SPECIFICATIONS

MWS – Linear

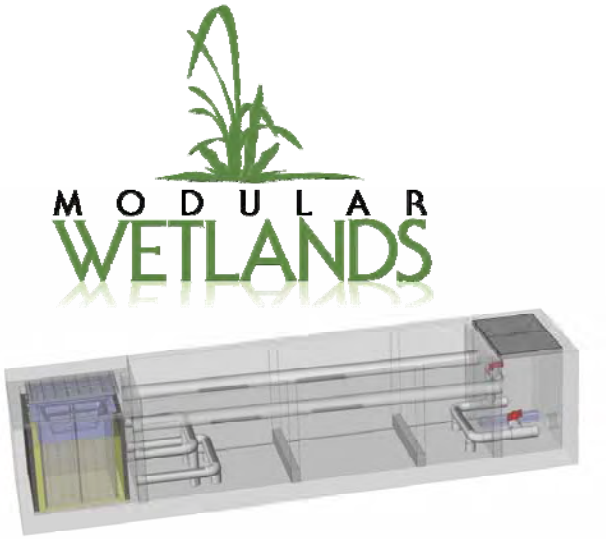
Hybrid Stormwater Filtration System

Modular Wetland Systems, Inc.
P.O. Box 869
Oceanside, CA 92049

www.modularwetlands.com
P 760-433-7640
F 760-433-3179

MWS – Linear

Hybrid Stormwater Filtration System



Save valuable space with small footprint for urban sites.

Improve BMP aesthetics with attractive native and tropical landscape plants.

Reduce lifetime costs with safer and less expensive maintenance

"The MWS – Linear hybrid stormwater treatment system is described as a self contained treatment train. This system utilizes an innovative combination of l treatment processes. Stormwater runoff flows into the system via pipe or curb/grate type catch basin opening. Polluted runoff first encounters a screening device to remove larger pollutants and then enters a hydrodynamic separation chamber which settles out the sediments and larger suspended solids. Next the runoff is treated by a revolutionary filter media, BioMediaGREEN that removes fines and associated pollutants, including bacteria. From there runoff enters of bioretention filter in the form of a subsurface flow vegetated gravel wetland. Within the wetland physical, chemical, and biological mechanisms remove the remaining particulate and dissolved pollutants. The purified runoff leaves the system via the discharge chamber. In the discharge chamber the rate of discharge is controlled by valves set to a desired rate".

Tested Pollutant Removal Efficiencies:

TSS Removal	Dissolved Lead Removal	Dissolved Copper Removal	TPH	E. coli Removal	Turbidity Removal
98%	81%	92%	99%	60.2%	92%

"Nature and Harmony Working Together in Perfect Harmony"

SPECIFICATIONS – MWS- LINEAR

Track Record: The MWS- Linear Hybrid Stormwater Treatment System is manufactured by a company whom is regularly engaged in the engineering design and production of treatment systems for stormwater.

Coverage: The MWS- Linear is designed to treat the water quality volume or water quality flow. For flow based design, high flow bypass is internal, for volume based design, high flow bypass is external and prior to pre-detention system. For offline volume based designs the MWS - Linear has the ability to treat the entire water quality volume when used with pre-storage and properly sized.

Non-Corrosive Materials: The MWS – Linear is designed with non-corrosive materials. All internal piping is SD35 PVC. Catch basin filter components, including mounting hardware, fasteners, support brackets, filtration material, and support frame are constructed of non-corrosive materials (316 stainless steel, and UV protected/marine grade fiberglass). Fasteners are stainless steel. Primary filter mesh is 316 stainless steel welded screens. Filtration basket screens for coarse, medium and fine filtration is ¾" x 1 ¾"expanded, 10 x 10 mesh, and 35 x 35 mesh, respectively. No polypropylene, monofilament netting or fabrics shall be used in this system. Media Protective Panels are constructed of UV protected/marine grade fiberglass. Mounts are constructed of stainless steel. BioMediaGREEN is an inert rock substrate and is non-corrosive. Perimeter filter structure is constructed of lightweight injection molded plastic. Mounting brackets are constructed of SD40 PVC and are mounted with 3/8" diameter stainless steel redheads. Drain down filter cover is constructed of UV protected/marine grade fiberglass and stainless steel hinge and mount.

Weight: Each complete unit weighs approximately 29,000 to 40,000 pounds and requires a boom crane to install. Details of this are provided in the installation section of the MWS-Linear Design Kit.

Transportation: The Modular Wetland System – Linear is designed to be transported on a standard flat bed truck. The unit easily fits on a flat bed truck without the need of special permitting.

Alternative Technology Configurations: The Modular Wetland System – Linear is modular is design. Each module will be up to 22 feet long and 5 feet wide. The system can be made in lengths varying from 13 to 100s of feet long. For lengths longer than 22 feet the system will shipped in modules and assembled on site. The Modular Wetland System – Linear has many alternative configurations. This allows the system to be adapted to many site conditions. Runoff can enter the system through a pipe, and/or a built in curb or grate type opening.

Energy Requirements: The Modular Wetland System – Linear is completely passive and requires no external energy sources.

Buoyancy Issues: Buoyancy is only a an issue when ground water levels rise above the bottom of the Modular Wetland System – Linear's concrete structure. With 8.5 cubic yards of wetland media there is no concern of floatation. As a precaution a footing can also be built into the systems concrete structure.

Durability: The structure of the box will be precast concrete. The concrete will be 28 day compressive strength fc = 5,000 psi. Steel reinforcing will be ASTM A – C857. Structure will support an H20 loading as indicted by AASHTO. The joint between the concrete sections will ship lap and joint sealed with ram-nek. Filter (excluding oil absorbent media) and support structures are of proven durability. The filter and mounting structures are of sufficient strength to support water, sediment, and debris loads when the filter is full, with no slippage, breaking, or tearing. All filters are warranted for a minimum of five (5) years.

Oil Absorbent Media: The MWS – Linear utilizes both physical and biological mechanisms to capture and filter oil and grease. A skimmer and boom system will be positioned on the internal perimeter of the catch basin insert. The primary filtration media, BioMediaGreen, utilized in the perimeter and drain down filters, has excellent hydrocarbon removal abilities. Within the wetland filter biological processes capture and

break down oil and grease. Much of the breakdown and transformation of oil and grease is performed by natural occurring bacteria.

Overflow Protection: The grate and curb type MWS – Linear are designed with an internal bypass consisting of two SD PVC pipes which direct high flows around the perimeter and wetland filter, directly into the discharge chamber. For the volume based vault type configuration, bypass should be located prior to the pre-detention system. For peak flows that exceed internal bypass capacity, external bypass is use.

Filter Bypass: Runoff will bypass filtration (BioMediaGREEN and wetland filter) components of the MWS - Linear. The system will still provide screening and settling during higher flow rates for internally bypassed flows. External bypass will bypass of treatment processes.

Pollutant Removal Efficiency: The MWS - Linear is capable of removing over 90% of the net annual total suspended solids (TSS) load based on a 20-micron particle size. Annual TSS removal efficiency models are based on documented removal efficiency performance from full-scale laboratory tests on BioMediaGreen and quarter-scale laboratory tests on the MWS – Linear flow based system.

POLLUTANT	REMOVAL EFFICIENCY
Trash & Litter	99%
TPH (mg/L)	99%
TSS (mg/L)	98%
E. Coli (MPN/100ml)	60%
Turbidity (NTU)	92%
Dissolved Metals (mg/L)	76%

Sil-Co-Sil 106. Mean particle diameter = 19 microns

Non-Scouring: During heavy storm events the runoff bypasses perimeter and wetland filter components. The system will not re-suspend solids at design flows.

Uniqueness: The Modular Wetland System – Linear is a complete self contained treatment train that incorporates capture, screening, sedimentation, filtration, bioretention, high flow bypass, and flow control into a single modular structure. This system provides four stages of treatment making it the only 4 stage treatment train stormwater filtration system, therefore making it unique to the industry. Other systems do not incorporate all the necessary attributes to make it a complete stormwater management device as with the Modular Wetland System – Linear. Therefore, no equal exists for this system.

Pretreatment & Preconditioning: Since the Modular Wetland System – Linear is a complete capture and treatment train stormwater management system no external pretreatment of preconditioning is necessary.

SPECIFICATIONS – BioMediaGREEN

BioMediaGREEN is a proprietary engineered filter media. Made of a unique combination of the inert naturally occurring material this product is non-combustible and do not pose a fire hazard, stable and non-reactive, and is also biodegradable. It is stable with no known adverse environmental effects.

This product has been tested in long-term carcinogenicity studies [inhalation and intraperitoneal injection (i.p.)] with no significant increase in lung tumors or abdominal tumors. Short-term biopersistent (inhalation and intra-tracheal injection) studies have shown that the products disappear very rapidly from the lung.

In October 2001, IARC classified this product as Group 3, "not classifiable as to its carcinogenicity to humans". The 2001 decision was based on the latest epidemiological studies and animal inhalation studies that show no relation between inhalation exposure and the development of tumors.

The product can typically be disposed of in an ordinary landfill (local regulations may apply). If you are unsure of the regulations, contact your local Public Health Department or the local office of the Environmental Protection Agency (EPA).

Coverage: When properly installed BioMediaGREEN Filter Blocks provide sufficient contact time, at rated flows, of passing contaminate water. The BioMediaGREEN material will capture and retain most pollutants that pass through it. The BioMediaGREEN material is made of a proprietary blend of inert substances. The BioMediaGREEN Filter Blocks can be used in different treatment devices, including but not limited to flume filters, trench drain filters, downspout filters, catch basin inserts, water polishing units, and hydrodynamic separators.

Non-Corrosive Materials: The BioMediaGreen material is made of non-corrosive materials.

Durability: The BioMediaGREEN material has been chosen for its proven durability, with an expected life of 2 plus years. The BioMediaGREEN material is of sufficient strength to support water, sediment, and debris loads when the media is at maximum flow; with no slippage, breaking, or tearing. The BioMediaGREEN material has been tested through rigorous flow and loading conditions.

Oil Absorbent Media: The BioMediaGREEN material has been proven to capture and retain hydrocarbons.

Pollutant Removal Efficiency: The BioMediaGREEN Filter Blocks are designed to capture high levels of Hydrocarbons including but not limited to oils & grease, gasoline, diesel, and PAHs. BioMediaGREEN Filter Blocks have the physical ability to block and filter trash and litter, grass and foliage, sediments, TSS, particulate and dissolved metals, nutrients, and bacteria.

BioMediaGREEN technology is based on a proprietary blend of synthetic inert natural substances aimed at removal of various stormwater pollutants. BioMediaGREEN was created to have a very porous structure capable of selectively removing pollutants while

allowing high flow through rates for water. As pollutants are captured by its structure, BioMediaGREEN captures most pollutants and maintains porosity and filtering capabilities.

Field and laboratory tests have confirmed the BioMediaGREEN capability to capture large percentage of TSS, hydrocarbons, nutrients, and heavy metals. Microbial reduction efficiency will vary depending on colony size, flow rates and site specific conditions.

POLLUTANT	REMOVAL EFFICIENCY
Oil & Grease (mg/L)	90%
TPH (mg/L)	99%
TSS (mg/L)	85%
Turbidity (NTU)	99%
Total Phosphorus (mg/L)	69.6%
Dissolved Metals (mg/L)	75.6%

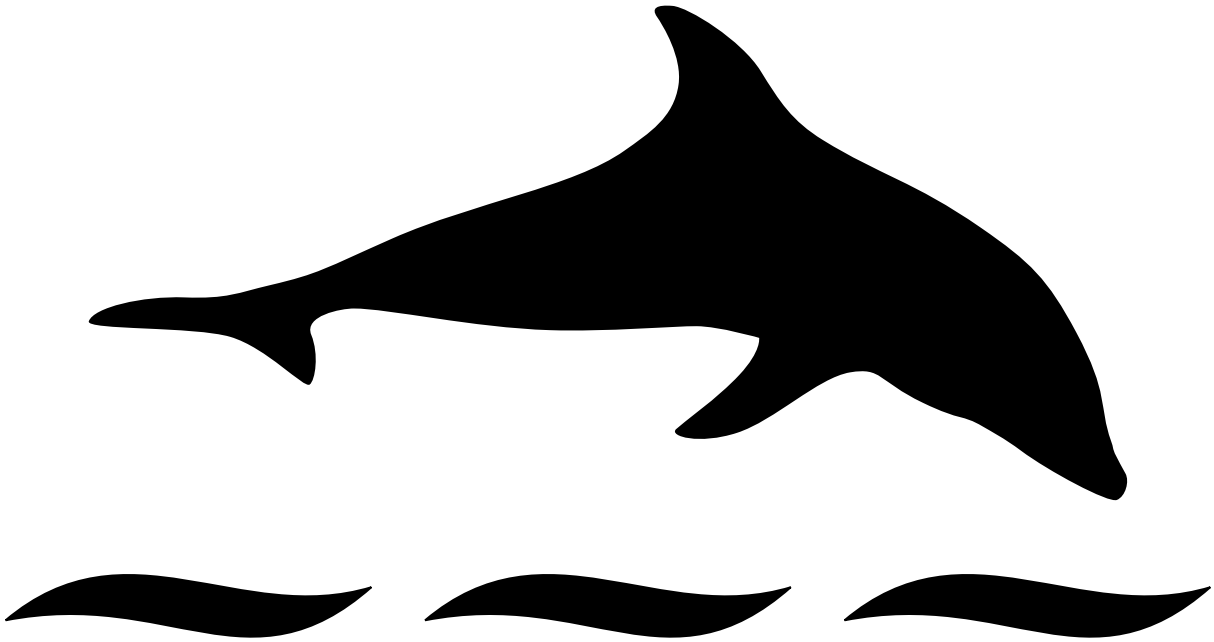
Sil-Co-Sil 106. Mean particle diameter = 19 microns

Replacement: Removal and replacement of the blocks is simple. Remove blocks from filtration system. Replace with new block of equal size.

Appendix D:
"NO DUMPING – DRAINS TO OCEAN" Stencil Examples

Sample Stencil 1

NO DUMPING



DRAINS TO OCEAN

Sample Stencil 2

Appendix E:
Catch Basin Cleaning

OPERATION & MAINTENANCE PLAN
FOR FILTER INSERT

The maintenance program will include the following key components:

1. **REGULAR SWEEPING AND REMOVAL OF DEBRIS:**
   Vehicle parking lot will be swept on a regular basis. Sediment and debris (litter, leaves, papers and cans, etc.) within the area, especially around the drainage inlet, will be collected and removed. The frequency of sweeping will be based on the amount of sediment and debris generated.

2. **REGULAR INSPECTIONS:**
   The catch basin, downspout, or trench drain filter insert will be inspected on a regular basis. The frequency of inspection will be based on pollutant loading, amount of debris, leaves, etc., and amount of runoff. At a minimum, there will be three inspections per year.

3. **CONDUCT OF THE VISUAL INSPECTION:**
   a. Broom sweep around the inlet and remove the inlet grate.
   b. Inspect the filter liner for serviceability. If called for, the filter body will be replaced.
   c. Check the condition of the adsorbent pouches and visually check the condition of the enclosed adsorbent. If the surface of the granules is more than 50% coated with a dark gray or black substance, the pouches will be replaced with new ones.
   d. Check for loose or missing nuts (on some models) and gaps between the filter and the inlet wall, which would allow bypass of the filter during low flows.
   e. The filter components will be replaced in the inlet and the grate replaced.

4. **CLEANING OUT THE FILTER INSERT:**
   Regardless of the model of filter insert, the devices must be cleaned out on a recurring basis. The manufacturer recommends at least three cleanings per year – more in high exposure areas. For the Flo-Gard+Plus filters, the filter must be cleaned when the solids level reaches close to the fullel tip.
   a. The Standard Filter, in most cases, can be cleaned out by removing the device from the inlet and dumping the contents into a DOT approved drum for later disposal. If the oil-absorbant pouches need to be changed, the time to change them is immediately after dumping and before the filter is replaced in the inlet.
   b. Because of weight, method of installation and so forth, some filter inserts will be cleaned with the aid of a vactor truck. If necessary, the oil-absorbant pouches will be changed after the pollutants have been removed and as the filter is being returned to service.

5. **MAINTENANCE LOG:**
   Keep a log of all inspections and maintenance performed on the catch basins, trench drains, and filter inserts. Keep this log on-site.

CATCH BASIN MAINTENANCE RECORD

SITE INFORMATION	
Contact:	Phone: ( )
Project Name:	
Address:	
Filter No. & Model:	

SERVICE INFORMATION		
Date of Service:	By:	
☐ Inspection	☐ Clean Debris	☐ Clean Silt/Sediment
☐ Replace Pouch	☐ Replace Rock	☐ Repair/Replace Parts
Comments:		
Approval Signature:		

SITE INFORMATION	
Contact:	Phone: ( )
Project Name:	
Address:	
Filter No. & Model:	

SERVICE INFORMATION		
Date of Service:	By:	
☐ Inspection	☐ Clean Debris	☐ Clean Silt/Sediment
☐ Replace Pouch	☐ Replace Rock	☐ Repair/Replace Parts
Comments:		
Approval Signature:		

CATCH BASIN MAINTENANCE RECORD

SITE INFORMATION		
Contact:	Phone: ( )	
Project Name:		
Address:		
Filter No. & Model:		

SERVICE INFORMATION		
Date of Service:	By:	
☐ Inspection	☐ Clean Debris	☐ Clean Silt/Sediment
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Approval Signature:		

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Contact:	Phone: ( )	
Project Name:		
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SERVICE INFORMATION		
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Comments:		
Approval Signature:		

Appendix F:
General Education Materials

Storm Drains are for Rain...

More than 50% of the automotive oil sold to do-it-yourself oil changers is not recycled. There are more than 600 State-certified used oil collection centers within Los Angeles County.

Never dispose of automotive fluids in the street or gutter. Take them to your local auto parts store, gas station or repair shop, or a household hazardous waste Roundup for recycling.

1(888)CLEAN LA
www.888CleanLA.com

...not automotive fluids.

Car Care Tips:

You can keep your car running smoothly and efficiently, and at the same time help prevent stormwater pollution by taking these easy steps...

- When changing vehicle fluids — motor oil, transmission, brake and radiator fluids — drain them into separate drip pans to avoid spills. Do not combine these fluids. Do not dispose of these fluids in the street, gutter or garbage. It is illegal.
- If a spill occurs, use kitty litter, sawdust or cornmeal for cleanup. Do not hose or rinse with water.
- Recycle all used vehicle fluids. Call 1(888)CLEAN LA or visitwww.888CleanLA.com for the location of an auto parts store or gas station that recycles these fluids, or for the location of a local household hazardous waste Roundup.
- Regularly check and maintain your car to keep it running safely and efficiently. Water runoff from streets, parking lots and driveways picks up oil and grease drippings, asbestos from brake linings, zinc from tires and organic compounds and metals from spilled fuels and carries them to the ocean.

PROJECT Pollution PREVENTION

Printed on recycled paper

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PROJECT Pollution PREVENTION

Printed on recycled paper

Good Cleaning Practices

Managing FATS, OIL and GREASE

POST IN CLEANUP/WORK AREA

THE RIGHT WAY

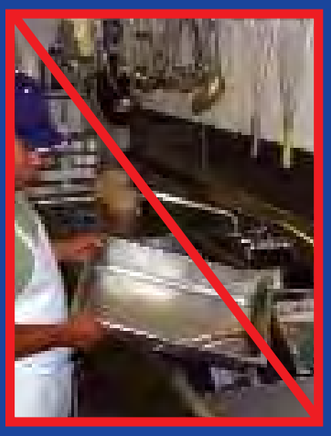
1 Wipe pots, pans, and work areas prior to washing.

2 Dispose of food waste directly into the trash.

3 Collect waste oil and store for recycling.

4 Clean mats inside over a utility sink. Use dry clean up for spills.

THE WRONG WAY



1 Do not pour cooking residue directly into the drain.

2 Avoid using the garbage disposal. Place greasy food in the trash.

3 Do not pour waste oil directly into the drain, parking lot or street.

4 Do not wash floor mats outside where water will run off directly into the storm drain.
Do not rinse spills into the street.

For more information call **(888) CLEAN LA** or visit **www.888CleanLA.com**

PUBLIC WORKS

County of Los Angeles Department of Public Works

environmental health

SANITATION DISTRICTS OF LOS ANGELES COUNTY

www.lacsd.org

Are You a Litter Bug and Don't Know It?

Take our quiz!

Have you ever...

- Dropped a cigarette butt or trash on the ground?
- Failed to pick up after your dog while out on a walk?
- Overwatered your lawn after applying fertilizers/pesticides?
- Disposed of used motor oil in the street, gutter or garbage?

If you answered **yes** to any of these actions, then **YOU ARE A LITTER BUG**!

Each of these behaviors contribute to stormwater pollution, which contaminates our ocean and waterways, kills marine life and causes beach closures.

You can become part of the solution!
To find out how, flip this card over.

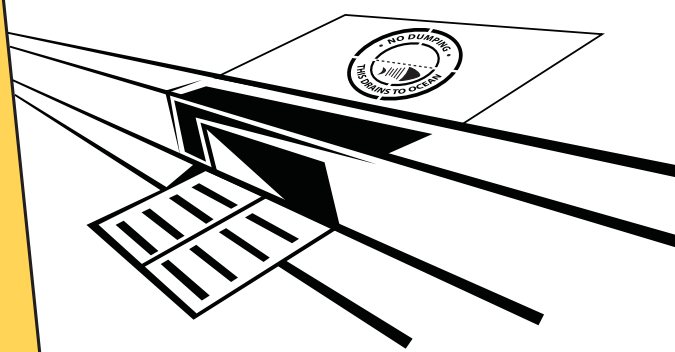
For more information, call or visit:

1 (888) CLEAN LA
www.888CleanLA.com

PROJECT Pollution PREVENTION

Follow these simple steps to prevent stormwater pollution:

- Put your garbage where it belongs — in the trash can.
- Pick up after your dog when out on a walk.
- Reduce pesticide and fertilizer use; don't overwater after application or apply if rain is forecast.
- Dispose of used motor oil at an oil recycling center or at a free Household Hazardous Waste/E-Waste collection event.



A message from the County of Los Angeles Department of Public Works.
Printed on recycled paper.

Don't Paint the Town Red!

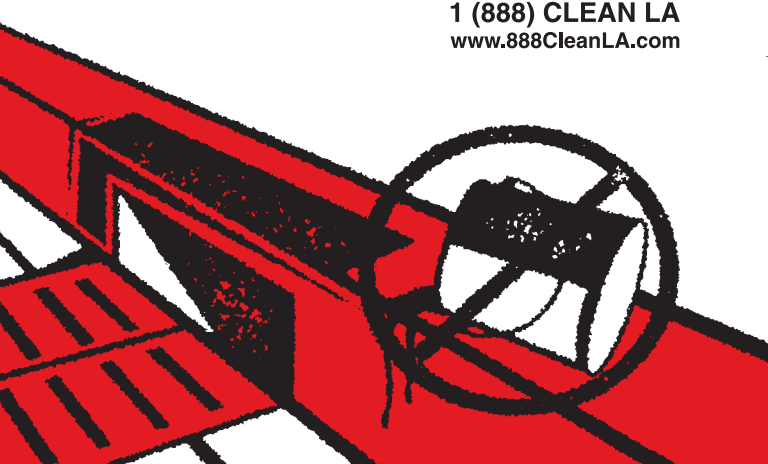
Storm drains are for rain…
they're not for paint disposal.

More than **197,000** times each month, L.A. County residents wash their dirty paint brushes under an outdoor faucet.

This dirty rinse water flows into the street, down the storm drain and straight to the ocean — **untreated**.

Remember to clean water-based paint brushes in the sink, rinse oil-based paint brushes with paint thinner, and take old paint and paint-related products to a Household Hazardous Waste/E-Waste collection event.

1 (888) CLEAN LA
www.888CleanLA.com



Tips for Paint Clean-Up:

L.A. County residents can help solve the stormwater pollution problem by taking these easy steps when working with paint and paint-related products…

- Never dispose of paint or paint-related products in the gutters or storm drains. This is called illegal dumping. Take them to a Household Hazardous Waste/E-Waste collection event. Call 1 (888) CLEAN LA or visit www.888CleanLA.com to locate an event near you.
- Buy only what you need. Reuse leftover paint for touch-ups or donate it to a local graffiti abatement program. Recycle or use excess paint.
- Clean water-based paint brushes in the sink.
- Oil-based paints should be cleaned with paint thinner. Filter and reuse paint thinner. Set the used thinner aside in a closed jar to settle-out paint particles.
- Store paints and paint-related products in rigid, durable and watertight containers with tight-fitting covers.

PROJECT Pollution PREVENTION

A message from the County of Los Angeles Department of Public Works.
Printed on recycled paper.

Storm Drains are for Rain...

More than 200,000 times each month, lawns and gardens throughout LA County are sprayed with pesticides. Overwatering or rain causes pesticides on leaves and grass to flow into the storm drain and to the ocean — untreated.

Please use pesticides wisely, not before a rain, and water carefully.

...not pesticides.

1(888)CLEAN LA
www.888CleanLA.com

Pesticide Tips:

You can keep your lawn and garden green and at the same time solve the pollution problem by taking these easy steps...

- Never dispose of lawn or garden chemicals in storm drains. This is called illegal dumping. Take them to a household hazardous waste roundup. Call 1(888)CLEAN LA or visit www.888CleanLA.com to locate a roundup or collection facility near you.
- More is not better. Use pesticides sparingly. "Spot" apply, rather than "blanket" apply.
- Read labels! Use only as directed.
- Use non-toxic products for your garden and lawn whenever possible.
- If you must store pesticides, make sure they are in a sealed, water-proof container that cannot leak.
- When watering your lawn, use the least amount of water possible so it doesn't run into the street and carry pesticide chemicals with it. Don't use pesticides before a rain storm. You will not only lose the pesticide, but also will be harming the environment.

PROJECT Pollution PREVENTION

Printed on recycled paper

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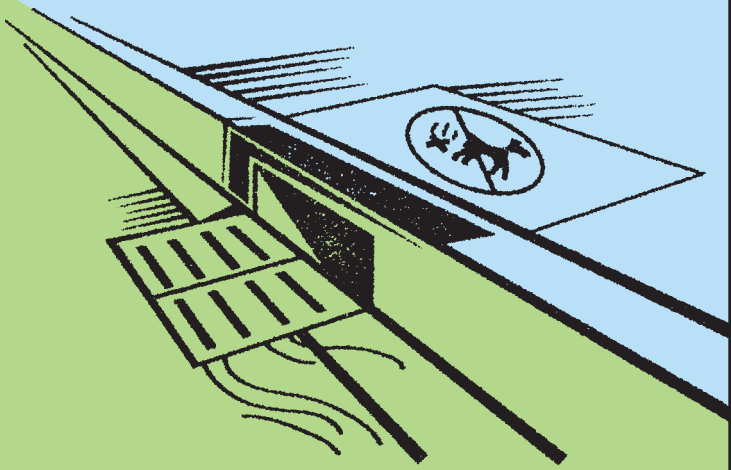
Pick Up After Your Pooch!



Storm drains are for rain…
they're not pooper scoopers.

L.A. County residents walk a dog without picking up the droppings more than **62,000** times per month.

Disease-causing dog waste washes from the ground and streets into storm drains and flows straight to the ocean — untreated.

Remember to bring a bag and clean up after your dog.

1 (888) CLEAN LA
www.888CleanLA.com

Tips for Dog Owners:

Dog owners can help solve the stormwater pollution problem by taking these easy steps…

- Clean up after your dog every single time.
- Take advantage of the complimentary waste bags offered in dispensers at local parks.
- Ensure you always have extra bags in your car so you are prepared when you travel with your dog.
- Carry extra bags when walking your dog and make them available to other pet owners who are without.
- Teach children how to properly clean up after a pet. Encourage them to throw the used bags in the nearest trash receptacle if they are away from home.
- Put a friendly message on the bulletin board at the local dog park to remind pet owners to clean up after their dogs.
- Tell friends and neighbors about the ill effects of animal waste on the environment. Encourage them to clean up after their pets as well.

PROJECT Pollution PREVENTION

Storm Drains are for Rain...

Stormdrains take runoff directly to creeks and the ocean without treatment. Pool chemicals can harm our natural creeks and waterways. Anything going into our stormdrains that isn't rainwater contributes to stormwater pollution, which contaminates our creeks and ocean, kills marine life and causes beach closures.

...not pool chemicals

LOS ANGELES COUNTY PUBLIC WORKS Public Service That Works

Swimming Pool Tips

Follow these simple steps to prevent stormwater pollution...

- Make sure all chemicals are dissipated before draining a pool or spa
- Do not drain pools within 5 days of adding chemicals
- Never backwash a filter into the street or stormdrain
- Cleanup chemical spills with absorbent, don't wash it down the drain
- Dispose of leftover chemicals and paints through a licensed hazardous waste disposal provider

PROJECT Pollution PREVENTION

Storm Drains are for Rain...

More than 50% of the automotive oil sold to do-it-yourself oil changers is not recycled. There are more than 600 State-certified used oil collection centers within Los Angeles County.

Never dispose of automotive fluids, recyclable products, or household hazardous wastes into the street or gutter. Take them to your local auto repair station, recycling center or a household hazardous waste roundup.

...they're not recycling centers.

1(888)CLEAN LA
www.888CleanLA.com

Recycling Tips:

You can help keep your community clean, protect our area waterways and make the beaches safe for ocean swimmers by putting recyclable materials where they belong — at a recycling center or household hazardous waste roundup. Never throw or pour anything into the streets or gutters...

- When changing vehicle fluids – transmission, hydraulic and motor oil, brake and radiator fluid – drain them into a drip pan to avoid spills. Do not combine these fluids. Do not dispose of them in the street, gutter or in the garbage. It is illegal.
- Recycle all used vehicle fluids. Call 1(888)CLEAN LA or visit www.888CleanLA.com for the location of a center that recycles these fluids, or for the location of a local household hazardous waste Roundup.
- Other materials that should be taken to a household hazardous waste Roundup are: paint and paint-related materials, household cleaners, batteries, pesticides and fertilizers, pool chemicals, and aerosol products.
- Aluminum, glass, plastic and newspapers should be placed in your curbside recycling bin or taken to a local recycling center.

PROJECT Pollution PREVENTION

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Recycling Tips:

You can help keep your community clean, protect our area waterways and make the beaches safe for ocean swimmers by putting recyclable materials where they belong — at a recycling center or household hazardous waste roundup. Never throw or pour anything into the streets or gutters...

- When changing vehicle fluids – transmission, hydraulic and motor oil, brake and radiator fluid – drain them into a drip pan to avoid spills. Do not combine these fluids. Do not dispose of them in the street, gutter or in the garbage. It is illegal.
- Recycle all used vehicle fluids. Call 1(888)CLEAN LA or visit www.888CleanLA.com for the location of a center that recycles these fluids, or for the location of a local household hazardous waste Roundup.
- Other materials that should be taken to a household hazardous waste Roundup are: paint and paint-related materials, household cleaners, batteries, pesticides and fertilizers, pool chemicals, and aerosol products.
- Aluminum, glass, plastic and newspapers should be placed in your curbside recycling bin or taken to a local recycling center.

PROJECT Pollution PREVENTION

Printed on recycled paper

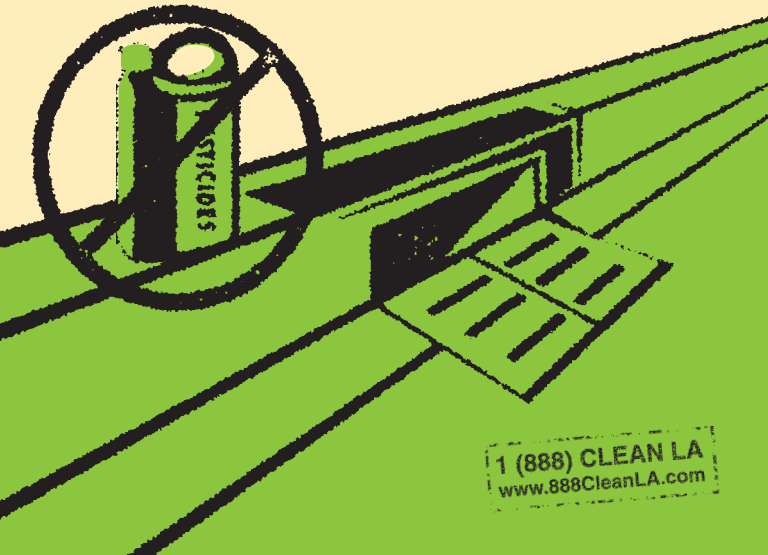
A Yard is a Terrible Thing to Waste!

Storm drains are for rain…**not yard waste.**

Residential yard waste represents about **13 percent** of the total waste generated in L.A. County.

Pesticides, fertilizer and yard waste such as leaves and mowed grass wash from the ground and streets into storm drains and flow straight to the ocean — **untreated**.

Remember to use pesticides and fertilizer wisely and pick-up yard waste.



Tips For Yard Care:

L.A. County residents can help solve the stormwater pollution problem by taking these easy steps…

- Do not over-fertilize and do not use fertilizer or pesticides near ditches, gutters or storm drains.
- Do not use fertilizer or pesticides before a rain.
- Follow the directions on the label carefully.
- Use pesticides sparingly — more is not better. "Spot" apply, rather than "blanket" apply.
- When watering your lawn, use the least amount of water possible so it doesn't run into the street carrying pesticides and other chemicals with it.
- Use non-toxic products for your garden and lawn whenever possible.
- If you must store pesticides or fertilizer, make sure they are in a sealed, water-proof container in a covered area to prevent runoff.
- Do not blow, sweep, hose or rake leaves or other yard trimmings into the street, gutter or storm drain.

PROJECT Pollution PREVENTION

A message from the County of Los Angeles Department of Public Works.
Printed on recycled paper.

Appendix G:
Operation and Maintenance Plan

MAINTENANCE, INSPECTION, AND REPAIR LOG

Site: ________________________________ Page: ______ of ______

Date: ______________ Inspector: ____________________ Followup: ______________

Date: ______________ Inspector: ____________________ Followup: ______________

Date: ______________ Inspector: ____________________ Followup: ______________

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Date: ______________ Inspector: ____________________ Followup: ______________

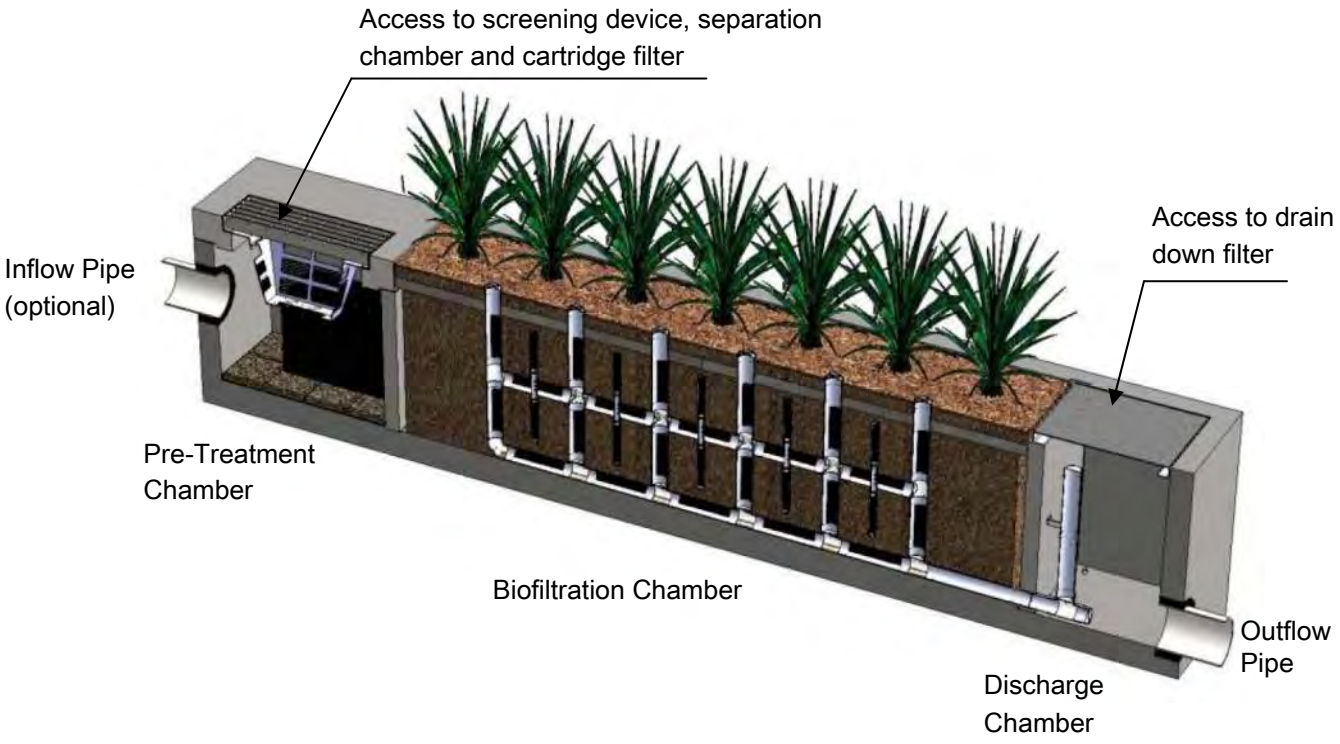
PLEASE MAKE COPIES OF ORIGINALS

Maintenance Guidelines for Modular Wetland System - Linear

Maintenance Summary

- Remove Trash from Screening Device – average maintenance interval is 6 to 12 months.
  - (*5 minute average service time*).
- Remove Sediment from Separation Chamber – average maintenance interval is 12 to 24 months.
  - (*10 minute average service time*).
- Replace Cartridge Filter Media – average maintenance interval 12 to 24 months.
  - (*10-15 minute per cartridge average service time*).
- Replace Drain Down Filter Media – average maintenance interval is 12 to 24 months.
  - (*5 minute average service time*).
- Trim Vegetation – average maintenance interval is 6 to 12 months.
  - (*Service time varies*).

System Diagram



Maintenance Procedures

Screening Device

1. Remove grate or manhole cover to gain access to the screening device in the Pre-Treatment Chamber. Vault type units do not have screening device. Maintenance can be performed without entry.
2. Remove all pollutants collected by the screening device. Removal can be done manually or with the use of a vacuum truck. The hose of the vacuum truck will not damage the screening device.
3. Screening device can easily be removed from the Pre-Treatment Chamber to gain access to separation chamber and media filters below. Replace grate or manhole cover when completed.

Separation Chamber

1. Perform maintenance procedures of screening device listed above before maintaining the separation chamber.
2. With a pressure washer spray down pollutants accumulated on walls and cartridge filters.
3. Vacuum out Separation Chamber and remove all accumulated pollutants. Replace screening device, grate or manhole cover when completed.

Cartridge Filters

1. Perform maintenance procedures on screening device and separation chamber before maintaining cartridge filters.
2. Enter separation chamber.
3. Unscrew the two bolts holding the lid on each cartridge filter and remove lid.
4. Remove each of 4 to 8 media cages holding the media in place.
5. Spray down the cartridge filter to remove any accumulated pollutants.
6. Vacuum out old media and accumulated pollutants.
7. Reinstall media cages and fill with new media from manufacturer or outside supplier. Manufacturer will provide specification of media and sources to purchase.
8. Replace the lid and tighten down bolts. Replace screening device, grate or manhole cover when completed.

Drain Down Filter

1. Remove hatch or manhole cover over discharge chamber and enter chamber.
2. Unlock and lift drain down filter housing and remove old media block. Replace with new media block. Lower drain down filter housing and lock into place.
3. Exit chamber and replace hatch or manhole cover.

Maintenance Notes

1. Following maintenance and/or inspection, it is recommended the maintenance operator prepare a maintenance/inspection record. The record should include any maintenance activities performed, amount and description of debris collected, and condition of the system and its various filter mechanisms.

2. The owner should keep maintenance/inspection record(s) for a minimum of five years from the date of maintenance. These records should be made available to the governing municipality for inspection upon request at any time.

3. Transport all debris, trash, organics and sediments to approved facility for disposal in accordance with local and state requirements.

4. Entry into chambers may require confined space training based on state and local regulations.

5. No fertilizer shall be used in the Biofiltration Chamber.

6. Irrigation should be provided as recommended by manufacturer and/or landscape architect. Amount of irrigation required is dependent on plant species. Some plants may require irrigation.

Maintenance Procedure Illustration

Screening Device

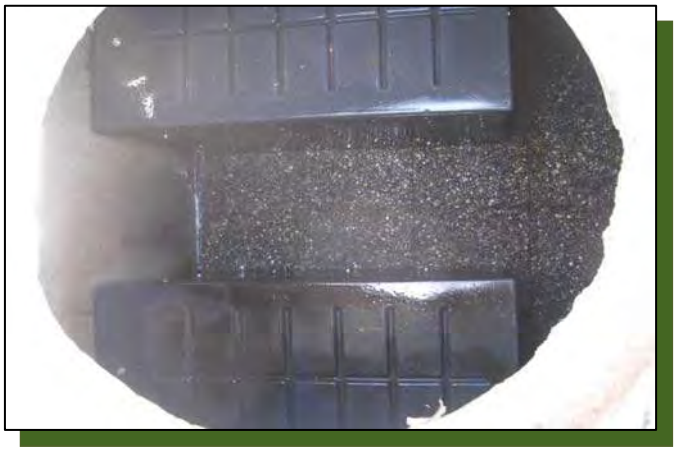
The screening device is located directly under the manhole or grate over the Pre-Treatment Chamber. It's mounted directly underneath for easy access and cleaning. Device can be cleaned by hand or with a vacuum truck.

Separation Chamber

The separation chamber is located directly beneath the screening device. It can be quickly cleaned using a vacuum truck or by hand. A pressure washer is useful to assist in the cleaning process.

Cartridge Filters

The cartridge filters are located in the Pre-Treatment chamber connected to the wall adjacent to the biofiltration chamber. The cartridges have removable tops to access the individual media filters. Once the cartridge is open media can be easily removed and replaced by hand or a vacuum truck.



Drain Down Filter

The drain down filter is located in the Discharge Chamber. The drain filter unlocks from the wall mount and hinges up. Remove filter block and replace with new block.

Trim Vegetation

Vegetation should be maintained in the same manner as surrounding vegetation and trimmed as needed. No fertilizer shall be used on the plants. Irrigation per the recommendation of the manufacturer and or landscape architect. Different types of vegetation requires different amounts of irrigation.

Inspection Form

Modular Wetland System, Inc.
P. 760.433-7640
F. 760-433-3176
E. Info@modularwetlands.com

www.modularwetlands.com

Inspection Report
Modular Wetlands System

Project Name _____

Project Address _____
(city) (Zip Code)

Owner / Management Company _____

Contact _____ Phone ( ) –

Inspector Name _____ Date ____/____/____ Time _____ AM / PM

Type of Inspection ☐ Routine ☐ Follow Up ☐ Complaint ☐ Storm Storm Event in Last 72-hours? ☐ No ☐ Yes

Weather Condition _____ Additional Notes _____

For Office Use Only
(Reviewed By)
(Date)
Office personnel to complete section to the left.

Inspection Checklist

Modular Wetland System Type (Curb, Grate or UG Vault): _____ Size (22', 14' or etc.): _____

Structural Integrity:	**Yes**	**No**	**Comments**
Damage to pre-treatment access cover (manhole cover/grate) or cannot be opened using normal lifting pressure?			
Damage to discharge chamber access cover (manhole cover/grate) or cannot be opened using normal lifting pressure?			
Does the MWS unit show signs of structural deterioration (cracks in the wall, damage to frame)?			
Is the inlet/outlet pipe or drain down pipe damaged or otherwise not functioning properly?			
Working Condition:			
Is there evidence of illicit discharge or excessive oil, grease, or other automobile fluids entering and clogging the unit?			
Is there standing water in inappropriate areas after a dry period?			
Is the filter insert (if applicable) at capacity and/or is there an accumulation of debris/trash on the shelf system?			
Does the depth of sediment/trash/debris suggest a blockage of the inflow pipe, bypass or cartridge filter? If yes, specify which one in the comments section. Note depth of accumulation in in pre-treatment chamber.			Depth:
Does the cartridge filter media need replacement in pre-treatment chamber and/or discharge chamber?			Chamber:
Any signs of improper functioning in the discharge chamber? Note issues in comments section.			
Other Inspection Items:			
Is there an accumulation of sediment/trash/debris in the wetland media (if applicable)?			
Is it evident that the plants are alive and healthy (if applicable)? Please note Plant Information below.			
Is there a septic or foul odor coming from inside the system?			

Waste:	**Yes**	**No**
Sediment / Silt / Clay		
Trash / Bags / Bottles		
Green Waste / Leaves / Foliage		

Recommended Maintenance	
No Cleaning Needed	
Schedule Maintenance as Planned	
Needs Immediate Maintenance	

Plant Information	
Damage to Plants	
Plant Replacement	
Plant Trimming	

Additional Notes: _____

2972 San Luis Rey Road, Oceanside, CA 92058 P (760) 433-7640 F (760) 433-3176

Maintenance Report

Modular Wetland System, Inc.
P. 760.433-7640
F. 760-433-3176
E. Info@modularwetlands.com

www.modularwetlands.com

Cleaning and Maintenance Report
Modular Wetlands System

Project Name _____

Project Address _____
(city) (Zip Code)

Owner / Management Company _____

Contact _____ Phone ( ) –

Inspector Name _____ Date ____/____/____ Time _____ AM / PM

Type of Inspection ☐ Routine ☐ Follow Up ☐ Complaint ☐ Storm Storm Event in Last 72-hours? ☐ No ☐ Yes

Weather Condition _____ Additional Notes _____

For Office Use Only
(Reviewed By)
(Date)
Office personnel to complete section to the left.

Site Map #	GPS Coordinates of Insert	Manufacturer / Description / Sizing	Trash Accumulation	Foliage Accumulation	Sediment Accumulation	Total Debris Accumulation	Condition of Media 25/50/75/100 (will be changed @ 75%)	Operational Per Manufactures' Specifications (If not, why?)
	Lat: Long:	MWS Catch Basins						
		MWS Sedimentation Basin						
		Media Filter Condition						
		Plant Condition						
		Drain Down Media Condition						
		Discharge Chamber Condition						
		Drain Down Pipe Condition						
		Inlet and Outlet Pipe Condition						

Comments:

2972 San Luis Rey Road, Oceanside, CA 92058 P. 760.433.7640 F. 760.433.3176

Modular Wetland System - Linear (MWS-Linear)

Maintenance Schedule

MWS - LINEAR	Cleaning Required	Est. Cleaning Time
Year 1	1) Clean Inlet Filter (6 Month Intervals) (does not apply to vault type) 2) Vacuum Catch Basin (12 Month Intervals) 3) Replace BioMedia Green Filter Media (12 month Intervals)	10 Minutes 25 Minutes 45 Minutes
Year 2	1) Clean Inlet Filter (6 Month Intervals) (does not apply to vault type) 2) Vacuum Catch Basin (12 Month Intervals) 3) Replace BioMedia Green Filter Media (12 month Intervals)	10 Minutes 25 Minutes 45 Minutes
Year 3	1) Clean Inlet Filter (6 Month Intervals) (does not apply to vault type) 2) Vacuum Catch Basin (12 Month Intervals) 3) Replace BioMedia Green Filter Media (12 month Intervals)	10 Minutes 25 Minutes 45 Minutes
Year 4	1) Clean Inlet Filter (6 Month Intervals) (does not apply to vault type) 2) Vacuum Catch Basin (12 Month Intervals) 3) Replace BioMedia Green Filter Media (12 month Intervals)	10 Minutes 25 Minutes 45 Minutes
Year 5	1) Clean Inlet Filter (6 Month Intervals) (does not apply to vault type) 2) Vacuum Catch Basin (12 Month Intervals) 3) Replace BioMedia Green Filter Media (12 month Intervals)	10 Minutes 25 Minutes 45 Minutes
Year 6	1) Clean Inlet Filter (6 Month Intervals) (does not apply to vault type) 2) Vacuum Catch Basin (12 Month Intervals) 3) Replace BioMedia Green Filter Media (12 month Intervals)	10 Minutes 25 Minutes 45 Minutes
Year 7	1) Clean Inlet Filter (6 Month Intervals) (does not apply to vault type) 2) Vacuum Catch Basin (12 Month Intervals) 3) Replace BioMedia Green Filter Media (12 month Intervals)	10 Minutes 25 Minutes 45 Minutes
Year 8	1) Clean Inlet Filter (6 Month Intervals) (does not apply to vault type) 2) Vacuum Catch Basin (12 Month Intervals) 3) Replace BioMedia Green Filter Media (12 month Intervals)	10 Minutes 25 Minutes 45 Minutes
Year 9…	1) Clean Inlet Filter (6 Month Intervals) (does not apply to vault type) 2) Vacuum Catch Basin (12 Month Intervals) 3) Replace BioMedia Green Filter Media (12 month Intervals)	10 Minutes 25 Minutes 45 Minutes
Year 15	1) Clean Inlet Filter (6 Month Intervals) (does not apply to vault type) 2) Vacuum Catch Basin (12 Month Intervals) 3) Replace BioMedia Green Filter Media (12 month Intervals) 4) Remove & Replace Wetland Plants & Media (every 10-20 years)	10 Minutes 25 Minutes 45 Minutes 6 to 8 Hours
Procedure 1 **Clean Inlet Filter** (does not apply to vault type) 	Modular Wetland Systems, Inc. recommends the catch basin filter be inspected and cleaned a minimum of once every six months and replacement of hydrocarbon booms once a year. The procedure is easily done with the use of any standard vacuum truck. Before doing maintenance please use proper safety and traffic control. 1) Remove grate or manhole, remove the deflector shield (grate type only). Note: entry into an underground stormwater vault such as an inlet vault requires certification in confined space training. 2) Remove all trash, debris, organics, and sediments collected by the inlet filter insert either manually or with the use of a vactor truck. 3) Evaluate hydrocarbon boom. If the boom is filled with hydrocarbons and oils it should be replaced. Attach new boom to basket with plastic ties through pre-drilled holes in basket. Place the deflector shield (grate type only) back into the filter. Hydrocarbon boom should be replaced annually. (The hydrocarbon boom may be classified as hazardous material and will have to be picked up and disposed of as hazardous waste).	**10 Minutes**

Procedure 2 **Vacuum Catch Basin** 	Modular Wetland Systems, Inc. recommends the separation chamber be inspected and cleaned a minimum of once a year. The procedure is easily done with the use of any standard vacuum truck. Before doing maintenance please use proper safety and traffic control. 1) Remove grate or manhole. 2) Remove catch basin filter. 3) Spray down pollutants accumulated on cartridge filters and catch basin walls. 4) Vacuum out sediments and debris accumulated on catch basin floor. 5) Replace catch basin filter, and replace grate or manhole cover.	**25 Minutes**
Procedure 3 **Replace BioMedia Green Media Filter**   	Modular Wetland Systems, Inc. recommends the BioMediaGREEN Cartridge Filters be inspected and cleaned a minimum of once a year. The procedure will require prior maintenance of catch basin. Before doing maintenance please use proper safety and traffic control. 1) Remove grate, remove catch basin filter. 2) Perform maintenance activities on catch basin. 3) Enter separation chamber, unscrew the two bolts holding the lid on the cartridge filter. This will expose the 14 pieces of BioMediaGREEN in each cartridge. 4) Evaluate media condition, replace if necessary. If the spaces between the media are filled with sediment and the surface of the media is dark brown or black the media should be replaced. The old media can be removed by hand by pulling the media pieces up out of the cartridge and taking them out of the catch basin. 5) Once all old media is removed, spray down the interior of the cartridge and vacuum out accumulated debris. 6) Use new pieces of BioMediaGREEN and slide down over the perforated PVC risers. The media will only go in one way for easy installation. Replace media over all risers. 5) Replace cartridge filter lid, replace catch basin filter, and replace grate or manhole cover. Modular Wetland Systems, Inc. recommends the drain down filter be inspected and maintained a minimum of once a year. 1) Open hatch of discharge chamber, enter chamber. 2) Unlatch fiberglass cover, remove media block, replace with new block, replace and latch cover. 3) Exit chamber, close and lock down the hatch. BioMediaGREEN	**45 Minutes**
Procedure 4 **Replace Wetland Media** 	Modular Wetland Systems, Inc. recommends the wetland media be evaluated every 3 to 5 years to test flow rate. The media life is approximately 15 to 20 years. The wetland media is an expanded shale that can be ordered from the manufacturer or independent supplier. If the flow through the wetland filter is decreasing the internal inflow and outflow pipes leading to and from the wetland chamber can be jetted. If the flow through the wetland is still minimal then the media may need to be replaced. To replace the media the following steps are required. Before doing maintenance please use proper safety and traffic control. 1) Remove plants and dispose. Have new plants standing ready to plant. 2) Use a larger vacuum truck to remove the media from the wetland chamber. 3) Spray down the chamber walls and remove all sediment and water. 4) Replace with new wetland media and plant plants.	**6 to 8 Hours**

MAINTENANCE, INSPECTION, AND REPAIR LOG

Site: _____ Page: 1 of 3

SD-12 – Efficient Irrigation

No. Onsite: ____ No. Inspected: ____ No. Requiring Action: ____

____ Timing of irrigation is proper for efficient irrigation
____ Sprinkler heads are oriented properly to avoid overspray on pavement
____ Proper amount of water is dispersed for the type of landscaping
____ Drip line irrigation systems are still functioning properly
____ Valves and switches are working properly

Corrective Action Required:

Scheduled Completion Date:

SD-10 – Landscape Planning

No. Onsite: ____ No. Inspected: ____ No. Requiring Action: ____

____ Planted areas allow water to enter, but not to leave the area
____ Adequate mulch or gravel is present in the landscape areas

Corrective Action Required:

Scheduled Completion Date:

PLEASE MAKE COPIES OF ORIGINALS

MAINTENANCE, INSPECTION, AND REPAIR LOG

Site: _____ Page: 2 of 3

SE-7 – Street Sweeping & Vacuuming

No. Onsite: ____ No. Inspected: ____ No. Requiring Action: ____

____ No evidence of sediment or trash accumulation

____ Contractor scheduled for regular visits (more frequent during rainy season)

____ Signs posted indicating sweeping schedule

Corrective Action Required:

Scheduled Completion Date:

SD-13 – Storm Drain Signage

No. Onsite: ____ No. Inspected: ____ No. Requiring Action: ____

____ Signs are in good condition and have not faded or broken

Corrective Action Required:

Scheduled Completion Date:

PLEASE MAKE COPIES OF ORIGINALS

MAINTENANCE, INSPECTION, AND REPAIR LOG

Site: _____ Page: 3 of 3

TC-32 – Filterra

No. Onsite: ____ No. Inspected: ____ No. Requiring Action: ____

____ Inspection of unit
____ Remove accumulated debris, trash, silt and mulch
____ Evaluate filter media and recharge as needed
____ Replace plant and prune as needed
____ Replace mulch
____ Update maintenance records
____ Other

Corrective Action Required:

Scheduled Completion Date:

PLEASE MAKE COPIES OF ORIGINALS

Appendix H:
Percolation Report

ALBUS-KEEFE & ASSOCIATES, INC.
GEOTECHNICAL CONSULTANTS

March 21, 2019
J.N.: 2789.00

Mr. Mitchell Gardner
G3 Urban
15235 S. Western Avenue
Gardena, CA 90249

Subject: **Geotechnical Investigation for Proposed Water Quality Improvements, Proposed Commercial and Residential Development, 2129 W. Rosecrans Avenue, Gardena, California**

Dear Mr. Gardner,

Albus-Keefe & Associates, Inc. has completed a geotechnical investigation of the site for evaluation of the percolation characteristics of the site soils. The scope of this investigation consisted of the following:

- Exploratory drilling, soil sampling and percolation test well installation
- Field percolation testing
- Laboratory testing of selected soil samples
- Engineering analysis of the data
- Preparation of this report

SITE DESCRIPTION AND PROPOSED DEVELOPMENT

Site Location and Description

The site is located at 2129 West Rosecrans Avenue, in the city of Gardena, California. The site consists of approximately 5.6 acres of land. Currently, the site consists of a taxi-cab facility that also provides auto maintenance of their vehicles. The site is developed with a single-story commercial building and a shed area where maintenance of auto vehicles take place. A small car wash facility is located at the northeast portion of the site. Undeveloped land is also present at the southeast corner of the site. Concrete- and asphalt-paving is present in the remaining portions of the site. The site is bordered by West Rosecrans Avenue to the south and industrial buildings to the west, north, and east. In addition, a large industrial structure is situated along the east property line. The location of the site and its relationship to the surrounding areas is shown on the Site Location Map, Figure 1.

The site is relatively level with elevations that vary from approximately 49 feet above mean sea level (MSL) to 52 feet above MSL based on Google Earth 2018. Drainage at the site appears to be directed toward concrete v-gutters located throughout the site which is then directed to the south towards West Rosecrans Avenue. Vegetation within the taxi cab facility is sparse and consists of a few trees along the perimeter of the lot. Groundcover and a few trees are also located within the undeveloped portion of the site.

© 2019 Google

N

SITE LOCATION MAP

G3 Urban
Proposed Commercial and Residential Development
2129 W. Rosecrans Avenue
Gardena, California

NOT TO SCALE

FIGURE 1

Proposed Development

We understand that the site will be redeveloped for residential and commercial/retail use. It is anticipated that the proposed site development will consist of 91 residential units and associated interior driveways, perimeter/retaining walls, underground utilities and a storm water infiltration system. Minor rough grading is also anticipated. An additional 2 buildings consisting of 14 units of mixed-use will be developed along the south portion of the site. We also understand that approximately 0.56 acre of the southwest portion of the site will be developed as a retail building.

No grading or structural plans were available in preparing this report. However, we anticipate that minor rough grading of the site will be required to achieve future surface configuration and we expect the proposed residential dwellings will be up to 3-story, wood-framed structures with concrete slabs on grade yielding relatively light foundation loads.

SUMMARY OF FIELD AND LABORATORY WORK

Subsurface Investigation

Subsurface exploration for this investigation was conducted on January 22, 2019 and consisted of four (4) exploratory borings and six (6) cone penetration test soundings to depths ranging from approximately 21.5 to 51.5 feet below the existing ground surface (bgs). The CPT soundings were advanced using a 30-ton CPT truck. The borings were drilled using a truck-mounted, continuous flight, hollow-stem-auger drill rig. A representative of *Albus-Keefe & Associates, Inc.* logged the exploratory borings. Visual and tactile identifications were made of the materials encountered, and their descriptions are presented in the Exploration Logs in Appendix A. The approximate locations of the exploratory excavations completed by this firm are shown on the enclosed Geotechnical Map, Plate 1.

Bulk, relatively undisturbed and Standard Penetration Test (SPT) samples were obtained at selected depths within the exploratory borings for subsequent laboratory testing. Relatively undisturbed samples were obtained using a 3-inch O.D., 2.5-inch I.D., California split-spoon soil sampler lined with brass rings. SPT samples were obtained from the borings using a standard, unlined SPT soil sampler. During each sampling interval, the sampler was driven 18 inches with successive drops of a 140-pound automatic hammer falling 30 inches. The number of blows required to advance the sampler was recorded for each six inches of advancement. The total blow count for the lower 12 inches of advancement per soil sample is recorded on the exploration log. Samples were placed in sealed containers or plastic bags and transported to our laboratory for analyses. The borings were backfilled with auger cuttings upon completion of sampling. Borings within asphalt-paved areas were capped with asphalt cold patch.

In addition, a percolation test well, P-1 was drilled and subsequently utilized for percolation testing. The percolation test well was excavated to an approximated depth of 15 feet in the vicinity of exploratory boring B-1. Within the test well a 3-inch-diameter casing was installed. Well screens were installed from near the bottom of the borings to ground surface. The annular space of the well screen section was filled with gravel for depths covering the extent of our testing. The remaining

annular space was then backfilled with native soils. After completion of the percolation test, the casing was removed and this boring was backfilled.

Percolation Testing

Percolation testing was performed on January 22, 2019, in general conformance with the constant-head test procedures outlined in the referenced Well Permeameter Method (USBR 7300-89). A water hose attached to a water source on site was connected to an inline flowmeter to measure the water flow. The flowmeter is capable of measuring flow rates up to 13 gallons per minute and as low as 0.06 gallons per minute. A valve was connected in line with the flowmeter to control the flow rate. A filling hose was used to connect the flowmeter and the test well. Water was then introduced by the filling hose near the bottom of the test well. A water level meter with 1/100-foot divisions was used to measure the depths to water surface from the top of well casings.

Flow to the well was terminated upon either completion of testing of all the pre-determined water levels or if the flow rate exceeded the maximum capacity of the flowmeter. Measurements obtained during the percolation testing are provided on Appendix C, Plate C-1.

Laboratory Testing

Selected soil samples of representative earth materials were tested to assist in the formulation of conclusions and recommendations presented in this report. Tests consisted of in-situ moisture content and dry density, and grain-size analysis. Results of laboratory testing relevant to percolation characteristics are presented in the Appendix B.

ANALYSIS OF DATA

Subsurface Conditions

Descriptions of the earth materials encountered during our investigation are summarized below and are presented in detail on the Exploration Logs presented in Appendix A.

The soils encountered within the site generally consist of artificial fill materials overlying older alluvial deposits. The artificial materials were observed in boring B-1 through B-3 to be up to approximately 7.5 feet thick. The artificial fill materials generally consisted of gray, brown, and black clay, silty sand, and clayey sand that are typically medium dense /stiff to very stiff.

The older alluvial materials were encountered beneath the artificial fills to the maximum depth explored, 51.5 feet below the existing ground surface. The alluvial materials are alternating fine-grained and coarse-grained material. The fine-grained material consisted of brown clay and silt with varying amounts of sand that are damp to wet and very stiff to hard. The coarse-grained material consisted of brown silty and clayey sand that are damp to wet and medium dense to dense.

Groundwater

Groundwater was encountered during this firm's investigation to the depth of 23.6 feet below the existing ground surface. A review of the referenced Seismic Hazard Zone Report 027 indicates that

historical high groundwater level for the general site area was estimated at approximately 25 feet below the existing ground surface.

Percolation Data

An analysis was performed to evaluate permeability using the flow rate obtained at the end of the constant-head stage of field percolation testing. The analysis was performed in accordance with the procedures provided in the referenced USBR 7300-89. The procedure essentially uses a closed-form solution to the percolation out of a small-diameter well. Using this method, we calculated a composite permeability value for the head condition maintained in each well. Since the flow to the well was less than the lower limit of our equipment, the minimum flow rate of the equipment was used. The result is summarized in Table 1 below and the supporting analysis is included in Appendix C, Plate C-2.

TABLE 1
Summary of Back-Calculated Permeability Coefficient

Location	Total Depth of Well (ft)	Depth to Water in Well (ft)	Height of Water in Well (ft)	Static Flow Rate (gal./min.)	Estimated Permeability, ks (in/hr.)
P-1	14.8	9.8	5	<0.06	<0.09

CONCLUSIONS AND RECOMMENDATIONS

Based on our observations in the field, we anticipate that the infiltration at the site would be too low to meet the minimum requirements set by the Los Angeles County Regional Water Quality Board. The interlayered nature of the subsurface soils which have impeded infiltration was observed in all of the exploratory borings. Infiltration of storm water through the use of a shallow chamber system or dry well at the site is deemed unfeasible. Therefore, treatment of storm water will require the use of other methods such as biofiltration.

LIMITATIONS

This report is based on the geotechnical data as described herein. The materials encountered in our boring excavations and utilized in our laboratory testing for this investigation are believed representative of the project area, and the conclusions and recommendations contained in this report are presented on that basis. However, soil and bedrock materials can vary in characteristics between points of exploration, both laterally and vertically, and those variations could affect the conclusions and recommendations contained herein. As such, observations by a geotechnical consultant during the construction phase of the storm water infiltration systems are essential to confirming the basis of this report.

This report has been prepared consistent with that level of care being provided by other professionals providing similar services at the same locale and time period. The contents of this report are professional opinions and as such, are not to be considered a guaranty or warranty.

This report should be reviewed and updated after a period of one year or if the site ownership or project concept changes from that described herein.

This report has been prepared for the exclusive use of **G3 Urban** to assist the project consultants in the design of the proposed development. This report has not been prepared for use by parties or projects other than those named or described herein. This report may not contain sufficient information for other parties or other purposes.

This report is subject to review by the controlling governmental agency.

We appreciate this opportunity to be of service to you. If you should have any questions regarding the contents of this report, please do not hesitate to call.

Sincerely,

ALBUS-KEEFE & ASSOCIATES, INC.

Mark Principe
Staff Engineer

Paul Hyun Jin Kim
Associate Engineer
P.E. 77214

Enclosures: Plate 1- Geotechnical Map
Appendix A - Exploratory Logs
Appendix B – Relevant Soil Laboratory Testing
Appendix C - Percolation Testing and Analyses

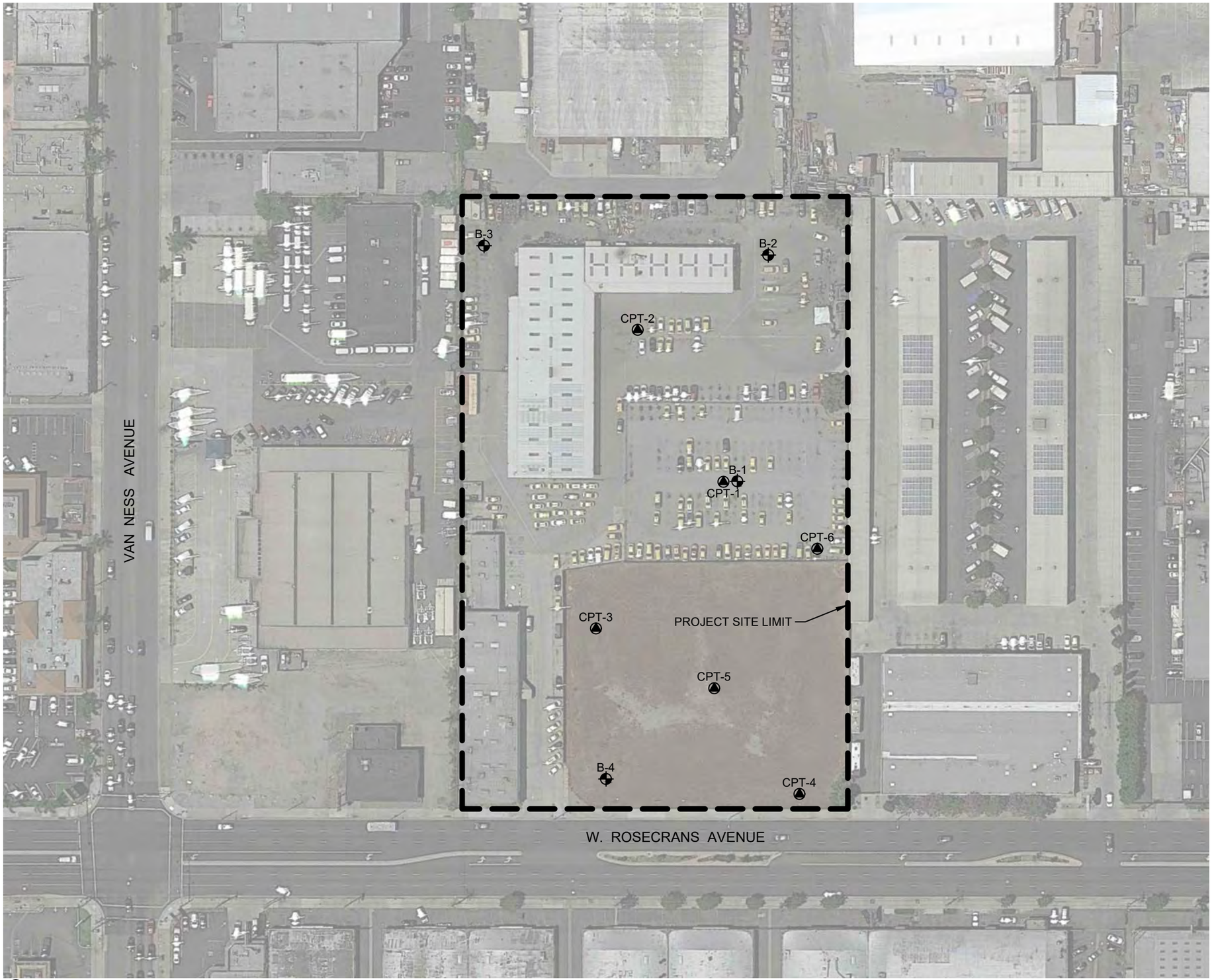
REFERENCES

Publications and Reports

CDMG, "Seismic Hazard Zone Report for the Inglewood 7.5-Minute Quadrangles, Los Angeles, California," Seismic Hazard Zone Report 027, 1998.

"Procedure for Performing Field Permeability Testing by the Well Permeameter Method", United States Department of The Interior, Bureau of Reclamation (USBR 7300-89).

Saxton, K.E., W.J. Rawls, J.S. Romberger, and R.I. Papendick. 1986, "Estimating generalized soil-water characteristics from texture", Soil Sci. Soc. Am. J. 50(4):1031-103



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0 50 100 200

APPROX SCALE : 1" = 100'

EXPLANATION

(Locations Approximate)

- Exploratory Boring
- Cone Penetration Test (CPT)

ALBUS-KEEFE & ASSOCIATES, INC.
GEOTECHNICAL CONSULTANTS

GEOTECHNICAL MAP

Job No.: 2789.00	Date: 03/14/19	Plate: 1

APPENDIX A

EXPLORATORY LOGS

EXPLORATION LOG

Project:		Location:
Address:		Elevation:
Job Number:	Client:	Date:
Drill Method:	Driving Weight:	Logged By:

Depth (feet)	Lith-ology	Material Description	Water	Samples			Laboratory Tests		
				Blows Per Foot	Core	Bulk	Moisture Content (%)	Dry Density (pcf)	Other Lab Tests

EXPLANATION

Solid lines separate geologic units and/or material types.

Dashed lines indicate unknown depth of geologic unit change or material type change.

5

Solid black rectangle in Core column represents California Split Spoon sampler (2.5in ID, 3in OD).

Double triangle in core column represents SPT sampler.

10

Vertical Lines in core column represents Shelby sampler.

Solid black rectangle in Bulk column respresents large bag sample.

Other Laboratory Tests:

15

Max = Maximum Dry Density/Optimum Moisture Content
EI = Expansion Index
SO4 = Soluble Sulfate Content
DSR = Direct Shear, Remolded
DS = Direct Shear, Undisturbed
SA = Sieve Analysis (1" through #200 sieve)
Hydro = Particle Size Analysis (SA with Hydrometer)
200 = Percent Passing #200 Sieve

20

Consol = Consolidation
SE = Sand Equivalent
Rval = R-Value
ATT = Atterberg Limits

EXPLORATION LOG

Project:		Location: B-1
Address: 2129 Rosecrans Ave, Gardena, CA 90249		Elevation: 50.9
Job Number: 2789.00	Client: G3 Urban	Date: 1/22/2019
Drill Method: Hollow-Stem Auger	Driving Weight: 140 lbs / 30 in	Logged By: PK

Depth (feet)	Lith-ology	Material Description	Water	Samples: Blows Per Foot	Samples: Core	Samples: Bulk	Laboratory Tests: Moisture Content (%)	Laboratory Tests: Dry Density (pcf)	Laboratory Tests: Other Lab Tests
		Asphalt Concrete (AC): 4 inches							SO4 ATT EI
		Crushed Aggregate Base (CAB): 5 inches							
		ARTIFICIAL FILL (Af) Silty Sand (SM): Brown, moist, medium dense, medium to coarse grained sand		17			15.6	110.7	
		Clayey Sand (SC): Mottled: brown, light brown, and reddish brown, damp to moist, medium dense, presence of trash		35			23.9	102.8	
5		Lean Clay (CL): Gray, damp to moist, stiff, presence of wire		43			13.3	119.5	Consol
		OLDER ALLUVIUM (Qoal) Clayey Sand (SC): brown and gray mottling, damp to moist, dense							
		@ 6 ft, medium to coarse grained sand							
10		@ 10 ft, Brown with white specs, moist, medium dense, coarse grained sand, scattered gravel		39			8.1	115.5	SA Hydro
		Sandy Lean Clay (CL): Brown with scattered gray mottling, damp to moist, very stiff, with silt							
15				19					SA Hydro ATT
		@ 18 ft, brown, olive brown, dark gray brown, hard							
20				27					ATT
		@ 23 ft, brown with dark brown mottling, moist, very stiff, micaceous							

Albus-Keefe & Associates, Inc.

Plate A-2

EXPLORATION LOG

Project:		Location: B-1
Address: 2129 Rosecrans Ave, Gardena, CA 90249		Elevation: 50.9
Job Number: 2789.00	Client: G3 Urban	Date: 1/22/2019
Drill Method: Hollow-Stem Auger	Driving Weight: 140 lbs / 30 in	Logged By: PK

Depth (feet)	Lith-ology	Material Description	Water	Samples: Blows Per Foot	Samples: Core	Samples: Bulk	Laboratory Tests: Moisture Content (%)	Laboratory Tests: Dry Density (pcf)	Laboratory Tests: Other Lab Tests
				10					200 ATT
		Silty Sand (SM): Brown, wet, dense, medium grained sand							
30				20					
		Sandy Lean Clay (CL): Brown, moist, hard, fine to medium grained sand							200 ATT
		Silty Sand (SM): Brown, wet, dense, fine to medium grained sand, trace coarse sand							
35				20					
		Sandy Silt (ML): Brown with orange brown staining, moist, hard, trace clay							
		Silty Sand (SM): Brown, wet, dense, trace clay binder							
40				23					
		@ 41 ft, brown with gray, moist, with clay							
45		@ 45 ft, brown, wet, medium dense, presence of clay binder		17					200
		@ 45.5 ft, moist, with clay							

EXPLORATION LOG

Project:		Location: B-1
Address: 2129 Rosecrans Ave, Gardena, CA 90249		Elevation: 50.9
Job Number: 2789.00	Client: G3 Urban	Date: 1/22/2019
Drill Method: Hollow-Stem Auger	Driving Weight: 140 lbs / 30 in	Logged By: PK

Depth (feet)	Lith-ology	Material Description	Water	Samples			Laboratory Tests		
				Blows Per Foot	Core	Bulk	Moisture Content (%)	Dry Density (pcf)	Other Lab Tests
		@ 50 ft, wet, dense, some coarse grained sand		20					
		Silt (ML): Brown and gray, damp to moist, hard, with clay							
		Clay (CL): Brown with orange brown staining, damp to moist, hard							
		End of boring at 51.5 feet. Groundwater encountered at 25 feet. Backfilled with soil cuttings.							

EXPLORATION LOG

Project:		Location: B-2
Address: 2129 Rosecrans Ave, Gardena, CA 90249		Elevation: 51.6
Job Number: 2789.00	Client: G3 Urban	Date: 1/22/2019
Drill Method: Hollow-Stem Auger	Driving Weight: 140 lbs / 30 in	Logged By: PK

Depth (feet)	Lith-ology	Material Description	Water	Samples: Blows Per Foot	Samples: Core	Samples: Bulk	Laboratory Tests: Moisture Content (%)	Laboratory Tests: Dry Density (pcf)	Laboratory Tests: Other Lab Tests
		ARTIFICIAL FILL (Af) Silty Sand (SM): Mottled brown and gray, damp to moist, medium dense		26			16.4	112.7	
		Sandy Clay (CL): Black, damp, very stiff, scattered gravel, asphalt fragments							
		Clay (CL): Gray to black, damp to moist, stiff		20			24.5	99	
5		@ 6 ft, very stiff		27			21.3	102.8	Consol
		OLDER ALLUVIUM (Qoal) Clayey Sand (SC): Mottled : brown, light brown, and dark orange brown, damp to moist, dense							
10		@ 10 ft, Brown, medium to coarse grained sand, scattered gravel		56			9.9	125.5	
		Silty Sand (SM): Brown to orange brown, damp to moist, medium dense, fine grained sand							
15				18					
		Clay (CL): Grayish brown, damp, very stiff							
20				17					
		End of boring at 21.5 feet. No groundwater encountered. Backfilled with soil cuttings.							

EXPLORATION LOG

Project:		Location: B-3
Address: 2129 Rosecrans Ave, Gardena, CA 90249		Elevation: 51.4
Job Number: 2789.00	Client: G3 Urban	Date: 1/22/2019
Drill Method: Hollow-Stem Auger	Driving Weight: 140 lbs / 30 in	Logged By: PK

Depth (feet)	Lith-ology	Material Description	Water	Samples: Blows Per Foot	Samples: Core	Samples: Bulk	Laboratory Tests: Moisture Content (%)	Laboratory Tests: Dry Density (pcf)	Laboratory Tests: Other Lab Tests
		Asphalt (SC): 3 inches							
		Crushed Aggregate Base (CAB): 5 inches							
		ARTIFICIAL FILL (Af)							
		Clay (CL): Gray and greenish gray, damp to moist, very stiff, with silt		26	■		16	111.7	
5		@ 4 ft, gray, damp, stiff		16	■		20.4	103	
		OLDER ALLUVIUM (Qoal)							
		Clayey Sand (SC): Brown to orange brown with grayish brown mottling, damp to moist, dense, medium to coarse grained sand, scattered gravel		58	■		11.3	124.1	
10		@ 10 ft, medium dense		39	■		11.8	122	
		Silty Sand (SM): Brown, damp to moist, medium dense, clay binder							
15		@ 15.5 ft, fine grained sand, no clay binder		20	⧗				
		Clay (CL): Grayish brown, damp, very stiff							
20		@ 20 ft, hard		29	⧗				
		Clayey Sand (SC): Brown mottled with: dark brown, reddish brown, and orange brown, damp to moist, dense							
		End of boring at 21.5 feet. No groundwater encountered. Backfilled with soil cuttings.							

EXPLORATION LOG

Project:		Location: B-4
Address: 2129 Rosecrans Ave, Gardena, CA 90249		Elevation: 49.1
Job Number: 2789.00	Client: G3 Urban	Date: 1/22/2019
Drill Method: Hollow-Stem Auger	Driving Weight: 140 lbs / 30 in	Logged By: PK

Depth (feet)	Lith-ology	Material Description	Water	Samples: Blows Per Foot	Samples: Core	Samples: Bulk	Laboratory Tests: Moisture Content (%)	Laboratory Tests: Dry Density (pcf)	Laboratory Tests: Other Lab Tests
		OLDER ALLUVIUM (Qoal) Sandy Fat Clay (CH): Orange brown and dark brown, damp to moist, hard, coarse grained sand		60	■	■	15.8	112.9	SO4 DS ATT pH Resist Ch EI Max
		Clayey Sand (SC): Orange brown to brown mottled with dark brown, damp, dense		50/ 7"	■	■	13.2	115.7	
5		@ 6 ft, very dense		84	■		9.2	122	
10		@ 10 ft, dense		59	■		20.3	110.5	
		Clay (CL): Grayish brown, damp to moist, very stiff							
15				20	⧗				
20		@ 20 ft, brown		18	⧗				

EXPLORATION LOG

Project:		Location: B-4
Address: 2129 Rosecrans Ave, Gardena, CA 90249		Elevation: 49.1
Job Number: 2789.00	Client: G3 Urban	Date: 1/22/2019
Drill Method: Hollow-Stem Auger	Driving Weight: 140 lbs / 30 in	Logged By: PK

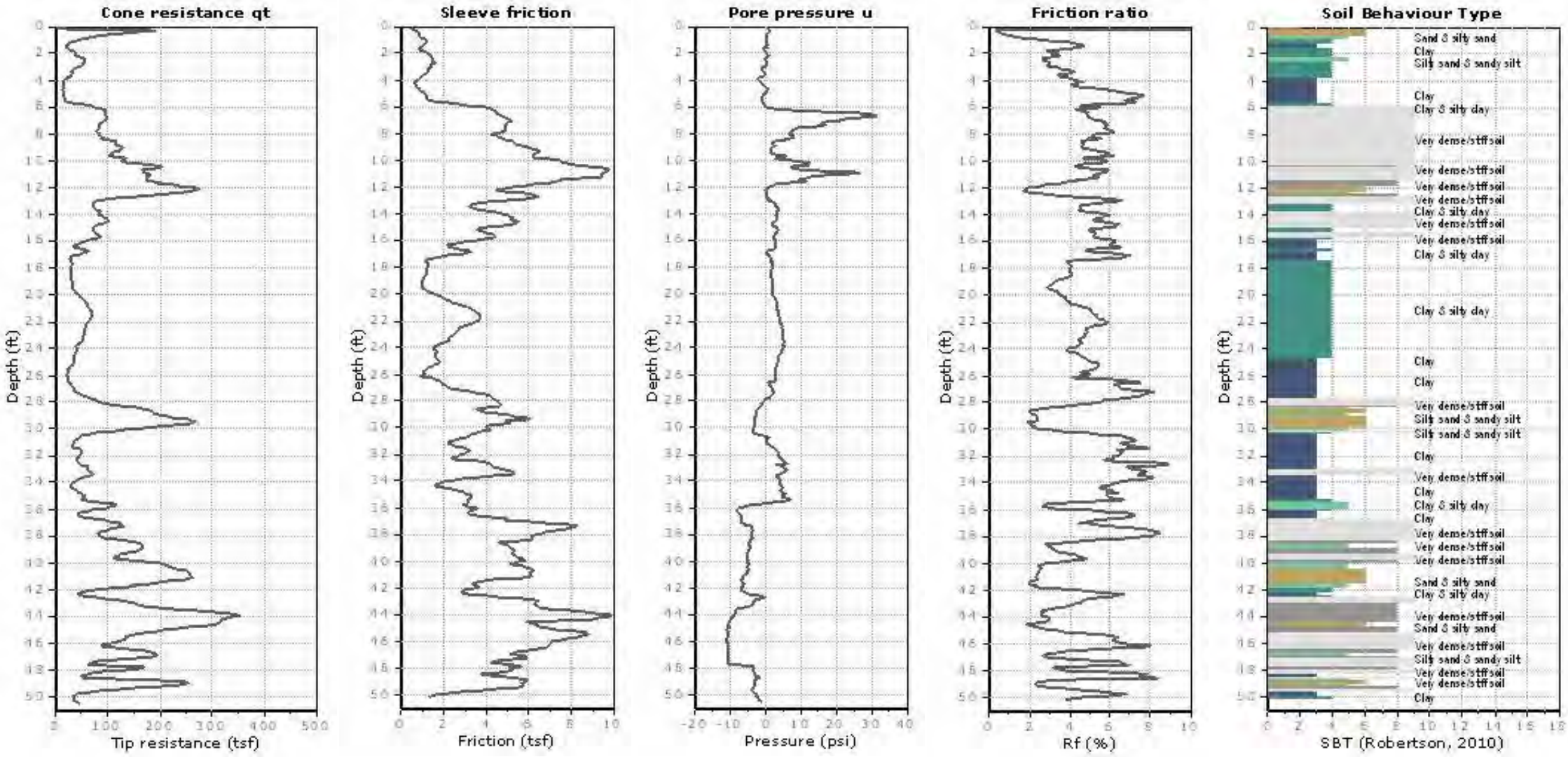
Depth (feet)	Lith-ology	Material Description	Water	Samples: Blows Per Foot	Samples: Core	Samples: Bulk	Laboratory Tests: Moisture Content (%)	Laboratory Tests: Dry Density (pcf)	Laboratory Tests: Other Lab Tests
		Silty Sand (SM): Brown to grayish brown, moist, dense, fine to medium grained sand, wet at top of the sample	▽	28					
		Clay (CL): Brown, damp to moist, very stiff							
30				14					
		Silty Sand (SM): Brown to orange brown, moist to very moist, medium dense, trace clay binder							
		End of boring at 31.5 feet. Groundwater at 23.6 feet. Backfilled with soil cuttings							

Kehoe Testing and Engineering
714-901-7270
steve@kehoetesting.com
www.kehoetesting.com

CPT-1

Project: **Albus-Keefe**
Location: **2129 Rosecrans Avenue, Gardena, CA**

Total depth: 50.54 ft, Date: 1/22/2019
Cone Type: Vertek



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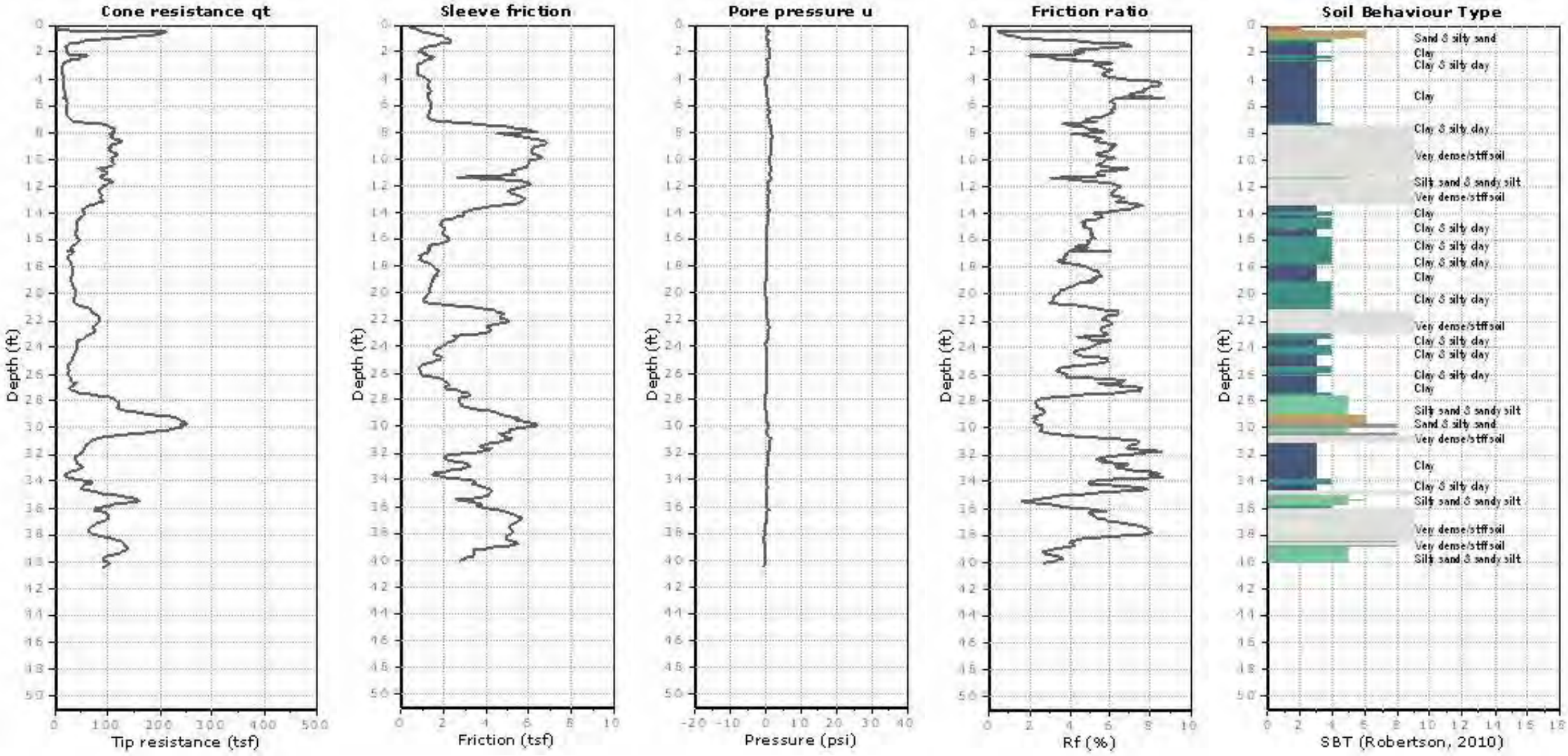
steve@kehoetesting.com
www.kehoetesting.com

CPT-2

Project: **Albus-Keefe**
Location: **2129 Rosecrans Avenue, Gardena, CA**

Total depth: 40.43 ft, Date: 1/22/2019
Cone Type: Vertek



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steve@kehoetesting.com
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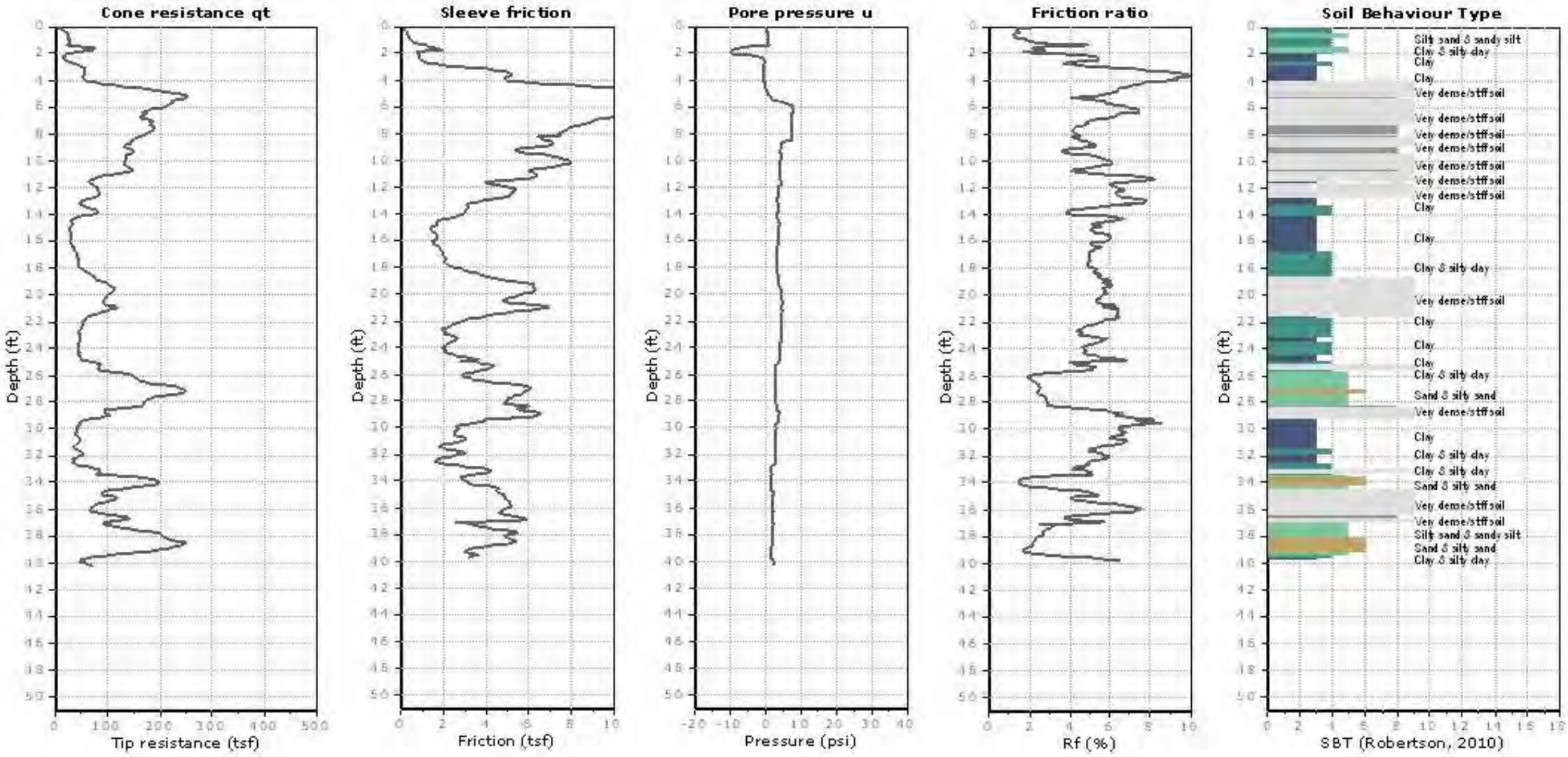
CPT-3

Project: **Albus-Keefe**
Location: **2129 Rosecrans Avenue, Gardena, CA**

Total depth: 40.18 ft, Date: 1/22/2019
Cone Type: Vertek



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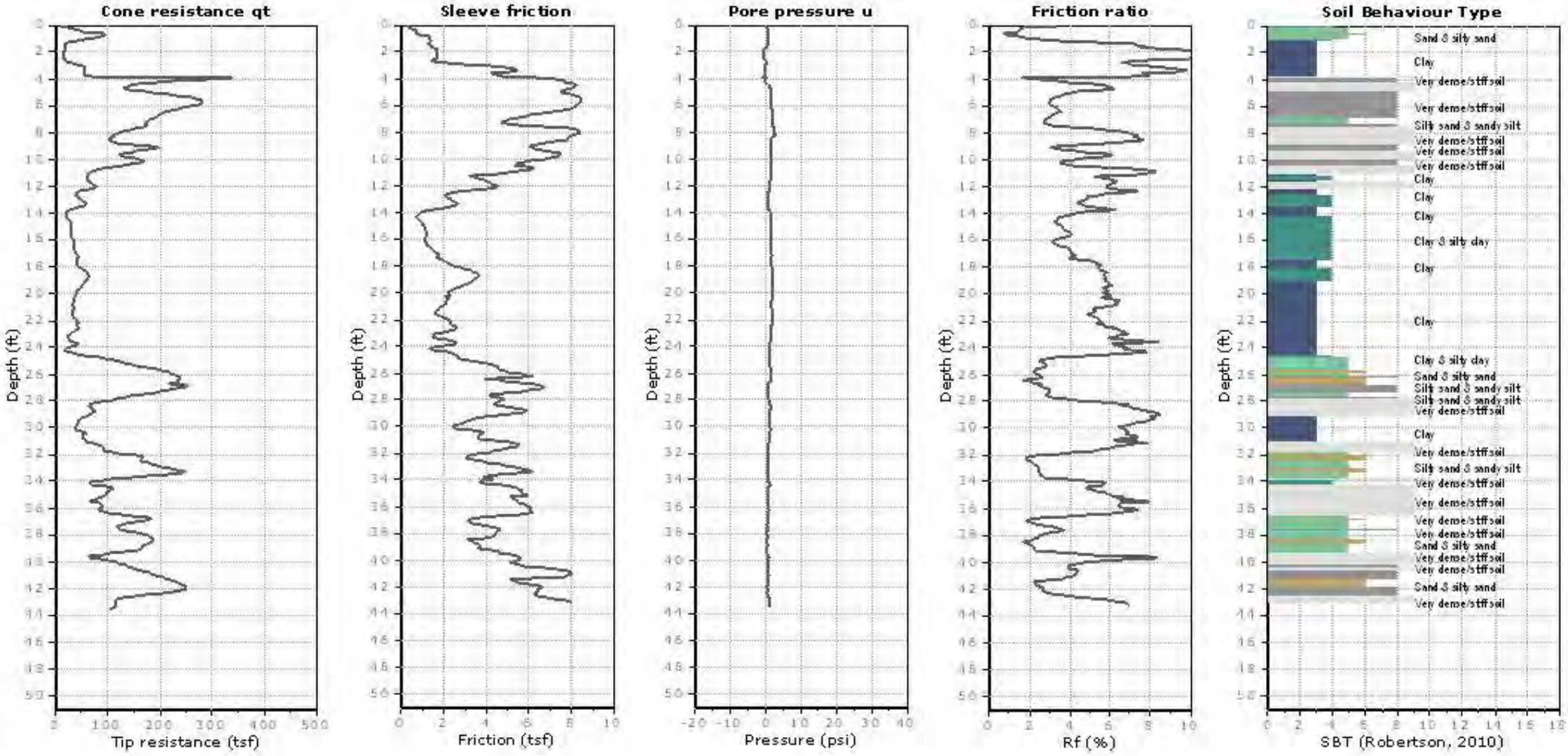
714-901-7270
steve@kehoetesting.com
www.kehoetesting.com

CPT-4

Project: **Albus-Keefe**
Location: **2129 Rosecrans Avenue, Gardena, CA**

Total depth: 43.51 ft, Date: 1/22/2019
Cone Type: Vertek



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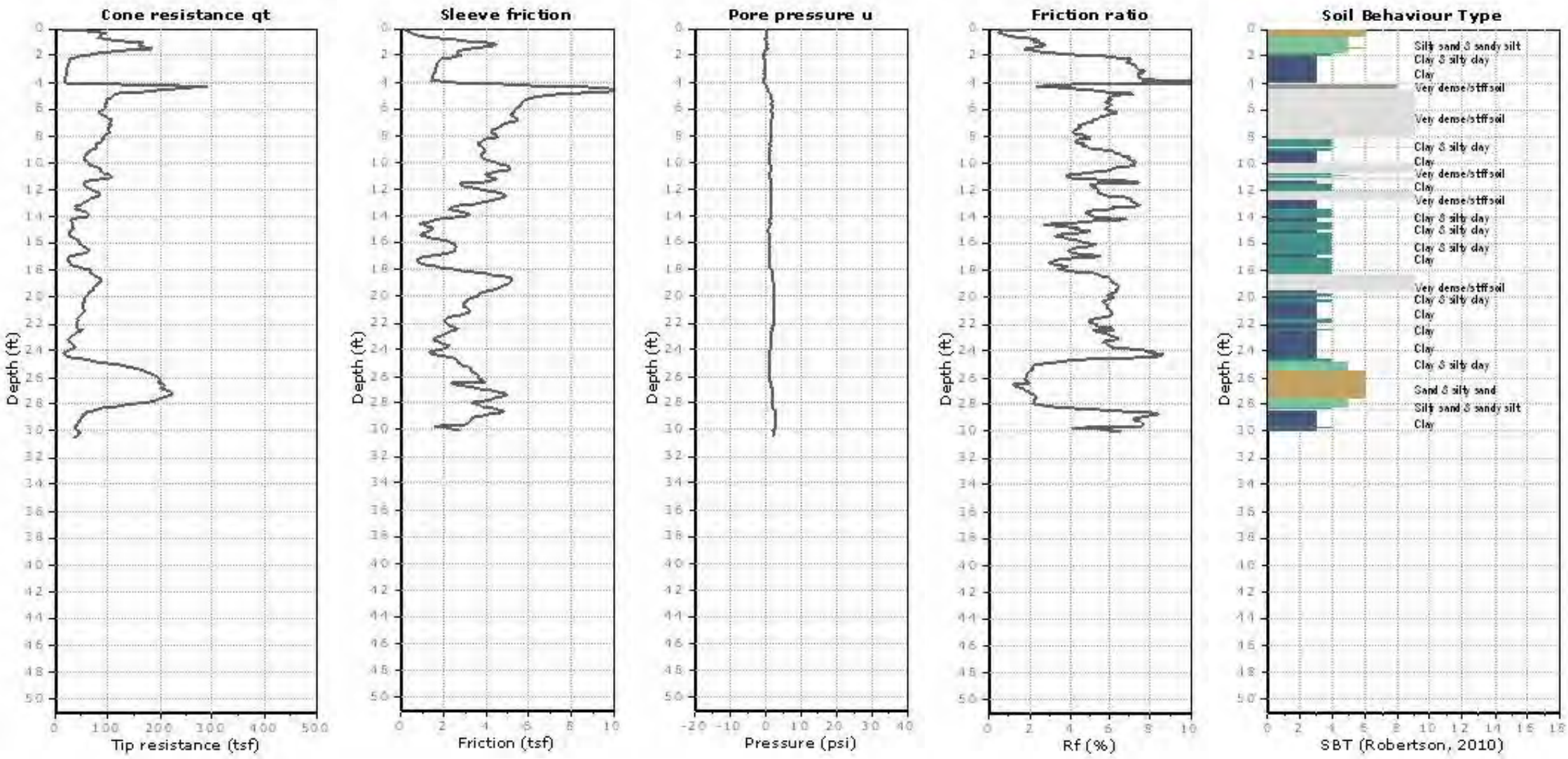
714-901-7270
steve@kehoetesting.com
www.kehoetesting.com

CPT-5A

Project: **Albus-Keefe**
Location: **2129 Rosecrans Avenue, Gardena, CA**

Total depth: 30.45 ft, Date: 1/22/2019
Cone Type: Vertek



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steve@kehoetesting.com
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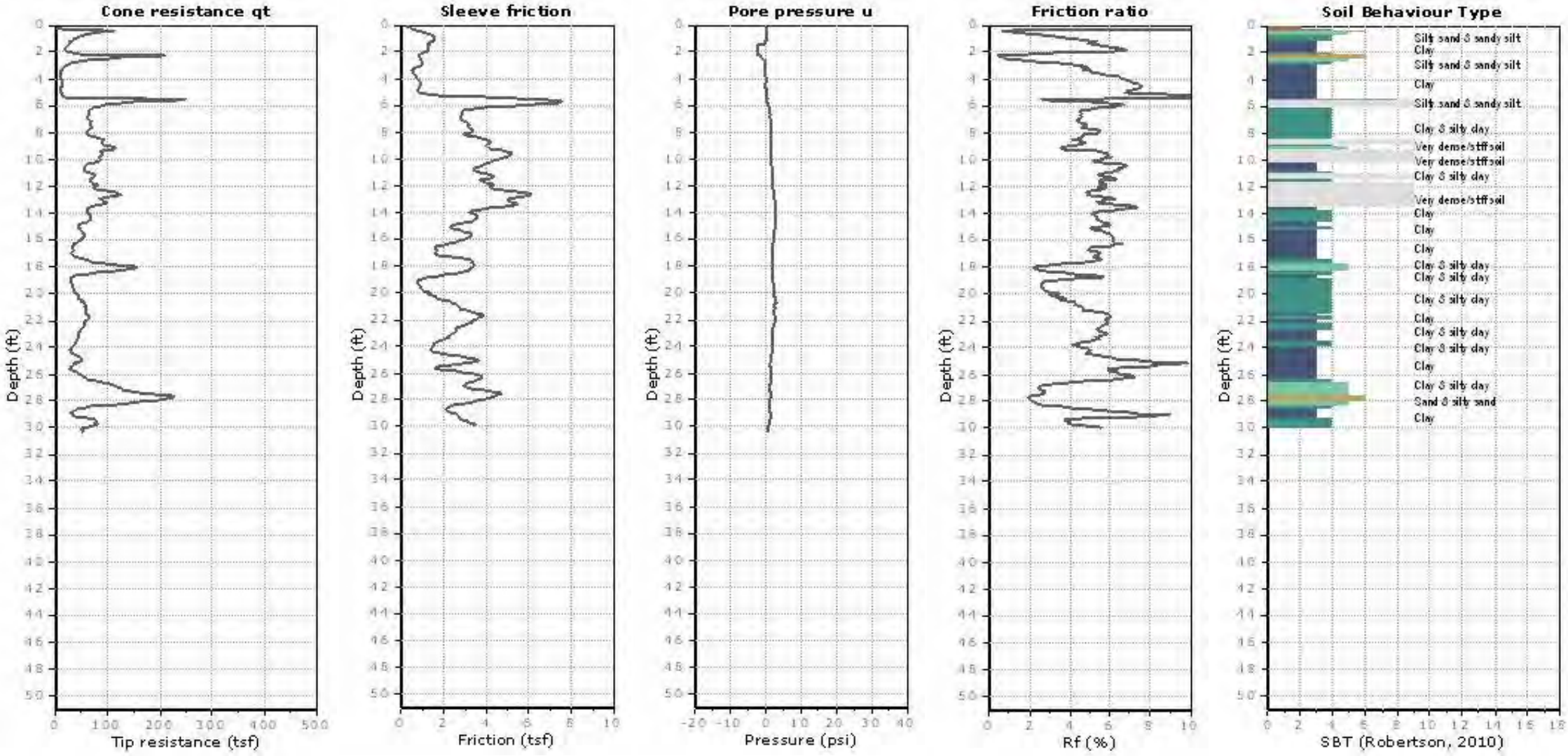
CPT-6

Project: **Albus-Keefe**
Location: **2129 Rosecrans Avenue, Gardena, CA**

Total depth: 30.34 ft, Date: 1/22/2019
Cone Type: Vertek

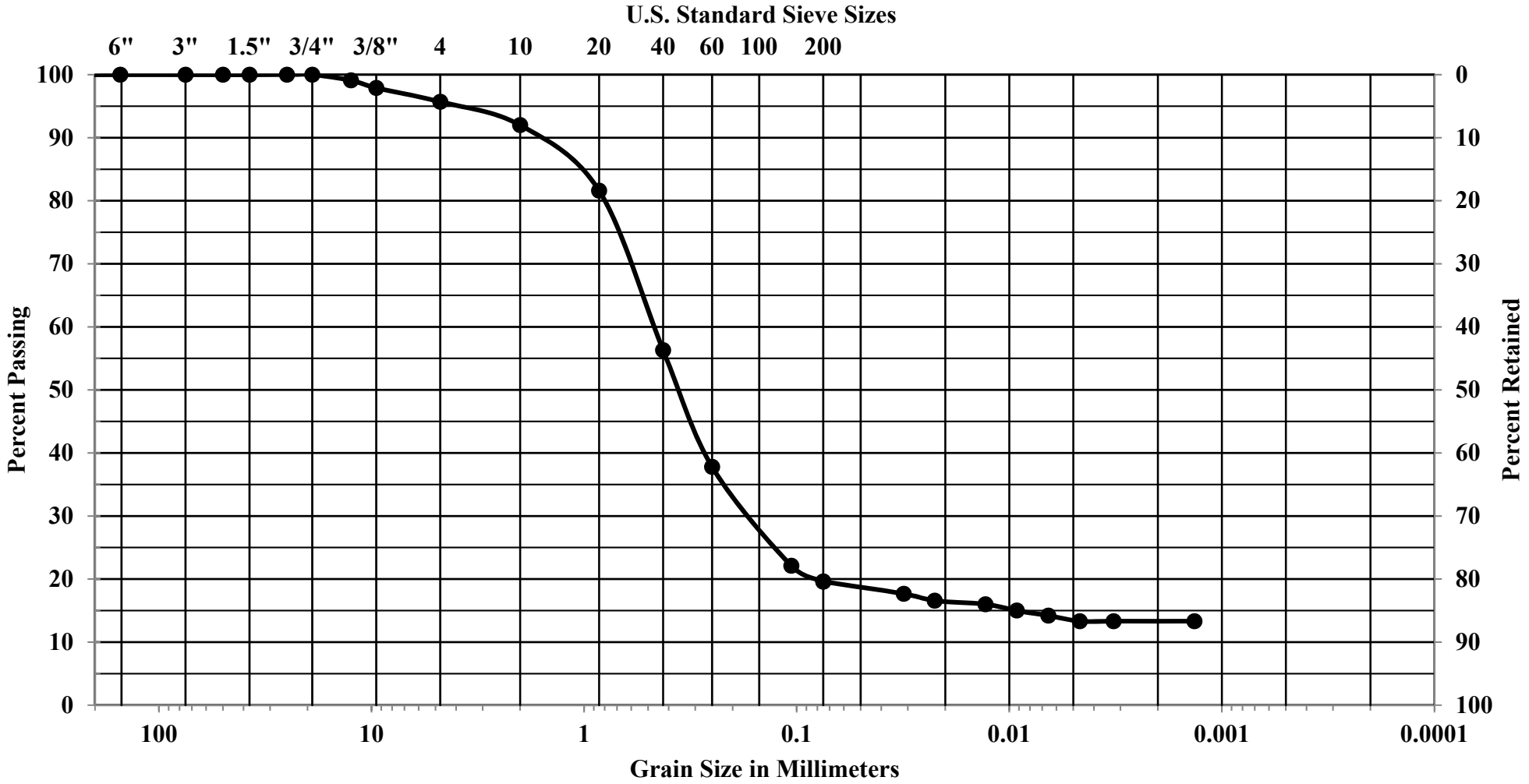


APPENDIX B

RELEVANT SOIL LABORATORY TESTING

GRAIN SIZE DISTRIBUTION

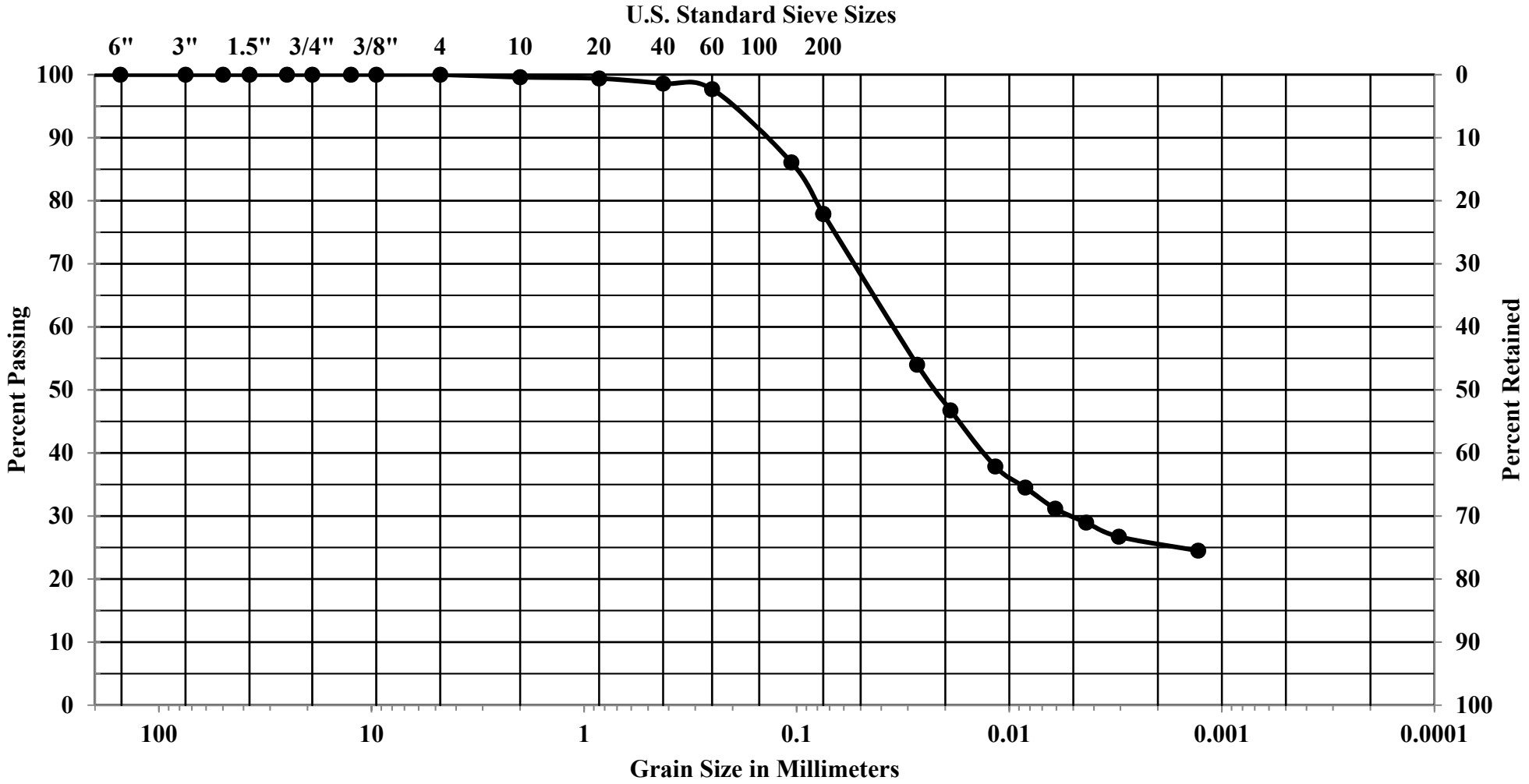
COBBLES	GRAVEL		SAND			SILT AND CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	



Job Number	Location	Depth	Description
2789.00	B-1	10	Clayey Sand (SC)

GRAIN SIZE DISTRIBUTION

COBBLES	GRAVEL		SAND			SILT AND CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	



Job Number	Location	Depth	Description
2789.00	B-1	15	Sandy Lean Clay (CL)

APPENDIX C

PERCOLATION TESTING AND ANALYSES

Field Percolation Testing - Constant Head

Client: G3 Urban

Job. No.: 2789.00

Date Tested: 1/22/2019

Test by: MP

Location: P-1

Top of Casing to Bottom of Well (ft): 14.8

Elev. of Ground Surface (ft): 50.9

Diam. of Test Hole (in): 8

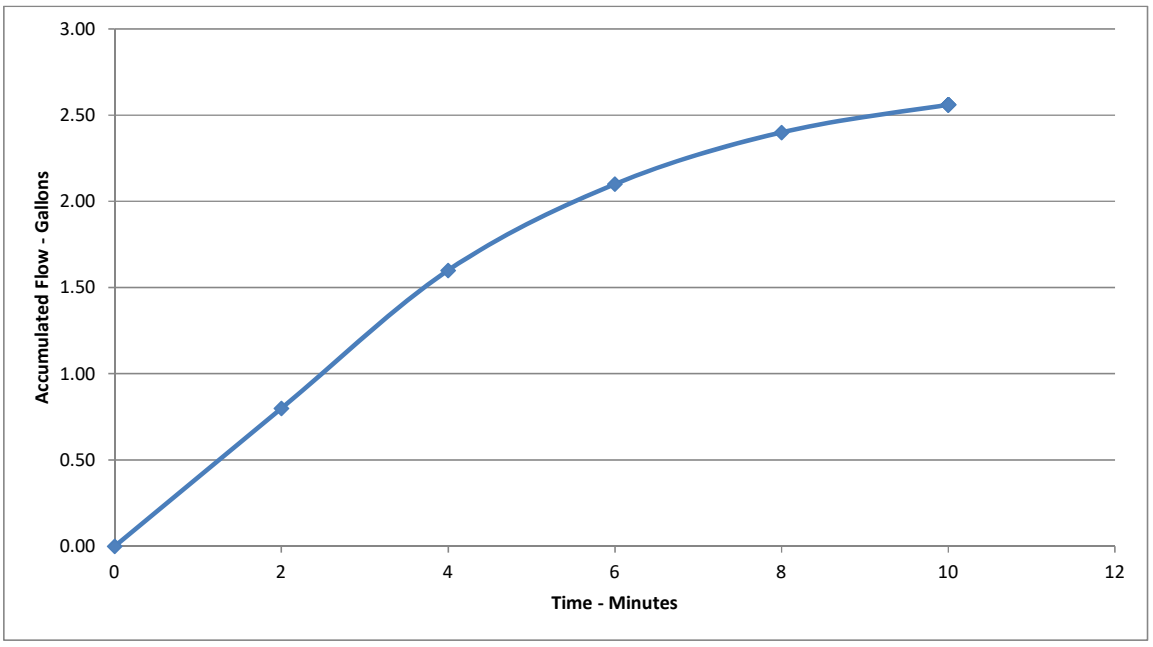
Diam. of Casing (in): 3

Ht. to Top of Casing (ft): 0

Water Tempurature (C°): 21

Constant Head

Elapsed Time (minutes)	Time	Depth to H2O (ft)	Flow Rate (gal./min.)	Total H_2O used (gal)
0	12:40	9.8	0.50	0.00
2	12:42	9.8	0.30	0.80
4	12:44	9.8	0.20	1.60
6	12:46	9.8	0.10	2.10
8	12:48	9.8	0.06	2.40
10	12:50	9.8	<0.06	2.56



INFILTRATION WELL DESIGN

Constant Head
USBR 7300-89 Method
J.N.: 2789.00
Client: G3 Gardena
Well No.: P-1

Low Water Table	Condition 1	
High Water Table & Water Below Bottom of Well	Condition 2	
High water Table with Water Above the Well Bottom	Condition 3	
		Units:
Enter Condition (1, 2 or 3):	1	
Ground Surface to Bottom of Well (h_1):	14.8	feet
Depth to Water (h_2):	9.8	feet
Height of Water in the Well (h_1-h_2=**h**):	5	feet
Radius of Well (**r**):	4.0	Inches
Minimum Volume Required:	1473.4	Gal.
Discharge Rate of Water Into Well for Steady-State Condition (**q**):	0.06	Gal/min.
Temperature (**T**):	21	Celsius
(Viscosity of Water @ Temp. T) / (Viscosity of water @ 20° C) (**V**):	0.9647	ft^3/min.
Unsaturated Distance Between the Water Surface in the Well and the Water table (T_u):		Ignore T_u
Factor of Safety:	1	
Coefficient of Permeability @ 20° C (k_{20}):	1.23E-04	ft/min.
Design k_{20}:	0.09	in./hr.

The presence or absence of a water table or impervious soil layer within a distance of less than three times that of the water depth in the well (measured from the water surface) will enable the water table to be classified as **Condition I**, **Condition II**, **Condtion III**.

Low Water Table-When the distance from the water surface in the test well to the ground water table, or to an impervious soil layer which is considered for test puposes to be equivalent to a water table, is greater than three times the depth of water in the well, classify as **Condition I**.

High Water Table-When the distance from the water surface in the test well to the ground water table or to an impervious layer is less than three times the depth of water in the well, a high water table condition exists. Use **Condition II** when the water table or impervious layer is below the well bottom. Use **Condition III** when the water table or impervious layer is above the well bottom.

Noise Measurement Field Data

Project:	Gardner Rosecrans Avenue	**Job Number:**	194091005
Site No.:	1	**Date:**	1/14/2020
Analyst:	Alex Howard	**Time:**	1:44 PM - 1:54 PM
Location:	14029 Spinning Avenue		
Noise Sources:	Airplanes flying overhead, traffic noise		
Comments:	none		

Results (dBA):

Leq:	Lmin:	Lmax:	Peak:
56.4	45.0	76.2	96.2

Equipment	
Sound Level Meter:	LD SoundExpert LxT
Calibrator:	CAL200
Response Time:	Slow
Weighting:	A
Microphone Height:	5 feet

Weather	
Temp. (degrees F):	64
Wind (mph):	< 5
Sky:	Clear
Bar. Pressure:	30.07" Hg
Humidity:	54%

Photo:

Kimley»Horn

Measurement Report

Report Summary

Meter's File Name	GR_EC_.005	Computer's File Name	SLM_0005586_GR_EC__005.00.ldbin
Meter	LxT SE		
Firmware	2.402		
User	Alex Howard	Location	
Description	Gardner Rosecrans Avenue Project		
Note			
Start Time	2020-01-14 13:44:26	Duration	0:10:00.0
End Time	2020-01-14 13:54:26	Run Time	0:10:00.0
Pause Time	0:00:00.0		

Results

Overall Metrics

LA_{eq}	56.4 dB		
LAE	84.2 dB	SEA	--- dB
EA	29.4 µPa²h		
LZ_{peak}	96.2 dB	2020-01-14 13:47:32	
LAS_{max}	76.2 dB	2020-01-14 13:47:32	
LAS_{min}	45.0 dB	2020-01-14 13:53:49	
LA_{eq}	56.4 dB		
LC_{eq}	65.0 dB	LC_{eq} - LA_{eq}	8.5 dB
LAI_{eq}	62.5 dB	LAI_{eq} - LA_{eq}	6.1 dB

Exceedances	Count	Duration
LAS > 85.0 dB	0	0:00:00.0
LAS > 115.0 dB	0	0:00:00.0
LZpeak > 135.0 dB	0	0:00:00.0
LZpeak > 137.0 dB	0	0:00:00.0
LZpeak > 140.0 dB	0	0:00:00.0

Community Noise	LDN	LDay	LNight
	56.4 dB	56.4 dB	0.0 dB

	LDEN	LDay	LEve	LNight
	56.4 dB	56.4 dB	--- dB	--- dB

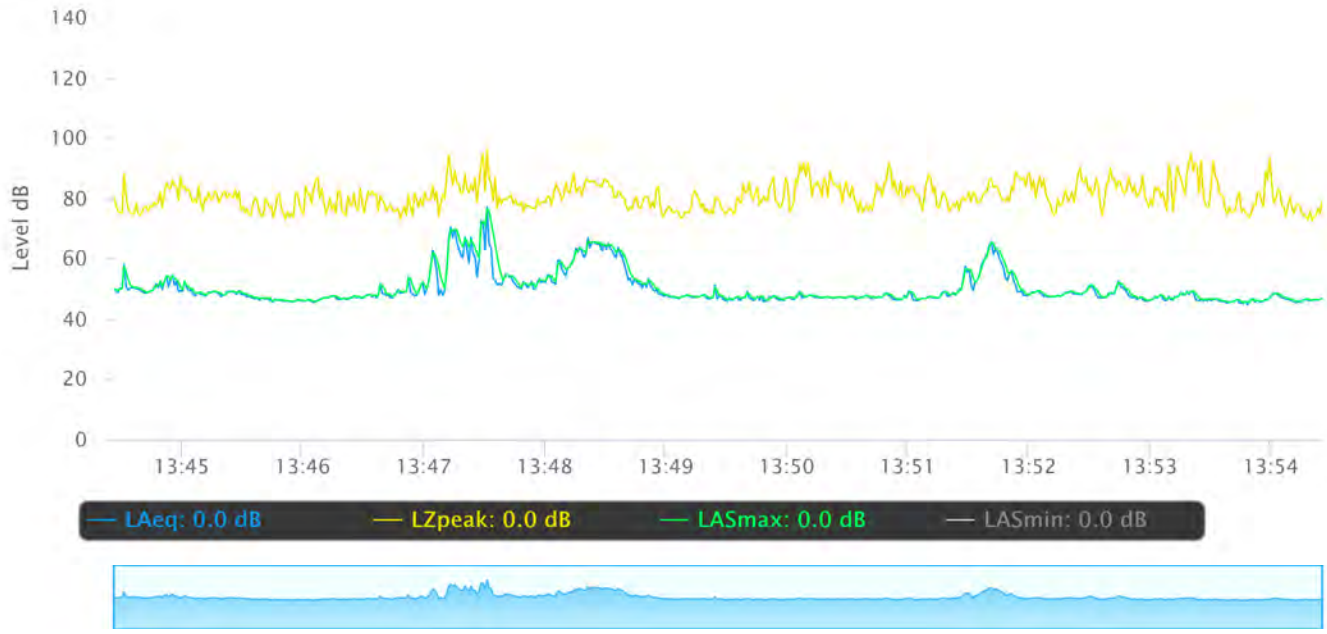
Any Data	A		C		Z	
	Level	Time Stamp	Level	Time Stamp	Level	Time Stamp
L_{eq}	56.4 dB		65.0 dB		--- dB	
$LS_{(max)}$	76.2 dB	2020-01-14 13:47:32	--- dB		--- dB	
$LS_{(min)}$	45.0 dB	2020-01-14 13:53:49	--- dB		--- dB	
$L_{Peak(max)}$	--- dB		--- dB		96.2 dB	2020-01-14 13:47:32

Overloads	Count	Duration	OBA Count	OBA Duration
	0	0:00:00.0	0	0:00:00.0

Statistics

LAS 5.0	63.4 dB
LAS 10.0	59.0 dB
LAS 33.3	49.2 dB
LAS 50.0	47.9 dB
LAS 66.6	47.2 dB
LAS 90.0	46.2 dB

Time History



Noise Measurement Field Data

Project:	Gardner Rosecrans Avenue	**Job Number:**	194091005
Site No.:	2	**Date:**	1/14/2020
Analyst:	Alex Howard	**Time:**	2:03 PM - 2:13 PM
Location:	2140 139th Street		
Noise Sources:	Traffic noise on 139th Street		
Comments:	none		

Results (dBA):

Leq:	Lmin:	Lmax:	Peak:
67.0	50.7	80.5	107.2

Equipment	
Sound Level Meter:	LD SoundExpert LxT
Calibrator:	CAL200
Response Time:	Slow
Weighting:	A
Microphone Height:	5 feet

Weather	
Temp. (degrees F):	64
Wind (mph):	< 5
Sky:	Partly Cloudy
Bar. Pressure:	30.05" Hg
Humidity:	54%

Photo:

Kimley»Horn

Measurement Report

Report Summary

Meter's File Name	GR_EC_.006	Computer's File Name	SLM_0005586_GR_EC__006.00.ldbin
Meter	LxT SE		
Firmware	2.402		
User	Alex Howard	Location	
Description	Gardner Rosecrans Avenue Project		
Note			
Start Time	2020-01-14 14:03:17	Duration	0:10:00.0
End Time	2020-01-14 14:13:17	Run Time	0:10:00.0
Pause Time	0:00:00.0		

Results

Overall Metrics

LA_{eq}	67.0 dB		
LAE	94.8 dB	SEA	--- dB
EA	335.1 µPa²h		
LZ_{peak}	107.2 dB	2020-01-14 14:03:25	
LAS_{max}	80.5 dB	2020-01-14 14:04:17	
LAS_{min}	50.7 dB	2020-01-14 14:09:41	
LA_{eq}	67.0 dB		
LC_{eq}	72.4 dB	LC_{eq} - LA_{eq}	5.3 dB
LAI_{eq}	69.7 dB	LAI_{eq} - LA_{eq}	2.7 dB

Exceedances

	Count	Duration
LAS > 85.0 dB	0	0:00:00.0
LAS > 115.0 dB	0	0:00:00.0
LZpeak > 135.0 dB	0	0:00:00.0
LZpeak > 137.0 dB	0	0:00:00.0
LZpeak > 140.0 dB	0	0:00:00.0

Community Noise

LDN	LDay	LNight
67.0 dB	67.0 dB	0.0 dB

LDEN	LDay	LEve	LNight
67.0 dB	67.0 dB	--- dB	--- dB

Any Data

	A		C		Z	
	Level	Time Stamp	Level	Time Stamp	Level	Time Stamp
L_{eq}	67.0 dB		72.4 dB		--- dB	
$LS_{(max)}$	80.5 dB	2020-01-14 14:04:17	--- dB		--- dB	
$LS_{(min)}$	50.7 dB	2020-01-14 14:09:41	--- dB		--- dB	
$L_{Peak(max)}$	--- dB		--- dB		107.2 dB	2020-01-14 14:03:25

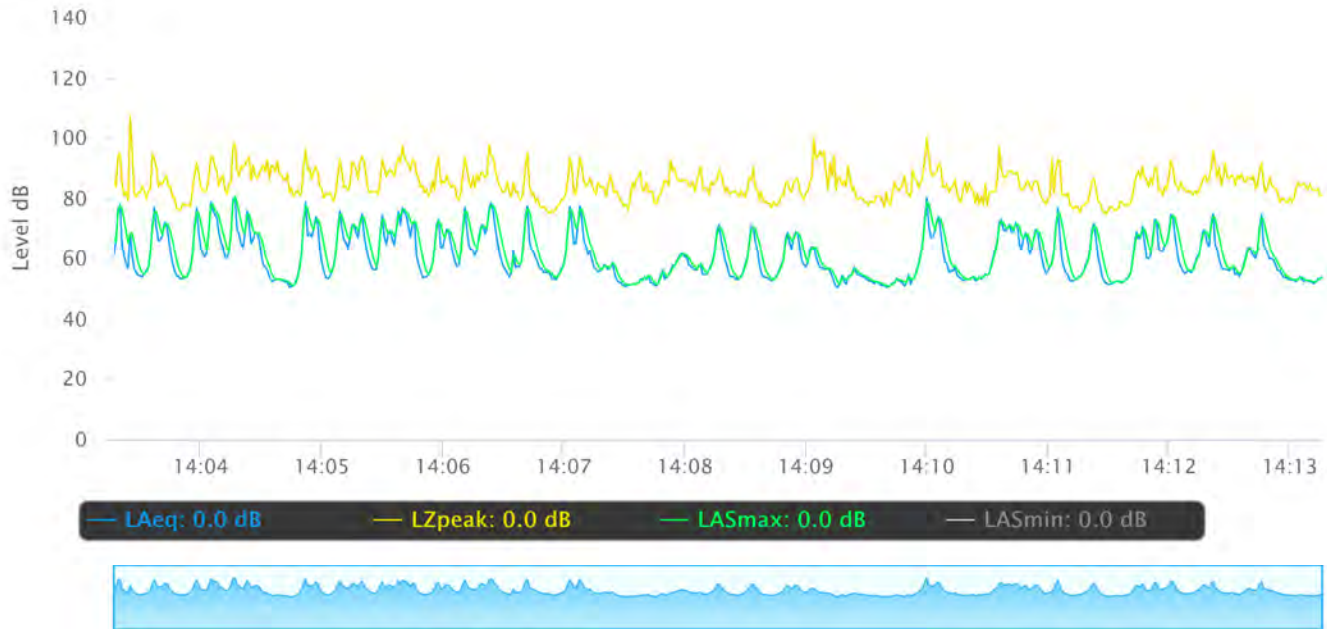
Overloads

Count	Duration	OBA Count	OBA Duration
0	0:00:00.0	0	0:00:00.0

Statistics

LAS 5.0	73.6 dB
LAS 10.0	71.5 dB
LAS 33.3	65.3 dB
LAS 50.0	60.0 dB
LAS 66.6	56.3 dB
LAS 90.0	52.8 dB

Time History



Noise Measurement Field Data

Project:	Gardner Rosecrans Avenue	**Job Number:**	194091005
Site No.:	3	**Date:**	1/14/2020
Analyst:	Alex Howard	**Time:**	
Location:	2123 144st Street		
Noise Sources:	Traffic noise		
Comments:	none		

Results (dBA):

Leq:	Lmin:	Lmax:	Peak:
59.2	43.1	75.9	100.5

Equipment	
Sound Level Meter:	LD SoundExpert LxT
Calibrator:	CAL200
Response Time:	Slow
Weighting:	A
Microphone Height:	5 feet

Weather	
Temp. (degrees F):	60
Wind (mph):	< 5
Sky:	Clear
Bar. Pressure:	30.05" Hg
Humidity:	53%

Photo:

Kimley»Horn

Measurement Report

Report Summary

Meter's File Name	GR_EC_.007	Computer's File Name	SLM_0005586_GR_EC__007.00.ldbin
Meter	LxT SE		
Firmware	2.402		
User	Alex Howard	Location	
Description	Gardner Rosecrans Avenue Project		
Note			
Start Time	2020-01-14 14:22:11	Duration	0:10:00.0
End Time	2020-01-14 14:32:11	Run Time	0:10:00.0
Pause Time	0:00:00.0		

Results

Overall Metrics

LA_{eq}	59.2 dB		
LAE	86.9 dB	SEA	--- dB
EA	54.8 µPa²h		
LZ_{peak}	100.5 dB	2020-01-14 14:28:10	
LAS_{max}	75.9 dB	2020-01-14 14:29:25	
LAS_{min}	43.1 dB	2020-01-14 14:26:13	
LA_{eq}	59.2 dB		
LC_{eq}	68.2 dB	LC_{eq} - LA_{eq}	9.0 dB
LAI_{eq}	60.7 dB	LAI_{eq} - LA_{eq}	1.6 dB

Exceedances	Count	Duration
LAS > 85.0 dB	0	0:00:00.0
LAS > 115.0 dB	0	0:00:00.0
LZpeak > 135.0 dB	0	0:00:00.0
LZpeak > 137.0 dB	0	0:00:00.0
LZpeak > 140.0 dB	0	0:00:00.0

Community Noise	LDN	LDay	LNight
	59.2 dB	59.2 dB	0.0 dB

	LDEN	LDay	LEve	LNight
	59.2 dB	59.2 dB	--- dB	--- dB

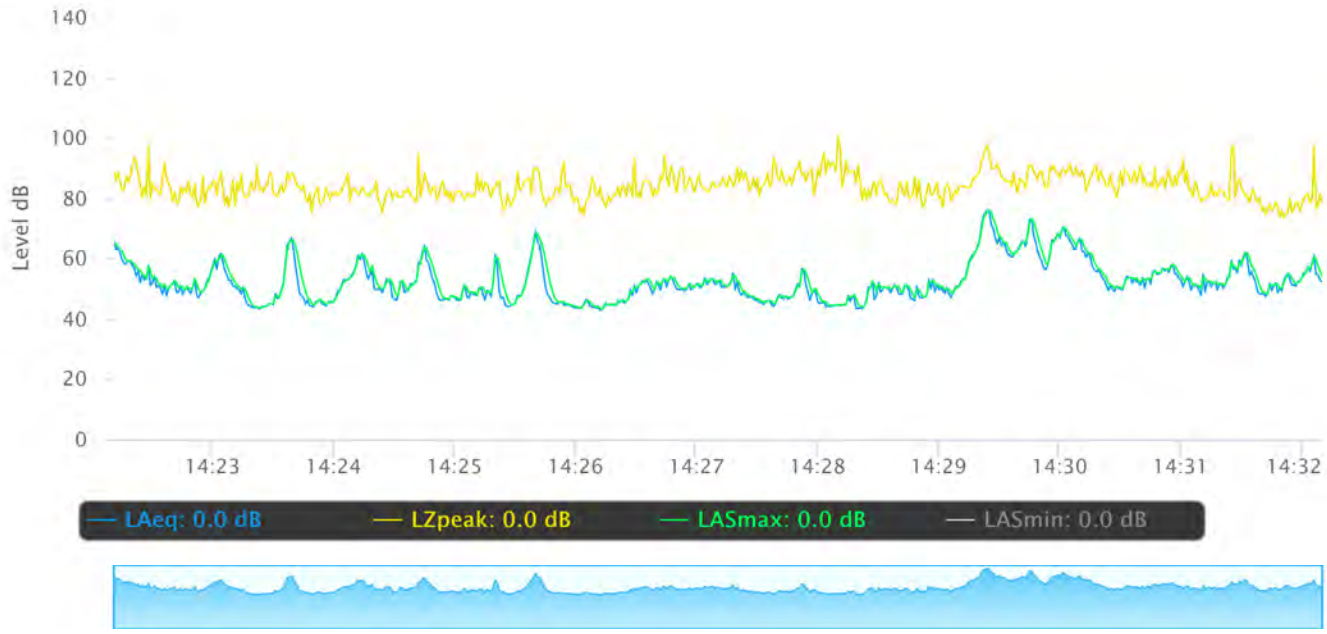
Any Data	A		C		Z	
	Level	Time Stamp	Level	Time Stamp	Level	Time Stamp
L_{eq}	59.2 dB		68.2 dB		--- dB	
$LS_{(max)}$	75.9 dB	2020-01-14 14:29:25	--- dB		--- dB	
$LS_{(min)}$	43.1 dB	2020-01-14 14:26:13	--- dB		--- dB	
$L_{Peak(max)}$	--- dB		--- dB		100.5 dB	2020-01-14 14:28:10

Overloads	Count	Duration	OBA Count	OBA Duration
	0	0:00:00.0	0	0:00:00.0

Statistics

LAS 5.0	65.4 dB
LAS 10.0	62.0 dB
LAS 33.3	53.1 dB
LAS 50.0	51.0 dB
LAS 66.6	49.2 dB
LAS 90.0	45.0 dB

Time History



LINSCOTT LAW & GREENSPAN engineers

TRANSPORTATION IMPACT STUDY

ROSECRANS PLACE MIXED-USE PROJECT

City of Gardena, California
February 27, 2020

Prepared for:

G3 Urban
15235 S. Western Avenue
Gardena, California 90249

LLG Ref. 1-19-4343-2

REGISTERED PROFESSIONAL ENGINEER
ALFRED C. YING
NO. TR1944
EXP. 06/30/20
TRAFFIC
STATE OF CALIFORNIA

REGISTERED PROFESSIONAL ENGINEER
CLARE M. LOOK-JAEGER
TR1878
EXP. 06/30/21
TRAFFIC
STATE OF CALIFORNIA

Prepared by:

Alfred C. Ying, P.E., PTP
Senior Transportation Engineer

Under the Supervision of:

Clare M. Look-Jaeger, P.E.
Principal

Linscott, Law & Greenspan, Engineers

600 S. Lake Avenue
Suite 500
Pasadena, CA 91106

626.796.2322 T
626.792.0941 F
www.llgengineers.com

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TRANSPORTATION IMPACT ANALYSIS

ROSECRANS PLACE MIXED-USE PROJECT

City of Gardena, California
February 27, 2020

1.0 INTRODUCTION

This transportation impact study has been prepared to identify and evaluate the potential transportation impacts of the proposed Rosecrans Place Mixed-Use project ("proposed project"). The proposed project site is located at 2101 and 2129 Rosecrans Avenue, which is situated northeast of the Rosecrans Avenue and Van Ness Avenue intersection in the City of Gardena, California. The proposed project site and general vicinity are shown in ***Figure 1-1***.

1.1 Transportation Study Overview

This transportation analysis follows current City of Gardena traffic study guidelines[1]. The traffic analysis also utilizes the intersection threshold criteria set forth in the Los Angeles County Department of Public Works (LACDPW) traffic study guidelines.[2] This traffic analysis evaluates potential project-related impacts at five study intersections in the vicinity of the project site. The study intersections were determined in consultation with City of Gardena staff. The Intersection Capacity Utilization method was used to determine Volume-to-Capacity ratios and corresponding Levels of Service at the study intersections.

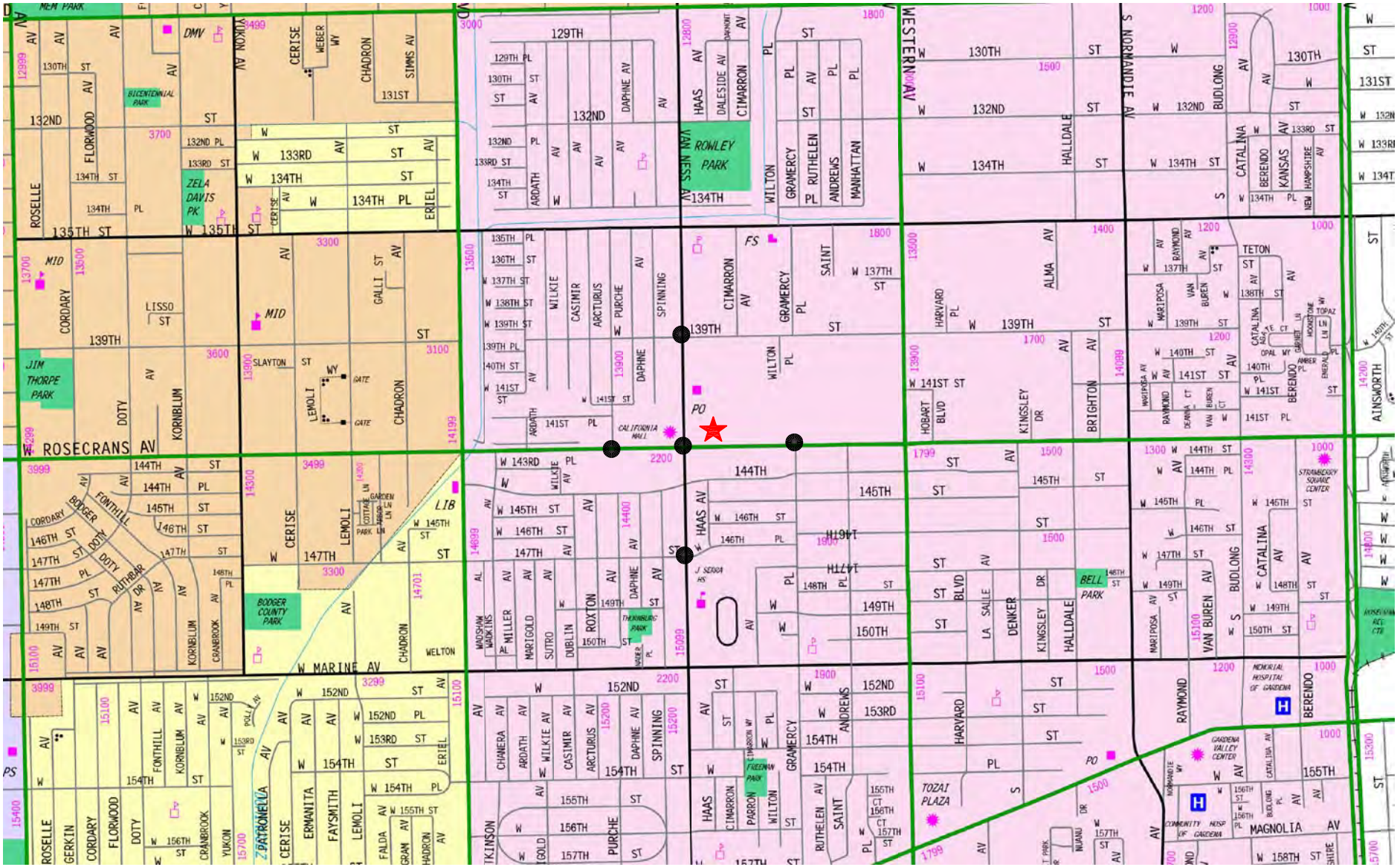
This study (i) presents existing traffic volumes, (ii) forecasts existing traffic volumes with the proposed project traffic volumes, (iii) forecasts future traffic volumes with ambient growth and the related projects, (iv) forecasts future traffic volumes with the proposed project traffic volumes, (v) determines project-related impacts, and (vi) recommends mitigation measures, where necessary.

1.2 Study Area

Based on consultation with City of Gardena staff, a total of five study intersections has been identified for evaluation during the weekday morning and afternoon peak hours. The study intersections provide local access to the study area and define the extent of the boundaries for this transportation impact analysis. Further discussion of the existing street system and study area is provided in Section 4.0 herein.

The general location of the project in relation to the study locations and surrounding street system is presented in *Figure 1-1*. The transportation analysis study area is generally comprised of those locations which have the greatest potential to experience significant transportation impacts due to the proposed projects as defined by the City of Gardena as the Lead Agency. In the transportation engineering practice, the study area generally includes those intersections that are:

[1] Community Development Element Circulation of the *Gardena General Plan 2006*.
[2] *Traffic Impact Analysis Report Guidelines*, County of Los Angeles Department of Public Works, January 1, 1997.



-2-

N

NOT TO SCALE

MAP SOURCE: RAND MCNALLY & COMPANY

★ PROJECT SITE

FIGURE 1-1
VICINITY MAP

LINSCOTT, LAW & GREENSPAN, engineers

ROSECRANS PLACE MIXED-USE PROJECT

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a. Immediately adjacent or in close proximity to the project site;

b. In the vicinity of the project site that are documented to have current or projected future adverse operational issues; and

c. In the vicinity of the project site that are forecast to experience a relatively greater percentage of project-related vehicular turning movements.

The locations selected for analysis were based on the above criteria, the proposed Rosecrans Place Mixed-Use project peak hour vehicle trip generation, the anticipated distribution of project vehicular trips, and existing intersection/corridor operations. As mentioned previously, a total of five study locations define the extent of the boundaries for this transportation impact study, as listed below:

1. Purche Avenue/Rosecrans Avenue
2. Van Ness Avenue/139th Street
3. Van Ness Avenue/Rosecrans Avenue
4. Van Ness Avenue/147th Street-146th Place
5. Gramercy Place/Rosecrans Avenue

1.3 Overview of Senate Bill 743

On September 27, 2013, Governor Brown signed Senate Bill (SB) 743 (Steinberg, 2013). Among other things, SB 743 created a process to change the methodology to analyze transportation impacts (Public Resources Code section 21000 and following) under the California Environmental Quality Act (CEQA). On December 30, 2013, the State of California Governor's Office of Planning and Research (OPR) released a preliminary evaluation of alternative methods of transportation analysis, which included analysis based on project vehicle miles traveled (VMT) rather than impacts to intersection Level of Service. OPR issued other draft discussion documents in March 2015 and January 2016, suggesting some new revisions to the state CEQA Guidelines. In November 2017, OPR submitted the proposed amendments to the CEQA Guidelines to the State's Natural Resources Agency (that include a proposed new Guidelines section 15064.3 which governs how VMT-based analyses of potential traffic impacts should be conducted). On January 26, 2018, the Natural Resources Agency published a Notice of Rulemaking, commencing the formal rulemaking process for the amendments to the CEQA Guidelines. On December 28, 2018, the California Office of Administrative Law adopted the proposed amendments, formally implementing the use of VMT as the metric for transportation analysis under CEQA and providing a grace period allowing local agencies to opt-in to the new metrics. As of January 2020, seven cities in the State have formally updated their transportation analysis guidelines to incorporate VMT metrics for CEQA analysis (in order, the Cities of Pasadena, San Francisco, Oakland, San Jose, Corona, Los Angeles, and Beverly Hills). All other agencies have until July 1, 2020, when Statewide compliance with the revised

CEQA Guidelines will be mandatory. Therefore, the analysis in this study utilizes existing, long-established protocols in accordance with CEQA and the City's current significance thresholds.

1.4 Los Angeles County Congestion Management Program Status

The Los Angeles County Congestion Management Program (CMP) was previously a state-mandated program that was enacted by the California State Legislature with the passage of Proposition 111 in 1990 that primarily utilized a level of service (LOS) performance metric. Senate Bill 743 contains amendments to current congestion management law that allows counties to opt out of the LOS standards that would otherwise apply in areas where CMPs are utilized. Pursuant to California Government Code §65088.3, local jurisdictions may opt out of the CMP requirement without penalty if a majority of the local jurisdictions representing a majority of the County's population formally adopt resolutions requesting to opt out of the program. As of November 2019, the majority of local agencies representing the majority of the County's population have adopted resolutions to opt out of the program. Therefore, the CMP is no longer applicable in Los Angeles County.

2.0 PROJECT DESCRIPTION

2.1 Site Location

The proposed project site is located at 2101 and 2129 Rosecrans Avenue within the City of Gardena, California. The proposed project is situated along the north side of Rosecrans Avenue, east of Van Ness Avenue. The existing development site is bounded by storage facilities, commercial, and light industrial uses. The proposed Rosecrans Place Mixed-Use project site location and general vicinity are shown in *Figure 1–1*.

2.2 Existing Project Site

The existing project site is currently occupied by approximately 42,400 square feet of commercial uses, surface parking, and drive aisles. A total of three buildings currently occupy the project site, including an approximate 11,500 square-foot office building, an approximate 5,400 square-foot building ancillary to the office building, and an approximate 25,500 square-foot automotive repair and taxi servicing building. The existing buildings are planned to be demolished to accommodate the development of the proposed project. An aerial photograph of the existing project site, the adjacent roadways, and the existing site access points are presented in ***Figure 2-1***. As indicated in *Figure 2-1*, the existing project site currently accommodates vehicular access via site driveways/curb cuts located along the southerly property frontage (i.e., along Rosecrans Avenue).

2.3 Project Description

The proposed project consists of the demolition of the existing buildings on-site and the development of a mixed-use project. A total of 105 residential dwelling units, comprising 50 attached townhome units, 41 detached single-family units, and 14 live-work units, will be constructed. In addition, a retail building totaling 5,080 square feet will also be developed as part of the proposed Rosecrans Place Mixed-Use project. Based on information provided by the project Architect, the proposed project is planned to satisfy the City of Gardena Code parking requirements by providing a total of 309 parking spaces (including 274 spaces for the residential/live-work component and 35 spaces for the retail component).

Construction of the proposed project is expected to commence in year 2020 with build-out by the end of year 2021/beginning of year 2022. The site plan for the proposed project is illustrated in ***Figure 2–2***. Vehicular access to the proposed project is planned to be provided via two driveways on Rosecrans Avenue. Further discussion of the project's site access and circulation scheme is provided in Section 3.0.

N

NOT TO SCALE

MAP SOURCE: GOOGLE EARTH

PROJECT SITE

EXISTING DRIVEWAY

FIGURE 2-1
AERIAL PHOTOGRAPH OF EXISTING PROJECT SITE

LINSCOTT, LAW & GREENSPAN, engineers

ROSECRANS PLACE MIXED-USE PROJECT

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SOURCE: ANGELENO ASSOCIATES, INC.

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FIGURE 2-2
PROJECT SITE PLAN

LINSCOTT, LAW & GREENSPAN, engineers

ROSECRANS PLACE MIXED-USE PROJECT

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3.0 SITE ACCESS AND CIRCULATION

3.1 Existing Vehicular Site Access

As indicated in *Figure 2-1*, the existing project site currently accommodates vehicular access via driveways located along the southerly property frontage (i.e., along Rosecrans Avenue). The westernmost driveway (i.e., the main driveway) presently provides inbound and outbound access to/from the site and accommodates both left-turn and right-turn ingress/egress turning movements. The other three driveway curb-cuts are currently not being used. All existing vehicular access points will be closed as part of the proposed project.

3.2 Proposed Project Vehicular Site Access

As presented in *Figure 2-2*, vehicular access to the proposed project is planned to be provided via two driveways on Rosecrans Avenue. The main project driveway will be located approximately mid-way along the project frontage. This driveway will accommodate vehicular access to the retail building as well as the residential component of the project. A second project driveway, which is planned to be provided east of the main project driveway, will be utilized mostly by the residential and live-work component of the project. The proposed project site driveways will be constructed to City of Gardena design standards.

As described in Section 3.1, full vehicular access (i.e., left-turn and right-turn ingress/egress turning movements) is currently provided at the existing project site. In order to continue to accommodate full vehicular access for the proposed project and to maintain existing ingress/egress movements for those driveways located along the south side of Rosecrans Avenue, some median modifications along Rosecrans Avenue in the immediate vicinity of the proposed project are proposed. It is recommended that the existing raised median located on Rosecrans Avenue (directly in front of the project site) be removed and replaced with two-way left-turn lane striping which would facilitate left-turn turning movements into and out of driveways located along both sides of Rosecrans Avenue. In addition, it is recommended that the existing eastbound left-turn pocket (which provides exclusive access to the existing project site) be removed as this driveway will be closed as part of the proposed project. The existing raised median in this area will be modified accordingly to accommodate the left-turn pocket removal. With the recommended Rosecrans Avenue median modifications, full vehicular access will be provided in the immediate project vicinity for both project patrons/residents and nearby businesses. A conceptual layout of the proposed Rosecrans Avenue median modifications is provided in ***Appendix A***.

3.3 Pedestrian Access

The proposed Rosecrans Avenue Mixed-Use project is located along a major corridor and in close proximity to numerous commercial business land uses. The project is well-located to encourage pedestrian activity and walking as a transportation mode.[3] Walkability is a term for the extent to

[3] For example, refer to http://www.walkscore.com/, which generates a walkability score of approximately 75-80 (Very Walkable) out of 100 for the project site. Walk Score calculates the walkability of an address by locating nearby stores,

which walking is readily available as a safe, connected, accessible and pleasant mode of transport. There are several criteria that are widely accepted as key aspects of the walkability of urban areas that should be satisfied. The underlying principle is that pedestrians should not be delayed, diverted, or placed in danger. The widely accepted characteristics of walkability are as follows:

> Connectivity: People can walk from one place to another without encountering major obstacles, obstructions, or loss of connectivity.
>
> Convivial: Pedestrian routes are friendly and attractive, and are perceived as such by pedestrians.
>
> Conspicuous: Suitable levels of lighting, visibility and surveillance over its entire length, with high quality delineation and signage.
>
> Comfortable: High quality and well-maintained footpaths of suitable widths, attractive landscaping and architecture, shelter and rest spaces, and a suitable allocation of roadspace to pedestrians.
>
> Convenient: Walking is a realistic travel choice, partly because of the impact of the other criteria set forth above, but also because walking routes are of a suitable length as a result of land use planning with minimal delays.

The project site is situated within walking distance to retail, restaurant, and other commercial businesses within the area. Pedestrian amenities in the area foster a favorable environment for walking as a transportation mode, which is evidenced by the considerable level of pedestrian activity in the area. Further, regional and local public bus transit stops are provided nearby on Rosecrans Avenue and Van Ness Avenue.

---

restaurants, schools, parks, etc. Walk Score measures how easy it is to live a car-lite lifestyle—not how pretty the area is for walking.

4.0 EXISTING STREET SYSTEM

4.1 Study Intersections

Immediate access to the proposed Rosecrans Avenue Mixed-Use project site is via Rosecrans Avenue. The following five study intersections were selected for analysis in consultation with City staff in order to determine potential impacts related to the proposed project:

1. Purche Avenue/Rosecrans Avenue
2. Van Ness Avenue/139th Street
3. Van Ness Avenue/Rosecrans Avenue
4. Van Ness Avenue/147th Street-146th Place
5. Gramercy Place/Rosecrans Avenue

All five study intersections are presently controlled by traffic signals. The existing roadway configurations at the study intersections are displayed in ***Figure 4–1***.

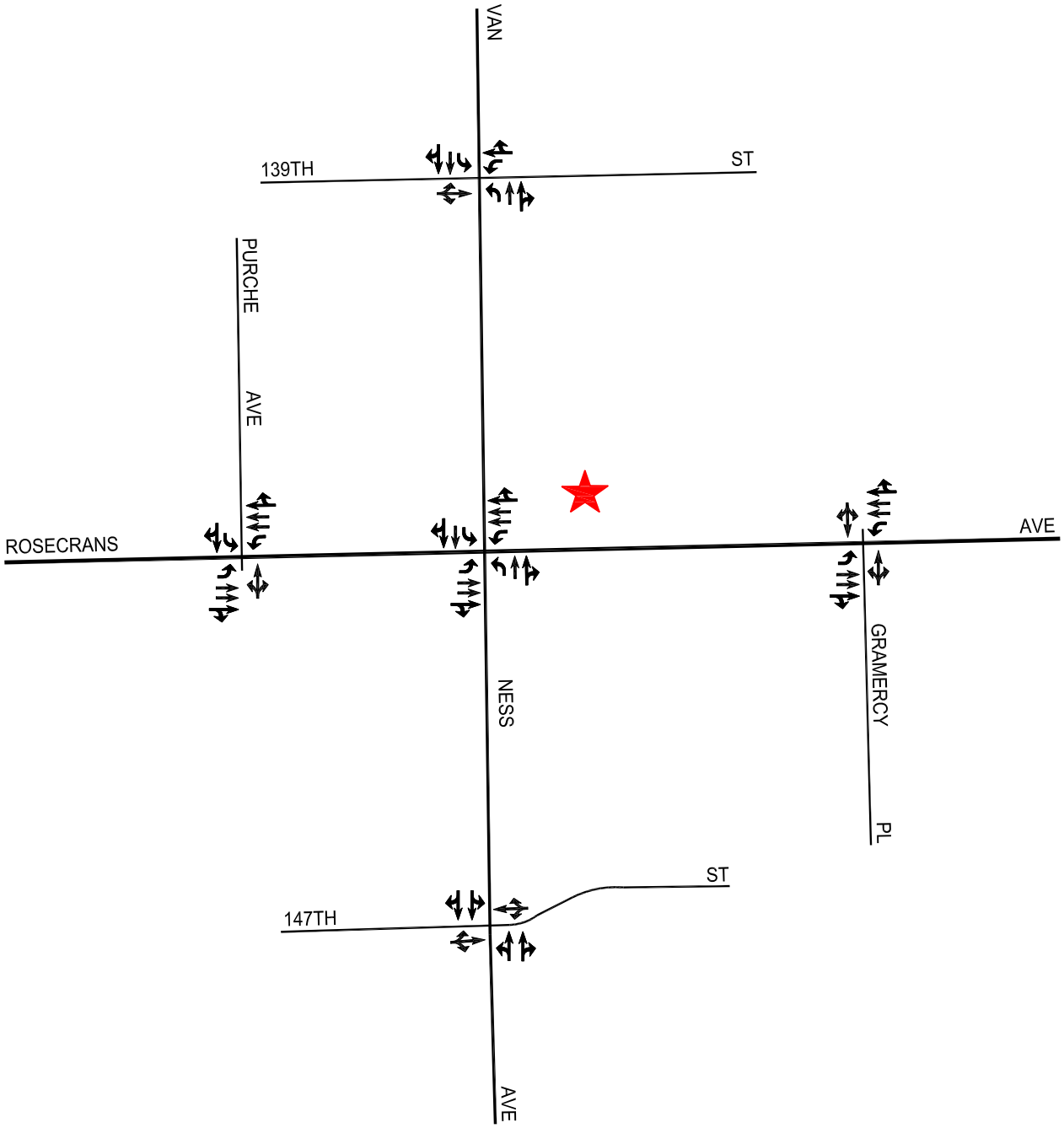
4.2 Roadway Classifications

The City of Gardena utilizes the roadway categories recognized by regional, state and federal transportation agencies. There are four categories in the roadway hierarchy, ranging from freeways with the highest capacity to two-lane undivided roadways with the lowest capacity. The roadway categories are summarized as follows:

- *Freeways* are limited-access and high speed travel ways included in the state and federal highway systems. Their purpose is to carry regional through-traffic. Access is provided by interchanges with typical spacing of one mile or greater. No local access is provided to adjacent land uses.

- *Arterial* roadways are major streets that primarily serve through-traffic and provide access to abutting properties as a secondary function. Arterials are generally designed with two to six travel lanes and their major intersections are signalized. This roadway type is divided into two categories: principal and minor arterials. Principal arterials are typically four-or-more lane roadways and serve both local and regional through-traffic. Minor arterials are typically two-to-four lane streets that service local and commute traffic.

- *Collector* roadways are streets that provide access and traffic circulation within residential and non-residential (e.g., commercial and industrial) areas. Collector roadways connect local streets to arterials and are typically designed with two through travel lanes (i.e., one through travel lane in each direction) that may accommodate on-street parking. They may also provide access to abutting properties.



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NOT TO SCALE

PROJECT SITE

FIGURE 4-1
EXISTING STREET SYSTEM

LINSCOTT, LAW & GREENSPAN, engineers

ROSECRANS PLACE MIXED-USE PROJECT

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- *Local* roadways distribute traffic within a neighborhood, or similar adjacent neighborhoods, and are not intended for use as a through-street or a link between higher capacity facilities such as collector or arterial roadways. Local streets are fronted by residential uses and do not typically serve commercial uses.

4.3 Roadway Descriptions

A review of the key roadways in the project vicinity and study area is summarized in ***Table 4-1***. As indicated in *Table 4-1,* the roadways within the project study area were reviewed in terms of the number of lanes provided, median types, posted speed limits, etc. Additionally, the roadway classifications of key roads in the project study area also are presented in *Table 4-1*.

4.4 Existing Public Bus Transit Service

Public bus transit service within the project study area is currently provided by Los Angeles County Metropolitan Transportation Authority (Metro), City of Gardena Transit, and Torrance Transit. A summary of the existing transit service, including the transit routes, destinations and peak hour headways is presented in ***Table 4–2***. The existing public transit routes in the project site vicinity are illustrated in ***Figure 4-2***.

Table 4-1
EXISTING ROADWAY DESCRIPTIONS

Roadway	Classification [1]	Travel Lanes		Median Types [4]	Speed Limit
		Direction [2]	No. Lanes [3]		
Purche Avenue	Local Street	NB-SB	2	N/A	25
Van Ness Avenue	Major Collector	NB-SB	4	2WLT-N/A	35
Gramercy Place	Local Street	NB-SB	2	N/A	25
139th Street	Collector Street	EB-WB	2	N/A-2WLT	25 to 35
Rosecrans Avenue	Arterial	EB-WB	6	RMI	40
147th Street	Local Street	EB-WB	2	N/A	30
146th Place	Local Street	EB-WB	2	N/A	25

Notes:
[1] Roadway classifications obtained from the *City of Gardena General Plan 2006 (Circulation Plan)* , adopted April 25, 2006.
[2] Direction of roadways in the project area: NB-SB = northbound and southbound; and EB-WB = eastbound and westbound.
[3] Number of lanes in both directions on the roadway.
[4] Median type of the road: RMI = Raised Median Island; 2WLT = 2-Way Left-Turn Lane; and N/A = Not Applicable.

Table 4-2
EXISTING TRANSIT ROUTES [1]

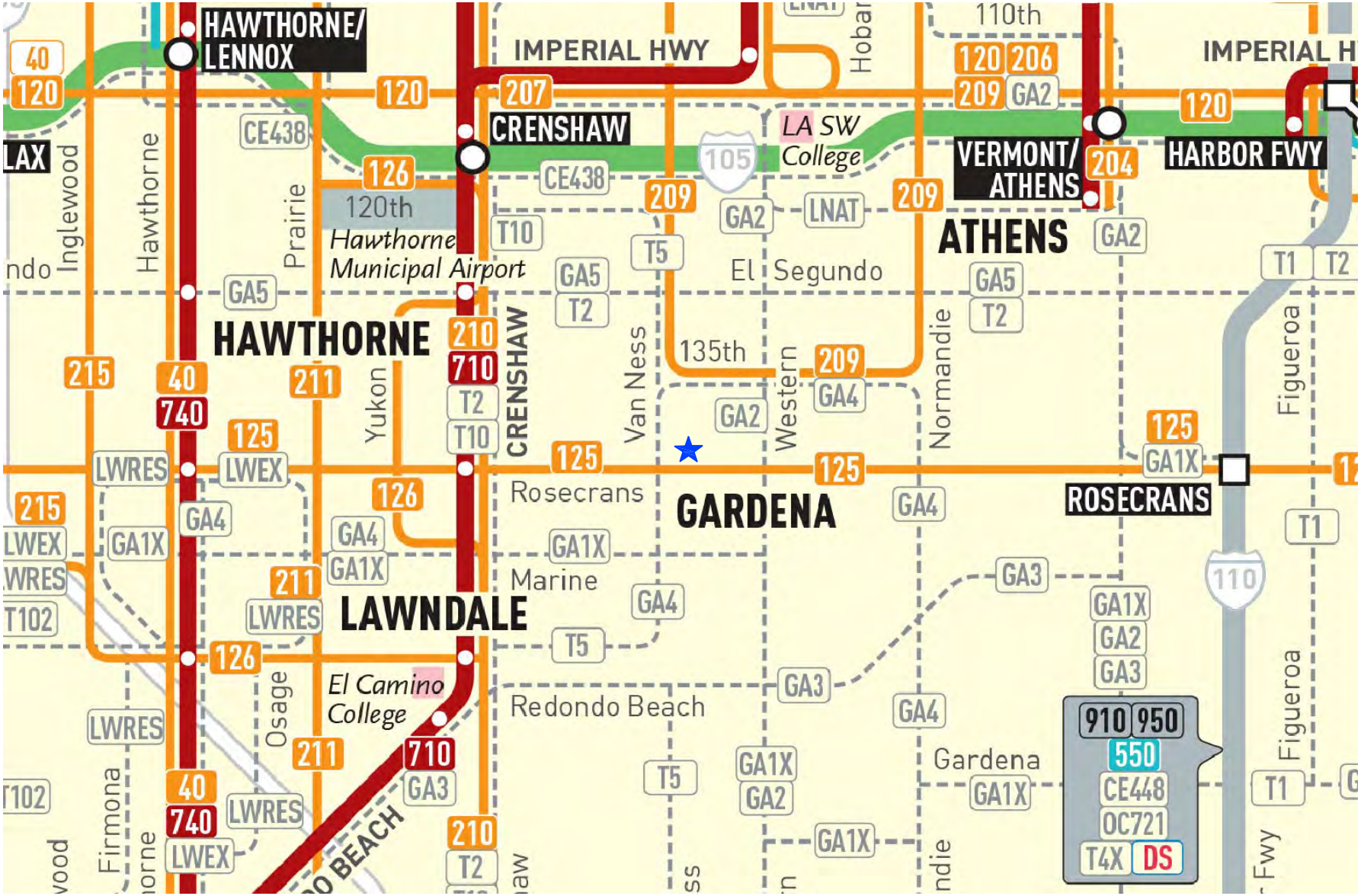
ROUTE	DESTINATIONS	ROADWAY(S) NEAR SITE	NO. OF BUSES/TRAINS DURING PEAK HOUR		
			DIR	AM	PM
GTRAN Line 1X	Redondo Beach to Downtown Los Angeles via Hawthorne, Torrance and Gardena	Van Ness Avenue, Marine Avenue	NB SB	2 2	2 2
GTRANS Line 2	Gardena to Torrance via Carson	Western Avenue, 139th Street, Rosecrans Avenue	NB SB	4 5	4 4
GTRANS Line 4	Harbor Gateway to Hawthorne via Gardena and Torrance	Van Ness Avenue, 139th Street, Rosecrans Avenue, 147th Street	EB WB	1 1	1 2
Metro 125	El Segundo to Norwalk via Lawndale, Los Angeles, Compton and Downey	Purche Avenue, Van Ness Avenue, Gramercy Place, Rosecrans Avenue	EB WB	3 4	3 3
Metro 209	Athens to Wilshire Center via Hawthorne, Hyde Park and Jefferson Park	Van Ness Avenue, 135th Street	NB SB	2 2	1 1
Metro 210/710	Redondo Beach to Hollywood via Torrance, Hawthorne, Inglewood, Jefferson Park and Koreatown	Crenshaw Boulevard, 139th Street, Rosecrans Avenue, 147th Street	NB SB	9 7	7 8
Metro Green Line	Norwalk to Redondo Beach via Downey, Lynwood, Willowbrook, Los Angeles, Hawthorne and El Segundo	Crenshaw Boulevard	EB WB	10 10	10 10
Torrance Transit 2	Torrance and Gardena	Crenshaw Boulevard, 139th Street, Rosecrans Avenue, 147th Street	NB SB	1 1	1 1

[1] Sources: City of Gardena (GTRANS), Los Angeles County Metropolitan Transportation Authority (Metro) and City of Torrance (Torrance Transit) websites, 2020.

Table 4-2 (Continued)
EXISTING TRANSIT ROUTES [1]

ROUTE	DESTINATIONS	ROADWAY(S) NEAR SITE	NO. OF BUSES/TRAINS DURING PEAK HOUR		
			DIR	AM	PM
Torrance Transit 5	Torrance and Gardena	Van Ness Avenue, 139th Street, Rosecrans Avenue, 147th Street	NB SB	1 1	1 1
Torrance Transit 10	Torrance and Gardena	Crenshaw Boulevard, 139th Street, Rosecrans Avenue, 147th Street	NB SB	2 2	2 2
TOTAL				70	66

[1] Sources: City of Gardena (GTRANS), Los Angeles County Metropolitan Transportation Authority (Metro) and City of Torrance (Torrance Transit) websites, 2020.



NOT TO SCALE

MAP SOURCE: METROPOLITAN TRANSPORTATION AUTHORITY WEBSITE

★ PROJECT SITE

FIGURE 4-2
EXISTING TRANSIT ROUTES

LINSCOTT, LAW & GREENSPAN, engineers

ROSECRANS PLACE MIXED-USE PROJECT

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5.0 TRAFFIC COUNTS

Manual counts of vehicular turning movements were conducted in May 2019 at each of the study intersections during the weekday morning (AM) and afternoon (PM) commute periods to determine the peak hour traffic volumes. The manual counts were conducted by an independent traffic count subconsultant (The Traffic Solution) at the study intersections from 7:00 to 10:00 AM to determine the weekday AM peak commute hour and from 4:00 to 7:00 PM to determine the weekday PM peak commute hour. In conjunction with the manual turning movement vehicle counts, counts of bicycle and pedestrian volumes were also collected during the peak periods. It is noted that all of the traffic counts were conducted when local schools were in session. Weekday traffic volumes at the study intersections show the typical peak periods between 7:00 to 10:00 AM and 4:00 to 7:00 PM generally associated with metropolitan peak commute hours.

The weekday peak hour manual counts of vehicle movements at the study intersections are summarized in ***Table 5-1***. The existing traffic volumes at the study intersections during the weekday AM and PM peak hours are shown in ***Figures 5-1*** and ***5-2***, respectively. Summary data worksheets of the manual traffic, pedestrian, and bicycle counts at the study intersections are contained in ***Appendix B***.

Table 5-1
EXISTING TRAFFIC VOLUMES [1]
WEEKDAY AM AND PM PEAK HOURS

NO.	INTERSECTION	DATE	DIR	AM PEAK HOUR		PM PEAK HOUR	
				BEGAN	VOLUME	BEGAN	VOLUME
1	Purche Avenue / Rosecrans Avenue	05/21/2019	NB	7:30	7	4:45	9
			SB		135		145
			EB		930		1,582
			WB		1,311		1,062
2	Van Ness Avenue / 139th Street	05/21/2019	NB	7:15	829	4:30	864
			SB		869		876
			EB		184		171
			WB		305		215
3	Van Ness Avenue / Rosecrans Avenue	05/21/2019	NB	7:30	721	4:45	733
			SB		859		847
			EB		917		1,523
			WB		1,438		1,132
4	Van Ness Avenue / 147th Street - 146th Place	05/21/2019	NB	7:30	763	5:00	759
			SB		727		743
			EB		169		163
			WB		78		33
5	Gramercy Place / Rosecrans Avenue	05/21/2019	NB	7:30	118	4:45	93
			SB		9		39
			EB		1,060		1,540
			WB		1,443		1,128

[1] Counts conducted by The Traffic Solution

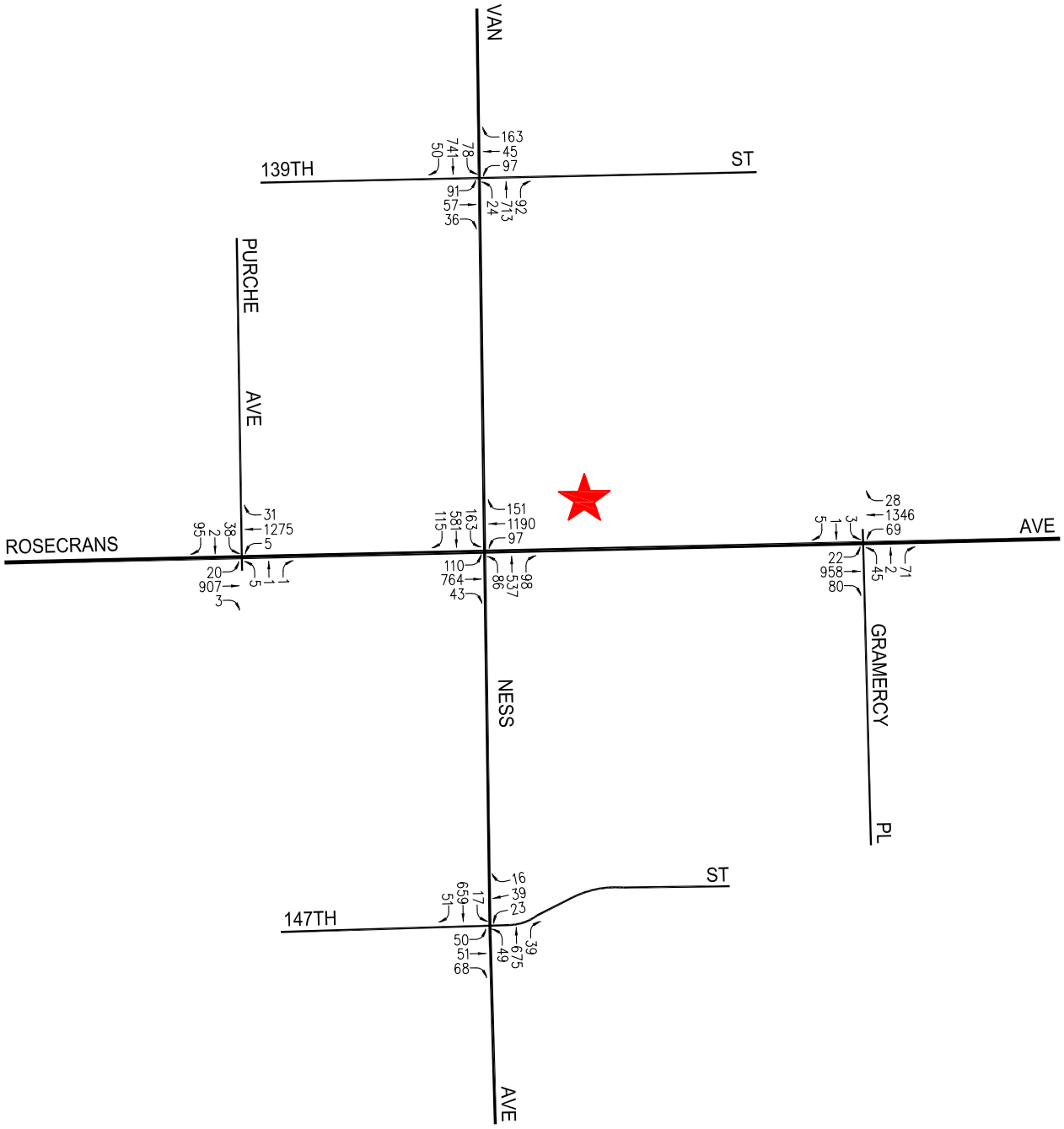

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FIGURE 5-1
EXISTING TRAFFIC VOLUMES
WEEKDAY AM PEAK HOUR
ROSECRANS PLACE MIXED-USE PROJECT

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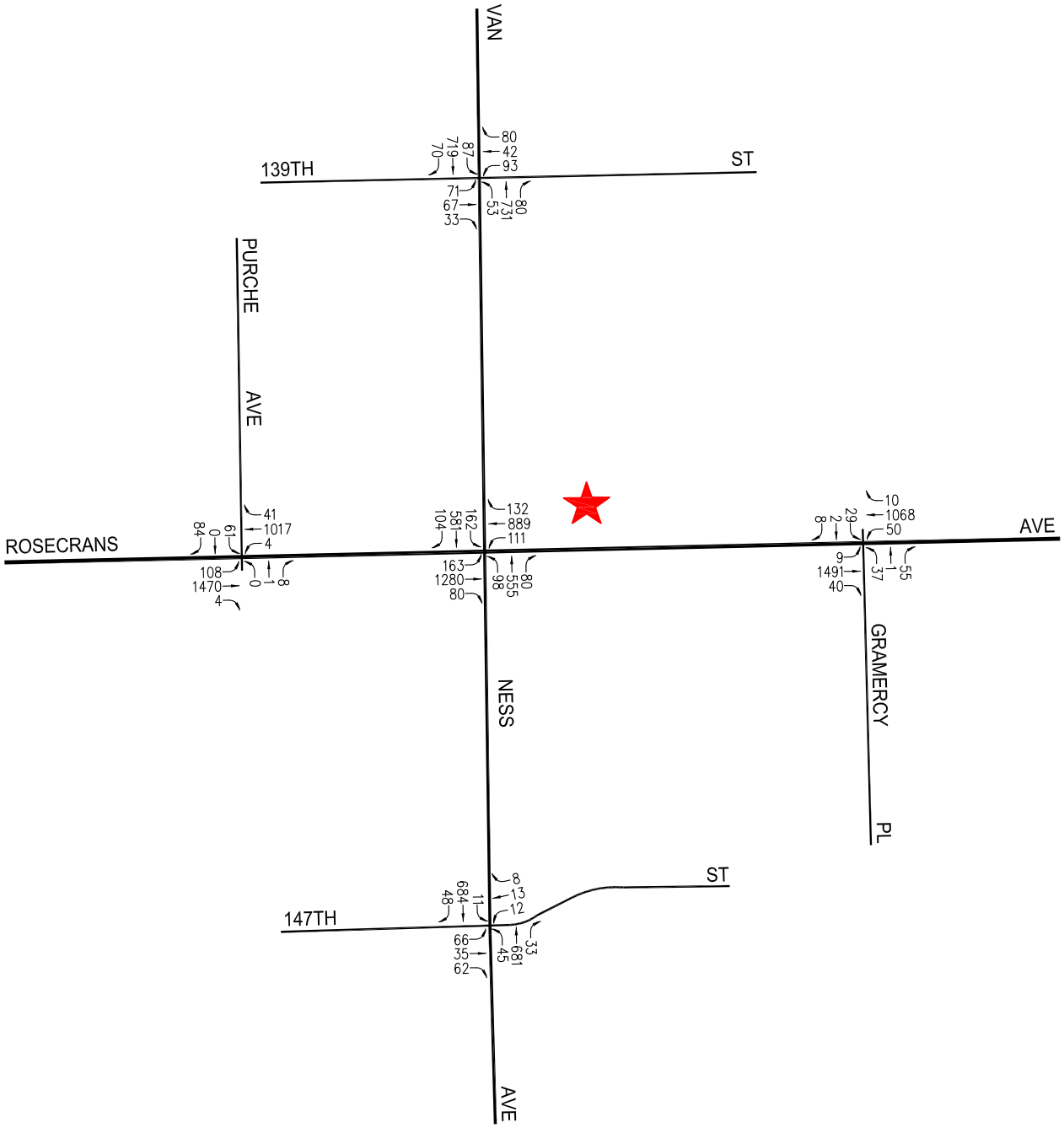

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FIGURE 5-2
EXISTING TRAFFIC VOLUMES
WEEKDAY PM PEAK HOUR
ROSECRANS PLACE MIXED-USE PROJECT

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6.0 CUMULATIVE DEVELOPMENT PROJECTS

The forecast of future pre-project conditions was prepared in accordance with procedures outlined in Section 15130 of the CEQA Guidelines. Specifically, the CEQA Guidelines provide two options for developing the future traffic volume forecast:

> "(A) A list of past, present, and probable future projects producing related or cumulative impacts, including, if necessary, those projects outside the control of the [lead] agency, or
>
> (B) A summary of projections contained in an adopted local, regional or statewide plan, or related planning document, that describes or evaluates conditions contributing to the cumulative effect. Such plans may include: a general plan, regional transportation plan, or plans for the reduction of greenhouse gas emissions. A summary of projections may also be contained in an adopted or certified prior environmental document for such a plan. Such projections may be supplemented with additional information such as a regional modeling program. Any such document shall be referenced and made available to the public at a location specified by the lead agency."

Accordingly, the transportation analysis provides a highly conservative estimate of future pre-project traffic volumes as it incorporates both the "A" and "B" options outlined in the CEQA Guidelines for purposes of developing the forecast.

6.1 Related Projects

A forecast of on-street traffic conditions prior to occupancy of the proposed project was prepared by incorporating the potential trips associated with other known development projects (related projects) in the area. With this information, the potential impact of the proposed project can be evaluated within the context of the cumulative impact of all ongoing development. The list of related projects was based on information on file at the City of Gardena and City of Hawthorne. The list of related projects in the project site area is presented in ***Table 6–1***. The location of the related projects is shown in ***Figure 6–1***.

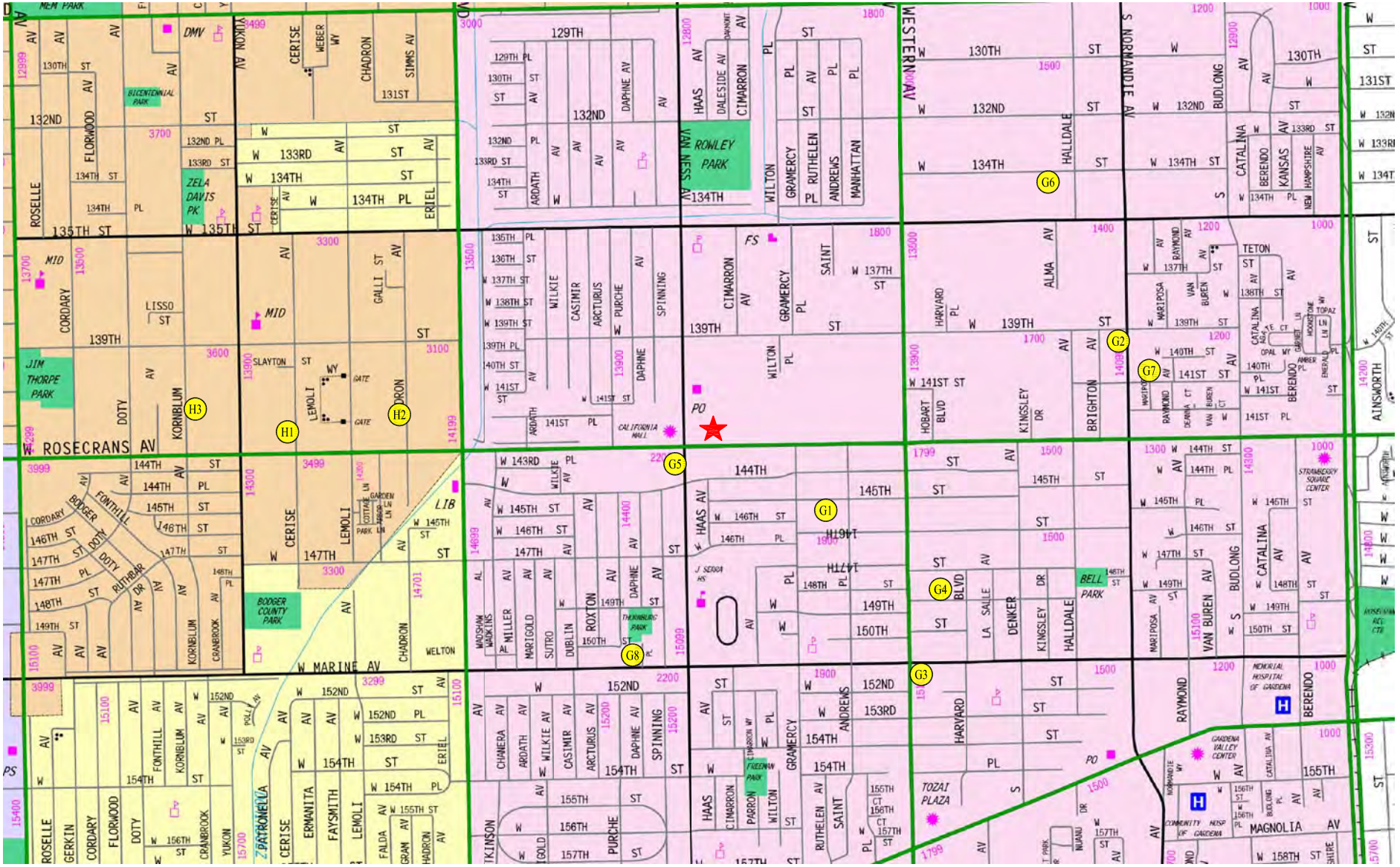
Traffic volumes expected to be generated by the related projects were calculated using rates provided in the current Institute of Transportation Engineers' (ITE) *Trip Generation Manual*[4]. The related projects' respective traffic generation for the weekday AM and PM peak hours, as well as on a daily basis for a typical weekday, is summarized in *Table 6-1*. The distribution of the related projects traffic volumes to the study intersections during the weekday AM and PM peak hours are displayed in ***Figures 6-2*** and ***6-3***, respectively.

[4] Institute of Transportation Engineers *Trip Generation Manual*, 10th Edition, Washington, D.C., 2017.

Table 6-1
RELATED PROJECTS LIST AND TRIP GENERATION [1]

MAP NO.	PROJECT STATUS	PROJECT NAME/NUMBER ADDRESS/LOCATION	LAND USE DATA		PROJECT DATA SOURCE	DAILY TRIP ENDS [2] VOLUMES	AM PEAK HOUR VOLUMES [2]			PM PEAK HOUR VOLUMES [2]		
			LAND-USE	SIZE			IN	OUT	TOTAL	IN	OUT	TOTAL
City of Gardena												
G1	Proposed	1932 W. 145th Street	Multifamily Housing (Low-Rise)	3 DU	[3]	22	0	1	1	1	1	2
G2	Proposed	13919 Normandie Avenue	Multifamily Housing (Low-Rise)	20 DU	[3]	146	2	7	9	7	4	11
G3	Under Construction	15106 S. Western Avenue	Retail	5,895 GLSF	[4]	223	4	2	6	11	11	22
			Less Existing Automotive Repair	(5,895) GLSF	[5]	(180)	(9)	(4)	(13)	(9)	(9)	(18)
G4	Proposed	1715 W. 149th Street	Townhomes	5 DU	[3]	37	0	2	2	2	1	3
G5	Under Construction	14321 Van Ness Avenue	Townhomes	35 DU	[3]	256	4	12	16	13	7	20
			Retail	1,835 GLSF	[4]	69	1	1	2	3	4	7
G6	Proposed	1528 W. 134th Street	Light Industrial	62,960 GSF	[6]	312	39	5	44	5	35	40
G7	Proposed	1335 W. 141st Street	Townhomes	50 DU	[3]	366	5	18	23	18	10	28
G8	Proposed	2415 Marine Avenue	Townhomes	64 DU	[3]	468	7	22	29	23	13	36
			Retail	1,072 GLSF	[4]	40	1	0	1	2	2	4
City of Hawthorne												
H1	Built Occupied	14135 Cerise Avenue	Apartments Affordable Housing	127 DU	[3]	930	13	45	58	45	26	71
H2	Built Occupied	14105 Chadron Avenue	Apartment	109 DU	[3]	798	12	38	50	38	23	61
H3	Under Construction	14128 Kornblum Avenue	Apartments	100 DU	[3]	732	11	35	46	35	21	56
TOTAL						4,219	90	184	274	194	149	343

[1] Source: City of Gardena Community Development Department and City of Hawthorne Department of Planning. The peak hour traffic volumes were based on forecast trip rates as provided in the ITE Trip Generation Manual, 10th Edition, 2017.
[2] Trips are one-way traffic movements, entering or leaving.
[3] ITE Land Use Code 220 (Multifamily Housing Low-Rise) trip generation average rates.
[4] ITE Land Use Code 820 (Shopping Center) trip generation average rates.
[5] ITE Land Use Code 942 (Automobile Care Center) trip generation average rates.
[6] ITE Land Use Code 110 (Light Industrial) trip generation average rates.



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MAP SOURCE: RAND MCNALLY & COMPANY

PROJECT SITE

(G) CITY OF GARDENA RELATED PROJECT

(H) CITY OF HAWTHORNE RELATED PROJECT

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FIGURE 6-1
LOCATION OF RELATED PROJECTS

ROSECRANS PLACE MIXED-USE PROJECT

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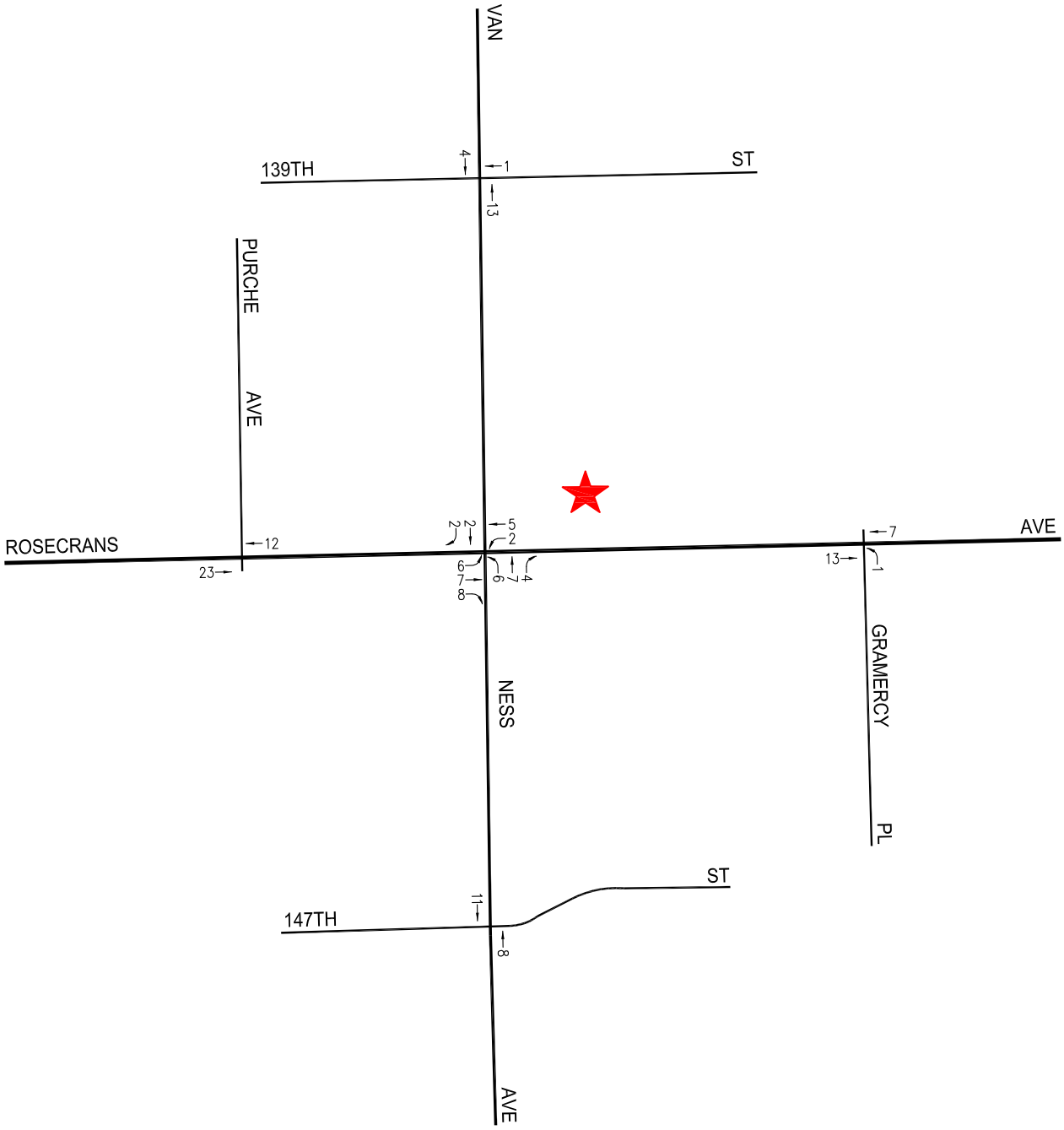

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PROJECT SITE

FIGURE 6-2

RELATED PROJECTS TRAFFIC VOLUMES

WEEKDAY AM PEAK HOUR

ROSECRANS PLACE MIXED-USE PROJECT

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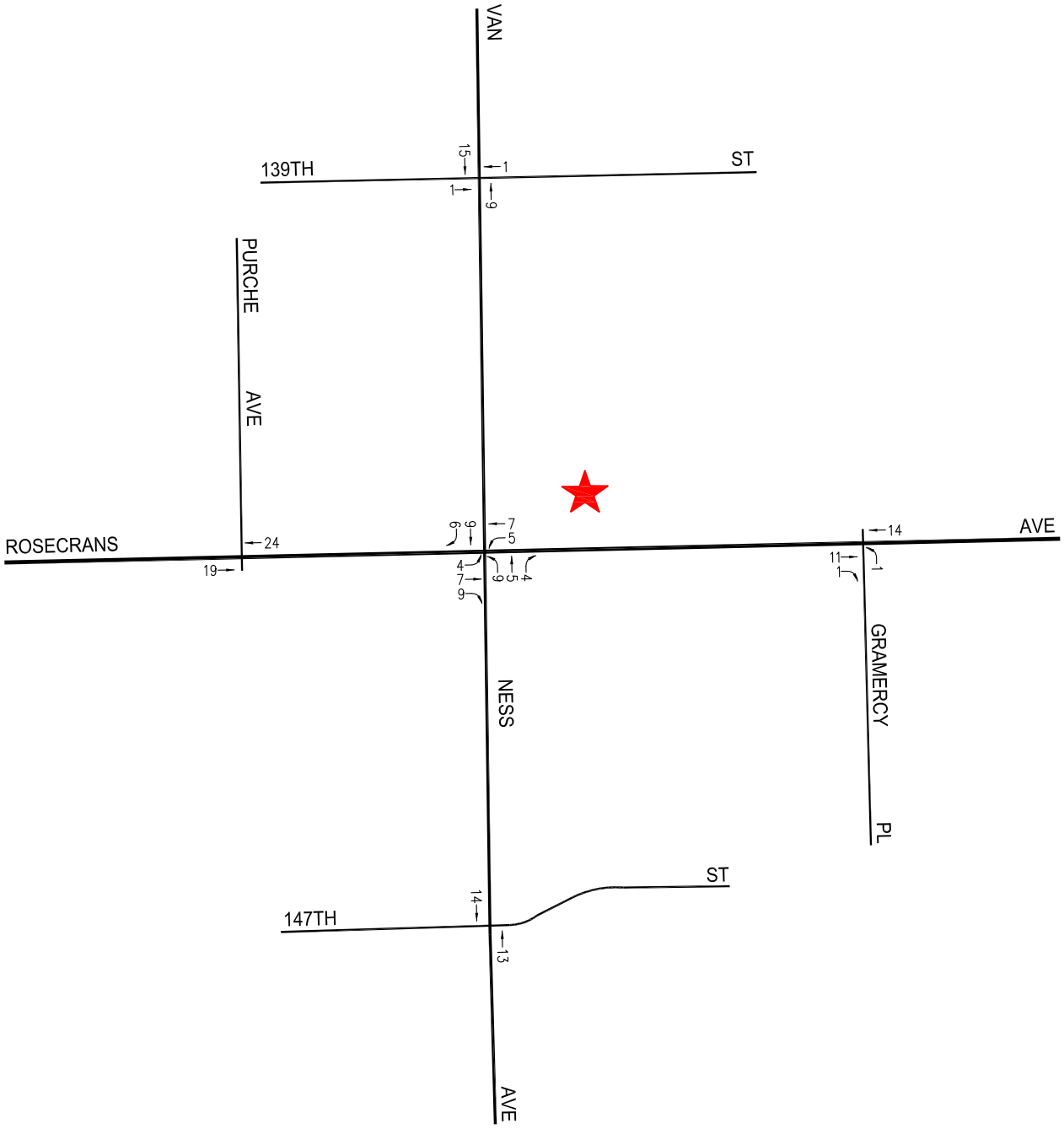

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PROJECT SITE

FIGURE 6-3

RELATED PROJECTS TRAFFIC VOLUMES

WEEKDAY PM PEAK HOUR

ROSECRANS PLACE MIXED-USE PROJECT

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6.2 Ambient Traffic Growth

In order to account for area-wide regional growth not included in this analysis, the existing traffic volumes were increased at an annual rate of one percent (1.0%) to the year 2022 (i.e., the anticipated year of project build-out). The ambient growth factor was based on general traffic growth factors provided in the *2010 Congestion Management Program for Los Angeles County* (the "CMP manual"). It is noted that based on review of the general traffic growth factors provided in the CMP manual for the project study area (i.e., RSA 18), it is anticipated that the existing traffic volumes are expected to increase at an annual rate of less than 1.0% per year between the years 2015 and 2025. Thus, application of the 1.0% annual growth factor allows for a conservative forecast of future traffic volumes in the area that likely overstates future traffic volumes. Further, it is noted that the CMP manual's traffic growth rate is intended to anticipate future traffic generated by development projects in the project vicinity. Thus, the inclusion in this traffic analysis of both a forecast of traffic generated by known related projects plus the use of an ambient traffic growth factor based on CMP traffic model data results in a conservative estimate of future traffic volumes at the study intersections.

7.0 TRAFFIC FORECASTING METHODOLOGY

In order to estimate the traffic impact characteristics of the proposed Rosecrans Place Mixed-Use project, a multi-step process has been utilized. The first step is trip generation, which estimates the total arriving and departing traffic volumes on a peak hour and daily basis. The traffic generation potential is forecast by applying the appropriate vehicle trip generation equations or rates to the project development tabulation.

The second step of the forecasting process is trip distribution, which identifies the origins and destinations of inbound and outbound project traffic volumes. These origins and destinations are typically based on demographics and existing/anticipated travel patterns in the study area.

The third step is traffic assignment, which involves the allocation of project traffic to study area streets and intersections. Traffic assignment is typically based on minimization of travel time, which may or may not involve the shortest route, depending on prevailing operating conditions and travel speeds. Traffic distribution patterns are indicated by general percentage orientation, while traffic assignment allocates specific volume forecasts to individual roadway links and intersection turning movements throughout the study area.

With the forecasting process complete and project traffic assignments developed, the impact of the proposed project is isolated by comparing operational (i.e., Level of Service) conditions at the selected key intersections using existing and expected future traffic volumes without and with forecast project traffic. The need for site-specific and/or cumulative local area traffic improvements can then be evaluated and the significance of the project's impacts identified.

7.1 Proposed Project Trip Generation

Traffic generation is expressed in vehicle trip ends, defined as one-way vehicular movements, either entering or exiting the generating land use. Traffic volumes expected to be generated by the proposed project were forecast for the weekday AM and PM peak hours, as well as over a 24-hour period for a typical weekday. Trip generation rates provided in the ITE *Trip Generation Manual*, 10th Edition for Land Use Code 210 (Single-Family Detached Housing), 221 (Multifamily Housing [Mid-Rise]), and 820 (Shopping Center) were utilized to forecast project traffic generation for the proposed project components. In addition, ITE Land Use Code 710 (General Office Building) trip generation rates were utilized to forecast project traffic generation for the workspace component of the live-work dwelling units. Traffic volumes expected to be generated by the proposed project components were based upon rates per number of residential units and rates per 1,000 square feet of floor area, as applicable.

In addition to the above project trip generation forecasts, a forecast was made of likely internal capture trips that could be anticipated at the site for the proposed uses. Internal capture trips are those trips made internal to the site between land uses in a mixed-use development. When combined within a mixed-use development, land uses tend to interact, and thus attract a portion of each other's trip generation (i.e., between the proposed project's residential and commercial components to

account for the synergistic effects of the proposed land use mix at the site). The internal capture trips were determined based on the *National Cooperative Highway Research Program (NCHRP) Report 684: Enhancing Internal Trip Capture Estimation for Mixed-Use Developments* publication. The detailed internal capture trip calculations are included in ***Appendix C***.

The weekday trip generation rates and forecast of the vehicular trips anticipated to be generated by the proposed project are presented in ***Table 7-1.*** As presented in *Table 7-1*, the proposed project is expected to generate 62 vehicle trips (20 inbound trips and 42 outbound trips) during the weekday AM peak hour. During the weekday PM peak hour, the proposed project is expected to generate 82 vehicle trips (48 inbound trips and 34 outbound trips). Over a 24-hour period, the proposed project is forecast to generate 916 daily trip ends during a typical weekday (approximately 458 inbound trips and 458 outbound trips).

7.2 Existing Use Trip Generation

Trip generation forecasts for the existing land uses were developed by conducting weekday AM and PM peak period traffic count data at the existing site driveway on Rosecrans Avenue. Manual traffic counts were conducted at the existing site driveway in order to document the traffic generated by the land uses currently occupying the site. Traffic counts were conducted during the weekday morning (7:00 to 10:00 AM) and afternoon (4:00 to 7:00 PM) peak periods. The counts were conducted by an independent traffic count subconsultant (The Traffic Solution) in May 2019. Summary data worksheets of the driveway traffic counts are provided in ***Appendix B***. As summarized in *Appendix B*, the existing uses generate 31 weekday AM peak hour trips (23 inbound trips and 8 outbound trips) and 27 weekday PM peak hour trips (6 inbound trips and 21 outbound trips).

7.3 Project Trip Generation Summary

The forecast of the net new vehicular trips anticipated to be generated by the proposed project are also presented in *Table 7-1*. As summarized in *Table 7-1*, the proposed project is expected to generate a net increase of 31 vehicle trips (3 fewer inbound trips and 34 more outbound trips) during the weekday AM peak hour. During the weekday PM peak hour, the proposed project is expected to generate a net increase of 55 vehicle trips (42 more inbound trips and 13 more outbound trips). Over a 24-hour period during a typical weekday, the proposed project is forecast to result in a net increase of 646 vehicle trips (323 inbound trips and 323 outbound trips).

7.4 Project Trip Distribution and Assignment

Project traffic volumes both entering and exiting the site have been distributed and assigned to the adjacent street system based on the following considerations:

- The site's proximity to major traffic corridors (i.e., Rosecrans Avenue, Van Ness Avenue, etc.);

- Expected localized traffic flow patterns based on adjacent roadway channelization and presence of traffic signals;

Table 7-1
PROJECT TRIP GENERATION FORECAST

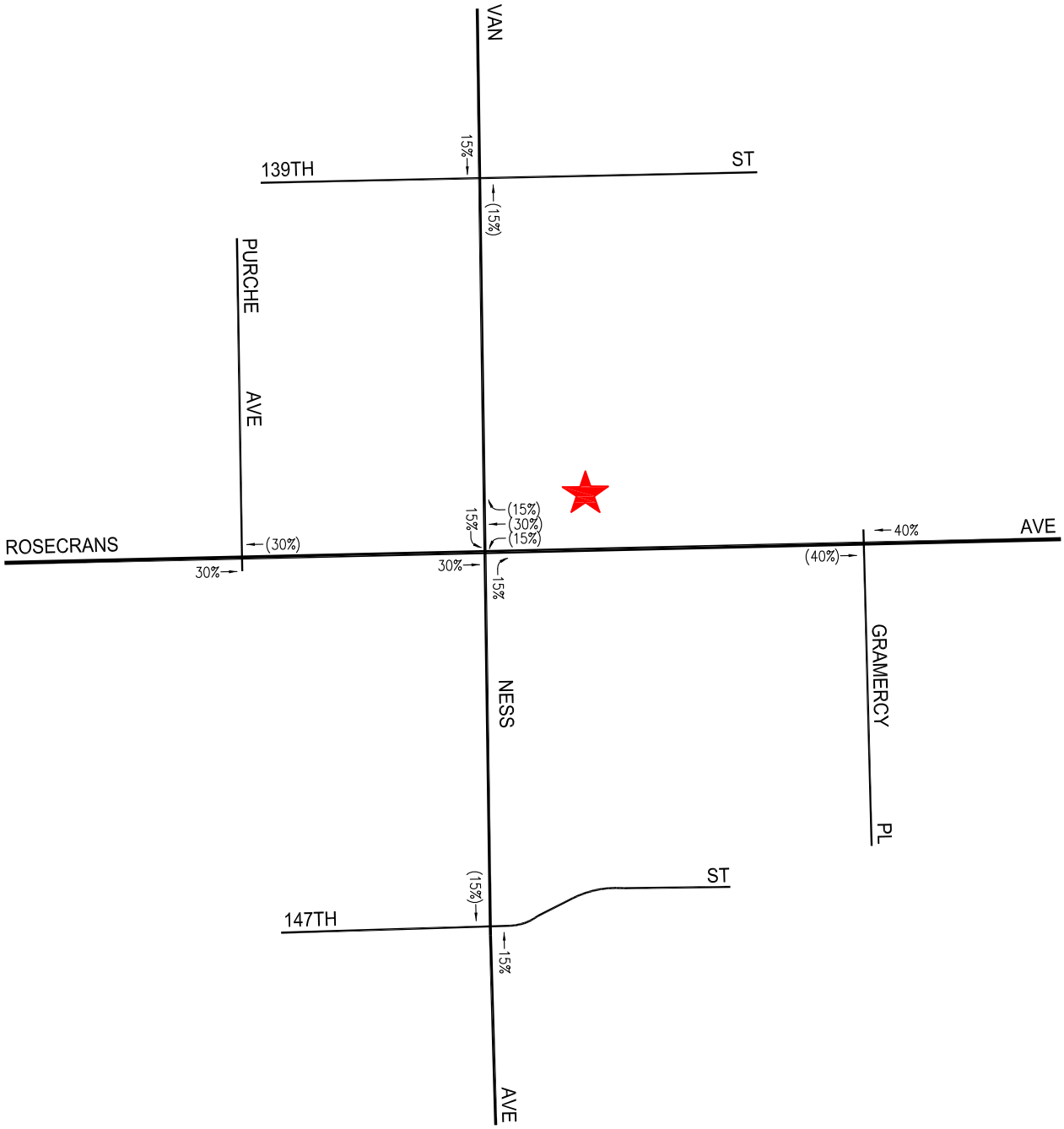
TRIP GENERATION RATES [1]									
	ITE LAND USE		WEEKDAY	WEEKDAY AM PEAK HOUR			WEEKDAY PM PEAK HOUR		
ITE LAND USE CATEGORY	CODE	VARIABLE	DAILY	IN (%)	OUT (%)	TOTAL	IN (%)	OUT (%)	TOTAL
Single-Family Detached Housing	210	Per Dwelling Unit	9.44	25%	75%	0.74	63%	37%	0.99
Multifamily Housing (Mid-Rise)	221	Per Dwelling Unit	5.44	26%	74%	0.36	61%	39%	0.44
General Office Building	710	Per 1,000 SF	9.74	86%	14%	1.16	16%	84%	1.15
Shopping Center	820	Per 1,000 SF	37.75	62%	38%	0.94	48%	52%	3.81

PROJECT TRIP GENERATION FORECAST									
	ITE LAND USE		DAILY TRIP ENDS [2]	AM PEAK HOUR VOLUMES [2]			PM PEAK HOUR VOLUMES [2]		
LAND USE	CODE	SIZE	VOLUMES	IN	OUT	TOTAL	IN	OUT	TOTAL
Proposed Project									
Multi-Family Housing	221	50 DU	272	5	13	18	13	9	22
Single-Family Housing	210	41 DU	388	8	22	30	26	15	41
Live-Work (Living Units)	221	14 DU	76	1	4	5	4	2	6
Live-Work (Work Space)	710	3,626 GSF	36	3	1	4	1	3	4
Retail	820	5,080 GSF	192	3	2	5	9	10	19
Internal Capture [3]			(48)	0	0	0	(5)	(5)	(10)
Subtotal Proposed Project			***916***	***20***	***42***	***62***	***48***	***34***	***82***
Existing Uses to be Removed [4]		(42,400) GSF	(270)	(23)	(8)	(31)	(6)	(21)	(27)
NET NEW PROJECT TRIPS			***646***	***(3)***	***34***	***31***	***42***	***13***	***55***

[1] Source: ITE "Trip Generation Manual", 10th Edition, 2017.
[2] Trips are one-way traffic movements, entering or leaving.
[3] Source: ITE "Trip Generation Handbook", 3rd Edition, 2017 and the National Cooperative Highway Research Program (NCHRP) Report 684 - "Enhanced Internal Trip Capture Estimation for Mixed-Use Developments", 2011. Internal capture trips are trips made to and from other components of the project (e.g., between the residential, live-work, and retail components). Refer to Appendix C for the NCHRP worksheets used to estimate the actual external vehicle trips during the AM and PM peak hours. For the purposes of this assessment, a credit of 5 percent (5%) of the total daily trips has been applied to account for internal capture over a 24-hour period.
[4] The AM and PM peak hour trips are based on driveway counts conducted at the site in May 2019 by The Traffic Solution. The PM peak hour of trip generation is assumed to represent 10 percent (10%) of daily trips.

- Existing intersection traffic volumes;
- Ingress/egress scheme planned for the proposed project; and
- Nearby population and employment centers.

The project traffic volume distribution percentages during weekday AM and PM peak hours at the study intersections are illustrated in ***Figure 7-1***. The forecast net new project traffic volumes at the study intersections for the weekday AM and PM peak hours are displayed in ***Figures 7-2*** and ***7-3***, respectively. The net new traffic volume assignments presented in *Figures 7-2* and *7-3* reflect the traffic distribution characteristics shown in *Figure 7-1* and the project traffic generation forecasts presented in *Table 7-1*.



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XX = INBOUND PERCENTAGE

(XX) = OUTBOUND PERCENTAGE

FIGURE 7-1
PROJECT TRIP DISTRIBUTION

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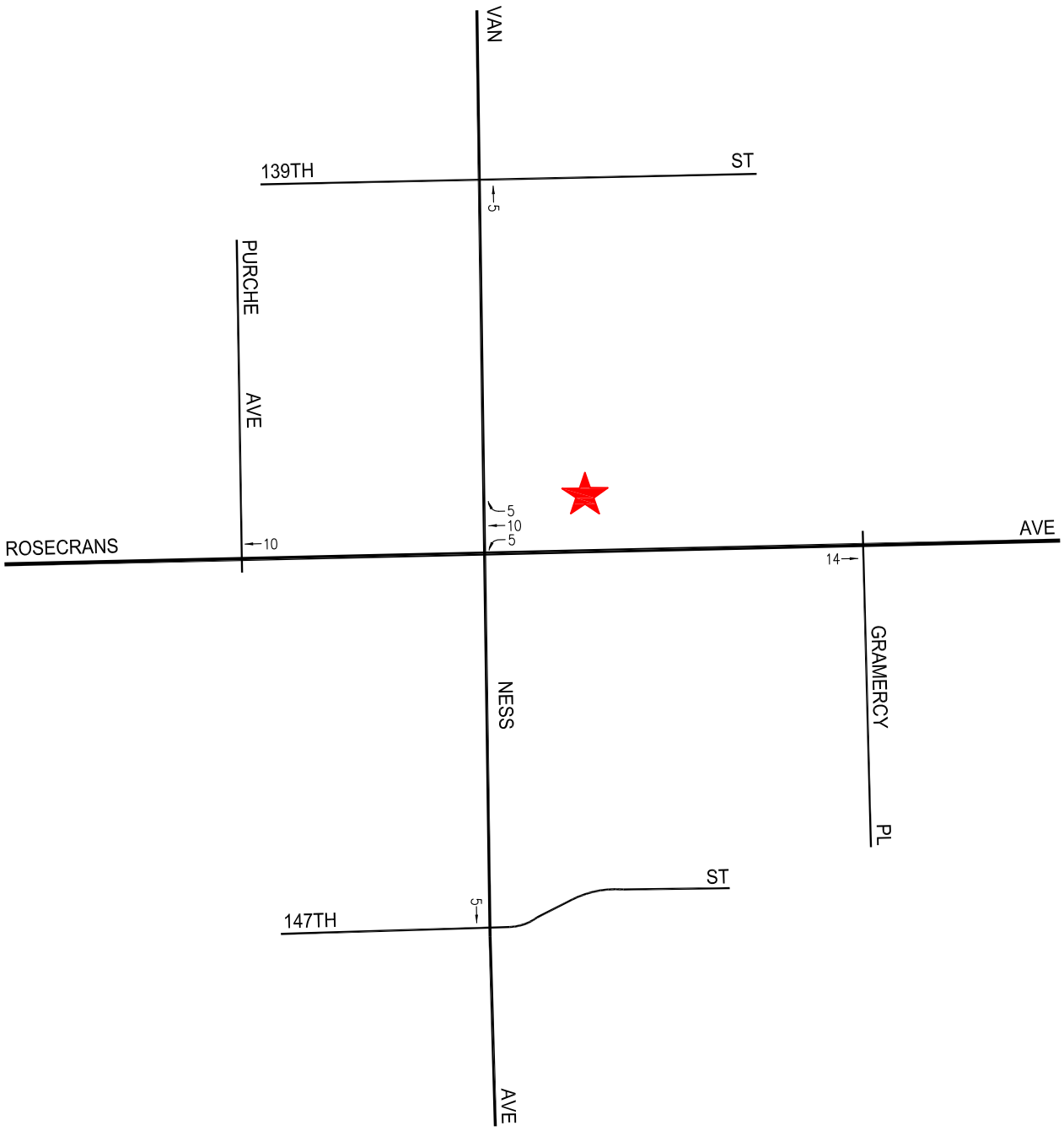

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FIGURE 7-2
NET NEW PROJECT TRAFFIC VOLUMES
WEEKDAY AM PEAK HOUR
ROSECRANS PLACE MIXED-USE PROJECT

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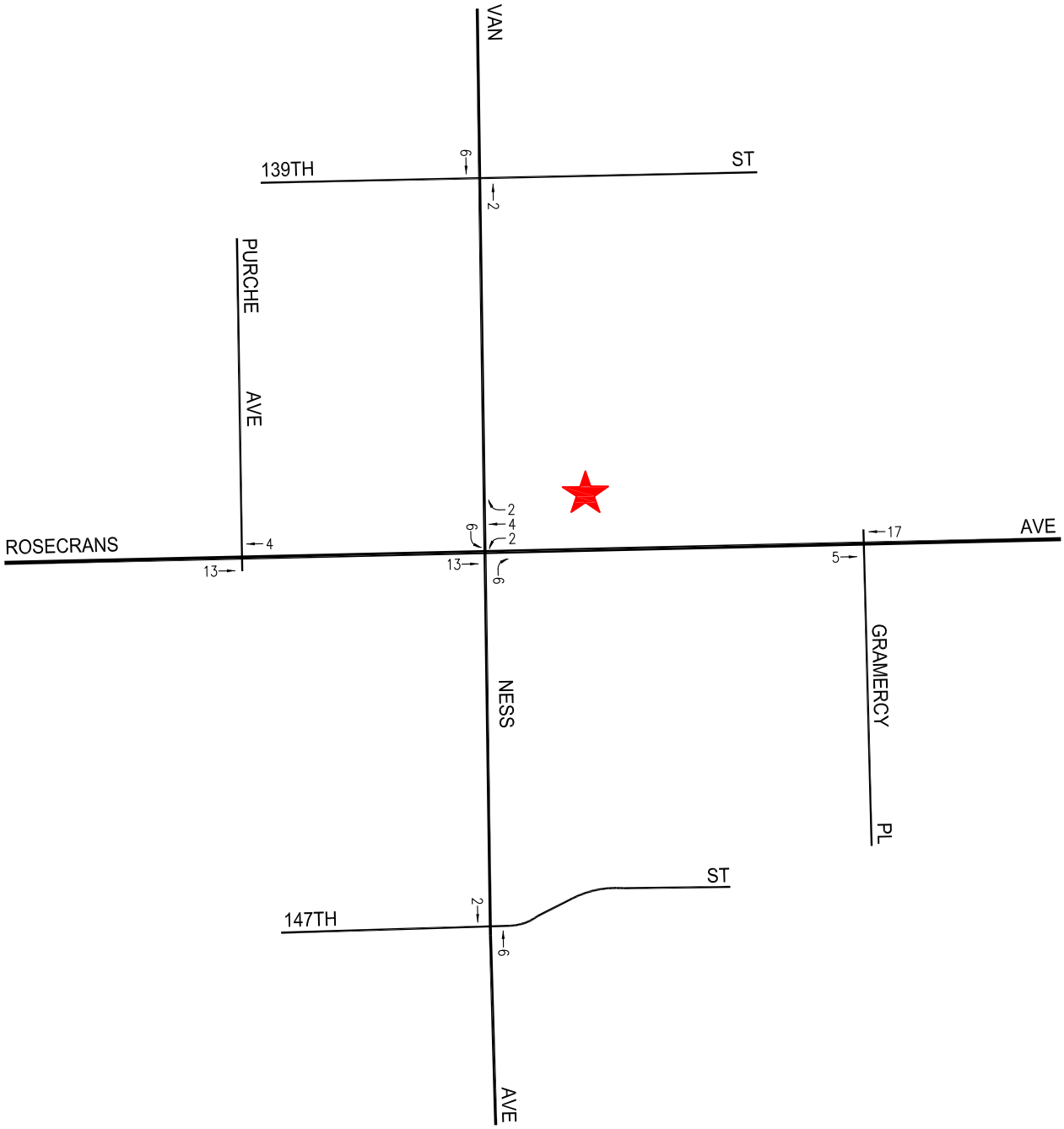

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FIGURE 7-3

NET NEW PROJECT TRAFFIC VOLUMES

WEEKDAY PM PEAK HOUR

ROSECRANS PLACE MIXED-USE PROJECT

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8.0 TRANSPORTATION IMPACT ANALYSIS METHODOLOGY

8.1 Intersection Analysis Methodology

The five study intersections were evaluated using the Intersection Capacity Utilization (ICU) method of analysis which determines Volume-to-Capacity (*v/c*) ratios on a critical lane basis. The overall intersection *v/c* ratio is subsequently assigned a Level of Service (LOS) value to describe intersection operations. Level of Service varies from LOS A (free flow condition) to LOS F (jammed condition). A description of the ICU method and corresponding Level of Service is provided in ***Appendix D***.

8.2 Intersection Impact Criteria and Thresholds

While the City of Gardena has established performance criteria for evaluating the circulation system (refer to Table CI-2 of the Community Development Element Circulation Plan), there is no established impact criteria for study intersections. Accordingly, consistent with other approved transportation impact analyses in Gardena, the significance of the potential project-generated traffic impacts was identified using the traffic impact analysis guidelines set forth in the LACDPW *Traffic Impact Analysis Report Guidelines*. According to the County's published guidelines, the impact is considered significant if the project-related increase in the *v/c* ratio equals or exceeds the threshold criteria presented in ***Table 8-1***.

Table 8-1
COUNTY OF LOS ANGELES
INTERSECTION IMPACT THRESHOLD CRITERIA

Pre-Project *v/c*	**Level of Service**	**Project Related Increase in *v/c***
0.71 to 0.80	C	equal to or greater than 0.04
0.81 to 0.90	D	equal to or greater than 0.02
0.91 or more	E / F	equal to or greater than 0.01

According to the City of Gardena performance criteria and County of Los Angeles requirements, the ICU calculations utilize a lane capacity of 1,600 vehicles per hour (vph) per lane for left-turn, through, and right-turn lanes, and 2,880 vph for dual left-turn lanes. Additionally, a clearance factor of 0.10 is included in the ICU calculations. The Sliding Scale Method requires mitigation of project transportation impacts whenever traffic generated by the proposed development causes an increase in the analyzed intersection *v/c* ratio by an amount equal to or greater than the values shown above.

The relative impact of the added (i.e., net new) project traffic volumes anticipated to be generated by the proposed Rosecrans Place Mixed-Use project during the weekday AM and PM peak hours was evaluated based on analysis of existing and future operating conditions at the study intersections, without and with the proposed project. The previously discussed capacity analysis procedures were utilized to evaluate the future *v/c* relationships and service level characteristics at each study intersection.

8.3 Intersection Transportation Impact Analysis Scenarios

Transportation impacts at the study intersections were analyzed for the following conditions:

[a] Existing conditions.

[b] Existing with project conditions.

[c] Condition [b] with implementation of project mitigation measures, where necessary.

[d] Condition (a) plus one percent (1.0%) annual ambient traffic growth through year 2022 and with completion and occupancy of the related projects (i.e., future without project conditions).

[e] Condition [d] with completion and occupancy of the proposed project.

[f] Condition [e] with implementation of project mitigation measures, where necessary.

The net new project traffic volumes were added for each new condition volumes (i.e., existing condition and future without project conditions) to determine the change in capacity utilization at the study intersections.

9.0 TRANSPORTATION IMPACT ANALYSIS

The transportation impact analysis prepared for the study intersections using the ICU methodology and application of the City of Gardena significant traffic impact criteria is summarized in ***Table 9–1***. The ICU data worksheets for the analyzed intersections are contained in *Appendix D*.

9.1 Existing Conditions

9.1.1 *Existing Conditions*

As indicated in column [1] of *Table 9–1*, all five study intersections are presently operating at LOS C or better during the weekday AM and PM peak hours under existing conditions. As previously mentioned, the existing traffic volumes at the study intersections during the weekday AM and PM peak hours are displayed in *Figures 5–1* and *5–2*, respectively.

9.1.2 *Existing With Project Conditions*

As shown in column [2] of *Table 9–1,* application of the study intersection threshold criteria (refer to *Table 8-1*) to the "Existing With Project" scenario indicates that the proposed project is not expected to create significant impacts at any of the study intersections. Incremental, but not significant, impacts are noted at the study intersections. Because there are no significant impacts, no traffic mitigation measures are required or recommended for the study intersections under the "Existing With Project" conditions. The existing with project traffic volumes at the study intersections during the weekday AM and PM peak hours are illustrated in ***Figures 9–1*** and ***9–2***, respectively.

9.2 Future Conditions

9.2.1 *Future Without Project Conditions*

The future cumulative baseline conditions were forecast based on the addition of traffic generated by the completion and occupancy of related projects, as well as the growth in traffic due to the combined effects of continuing development, intensification of existing developments and other factors (i.e., ambient growth). The *v/c* ratios at all of the study intersections are incrementally increased with the addition of ambient traffic and traffic generated by the related projects listed in *Table 6–1*. As presented in column [3] of *Table 9–1*, all five study intersections are expected to continue operating at LOS C or better during the weekday AM and PM peak hours with the addition of growth in ambient traffic and related projects traffic under the future without project conditions. The future without project (existing, ambient growth and related projects) traffic volumes at the study intersections during the weekday AM and PM peak hours are presented in ***Figures 9–3*** and ***9–4***, respectively.

9.2.2 *Future With Project Conditions*

As shown in column [4] of *Table 9–1,* application of the study intersection threshold criteria (refer to *Table 8-1*) to the "Future With Proposed Project" scenario indicates that the proposed project is not expected to create significant impacts at any of the study intersections. Incremental, but not significant, impacts are noted at the study intersections. Because there are no significant impacts, no

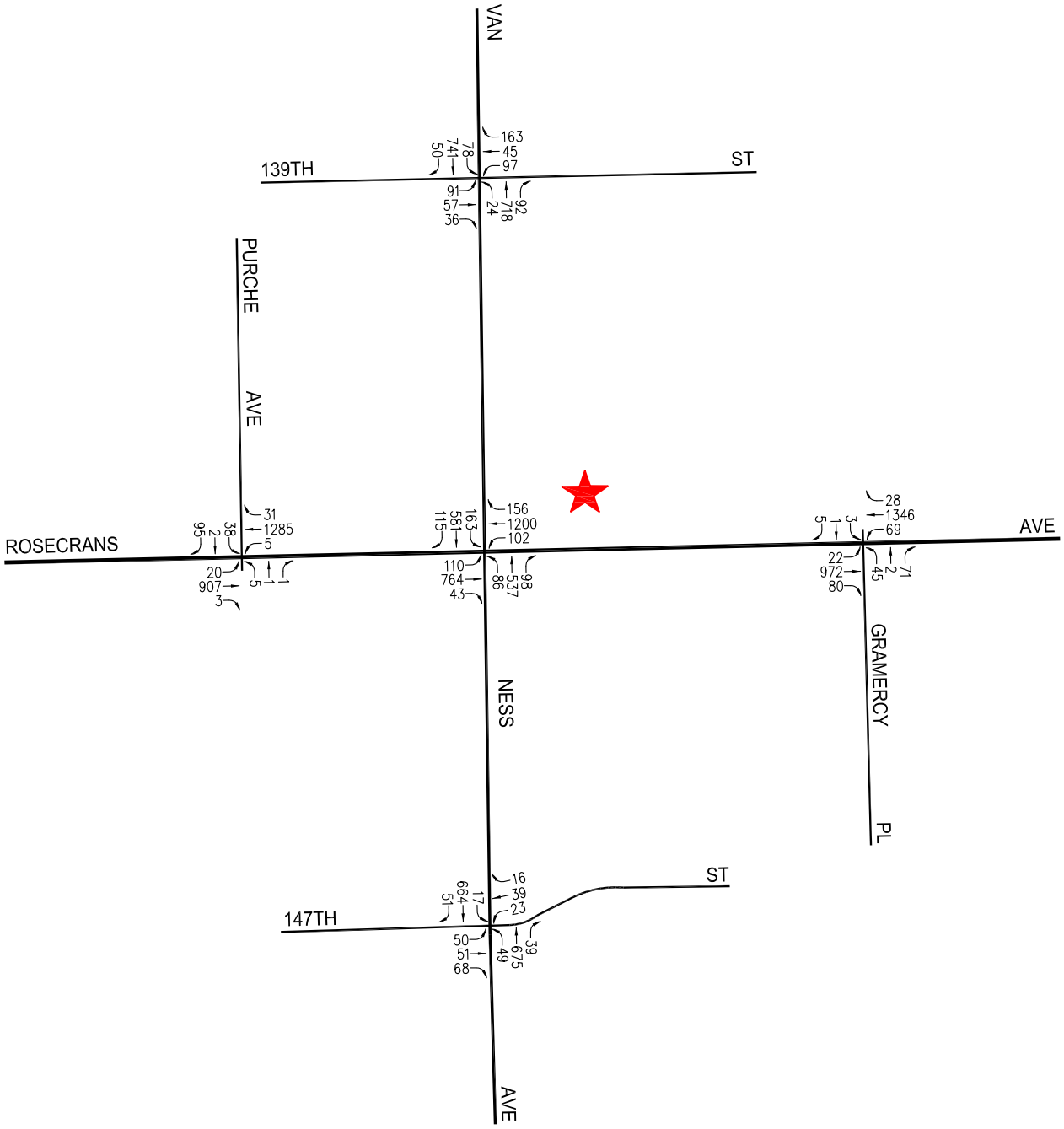
Table 9-1
SUMMARY OF VOLUME TO CAPACITY RATIOS
AND LEVELS OF SERVICE
WEEKDAY AM AND PM PEAK HOURS

NO.	INTERSECTION	PEAK HOUR	[1] YEAR 2019 EXISTING V/C or DELAY	[1] LOS [a]	[2] YEAR 2019 EXISTING W/ PROJECT V/C or Delay	[2] LOS [a]	[2] CHANGE V/C or DELAY [(2)-(1)]	[2] SIGNIF. IMPACT [b]	[3] YEAR 2022 FUTURE PRE-PROJECT V/C or DELAY	[3] LOS [a]	[4] YEAR 2022 FUTURE W/ PROJECT V/C or DELAY	[4] LOS [a]	[4] CHANGE V/C or DELAY [(4)-(3)]	[4] SIGNIF. IMPACT [b]
1	Purche Avenue/	AM	0.450	A	0.452	A	0.002	No	0.463	A	0.465	A	0.002	No
	Rosecrans Avenue	PM	0.468	A	0.470	A	0.003	No	0.483	A	0.486	A	0.003	No
2	Van Ness Avenue/	AM	0.587	A	0.589	A	0.002	No	0.607	B	0.608	B	0.001	No
	139th Street	PM	0.573	A	0.573	A	0.000	No	0.591	A	0.591	A	0.000	No
3	Van Ness Avenue/	AM	0.748	C	0.752	C	0.004	No	0.776	C	0.779	C	0.003	No
	Rosecrans Avenue	PM	0.752	C	0.762	C	0.010	No	0.781	C	0.791	C	0.010	No
4	Van Ness Avenue/	AM	0.464	A	0.464	A	0.000	No	0.478	A	0.479	A	0.001	No
	147th Street-146th Place	PM	0.456	A	0.456	A	0.000	No	0.470	A	0.471	A	0.001	No
5	Gramercy Place/	AM	0.476	A	0.476	A	0.000	No	0.489	A	0.489	A	0.000	No
	Rosecrans Avenue	PM	0.526	A	0.528	A	0.002	No	0.543	A	0.544	A	0.001	No

[a] Level of Service (LOS) is based on the reported ICU value for signalized intersections.

[b] According to the County of Los Angeles Department of Public Works' *Traffic Impact Analysis Report Guidelines*, January 1, 1997, Page 6: an impact is considered significant if the project-related increase in the volume-to-capacity ratio (v/c) equals or exceeds the thresholds shown below:

Level of Service	Pre-Project V/C	Project-Related Increase in V/C
C	> 0.700 - 0.800	equal to or greater than 0.040
D	> 0.800 - 0.900	equal to or greater than 0.020
E/F	> 0.900	equal to or greater than 0.010



NOTE: PROJECT VOLUMES REFLECT NET NEW PROJECT VEHICLE TRIPS

N

NOT TO SCALE

★ PROJECT SITE

FIGURE 9-1

EXISTING WITH PROJECT TRAFFIC VOLUMES

WEEKDAY AM PEAK HOUR

ROSECRANS PLACE MIXED-USE PROJECT

LINSCOTT, LAW & GREENSPAN, engineers

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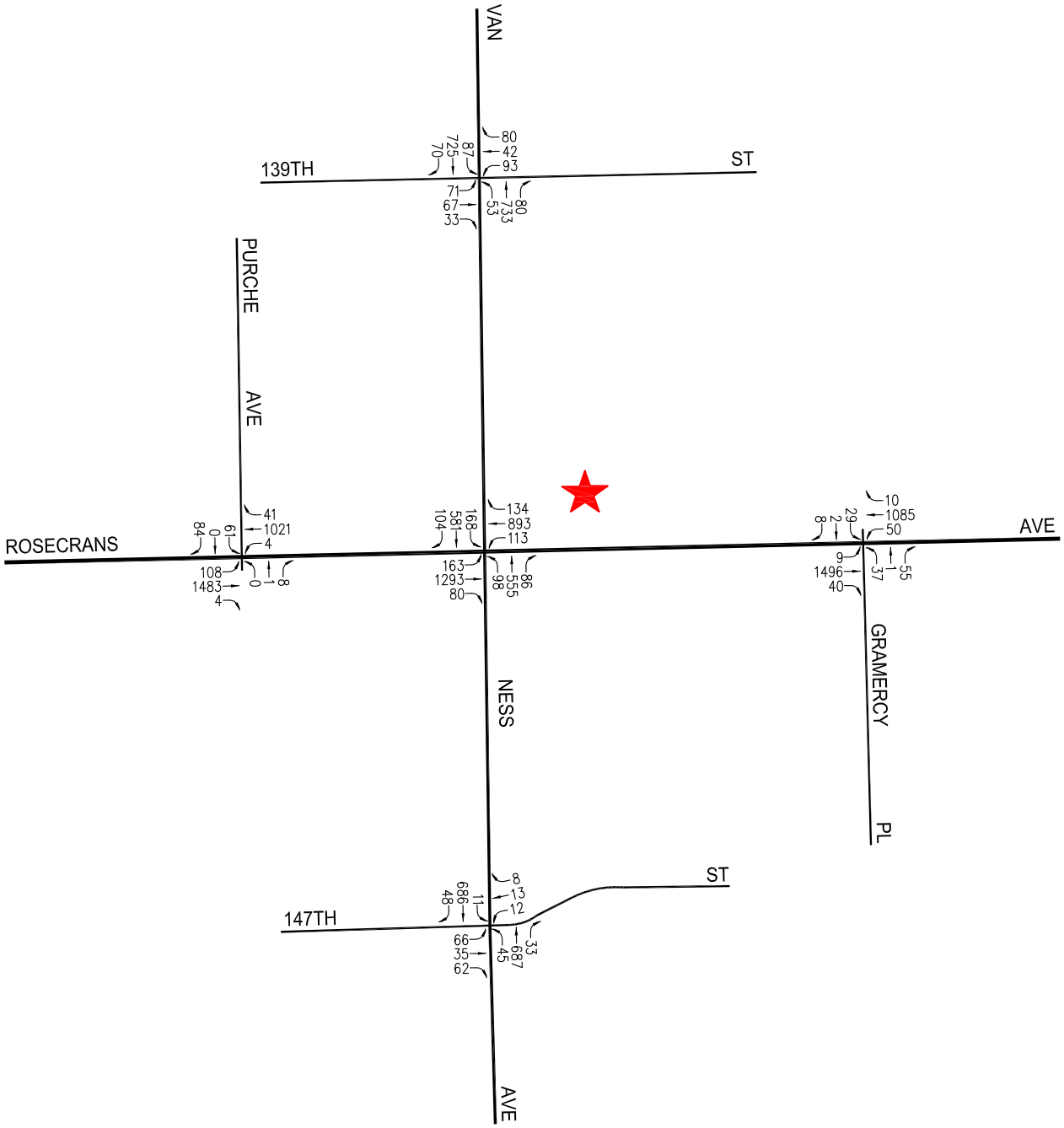

NOTE: PROJECT VOLUMES REFLECT NET NEW PROJECT VEHICLE TRIPS

N

NOT TO SCALE

PROJECT SITE

FIGURE 9-2

EXISTING WITH PROJECT TRAFFIC VOLUMES

WEEKDAY PM PEAK HOUR

LINSCOTT, LAW & GREENSPAN, engineers

ROSECRANS PLACE MIXED-USE PROJECT

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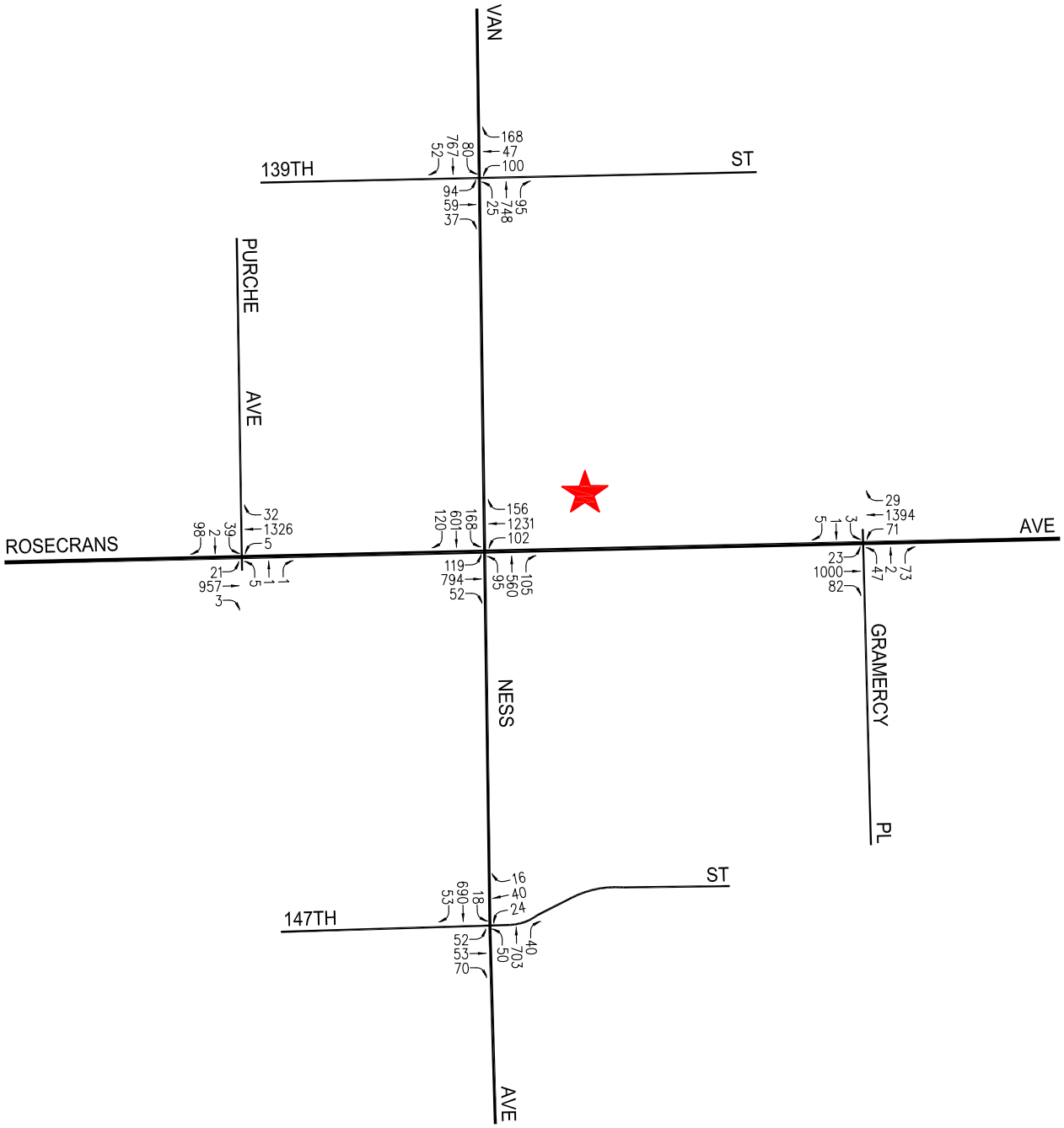

N

NOT TO SCALE

PROJECT SITE

FIGURE 9-3

FUTURE WITHOUT PROJECT TRAFFIC VOLUMES

WEEKDAY AM PEAK HOUR

LINSCOTT, LAW & GREENSPAN, engineers

ROSECRANS PLACE MIXED-USE PROJECT

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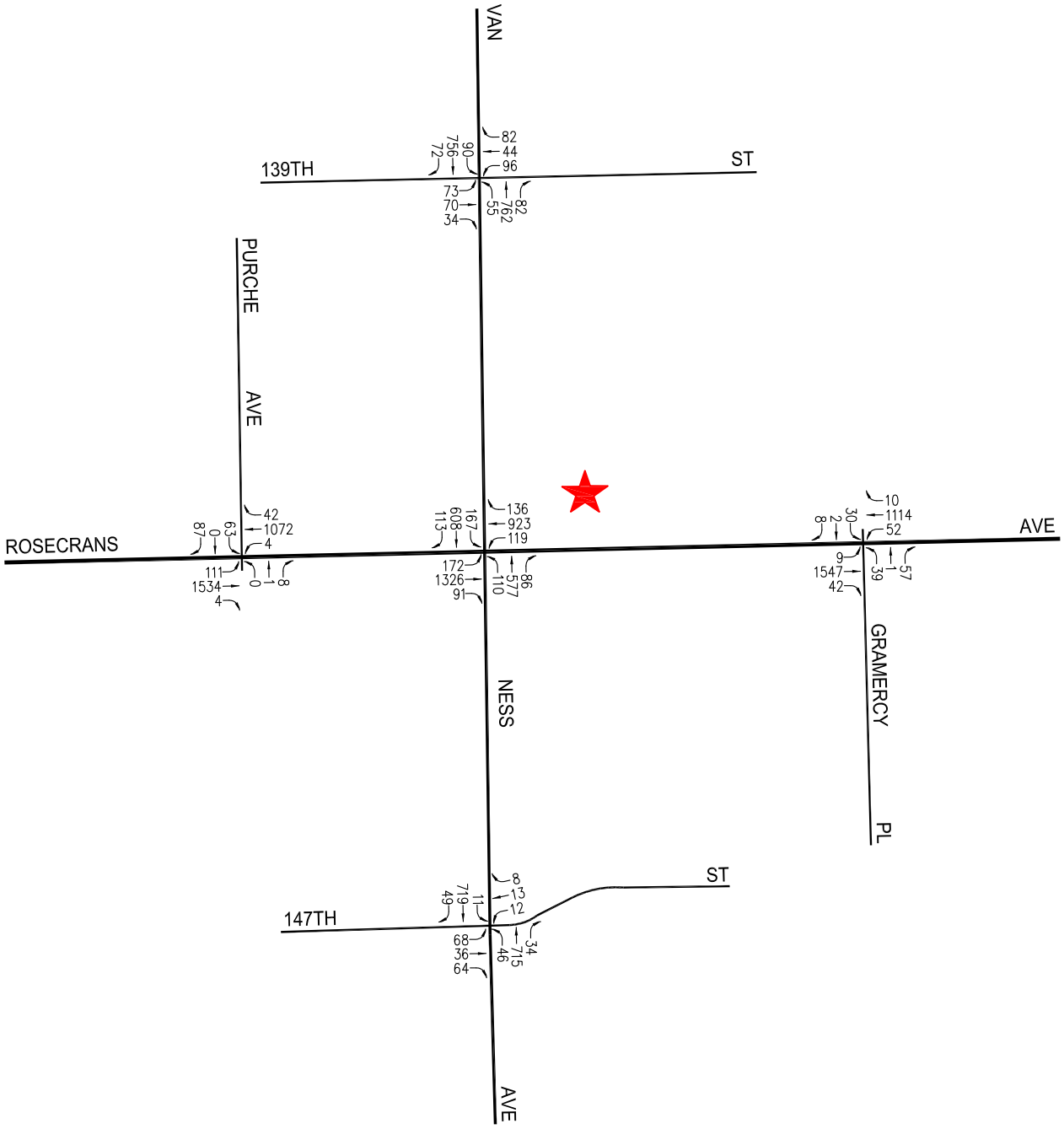

PROJECT SITE

NOT TO SCALE

FIGURE 9-4

FUTURE WITHOUT PROJECT TRAFFIC VOLUMES

WEEKDAY PM PEAK HOUR

LINSCOTT, LAW & GREENSPAN, engineers

ROSECRANS PLACE MIXED-USE PROJECT

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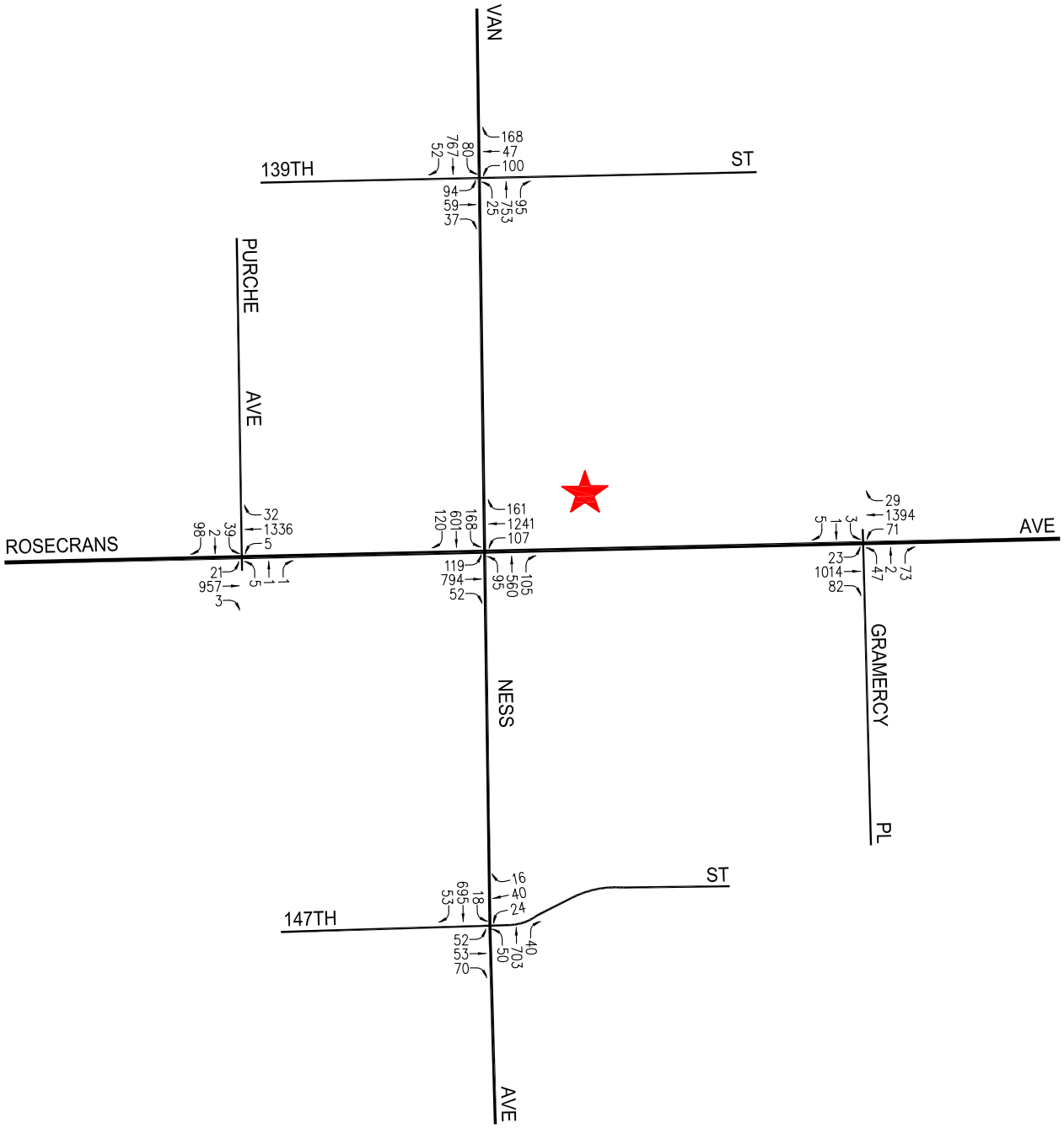
traffic mitigation measures are required or recommended for the study intersections. The future with project (existing, ambient growth, related projects and project) traffic volumes at the study intersections during the weekday AM and PM peak hours are illustrated in ***Figures 9–5*** and ***9–6***, respectively.



NOTE: PROJECT VOLUMES REFLECT NET NEW PROJECT VEHICLE TRIPS

NOT TO SCALE

PROJECT SITE

FIGURE 9-5

FUTURE WITH PROJECT TRAFFIC VOLUMES

WEEKDAY AM PEAK HOUR

ROSECRANS PLACE MIXED-USE PROJECT

LINSCOTT, LAW & GREENSPAN, engineers

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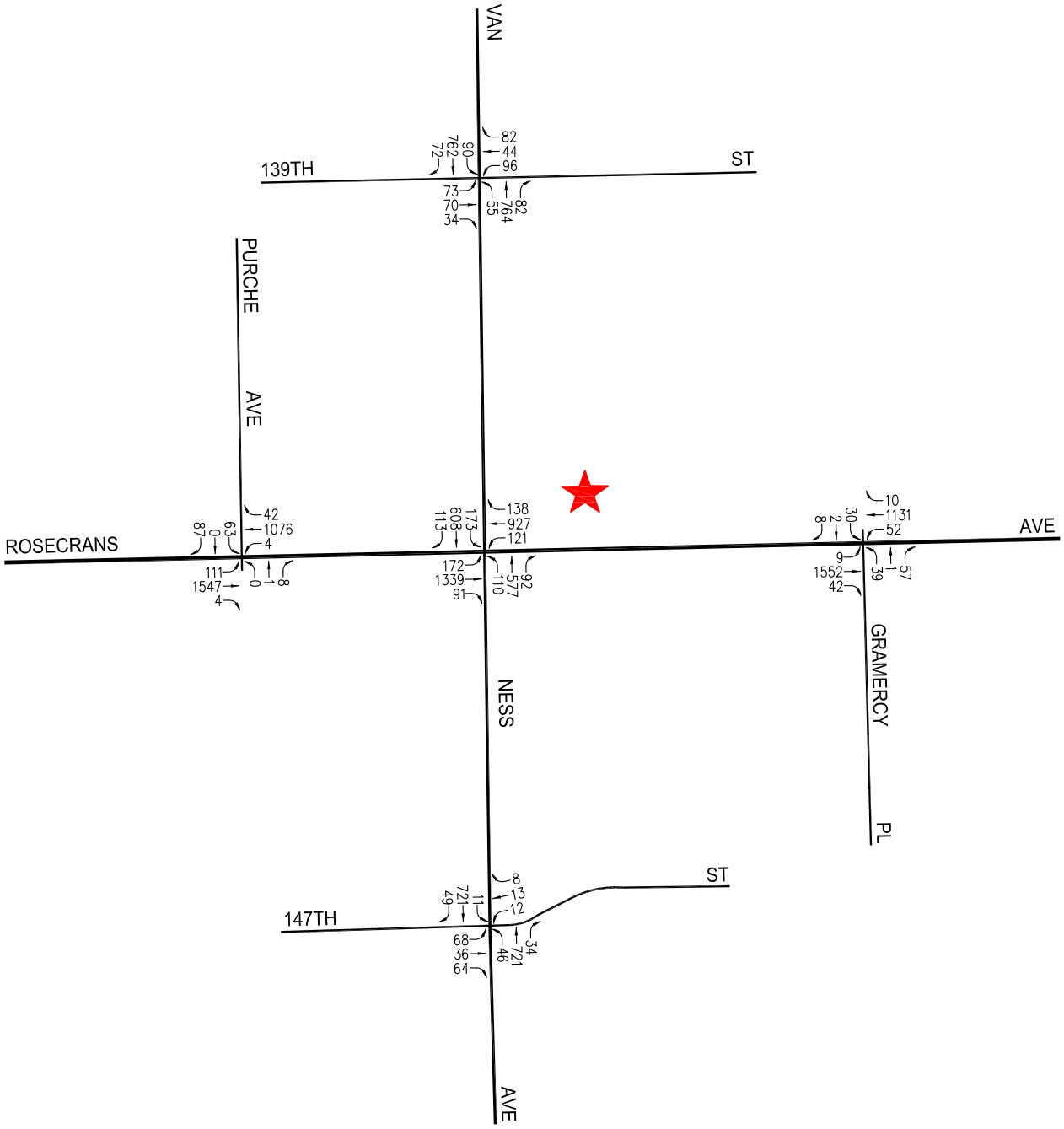

NOTE: PROJECT VOLUMES REFLECT NET NEW PROJECT VEHICLE TRIPS

N

NOT TO SCALE

PROJECT SITE

FIGURE 9-6

FUTURE WITH PROJECT TRAFFIC VOLUMES

WEEKDAY PM PEAK HOUR

ROSECRANS PLACE MIXED-USE PROJECT

LINSCOTT, LAW & GREENSPAN, engineers

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10.0 TRANSPORTATION IMPROVEMENT MEASURES

The transportation impact analysis has been based on a conservative approach with respect to the analysis of potential project-related impacts. As summarized in Subsections 9.1.2 (Existing With Project Conditions) and 9.2.2 (Future With Project Conditions) herein, application of the study intersection threshold criteria (refer to *Table 8-1*) to the with proposed project scenarios indicates that the proposed project is not expected to create significant impacts at the five study intersections. Incremental, but not significant, impacts are noted at the study intersections. Because there are no significant impacts, no formal transportation mitigation measures are required or recommended for the study intersections.

As described in Section 3.1, full vehicular access (i.e., left-turn and right-turn ingress/egress turning movements) is currently provided at the existing project site. In order to continue to accommodate full vehicular access for the proposed project and to maintain existing ingress/egress movements for those driveways located along the south side of Rosecrans Avenue, it is recommended that the existing raised median located on Rosecrans Avenue (directly in front of the project site) be removed and replaced with two-way left-turn lane striping. In addition, it is recommended that the existing eastbound left-turn pocket (which provides exclusive access to the existing project site) be removed as this driveway will be closed as part of the proposed project. The existing raised median in this area will be modified accordingly to accommodate the left-turn pocket removal. With the recommended Rosecrans Avenue median and striping modifications, full vehicular access will be provided in the immediate project vicinity for both project patrons/residents and nearby businesses. In addition, it is recommended that appropriate sight distances be provided at the proposed project site driveways in order to minimize potential pedestrian/vehicle conflicts along the adjacent public sidewalk. Any proposed landscaping near the project driveways should also be less than 36 inches in height so as to not obstruct the motorists' line of sight.

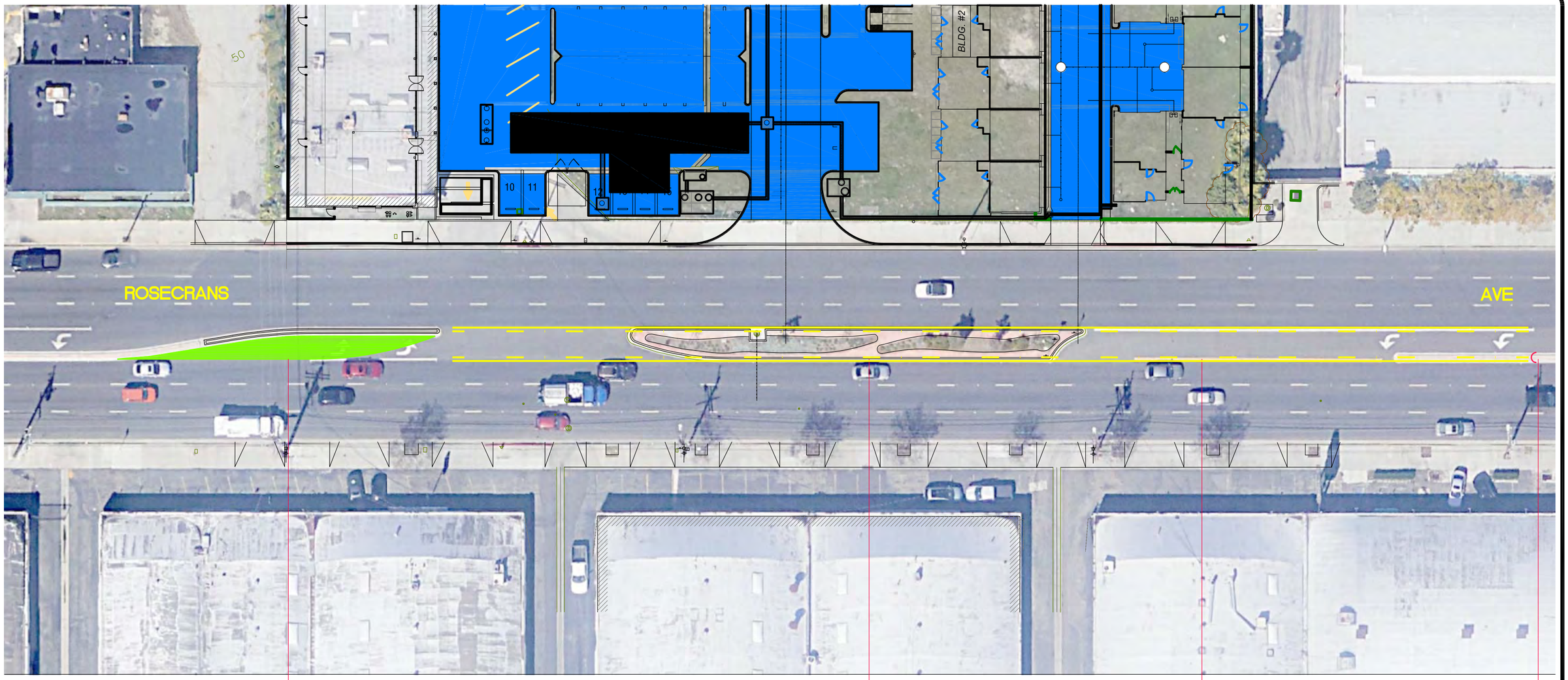
11.0 CONCLUSIONS

This transportation impact study has been prepared for the proposed Rosecrans Place Mixed-Use project located within the City of Gardena, California. A total of 105 residential dwelling units, comprising 50 attached townhome units, 41 detached single-family units, and 14 live-work units, will be constructed. In addition, a retail building totaling 5,080 square feet will also be developed as part of the proposed Rosecrans Place Mixed-Use project. Based on information provided by the project Architect, the proposed project is planned to satisfy the City of Gardena Code parking requirements by providing a total of 309 parking spaces (including 274 spaces for the residential/live-work component and 35 spaces for the retail component). Construction of the proposed project is expected to commence in year 2020 with build-out by the end of year 2021/beginning of year 2022.

In order to evaluate the potential impacts to the local street system, five study intersections were analyzed to determine changes in operation following occupancy and utilization of the proposed Rosecrans Place Mixed-Use project. It is concluded that the proposed project is not expected to create significant impacts at any of the study intersections. Incremental, but not significant, impacts are noted at the study intersections. Because there are no significant impacts, no formal traffic mitigation measures are required or recommended for the study intersections.

APPENDIX A

PROPOSED ROSECRANS AVENUE MEDIAN MODIFICATIONS



N

SCALE 1" = 40'

APPENDIX FIGURE A
PROPOSED ROSECRANS AVENUE MEDIAN MODIFICATIONS

ROSECRANS PLACE MIXED-USE PROJECT

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APPENDIX B

TRAFFIC COUNT DATA COUNT

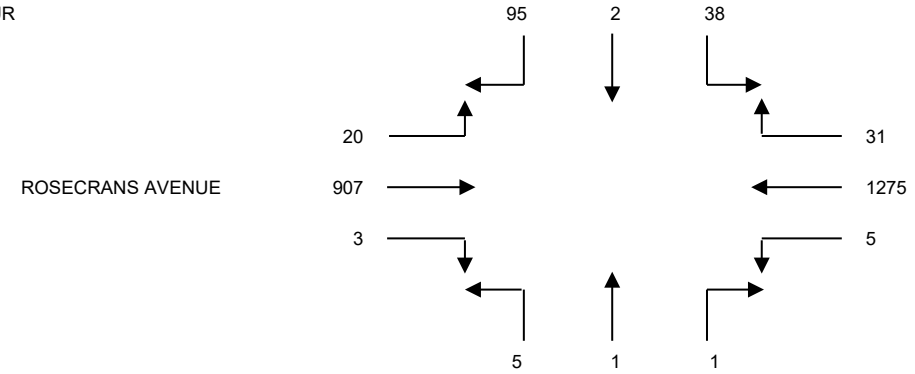
INTERSECTION TURNING MOVEMENT COUNT SUMMARY

CLIENT: LLG - PASADENA
PROJECT: CITY OF GARDENA
DATE: TUESDAY, MAY 21, 2019
PERIOD: 07:00 AM TO 10:00 AM
INTERSECTION: N/S PURCHE AVENUE
E/W ROSECRANS AVENUE
FILE NUMBER: 1_AM

15 MINUTE	1	2	3	4	5	6	7	8	9	10	11	12
TOTALS	SBRT	SBTH	SBLT	WBRT	WBTH	WBLT	NBRT	NBTH	NBLT	EBRT	EBTH	EBLT
0700-0715	16	0	10	7	298	0	0	0	1	0	134	4
0715-0730	17	0	10	4	300	0	1	1	3	0	173	7
0730-0745	25	1	16	5	300	0	0	1	0	2	211	7
0745-0800	28	0	10	10	345	2	0	0	1	0	263	5
0800-0815	26	1	6	9	337	2	0	0	4	1	219	5
0815-0830	16	0	6	7	293	1	1	0	0	0	214	3
0830-0845	12	0	8	6	272	2	1	0	0	2	189	5
0845-0900	20	1	7	10	247	1	0	0	0	2	158	8
0900-0915	20	0	10	6	245	2	1	0	2	2	164	10
0915-0930	19	0	6	9	255	1	1	0	1	0	152	11
0930-0945	12	0	9	6	239	1	1	0	0	1	169	12
0945-1000	21	0	11	3	236	2	0	0	1	2	161	18

1 HOUR	1	2	3	4	5	6	7	8	9	10	11	12	
TOTALS	SBRT	SBTH	SBLT	WBRT	WBTH	WBLT	NBRT	NBTH	NBLT	EBRT	EBTH	EBLT	TOTALS
0700-0800	86	1	46	26	1243	2	1	2	5	2	781	23	2218
0715-0815	96	2	42	28	1282	4	1	2	8	3	866	24	2358
0730-0830	95	2	38	31	1275	5	1	1	5	3	907	20	2383
0745-0845	82	1	30	32	1247	7	2	0	5	3	885	18	2312
0800-0900	74	2	27	32	1149	6	2	0	4	5	780	21	2102
0815-0915	68	1	31	29	1057	6	3	0	2	6	725	26	1954
0830-0930	71	1	31	31	1019	6	3	0	3	6	663	34	1868
0845-0945	71	1	32	31	986	5	3	0	3	5	643	41	1821
0900-1000	72	0	36	24	975	6	3	0	4	5	646	51	1822

A.M. PEAK HOUR
0730-0830



DATA PROVIDED BY:

THE TRAFFIC SOLUTION
329 DIAMOND STREET
ARCADIA, CALIFORNIA 91005
PH: 626-446-7978
FAX: 626-446-2877
.

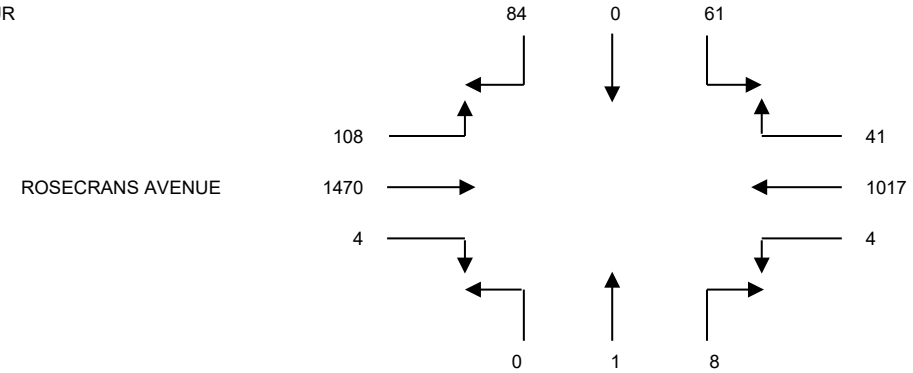
INTERSECTION TURNING MOVEMENT COUNT SUMMARY

CLIENT: LLG - PASADENA
PROJECT: CITY OF GARDENA
DATE: TUESDAY, MAY 21, 2019
PERIOD: 04:00 PM TO 07:00 PM
INTERSECTION: N/S PURCHE AVENUE
E/W ROSECRANS AVENUE
FILE NUMBER: 1_PM

15 MINUTE TOTALS	1 SBRT	2 SBTH	3 SBLT	4 WBRT	5 WBTH	6 WBLT	7 NBRT	8 NBTH	9 NBLT	10 EBRT	11 EBTH	12 EBLT
0400-0415	28	0	15	10	200	5	3	0	1	1	306	29
0415-0430	22	0	15	15	221	4	5	0	2	1	335	35
0430-0445	35	0	19	12	206	2	2	0	1	2	342	35
0445-0500	30	0	19	8	235	2	3	0	0	2	395	29
0500-0515	20	0	18	10	259	1	1	0	0	1	349	30
0515-0530	15	0	13	13	265	0	2	1	0	1	377	28
0530-0545	19	0	11	10	258	1	2	0	0	0	349	21
0545-0600	23	0	18	9	260	1	1	0	0	0	332	31
0600-0615	22	0	11	12	279	2	1	0	0	0	330	34
0615-0630	15	0	19	16	241	0	1	0	0	1	343	21
0630-0645	19	0	10	11	196	0	2	0	1	0	303	21
0645-0700	19	0	10	6	211	0	0	0	0	0	308	27

1 HOUR TOTALS	1 SBRT	2 SBTH	3 SBLT	4 WBRT	5 WBTH	6 WBLT	7 NBRT	8 NBTH	9 NBLT	10 EBRT	11 EBTH	12 EBLT	TOTALS
0400-0500	115	0	68	45	862	13	13	0	4	6	1378	128	2632
0415-0515	107	0	71	45	921	9	11	0	3	6	1421	129	2723
0430-0530	100	0	69	43	965	5	8	1	1	6	1463	122	2783
0445-0545	84	0	61	41	1017	4	8	1	0	4	1470	108	2798
0500-0600	77	0	60	42	1042	3	6	1	0	2	1407	110	2750
0515-0615	79	0	53	44	1062	4	6	1	0	1	1388	114	2752
0530-0630	79	0	59	47	1038	4	5	0	0	1	1354	107	2694
0545-0645	79	0	58	48	976	3	5	0	1	1	1308	107	2586
0600-0700	75	0	50	45	927	2	4	0	1	1	1284	103	2492

P.M. PEAK HOUR
0445-0545



DATA PROVIDED BY:

THE TRAFFIC SOLUTION
329 DIAMOND STREET
ARCADIA, CALIFORNIA 91005
PH: 626-446-7978
FAX: 626-446-2877
.

PEDESTRIAN - BICYCLE COUNT SUMMARY

CLIENT: LLG - PASADENA

PROJECT: CITY OF GARDENA

DATE: TUESDAY, MAY 21, 2019

PERIOD: 07:00 AM TO 10:00 AM

INTERSECTION: PURCHE AVENUE / ROSECRANS AVENUE

FILE: 1AMPED-BIKE

	PEDESTRIAN MOVEMENTS			
15-MINUTE PERIOD	NORTH LEG A	EAST LEG B	SOUTH LEG C	WEST LEG D
0700-0715	2	2	1	0
0715-0730	2	2	0	0
0730-0745	1	0	1	0
0745-0800	1	2	0	0
0800-0815	0	0	1	0
0815-0830	0	0	0	0
0830-0845	2	0	1	0
0845-0900	0	0	2	0
0900-0915	5	1	0	0
0915-0930	1	0	1	0
0930-0945	2	0	1	0
0945-1000	2	0	0	0

	BICYCLIST MOVEMENTS			
15-MINUTE PERIOD	NORTH LEG A	EAST LEG B	SOUTH LEG C	WEST LEG D
0700-0715	1	0	0	0
0715-0730	2	1	1	0
0730-0745	0	0	0	0
0745-0800	0	0	0	0
0800-0815	1	0	1	0
0815-0830	0	0	1	0
0830-0845	0	0	0	0
0845-0900	1	0	0	0
0900-0915	0	0	0	0
0915-0930	0	0	1	0
0930-0945	1	0	0	0
0945-1000	3	0	1	0

	PEDESTRIAN MOVEMENTS				
1-HOUR PERIOD	NORTH LEG A	EAST LEG B	SOUTH LEG C	WEST LEG D	TOTALS
0700-0800	6	6	2	0	14
0715-0815	4	4	2	0	10
0730-0830	2	2	2	0	6
0745-0845	3	2	2	0	7
0800-0900	2	0	4	0	6
0815-0915	7	1	3	0	11
0830-0930	8	1	4	0	13
0845-0945	8	1	4	0	13
0900-1000	10	1	2	0	13

	BICYCLIST MOVEMENTS				
1-HOUR PERIOD	NORTH LEG A	EAST LEG B	SOUTH LEG C	WEST LEG D	TOTALS
0700-0800	3	1	1	0	5
0715-0815	3	1	2	0	6
0730-0830	1	0	2	0	3
0745-0845	1	0	2	0	3
0800-0900	2	0	2	0	4
0815-0915	1	0	1	0	2
0830-0930	1	0	1	0	2
0845-0945	2	0	1	0	3
0900-1000	4	0	2	0	6

THE TRAFFIC SOLUTION
9 ALTA STREET UNIT E
ARCADIA, CALIFORNIA 91006
626.485.8048 PHONE
trafsolutn@aol.com

PEDESTRIAN - BICYCLE COUNT SUMMARY

CLIENT: LLG - PASADENA

PROJECT: CITY OF GARDENA

DATE: TUESDAY, MAY 21, 2019

PERIOD: 04:00 PM TO 07:00 PM

INTERSECTION: PURCHE AVENUE / ROSECRANS AVENUE

FILE: 1PMPED-BIKE

	PEDESTRIAN MOVEMENTS			
15-MINUTE PERIOD	NORTH LEG A	EAST LEG B	SOUTH LEG C	WEST LEG D
0400-0415	1	0	2	0
0415-0430	0	1	1	0
0430-0445	3	3	0	0
0445-0500	0	2	1	0
0500-0515	1	0	1	0
0515-0530	3	3	0	0
0530-0545	6	0	2	0
0545-0600	2	1	1	0
0600-0615	1	2	0	0
0615-0630	1	0	0	0
0630-0645	0	0	1	0
0645-0700	1	0	2	0

	BICYCLIST MOVEMENTS			
15-MINUTE PERIOD	NORTH LEG A	EAST LEG B	SOUTH LEG C	WEST LEG D
0400-0415	3	0	0	0
0415-0430	2	2	1	0
0430-0445	0	0	1	0
0445-0500	0	0	0	0
0500-0515	0	0	0	0
0515-0530	0	2	1	0
0530-0545	0	0	0	0
0545-0600	0	0	0	0
0600-0615	0	0	0	0
0615-0630	0	2	1	0
0630-0645	1	4	2	0
0645-0700	0	0	0	0

	PEDESTRIAN MOVEMENTS				
1-HOUR PERIOD	NORTH LEG A	EAST LEG B	SOUTH LEG C	WEST LEG D	TOTALS
0400-0500	4	6	4	0	14
0415-0515	4	6	3	0	13
0430-0530	7	8	2	0	17
0445-0545	10	5	4	0	19
0500-0600	12	4	4	0	20
0515-0615	12	6	3	0	21
0530-0630	10	3	3	0	16
0545-0645	4	3	2	0	9
0600-0700	3	2	3	0	8

	BICYCLIST MOVEMENTS				
1-HOUR PERIOD	NORTH LEG A	EAST LEG B	SOUTH LEG C	WEST LEG D	TOTALS
0400-0500	5	2	2	0	9
0415-0515	2	2	2	0	6
0430-0530	0	2	2	0	4
0445-0545	0	2	1	0	3
0500-0600	0	2	1	0	3
0515-0615	0	2	1	0	3
0530-0630	0	2	1	0	3
0545-0645	1	6	3	0	10
0600-0700	1	6	3	0	10

THE TRAFFIC SOLUTION
9 ALTA STREET UNIT E
ARCADIA, CALIFORNIA 91006
626.485.8048 PHONE
trafsolutn@aol.com

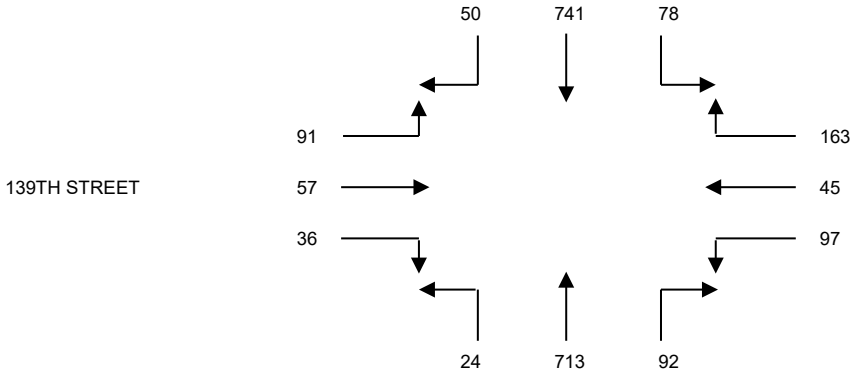
INTERSECTION TURNING MOVEMENT COUNT SUMMARY

CLIENT: LLG - PASADENA
PROJECT: CITY OF GARDENA
DATE: TUESDAY, MAY 21, 2019
PERIOD: 07:00 AM TO 10:00 AM
INTERSECTION: N/S VAN NESS AVENUE
E/W 139TH STREET
FILE NUMBER: 2_AM

15 MINUTE	1	2	3	4	5	6	7	8	9	10	11	12
TOTALS	SBRT	SBTH	SBLT	WBRT	WBTH	WBLT	NBRT	NBTH	NBLT	EBRT	EBTH	EBLT
0700-0715	11	110	6	26	5	12	13	129	4	9	10	6
0715-0730	11	146	14	36	8	20	21	154	3	10	14	14
0730-0745	10	199	15	51	10	29	25	175	5	8	19	28
0745-0800	14	200	20	43	14	30	28	211	6	10	14	33
0800-0815	15	196	29	33	13	18	18	173	10	8	10	16
0815-0830	10	155	20	39	7	11	19	145	5	8	12	5
0830-0845	13	141	14	25	8	14	18	133	3	7	12	4
0845-0900	13	110	10	17	12	10	17	121	4	8	10	4
0900-0915	9	108	13	13	10	10	10	117	4	7	9	6
0915-0930	11	114	8	15	9	8	8	103	2	4	13	3
0930-0945	16	118	4	10	9	7	16	109	4	3	8	4
0945-1000	13	116	5	8	7	8	12	105	3	3	7	3

1 HOUR	1	2	3	4	5	6	7	8	9	10	11	12	
TOTALS	SBRT	SBTH	SBLT	WBRT	WBTH	WBLT	NBRT	NBTH	NBLT	EBRT	EBTH	EBLT	TOTALS
0700-0800	46	655	55	156	37	91	87	669	18	37	57	81	1989
0715-0815	50	741	78	163	45	97	92	713	24	36	57	91	2187
0730-0830	49	750	84	166	44	88	90	704	26	34	55	82	2172
0745-0845	52	692	83	140	42	73	83	662	24	33	48	58	1990
0800-0900	51	602	73	114	40	53	72	572	22	31	44	29	1703
0815-0915	45	514	57	94	37	45	64	516	16	30	43	19	1480
0830-0930	46	473	45	70	39	42	53	474	13	26	44	17	1342
0845-0945	49	450	35	55	40	35	51	450	14	22	40	17	1258
0900-1000	49	456	30	46	35	33	46	434	13	17	37	16	1212

A.M. PEAK HOUR
0715-0815



DATA PROVIDED BY:

THE TRAFFIC SOLUTION
329 DIAMOND STREET
ARCADIA, CALIFORNIA 91005
PH: 626-446-7978
FAX: 626-446-2877
.

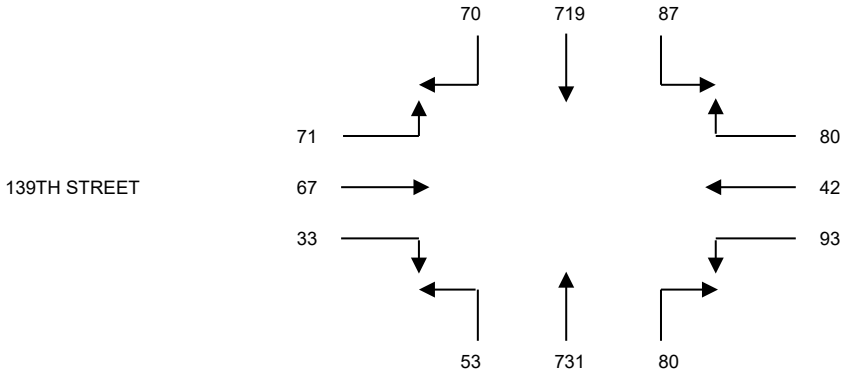
INTERSECTION TURNING MOVEMENT COUNT SUMMARY

CLIENT: LLG - PASADENA
PROJECT: CITY OF GARDENA
DATE: TUESDAY, MAY 21, 2019
PERIOD: 04:00 PM TO 07:00 PM
INTERSECTION: N/S VAN NESS AVENUE
E/W 139TH STREET
FILE NUMBER: 2_PM

15 MINUTE	1	2	3	4	5	6	7	8	9	10	11	12
TOTALS	SBRT	SBTH	SBLT	WBRT	WBTH	WBLT	NBRT	NBTH	NBLT	EBRT	EBTH	EBLT
0400-0415	14	173	23	27	11	23	17	195	7	5	17	18
0415-0430	13	177	24	21	9	19	20	188	10	9	13	16
0430-0445	15	180	25	24	10	23	20	194	10	10	15	20
0445-0500	17	170	23	25	12	25	15	182	8	8	16	21
0500-0515	18	186	20	17	9	20	20	181	15	8	19	15
0515-0530	20	183	19	14	11	25	25	174	20	7	17	15
0530-0545	21	185	20	15	10	23	25	179	22	10	18	14
0545-0600	10	170	21	20	15	20	21	150	18	7	10	19
0600-0615	10	169	20	20	18	22	24	140	18	7	10	20
0615-0630	8	151	19	17	17	20	22	137	16	8	11	20
0630-0645	9	140	20	18	15	18	18	129	14	7	15	15
0645-0700	7	144	16	17	14	14	15	115	11	5	9	12

1 HOUR	1	2	3	4	5	6	7	8	9	10	11	12	
TOTALS	SBRT	SBTH	SBLT	WBRT	WBTH	WBLT	NBRT	NBTH	NBLT	EBRT	EBTH	EBLT	TOTALS
0400-0500	59	700	95	97	42	90	72	759	35	32	61	75	2117
0415-0515	63	713	92	87	40	87	75	745	43	35	63	72	2115
0430-0530	70	719	87	80	42	93	80	731	53	33	67	71	2126
0445-0545	76	724	82	71	42	93	85	716	65	33	70	65	2122
0500-0600	69	724	80	66	45	88	91	684	75	32	64	63	2081
0515-0615	61	707	80	69	54	90	95	643	78	31	55	68	2031
0530-0630	49	675	80	72	60	85	92	606	74	32	49	73	1947
0545-0645	37	630	80	75	65	80	85	556	66	29	46	74	1823
0600-0700	34	604	75	72	64	74	79	521	59	27	45	67	1721

P.M. PEAK HOUR
0430-0530



DATA PROVIDED BY:

THE TRAFFIC SOLUTION
329 DIAMOND STREET
ARCADIA, CALIFORNIA 91005
PH: 626-446-7978
FAX: 626-446-2877
.

PEDESTRIAN - BICYCLE COUNT SUMMARY

CLIENT: LLG - PASADENA

PROJECT: CITY OF GARDENA

DATE: TUESDAY, MAY 21, 2019

PERIOD: 07:00 AM TO 10:00 AM

INTERSECTION: VAN NESS AVENUE / 139TH STREET

FILE: 2AMPED-BIKE

	PEDESTRIAN MOVEMENTS			
15-MINUTE PERIOD	NORTH LEG A	EAST LEG B	SOUTH LEG C	WEST LEG D
0700-0715	1	0	3	1
0715-0730	1	1	3	2
0730-0745	2	3	6	3
0745-0800	0	1	1	1
0800-0815	0	0	1	2
0815-0830	1	0	0	1
0830-0845	0	0	2	1
0845-0900	0	0	0	1
0900-0915	2	4	3	3
0915-0930	0	0	2	0
0930-0945	0	0	0	4
0945-1000	1	0	0	1

	BICYCLIST MOVEMENTS			
15-MINUTE PERIOD	NORTH LEG A	EAST LEG B	SOUTH LEG C	WEST LEG D
0700-0715	1	0	1	1
0715-0730	0	1	0	1
0730-0745	0	1	0	1
0745-0800	0	1	0	0
0800-0815	0	0	0	0
0815-0830	0	0	0	0
0830-0845	0	0	0	1
0845-0900	0	0	0	0
0900-0915	0	0	0	0
0915-0930	0	0	0	1
0930-0945	1	0	0	0
0945-1000	0	0	0	0

	PEDESTRIAN MOVEMENTS				
1-HOUR PERIOD	NORTH LEG A	EAST LEG B	SOUTH LEG C	WEST LEG D	TOTALS
0700-0800	4	5	13	7	29
0715-0815	3	5	11	8	27
0730-0830	3	4	8	7	22
0745-0845	1	1	4	5	11
0800-0900	1	0	3	5	9
0815-0915	3	4	5	6	18
0830-0930	2	4	7	5	18
0845-0945	2	4	5	8	19
0900-1000	3	4	5	8	20

	BICYCLIST MOVEMENTS				
1-HOUR PERIOD	NORTH LEG A	EAST LEG B	SOUTH LEG C	WEST LEG D	TOTALS
0700-0800	1	3	1	3	8
0715-0815	0	3	0	2	5
0730-0830	0	2	0	1	3
0745-0845	0	1	0	1	2
0800-0900	0	0	0	1	1
0815-0915	0	0	0	1	1
0830-0930	0	0	0	2	2
0845-0945	1	0	0	1	2
0900-1000	1	0	0	1	2

THE TRAFFIC SOLUTION
9 ALTA STREET UNIT E
ARCADIA, CALIFORNIA 91006
626.485.8048 PHONE
trafsolutn@aol.com

PEDESTRIAN - BICYCLE COUNT SUMMARY

CLIENT: LLG - PASADENA

PROJECT: CITY OF GARDENA

DATE: TUESDAY, MAY 21, 2019

PERIOD: 04:00 PM TO 07:00 PM

INTERSECTION: VAN NESS AVENUE / 139TH STREET

FILE: 2PMPED-BIKE

	PEDESTRIAN MOVEMENTS			
15-MINUTE PERIOD	NORTH LEG A	EAST LEG B	SOUTH LEG C	WEST LEG D
0400-0415	0	7	0	9
0415-0430	2	0	1	7
0430-0445	1	3	2	4
0445-0500	1	2	2	3
0500-0515	1	5	2	4
0515-0530	0	1	1	3
0530-0545	1	2	2	5
0545-0600	1	4	2	4
0600-0615	1	3	2	4
0615-0630	0	1	1	4
0630-0645	1	0	0	1
0645-0700	0	0	0	0

	BICYCLIST MOVEMENTS			
15-MINUTE PERIOD	NORTH LEG A	EAST LEG B	SOUTH LEG C	WEST LEG D
0400-0415	0	0	0	0
0415-0430	0	0	0	2
0430-0445	0	1	0	1
0445-0500	0	1	0	1
0500-0515	0	0	0	0
0515-0530	0	0	0	0
0530-0545	0	1	0	1
0545-0600	0	1	0	1
0600-0615	0	0	0	1
0615-0630	0	1	0	0
0630-0645	0	0	0	0
0645-0700	0	0	0	0

	PEDESTRIAN MOVEMENTS				
1-HOUR PERIOD	NORTH LEG A	EAST LEG B	SOUTH LEG C	WEST LEG D	TOTALS
0400-0500	4	12	5	23	44
0415-0515	5	10	7	18	40
0430-0530	3	11	7	14	35
0445-0545	3	10	7	15	35
0500-0600	3	12	7	16	38
0515-0615	3	10	7	16	36
0530-0630	3	10	7	17	37
0545-0645	3	8	5	13	29
0600-0700	2	4	3	9	18

	BICYCLIST MOVEMENTS				
1-HOUR PERIOD	NORTH LEG A	EAST LEG B	SOUTH LEG C	WEST LEG D	TOTALS
0400-0500	0	2	0	4	6
0415-0515	0	2	0	4	6
0430-0530	0	2	0	2	4
0445-0545	0	2	0	2	4
0500-0600	0	2	0	2	4
0515-0615	0	2	0	3	5
0530-0630	0	3	0	3	6
0545-0645	0	2	0	2	4
0600-0700	0	1	0	1	2

THE TRAFFIC SOLUTION
9 ALTA STREET UNIT E
ARCADIA, CALIFORNIA 91006
626.485.8048 PHONE
trafsolutn@aol.com

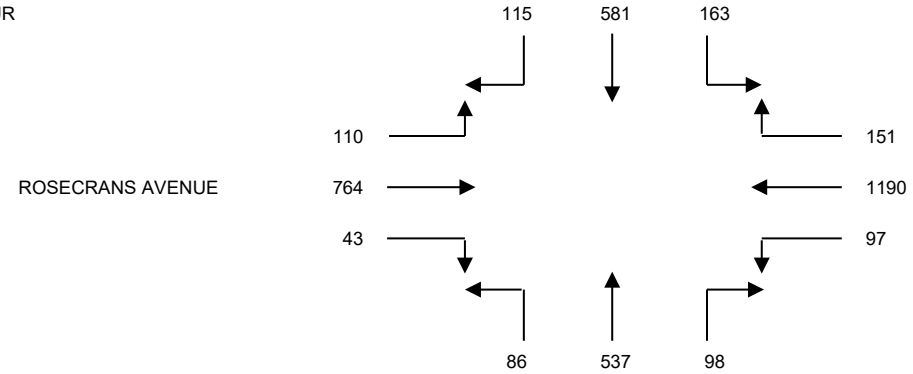
INTERSECTION TURNING MOVEMENT COUNT SUMMARY

CLIENT: LLG - PASADENA
PROJECT: CITY OF GARDENA
DATE: TUESDAY, MAY 21, 2019
PERIOD: 07:00 AM TO 10:00 AM
INTERSECTION: N/S VAN NESS AVENUE
E/W ROSECRANS AVENUE
FILE NUMBER: 3_AM

15 MINUTE	1	2	3	4	5	6	7	8	9	10	11	12
TOTALS	SBRT	SBTH	SBLT	WBRT	WBTH	WBLT	NBRT	NBTH	NBLT	EBRT	EBTH	EBLT
0700-0715	10	91	17	35	266	29	10	127	10	4	150	10
0715-0730	20	127	27	34	268	21	14	139	12	11	173	18
0730-0745	23	158	34	44	321	32	20	155	17	13	184	20
0745-0800	34	169	52	36	294	23	30	133	20	14	188	33
0800-0815	34	140	47	32	294	22	28	144	29	10	195	28
0815-0830	24	114	30	39	281	20	20	105	20	6	197	29
0830-0845	23	90	29	27	231	31	21	101	19	7	164	27
0845-0900	23	70	33	30	216	24	22	91	20	5	143	20
0900-0915	20	61	36	28	227	20	14	90	17	9	149	19
0915-0930	27	83	36	27	224	21	12	74	19	5	137	17
0930-0945	29	73	29	35	200	19	12	69	16	7	141	15
0945-1000	28	65	28	32	197	14	11	73	16	7	138	18

1 HOUR	1	2	3	4	5	6	7	8	9	10	11	12	
TOTALS	SBRT	SBTH	SBLT	WBRT	WBTH	WBLT	NBRT	NBTH	NBLT	EBRT	EBTH	EBLT	TOTALS
0700-0800	87	545	130	149	1149	105	74	554	59	42	695	81	3670
0715-0815	111	594	160	146	1177	98	92	571	78	48	740	99	3914
0730-0830	115	581	163	151	1190	97	98	537	86	43	764	110	3935
0745-0845	115	513	158	134	1100	96	99	483	88	37	744	117	3684
0800-0900	104	414	139	128	1022	97	91	441	88	28	699	104	3355
0815-0915	90	335	128	124	955	95	77	387	76	27	653	95	3042
0830-0930	93	304	134	112	898	96	69	356	75	26	593	83	2839
0845-0945	99	287	134	120	867	84	60	324	72	26	570	71	2714
0900-1000	104	282	129	122	848	74	49	306	68	28	565	69	2644

A.M. PEAK HOUR
0730-0830



DATA PROVIDED BY:

THE TRAFFIC SOLUTION
329 DIAMOND STREET
ARCADIA, CALIFORNIA 91005
PH: 626-446-7978
FAX: 626-446-2877
.

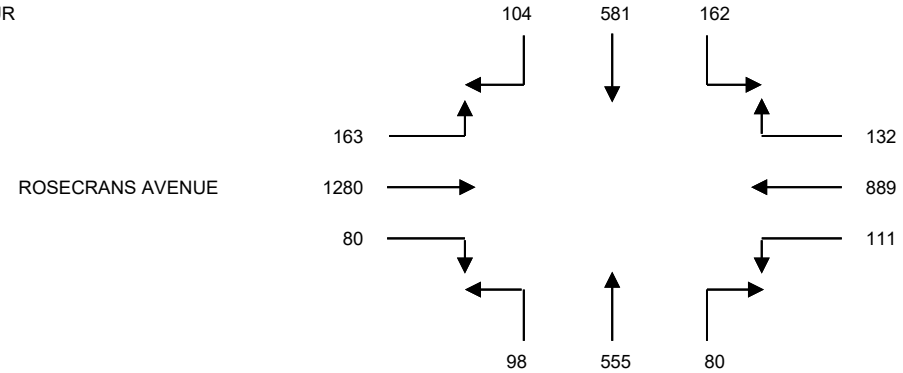
INTERSECTION TURNING MOVEMENT COUNT SUMMARY

CLIENT: LLG - PASADENA
PROJECT: CITY OF GARDENA
DATE: TUESDAY, MAY 21, 2019
PERIOD: 04:00 PM TO 07:00 PM
INTERSECTION: N/S VAN NESS AVENUE
E/W ROSECRANS AVENUE
FILE NUMBER: 3_PM

15 MINUTE TOTALS	1 SBRT	2 SBTH	3 SBLT	4 WBRT	5 WBTH	6 WBLT	7 NBRT	8 NBTH	9 NBLT	10 EBRT	11 EBTH	12 EBLT
0400-0415	28	120	45	36	165	26	22	144	21	15	271	40
0415-0430	21	129	47	26	196	17	20	129	22	19	283	39
0430-0445	25	148	43	32	173	25	20	140	21	21	314	33
0445-0500	20	127	48	28	217	25	20	163	22	23	327	42
0500-0515	26	145	37	30	202	33	21	132	22	16	322	41
0515-0530	26	149	36	41	247	30	21	121	26	24	325	35
0530-0545	32	160	41	33	223	23	18	139	28	17	306	45
0545-0600	21	120	38	37	237	28	16	132	30	18	318	31
0600-0615	29	132	35	23	238	21	15	120	27	16	303	32
0615-0630	25	114	32	24	201	33	13	105	23	16	291	34
0630-0645	26	115	34	26	172	25	16	103	22	15	280	32
0645-0700	25	88	47	22	152	18	10	91	20	15	281	39

1 HOUR TOTALS	1 SBRT	2 SBTH	3 SBLT	4 WBRT	5 WBTH	6 WBLT	7 NBRT	8 NBTH	9 NBLT	10 EBRT	11 EBTH	12 EBLT	TOTALS
0400-0500	94	524	183	122	751	93	82	576	86	78	1195	154	3938
0415-0515	92	549	175	116	788	100	81	564	87	79	1246	155	4032
0430-0530	97	569	164	131	839	113	82	556	91	84	1288	151	4165
0445-0545	104	581	162	132	889	111	80	555	98	80	1280	163	4235
0500-0600	105	574	152	141	909	114	76	524	106	75	1271	152	4199
0515-0615	108	561	150	134	945	102	70	512	111	75	1252	143	4163
0530-0630	107	526	146	117	899	105	62	496	108	67	1218	142	3993
0545-0645	101	481	139	110	848	107	60	460	102	65	1192	129	3794
0600-0700	105	449	148	95	763	97	54	419	92	62	1155	137	3576

P.M. PEAK HOUR
0445-0545



DATA PROVIDED BY:

THE TRAFFIC SOLUTION
329 DIAMOND STREET
ARCADIA, CALIFORNIA 91005
PH: 626-446-7978
FAX: 626-446-2877
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PEDESTRIAN - BICYCLE COUNT SUMMARY

CLIENT: LLG - PASADENA

PROJECT: CITY OF GARDENA

DATE: TUESDAY, MAY 21, 2019

PERIOD: 07:00 AM TO 10:00 AM

INTERSECTION: VAN NESS AVENUE / ROSECRANS AVENUE

FILE: 3AMPED-BIKE

	PEDESTRIAN MOVEMENTS			
15-MINUTE PERIOD	NORTH LEG A	EAST LEG B	SOUTH LEG C	WEST LEG D
0700-0715	0	0	1	2
0715-0730	1	1	5	2
0730-0745	1	0	2	2
0745-0800	0	1	1	2
0800-0815	0	0	1	1
0815-0830	1	1	0	1
0830-0845	1	0	1	4
0845-0900	0	0	0	1
0900-0915	0	1	1	1
0915-0930	1	0	0	0
0930-0945	5	0	1	2
0945-1000	6	6	0	1

	BICYCLIST MOVEMENTS			
15-MINUTE PERIOD	NORTH LEG A	EAST LEG B	SOUTH LEG C	WEST LEG D
0700-0715	1	1	1	0
0715-0730	1	0	0	1
0730-0745	0	0	0	0
0745-0800	2	0	2	1
0800-0815	1	1	0	0
0815-0830	0	1	0	0
0830-0845	0	0	0	0
0845-0900	0	0	0	0
0900-0915	0	0	0	0
0915-0930	0	0	0	1
0930-0945	0	0	0	0
0945-1000	2	0	1	0

	PEDESTRIAN MOVEMENTS				
1-HOUR PERIOD	NORTH LEG A	EAST LEG B	SOUTH LEG C	WEST LEG D	TOTALS
0700-0800	2	2	9	8	21
0715-0815	2	2	9	7	20
0730-0830	2	2	4	6	14
0745-0845	2	2	3	8	15
0800-0900	2	1	2	7	12
0815-0915	2	2	2	7	13
0830-0930	2	1	2	6	11
0845-0945	6	1	2	4	13
0900-1000	12	7	2	4	25

	BICYCLIST MOVEMENTS				
1-HOUR PERIOD	NORTH LEG A	EAST LEG B	SOUTH LEG C	WEST LEG D	TOTALS
0700-0800	4	1	3	2	10
0715-0815	4	1	2	2	9
0730-0830	3	2	2	1	8
0745-0845	3	2	2	1	8
0800-0900	1	2	0	0	3
0815-0915	0	1	0	0	1
0830-0930	0	0	0	1	1
0845-0945	0	0	0	1	1
0900-1000	2	0	1	1	4

THE TRAFFIC SOLUTION
9 ALTA STREET UNIT E
ARCADIA, CALIFORNIA 91006
626.485.8048 PHONE
trafsolutn@aol.com

PEDESTRIAN - BICYCLE COUNT SUMMARY

CLIENT: LLG - PASADENA

PROJECT: CITY OF GARDENA

DATE: TUESDAY, MAY 21, 2019

PERIOD: 04:00 PM TO 07:00 PM

INTERSECTION: VAN NESS AVENUE / ROSECRANS AVENUE

FILE: 3PMPED-BIKE

	PEDESTRIAN MOVEMENTS			
15-MINUTE PERIOD	NORTH LEG A	EAST LEG B	SOUTH LEG C	WEST LEG D
0400-0415	2	2	7	0
0415-0430	0	2	4	4
0430-0445	2	2	4	7
0445-0500	0	0	4	3
0500-0515	0	4	1	2
0515-0530	0	4	3	5
0530-0545	1	0	1	1
0545-0600	2	3	2	3
0600-0615	0	0	4	3
0615-0630	0	0	5	4
0630-0645	1	1	1	2
0645-0700	2	1	0	3

	BICYCLIST MOVEMENTS			
15-MINUTE PERIOD	NORTH LEG A	EAST LEG B	SOUTH LEG C	WEST LEG D
0400-0415	0	0	2	0
0415-0430	1	2	2	0
0430-0445	1	0	1	0
0445-0500	0	0	1	1
0500-0515	0	0	1	1
0515-0530	0	0	1	0
0530-0545	0	0	0	0
0545-0600	1	1	4	0
0600-0615	1	1	1	0
0615-0630	1	0	0	1
0630-0645	0	0	1	1
0645-0700	0	1	1	0

	PEDESTRIAN MOVEMENTS				
1-HOUR PERIOD	NORTH LEG A	EAST LEG B	SOUTH LEG C	WEST LEG D	TOTALS
0400-0500	4	6	19	14	43
0415-0515	2	8	13	16	39
0430-0530	2	10	12	17	41
0445-0545	1	8	9	11	29
0500-0600	3	11	7	11	32
0515-0615	3	7	10	12	32
0530-0630	3	3	12	11	29
0545-0645	3	4	12	12	31
0600-0700	3	2	10	12	27

	BICYCLIST MOVEMENTS				
1-HOUR PERIOD	NORTH LEG A	EAST LEG B	SOUTH LEG C	WEST LEG D	TOTALS
0400-0500	2	2	6	1	11
0415-0515	2	2	5	2	11
0430-0530	1	0	4	2	7
0445-0545	0	0	3	2	5
0500-0600	1	1	6	1	9
0515-0615	2	2	6	0	10
0530-0630	3	2	5	1	11
0545-0645	3	2	6	2	13
0600-0700	2	2	3	2	9

THE TRAFFIC SOLUTION
9 ALTA STREET UNIT E
ARCADIA, CALIFORNIA 91006
626.485.8048 PHONE
trafsolutn@aol.com

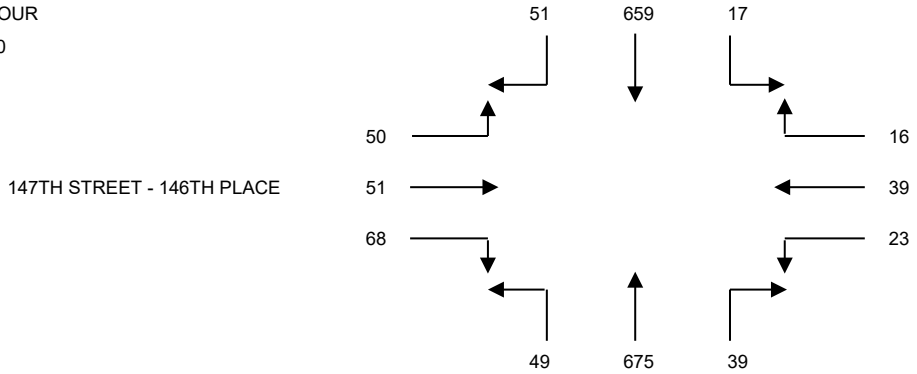
INTERSECTION TURNING MOVEMENT COUNT SUMMARY

CLIENT: LLG - PASADENA
PROJECT: CITY OF GARDENA
DATE: TUESDAY, MAY 21, 2019
PERIOD: 07:00 AM TO 10:00 AM
INTERSECTION: N/S VAN NESS AVENUE
E/W 147TH STREET - 146TH PLACE
FILE NUMBER: 4_AM

15 MINUTE TOTALS	1 SBRT	2 SBTH	3 SBLT	4 WBRT	5 WBTH	6 WBLT	7 NBRT	8 NBTH	9 NBLT	10 EBRT	11 EBTH	12 EBLT
0700-0715	5	122	1	1	2	5	3	121	4	8	2	10
0715-0730	10	143	3	5	5	9	4	132	8	9	5	11
0730-0745	10	176	5	6	7	8	10	158	11	20	10	12
0745-0800	13	198	8	3	14	4	14	194	13	17	23	11
0800-0815	16	152	3	2	12	4	9	164	15	13	10	11
0815-0830	12	133	1	5	6	7	6	159	10	18	8	16
0830-0845	8	112	3	2	5	8	4	120	8	12	4	8
0845-0900	9	93	2	2	4	3	3	111	10	7	4	11
0900-0915	7	98	0	4	2	3	0	108	8	12	2	16
0915-0930	8	99	0	0	3	4	1	97	5	12	2	11
0930-0945	5	85	0	0	2	1	2	99	7	9	5	10
0945-1000	6	88	1	0	1	1	1	86	6	6	3	8

1 HOUR TOTALS	1 SBRT	2 SBTH	3 SBLT	4 WBRT	5 WBTH	6 WBLT	7 NBRT	8 NBTH	9 NBLT	10 EBRT	11 EBTH	12 EBLT	TOTALS
0700-0800	38	639	17	15	28	26	31	605	36	54	40	44	1573
0715-0815	49	669	19	16	38	25	37	648	47	59	48	45	1700
0730-0830	51	659	17	16	39	23	39	675	49	68	51	50	1737
0745-0845	49	595	15	12	37	23	33	637	46	60	45	46	1598
0800-0900	45	490	9	11	27	22	22	554	43	50	26	46	1345
0815-0915	36	436	6	13	17	21	13	498	36	49	18	51	1194
0830-0930	32	402	5	8	14	18	8	436	31	43	12	46	1055
0845-0945	29	375	2	6	11	11	6	415	30	40	13	48	986
0900-1000	26	370	1	4	8	9	4	390	26	39	12	45	934

A.M. PEAK HOUR
0730-0830



DATA PROVIDED BY:

THE TRAFFIC SOLUTION
329 DIAMOND STREET
ARCADIA, CALIFORNIA 91005
PH: 626-446-7978
FAX: 626-446-2877
.

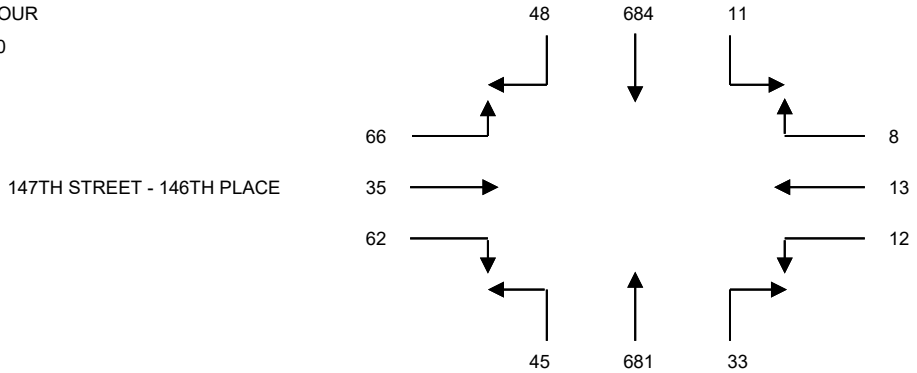
INTERSECTION TURNING MOVEMENT COUNT SUMMARY

CLIENT: LLG - PASADENA
PROJECT: CITY OF GARDENA
DATE: TUESDAY, MAY 21, 2019
PERIOD: 04:00 PM TO 07:00 PM
INTERSECTION: N/S VAN NESS AVENUE
E/W 147TH STREET - 146TH PLACE
FILE NUMBER: 4_PM

15 MINUTE TOTALS	1 SBRT	2 SBTH	3 SBLT	4 WBRT	5 WBTH	6 WBLT	7 NBRT	8 NBTH	9 NBLT	10 EBRT	11 EBTH	12 EBLT
0400-0415	14	138	3	1	8	4	11	175	7	15	9	14
0415-0430	13	148	1	3	7	5	9	150	13	17	10	15
0430-0445	15	158	2	2	3	4	5	163	16	11	6	16
0445-0500	12	160	2	3	8	2	3	163	7	7	10	16
0500-0515	14	162	4	2	4	3	5	175	10	15	11	16
0515-0530	10	191	4	2	2	2	12	181	8	13	8	15
0530-0545	9	175	2	3	4	4	7	166	10	15	11	19
0545-0600	15	156	1	1	3	3	9	159	17	19	5	16
0600-0615	18	146	0	0	2	5	13	152	11	15	6	18
0615-0630	8	143	1	1	4	1	9	140	6	14	6	10
0630-0645	12	131	2	0	2	3	7	110	8	11	6	6
0645-0700	8	130	2	1	2	3	6	122	6	10	5	8

1 HOUR TOTALS	1 SBRT	2 SBTH	3 SBLT	4 WBRT	5 WBTH	6 WBLT	7 NBRT	8 NBTH	9 NBLT	10 EBRT	11 EBTH	12 EBLT	TOTALS
0400-0500	54	604	8	9	26	15	28	651	43	50	35	61	1584
0415-0515	54	628	9	10	22	14	22	651	46	50	37	63	1606
0430-0530	51	671	12	9	17	11	25	682	41	46	35	63	1663
0445-0545	45	688	12	10	18	11	27	685	35	50	40	66	1687
0500-0600	48	684	11	8	13	12	33	681	45	62	35	66	1698
0515-0615	52	668	7	6	11	14	41	658	46	62	30	68	1663
0530-0630	50	620	4	5	13	13	38	617	44	63	28	63	1558
0545-0645	53	576	4	2	11	12	38	561	42	59	23	50	1431
0600-0700	46	550	5	2	10	12	35	524	31	50	23	42	1330

P.M. PEAK HOUR
0500-0600



DATA PROVIDED BY:

THE TRAFFIC SOLUTION
329 DIAMOND STREET
ARCADIA, CALIFORNIA 91005
PH: 626-446-7978
FAX: 626-446-2877
.

PEDESTRIAN - BICYCLE COUNT SUMMARY

CLIENT: LLG - PASADENA

PROJECT: CITY OF GARDENA

DATE: TUESDAY, MAY 21, 2019

PERIOD: 07:00 AM TO 10:00 AM

INTERSECTION: VAN NESS AVENUE / 147TH STREET - 146TH PLACE

FILE: 4AMPED-BIKE

	PEDESTRIAN MOVEMENTS			
15-MINUTE PERIOD	NORTH LEG A	EAST LEG B	SOUTH LEG C	WEST LEG D
0700-0715	1	1	0	1
0715-0730	0	0	2	1
0730-0745	0	1	0	0
0745-0800	1	4	0	0
0800-0815	0	0	0	0
0815-0830	1	0	0	2
0830-0845	0	0	0	3
0845-0900	1	0	0	1
0900-0915	0	0	1	1
0915-0930	0	0	0	0
0930-0945	1	0	1	1
0945-1000	0	0	0	0

	BICYCLIST MOVEMENTS			
15-MINUTE PERIOD	NORTH LEG A	EAST LEG B	SOUTH LEG C	WEST LEG D
0700-0715	0	0	0	0
0715-0730	0	0	0	1
0730-0745	0	0	0	0
0745-0800	0	0	0	1
0800-0815	0	1	0	0
0815-0830	0	0	0	0
0830-0845	0	0	0	0
0845-0900	0	0	0	0
0900-0915	0	0	0	0
0915-0930	0	0	0	0
0930-0945	0	0	0	0
0945-1000	0	0	0	1

	PEDESTRIAN MOVEMENTS				
1-HOUR PERIOD	NORTH LEG A	EAST LEG B	SOUTH LEG C	WEST LEG D	TOTALS
0700-0800	2	6	2	2	12
0715-0815	1	5	2	1	9
0730-0830	2	5	0	2	9
0745-0845	2	4	0	5	11
0800-0900	2	0	0	6	8
0815-0915	2	0	1	7	10
0830-0930	1	0	1	5	7
0845-0945	2	0	2	3	7
0900-1000	1	0	2	2	5

	BICYCLIST MOVEMENTS				
1-HOUR PERIOD	NORTH LEG A	EAST LEG B	SOUTH LEG C	WEST LEG D	TOTALS
0700-0800	0	0	0	2	2
0715-0815	0	1	0	2	3
0730-0830	0	1	0	1	2
0745-0845	0	1	0	1	2
0800-0900	0	1	0	0	1
0815-0915	0	0	0	0	0
0830-0930	0	0	0	0	0
0845-0945	0	0	0	0	0
0900-1000	0	0	0	1	1

THE TRAFFIC SOLUTION
9 ALTA STREET UNIT E
ARCADIA, CALIFORNIA 91006
626.485.8048 PHONE
trafsolutn@aol.com

PEDESTRIAN - BICYCLE COUNT SUMMARY

CLIENT: LLG - PASADENA

PROJECT: CITY OF GARDENA

DATE: TUESDAY, MAY 21, 2019

PERIOD: 04:00 PM TO 07:00 PM

INTERSECTION: VAN NESS AVENUE / 147TH STREET - 146TH PLACE

FILE: 4PMPED-BIKE

	PEDESTRIAN MOVEMENTS			
15-MINUTE PERIOD	NORTH LEG A	EAST LEG B	SOUTH LEG C	WEST LEG D
0400-0415	0	2	0	1
0415-0430	1	0	0	0
0430-0445	0	1	0	2
0445-0500	0	0	0	2
0500-0515	2	0	0	0
0515-0530	2	0	0	2
0530-0545	0	0	0	0
0545-0600	1	0	0	0
0600-0615	4	0	0	0
0615-0630	0	0	1	0
0630-0645	1	0	0	4
0645-0700	1	0	0	1

	BICYCLIST MOVEMENTS			
15-MINUTE PERIOD	NORTH LEG A	EAST LEG B	SOUTH LEG C	WEST LEG D
0400-0415	0	0	0	0
0415-0430	0	1	0	0
0430-0445	0	0	0	0
0445-0500	0	0	0	0
0500-0515	0	0	0	0
0515-0530	0	0	0	0
0530-0545	0	0	0	0
0545-0600	0	0	0	0
0600-0615	0	0	0	1
0615-0630	0	0	0	1
0630-0645	0	0	0	0
0645-0700	0	1	0	0

	PEDESTRIAN MOVEMENTS				
1-HOUR PERIOD	NORTH LEG A	EAST LEG B	SOUTH LEG C	WEST LEG D	TOTALS
0400-0500	1	3	0	5	9
0415-0515	3	1	0	4	8
0430-0530	4	1	0	6	11
0445-0545	4	0	0	4	8
0500-0600	5	0	0	2	7
0515-0615	7	0	0	2	9
0530-0630	5	0	1	0	6
0545-0645	6	0	1	4	11
0600-0700	6	0	1	5	12

	BICYCLIST MOVEMENTS				
1-HOUR PERIOD	NORTH LEG A	EAST LEG B	SOUTH LEG C	WEST LEG D	TOTALS
0400-0500	0	1	0	0	1
0415-0515	0	1	0	0	1
0430-0530	0	0	0	0	0
0445-0545	0	0	0	0	0
0500-0600	0	0	0	0	0
0515-0615	0	0	0	1	1
0530-0630	0	0	0	2	2
0545-0645	0	0	0	2	2
0600-0700	0	1	0	2	3

THE TRAFFIC SOLUTION
9 ALTA STREET UNIT E
ARCADIA, CALIFORNIA 91006
626.485.8048 PHONE
trafsolutn@aol.com

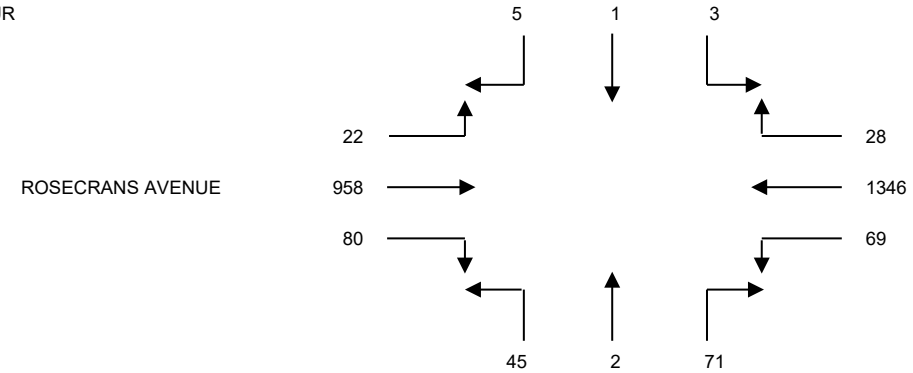
INTERSECTION TURNING MOVEMENT COUNT SUMMARY

CLIENT: LLG - PASADENA
PROJECT: CITY OF GARDENA
DATE: TUESDAY, MAY 21, 2019
PERIOD: 07:00 AM TO 10:00 AM
INTERSECTION: N/S GRAMERCY PLACE
E/W ROSECRANS AVENUE
FILE NUMBER: 5_AM

15 MINUTE	1	2	3	4	5	6	7	8	9	10	11	12
TOTALS	SBRT	SBTH	SBLT	WBRT	WBTH	WBLT	NBRT	NBTH	NBLT	EBRT	EBTH	EBLT
0700-0715	2	0	0	6	362	4	8	0	4	2	167	1
0715-0730	0	0	1	7	333	7	14	0	6	5	198	1
0730-0745	0	0	0	5	351	12	11	1	14	15	234	3
0745-0800	3	1	1	7	340	27	19	0	12	28	265	3
0800-0815	1	0	1	10	336	19	22	1	11	27	233	5
0815-0830	1	0	1	6	319	11	19	0	8	10	226	11
0830-0845	0	0	0	9	325	8	17	0	5	8	225	5
0845-0900	0	0	0	4	271	8	10	1	6	9	199	7
0900-0915	3	0	0	6	253	6	11	0	6	7	182	3
0915-0930	1	0	0	2	256	4	11	0	9	13	160	2
0930-0945	1	0	0	0	269	5	15	0	6	11	189	2
0945-1000	3	0	0	1	241	6	8	1	7	7	190	5

1 HOUR	1	2	3	4	5	6	7	8	9	10	11	12	
TOTALS	SBRT	SBTH	SBLT	WBRT	WBTH	WBLT	NBRT	NBTH	NBLT	EBRT	EBTH	EBLT	TOTALS
0700-0800	5	1	2	25	1386	50	52	1	36	50	864	8	2480
0715-0815	4	1	3	29	1360	65	66	2	43	75	930	12	2590
0730-0830	5	1	3	28	1346	69	71	2	45	80	958	22	2630
0745-0845	5	1	3	32	1320	65	77	1	36	73	949	24	2586
0800-0900	2	0	2	29	1251	46	68	2	30	54	883	28	2395
0815-0915	4	0	1	25	1168	33	57	1	25	34	832	26	2206
0830-0930	4	0	0	21	1105	26	49	1	26	37	766	17	2052
0845-0945	5	0	0	12	1049	23	47	1	27	40	730	14	1948
0900-1000	8	0	0	9	1019	21	45	1	28	38	721	12	1902

A.M. PEAK HOUR
0730-0830



DATA PROVIDED BY:

THE TRAFFIC SOLUTION
329 DIAMOND STREET
ARCADIA, CALIFORNIA 91005
PH: 626-446-7978
FAX: 626-446-2877
.

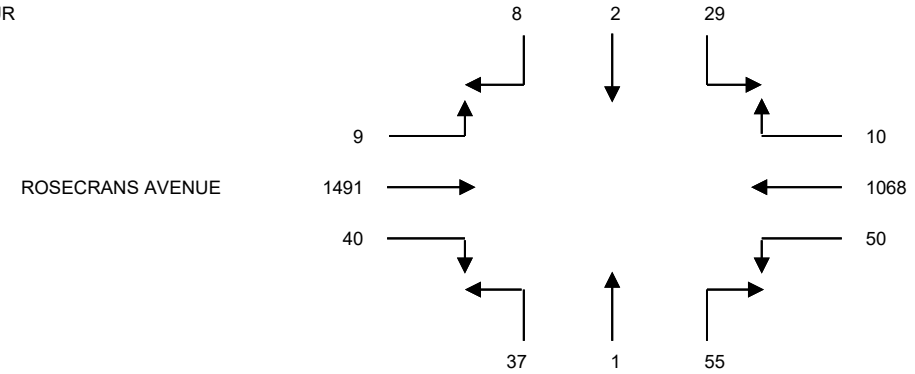
INTERSECTION TURNING MOVEMENT COUNT SUMMARY

CLIENT: LLG - PASADENA
PROJECT: CITY OF GARDENA
DATE: TUESDAY, MAY 21, 2019
PERIOD: 04:00 PM TO 07:00 PM
INTERSECTION: N/S GRAMERCY PLACE
E/W ROSECRANS AVENUE
FILE NUMBER: 5_PM

15 MINUTE	1	2	3	4	5	6	7	8	9	10	11	12
TOTALS	SBRT	SBTH	SBLT	WBRT	WBTH	WBLT	NBRT	NBTH	NBLT	EBRT	EBTH	EBLT
0400-0415	2	1	9	2	203	11	22	0	13	17	346	1
0415-0430	3	0	6	4	216	10	18	0	8	11	354	3
0430-0445	2	0	8	0	224	9	10	0	9	15	359	3
0445-0500	1	0	7	3	249	13	16	0	7	11	365	2
0500-0515	3	1	8	1	252	15	15	1	9	14	387	4
0515-0530	1	1	5	3	292	12	13	0	12	9	374	2
0530-0545	3	0	9	3	275	10	11	0	9	6	365	1
0545-0600	2	0	7	1	259	11	13	0	10	10	355	1
0600-0615	7	0	4	0	283	7	7	0	6	14	357	2
0615-0630	5	0	1	0	247	8	14	0	9	9	333	1
0630-0645	3	0	0	0	210	8	5	0	4	13	320	3
0645-0700	2	0	1	2	193	5	8	0	5	15	310	1

1 HOUR	1	2	3	4	5	6	7	8	9	10	11	12	
TOTALS	SBRT	SBTH	SBLT	WBRT	WBTH	WBLT	NBRT	NBTH	NBLT	EBRT	EBTH	EBLT	TOTALS
0400-0500	8	1	30	9	892	43	66	0	37	54	1424	9	2573
0415-0515	9	1	29	8	941	47	59	1	33	51	1465	12	2656
0430-0530	7	2	28	7	1017	49	54	1	37	49	1485	11	2747
0445-0545	8	2	29	10	1068	50	55	1	37	40	1491	9	2800
0500-0600	9	2	29	8	1078	48	52	1	40	39	1481	8	2795
0515-0615	13	1	25	7	1109	40	44	0	37	39	1451	6	2772
0530-0630	17	0	21	4	1064	36	45	0	34	39	1410	5	2675
0545-0645	17	0	12	1	999	34	39	0	29	46	1365	7	2549
0600-0700	17	0	6	2	933	28	34	0	24	51	1320	7	2422

P.M. PEAK HOUR
0445-0545



DATA PROVIDED BY:

THE TRAFFIC SOLUTION
329 DIAMOND STREET
ARCADIA, CALIFORNIA 91005
PH: 626-446-7978
FAX: 626-446-2877
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PEDESTRIAN - BICYCLE COUNT SUMMARY

CLIENT: LLG - PASADENA

PROJECT: CITY OF GARDENA

DATE: TUESDAY, MAY 21, 2019

PERIOD: 07:00 AM TO 10:00 AM

INTERSECTION: GRAMERCY PLACE / ROSECRANS AVENUE

FILE: 5AMPED-BIKE

	PEDESTRIAN MOVEMENTS			
15-MINUTE PERIOD	NORTH LEG A	EAST LEG B	SOUTH LEG C	WEST LEG D
0700-0715	0	0	0	0
0715-0730	1	0	0	0
0730-0745	1	0	1	1
0745-0800	2	1	1	5
0800-0815	0	0	0	0
0815-0830	0	0	1	0
0830-0845	1	0	1	0
0845-0900	1	0	0	0
0900-0915	0	0	2	0
0915-0930	1	0	1	0
0930-0945	2	0	2	0
0945-1000	1	0	1	0

	BICYCLIST MOVEMENTS			
15-MINUTE PERIOD	NORTH LEG A	EAST LEG B	SOUTH LEG C	WEST LEG D
0700-0715	1	0	1	0
0715-0730	0	0	1	0
0730-0745	0	0	1	0
0745-0800	1	0	2	0
0800-0815	1	0	1	0
0815-0830	1	0	0	0
0830-0845	0	0	0	0
0845-0900	0	0	1	0
0900-0915	0	0	0	0
0915-0930	0	0	0	0
0930-0945	0	0	0	0
0945-1000	0	0	3	0

	PEDESTRIAN MOVEMENTS				
1-HOUR PERIOD	NORTH LEG A	EAST LEG B	SOUTH LEG C	WEST LEG D	TOTALS
0700-0800	4	1	2	6	13
0715-0815	4	1	2	6	13
0730-0830	3	1	3	6	13
0745-0845	3	1	3	5	12
0800-0900	2	0	2	0	4
0815-0915	2	0	4	0	6
0830-0930	3	0	4	0	7
0845-0945	4	0	5	0	9
0900-1000	4	0	6	0	10

	BICYCLIST MOVEMENTS				
1-HOUR PERIOD	NORTH LEG A	EAST LEG B	SOUTH LEG C	WEST LEG D	TOTALS
0700-0800	2	0	5	0	7
0715-0815	2	0	5	0	7
0730-0830	3	0	4	0	7
0745-0845	3	0	3	0	6
0800-0900	2	0	2	0	4
0815-0915	1	0	1	0	2
0830-0930	0	0	1	0	1
0845-0945	0	0	1	0	1
0900-1000	0	0	3	0	3

THE TRAFFIC SOLUTION
9 ALTA STREET UNIT E
ARCADIA, CALIFORNIA 91006
626.485.8048 PHONE
trafsolutn@aol.com

PEDESTRIAN - BICYCLE COUNT SUMMARY

CLIENT: LLG - PASADENA
PROJECT: CITY OF GARDENA
DATE: TUESDAY, MAY 21, 2019
PERIOD: 04:00 PM TO 07:00 PM
INTERSECTION: GRAMERCY PLACE / ROSECRANS AVENUE

FILE: 5PMPED-BIKE

	PEDESTRIAN MOVEMENTS			
15-MINUTE PERIOD	NORTH LEG A	EAST LEG B	SOUTH LEG C	WEST LEG D
0400-0415	1	0	1	0
0415-0430	3	0	0	0
0430-0445	2	1	0	0
0445-0500	3	1	1	0
0500-0515	0	0	1	0
0515-0530	1	0	2	2
0530-0545	1	1	1	0
0545-0600	0	0	1	0
0600-0615	0	0	0	0
0615-0630	2	0	1	0
0630-0645	2	0	0	0
0645-0700	1	0	0	0

	BICYCLIST MOVEMENTS			
15-MINUTE PERIOD	NORTH LEG A	EAST LEG B	SOUTH LEG C	WEST LEG D
0400-0415	3	0	0	0
0415-0430	0	0	0	0
0430-0445	2	0	0	0
0445-0500	1	0	2	0
0500-0515	2	0	1	0
0515-0530	1	0	0	0
0530-0545	0	0	0	0
0545-0600	2	0	0	0
0600-0615	1	0	0	0
0615-0630	0	0	0	0
0630-0645	0	0	0	0
0645-0700	0	0	0	0

	PEDESTRIAN MOVEMENTS				
1-HOUR PERIOD	NORTH LEG A	EAST LEG B	SOUTH LEG C	WEST LEG D	TOTALS
0400-0500	9	2	2	0	13
0415-0515	8	2	2	0	12
0430-0530	6	2	4	2	14
0445-0545	5	2	5	2	14
0500-0600	2	1	5	2	10
0515-0615	2	1	4	2	9
0530-0630	3	1	3	0	7
0545-0645	4	0	2	0	6
0600-0700	5	0	1	0	6

	BICYCLIST MOVEMENTS				
1-HOUR PERIOD	NORTH LEG A	EAST LEG B	SOUTH LEG C	WEST LEG D	TOTALS
0400-0500	6	0	2	0	8
0415-0515	5	0	3	0	8
0430-0530	6	0	3	0	9
0445-0545	4	0	3	0	7
0500-0600	5	0	1	0	6
0515-0615	4	0	0	0	4
0530-0630	3	0	0	0	3
0545-0645	3	0	0	0	3
0600-0700	1	0	0	0	1

THE TRAFFIC SOLUTION
9 ALTA STREET UNIT E
ARCADIA, CALIFORNIA 91006
626.485.8048 PHONE
trafsolutn@aol.com

DRIVEWAY COUNT SUMMARY

CLIENT: LLG - PASADENA
PROJECT: CITY OF GARDENA
DATE: TUESDAY, MAY 21, 2019
PERIOD: 07:00 AM TO 10:00 AM
LOCATION: 2129 W. ROSECRANS AVENUE

FILE NUMBER: 6_AM

15 MINUTE	ENTRANCE		EXIT	
TOTALS	WBRT	EBLT	SBRT	SBLT
0700-0715	7	1	2	0
0715-0730	2	1	1	0
0730-0745	3	1	0	0
0745-0800	1	2	0	0
0800-0815	1	2	2	0
0815-0830	2	5	1	0
0830-0845	5	2	1	0
0845-0900	2	4	4	0
0900-0915	3	3	3	0
0915-0930	6	6	3	0
0930-0945	2	2	4	0
0945-1000	2	3	5	0

1 HOUR	ENTRANCE		EXIT		TOTALS	
TOTALS	WBRT	EBLT	SBRT	SBLT	ENTRANCE	EXIT
0700-0800	13	5	3	0	18	3
0715-0815	7	6	3	0	13	3
0730-0830	7	10	3	0	17	3
0745-0845	9	11	4	0	20	4
0800-0900	10	13	8	0	23	8
0815-0915	12	14	9	0	26	9
0830-0930	16	15	11	0	31	11
0845-0945	13	15	14	0	28	14
0900-1000	13	14	15	0	27	15

DATA PROVIDED BY:

THE TRAFFIC SOLUTION
329 DIAMOND STREET
ARCADIA, CALIFORNIA 91005
PH: 626-446-7978
FAX: 626-446-2877
.

DRIVEWAY COUNT SUMMARY

CLIENT: LLG - PASADENA
PROJECT: CITY OF GARDENA
DATE: TUESDAY, MAY 21, 2019
PERIOD: 04:00 PM TO 07:00 PM
LOCATION: 2129 W. ROSECRANS AVENUE

FILE NUMBER: 6_PM

15 MINUTE	ENTRANCE		EXIT	
TOTALS	WBRT	EBLT	SBRT	SBLT
0400-0415	0	0	6	1
0415-0430	3	1	2	0
0430-0445	0	1	7	0
0445-0500	0	1	5	0
0500-0515	0	1	1	0
0515-0530	0	0	4	0
0530-0545	1	0	1	0
0545-0600	0	0	1	1
0600-0615	0	0	0	1
0615-0630	0	2	1	0
0630-0645	1	1	1	0
0645-0700	0	0	2	0

1 HOUR	ENTRANCE		EXIT		TOTALS	
TOTALS	WBRT	EBLT	SBRT	SBLT	ENTRANCE	EXIT
0400-0500	3	3	20	1	6	21
0415-0515	3	4	15	0	7	15
0430-0530	0	3	17	0	3	17
0445-0545	1	2	11	0	3	11
0500-0600	1	1	7	1	2	8
0515-0615	1	0	6	2	1	8
0530-0630	1	2	3	2	3	5
0545-0645	1	3	3	2	4	5
0600-0700	1	3	4	1	4	5

DATA PROVIDED BY:

THE TRAFFIC SOLUTION
329 DIAMOND STREET
ARCADIA, CALIFORNIA 91005
PH: 626-446-7978
FAX: 626-446-2877
.

APPENDIX C

INTERNAL CAPTURE TRIPS CALCULATIONS

NCHRP 684 Internal Trip Capture Estimation Tool			
Project Name:	2129 W. Rosecrans Avenue Mixed-Use	**Organization:**	LLG Engineers
Project Location:	2101 -2129 W. Rosecrans Avenue,	**Performed By:**	GT
Scenario Description:	Proposed Project	**Date:**	2/10/2020
Analysis Year:	To Be Determined	**Checked By:**	
Analysis Period:	**AM Street Peak Hour**	**Date:**	

Table 1-A: Base Vehicle-Trip Generation Estimates (Single-Use Site Estimate)

Land Use	Development Data (*For Information Only*)			Estimated Vehicle-Trips[3]		
	ITE LUCs[1]	Quantity	Units	Total	Entering	Exiting
Office	710	4	KSF	4	3	1
Retail	820	5	KSF	5	3	2
Restaurant				0		
Cinema/Entertainment				0		
Residential	210/221	105	DU	53	14	39
Hotel				0		
All Other Land Uses[2]				0		
				62	20	42

Table 2-A: Mode Split and Vehicle Occupancy Estimates

Land Use	Entering Trips			Exiting Trips		
	Veh. Occ.[4]	% Transit	% Non-Motorized	Veh. Occ.[4]	% Transit	% Non-Motorized
Office	1.00	0%	0%			
Retail	1.00	0%	0%			
Restaurant						
Cinema/Entertainment						
Residential	1.00	0%	0%			
Hotel						
All Other Land Uses[2]						

Table 3-A: Average Land Use Interchange Distances (Feet Walking Distance)

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office						
Retail						
Restaurant						
Cinema/Entertainment						
Residential						
Hotel						

Table 4-A: Internal Person-Trip Origin-Destination Matrix*

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		0	0	0	0	0
Retail	0		0	0	0	0
Restaurant	0	0		0	0	0
Cinema/Entertainment	0	0	0		0	0
Residential	0	0	0	0		0
Hotel	0	0	0	0	0	

Table 5-A: Computations Summary

	Total	Entering	Exiting
All Person-Trips	62	20	42
Internal Capture Percentage	0%	0%	0%
External Vehicle-Trips[5]	62	20	42
External Transit-Trips[6]	0	0	0
External Non-Motorized Trips[6]	0	0	0

Table 6-A: Internal Trip Capture Percentages by Land Use

Land Use	Entering Trips	Exiting Trips
Office	0%	0%
Retail	0%	0%
Restaurant	N/A	N/A
Cinema/Entertainment	N/A	N/A
Residential	0%	0%
Hotel	N/A	N/A

[1]Land Use Codes (LUCs) from *Trip Generation Manual*, published by the Institute of Transportation Engineers.

[2]Total estimate for all other land uses at mixed-use development site is not subject to internal trip capture computations in this estimator.

[3]Enter trips assuming no transit or non-motorized trips (as assumed in ITE *Trip Generation Manual*).

[4]Enter vehicle occupancy assumed in Table 1-A vehicle trips. If vehicle occupancy changes for proposed mixed-use project, manual adjustments must be made to Tables 5-A, 9-A (O and D). Enter transit, non-motorized percentages that will result with proposed mixed-use project complete.

[5]Vehicle-trips computed using the mode split and vehicle occupancy values provided in Table 2-A.

[6]Person-Trips

*Indicates computation that has been rounded to the nearest whole number.

Estimation Tool Developed by the Texas A&M Transportation Institute - Version 2013.1

Project Name:	2129 W. Rosecrans Avenue Mixed-Use
Analysis Period:	**AM Street Peak Hour**

Table 7-A: Conversion of Vehicle-Trip Ends to Person-Trip Ends

Land Use	Table 7-A (D): Entering Trips			Table 7-A (O): Exiting Trips		
	Veh. Occ.	Vehicle-Trips	Person-Trips*	Veh. Occ.	Vehicle-Trips	Person-Trips*
Office	1.00	3	3	1.00	1	1
Retail	1.00	3	3	1.00	2	2
Restaurant	1.00	0	0	1.00	0	0
Cinema/Entertainment	1.00	0	0	1.00	0	0
Residential	1.00	14	14	1.00	39	39
Hotel	1.00	0	0	1.00	0	0

Table 8-A (O): Internal Person-Trip Origin-Destination Matrix (Computed at Origin)

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		0	1	0	0	0
Retail	1		0	0	0	0
Restaurant	0	0		0	0	0
Cinema/Entertainment	0	0	0		0	0
Residential	1	0	8	0		0
Hotel	0	0	0	0	0	

Table 8-A (D): Internal Person-Trip Origin-Destination Matrix (Computed at Destination)

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		1	0	0	0	0
Retail	0		0	0	0	0
Restaurant	0	0		0	1	0
Cinema/Entertainment	0	0	0		0	0
Residential	0	1	0	0		0
Hotel	0	0	0	0	0	

Table 9-A (D): Internal and External Trips Summary (Entering Trips)

Destination Land Use	Person-Trip Estimates			External Trips by Mode*		
	Internal	External	Total	Vehicles[1]	Transit[2]	Non-Motorized[2]
Office	0	3	3	3	0	0
Retail	0	3	3	3	0	0
Restaurant	0	0	0	0	0	0
Cinema/Entertainment	0	0	0	0	0	0
Residential	0	14	14	14	0	0
Hotel	0	0	0	0	0	0
All Other Land Uses[3]	0	0	0	0	0	0

Table 9-A (O): Internal and External Trips Summary (Exiting Trips)

Origin Land Use	Person-Trip Estimates			External Trips by Mode*		
	Internal	External	Total	Vehicles[1]	Transit[2]	Non-Motorized[2]
Office	0	1	1	1	0	0
Retail	0	2	2	2	0	0
Restaurant	0	0	0	0	0	0
Cinema/Entertainment	0	0	0	0	0	0
Residential	0	39	39	39	0	0
Hotel	0	0	0	0	0	0
All Other Land Uses[3]	0	0	0	0	0	0

[1]Vehicle-trips computed using the mode split and vehicle occupancy values provided in Table 2-A

[2]Person-Trips

[3]Total estimate for all other land uses at mixed-use development site is not subject to internal trip capture computations in this estimator

*Indicates computation that has been rounded to the nearest whole number.

NCHRP 684 Internal Trip Capture Estimation Tool			
Project Name:	2129 W. Rosecrans Avenue Mixed-Use	**Organization:**	LLG Engineers
Project Location:	2101 -2129 W. Rosecrans Avenue,	**Performed By:**	GT
Scenario Description:	Proposed Project	**Date:**	2/10/2020
Analysis Year:	To Be Determined	**Checked By:**	
Analysis Period:	**PM Street Peak Hour**	**Date:**	

Table 1-P: Base Vehicle-Trip Generation Estimates (Single-Use Site Estimate)

Land Use	Development Data (*For Information Only*)			Estimated Vehicle-Trips[3]		
	ITE LUCs[1]	Quantity	Units	Total	Entering	Exiting
Office	710	4	KSF	4	1	3
Retail	820	5	KSF	19	9	10
Restaurant				0		
Cinema/Entertainment				0		
Residential	210/221	105	DU	69	43	26
Hotel				0		
All Other Land Uses[2]				0		
				92	53	39

Table 2-P: Mode Split and Vehicle Occupancy Estimates

Land Use	Entering Trips			Exiting Trips		
	Veh. Occ.[4]	% Transit	% Non-Motorized	Veh. Occ.[4]	% Transit	% Non-Motorized
Office	1.00	0%	0%			
Retail	1.00	0%	0%			
Restaurant						
Cinema/Entertainment						
Residential	1.00	0%	0%			
Hotel						
All Other Land Uses[2]						

Table 3-P: Average Land Use Interchange Distances (Feet Walking Distance)

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office						
Retail						
Restaurant						
Cinema/Entertainment						
Residential						
Hotel						

Table 4-P: Internal Person-Trip Origin-Destination Matrix*

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		1	0	0	0	0
Retail	0		0	0	3	0
Restaurant	0	0		0	0	0
Cinema/Entertainment	0	0	0		0	0
Residential	0	1	0	0		0
Hotel	0	0	0	0	0	

Table 5-P: Computations Summary

	Total	Entering	Exiting
All Person-Trips	92	53	39
Internal Capture Percentage	11%	9%	13%
External Vehicle-Trips[5]	82	48	34
External Transit-Trips[6]	0	0	0
External Non-Motorized Trips[6]	0	0	0

Table 6-P: Internal Trip Capture Percentages by Land Use

Land Use	Entering Trips	Exiting Trips
Office	0%	33%
Retail	22%	30%
Restaurant	N/A	N/A
Cinema/Entertainment	N/A	N/A
Residential	7%	4%
Hotel	N/A	N/A

[1]Land Use Codes (LUCs) from *Trip Generation Manual*, published by the Institute of Transportation Engineers.

[2]Total estimate for all other land uses at mixed-use development site is not subject to internal trip capture computations in this estimator.

[3]Enter trips assuming no transit or non-motorized trips (as assumed in ITE *Trip Generation Manual*).

[4]Enter vehicle occupancy assumed in Table 1-P vehicle trips. If vehicle occupancy changes for proposed mixed-use project, manual adjustments must be made

[5]Vehicle-trips computed using the mode split and vehicle occupancy values provided in Table 2-P.

[6]Person-Trips

*Indicates computation that has been rounded to the nearest whole number.

Project Name:	2129 W. Rosecrans Avenue Mixed-Use
Analysis Period:	**PM Street Peak Hour**

Table 7-P: Conversion of Vehicle-Trip Ends to Person-Trip Ends

Land Use	Table 7-P (D): Entering Trips			Table 7-P (O): Exiting Trips		
	Veh. Occ.	Vehicle-Trips	Person-Trips*	Veh. Occ.	Vehicle-Trips	Person-Trips*
Office	1.00	1	1	1.00	3	3
Retail	1.00	9	9	1.00	10	10
Restaurant	1.00	0	0	1.00	0	0
Cinema/Entertainment	1.00	0	0	1.00	0	0
Residential	1.00	43	43	1.00	26	26
Hotel	1.00	0	0	1.00	0	0

Table 8-P (O): Internal Person-Trip Origin-Destination Matrix (Computed at Origin)

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		1	0	0	0	0
Retail	0		3	0	3	1
Restaurant	0	0		0	0	0
Cinema/Entertainment	0	0	0		0	0
Residential	1	11	5	0		1
Hotel	0	0	0	0	0	

Table 8-P (D): Internal Person-Trip Origin-Destination Matrix (Computed at Destination)

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		1	0	0	2	0
Retail	0		0	0	20	0
Restaurant	0	5		0	7	0
Cinema/Entertainment	0	0	0		2	0
Residential	1	1	0	0		0
Hotel	0	0	0	0	0	

Table 9-P (D): Internal and External Trips Summary (Entering Trips)

Destination Land Use	Person-Trip Estimates			External Trips by Mode*		
	Internal	External	Total	Vehicles[1]	Transit[2]	Non-Motorized[2]
Office	0	1	1	1	0	0
Retail	2	7	9	7	0	0
Restaurant	0	0	0	0	0	0
Cinema/Entertainment	0	0	0	0	0	0
Residential	3	40	43	40	0	0
Hotel	0	0	0	0	0	0
All Other Land Uses[3]	0	0	0	0	0	0

Table 9-P (O): Internal and External Trips Summary (Exiting Trips)

Origin Land Use	Person-Trip Estimates			External Trips by Mode*		
	Internal	External	Total	Vehicles[1]	Transit[2]	Non-Motorized[2]
Office	1	2	3	2	0	0
Retail	3	7	10	7	0	0
Restaurant	0	0	0	0	0	0
Cinema/Entertainment	0	0	0	0	0	0
Residential	1	25	26	25	0	0
Hotel	0	0	0	0	0	0
All Other Land Uses[3]	0	0	0	0	0	0

[1]Vehicle-trips computed using the mode split and vehicle occupancy values provided in Table 2-P

[2]Person-Trips

[3]Total estimate for all other land uses at mixed-use development site is not subject to internal trip capture computations in this estimator

*Indicates computation that has been rounded to the nearest whole number.

APPENDIX D

ICU AND LEVELS OF SERVICE EXPLANATION
ICU DATA WORKSHEETS – WEEKDAY AM AND PM PEAK HOURS

INTERSECTION CAPACITY UTILIZATION (ICU) DESCRIPTION

Level of Service is a term used to describe prevailing conditions and their effect on traffic. Broadly interpreted, the Levels of Service concept denotes any one of a number of differing combinations of operating conditions which may occur as a roadway is accommodating various traffic volumes. Level of Service is a qualitative measure of the effect of such factors as travel speed, travel time, traffic interruptions, freedom to maneuver, safety, driving comfort and convenience.

Six Levels of Service, A through F, have been defined in the 1965 *Highway Capacity Manual*, published by the Transportation Research Board. Level of Service A describes a condition of free flow, with low traffic volumes and relatively high speeds, while Level of Service F describes forced traffic flow at low speeds with jammed conditions and queues which cannot clear during the green phases.

The Intersection Capacity Utilization (ICU) method of intersection capacity analysis has been used in our studies. It directly relates traffic demand and available capacity for key intersection movements, regardless of present signal timing, The capacity per hour of green time for each approach is calculated based on the methods of the *Highway Capacity Manual*. The proportion of total signal time needed by each key movement is determined and compared to the total time available (100 percent of the hour). The result of summing the requirements of the conflicting key movements plus an allowance for clearance times is expressed as a decimal fraction. Conflicting key traffic movements are those opposing movements whose combined green time requirements are greatest.

The resulting ICU represents the proportion of the total hour required to accommodate intersection demand volumes if the key conflicting traffic movements are operating at capacity. Other movements may be operating near capacity, or may be operating at significantly better levels. The ICU may be translated to a Level of Service as tabulated below.

The Levels of Service (abbreviated from the *Highway Capacity Manual*) are listed here with their corresponding ICU and Load Factor equivalents. Load Factor is that proportion of the signal cycles during the peak hour which are fully loaded; i.e. when all of the vehicles waiting at the beginning of green are not able to clear on that green phase.

Intersection Capacity Utilization Characteristics

Level of Service	Load Factor	Equivalent ICU
A	0.0	0.00 - 0.60
B	0.0 - 0.1	0.61 - 0.70
C	0.1 - 0.3	0.71 - 0.80
D	0.3 - 0.7	0.81 - 0.90
E	0.7 - 1.0	0.91 - 1.00
F	Not Applicable	Not Applicable

SERVICE LEVEL A
There are no loaded cycles and few are even close to loaded at this service level. No approach phase is fully utilized by traffic and no vehicle waits longer than one red indication.

SERVICE LEVEL B
This level represents stable operation where an occasional approach phase is fully utilized and a substantial number are approaching full use. Many drivers begin to feel restricted within platoons of vehicles.

SERVICE LEVEL C
At this level stable operation continues. Loading is still intermittent but more frequent than at Level B. Occasionally drivers may have to wait through more than one red signal indication and backups may develop behind turning vehicles. Most drivers feel somewhat restricted, but not objectionably so.

SERVICE LEVEL D
This level encompasses a zone of increasing restriction approaching instability at the intersection. Delays to approaching vehicles may be substantial during short peaks within the peak hour, but enough cycles with lower demand occur to permit periodic clearance of queues, thus preventing excessive backups. Drivers frequently have to wait through more than one red signal. This level is the lower limit of acceptable operation to most drivers.

SERVICE LEVEL E
This represents near capacity and capacity operation. At capacity (ICU = 1.0) it represents the most vehicles that the particular intersection can accommodate. However, full utilization of every signal cycle is seldom attained no matter how great the demand. At this level all drivers wait through more than one red signal, and frequently through several.

SERVICE LEVEL F
Jammed conditions. Traffic backed up from a downstream location on one of the street restricts or prevents movement of traffic through the intersection under consideration.

LINSCOTT, LAW & GREENSPAN, ENGINEERS
600 S. Lake Avenue, Ste 500, Pasadena 91106
(626) 796.2322 Fax (626) 792.0941

INTERSECTION CAPACITY UTILIZATION

Purche Avenue @ Rosecrans Avenue

N-S St: Purche Avenue
E-W St: Rosecrans Avenue
Project: Rosecrans Place Project/1-19-4343-2
File: ICU1

Peak hr: AM
Annual Growth: 1.00%

Date: 2/13/2020
Date of Count: 2019
Projection Year: 2022

	2019 EXISTING TRAFFIC			2019 EXISTING WITH PROJECT				2019 EXISTING W/ PROJECT + MITIGATION				2022 FUTURE PRE-PROJECT					2022 FUTURE WITH PROJECT			
Movement	1 Volume	2 Capacity	V/C Ratio	Added Volume	Total Volume	2 Capacity	V/C Ratio	Added Volume	Total Volume	2 Capacity	V/C Ratio	Added Amb. Grow. Volume	Added Rel. Proj. Volume	Total Volume	2 Capacity	V/C Ratio	Added Volume	Total Volume	2 Capacity	V/C Ratio
NB Left [3]	5	0	0.003	0	5	0	0.003	0	5	0	0.003	0	0	5	0	0.003	0	5	0	0.003
NB Thru [3]	1	1600	0.004 *	0	1	1600	0.004 *	0	1	1600	0.004 *	0	0	1	1600	0.004 *	0	1	1600	0.004 *
NB Right [3]	1	0	0.000	0	1	0	0.000	0	1	0	0.000	0	0	1	0	0.000	0	1	0	0.000
SB Left [3]	38	1600	0.024	0	38	1600	0.024	0	38	1600	0.024	1	0	39	1600	0.024	0	39	1600	0.024
SB Thru [3]	2	1600	0.061 *	0	2	1600	0.061 *	0	2	1600	0.061 *	0	0	2	1600	0.063 *	0	2	1600	0.063 *
SB Right [3]	95	0	0.000	0	95	0	0.000	0	95	0	0.000	3	0	98	0	0.000	0	98	0	0.000
EB Left	20	1600	0.013 *	0	20	1600	0.013 *	0	20	1600	0.013 *	1	0	21	1600	0.013 *	0	21	1600	0.013 *
EB Thru	907	4800	0.190	0	907	4800	0.190	0	907	4800	0.190	27	23	957	4800	0.200	0	957	4800	0.200
EB Right	3	0	0.000	0	3	0	0.000	0	3	0	0.000	0	0	3	0	0.000	0	3	0	0.000
WB Left	5	1600	0.003	0	5	1600	0.003	0	5	1600	0.003	0	0	5	1600	0.003	0	5	1600	0.003
WB Thru	1275	4800	0.272 *	10	1285	4800	0.274 *	0	1285	4800	0.274 *	39	12	1326	4800	0.283 *	10	1336	4800	0.285 *
WB Right	31	0	0.000	0	31	0	0.000	0	31	0	0.000	1	0	32	0	0.000	0	32	0	0.000
Yellow Allowance			0.100 *				0.100 *				0.100 *					0.100 *				0.100 *
ICU			0.450				0.452				0.452					0.463				0.465
LOS			A				A				A					A				A

** Key conflicting movement as a part of ICU*
1 Counts conducted by: The Traffic Solution
2 Capacity expressed in veh/hour of green
3 Northbound and Southbound approaches operate under split phasing.

LINSCOTT, LAW & GREENSPAN, ENGINEERS
600 S. Lake Avenue, Ste 500, Pasadena 91106
(626) 796.2322 Fax (626) 792.0941

INTERSECTION CAPACITY UTILIZATION

Purche Avenue @ Rosecrans Avenue

N-S St: Purche Avenue
E-W St: Rosecrans Avenue
Project: Rosecrans Place Project/1-19-4343-2
File: ICU1

Peak hr: PM
Annual Growth: 1.00%

Date: 2/13/2020
Date of Count: 2019
Projection Year: 2022

	2019 EXISTING TRAFFIC			2019 EXISTING WITH PROJECT				2019 EXISTING W/ PROJECT + MITIGATION				2022 FUTURE PRE-PROJECT					2022 FUTURE WITH PROJECT			
Movement	1 Volume	2 Capacity	V/C Ratio	Added Volume	Total Volume	2 Capacity	V/C Ratio	Added Volume	Total Volume	2 Capacity	V/C Ratio	Added Amb. Grow. Volume	Added Rel. Proj. Volume	Total Volume	2 Capacity	V/C Ratio	Added Volume	Total Volume	2 Capacity	V/C Ratio
NB Left [3]	0	0	0.000	0	0	0	0.000	0	0	0	0.000	0	0	0	0	0.000	0	0	0	0.000
NB Thru [3]	1	1600	0.006 *	0	1	1600	0.006 *	0	1	1600	0.006 *	0	0	1	1600	0.006 *	0	1	1600	0.006 *
NB Right [3]	8	0	0.000	0	8	0	0.000	0	8	0	0.000	0	0	8	0	0.000	0	8	0	0.000
SB Left [3]	61	1600	0.038	0	61	1600	0.038	0	61	1600	0.038	2	0	63	1600	0.039	0	63	1600	0.039
SB Thru [3]	0	1600	0.053 *	0	0	1600	0.053 *	0	0	1600	0.053 *	0	0	0	1600	0.054 *	0	0	1600	0.054 *
SB Right [3]	84	0	0.000	0	84	0	0.000	0	84	0	0.000	3	0	87	0	0.000	0	87	0	0.000
EB Left	108	1600	0.068	0	108	1600	0.068	0	108	1600	0.068	3	0	111	1600	0.069	0	111	1600	0.069
EB Thru	1470	4800	0.307 *	13	1483	4800	0.310 *	0	1483	4800	0.310 *	45	19	1534	4800	0.320 *	13	1547	4800	0.323 *
EB Right	4	0	0.000	0	4	0	0.000	0	4	0	0.000	0	0	4	0	0.000	0	4	0	0.000
WB Left	4	1600	0.003 *	0	4	1600	0.003 *	0	4	1600	0.003 *	0	0	4	1600	0.003 *	0	4	1600	0.003 *
WB Thru	1017	4800	0.220	4	1021	4800	0.221	0	1021	4800	0.221	31	24	1072	4800	0.232	4	1076	4800	0.233
WB Right	41	0	0.000	0	41	0	0.000	0	41	0	0.000	1	0	42	0	0.000	0	42	0	0.000
Yellow Allowance			0.100 *				0.100 *				0.100 *					0.100 *				0.100 *
ICU			0.468				0.470				0.470					0.483				0.486
LOS			A				A				A					A				A

** Key conflicting movement as a part of ICU*
1 Counts conducted by: The Traffic Solution
2 Capacity expressed in veh/hour of green
3 Northbound and Southbound approaches operate under split phasing.

LINSCOTT, LAW & GREENSPAN, ENGINEERS
600 S. Lake Avenue, Ste 500, Pasadena 91106
(626) 796.2322 Fax (626) 792.0941

INTERSECTION CAPACITY UTILIZATION

Van Ness Avenue @ 139th Street

N-S St: Van Ness Avenue
E-W St: 139th Street
Project: Rosecrans Place Project/1-19-4343-2
File: ICU2

Peak hr: AM
Annual Growth: 1.00%

Date: 2/13/2020
Date of Count: 2019
Projection Year: 2022

	2019 EXISTING TRAFFIC			2019 EXISTING WITH PROJECT				2019 EXISTING W/ PROJECT + MITIGATION				2022 FUTURE PRE-PROJECT					2022 FUTURE WITH PROJECT			
Movement	1 Volume	2 Capacity	V/C Ratio	Added Volume	Total Volume	2 Capacity	V/C Ratio	Added Volume	Total Volume	2 Capacity	V/C Ratio	Added Amb. Grow. Volume	Added Rel. Proj. Volume	Total Volume	2 Capacity	V/C Ratio	Added Volume	Total Volume	2 Capacity	V/C Ratio
NB Left	24	1600	0.015	0	24	1600	0.015	0	24	1600	0.015	1	0	25	1600	0.016	0	25	1600	0.016
NB Thru	713	3200	0.252 *	5	718	3200	0.253 *	0	718	3200	0.253 *	22	13	748	3200	0.263 *	5	753	3200	0.265 *
NB Right	92	0	0.000	0	92	0	0.000	0	92	0	0.000	3	0	95	0	0.000	0	95	0	0.000
SB Left	78	1600	0.049 *	0	78	1600	0.049 *	0	78	1600	0.049 *	2	0	80	1600	0.050 *	0	80	1600	0.050 *
SB Thru	741	3200	0.247	0	741	3200	0.247	0	741	3200	0.247	22	4	767	3200	0.256	0	767	3200	0.256
SB Right	50	0	0.000	0	50	0	0.000	0	50	0	0.000	2	0	52	0	0.000	0	52	0	0.000
EB Left	91	0	0.057 *	0	91	0	0.057 *	0	91	0	0.057 *	3	0	94	0	0.059 *	0	94	0	0.059 *
EB Thru	57	1600	0.115	0	57	1600	0.115	0	57	1600	0.115	2	0	59	1600	0.119	0	59	1600	0.119
EB Right	36	0	0.000	0	36	0	0.000	0	36	0	0.000	1	0	37	0	0.000	0	37	0	0.000
WB Left	97	1600	0.061	0	97	1600	0.061	0	97	1600	0.061	3	0	100	1600	0.063	0	100	1600	0.063
WB Thru	45	1600	0.130 *	0	45	1600	0.130 *	0	45	1600	0.130 *	1	1	47	1600	0.134 *	0	47	1600	0.134 *
WB Right	163	0	0.000	0	163	0	0.000	0	163	0	0.000	5	0	168	0	0.000	0	168	0	0.000
Yellow Allowance			0.100 *				0.100 *				0.100 *					0.100 *				0.100 *
ICU			0.587				0.589				0.589					0.607				0.608
LOS			A				A				A					B				B

** Key conflicting movement as a part of ICU*
1 Counts conducted by: The Traffic Solution
2 Capacity expressed in veh/hour of green

LINSCOTT, LAW & GREENSPAN, ENGINEERS
600 S. Lake Avenue, Ste 500, Pasadena 91106
(626) 796.2322 Fax (626) 792.0941

INTERSECTION CAPACITY UTILIZATION

Van Ness Avenue @ 139th Street

N-S St: Van Ness Avenue
E-W St: 139th Street
Project: Rosecrans Place Project/1-19-4343-2
File: ICU2

Peak hr: PM
Annual Growth: 1.00%

Date: 2/13/2020
Date of Count: 2019
Projection Year: 2022

	2019 EXISTING TRAFFIC			2019 EXISTING WITH PROJECT				2019 EXISTING W/ PROJECT + MITIGATION				2022 FUTURE PRE-PROJECT					2022 FUTURE WITH PROJECT			
Movement	1 Volume	2 Capacity	V/C Ratio	Added Volume	Total Volume	2 Capacity	V/C Ratio	Added Volume	Total Volume	2 Capacity	V/C Ratio	Added Amb. Grow. Volume	Added Rel. Proj. Volume	Total Volume	2 Capacity	V/C Ratio	Added Volume	Total Volume	2 Capacity	V/C Ratio
NB Left	53	1600	0.033	0	53	1600	0.033	0	53	1600	0.033	2	0	55	1600	0.034	0	55	1600	0.034
NB Thru	731	3200	0.253 *	2	733	3200	0.254 *	0	733	3200	0.254 *	22	9	762	3200	0.264 *	2	764	3200	0.264 *
NB Right	80	0	0.000	0	80	0	0.000	0	80	0	0.000	2	0	82	0	0.000	0	82	0	0.000
SB Left	87	1600	0.054 *	0	87	1600	0.054 *	0	87	1600	0.054 *	3	0	90	1600	0.056 *	0	90	1600	0.056 *
SB Thru	719	3200	0.247	6	725	3200	0.248	0	725	3200	0.248	22	15	756	3200	0.259	6	762	3200	0.261
SB Right	70	0	0.000	0	70	0	0.000	0	70	0	0.000	2	0	72	0	0.000	0	72	0	0.000
EB Left	71	0	0.044	0	71	0	0.044	0	71	0	0.044	2	0	73	0	0.046	0	73	0	0.046
EB Thru	67	1600	0.107 *	0	67	1600	0.107 *	0	67	1600	0.107 *	2	1	70	1600	0.111 *	0	70	1600	0.111 *
EB Right	33	0	0.000	0	33	0	0.000	0	33	0	0.000	1	0	34	0	0.000	0	34	0	0.000
WB Left	93	1600	0.058 *	0	93	1600	0.058 *	0	93	1600	0.058 *	3	0	96	1600	0.060 *	0	96	1600	0.060 *
WB Thru	42	1600	0.076	0	42	1600	0.076	0	42	1600	0.076	1	1	44	1600	0.079	0	44	1600	0.079
WB Right	80	0	0.000	0	80	0	0.000	0	80	0	0.000	2	0	82	0	0.000	0	82	0	0.000
Yellow Allowance			0.100 *				0.100 *				0.100 *					0.100 *				0.100 *
ICU			0.573				0.573				0.573					0.591				0.591
LOS			A				A				A					A				A

** Key conflicting movement as a part of ICU*
1 Counts conducted by: The Traffic Solution
2 Capacity expressed in veh/hour of green

LINSCOTT, LAW & GREENSPAN, ENGINEERS
600 S. Lake Avenue, Ste 500, Pasadena 91106
(626) 796.2322 Fax (626) 792.0941

INTERSECTION CAPACITY UTILIZATION

Van Ness Avenue @ Rosecrans Avenue

N-S St: Van Ness Avenue
E-W St: Rosecrans Avenue
Project: Rosecrans Place Project/1-19-4343-2
File: ICU3

Peak hr: AM
Annual Growth: 1.00%

Date: 2/13/2020
Date of Count: 2019
Projection Year: 2022

	2019 EXISTING TRAFFIC			2019 EXISTING WITH PROJECT				2019 EXISTING W/ PROJECT + MITIGATION				2022 FUTURE PRE-PROJECT					2022 FUTURE WITH PROJECT			
Movement	1 Volume	2 Capacity	V/C Ratio	Added Volume	Total Volume	2 Capacity	V/C Ratio	Added Volume	Total Volume	2 Capacity	V/C Ratio	Added Amb. Grow. Volume	Added Rel. Proj. Volume	Total Volume	2 Capacity	V/C Ratio	Added Volume	Total Volume	2 Capacity	V/C Ratio
NB Left	86	1600	0.054	0	86	1600	0.054	0	86	1600	0.054	3	6	95	1600	0.059	0	95	1600	0.059
NB Thru	537	3200	0.198 *	0	537	3200	0.198 *	0	537	3200	0.198 *	16	7	560	3200	0.208 *	0	560	3200	0.208 *
NB Right	98	0	0.000	0	98	0	0.000	0	98	0	0.000	3	4	105	0	0.000	0	105	0	0.000
SB Left	163	1600	0.102 *	0	163	1600	0.102 *	0	163	1600	0.102 *	5	0	168	1600	0.105 *	0	168	1600	0.105 *
SB Thru	581	3200	0.218	0	581	3200	0.218	0	581	3200	0.218	18	2	601	3200	0.225	0	601	3200	0.225
SB Right	115	0	0.000	0	115	0	0.000	0	115	0	0.000	3	2	120	0	0.000	0	120	0	0.000
EB Left	110	1600	0.069 *	0	110	1600	0.069 *	0	110	1600	0.069 *	3	6	119	1600	0.074 *	0	119	1600	0.074 *
EB Thru	764	4800	0.168	0	764	4800	0.168	0	764	4800	0.168	23	7	794	4800	0.176	0	794	4800	0.176
EB Right	43	0	0.000	0	43	0	0.000	0	43	0	0.000	1	8	52	0	0.000	0	52	0	0.000
WB Left	97	1600	0.061	5	102	1600	0.064	0	102	1600	0.064	3	2	102	1600	0.064	5	107	1600	0.067
WB Thru	1190	4800	0.279 *	10	1200	4800	0.283 *	0	1200	4800	0.283 *	36	5	1231	4800	0.289 *	10	1241	4800	0.292 *
WB Right	151	0	0.000	5	156	0	0.000	0	156	0	0.000	5	0	156	0	0.000	5	161	0	0.000
Yellow Allowance			0.100 *				0.100 *				0.100 *					0.100 *				0.100 *
ICU			0.748				0.752				0.752					0.776				0.779
LOS			C				C				C					C				C

** Key conflicting movement as a part of ICU*
1 Counts conducted by: The Traffic Solution
2 Capacity expressed in veh/hour of green

LINSCOTT, LAW & GREENSPAN, ENGINEERS
600 S. Lake Avenue, Ste 500, Pasadena 91106
(626) 796.2322 Fax (626) 792.0941

INTERSECTION CAPACITY UTILIZATION

Van Ness Avenue @ Rosecrans Avenue

N-S St: Van Ness Avenue
E-W St: Rosecrans Avenue
Project: Rosecrans Place Project/1-19-4343-2
File: ICU3

Peak hr: PM
Annual Growth: 1.00%

Date: 2/13/2020
Date of Count: 2019
Projection Year: 2022

	2019 EXISTING TRAFFIC			2019 EXISTING WITH PROJECT				2019 EXISTING W/ PROJECT + MITIGATION				2022 FUTURE PRE-PROJECT					2022 FUTURE WITH PROJECT			
Movement	1 Volume	2 Capacity	V/C Ratio	Added Volume	Total Volume	2 Capacity	V/C Ratio	Added Volume	Total Volume	2 Capacity	V/C Ratio	Added Amb. Grow. Volume	Added Rel. Proj. Volume	Total Volume	2 Capacity	V/C Ratio	Added Volume	Total Volume	2 Capacity	V/C Ratio
NB Left	98	1600	0.061	0	98	1600	0.061	0	98	1600	0.061	3	9	110	1600	0.069	0	110	1600	0.069
NB Thru	555	3200	0.198 *	0	555	3200	0.200 *	0	555	3200	0.200 *	17	5	577	3200	0.207 *	0	577	3200	0.209 *
NB Right	80	0	0.000	6	86	0	0.000	0	86	0	0.000	2	4	86	0	0.000	6	92	0	0.000
SB Left	162	1600	0.101 *	6	168	1600	0.105 *	0	168	1600	0.105 *	5	0	167	1600	0.104 *	6	173	1600	0.108 *
SB Thru	581	3200	0.214	0	581	3200	0.214	0	581	3200	0.214	18	9	608	3200	0.225	0	608	3200	0.225
SB Right	104	0	0.000	0	104	0	0.000	0	104	0	0.000	3	6	113	0	0.000	0	113	0	0.000
EB Left	163	1600	0.102	0	163	1600	0.102	0	163	1600	0.102	5	4	172	1600	0.108	0	172	1600	0.108
EB Thru	1280	4800	0.283 *	13	1293	4800	0.286 *	0	1293	4800	0.286 *	39	7	1326	4800	0.295 *	13	1339	4800	0.298 *
EB Right	80	0	0.000	0	80	0	0.000	0	80	0	0.000	2	9	91	0	0.000	0	91	0	0.000
WB Left	111	1600	0.069 *	2	113	1600	0.071 *	0	113	1600	0.071 *	3	5	119	1600	0.074 *	2	121	1600	0.076 *
WB Thru	889	4800	0.213	4	893	4800	0.214	0	893	4800	0.214	27	7	923	4800	0.221	4	927	4800	0.222
WB Right	132	0	0.000	2	134	0	0.000	0	134	0	0.000	4	0	136	0	0.000	2	138	0	0.000
Yellow Allowance			0.100 *				0.100 *				0.100 *					0.100 *				0.100 *
ICU			0.752				0.762				0.762					0.781				0.791
LOS			C				C				C					C				C

** Key conflicting movement as a part of ICU*
1 Counts conducted by: The Traffic Solution
2 Capacity expressed in veh/hour of green

LINSCOTT, LAW & GREENSPAN, ENGINEERS
600 S. Lake Avenue, Ste 500, Pasadena 91106
(626) 796.2322 Fax (626) 792.0941

INTERSECTION CAPACITY UTILIZATION

Van Ness Avenue @ 147th Street - 146th Place

N-S St: Van Ness Avenue
E-W St: 147th Street - 146th Place
Project: Rosecrans Place Project/1-19-4343-2
File: ICU4

Peak hr: AM
Annual Growth: 1.00%

Date: 2/13/2020
Date of Count: 2019
Projection Year: 2022

	2019 EXISTING TRAFFIC			2019 EXISTING WITH PROJECT				2019 EXISTING W/ PROJECT + MITIGATION				2022 FUTURE PRE-PROJECT					2022 FUTURE WITH PROJECT			
Movement	1 Volume	2 Capacity	V/C Ratio	Added Volume	Total Volume	2 Capacity	V/C Ratio	Added Volume	Total Volume	2 Capacity	V/C Ratio	Added Amb. Grow. Volume	Added Rel. Proj. Volume	Total Volume	2 Capacity	V/C Ratio	Added Volume	Total Volume	2 Capacity	V/C Ratio
NB Left	49	0	0.015	0	49	0	0.015 *	0	49	0	0.015 *	1	0	50	0	0.016	0	50	0	0.016 *
NB Thru	675	3200	0.238 *	0	675	3200	0.238	0	675	3200	0.238	20	8	703	3200	0.248	0	703	3200	0.248
NB Right	39	0	0.000	0	39	0	0.000	0	39	0	0.000	1	0	40	0	0.000	0	40	0	0.000
SB Left	17	0	0.005 *	0	17	0	0.005	0	17	0	0.005	1	0	18	0	0.006	0	18	0	0.006
SB Thru	659	3200	0.227	5	664	3200	0.229 *	0	664	3200	0.229 *	20	11	690	3200	0.238	5	695	3200	0.239 *
SB Right	51	0	0.000	0	51	0	0.000	0	51	0	0.000	2	0	53	0	0.000	0	53	0	0.000
EB Left	50	0	0.031	0	50	0	0.031	0	50	0	0.031	2	0	52	0	0.033	0	52	0	0.033
EB Thru	51	1600	0.106 *	0	51	1600	0.106 *	0	51	1600	0.106 *	2	0	53	1600	0.109 *	0	53	1600	0.109 *
EB Right	68	0	0.000	0	68	0	0.000	0	68	0	0.000	2	0	70	0	0.000	0	70	0	0.000
WB Left	23	0	0.014 *	0	23	0	0.014 *	0	23	0	0.014 *	1	0	24	0	0.015 *	0	24	0	0.015 *
WB Thru	39	1600	0.049	0	39	1600	0.049	0	39	1600	0.049	1	0	40	1600	0.050	0	40	1600	0.050
WB Right	16	0	0.000	0	16	0	0.000	0	16	0	0.000	0	0	16	0	0.000	0	16	0	0.000
Yellow Allowance			0.100 *				0.100 *				0.100 *					0.100 *				0.100 *
ICU			0.464				0.464				0.464					0.478				0.479
LOS			A				A				A					A				A

** Key conflicting movement as a part of ICU*
1 Counts conducted by: The Traffic Solution
2 Capacity expressed in veh/hour of green

LINSCOTT, LAW & GREENSPAN, ENGINEERS
600 S. Lake Avenue, Ste 500, Pasadena 91106
(626) 796.2322 Fax (626) 792.0941

INTERSECTION CAPACITY UTILIZATION

Van Ness Avenue @ 147th Street - 146th Place

N-S St: Van Ness Avenue
E-W St: 147th Street - 146th Place
Project: Rosecrans Place Project/1-19-4343-2
File: ICU4

Peak hr: PM
Annual Growth: 1.00%

Date: 2/13/2020
Date of Count: 2019
Projection Year: 2022

	2019 EXISTING TRAFFIC			2019 EXISTING WITH PROJECT				2019 EXISTING W/ PROJECT + MITIGATION				2022 FUTURE PRE-PROJECT					2022 FUTURE WITH PROJECT			
Movement	1 Volume	2 Capacity	V/C Ratio	Added Volume	Total Volume	2 Capacity	V/C Ratio	Added Volume	Total Volume	2 Capacity	V/C Ratio	Added Amb. Grow. Volume	Added Rel. Proj. Volume	Total Volume	2 Capacity	V/C Ratio	Added Volume	Total Volume	2 Capacity	V/C Ratio
NB Left	45	0	0.014 *	0	45	0	0.014 *	0	45	0	0.014 *	1	0	46	0	0.014 *	0	46	0	0.014 *
NB Thru	681	3200	0.237	6	687	3200	0.239	0	687	3200	0.239	21	13	715	3200	0.248	6	721	3200	0.250
NB Right	33	0	0.000	0	33	0	0.000	0	33	0	0.000	1	0	34	0	0.000	0	34	0	0.000
SB Left	11	0	0.003	0	11	0	0.003	0	11	0	0.003	0	0	11	0	0.003	0	11	0	0.003
SB Thru	684	3200	0.232 *	2	686	3200	0.233 *	0	686	3200	0.233 *	21	14	719	3200	0.243 *	2	721	3200	0.244 *
SB Right	48	0	0.000	0	48	0	0.000	0	48	0	0.000	1	0	49	0	0.000	0	49	0	0.000
EB Left	66	0	0.041	0	66	0	0.041	0	66	0	0.041	2	0	68	0	0.043	0	68	0	0.043
EB Thru	35	1600	0.102 *	0	35	1600	0.102 *	0	35	1600	0.102 *	1	0	36	1600	0.105 *	0	36	1600	0.105 *
EB Right	62	0	0.000	0	62	0	0.000	0	62	0	0.000	2	0	64	0	0.000	0	64	0	0.000
WB Left	12	0	0.008 *	0	12	0	0.008 *	0	12	0	0.008 *	0	0	12	0	0.008 *	0	12	0	0.008 *
WB Thru	13	1600	0.021	0	13	1600	0.021	0	13	1600	0.021	0	0	13	1600	0.021	0	13	1600	0.021
WB Right	8	0	0.000	0	8	0	0.000	0	8	0	0.000	0	0	8	0	0.000	0	8	0	0.000
Yellow Allowance			0.100 *				0.100 *				0.100 *					0.100 *				0.100 *
ICU			0.456				0.456				0.456					0.470				0.471
LOS			A				A				A					A				A

** Key conflicting movement as a part of ICU*
1 Counts conducted by: The Traffic Solution
2 Capacity expressed in veh/hour of green

LINSCOTT, LAW & GREENSPAN, ENGINEERS
600 S. Lake Avenue, Ste 500, Pasadena 91106
(626) 796.2322 Fax (626) 792.0941

INTERSECTION CAPACITY UTILIZATION

Gramercy Place @ Rosecrans Avenue

N-S St:	Gramercy Place	Peak hr:	AM
E-W St:	Rosecrans Avenue	Annual Growth:	1.00%
Project:	Rosecrans Place Project/1-19-4343-2		
File:	ICU5		

Date:	2/13/2020
Date of Count:	2019
Projection Year:	2022

	2019 EXISTING TRAFFIC			2019 EXISTING WITH PROJECT				2019 EXISTING W/ PROJECT + MITIGATION				2022 FUTURE PRE-PROJECT					2022 FUTURE WITH PROJECT			
Movement	1 Volume	2 Capacity	V/C Ratio	Added Volume	Total Volume	2 Capacity	V/C Ratio	Added Volume	Total Volume	2 Capacity	V/C Ratio	Added Amb. Grow. Volume	Added Rel. Proj. Volume	Total Volume	2 Capacity	V/C Ratio	Added Volume	Total Volume	2 Capacity	V/C Ratio
NB Left	45	0	0.028	0	45	0	0.028	0	45	0	0.028	1	1	47	0	0.029	0	47	0	0.029
NB Thru	2	1600	0.074 *	0	2	1600	0.074 *	0	2	1600	0.074 *	0	0	2	1600	0.076 *	0	2	1600	0.076 *
NB Right	71	0	0.000	0	71	0	0.000	0	71	0	0.000	2	0	73	0	0.000	0	73	0	0.000
SB Left	3	0	0.002 *	0	3	0	0.002 *	0	3	0	0.002 *	0	0	3	0	0.002 *	0	3	0	0.002 *
SB Thru	1	1600	0.006	0	1	1600	0.006	0	1	1600	0.006	0	0	1	1600	0.006	0	1	1600	0.006
SB Right	5	0	0.000	0	5	0	0.000	0	5	0	0.000	0	0	5	0	0.000	0	5	0	0.000
EB Left	22	1600	0.014 *	0	22	1600	0.014 *	0	22	1600	0.014 *	1	0	23	1600	0.014 *	0	23	1600	0.014 *
EB Thru	958	4800	0.216	14	972	4800	0.219	0	972	4800	0.219	29	13	1000	4800	0.225	14	1014	4800	0.228
EB Right	80	0	0.000	0	80	0	0.000	0	80	0	0.000	2	0	82	0	0.000	0	82	0	0.000
WB Left	69	1600	0.043	0	69	1600	0.043	0	69	1600	0.043	2	0	71	1600	0.044	0	71	1600	0.044
WB Thru	1346	4800	0.286 *	0	1346	4800	0.286 *	0	1346	4800	0.286 *	41	7	1394	4800	0.296 *	0	1394	4800	0.296 *
WB Right	28	0	0.000	0	28	0	0.000	0	28	0	0.000	1	0	29	0	0.000	0	29	0	0.000
Yellow Allowance			0.100 *				0.100 *				0.100 *					0.100 *				0.100 *
ICU			0.476				0.476				0.476					0.489				0.489
LOS			A				A				A					A				A

** Key conflicting movement as a part of ICU*
1 Counts conducted by: The Traffic Solution
2 Capacity expressed in veh/hour of green

LINSCOTT, LAW & GREENSPAN, ENGINEERS
600 S. Lake Avenue, Ste 500, Pasadena 91106
(626) 796.2322 Fax (626) 792.0941

INTERSECTION CAPACITY UTILIZATION

Gramercy Place @ Rosecrans Avenue

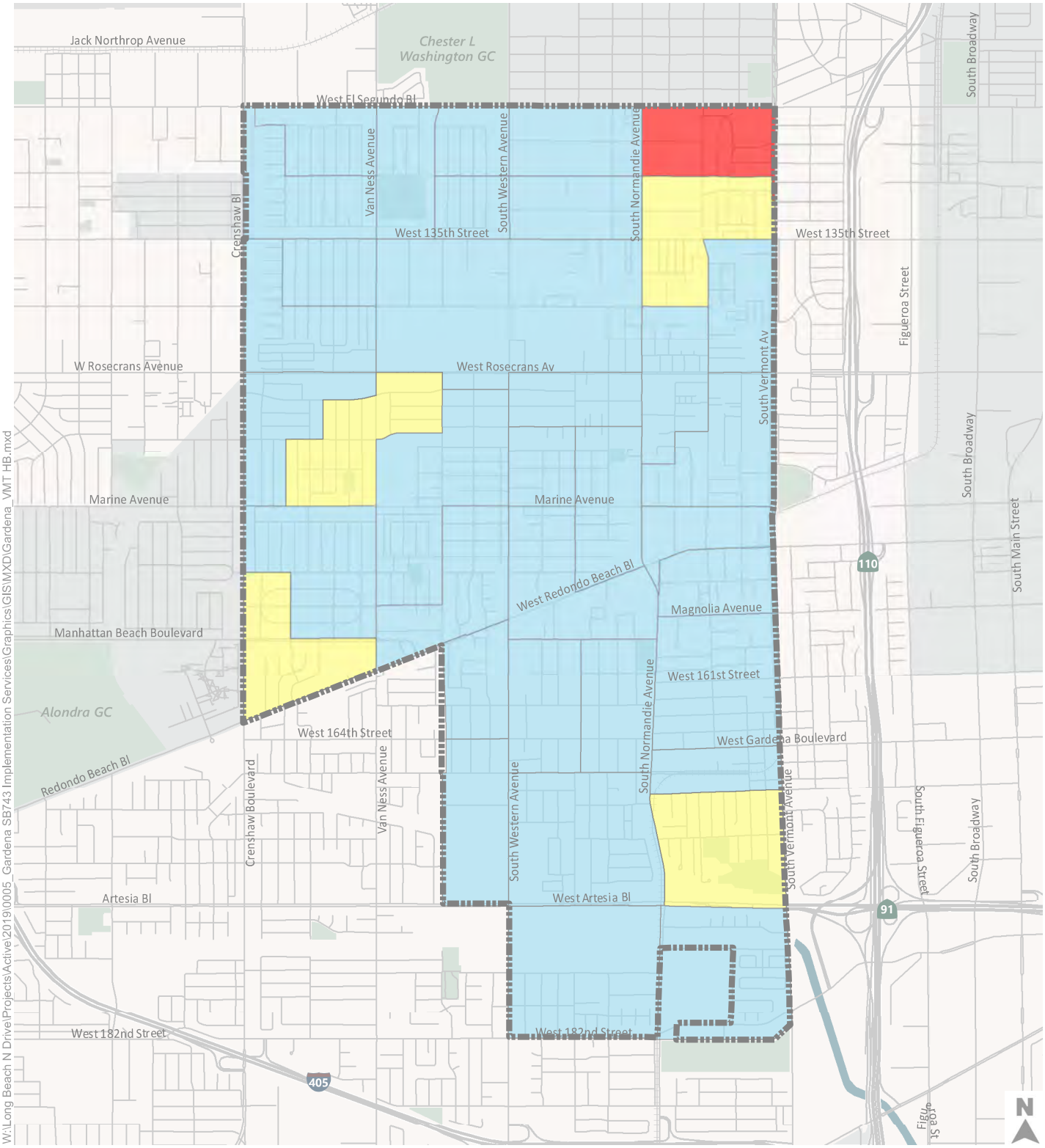
N-S St: Gramercy Place
E-W St: Rosecrans Avenue
Project: Rosecrans Place Project/1-19-4343-2
File: ICU5

Peak hr: PM
Annual Growth: 1.00%

Date: 2/13/2020
Date of Count: 2019
Projection Year: 2022

	2019 EXISTING TRAFFIC			2019 EXISTING WITH PROJECT				2019 EXISTING W/ PROJECT + MITIGATION				2022 FUTURE PRE-PROJECT					2022 FUTURE WITH PROJECT			
Movement	1 Volume	2 Capacity	V/C Ratio	Added Volume	Total Volume	2 Capacity	V/C Ratio	Added Volume	Total Volume	2 Capacity	V/C Ratio	Added Amb. Grow. Volume	Added Rel. Proj. Volume	Total Volume	2 Capacity	V/C Ratio	Added Volume	Total Volume	2 Capacity	V/C Ratio
NB Left	37	0	0.023	0	37	0	0.023	0	37	0	0.023	1	1	39	0	0.024	0	39	0	0.024
NB Thru	1	1600	0.058 *	0	1	1600	0.058 *	0	1	1600	0.058 *	0	0	1	1600	0.061 *	0	1	1600	0.061 *
NB Right	55	0	0.000	0	55	0	0.000	0	55	0	0.000	2	0	57	0	0.000	0	57	0	0.000
SB Left	29	0	0.018 *	0	29	0	0.018 *	0	29	0	0.018 *	1	0	30	0	0.019 *	0	30	0	0.019 *
SB Thru	2	1600	0.024	0	2	1600	0.024	0	2	1600	0.024	0	0	2	1600	0.025	0	2	1600	0.025
SB Right	8	0	0.000	0	8	0	0.000	0	8	0	0.000	0	0	8	0	0.000	0	8	0	0.000
EB Left	9	1600	0.006	0	9	1600	0.006	0	9	1600	0.006	0	0	9	1600	0.006	0	9	1600	0.006
EB Thru	1491	4800	0.319 *	5	1496	4800	0.320 *	0	1496	4800	0.320 *	45	11	1547	4800	0.331 *	5	1552	4800	0.332 *
EB Right	40	0	0.000	0	40	0	0.000	0	40	0	0.000	1	1	42	0	0.000	0	42	0	0.000
WB Left	50	1600	0.031 *	0	50	1600	0.031 *	0	50	1600	0.031 *	2	0	52	1600	0.033 *	0	52	1600	0.033 *
WB Thru	1068	4800	0.225	17	1085	4800	0.228	0	1085	4800	0.228	32	14	1114	4800	0.234	17	1131	4800	0.238
WB Right	10	0	0.000	0	10	0	0.000	0	10	0	0.000	0	0	10	0	0.000	0	10	0	0.000
Yellow Allowance			0.100 *				0.100 *				0.100 *					0.100 *				0.100 *
ICU			0.526				0.528				0.528					0.543				0.544
LOS			A				A				A					A				A

** Key conflicting movement as a part of ICU*
1 Counts conducted by: The Traffic Solution
2 Capacity expressed in veh/hour of green



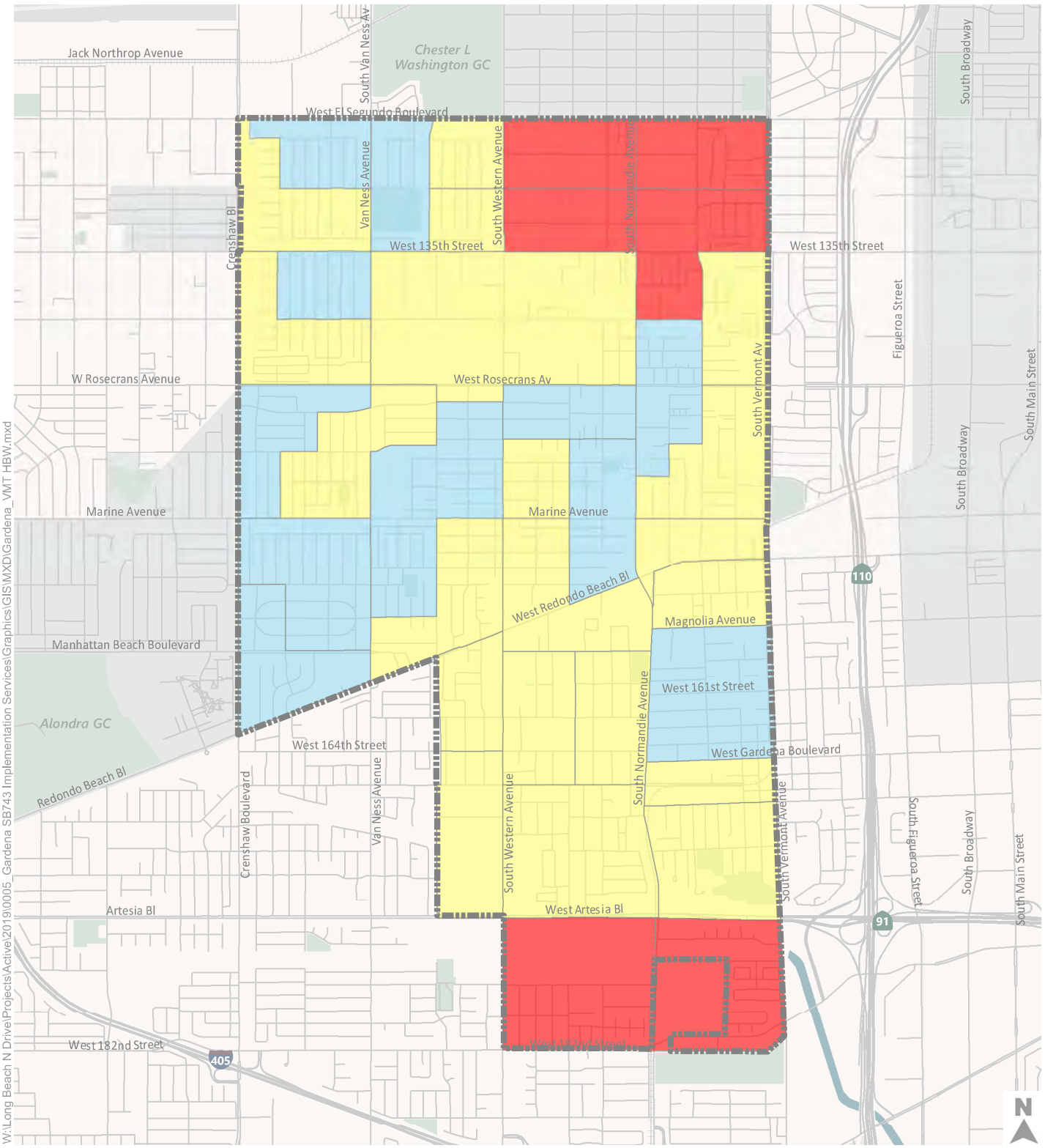
<-15% below SCAG Regional Average

0 to -15% below SCAG Regional Average

Higher than SCAG Regional Average

Figure 1

SCAG Model (2012)
Daily Residential Home Based VMT per Capita



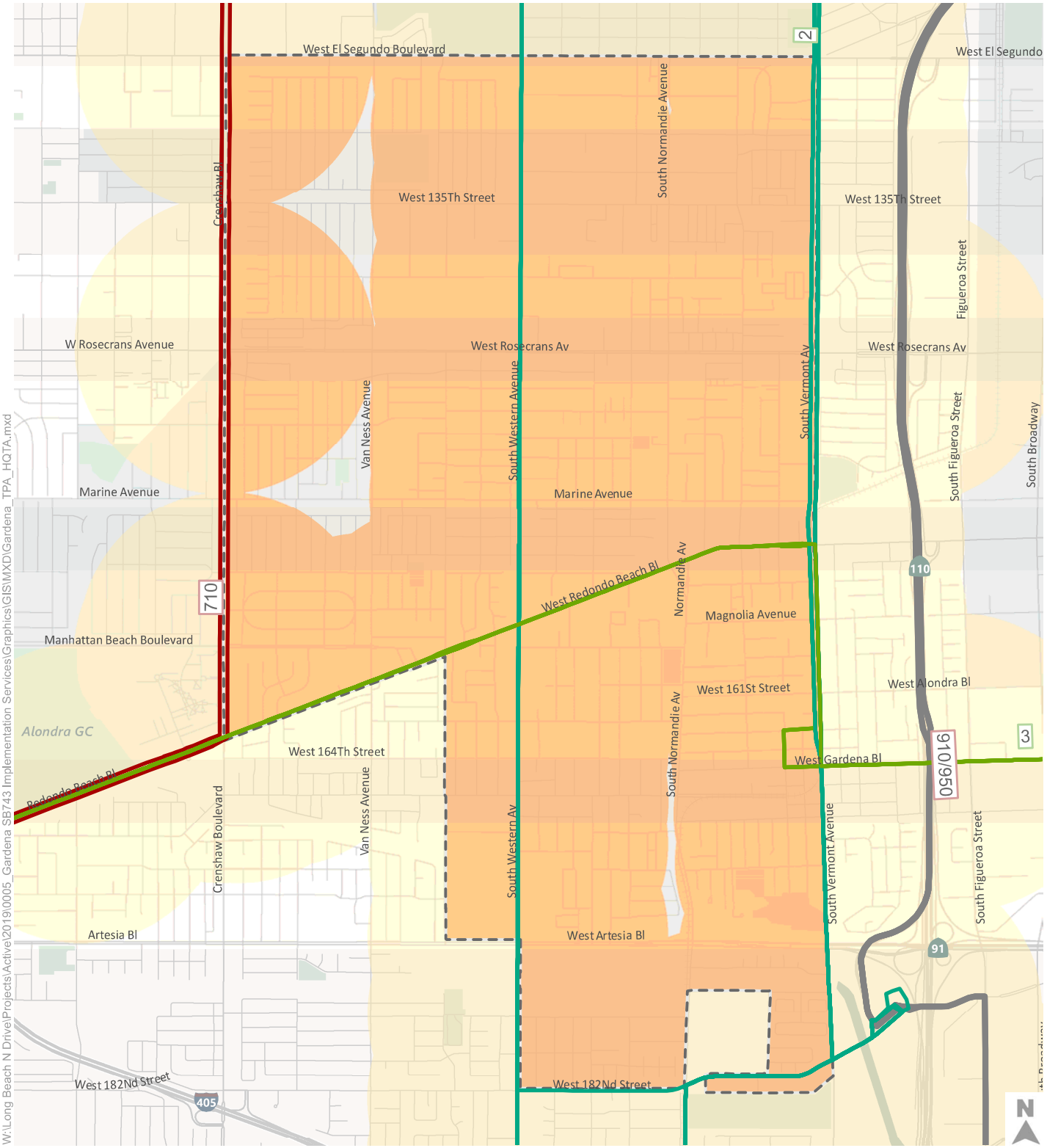
<-15% below SCAG Regional Average

0 to -15% below SCAG Regional Average

Higher than SCAG Regional Average

Figure 2

SCAG Model (2012)
Daily Home Based Work VMT per Employee



Gardena

Frequent Transit Area in Gardena

Frequent Transit Area Near Gardena

Frequent Bus Routes

GTrans 2

GTrans 3

Metro Bus 710

Metro Silver Line 910/950

Figure 3

High-Quality Transit Areas

AT&T
100 W ALONDRA BLVD
Suite
GARDENA, CA 90248

T: 3105152429
F: 3105234740
www.att.com

March 15, 2019

Bonnie Walker
Southern California Utility Solutions, Inc.
2129 Rosecrans Ave.
Gardena, California 90249

Ms. Walker,

This letter is in response to your request for information on the availability of AT&T service at 2129 Rosecrans Ave. Gardena, CA .

Attn: Herb Gardner
G3 Urban
15235 S Western Ave.
Gardena, CA 90249

RE: 2129 Rosecrans Ave. Gardena, CA

This letter acknowledges that the above referenced project is located in an area served by AT&T. Any service arrangements for this location will be subject to later discussions and agreements between the developer and AT&T. Please be advised that this letter is not a commitment by AT&T to provide service to 2129 Rosecrans Ave. Gardena, CA. but an acknowledgement that we have service in this area.

Please contact me at the phone number included in this letter if you have any questions.

Thank you for contacting AT&T.

Sincerely,

Craig Chinen
BIC* and Facilities Engineer

Will Serve Letter

3/14/2019

Herb Gardner
G3 Urban
15235 S Western Ave
Gardena, CA 90249

Project Name:	WSL - 2129 Rosecrans Ave
LOCATION:	2129 Rosecrans Ave, Gardena, CA 90249

Re: May Serve Letter by Charter Communications or an affiliate authorized to provide service ("Charter")

Thank you for your interest in receiving Charter service. The purpose of this letter is to confirm that the Property is within an area that Charter may lawfully serve. However, it is not a commitment to provide service to the Property. Prior to any determination as to whether service can or will be provided to the Property, Charter will conduct a survey of the Property and will need the following information from you:

- Exact site address and legal description
- Is this an existing building or new construction?
- Site plans, blue prints, plat maps or any similar data
- The location of any existing utilities or utility easements
- _____

Please forward this information to the construction manager listed below. Upon receipt, a Charter representative will be assigned to you to work through the process. Ultimately, a mutually acceptable service agreement for the Property will be required and your cooperation in the process is appreciated.

Construction Manager Contact:

Xanthis , Anthony
Construction Manager - Zone 7N
1529 Valley Dr
Hermosa Beach, CA 90254
310-216-4182
Anthony.Xanthis@charter.com

Sincerely,

Anthony Xanthis

701 N. Bullis Rd.
Compton, CA 90224-9099

March 25, 2019

Southern California Utility Solutions
29970 Technology Dr STE 110
Murrieta CA 92563
Attn: Bonnie Walker

Subject: Will Serve - G3 Urban 15235 S Western Ave Gardena, CA 90249
Attn: Herb Gardner 2129 Rosecrans Ave, Gardena

Thank you for inquiring about the availability of natural gas service for your project. We are pleased to inform you that Southern California Gas Company (SoCalGas) has facilities in the area where the above named project is being proposed. The service would be in accordance with SoCalGas' policies and extension rules on file with the California Public Utilities Commission (CPUC) at the time contractual arrangements are made.

This letter should not be considered a contractual commitment to serve the proposed project, and is only provided for informational purposes only. The availability of natural gas service is based upon natural gas supply conditions and is subject to changes in law or regulation. As a public utility, SoCalGas is under the jurisdiction of the Commission and certain federal regulatory agencies, and gas service will be provided in accordance with the rules and regulations in effect at the time service is provided. Natural gas service is also subject to environmental regulations, which could affect the construction of a main or service line extension (for example, if hazardous wastes were encountered in the process of installing the line). Applicable regulations will be determined once a contract with SoCalGas is executed.

If you need assistance choosing the appropriate gas equipment for your project, or would like to discuss the most effective applications of energy efficiency techniques, please contact our area Service Center at 800-427-2200.

Thank you again for choosing clean, reliable, and safe natural gas, your best energy value.

Sincerely,

Oscar Mariscal

Oscar Mariscal
Pipeline Planning Assistant
SoCalGas-Compton HQ

COUNTY SANITATION DISTRICTS
OF LOS ANGELES COUNTY

1955 Workman Mill Road, Whittier, CA 90601-1400
Mailing Address: P.O. Box 4998, Whittier, CA 90607-4998
Telephone: (562) 699-7411, FAX: (562) 699-5422
www.lacsd.org

GRACE ROBINSON HYDE
Chief Engineer and General Manager

April 4, 2019

Ref. Doc. No.: 4996494

Mr. Daniel Ramirez
Project Coordinator
C&V Consulting, Inc.
6 Orchard Road, Suite 200
Lake Forest, CA 92630

Dear Mr. Ramirez:

Will Serve Letter for Rosecrans and Van Ness Residential Project

The Sanitation Districts of Los Angeles County (Districts) received your will serve letter request for the subject project on March 18, 2019. The proposed project is located within the jurisdictional boundaries of District No. 5. We offer the following comments regarding sewerage service:

1. The wastewater flow originating from the proposed project will discharge to a local sewer line, which is not maintained by the Districts, for conveyance to the Districts' East Rosecrans Avenue Trunk Sewer Section 1, located in Rosecrans Avenue east of Van Ness Avenue. The Districts' 18-inch diameter trunk sewer has a capacity of 2.5 million gallons per day (mgd) and conveyed a peak flow of 0.1 mgd when last measured in 2017.

2. The wastewater generated by the proposed project will be treated at the Joint Water Pollution Control Plant located in the City of Carson, which has a capacity of 400 mgd and currently produces an average flow of 261.1 mgd.

3. The expected increase in average wastewater flow from the project, described in the conceptual site plan as 41 detached residential units, 50 attached residential units, and 14 live work units which include a total of 3,430 square feet of work space, is 19,512 gallons per day, after all structures on the project site are demolished. For a copy of the Districts' average wastewater generation factors, go to www.lacsd.org, Wastewater & Sewer Systems, click on Will Serve Program, and click on the Table 1, Loadings for Each Class of Land Use link.

4. The Districts are empowered by the California Health and Safety Code to charge a fee for the privilege of connecting (directly or indirectly) to the Districts' Sewerage System for increasing the strength or quantity of wastewater discharged from connected facilities. This connection fee is a capital facilities fee that is imposed in an amount sufficient to construct an incremental expansion of the Sewerage System to accommodate the proposed project. Payment of a connection fee will be required before a permit to connect to the sewer is issued. For more information and a copy of the Connection Fee Information Sheet, go to www.lacsd.org, Wastewater & Sewer Systems, click on Will Serve Program, and search for the appropriate link.

In determining the impact to the Sewerage System and applicable connection fees, the Districts' Chief Engineer and General Manager will determine the user category (e.g. Condominium, Single Family home, etc.) that best represents the actual or anticipated use of the parcel or facilities on the parcel. For more specific information regarding the connection fee application procedure and fees, please contact the Connection Fee Counter at (562) 908-4288, extension 2727.

5. In order for the Districts to conform to the requirements of the Federal Clean Air Act (CAA), the capacities of the Districts' wastewater treatment facilities are based on the regional growth forecast adopted by the Southern California Association of Governments (SCAG). Specific policies included in the development of the SCAG regional growth forecast are incorporated into clean air plans, which are prepared by the South Coast and Antelope Valley Air Quality Management Districts in order to improve air quality in the South Coast and Mojave Desert Air Basins as mandated by the CCA. All expansions of Districts' facilities must be sized and service phased in a manner that will be consistent with the SCAG regional growth forecast for the counties of Los Angeles, Orange, San Bernardino, Riverside, Ventura, and Imperial. The available capacity of the Districts' treatment facilities will, therefore, be limited to levels associated with the approved growth identified by SCAG. As such, this letter does not constitute a guarantee of wastewater service, but is to advise you that the Districts intend to provide this service up to the levels that are legally permitted and to inform you of the currently existing capacity and any proposed expansion of the Districts' facilities.

If you have any questions, please contact the undersigned at (562) 908-4288, extension 2717.

Very truly yours,

Adriana Raza
Customer Service Specialist
Facilities Planning Department

AR:ar

cc: A. Schmidt
A. Howard

Will Serve Letter Only

SOUTHERN CALIFORNIA EDISON
An EDISON INTERNATIONAL Company

3/15/19

G3 Urban

2129 Rosecrans Ave., Gardena

Your project is located in Southern California Edison (SCE) service territory. SCE will serve the above subject project's electrical requirements per the California Public Utilities Commission and Federal Energy Regulatory Commission tariffs.

SCE may need to conduct utility studies, where applicable, to assess whether additions or modifications to the existing electric infrastructure are required to serve this project. Where applicable, SCE has attached Appendix (B) which not only describes the study, and permitting, but includes a Project Information Sheet that will need to be completed by you and submitted to SCE if your project is at a point where SCE has to determine the required electrical utility work. This Will-Serve letter does not imply that either: (i) these studies have been completed, or (ii) that any required California Environmental Quality Act (CEQA) analysis of project-related electric utility impacts has been conducted.

I am the SCE Design Representative currently assigned to this project. SCE or Applicant will design and construct all required electrical infrastructure to serve this project provided you enter into the applicable contractual agreements with SCE identify scope of electrical utility work required, and supply the following information:

- Site plans as required
- Required contracts and agreements (fully executed)
- Applicable fees
- Local permits
- Required easement documents

Your project will be scheduled for construction once SCE has all the necessary information for your project and you have submitted or agreed to the applicable requirements as stated above, and paid any necessary fees.

If your project will not require SCE services, please notify us so that we can update our records.

SCE appreciates your business. If you have any questions, please feel free to call me at (714) 296-7609.

Sincerely,

SCE Design Representative

Enclosure: Appendix B, where applicable

Appendix B

SOUTHERN CALIFORNIA EDISON
An EDISON INTERNATIONAL Company

3/15/19

G3 Urban

2129 Rosecrans Ave., Gardean

As your Southern California Edison (SCE) Design Representative for this project, I am committed to providing you with excellent customer service. The following information is intended to help explain SCE's planning and permitting process for the electric infrastructure needed to serve your Project.

Depending on the scope of work necessary to serve your project (electric facility installation, removal, relocation, rearrangement and/or replacement), it may be necessary for you to submit an Advanced Engineering Fee. This Fee will be applied to certain expenses associated with preliminary design and engineering work required to estimate the cost for SCE to perform the electric work associated with your project. Please note: Depending on factors such as resource constraints, construction or relocation of SCE facilities requirements, the need for environmental review, and so forth, delays in meeting your projected completion date may occur. To help minimize the potential for delays it is imperative that you provide all requested information as early as possible.

If the project results in the need for SCE to perform work on SCE electrical facilities that operate at between 50 and 200 kilovolts (kV), please be advised these facilities are subject to the California Public Utilities Commission's (CPUC's) General Order 131-D (GO 131-D) Permit to Construct (PTC) requirements. For the CPUC PTC review, the CPUC acts as the lead agency under the California Environmental Quality Act (CEQA). Depending on the scope of SCE's work, certain exemptions to the PTC requirements may be available. If no exemptions are available, the PTC application preparation and environmental approval process could take a minimum of 24 - 48 months.

If you anticipate that your project will require work to be performed on SCE electrical facilities operated at between 50 kV and 200 kV, please inform me at your earliest possible convenience for further assistance to determine the potential G.O.131-D permitting requirements and/or permitting exemption(s).

In order for SCE to determine the required electrical utility work necessary to support your project, and to determine any permitting requirements and costs associated with constructing these facilities, project plans and a completed Customer Project Information Sheet will need to be submitted.

If you have any additional questions, please feel free to call me at (714) 296-7609.

Sincerely,

SCE Design Representative

Golden State
Water Company
A Subsidiary of American States Water Company

September 20, 2019
Daniel Ramirez (consultant)
dramirez@cvc-inc.net

Re: Will Serve Letter for 2129 Rosecrans Ave., Gardena CA 90249

To Whom it May Concern:

This letter is to inform you that water service is available to the above referenced address from Golden State Water Company's (GSWC) Southwest District water system located in Los Angeles County. Service to the address can be provided from our existing water facilities within Rosecrans Avenue.

Upon completion and execution of an agreement between Golden State Water Company (GSWC) and the applicant that contains satisfactory financial arrangements and other provisions governing the extension of water service under the Water Service Agreement, GSWC will begin providing water service for the referenced address once all owner obligations have been satisfied. Analysis of more detailed development plans may require the owner to participate in the construction of special facilities prior to the Company providing water service.

GSWC is committed to providing water service to all customers within its service area, consistent with the company's obligations under rules, statutes and regulations of both the California Department of Public Health and the California Public Utilities Commission.

Unless modified or extended by GSWC, this Will Serve Letter shall terminate and be of no further force and effect one year from the date indicated above.

If you have any questions concerning the issues addressed in this letter, please let us know.

Sincerely,

Joseph Zhao, P.E., PhD.
Operations Engineer Southwest District

1600 W. Redondo Beach Blvd., Suite 101, Gardena, CA 90247
Tel: (310) 767-8200 Fax: (310) 436-6065