0	5.0
Max Green Setting (Gmax), s	21.0	59.0	11.0	44.0
Max Q Clear Time (g_c+I1), s	10.2	8.3	3.6	9.4
Green Ext Time (p_c), s	0.4	10.4	0.0	5.2

Intersection Summary	
HCM 6th Ctrl Delay	8.1
HCM 6th LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	106	61	204	35	67	21	125	903	31	11	839	112
Future Volume (veh/h)	106	61	204	35	67	21	125	903	31	11	839	112
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99		0.99	0.99		0.99	1.00		0.97	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1945	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	112	64	153	37	71	6	132	951	30	12	883	103
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	213	113	201	422	523	455	336	1841	58	340	1674	195
Arrive On Green	0.28	0.28	0.28	0.28	0.28	0.28	0.52	0.52	0.52	0.52	0.52	0.52
Sat Flow, veh/h	423	404	719	1156	1870	1625	570	3512	111	573	3193	373
Grp Volume(v), veh/h	329	0	0	37	71	6	132	481	500	12	491	495
Grp Sat Flow(s),veh/h/ln	1546	0	0	1156	1870	1625	570	1777	1846	573	1777	1789
Q Serve(g_s), s	7.3	0.0	0.0	0.0	1.4	0.1	10.1	9.0	9.0	0.7	9.3	9.3
Cycle Q Clear(g_c), s	9.8	0.0	0.0	1.5	1.4	0.1	19.4	9.0	9.0	9.7	9.3	9.3
Prop In Lane	0.34		0.47	1.00		1.00	1.00		0.06	1.00		0.21
Lane Grp Cap(c), veh/h	527	0	0	422	523	455	336	931	968	340	931	938
V/C Ratio(X)	0.62	0.00	0.00	0.09	0.14	0.01	0.39	0.52	0.52	0.04	0.53	0.53
Avail Cap(c_a), veh/h	904	0	0	711	990	861	395	1115	1159	399	1115	1123
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	16.6	0.0	0.0	13.8	13.7	13.3	14.4	7.9	7.9	11.1	8.0	8.0
Incr Delay (d2), s/veh	1.2	0.0	0.0	0.1	0.1	0.0	0.7	0.4	0.4	0.0	0.5	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.2	0.0	0.0	0.3	0.6	0.0	1.1	2.5	2.6	0.1	2.6	2.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	17.9	0.0	0.0	13.9	13.9	13.3	15.1	8.4	8.3	11.1	8.4	8.4
LnGrp LOS	B	A	A	B	B	B	B	A	A	B	A	A
Approach Vol, veh/h		329			114			1113			998	
Approach Delay, s/veh		17.9			13.8			9.2			8.5	
Approach LOS		B			B			A			A	

Timer - Assigned Phs	2	4	6	8
Phs Duration (G+Y+Rc), s	19.3	31.7	19.3	31.7
Change Period (Y+Rc), s	5.0	5.0	5.0	5.0
Max Green Setting (Gmax), s	27.0	32.0	27.0	32.0
Max Q Clear Time (g_c+I1), s	3.5	11.7	11.8	21.4
Green Ext Time (p_c), s	0.5	6.5	1.8	5.3

Intersection Summary	
HCM 6th Ctrl Delay	10.2
HCM 6th LOS	B

Intersection	
Int Delay, s/veh	1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	6	86	40	1052	1002	17
Future Vol, veh/h	6	86	40	1052	1002	17
Conflicting Peds, #/hr	0	0	3	0	0	3
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	100	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	6	91	42	1107	1055	18

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1705	540	1076	0	-	0
Stage 1	1067	-	-	-	-	-
Stage 2	638	-	-	-	-	-
Critical Hdwy	6.84	6.94	4.14	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.22	-	-	-
Pot Cap-1 Maneuver	82	486	644	-	-	-
Stage 1	292	-	-	-	-	-
Stage 2	488	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	76	485	642	-	-	-
Mov Cap-2 Maneuver	76	-	-	-	-	-
Stage 1	272	-	-	-	-	-
Stage 2	487	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	18.7	0.4	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	642	-	359	-	-
HCM Lane V/C Ratio	0.066	-	0.27	-	-
HCM Control Delay (s)	11	-	18.7	-	-
HCM Lane LOS	B	-	C	-	-
HCM 95th %tile Q(veh)	0.2	-	1.1	-	-

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	102	60	1016	55	44	1030
Future Volume (veh/h)	102	60	1016	55	44	1030
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	0.99		0.99	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	107	35	1069	54	46	1084
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	152	50	2035	103	403	2102
Arrive On Green	0.12	0.12	0.59	0.59	0.59	0.59
Sat Flow, veh/h	1292	423	3534	174	501	3647
Grp Volume(v), veh/h	143	0	552	571	46	1084
Grp Sat Flow(s),veh/h/ln	1726	0	1777	1838	501	1777
Q Serve(g_s), s	2.9	0.0	6.7	6.7	2.2	6.5
Cycle Q Clear(g_c), s	2.9	0.0	6.7	6.7	8.8	6.5
Prop In Lane	0.75	0.24		0.09	1.00	
Lane Grp Cap(c), veh/h	204	0	1051	1087	403	2102
V/C Ratio(X)	0.70	0.00	0.53	0.53	0.11	0.52
Avail Cap(c_a), veh/h	1433	0	2434	2518	793	4868
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	15.3	0.0	4.4	4.4	7.0	4.3
Incr Delay (d2), s/veh	4.4	0.0	0.4	0.4	0.1	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	0.0	0.9	0.9	0.2	0.8
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	19.7	0.0	4.8	4.8	7.1	4.5
LnGrp LOS	B	A	A	A	A	A
Approach Vol, veh/h	143		1123			1130
Approach Delay, s/veh	19.7		4.8			4.6
Approach LOS	B		A			A

Timer - Assigned Phs				4		6	8
Phs Duration (G+Y+Rc), s				26.9		9.3	26.9
Change Period (Y+Rc), s				5.5		5.0	5.5
Max Green Setting (Gmax), s				49.5		30.0	49.5
Max Q Clear Time (g_c+I1), s				10.8		4.9	8.7
Green Ext Time (p_c), s				10.5		0.4	9.1

Intersection Summary	
HCM 6th Ctrl Delay	5.6
HCM 6th LOS	A

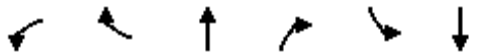
Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	83	918	130	255	1612	306	125	658	276	254	730	124
Future Volume (veh/h)	83	918	130	255	1612	306	125	658	276	254	730	124
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1945	1870	1870	1870
Adj Flow Rate, veh/h	87	966	117	268	1697	140	132	693	164	267	768	118
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	218	2092	250	302	2456	604	158	1022	466	321	898	138
Arrive On Green	0.06	0.36	0.36	0.09	0.38	0.38	0.09	0.29	0.29	0.09	0.29	0.29
Sat Flow, veh/h	3456	5857	701	3456	6434	1583	1781	3554	1621	3456	3080	473
Grp Volume(v), veh/h	87	794	289	268	1697	140	132	693	164	267	443	443
Grp Sat Flow(s),veh/h/ln	1728	1609	1732	1728	1609	1583	1781	1777	1621	1728	1777	1776
Q Serve(g_s), s	2.9	15.2	15.5	9.2	26.6	7.2	8.8	20.7	9.6	9.1	28.2	28.2
Cycle Q Clear(g_c), s	2.9	15.2	15.5	9.2	26.6	7.2	8.8	20.7	9.6	9.1	28.2	28.2
Prop In Lane	1.00		0.40	1.00		1.00	1.00		1.00	1.00		0.27
Lane Grp Cap(c), veh/h	218	1724	619	302	2456	604	158	1022	466	321	518	518
V/C Ratio(X)	0.40	0.46	0.47	0.89	0.69	0.23	0.84	0.68	0.35	0.83	0.85	0.86
Avail Cap(c_a), veh/h	302	1724	619	302	2456	604	171	1140	520	331	570	570
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.81	0.81	0.81
Uniform Delay (d), s/veh	54.0	29.7	29.8	54.2	31.2	25.2	53.8	37.8	33.9	53.5	40.1	40.1
Incr Delay (d2), s/veh	0.4	0.9	2.5	24.7	1.6	0.9	25.3	1.9	0.8	12.5	10.3	10.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	5.8	6.6	4.9	10.1	2.8	5.0	9.1	3.9	4.5	13.6	13.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	54.5	30.6	32.3	78.9	32.8	26.1	79.1	39.7	34.7	66.0	50.4	50.4
LnGrp LOS	D	C	C	E	C	C	E	D	C	E	D	D
Approach Vol, veh/h		1170			2105			989			1153	
Approach Delay, s/veh		32.8			38.2			44.1			54.0	
Approach LOS		C			D			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	16.0	48.4	15.1	40.5	13.1	51.3	15.6	40.0
Change Period (Y+Rc), s	5.5	5.5	4.5	5.5	5.5	5.5	4.5	5.5
Max Green Setting (Gmax), s	10.5	38.5	11.5	38.5	10.5	38.5	11.5	38.5
Max Q Clear Time (g_c+I1), s	11.2	17.5	10.8	30.2	4.9	28.6	11.1	22.7
Green Ext Time (p_c), s	0.0	10.5	0.0	4.8	0.0	8.7	0.0	7.1

Intersection Summary	
HCM 6th Ctrl Delay	41.5
HCM 6th LOS	D



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	128	120	1156	171	102	779
Future Volume (veh/h)	128	120	1156	171	102	779
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		0.98	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1885	1961	1885	1885	1885	1885
Adj Flow Rate, veh/h	135	11	1217	165	107	820
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	1	1	1	1	1	1
Cap, veh/h	170	157	3322	450	388	2885
Arrive On Green	0.09	0.09	0.73	0.73	0.04	0.81
Sat Flow, veh/h	1795	1662	4737	619	1795	3676
Grp Volume(v), veh/h	135	11	914	468	107	820
Grp Sat Flow(s),veh/h/ln	1795	1662	1716	1755	1795	1791
Q Serve(g_s), s	7.4	0.6	9.9	9.9	1.4	5.8
Cycle Q Clear(g_c), s	7.4	0.6	9.9	9.9	1.4	5.8
Prop In Lane	1.00	1.00		0.35	1.00	
Lane Grp Cap(c), veh/h	170	157	2496	1277	388	2885
V/C Ratio(X)	0.79	0.07	0.37	0.37	0.28	0.28
Avail Cap(c_a), veh/h	377	349	2496	1277	518	2885
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.54	0.54	1.00	1.00
Uniform Delay (d), s/veh	44.3	41.3	5.1	5.1	3.4	2.5
Incr Delay (d2), s/veh	8.1	0.2	0.2	0.4	0.1	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.6	0.3	2.9	3.0	0.3	1.3
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	52.4	41.4	5.3	5.5	3.6	2.7
LnGrp LOS	D	D	A	A	A	A
Approach Vol, veh/h	146		1382			927
Approach Delay, s/veh	51.6		5.4			2.8
Approach LOS	D		A			A

Timer - Assigned Phs	2	4	7	8
Phs Duration (G+Y+Rc), s	14.5	85.5	7.8	77.7
Change Period (Y+Rc), s	5.0	5.0	4.0	5.0
Max Green Setting (Gmax), s	21.0	69.0	11.0	54.0
Max Q Clear Time (g_c+I1), s	9.4	7.8	3.4	11.9
Green Ext Time (p_c), s	0.3	10.2	0.0	7.6

Intersection Summary	
HCM 6th Ctrl Delay	7.1
HCM 6th LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	143	110	147	31	55	30	112	1160	55	37	790	91
Future Volume (veh/h)	143	110	147	31	55	30	112	1160	55	37	790	91
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.97	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1961	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	151	116	120	33	58	10	118	1221	53	39	832	83
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	257	168	148	433	570	502	346	1768	77	243	1664	166
Arrive On Green	0.30	0.30	0.30	0.30	0.30	0.30	0.51	0.51	0.51	0.51	0.51	0.51
Sat Flow, veh/h	534	555	490	1152	1885	1658	614	3492	151	438	3286	328
Grp Volume(v), veh/h	387	0	0	33	58	10	118	626	648	39	453	462
Grp Sat Flow(s),veh/h/ln	1579	0	0	1152	1885	1658	614	1791	1853	438	1791	1823
Q Serve(g_s), s	9.9	0.0	0.0	0.0	1.2	0.2	8.2	13.9	13.9	3.9	8.8	8.8
Cycle Q Clear(g_c), s	11.8	0.0	0.0	1.4	1.2	0.2	17.0	13.9	13.9	17.8	8.8	8.8
Prop In Lane	0.39		0.31	1.00		1.00	1.00		0.08	1.00		0.18
Lane Grp Cap(c), veh/h	573	0	0	433	570	502	346	907	938	243	907	923
V/C Ratio(X)	0.67	0.00	0.00	0.08	0.10	0.02	0.34	0.69	0.69	0.16	0.50	0.50
Avail Cap(c_a), veh/h	904	0	0	679	972	855	410	1095	1132	289	1095	1114
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	16.7	0.0	0.0	13.2	13.1	12.8	14.2	9.8	9.8	16.6	8.5	8.5
Incr Delay (d2), s/veh	1.4	0.0	0.0	0.1	0.1	0.0	0.6	1.4	1.4	0.3	0.4	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.9	0.0	0.0	0.3	0.5	0.1	1.0	4.3	4.4	0.4	2.6	2.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	18.1	0.0	0.0	13.3	13.2	12.8	14.7	11.2	11.2	16.9	9.0	9.0
LnGrp LOS	B	A	A	B	B	B	B	B	B	B	A	A
Approach Vol, veh/h		387			101			1392			954	
Approach Delay, s/veh		18.1			13.2			11.5			9.3	
Approach LOS		B			B			B			A	

Timer - Assigned Phs	2	4	6	8
Phs Duration (G+Y+Rc), s	20.8	31.5	20.8	31.5
Change Period (Y+Rc), s	5.0	5.0	5.0	5.0
Max Green Setting (Gmax), s	27.0	32.0	27.0	32.0
Max Q Clear Time (g_c+I1), s	3.4	19.8	13.8	19.0
Green Ext Time (p_c), s	0.4	4.9	2.0	7.5

Intersection Summary		
HCM 6th Ctrl Delay	11.7	
HCM 6th LOS	B	

Intersection	
Int Delay, s/veh	0.6

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	8	31	44	1233	880	33
Future Vol, veh/h	8	31	44	1233	880	33
Conflicting Peds, #/hr	0	0	3	0	0	3
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	100	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	1	1	1	1	1	1
Mvmt Flow	8	33	46	1298	926	35

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1688	484	964	0	-	0
Stage 1	947	-	-	-	-	-
Stage 2	741	-	-	-	-	-
Critical Hdwy	6.82	6.92	4.12	-	-	-
Critical Hdwy Stg 1	5.82	-	-	-	-	-
Critical Hdwy Stg 2	5.82	-	-	-	-	-
Follow-up Hdwy	3.51	3.31	2.21	-	-	-
Pot Cap-1 Maneuver	85	531	716	-	-	-
Stage 1	340	-	-	-	-	-
Stage 2	435	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	79	529	714	-	-	-
Mov Cap-2 Maneuver	79	-	-	-	-	-
Stage 1	317	-	-	-	-	-
Stage 2	434	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	22.7	0.4	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	714	-	244	-	-
HCM Lane V/C Ratio	0.065	-	0.168	-	-
HCM Control Delay (s)	10.4	-	22.7	-	-
HCM Lane LOS	B	-	C	-	-
HCM 95th %tile Q(veh)	0.2	-	0.6	-	-

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	71	59	1338	109	66	829
Future Volume (veh/h)	71	59	1338	109	66	829
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	0.99		0.99	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	75	33	1408	111	69	873
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	1	1	1	1	1	1
Cap, veh/h	113	50	2200	173	312	2343
Arrive On Green	0.09	0.09	0.65	0.65	0.65	0.65
Sat Flow, veh/h	1187	522	3457	264	346	3676
Grp Volume(v), veh/h	109	0	747	772	69	873
Grp Sat Flow(s),veh/h/ln	1726	0	1791	1836	346	1791
Q Serve(g_s), s	2.6	0.0	10.4	10.5	6.2	4.7
Cycle Q Clear(g_c), s	2.6	0.0	10.4	10.5	16.7	4.7
Prop In Lane	0.69	0.30		0.14	1.00	
Lane Grp Cap(c), veh/h	164	0	1172	1201	312	2343
V/C Ratio(X)	0.66	0.00	0.64	0.64	0.22	0.37
Avail Cap(c_a), veh/h	1236	0	2117	2170	494	4235
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	18.3	0.0	4.3	4.3	9.3	3.3
Incr Delay (d2), s/veh	4.6	0.0	0.6	0.6	0.4	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.1	0.0	1.4	1.4	0.4	0.6
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	22.9	0.0	4.9	4.9	9.7	3.4
LnGrp LOS	C	A	A	A	A	A
Approach Vol, veh/h	109		1519			942
Approach Delay, s/veh	22.9		4.9			3.9
Approach LOS	C		A			A

Timer - Assigned Phs				4		6	8
Phs Duration (G+Y+Rc), s				32.9		9.0	32.9
Change Period (Y+Rc), s				5.5		5.0	5.5
Max Green Setting (Gmax), s				49.5		30.0	49.5
Max Q Clear Time (g_c+I1), s				18.7		4.6	12.5
Green Ext Time (p_c), s				8.7		0.3	14.7

Intersection Summary	
HCM 6th Ctrl Delay	5.3
HCM 6th LOS	A

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	220	1524	156	164	1300	388	148	770	301	240	490	130
Future Volume (veh/h)	220	1524	156	164	1300	388	148	770	301	240	490	130
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.98	1.00		0.96	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1961	1885	1885	1885
Adj Flow Rate, veh/h	232	1604	150	173	1368	248	156	811	197	253	516	116
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	276	2292	214	231	2366	570	183	1051	469	305	811	181
Arrive On Green	0.08	0.38	0.38	0.07	0.36	0.36	0.10	0.29	0.29	0.09	0.28	0.28
Sat Flow, veh/h	3483	6070	567	3483	6485	1561	1795	3582	1599	3483	2906	650
Grp Volume(v), veh/h	232	1285	469	173	1368	248	156	811	197	253	317	315
Grp Sat Flow(s),veh/h/ln	1742	1621	1774	1742	1621	1561	1795	1791	1599	1742	1791	1766
Q Serve(g_s), s	7.9	26.8	26.8	5.9	20.4	14.4	10.3	24.8	11.9	8.6	18.6	18.8
Cycle Q Clear(g_c), s	7.9	26.8	26.8	5.9	20.4	14.4	10.3	24.8	11.9	8.6	18.6	18.8
Prop In Lane	1.00		0.32	1.00		1.00	1.00		1.00	1.00		0.37
Lane Grp Cap(c), veh/h	276	1837	670	231	2366	570	183	1051	469	305	499	492
V/C Ratio(X)	0.84	0.70	0.70	0.75	0.58	0.44	0.85	0.77	0.42	0.83	0.63	0.64
Avail Cap(c_a), veh/h	276	1837	670	276	2366	570	232	1149	513	305	500	493
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.93	0.93	0.93
Uniform Delay (d), s/veh	54.5	31.6	31.6	55.0	30.7	28.8	53.0	38.7	34.2	53.9	37.9	38.0
Incr Delay (d2), s/veh	19.3	2.2	6.0	6.8	1.0	2.4	17.7	3.5	1.0	15.4	3.1	3.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.1	10.4	12.1	2.7	7.8	5.7	5.5	11.2	4.7	4.4	8.5	8.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	73.8	33.8	37.6	61.8	31.7	31.2	70.7	42.2	35.2	69.2	41.0	41.2
LnGrp LOS	E	C	D	E	C	C	E	D	D	E	D	D
Approach Vol, veh/h		1986			1789			1164			885	
Approach Delay, s/veh		39.4			34.5			44.9			49.1	
Approach LOS		D			C			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	13.5	50.8	16.7	39.0	15.0	49.3	15.0	40.7
Change Period (Y+Rc), s	5.5	5.5	4.5	5.5	5.5	5.5	4.5	5.5
Max Green Setting (Gmax), s	9.5	40.5	15.5	33.5	9.5	40.5	10.5	38.5
Max Q Clear Time (g_c+I1), s	7.9	28.8	12.3	20.8	9.9	22.4	10.6	26.8
Green Ext Time (p_c), s	0.0	9.8	0.1	4.7	0.0	13.3	0.0	6.7

Intersection Summary	
HCM 6th Ctrl Delay	40.5
HCM 6th LOS	D

Opening Year Plus Project Conditions

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	163	136	916	126	112	799
Future Volume (veh/h)	163	136	916	126	112	799
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		0.97	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1870	1945	1870	1870	1870	1870
Adj Flow Rate, veh/h	172	17	964	117	118	841
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	213	197	3139	380	467	2735
Arrive On Green	0.12	0.12	0.68	0.68	0.04	0.77
Sat Flow, veh/h	1781	1648	4764	556	1781	3647
Grp Volume(v), veh/h	172	17	713	368	118	841
Grp Sat Flow(s),veh/h/ln	1781	1648	1702	1748	1781	1777
Q Serve(g_s), s	8.5	0.8	7.6	7.6	1.6	6.4
Cycle Q Clear(g_c), s	8.5	0.8	7.6	7.6	1.6	6.4
Prop In Lane	1.00	1.00		0.32	1.00	
Lane Grp Cap(c), veh/h	213	197	2325	1194	467	2735
V/C Ratio(X)	0.81	0.09	0.31	0.31	0.25	0.31
Avail Cap(c_a), veh/h	416	385	2325	1194	610	2735
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.79	0.79	1.00	1.00
Uniform Delay (d), s/veh	38.6	35.3	5.7	5.7	3.7	3.1
Incr Delay (d2), s/veh	7.2	0.2	0.3	0.5	0.1	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.1	0.3	2.3	2.4	0.4	1.6
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	45.8	35.5	6.0	6.3	3.8	3.4
LnGrp LOS	D	D	A	A	A	A
Approach Vol, veh/h	189		1081			959
Approach Delay, s/veh	44.9		6.1			3.5
Approach LOS	D		A			A

Timer - Assigned Phs	2	4	7	8
Phs Duration (G+Y+Rc), s	15.7	74.3	7.8	66.5
Change Period (Y+Rc), s	5.0	5.0	4.0	5.0
Max Green Setting (Gmax), s	21.0	59.0	11.0	44.0
Max Q Clear Time (g_c+I1), s	10.5	8.4	3.6	9.6
Green Ext Time (p_c), s	0.4	10.4	0.0	5.3

Intersection Summary	
HCM 6th Ctrl Delay	8.2
HCM 6th LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	107	61	204	35	67	21	125	913	31	11	843	113
Future Volume (veh/h)	107	61	204	35	67	21	125	913	31	11	843	113
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99		0.99	0.99		0.99	1.00		0.97	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1945	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	113	64	154	37	71	6	132	961	30	12	887	104
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	213	112	202	420	525	456	334	1844	58	336	1675	196
Arrive On Green	0.28	0.28	0.28	0.28	0.28	0.28	0.52	0.52	0.52	0.52	0.52	0.52
Sat Flow, veh/h	426	401	719	1155	1870	1626	567	3514	110	567	3191	374
Grp Volume(v), veh/h	331	0	0	37	71	6	132	486	505	12	494	497
Grp Sat Flow(s),veh/h/ln	1545	0	0	1155	1870	1626	567	1777	1847	567	1777	1789
Q Serve(g_s), s	7.4	0.0	0.0	0.0	1.5	0.1	10.3	9.2	9.2	0.7	9.4	9.4
Cycle Q Clear(g_c), s	9.9	0.0	0.0	1.5	1.5	0.1	19.7	9.2	9.2	9.9	9.4	9.4
Prop In Lane	0.34		0.47	1.00		1.00	1.00		0.06	1.00		0.21
Lane Grp Cap(c), veh/h	528	0	0	420	525	456	334	932	969	336	932	939
V/C Ratio(X)	0.63	0.00	0.00	0.09	0.14	0.01	0.40	0.52	0.52	0.04	0.53	0.53
Avail Cap(c_a), veh/h	898	0	0	703	983	854	390	1107	1150	392	1107	1114
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	16.8	0.0	0.0	13.8	13.8	13.3	14.5	8.0	8.0	11.2	8.0	8.0
Incr Delay (d2), s/veh	1.2	0.0	0.0	0.1	0.1	0.0	0.8	0.5	0.4	0.0	0.5	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.3	0.0	0.0	0.3	0.6	0.0	1.2	2.6	2.7	0.1	2.6	2.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	18.0	0.0	0.0	13.9	13.9	13.4	15.3	8.4	8.4	11.3	8.5	8.5
LnGrp LOS	B	A	A	B	B	B	B	A	A	B	A	A
Approach Vol, veh/h		331			114			1123			1003	
Approach Delay, s/veh		18.0			13.9			9.2			8.5	
Approach LOS		B			B			A			A	

Timer - Assigned Phs	2	4	6	8
Phs Duration (G+Y+Rc), s	19.4	32.0	19.4	32.0
Change Period (Y+Rc), s	5.0	5.0	5.0	5.0
Max Green Setting (Gmax), s	27.0	32.0	27.0	32.0
Max Q Clear Time (g_c+I1), s	3.5	11.9	11.9	21.7
Green Ext Time (p_c), s	0.5	6.5	1.8	5.3

Intersection Summary	
HCM 6th Ctrl Delay	10.3
HCM 6th LOS	B

Intersection	
Int Delay, s/veh	2.3

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	21	100	58	1052	1004	20
Future Vol, veh/h	21	100	58	1052	1004	20
Conflicting Peds, #/hr	0	0	3	0	0	3
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	100	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	22	105	61	1107	1057	21

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1747	542	1081	0	-	0
Stage 1	1071	-	-	-	-	-
Stage 2	676	-	-	-	-	-
Critical Hdwy	6.84	6.94	4.14	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.22	-	-	-
Pot Cap-1 Maneuver	77	485	641	-	-	-
Stage 1	290	-	-	-	-	-
Stage 2	467	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	69	484	639	-	-	-
Mov Cap-2 Maneuver	69	-	-	-	-	-
Stage 1	262	-	-	-	-	-
Stage 2	466	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	36.6	0.6	0
HCM LOS	E		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	639	-	237	-	-
HCM Lane V/C Ratio	0.096	-	0.537	-	-
HCM Control Delay (s)	11.2	-	36.6	-	-
HCM Lane LOS	B	-	E	-	-
HCM 95th %tile Q(veh)	0.3	-	2.9	-	-

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	102	60	1034	55	44	1090
Future Volume (veh/h)	102	60	1034	55	44	1090
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	0.99		0.99	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	107	34	1088	54	46	1147
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	152	48	2074	103	398	2140
Arrive On Green	0.12	0.12	0.60	0.60	0.60	0.60
Sat Flow, veh/h	1302	414	3538	171	492	3647
Grp Volume(v), veh/h	142	0	561	581	46	1147
Grp Sat Flow(s),veh/h/ln	1728	0	1777	1838	492	1777
Q Serve(g_s), s	3.0	0.0	6.9	6.9	2.2	7.1
Cycle Q Clear(g_c), s	3.0	0.0	6.9	6.9	9.1	7.1
Prop In Lane	0.75	0.24		0.09	1.00	
Lane Grp Cap(c), veh/h	202	0	1070	1107	398	2140
V/C Ratio(X)	0.70	0.00	0.52	0.52	0.12	0.54
Avail Cap(c_a), veh/h	1386	0	2353	2434	754	4705
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	15.9	0.0	4.3	4.3	7.0	4.4
Incr Delay (d2), s/veh	4.4	0.0	0.4	0.4	0.1	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.3	0.0	1.0	1.0	0.2	0.9
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	20.3	0.0	4.7	4.7	7.1	4.6
LnGrp LOS	C	A	A	A	A	A
Approach Vol, veh/h	142		1142			1193
Approach Delay, s/veh	20.3		4.7			4.7
Approach LOS	C		A			A

Timer - Assigned Phs	4	6	8
Phs Duration (G+Y+Rc), s	28.0	9.4	28.0
Change Period (Y+Rc), s	5.5	5.0	5.5
Max Green Setting (Gmax), s	49.5	30.0	49.5
Max Q Clear Time (g_c+I1), s	11.1	5.0	8.9
Green Ext Time (p_c), s	11.4	0.4	9.4

Intersection Summary	
HCM 6th Ctrl Delay	5.6
HCM 6th LOS	A

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	88	919	130	255	1612	315	125	662	276	281	741	146
Future Volume (veh/h)	88	919	130	255	1612	315	125	662	276	281	741	146
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1945	1870	1870	1870
Adj Flow Rate, veh/h	93	967	117	268	1697	139	132	697	165	296	780	139
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	220	2053	245	302	2408	592	158	1035	472	331	897	160
Arrive On Green	0.06	0.35	0.35	0.09	0.37	0.37	0.09	0.29	0.29	0.10	0.30	0.30
Sat Flow, veh/h	3456	5858	700	3456	6434	1583	1781	3554	1621	3456	3005	535
Grp Volume(v), veh/h	93	795	289	268	1697	139	132	697	165	296	461	458
Grp Sat Flow(s),veh/h/ln	1728	1609	1732	1728	1609	1583	1781	1777	1621	1728	1777	1764
Q Serve(g_s), s	3.1	15.4	15.6	9.2	26.9	7.2	8.8	20.8	9.6	10.2	29.5	29.5
Cycle Q Clear(g_c), s	3.1	15.4	15.6	9.2	26.9	7.2	8.8	20.8	9.6	10.2	29.5	29.5
Prop In Lane	1.00		0.40	1.00		1.00	1.00		1.00	1.00		0.30
Lane Grp Cap(c), veh/h	220	1691	607	302	2408	592	158	1035	472	331	530	526
V/C Ratio(X)	0.42	0.47	0.48	0.89	0.70	0.23	0.84	0.67	0.35	0.89	0.87	0.87
Avail Cap(c_a), veh/h	302	1691	607	302	2408	592	171	1140	520	331	570	566
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.79	0.79	0.79
Uniform Delay (d), s/veh	54.1	30.3	30.4	54.2	31.9	25.8	53.8	37.5	33.6	53.6	39.9	39.9
Incr Delay (d2), s/veh	0.5	0.9	2.7	24.7	1.8	0.9	25.3	1.8	0.8	20.4	11.4	11.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.3	5.9	6.7	4.9	10.3	2.9	5.0	9.2	3.9	5.3	14.3	14.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	54.5	31.2	33.1	78.9	33.7	26.7	79.1	39.3	34.3	74.0	51.3	51.4
LnGrp LOS	D	C	C	E	C	C	E	D	C	E	D	D
Approach Vol, veh/h		1177			2104			994			1215	
Approach Delay, s/veh		33.5			39.0			43.8			56.8	
Approach LOS		C			D			D			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	16.0	47.6	15.1	41.3	13.1	50.4	16.0	40.4
Change Period (Y+Rc), s	5.5	5.5	4.5	5.5	5.5	5.5	4.5	5.5
Max Green Setting (Gmax), s	10.5	38.5	11.5	38.5	10.5	38.5	11.5	38.5
Max Q Clear Time (g_c+I1), s	11.2	17.6	10.8	31.5	5.1	28.9	12.2	22.8
Green Ext Time (p_c), s	0.0	10.5	0.0	4.3	0.1	8.4	0.0	7.1

Intersection Summary	
HCM 6th Ctrl Delay	42.6
HCM 6th LOS	D

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	137	120	1156	177	102	779
Future Volume (veh/h)	137	120	1156	177	102	779
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		0.98	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1885	1961	1885	1885	1885	1885
Adj Flow Rate, veh/h	144	11	1217	170	107	820
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	1	1	1	1	1	1
Cap, veh/h	180	166	3284	459	384	2865
Arrive On Green	0.10	0.10	0.72	0.72	0.04	0.80
Sat Flow, veh/h	1795	1662	4718	635	1795	3676
Grp Volume(v), veh/h	144	11	918	469	107	820
Grp Sat Flow(s),veh/h/ln	1795	1662	1716	1752	1795	1791
Q Serve(g_s), s	7.8	0.6	10.2	10.2	1.4	5.9
Cycle Q Clear(g_c), s	7.8	0.6	10.2	10.2	1.4	5.9
Prop In Lane	1.00	1.00		0.36	1.00	
Lane Grp Cap(c), veh/h	180	166	2477	1265	384	2865
V/C Ratio(X)	0.80	0.07	0.37	0.37	0.28	0.29
Avail Cap(c_a), veh/h	377	349	2477	1265	513	2865
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.53	0.53	1.00	1.00
Uniform Delay (d), s/veh	44.0	40.8	5.3	5.3	3.6	2.6
Incr Delay (d2), s/veh	8.1	0.2	0.2	0.4	0.1	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.9	0.3	3.0	3.1	0.4	1.4
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	52.1	40.9	5.5	5.7	3.7	2.8
LnGrp LOS	D	D	A	A	A	A
Approach Vol, veh/h	155		1387			927
Approach Delay, s/veh	51.3		5.6			2.9
Approach LOS	D		A			A

Timer - Assigned Phs	2	4	7	8
Phs Duration (G+Y+Rc), s	15.0	85.0	7.8	77.2
Change Period (Y+Rc), s	5.0	5.0	4.0	5.0
Max Green Setting (Gmax), s	21.0	69.0	11.0	54.0
Max Q Clear Time (g_c+I1), s	9.8	7.9	3.4	12.2
Green Ext Time (p_c), s	0.3	10.2	0.0	7.6

Intersection Summary	
HCM 6th Ctrl Delay	7.5
HCM 6th LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	144	110	148	31	55	30	112	1166	55	37	798	92
Future Volume (veh/h)	144	110	148	31	55	30	112	1166	55	37	798	92
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.97	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1961	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	152	116	121	33	58	10	118	1227	53	39	840	84
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	257	167	149	432	572	503	342	1771	76	241	1666	167
Arrive On Green	0.30	0.30	0.30	0.30	0.30	0.30	0.51	0.51	0.51	0.51	0.51	0.51
Sat Flow, veh/h	536	552	491	1151	1885	1658	609	3493	151	435	3285	328
Grp Volume(v), veh/h	389	0	0	33	58	10	118	629	651	39	458	466
Grp Sat Flow(s),veh/h/ln	1578	0	0	1151	1885	1658	609	1791	1853	435	1791	1823
Q Serve(g_s), s	10.1	0.0	0.0	0.0	1.2	0.2	8.4	14.1	14.1	3.9	8.9	8.9
Cycle Q Clear(g_c), s	11.9	0.0	0.0	1.4	1.2	0.2	17.3	14.1	14.1	18.1	8.9	8.9
Prop In Lane	0.39		0.31	1.00		1.00	1.00		0.08	1.00		0.18
Lane Grp Cap(c), veh/h	574	0	0	432	572	503	342	908	939	241	908	924
V/C Ratio(X)	0.68	0.00	0.00	0.08	0.10	0.02	0.34	0.69	0.69	0.16	0.50	0.50
Avail Cap(c_a), veh/h	897	0	0	672	965	849	403	1086	1124	284	1086	1105
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	16.8	0.0	0.0	13.3	13.2	12.9	14.4	9.9	9.9	16.8	8.6	8.6
Incr Delay (d2), s/veh	1.4	0.0	0.0	0.1	0.1	0.0	0.6	1.5	1.5	0.3	0.4	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.0	0.0	0.0	0.3	0.5	0.1	1.0	4.4	4.5	0.4	2.7	2.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	18.3	0.0	0.0	13.4	13.3	12.9	15.0	11.4	11.4	17.1	9.0	9.0
LnGrp LOS	B	A	A	B	B	B	B	B	B	B	A	A
Approach Vol, veh/h		389			101			1398			963	
Approach Delay, s/veh		18.3			13.3			11.7			9.4	
Approach LOS		B			B			B			A	

Timer - Assigned Phs	2	4	6	8
Phs Duration (G+Y+Rc), s	21.0	31.8	21.0	31.8
Change Period (Y+Rc), s	5.0	5.0	5.0	5.0
Max Green Setting (Gmax), s	27.0	32.0	27.0	32.0
Max Q Clear Time (g_c+I1), s	3.4	20.1	13.9	19.3
Green Ext Time (p_c), s	0.4	4.9	2.0	7.4

Intersection Summary	
HCM 6th Ctrl Delay	11.8
HCM 6th LOS	B

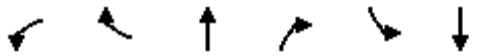
Intersection	
Int Delay, s/veh	1.4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	17	39	93	1233	886	41
Future Vol, veh/h	17	39	93	1233	886	41
Conflicting Peds, #/hr	0	0	3	0	0	3
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	100	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	1	1	1	1	1	1
Mvmt Flow	18	41	98	1298	933	43

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1803	491	979	0	-	0
Stage 1	958	-	-	-	-	-
Stage 2	845	-	-	-	-	-
Critical Hdwy	6.82	6.92	4.12	-	-	-
Critical Hdwy Stg 1	5.82	-	-	-	-	-
Critical Hdwy Stg 2	5.82	-	-	-	-	-
Follow-up Hdwy	3.51	3.31	2.21	-	-	-
Pot Cap-1 Maneuver	72	526	707	-	-	-
Stage 1	335	-	-	-	-	-
Stage 2	384	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	62	524	705	-	-	-
Mov Cap-2 Maneuver	62	-	-	-	-	-
Stage 1	287	-	-	-	-	-
Stage 2	383	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	39.7	0.8	0
HCM LOS	E		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	705	-	161	-	-
HCM Lane V/C Ratio	0.139	-	0.366	-	-
HCM Control Delay (s)	10.9	-	39.7	-	-
HCM Lane LOS	B	-	E	-	-
HCM 95th %tile Q(veh)	0.5	-	1.5	-	-



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	71	59	1387	109	66	861
Future Volume (veh/h)	71	59	1387	109	66	861
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	0.99		0.99	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	75	36	1460	111	69	906
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	1	1	1	1	1	1
Cap, veh/h	109	53	2244	170	299	2383
Arrive On Green	0.09	0.09	0.67	0.67	0.67	0.67
Sat Flow, veh/h	1152	553	3467	255	329	3676
Grp Volume(v), veh/h	112	0	772	799	69	906
Grp Sat Flow(s),veh/h/ln	1721	0	1791	1837	329	1791
Q Serve(g_s), s	2.8	0.0	11.1	11.3	6.9	5.0
Cycle Q Clear(g_c), s	2.8	0.0	11.1	11.3	18.2	5.0
Prop In Lane	0.67	0.32		0.14	1.00	
Lane Grp Cap(c), veh/h	163	0	1192	1223	299	2383
V/C Ratio(X)	0.69	0.00	0.65	0.65	0.23	0.38
Avail Cap(c_a), veh/h	1178	0	2023	2076	451	4046
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	19.2	0.0	4.3	4.3	9.7	3.3
Incr Delay (d2), s/veh	5.0	0.0	0.6	0.6	0.4	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	0.0	1.5	1.6	0.4	0.6
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	24.2	0.0	4.9	4.9	10.1	3.4
LnGrp LOS	C	A	A	A	B	A
Approach Vol, veh/h	112		1571			975
Approach Delay, s/veh	24.2		4.9			3.9
Approach LOS	C		A			A

Timer - Assigned Phs		4		6	8
Phs Duration (G+Y+Rc), s		34.7		9.2	34.7
Change Period (Y+Rc), s		5.5		5.0	5.5
Max Green Setting (Gmax), s		49.5		30.0	49.5
Max Q Clear Time (g_c+I1), s		20.2		4.8	13.3
Green Ext Time (p_c), s		9.0		0.3	15.4

Intersection Summary	
HCM 6th Ctrl Delay	5.3
HCM 6th LOS	A

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	235	1524	156	164	1300	413	148	779	301	255	496	142
Future Volume (veh/h)	235	1524	156	164	1300	413	148	779	301	255	496	142
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.98	1.00		0.96	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1961	1885	1885	1885
Adj Flow Rate, veh/h	247	1604	150	173	1368	277	156	820	199	268	522	126
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	276	2284	214	231	2358	568	183	1056	471	305	802	193
Arrive On Green	0.08	0.38	0.38	0.07	0.36	0.36	0.10	0.29	0.29	0.09	0.28	0.28
Sat Flow, veh/h	3483	6070	567	3483	6485	1561	1795	3582	1599	3483	2862	688
Grp Volume(v), veh/h	247	1285	469	173	1368	277	156	820	199	268	326	322
Grp Sat Flow(s),veh/h/ln	1742	1621	1774	1742	1621	1561	1795	1791	1599	1742	1791	1759
Q Serve(g_s), s	8.4	26.9	26.9	5.9	20.4	16.5	10.3	25.1	12.0	9.1	19.2	19.4
Cycle Q Clear(g_c), s	8.4	26.9	26.9	5.9	20.4	16.5	10.3	25.1	12.0	9.1	19.2	19.4
Prop In Lane	1.00		0.32	1.00		1.00	1.00		1.00	1.00		0.39
Lane Grp Cap(c), veh/h	276	1830	667	231	2358	568	183	1056	471	305	502	493
V/C Ratio(X)	0.90	0.70	0.70	0.75	0.58	0.49	0.85	0.78	0.42	0.88	0.65	0.65
Avail Cap(c_a), veh/h	276	1830	667	276	2358	568	232	1149	513	305	502	493
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.92	0.92	0.92
Uniform Delay (d), s/veh	54.8	31.7	31.7	55.0	30.8	29.5	53.0	38.7	34.1	54.1	38.0	38.1
Incr Delay (d2), s/veh	28.3	2.3	6.1	6.8	1.0	3.0	17.7	3.7	1.0	21.9	3.3	3.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.7	10.4	12.1	2.7	7.8	6.6	5.5	11.4	4.8	4.9	8.8	8.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	83.0	34.0	37.8	61.8	31.8	32.5	70.7	42.4	35.1	76.1	41.3	41.6
LnGrp LOS	F	C	D	E	C	C	E	D	D	E	D	D
Approach Vol, veh/h		2001			1818			1175			916	
Approach Delay, s/veh		41.0			34.8			44.9			51.6	
Approach LOS		D			C			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	13.5	50.7	16.7	39.1	15.0	49.1	15.0	40.9
Change Period (Y+Rc), s	5.5	5.5	4.5	5.5	5.5	5.5	4.5	5.5
Max Green Setting (Gmax), s	9.5	40.5	15.5	33.5	9.5	40.5	10.5	38.5
Max Q Clear Time (g_c+I1), s	7.9	28.9	12.3	21.4	10.4	22.4	11.1	27.1
Green Ext Time (p_c), s	0.0	9.7	0.1	4.7	0.0	13.4	0.0	6.7

Intersection Summary	
HCM 6th Ctrl Delay	41.5
HCM 6th LOS	D

Appendix E: Traffic Signal Warrant Analysis Worksheets

Figure 4C-101 (CA). Traffic Signal Warrants Worksheet (Sheet 1 of 5)

COUNT DATE 10 May 2022

DIST ____ CO ____ RTE ____ PM ____

CALC ____ DATE ____

CHK ____ DATE ____

Major St: Normandie Av — Critical Approach Speed 35 mph

Minor St: 169th St — Critical Approach Speed 25 mph

Speed limit or critical speed on major street traffic > 40 mph..... ☐ or

In built up area of isolated community of < 10,000 population..... ☐ } RURAL (R)

☒ URBAN (U)

WARRANT 1 - Eight Hour Vehicular Volume SATISFIED YES ☐ NO ☒

(Condition A or Condition B or combination of A and B must be satisfied)

Condition A - Minimum Vehicle Volume 100% SATISFIED YES ☐ NO ☒

80% SATISFIED YES ☐ NO ☒

	MINIMUM REQUIREMENTS (80% SHOWN IN BRACKETS)				7 AM	8 AM	12 PM	1 PM	2 PM	3 PM	4 PM	5 PM
	U	R	U	R								Hour
APPROACH LANES	1		2 or More									
Both Approaches Major Street	500 (400)	350 (280)	600 (480)	420 (336)	1,513	1,881	1,522	1,586	1,571	1,952	2,078	2,078
Highest Approach Minor Street	150 (120)	105 (84)	200 (160)	140 (112)	62	75	43	42	48	44	50	44

Condition B - Interruption of Continuous Traffic 100% SATISFIED YES ☐ NO ☒

80% SATISFIED YES ☐ NO ☒

	MINIMUM REQUIREMENTS (80% SHOWN IN BRACKETS)				7 AM	8 AM	12 PM	1 PM	2 PM	3 PM	4 PM	5 PM
	U	R	U	R								Hour
APPROACH LANES	1		2 or More									
Both Approaches Major Street	750 (600)	525 (420)	900 (720)	630 (504)	1,513	1,881	1,522	1,586	1,571	1,952	2,078	2,078
Highest Approach Minor Street	75 (60)	53 (42)	100 (80)	70 (56)	62	75	43	42	48	44	50	44

Combination of Conditions A & B SATISFIED YES ☐ NO ☒

REQUIREMENT	CONDITION	✓	FULFILLED
TWO CONDITIONS SATISFIED 80%	A. MINIMUM VEHICULAR VOLUME		Yes ☐ No ☒
	AND, B. INTERRUPTION OF CONTINUOUS TRAFFIC		
AND, AN ADEQUATE TRIAL OF OTHER ALTERNATIVES THAT COULD CAUSE LESS DELAY AND INCONVENIENCE TO TRAFFIC HAS FAILED TO SOLVE THE TRAFFIC PROBLEMS			Yes ☐ No ☒

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

Figure 4C-101 (CA). Traffic Signal Warrants Worksheet (Sheet 2 of 5)

WARRANT 2 - Four Hour Vehicular Volume **SATISFIED* YES ☐ NO ☒**

Record hourly vehicular volumes for any four hours of an average day.

APPROACH LANES	One	2 or More	7 AM	8 AM	2 PM	4 PM
			Hour			
Both Approaches - Major Street		X	1,513	1,881	1,571	2,078
Higher Approach - Minor Street	X		62	75	48	50

*All plotted points fall above the applicable curve in Figure 4C-1. (URBAN AREAS)	Yes ☐	No ☒
~~OR, All plotted points fall above the applicable curve in Figure 4C-2. (RURAL AREAS)~~	~~Yes ☐~~	~~No ☐~~

WARRANT 3 - Peak Hour **SATISFIED YES ☐ NO ☒**
(Part A or Part B must be satisfied)

Not met in Existing

PART A **SATISFIED YES ☐ NO ☒**

(All parts 1, 2, and 3 below must be satisfied for the same one hour, for any four consecutive 15-minute periods)

1. The total delay experienced by traffic on one minor street approach (one direction only) controlled by a STOP sign equals or exceeds four vehicle-hours for a one-lane approach, or five vehicle-hours for a two-lane approach; AND	Yes ☐	No ☐
2. The volume on the same minor [illegible]ly) equals or exceeds 100 vph for one moving lane of t[illegible]anes; AND	Yes ☐	No ☐
3. The total entering volume serviced during the hour equals or exceeds 800 vph for intersections with four or more approaches or 650 vph for intersections with three approaches.	Yes ☐	No ☐

See Attachment A

PART B **SATISFIED YES ☐ NO ☒**

APPROACH LANES	One	2 or More	Hour
Both Approaches - Major Street			
Higher Approach - Minor Street			

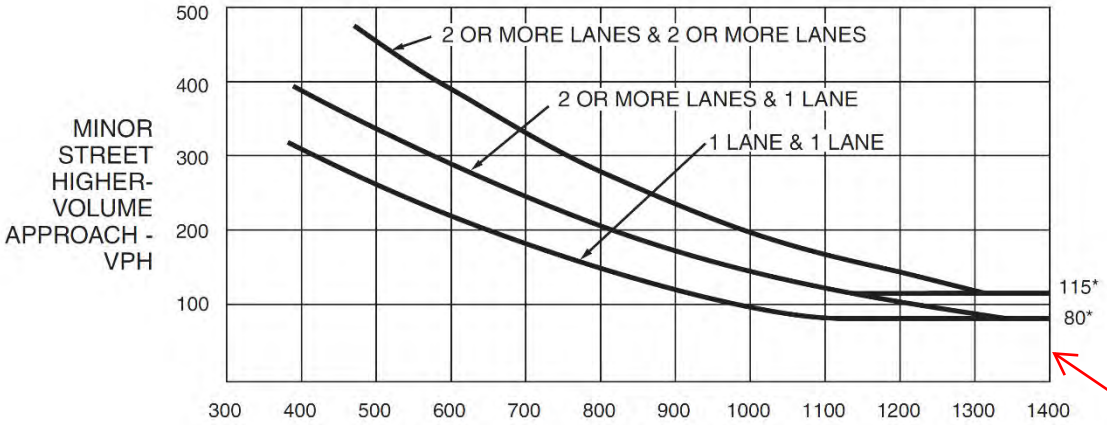
See Attachment A

The plotted point falls above the applicable curve in Figure 4C-3. (URBAN AREAS)	Yes ☐	No ☐
OR, The plotted point falls above the applicable curve in Figure 4C-4. (RURAL AREAS)	Yes ☐	No ☐

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

Warrant 3 is projected to be met in the Opening Year Plus Project AM scenario

Figure 4C-1. Warrant 2, Four-Hour Vehicular Volume

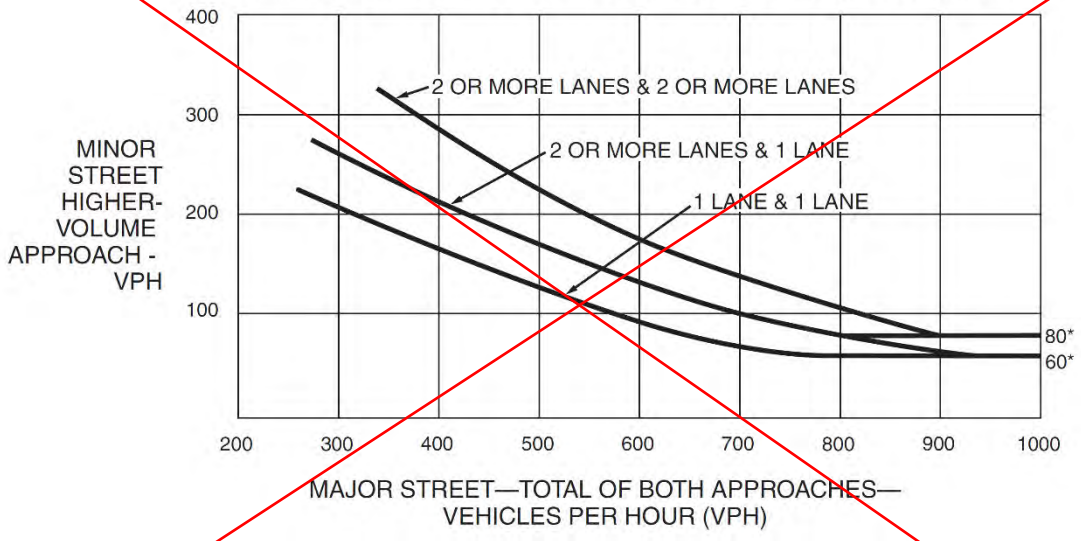


*Note: 115 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 80 vph applies as the lower threshold volume for a minor-street approach with one lane.

Minor street highest approach volume does not exceed 80 vph during any hour.

Figure 4C-2. Warrant 2, Four-Hour Vehicular Volume (70% Factor)

(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 40 MPH ON MAJOR STREET)



*Note: 80 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 60 vph applies as the lower threshold volume for a minor-street approach with one lane.

Figure 4C-101 (CA). Traffic Signal Warrants Worksheet (Sheet 3 of 5)

WARRANT 4 - Pedestrian Volume
(Parts 1 and 2 Must Be Satisfied)

SATISFIED YES ☐ NO ☐

Part 1 (Parts A or B must be satisfied)

	Hours - - ->				
A.	Vehicles per hour for any 4 hours				
	Pedestrians per hour for any 4 hours				

Figure 4C-5 or Figure 4C-6
SATISFIED YES ☐ NO ☐

Warrant was not performed due to low pedestrian crossing volumes per intersection turning movement counts.

	Hours - - ->				
B.	Vehicles per hour for any 1 hour				
	Pedestrians per hour for any 1 hour				

C-7 or Figure 4C-8
ED YES ☐ NO ☐

Part 2 **SATISFIED YES ☐ NO ☐**

AND, The distance to the nearest traffic signal along the major street is greater than 300 ft	Yes ☐ No ☐
OR, The proposed traffic signal will not restrict progressive traffic flow along the major street.	Yes ☐ No ☐

WARRANT 5 - School Crossing
(Parts A and B Must Be Satisfied)

SATISFIED YES ☐ NO ☐

Part A **SATISFIED YES ☐ NO ☐**
Gap/Minutes and # of Children

		Hour	
Gaps vs Minutes	Minutes Children Using Crossing		
	Number of Adequate Gaps		Gaps < Minutes YES ☐ NO ☐
School Age Pedestrians			0/hr YES ☐ NO ☐
AND, Consideration has			Yes ☐ No ☐

Warrant was not performed due to no school in close proximity to Project site and Normandie/169th intersection.

Part B **SATISFIED YES ☐ NO ☐**

The distance to the nearest traffic signal along the major street is greater than 300 ft	Yes ☐ No ☐
OR, The proposed signal will not restrict the progressive movement of traffic.	Yes ☐ No ☐

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

Figure 4C-101 (CA). Traffic Signal Warrants Worksheet (Sheet 4 of 5)

WARRANT 6 - Coordinated Signal System **SATISFIED YES ☐ NO ☐**
(All Parts Must Be Satisfied)

MINIMUM REQUIREMENTS	DISTANCE TO NEAREST SIGNAL	
≥ 1000 ft	___ ft	Yes ☐ No ☐
On a one-way street or a traffic control signals are vehicular platooning.	adjacent ee of	Yes ☐ No ☐
OR, On a two-way street, adjacent traffic control signals do not provide the necessary degree of platooning and the proposed and adjacent traffic control signals will collectively provide a progressive operation.		

Warrant was not performed due to acceptable operating conditions along Normandie Avenue per LOS analysis.

WARRANT 7 - Crash Experience Warrant **SATISFIED YES ☐ NO ☒**
(All Parts Must Be Satisfied)

Adequate trial of alternatives with satisfactory observance and enforcement has failed to reduce the crash frequency.			Yes ☐ No ☐ N/A
REQUIREMENTS	Number of crashes reported within a 12 month period susceptible to correction by a traffic signal, and involving injury or damage exceeding the requirements for a reportable crash.		Yes ☐ No ☒
5 OR MORE			
REQUIREMENTS	CONDITIONS	✓	
ONE CONDITION SATISFIED 80%	Warrant 1, Condition A - Minimum Vehicular Volume		Yes ☐ No ☒
	OR, Warrant 1, Condition B - Interruption of Continuous Traffic		
	OR, Warrant 4, Pedestrian Volume Condition Ped Vol ≥ 80% of Figure 4C-5 through Figure 4C-8		

WARRANT 8 - Roadway Network **SATISFIED YES ☐ NO ☒**
(All Parts Must Be Satisfied)

MINIMUM VOLUME REQUIREMENTS	7:45 AM ENTERING VOLUMES - ALL APPROACHES	✓	FULFILLED
1000 Veh/Hr Yes	During Typical Weekday Peak Hour See Att. B Veh/Hr and has 5-year projected traffic volumes that meet one or more of Warrants 1, 2, and 3 during an average weekday.	x	Yes ☒ No ☐
	OR During Each of Any 5 Hrs. of a Sat. or Sun _____ Veh/Hr	N/A	

CHARACTERISTICS OF MAJOR ROUTES	MAJOR ROUTE A	MAJOR ROUTE B	
Hwy. System Serving as Principal Network for Through Traffic			169th Street not a major route
Rural or Suburban Highway Outside Of, Entering, or Traversing a City			
Appears as Major Route on an Official Plan			
Any Major Route Characteristics Met, Both Streets			Yes ☐ No ☒

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

Figure 4C-101 (CA). Traffic Signal Warrants Worksheet (Sheet 5 of 5)

WARRANT 9 - Intersection Near a Grade Crossing **SATISFIED YES ☐ NO ☐**
(Both Parts A and B Must Be Satisfied)

PART A A grade crossing exists on an approach controlled by a STOP or YIELD sign and the center of the track nearest to the intersection is within 140 feet of the stop line or yield line on the approach. Track Center Line to Limit Line _____ ft	Yes ☐ No ☐
PART B **There is one minor street approach lane at the track crossing -** During the highest traffic volume hour during which rail traffic uses the crossing, the plotted point falls above the applicable curve in Figure 4C-9. Major Street - Total of both approaches: _____ VPH Minor Street - Crosses the track (one direction only, approaching the intersection): _____ VPH X AF (Use Tables 4C-2, 3, & 4 below to calculate AF) = _____ VPH	Yes ☐ No ☐
OR, There are two or more minor street approach lanes at the track crossing - During the highest traffic volume hour during which rail traffic uses the crossing, the plotted point falls above the applicable curve in Figure 4C-10. Major Street - Total of both approaches : _____ VPH Minor Street - Crosses the track (one direction only, approaching the intersection): _____ VPH X AF (Use Tables 4C-2, 3, & 4 below to calcualte AF) = _____ VPH	

The minor street approach[illegible] ent factors (AF)
as described in Section 4[illegible]

Warrant not performed. Warrant 9 pertains to grade crossings on minor streets. Railroad crosses the major street near Normandie/169th.

1- Number of Rail Traffic p[illegible] t factor from table 4C-2____

2- Percentage of High-Oc[illegible] t factor from table 4C-3____

3- Percentage of Tractor-Trailer Trucks on Minor Street Approach_____ Adjustment factor from table 4C-4____

NOTE: If no data is availale or known, then use AF = 1 (no adjustment)

Attachment A

FEHR PEERS

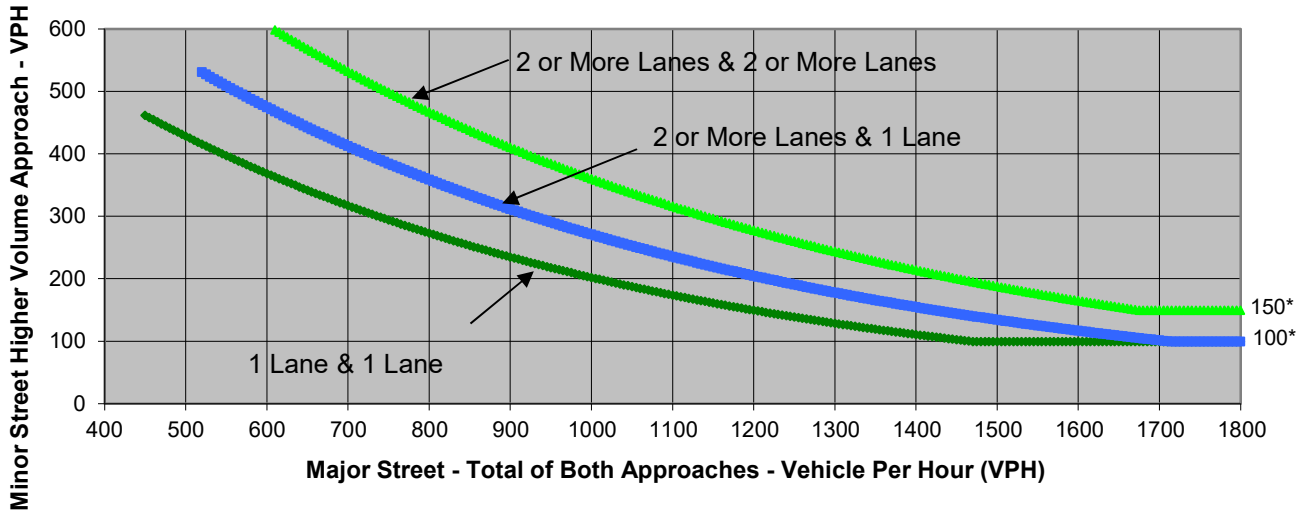
Major Street	Normandie Avenue	Project	16911 Normandie Avenue Project
Minor Street	169th Street	Scenario	Existing Conditions
		Peak Hour	AM (7:45 AM)

Turn Movement Volumes

	NB	SB	EB	WB
Approach Volume	979	1,018	84	
Total	979	1,018	84	0

Major Street Direction

x	North/South
	East/West



* Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

Source: *California Manual on Uniform Traffic Control Devices*, Caltrans, 2014

	Major Street	Minor Street	Warrant Met
	Normandie Avenue	169th Street	
Number of Approach Lanes	**2**	**1**	**NO**
Traffic Volume (VPH) *	**1,997**	**84**	

* Note: Traffic Volume for Major Street is Total Volume of Both Approches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

FEHR PEERS

Major Street	Normandie Avenue
Minor Street	169th Street

Project	16911 Normandie Avenue Project
Scenario	Existing Conditions
Peak Hour	AM (7:45 AM)

Turn Movement Volumes

	NB	SB	EB	WB
Approach Volume	979	1,018	84	
Total	979	1,018	84	0

Major Street Direction

x	North/South
	East/West

Intersection Geometry

Number of Approach Lanes for Minor Street	1
Total Approaches	3

Worst Case Delay for Minor Street

Stopped Delay (seconds per vehicle)	20.3
Approach with Worst Case Delay	EB
Total Vehicles on Approach	84

See Appendix D

Warrant 3A, Peak Hour			
	Peak Hour Delay on Minor Approach (vehicle-hours)	**Peak Hour Volume on Minor Approach (vph)**	**Peak Hour Entering Volume Serviced (vph)**
Existing Conditions	**0.5**	**84**	**2,081**
Limiting Value	**4**	**100**	**650**
Condition Satisfied?	**Not Met**	**Not Met**	**Met**
Warrant Met	**NO**		

FEHR PEERS

Major Street	Normandie Avenue
Minor Street	169th Street

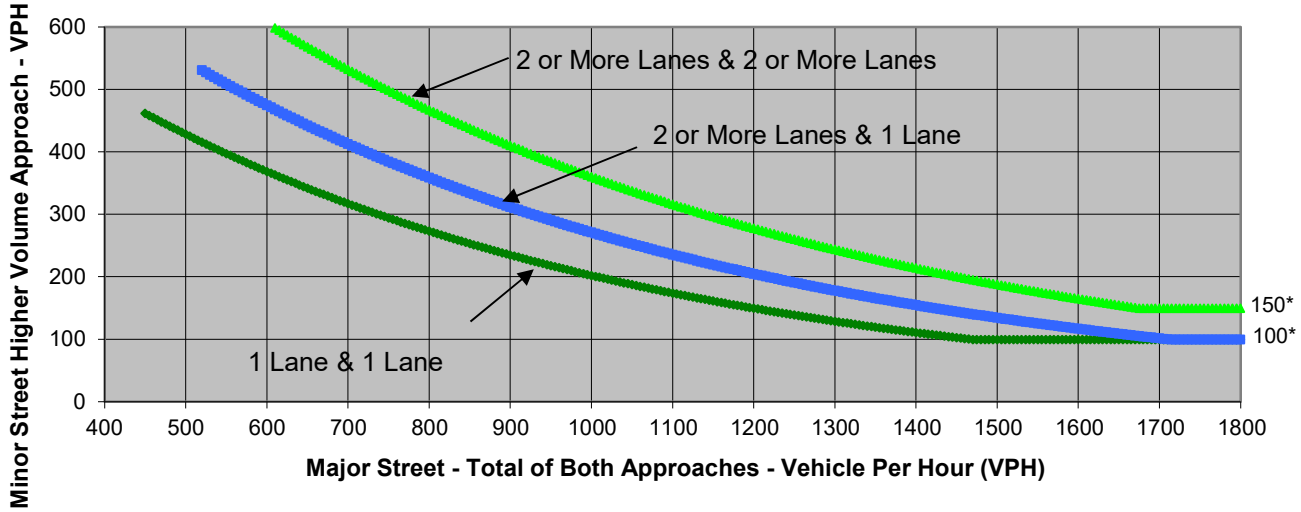
Project	16911 Normandie Avenue Project
Scenario	Existing Conditions
Peak Hour	PM (4 PM)

Turn Movement Volumes

	NB	SB	EB	WB
Approach Volume	1,206	872	50	
Total	1,206	872	50	0

Major Street Direction

x	North/South
	East/West



* Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

Source: *California Manual on Uniform Traffic Control Devices*, Caltrans, 2014

	Major Street	Minor Street	Warrant Met
	Normandie Avenue	169th Street	
Number of Approach Lanes	**2**	**1**	**NO**
Traffic Volume (VPH) *	**2,078**	**50**	

* Note: Traffic Volume for Major Street is Total Volume of Both Approches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

FEHR PEERS

Major Street	Normandie Avenue
Minor Street	169th Street

Project	16911 Normandie Avenue Project
Scenario	Existing Conditions
Peak Hour	PM (4 PM)

Turn Movement Volumes

	NB	SB	EB	WB
Approach Volume	1,206	872	50	
Total	1,206	872	50	0

Major Street Direction

x	North/South
	East/West

Intersection Geometry

Number of Approach Lanes for Minor Street	1
Total Approaches	3

Worst Case Delay for Minor Street

Stopped Delay (seconds per vehicle)	21.5
Approach with Worst Case Delay	EB
Total Vehicles on Approach	50

See Appendix D

Warrant 3A, Peak Hour			
	Peak Hour Delay on Minor Approach (vehicle-hours)	**Peak Hour Volume on Minor Approach (vph)**	**Peak Hour Entering Volume Serviced (vph)**
Existing Conditions	**0.3**	**50**	**2,128**
Limiting Value	**4**	**100**	**650**
Condition Satisfied?	**Not Met**	**Not Met**	**Met**
Warrant Met	**NO**		

Attachment B

FEHR PEERS

Major Street	Normandie Avenue
Minor Street	169th Street

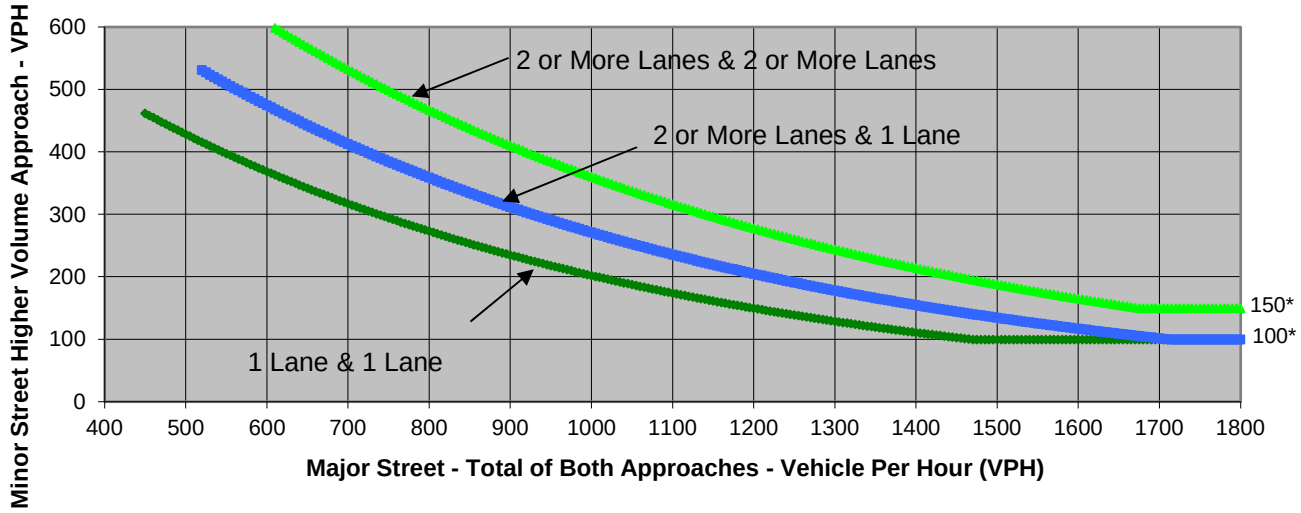
Project	16911 Normandie Avenue Project
Scenario	Opening Year Plus Project
Peak Hour	AM

Turn Movement Volumes

	NB	SB	EB	WB
Approach Volume	1,110	1,023	121	
Total	1,110	1,023	121	0

Major Street Direction

x	North/South
	East/West



* Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

Source: *California Manual on Uniform Traffic Control Devices*, Caltrans, 2014

	Major Street	Minor Street	Warrant Met
	Normandie Avenue	169th Street	
Number of Approach Lanes	**2**	**1**	**YES**
Traffic Volume (VPH) *	**2,133**	**121**	

* Note: Traffic Volume for Major Street is Total Volume of Both Approches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.