Los Angeles County
Department of Regional Planning
Transdev Facilities

Project No. 2018-004292

Conditional Use Permit No. RPPL2018006758

Environmental Assessment No. RPPL2019000742

Initial Study: Mitigated Negative Declaration

Volume II – Technical Appendices

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May 2020

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APPENDIX A

Air Quality and Greenhouse Gas Study

Air Quality and Greenhouse Gas Study

for the

Transdev Facility Project

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July 2019

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EXECUTIVE SUMMARY

This Air Quality and Greenhouse Gas (GHG) Study assesses and discusses the potential air quality and GHG impacts that may occur with the implementation of the Transdev Facility Project (Project), located in the City of Los Angeles. The analysis estimates future emission levels at surrounding land uses resulting from construction and operation of the Project and identifies the potential for significant impacts. An evaluation of the Project's contribution to potential cumulative air quality impacts is also provided. Air quality worksheets are provided in **Appendix B: CalEEMod Air Quality/Greenhouse Gas Emission Output Files.**

This report summarizes the potential for the Project to conflict with an applicable air quality plan; violate an air quality standard or threshold; result in a cumulatively net increase of criteria pollutant emissions; expose sensitive receptors to substantial pollutant concentrations; or create objectionable odors affecting a substantial number of people. The findings of the analyses are as follows:

- The Project would be consistent with air quality policies set forth by the South Coast Air Quality Management District (SCAQMD) and the Air Quality Management Plan.
- Construction and operational emissions would not contribute to short- or long-term emissions that would increase the carcinogenic effects on sensitive receptors. Emissions associated with operation would not exceed the SCAQMD-recommended thresholds. Thus, the Project would not result in a regional violation of applicable air quality standards or jeopardize the timely attainment of such standards in the South Coast Air Basin.
- Operation of the Project will not employ toxic air contaminant–emitting processes. No substantial pollutant concentration would be generated.
- Project construction and operations would not result in significant levels of odors.
- The Project would result in less than significant cumulative air quality impacts during construction and operation of the Project.

INTRODUCTION

This Air Quality and GHG Study was prepared to evaluate the potential impacts during construction and operation of the Transdev Facility Project (Project) located in unincorporated County of Los Angeles, California. The report provides a summary of the Project components; describes the existing regulatory framework for air pollutants; discusses the environmental setting of the Project; and assesses the potential environmental impacts pertaining to air quality that may result from Project implementation. Determination of significance for Project impacts is based on analysis in accordance with the applicable regulatory thresholds.

PROJECT DESCRIPTION

The proposed Project is located at 636 East Rosecrans Avenue and 14110-14438 South Avalon Boulevard, in unincorporated County of Los Angeles. Regional access is provided by Interstate 110 (I-110) approximately 1.18 miles west of the Project site and Interstate 105 (I-105) approximately 1.76 miles north of the Project site.

The 5.35-acre Project site is located on the southeast corner of Rosecrans Avenue and South Avalon Boulevard. Local access is provided by one existing driveway on Avalon Boulevard and three existing driveways on Rosecrans Avenue. The Project site includes Assessor's Parcel Numbers (APN) 6137-006-033, 6137-006-034, 6137-006-037, 6137-006-043, and a portion of 6137-005-027.

The existing building located at 636 East Rosecrans Avenue will be remodeled for use by the Applicant to provide bus maintenance and administrative/operational services to the Los Angeles County Metropolitan Transportation Authority (Metro). Tenant improvements within the existing building will be constructed to provide administrative and operational office and conference space, space for Metro dispatch activities, fare collection, rest rooms (including the remodeling of existing rest rooms), maintenance staff break room, and bus driver lounge gathering area.

The garage portion of the existing building will have three lifts installed for bus maintenance, and two new 16 foot wide bus access openings with metal roll-up doors will be cut into the existing east wall of the building to allow buses to enter the maintenance area. Additionally, the Applicant is proposing to construct a fully enclosed steel canopy structure (approximately 50 feet by 80 feet) adjacent to the existing building to provide four additional maintenance bays for the servicing of buses.

In addition to the Compressed Natural Gas (CNG) fueling facility that will be located on Parcel 6137-006-034, a bus wash station will be installed under the existing canopy (approximately 34' x 38') currently existing on this parcel.

The on-site activities will include: parking of the buses, parking for nonrevenue-generating Metro support vehicles (located on parcels 6137-006-027, and 6137-006-037), dedicated and separate parking for bus drivers (located on parcel 6137-006-043), as well as Metro's and the Applicant's operational and maintenance employees. The Applicant will perform light maintenance of the Metro bus fleet on site, and the Applicant will also provide bus-washing, and fueling service for the bus fleet on site.

It is expected that the Facility will have an administrative staff of approximately 25 employees (both the Applicant, and Metro) and a maintenance staff of approximately 20 employees. The employees will be working over the three shifts noted above.

It is expected that the Facility will accommodate approximately 90 buses. Except for the two hours during which the facility would be closed (from 1AM to 3AM), the buses are in continuous operation, and are only in the parking area long enough for a change of drivers.

Once a bus arrives back at the facility, that bus will enter the Project site from Avalon Boulevard and proceed to a designated area for the secure removal of the fare box, and then onto one of the Compressed Natural Gas ("CNG") fueling dispensing pumps before proceeding through the automated bus washing station (the fare boxes, the bush washing station and the CNG facility are all located on parcels 6137-006-033, and 6137-006-034). The bus will then return to the bus parking area where a new driver will take over the bus, and leave the facility onto Avalon Boulevard to run its regularly scheduled route.

It is expected that the construction on site will take between six and nine months. The construction work will include the CNG facility, the enclosed metal maintenance canopy, the installation of the bus wash equipment, pavement repair where trenching as occurred, and the internal tenant improvement work within the existing building, along with the interior and exterior demolition work necessary to allow for the new construction. Additionally, new grading and paving will occur on Parcels 6137-005-027 and 6137-006-037.

The grading operation is expected to result in approximately 500 cubic yards of export from Parcel 6137-005-027. The export operations for this Parcel are expected to take a week, with five truck trips per day over that week. The grading operation is expected to result in approximately 300 cubic yards of export from Parcel 6137-005-037. The export operations for this Parcel are expected to take three to four days, with five truck trips per day over that time period. The export is expected to be taken to United Landfill, 1245 Arrow Hwy., Irwindale, Ca. 91706. The route to the landfill is proposed to take Rosecrans Avenue east to the 710 Freeway north, then to the 105 Freeway east, then to the 605 Freeway north to Arrow Highway.

REGULATORY SETTING

Ambient air quality and GHG emissions present complex environmental issues that require regulatory attention on both large and small scales. The cumulative nature of project-level and localized emissions contributing to greater regional conditions warrants that regulatory policies be instituted on national, state, and regional levels to address air quality and GHG concerns. The following sections outline the applicable regulatory framework that exists at the national, state, and regional levels for air quality and GHGs.

Air Quality

Background

The United States Environmental Protection Agency (USEPA) is responsible for federal oversight and enforcement of air quality management policies under the 1970 Clean Air Act (CAA). Each individual state is tasked with preparing and adhering to State Implementation Plans[1] (SIPs) for achieving the goals set forth within the CAA. California has some of the most stringent air quality policies in the country and, through the California Air Resources Board (CARB) branch of the California Environmental Protection Agency (CalEPA), has developed its own ambient air quality standards (AAQS). The state is divided into air quality jurisdictions; each jurisdiction is governed by a regional air district that oversees policy implementation, permitting of air pollution emission sources, and enforcement of regulatory requirements. Six criteria air pollutants (CAPs) are monitored at the federal, state, and regional levels. These six CAPs—ozone, particulate matter PM10 and PM2.5, nitrogen dioxide, carbon monoxide, lead, and sulfur dioxide—were identified based on a consensus of decades of research that concluded inhalation of each of the chemicals results in adverse health effects in humans. The six pollutants are identified below in **Table 1: Sources and Health Effects of Criteria Air Pollutants**, along with their common sources and primary health effects from inhalation exposure.

Table 1
Sources and Health Effects of Criteria Air Pollutants

Pollutants	Sources	Primary Effects
Ozone (O3)	Formed when VOCs and NOx react in the presence of sunlight; VOC sources include any source that burns fuels (e.g., gasoline, natural gas, wood, oil), solvents, petroleum processing, and storage and pesticides	Breathing difficulties; lung tissue damage; damage to rubber and some plastics

1 A State Implementation Plan is a document prepared by each state describing existing air quality conditions and measures that will be followed to attain and maintain National Ambient Air Quality Standards.

Pollutants	Sources	Primary Effects
Respirable particulate matter (PM10)	Road dust, windblown dust (agriculture) and construction (fireplaces); also formed from other pollutants (e.g., acid rain, NOx, oxides of sulfur [SOx], organics) and from incomplete combustion of any fuel	Increases respiratory disease, lung damage, cancer, premature death; reduced visibility; surface soiling
Fine particulate matter (PM2.5)	Fuel combustion in motor vehicles, equipment, and industrial sources; residential and agricultural burning; also formed from reaction of other pollutants (e.g., acid rain, NOx, SOx, organics)	Increases respiratory disease, lung damage, cancer, premature death; reduced visibility; surface soiling
Carbon monoxide (CO)	Any source that burns fuel, such as automobiles, trucks, heavy construction equipment, farming equipment, and residential heating	Chest pain in heart patients; headaches; reduced mental alertness
Nitrogen dioxide (NO2)	*See* carbon monoxide.	Lung irritation and damage
Lead (Pb)	Metal smelters, resource recovery, leaded gasoline, deterioration of lead paint	Learning disabilities; brain and kidney damage
Sulfur dioxide (SO2)	Coal- or oil-burning power plants and industries, refineries, diesel engines	Increases lung disease and breathing problems for asthmatics; reacts in the atmosphere to form acid rain

Source: California Air Resources Board, "ARB Fact Sheet: Air Pollution and Health" (2009), http://www.arb.ca.gov/research/health/fs/fs1/fs1.htm (accessed February 2019).

Ozone

Ozone (O3) is a gas formed when volatile organic compounds (VOCs) and oxides of nitrogen (NOx), both byproducts of internal combustion engine exhaust and other sources, undergo slow photochemical reactions in the presence of sunlight. Ozone concentrations are generally highest during the summer months, when direct sunlight, light wind, and warm temperature conditions are favorable to the formation of this pollutant.

Volatile Organic Compounds

VOCs are compounds comprised primarily of atoms of hydrogen and carbon. Internal combustion associated with motor vehicle usage is the major source of hydrocarbons. Adverse effects on human health are not caused directly by VOCs, but rather by reactions of VOCs to form secondary air pollutants, including ozone. VOCs themselves are not criteria pollutants; however, they contribute to the formation of ozone and are regulated under state policies.

Respirable Particulate Matter

Respirable particulate matter (PM10) consists of extremely small, suspended particles or droplets 10 micrometers (μm) or smaller in diameter. Some sources of PM10, like pollen and windstorms, are

naturally occurring. However, in populated areas, most PM10 is caused by road dust, diesel soot, combustion products, the abrasion of tires and brakes, and construction activities.

Fine Particulate Matter

PM2.5 refers to fine particulate matter that is 2.5 µm or smaller in size. Sources of PM2.5 include fuel combustion from automobiles, power plants, wood burning, industrial processes, and diesel-powered vehicles, such as buses and trucks. These fine particles are also formed in the atmosphere when gases, such as sulfur dioxide (SO2), NOx, and VOCs are transformed in the air by chemical reactions.

Carbon Monoxide

Carbon monoxide (CO) is a colorless, odorless gas produced by the incomplete combustion of fuels. CO concentrations tend to be the highest during winter mornings with little to no wind, when surface-based inversions trap the pollutant at ground levels. Because CO is emitted directly from internal combustion engines, unlike ozone, and because motor vehicles operating at slow speeds are the primary source of CO in the South Coast Air Basin (Basin), the highest ambient CO concentrations are generally found near congested transportation corridors and intersections.

Nitrogen Dioxide

Nitrogen dioxide (NO2) is a reddish-brown, highly reactive gas that is formed in the ambient air through the oxidation of nitric oxide (NO). NO2 is also a byproduct of fuel combustion. The principle form of NO2 produced by combustion is NO, but NO reacts quickly to form NO2, creating the mixture of NO and NO2 referred to as NOx. NO2 acts as an acute irritant and, in equal concentrations, is more injurious than NO. At atmospheric concentrations, however, NOx is only potentially irritating. NO2 absorbs blue light, the result of which is a brownish-red cast to the atmosphere and reduced visibility.

Lead

Lead (Pb) occurs in the atmosphere as particulate matter. The combustion of leaded gasoline is the primary source of airborne lead in the Basin. The use of leaded gasoline is no longer permitted for on-road motor vehicles, so most such combustion emissions are associated with off-road vehicles, such as race cars, that use leaded gasoline. Other sources of Pb include the manufacturing and recycling of batteries; sanding or removal of lead-based paint; ink; ceramics; ammunition; and secondary lead smelters.

Sulfur Dioxide

SO2 is a colorless, extremely irritating gas or liquid. It enters the atmosphere as a pollutant mainly as a result of the burning of high-sulfur-content fuel oils and coal, as well as from chemical processes occurring at chemical plants and refineries. When SO2 oxidizes in the atmosphere, it forms sulfates (SO4).

Federal

The USEPA sets national vehicle and stationary source emission standards; oversees approval of all SIPs; provides research and guidance for air pollution programs; and sets National Ambient Air Quality Standards (NAAQS). The NAAQS for the six CAPs are shown in **Table 2: Ambient Air Quality Standards** and were identified from provisions of the 1970 CAA. The sections of the CAA that are most applicable to the Project include Title I: Nonattainment Provisions and Title II: Mobile Source Provisions.

The CAA and the promulgated standards have evolved as a living document over time as research into the effects of air pollution has enhanced regulatory understanding of the associated issues. The 1990 amendments to the CAA identify specific emission reduction goals for areas not meeting the NAAQS. These amendments require both a demonstration of reasonable further progress toward attainment and incorporation of additional sanctions for failure to attain or to meet interim milestones. On the national level, the USEPA designates regions as achieving "attainment" or suffering from "nonattainment" of the NAAQS based on air quality monitoring data. Regions that are designated as being in nonattainment are responsible for devising localized strategies for reducing emissions of CAPs and achieving regional attainment within a predetermined timeframe set by the USEPA.

The NAAQS were further amended in July 1997 to include an 8-hour standard for ozone and to adopt an NAAQS for PM2.5. The NAAQS were amended again in September 2006 to include an established methodology for calculating PM2.5, as well as to revoke the annual PM10 threshold. Additional revisions to the AAQS may be implemented in the future as the science of air quality progresses.

Table 2
Ambient Air Quality Standards

Pollutant	Averaging Time	California Standards		Federal Standards		
		Concentration	Method	Primary	Secondary	Method
Ozone (O3)	1 hour	0.09 ppm (180 µg/m^3)	Ultraviolet photometry	—	Same as primary standard	Ultraviolet photometry
	8 hours	0.07 ppm (137 µg/m^3)		0.075 ppm (147 µg/m^3)		
	24 hours	50 µg/m^3		150 µg/m^3		

Pollutant	Averaging Time	California Standards		Federal Standards		
		Concentration	Method	Primary	Secondary	Method
Respirable particulate matter (PM10)	Annual arithmetic mean	20 µg/m^3	Gravimetric or beta attenuation	—	Same as primary standard	Inertial separation and gravimetric analysis
Fine particulate matter (PM2.5)	24 hours	No separate state standard		35 µg/m^3	Same as primary standard	Inertial separation and gravimetric analysis
	Annual arithmetic mean	12 µg/m^3	Gravimetric or beta attenuation	15 µg/m^3		
Carbon monoxide (CO)	8 hours	9.0 ppm (10 mg/m^3)	Nondispersive infrared photometry (NDIR)	9 ppm (10 mg/m^3)	None	NDIR
	1 hour	20 ppm (23 mg/m^3)		35 ppm (40 mg/m^3)		
Nitrogen dioxide (NO2)	Annual arithmetic mean	0.03 ppm (57 µg/m^3)	Gas phase chemilumi-nescence	0.053 ppm (100 µg/m^3)	Same as primary standard	Gas phase chemilumi-nescence
	1 hour	0.18 ppm (339 µg/m^3)		0.100 ppm (188 µg/m^3)		

Source: California Air Resources Board website at: http://www.arb.ca.gov/research/aaqs/aaqs.htm (accessed July 2019).
Note: ppm = parts per million.

State

The California Clean Air Act, signed into law in 1988, requires all areas of the state to achieve and maintain the California Ambient Air Quality Standards (CAAQS) by the earliest practicable date. The CARB is responsible for the coordination and administration of both state and federal air pollution control programs within California. In this capacity, CARB conducts research, sets CAAQS, compiles emission inventories, develops suggested control measures, and provides oversight of local programs. CARB establishes emissions standards for motor vehicles sold in California, consumer products, and various types of commercial equipment. It also sets fuel specifications to further reduce vehicular emissions and the CAAQS currently in effect for each of the criteria pollutants, as well as other pollutants recognized by the state. The CAAQS are provided in **Table 2**; it should be noted that the CAAQS are generally more stringent than the NAAQS, reflecting California's diligent efforts toward reducing air pollution and improving air quality.

Regional

In California, jurisdiction over air quality management, enforcement, and planning divided into 35 geographic regions. Within each region, a local air district is responsible for oversight of air quality

monitoring, modeling, permitting, and enforcement to ensure that regulatory violations are avoided wherever possible.

The Project site is located within the 6,700-square-mile Basin and is under the jurisdiction of the South Coast Air Quality Management District (SCAQMD). The Basin includes the southern two-thirds of Los Angeles County, all of Orange County, and the western urbanized portions of Riverside and San Bernardino Counties.

South Coast Air Quality Management District

SCAQMD shares responsibility with CARB for ensuring that all state and federal AAQS are achieved and maintained over an area of approximately 10,743 square miles. This area includes the South Coast and Salton Sea Air Basins, all of Orange County, and the nondesert portions of Los Angeles, Riverside, and San Bernardino Counties. It does not include the Antelope Valley or the nondesert portion of western San Bernardino County.

SCAQMD is responsible for controlling emissions, primarily from stationary sources. SCAQMD maintains air quality monitoring stations throughout the air basins. SCAQMD, in coordination with the Southern California Association of Governments (SCAG), is also responsible for developing, updating, and implementing the Air Quality Management Plan (AQMP) for the air basins. An AQMP is a plan prepared and implemented by an air pollution district for a county or region designated as being in nonattainment of the NAAQS or CAAQS. The term "nonattainment area" is used to refer to an air basin in which one or more AAQS are exceeded. SCAQMD also prepares the SIP for its jurisdiction and promulgates rules and regulations. The SIP includes strategies and tactics to be used to attain the federal ozone standards in the South Coast Air Basin. The SIP elements are taken from the most recent AQMP.

SCAQMD approved a Final 2016 AQMP on March 3, 2017.[2] The 2016 AQMP includes transportation control measures developed by SCAG from its *2016–2040 Regional Transportation Plan/Sustainable Communities Strategy,* as well as the integrated strategies and measures needed to meet the NAAQS. The 2016 AQMP demonstrates attainment of the 1-hour and 8-hour ozone NAAQS, as well as the latest 24-hour and annual PM2.5 standards.

SCAQMD is responsible for limiting the amount of emissions that can be generated throughout the air basins by various stationary, area, and mobile sources. Specific rules and regulations have been adopted by the SCAQMD Governing Board that limit the emissions that can be generated by various uses/activities

2 South Coast Air Quality Management District (SCAQMD), "Final 2016 Air Quality Management Plan" (2016), accessed February 2019, http://www.aqmd.gov/home/library/clean-air-plans/air-quality-mgt-plan/final-2016-aqmp.

and identifying specific pollution-reduction measures that must be implemented in association with various uses and activities. These rules regulate not only the emissions of the federal and state criteria pollutants, but also toxic air contaminants (TACs) and acutely hazardous materials. The rules are also subject to ongoing refinement by SCAQMD.

Among the SCAQMD rules applicable to the Project are Rule 403 (Fugitive Dust) and Rule 1113 (Architectural Coatings). Rule 403 requires the use of stringent best available control measures (BACMs) to minimize PM10 emissions during grading and construction activities. Rule 1113 limits the VOC content of coatings, with a VOC content limit for flat coatings of 50 grams per liter (g/L).[3] Additional details regarding these rules and other potentially applicable rules are presented as follows.

Rule 402 (Nuisance): This rule states that a "person shall not discharge from any source whatsoever such quantities of air contaminants or other material which cause injury, detriment, nuisance, or annoyance to any considerable number of persons or to the public, or which endanger the comfort, repose, health or safety of any such persons or to the public, or which cause, or have a natural tendency to cause, injury or damage to business or property."[4]

Rule 403 (Fugitive Dust). This rule requires fugitive dust sources to implement BACMs for all sources and prohibits all forms of visible particulate matter from crossing any property line. BACMs may include application of water or chemical stabilizers to disturbed soils covering haul vehicles; restricting vehicle speeds on unpaved roads to 15 miles per hour (mph); sweeping loose dirt from paved site-access roadways; cessation of construction activity when winds exceed 25 mph; and establishing a permanent ground cover on finished sites. SCAQMD Rule 403 is intended to reduce PM10 emissions from any transportation, handling, construction, or storage activity that has the potential to generate fugitive dust (see also Rule 1186).

Rule 1113 (Architectural Coatings). This rule requires manufacturers, distributors, and end users of architectural and industrial maintenance coatings to reduce VOC emissions from the use of these coatings, primarily by placing limits on the VOC content of various coating categories.

Rule 1146.2 (Emissions of Oxides of Nitrogen from Large Water Heaters and Small Boilers and Process Heaters). This rule requires manufacturers, distributors, retailers, refurbishers, installers, and operators

3 SCAQMD, "Rule 1113 Architectural Coating" (amended September 6, 2013), accessed February 2019, http://www.aqmd.gov/docs/default-source/rule-book/reg-xi/r1113.pdf.

4 SCAQMD, "Rule 402—Nuisance," accessed February 2019, http://www.aqmd.gov/docs/default-source/rule-book/rule-iv/rule-402.pdf.

of new and existing units to reduce NOx emissions from natural-gas-fired water heaters, boilers, and process heaters as defined in this rule.

Rule 1186 (PM10 Emissions from Paved and Unpaved Roads, and Livestock Operations). This rule applies to owners and operators of paved and unpaved roads and livestock operations. The rule is intended to reduce PM10 emissions by requiring the cleanup of material deposited onto paved roads, use of certified street sweeping equipment, and treatment of high-use unpaved roads (see also Rule 403).

Stationary emissions sources subject to these rules are regulated through SCAQMD's permitting process. Through this permitting process, SCAQMD also monitors the amount of stationary emissions being generated and uses this information in developing AQMPs.

Local

County of Los Angeles General Plan

The Air Quality Element summarizes air quality issues and outlines the goals and policies that will improve air quality and reduce greenhouse gas emissions. The Community Climate Action Plan is a sub-component of the Air Quality Element. The policies that are most relevant to air quality emissions include:

Policy AQ 1.1: Minimize health risks to people from industrial toxic or hazardous air pollutant emissions, with an emphasis on local hot spots, such as existing point sources affecting immediate sensitive receptors

Policy AQ 1.2: Encourage the use of low or no volatile organic compound (VOC) emitting materials

Policy AQ 1.3: Reduce particulate inorganic and biological emissions from construction, grading, excavation, and demolition to the maximum extent feasible

Greenhouse Gases

Background

GHGs are gases that trap heat in the atmosphere; the effect is analogous to the way a greenhouse retains heat. Common GHGs include water vapor, carbon dioxide (CO2), methane (CH4), nitrous oxides, chlorofluorocarbons, hydrofluorocarbons, perfluorocarbons, sulfur hexafluoride, ozone, and aerosols. The presence of these GHGs in the atmosphere affects the earth's surface temperature, which would be

about 34°C cooler without the natural heat-trapping effect of GHGs.[5] Both natural processes and human activities emit GHGs. However, it is believed that emissions from human activities, such as electricity production and vehicle use, have elevated the concentration of these gases in the atmosphere beyond the level of naturally occurring concentrations. **Table 3**: **Greenhouse Gases**, presents information on the GHGs of primary concern that are most environmentally prevalent.

Table 3
Greenhouse Gases

Greenhouse Gas	Description and Physical Properties	Sources
Carbon dioxide (CO2)	Carbon dioxide is an odorless, colorless, natural GHG. GWP = 1.	Carbon dioxide is emitted from natural and anthropogenic sources. Natural sources include decomposition of dead organic matter; respiration of bacteria, plants, animals, and fungus; evaporation from oceans; and volcanic outgassing. Anthropogenic sources are from burning coal, oil, natural gas, and wood. The concentration in 2005 was 379 ppm, which is an increase of about 1.4 ppm per year since 1960.
Haloalkanes	Haloalkanes (also known as halogenoalkanes or alkyl halides) are colorless, relatively odorless, and hydrophobic.	Haloalkanes are mostly human-produced such as flame retardants, fire extinguishants, refrigerants, propellants, solvents, and pharmaceuticals. Non-artificial-source haloalkanes do occur, mostly through enzyme-mediated synthesis by bacteria, fungi, and especially sea microalgae (seaweeds).
Methane (CH4)	Methane is a flammable gas and is the main component of natural gas. GWP = 21.	A natural source of methane is from the anaerobic decay of organic matter. Methane is extracted from geological deposits (natural gas fields). Other sources are from landfills, fermentation of manure, and cattle.
Nitrous oxide (N2O)	Nitrous oxide is also known as laughing gas and is a colorless GHG. GWP = 310.	Microbial processes in soil and water, fuel combustion, and industrial processes.
Perfluorocarbons (PFCs)	Perfluorocarbons liquids are colorless with high density, up to more than twice that of water. It is also an odorless, nonflammable, unreactive gas.	Man-made compounds containing just fluorine and carbon. They are used mainly in the electronics sector in semiconductor manufacture, with significant usage as refrigerants.

5 California Environmental Protection Agency, *Climate Action Team, Climate Action Team Report to Governor Schwarzenegger and the California Legislature,* www.climatechange.ca.gov/climate_action_team /reports/index.html, (March 2006), accessed June 10, 2013.

Greenhouse Gas	Description and Physical Properties	Sources
Sulfur hexafluoride (SF6)	Sulfur hexafluoride is an inorganic, colorless, odorless, nonflammable, extremely potent GHG that is an excellent electrical insulator. GWP = 22,800	Sulfur hexafluoride emissions are virtually all of anthropogenic origin including electricity sector, magnesium industry, electronics industry, and adiabatic property.

Source: Intergovernmental Panel on Climate Change, Summary for Policymakers, Climate Change 2013: The Physical Science Basis, Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change (Cambridge University Press: Cambridge, United Kingdom and New York, NY, USA) 2014.

Notes: ppm = parts per million; ppt = parts per trillion (measure of concentration in the atmosphere); GWP = global warming potential.

The global warming potential (GWP) is the potential of a gas or aerosol to trap heat in the atmosphere. The GWP compares the amount of heat trapped by a certain mass of the gas in question to the amount of heat trapped by a similar mass of carbon dioxide. A GWP is calculated over a specific time interval, commonly 20, 100, or 500 years. GWP is expressed as a factor of carbon dioxide (whose GWP is standardized to 1). For example, the 100-year GWP of methane is 28, which means that if the same mass of methane and carbon dioxide were introduced into the atmosphere, that methane will trap 28 times more heat than the carbon dioxide over the next 100 years.[6]

Federal

The U.S. Supreme Court ruled in *Massachusetts v. Environmental Protection Agency*, 127 S.Ct. 1438 (2007), that CO2 and other GHGs are pollutants under the federal Clean Air Act, which the USEPA must regulate if it determines they pose an endangerment to public health or welfare. The U.S. Supreme Court did not mandate that the USEPA enact regulations to reduce GHG emissions. Instead, the court found that the USEPA could avoid taking action if it found that GHGs do not contribute to climate change or if it offered a "reasonable explanation" for not determining that GHGs contribute to climate change.

On April 17, 2009, the United States Environmental Protection Agency (USEPA) released a proposed finding that determined climate change poses a risk to public health. The USEPA held a 60-day public comment period, which ended June 23, 2009, and received more than 380,000 public comments. On December 7, 2009, the USEPA Administrator (Administrator) signed two distinct findings regarding GHGs under section 202(a) of the CAA:

Endangerment Finding: The Administrator finds that the current and projected concentrations of the six key well-mixed GHGs—carbon dioxide (CO2), methane (CH4), nitrous oxide (N2O), hydrofluorocarbons

6 Working Group, Fifth Assessment Report of the Intergovernmental Panel on Climate Change, 2013.

(HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF6)—in the atmosphere threaten the public health and welfare of current and future generations.

Cause or Contribute Finding: The Administrator finds that the combined emissions of these well-mixed greenhouse gases from new motor vehicles and new motor vehicle engines contribute to the greenhouse gas pollution which threatens public health and welfare.

These findings do not themselves impose any requirements on industry or other entities. However, this action is a prerequisite to finalizing the proposed USEPA GHG standards for light-duty vehicles. These were jointly proposed by the USEPA and the Department of Transportation's National Highway Traffic Safety Administration (NHTSA) on September 15, 2009. The two findings were published in Federal Register Docket ID No. EPA-HQ-OAR-2009-0171. The final rule was effective January 14, 2010.

The USEPA has issued the Final Mandatory Reporting of Greenhouse Gases Rule that requires reporting of GHG emissions from large sources and suppliers in the United States. Under the rule (effective December 29, 2009), suppliers of fossil fuels or industrial GHGs, manufacturers of vehicles and engines, and facilities that emit 25,000 metric tons or more per year of GHG emissions are required to submit annual reports to the USEPA. The gases covered by the proposed rule are CO2, CH4, N2O, HFC, PFC, SF6, and other fluorinated gases including nitrogen trifluoride (NF3) and hydrofluorinated ethers (HFEs).

On September 15, 2009, the USEPA and the NHTSA proposed a new national program to reduce greenhouse gas emissions and improve fuel economy for all new cars and trucks sold in the United States. The USEPA proposed the first-ever national GHG emissions standards under the Clean Air Act (CAA), and NHTSA proposed Corporate Average Fuel Economy (CAFE) standards under the Energy Policy and Conservation Act. This proposed national program would allow automobile manufacturers to build a single light-duty national fleet that satisfies all requirements under both federal programs and the standards of California and other states.

On July 20, 2011, the EPA published its final rule deferring GHG permitting requirements for carbon dioxide emission from biomass-fired and other biogenic sources until July 21, 2014. Environmental groups have challenged the deferral. In September 2011, EPA released an "Accounting Framework for Biogenic CO2 Emissions from Stationary Sources," which analyzes accounting methodologies and suggests an implementation for biogenic carbon dioxide emitted from stationary sources.

On April 4, 2012, EPA published a proposed rule to establish, for the first time, a new source performance standard for GHG emissions. Under the proposed rule, new fossil-fuel-fired electric generating units larger than 25 megawatts (MW) would be required to limit emissions to 1,000 pounds of CO2 per megawatt-

hour (MWh) on an average annual basis, subject to certain exceptions. On April 17, 2012, EPA issued emission rules for oil production and natural gas production and processing operations.

State

Assembly Bill 1493

California Assembly Bill (AB) 1493 (Pavley), enacted on July 22, 2002, requires the California Air Resources Board (CARB) to adopt regulations that reduce GHGs emitted by passenger vehicles and light-duty trucks. The CARB estimates that the regulation would reduce climate change emissions from the light-duty passenger vehicle fleet by an estimated 18 percent in 2020 and by 27 percent in 2030.[7] On June 30, 2009, the USEPA granted a waiver of CAA preemption to California for the state's GHG emission standards for motor vehicles beginning with the 2009 model year. The waiver was published in the Federal Register on July 8, 2009.

Executive Order S-3-05 and the Climate Action Team

Executive Order S-3-05, which was signed by Governor Schwarzenegger in 2005, proclaims that California is vulnerable to the impacts of climate change. It declares that increased temperatures could reduce the Sierra snowpack, further exacerbate California's air quality problems, and potentially cause a rise in sea levels. To combat those concerns, the Executive Order established the following total GHG emission targets:

- By 2010, reduce GHG emissions to 2000 levels.
- By 2020, reduce GHG emissions to 1990 levels.
- By 2050, reduce GHG emissions to 80 percent below 1990 levels.

The 2050 reduction goal represents what scientists believe is necessary to reach levels that will stabilize the climate. The 2020 goal was established to be an aggressive but achievable midterm target. To meet these targets, the governor directed the secretary of the California Environmental Protection Agency to lead a Climate Action Team made up of representatives from the Transportation, Agency; the Department of Food and Agriculture; the Resources Agency; the CARB; the Energy Commission; and the Public Utilities Commission. The Climate Action Team's Report to the Governor in 2006 contains recommendations and strategies to help ensure that the targets in Executive Order S-3-05 are met.[8]

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7 California Air Resources Board, Fact Sheet, Climate Change Emission Control Regulations (December 10, 2004).

8 State of California, Environmental Protection Agency, Climate Action Team, Climate Action Team Report to Governor Schwarzenegger and the California Legislature, http://www.climatechange.ca.gov/climate_action_team/reports/index.html#catreports (March 2006), accessed July 2019.

Executive Order S-01-7

Former governor Arnold Schwarzenegger signed Executive Order S-01-07 on January 18, 2007. The order mandated that a statewide goal be established to reduce the carbon intensity of California's transportation fuels by at least 10 percent by 2020. It also established a Low Carbon Fuel Standard for transportation fuels for California.

California Air Resources Board

On October 24, 2008, the CARB released the first preliminary draft of recommended approaches for setting interim significance thresholds for GHG under the California Environmental Quality Act (CEQA). The draft approach seeks to establish GHG thresholds and/or performance standards based on sector types, as defined in the 2008 Scoping Plan. Sectors identified in the 2008 Scoping Plan are Transportation, Electricity, Industrial, Commercial and Residential, Agricultural, High Global Warming Potential, and Recycling and Waste. CARB has not yet finalized the proposed thresholds/performance standards.

Assembly Bill 32

In 2006, the California State Legislature enacted AB 32, the California Global Warming Solutions Act of 2006. AB 32 focuses on reducing GHG emissions in California. GHGs, as defined under AB 32, include CO_2, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride.

AB 32 requires that GHGs emitted in California be reduced to 1990 levels by the year 2020. CARB is the state agency charged with monitoring and regulating sources of emissions of GHGs that cause global warming as part of an effort to reduce emissions of GHGs.

The CARB Governing Board approved the 1990 GHG emissions level of 427 MMTCO2e on December 6, 2007. Therefore, by 2020, emissions in California are required to be at or below 427 MMTCO2e.

Under the current "business as usual" scenario, statewide emissions are increasing at a rate of approximately 1 percent per year as noted below.

- 1990: 427 MMTCO2e
- 2004: 480 MMTCO2e
- 2008: 495 MMTCO2e
- 2020: 596 MMTCO2e

Under AB 32, the CARB published its *Final Expanded List of Early Action Measures to Reduce Greenhouse Gas Emissions in California*.[9] The CARB has 44 early action measures that apply to the transportation, commercial, forestry, agriculture, cement, oil and gas, fire suppression, fuels, education, energy efficiency, electricity, and waste sectors. Of those early action measures, nine are considered discrete early action measures,[10] as they were adopted by the CARB and enforceable by January 1, 2010. The CARB estimates that the 44 early action measures will result in reductions of at least 42 MMTCO2e by 2020, representing approximately 25 percent of the 2020 target.

CEQA is only discussed once in the Early Action Measures report. The California Air Pollution Control Officer's Association suggested that CARB work with local air districts on approaches to review GHG impacts under the CEQA process, including significance thresholds for GHGs for projects and to develop a process for capturing reductions that result from CEQA mitigations. CARB's response to this recommendation in the report is as follows:

> *The Governor's Office of Planning and Research is charged with providing statewide guidance on CEQA implementation. With respect to quantifying any reductions that result from project-level mitigation of GHG emissions, we would like to see air districts take a lead role in tracking such reductions in their regions.*[11]

The CARB approved the Climate Change Proposed Scoping Plan (Scoping Plan) in December 2008. The Scoping Plan

> *proposes a comprehensive set of actions designed to reduce overall GHG emissions in California, improve our environment, reduce our dependence on oil, diversify our energy sources, save energy, create new jobs, and enhance public health.*[12]

As noted in the approved 2008 Scoping Plan, the projected total business-as-usual emissions for year 2020 (estimated as 506.8 MMTCO2e) must be reduced by approximately 16 percent to achieve the CARB's approved 2020 emission target of 427 MMTCO2e. CARB updated the 2008 Scoping Plan in May 2014 (Updated 2014 Scoping Plan).[13] The Updated 2014 Scoping Plan adjusted the 1990 GHG emissions level to 431 MMTCO2e and the updated 2020 GHG emissions forecast is 509 MMTCO2e which took credit for

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9 California Air Resources Board, *Expanded List of Early Action Measures to Reduce Greenhouse Gas Emissions in California Recommended for Board Consideration* (October 2007), http://www.arb.ca.gov/cc/ccea/meetings/ea_final_report.pdf, accessed July 6, 2014.

10 Discrete early actions are regulations to reduce greenhouse gas emissions adopted by the CARB Governing Board and enforceable by January 1, 2010.

11 California Air Resources Board, (October 2007).

12 California Air Resources Board, Climate Change Scoping Plan, a framework for change as approved December 2008. http://www.arb.ca.gov/cc/scopingplan/document/adopted_scoping_plan.pdf. (December 2008), accessed June 10, 2013.

13 CARB, First Update to the Climate Change Scoping Plan, building on the framework pursuant to AB 32, May 2014.

certain GHG emission reduction measures already in place (e.g., the Renewable Portfolio Standard). As revised in 2014, the projected total business-as-usual emissions for year 2020 must be reduced by approximately 15 percent to achieve the CARB's approved 2020 emission target of 431 MMTCO2e. The Updated 2014 Scoping Plan also recommend a 40 percent reduction in GHG emissions from 1990 levels by 2030 and a 60 percent reduction in GHG emissions from 1990 levels by 2040.

The 2008 Scoping Plan identifies recommended measures for multiple GHG emission sectors and the associated emission reductions needed to achieve the year 2020 emissions target—each sector has a different emission reduction target. Most of the measures target the transportation and electricity sectors. As stated in the 2008 Scoping Plan, the key elements of the strategy for achieving the 2020 GHG target include:

- Expanding and strengthening existing energy efficiency programs as well as building and appliance standards
- Achieving a statewide renewable energy mix of 33 percent
- Developing a California cap-and-trade program that links with other Western Climate Initiative partner programs to create a regional market system
- Establishing targets for transportation-related GHG emissions for regions throughout California and pursuing policies and incentives to achieve those targets
- Adopting and implementing measures pursuant to existing state laws and policies, including California's clean car standards, goods movement measures, and the Low Carbon Fuel Standard
- Creating targeted fees, including a public goods charge on water use, fees on high global warming potential gases, and a fee to fund the administrative costs of the state's long-term commitment to AB 32 implementation

In addition, the Scoping Plan differentiates between "capped" and "uncapped" strategies. "Capped" strategies are subject to the proposed cap-and-trade program.[14] The 2008 Scoping Plan states that the inclusion of these emissions within the cap-and-trade program will help ensure that the year 2020 emission targets are met despite some degree of uncertainty in the emission reduction estimates for any individual measure. "Uncapped" strategies include additional reductions that will not be subject to the cap-and-trade emissions requirements. They are provided as a margin of safety to help achieve required GHG emission reductions.

[14] The cap-and-trade program is a central element of AB 32 and covers major sources of GHG emissions in the state such as refineries, power plants, industrial facilities, and transportation fuels. The regulation includes an enforceable GHG cap that will decline over time. CARB will distribute allowances, which are tradeable permits, equal to the emission allowed under the cap.

Senate Bill 32

On September 8, 2016, Governor Brown enacted SB 32 that extends AB 32 another ten years to 2030 and increase the State's objectives. SB 32 calls on Statewide reductions in GHG emissions to 40 percent below 1990 levels by 2030. This bill would become operative only if AB 197 is enacted and becomes effective on or before January 1, 2017.

Assembly Bill 197

On September 8, 2016, Governor Brown enacted AB 197 which requires ARB to approve a statewide GHG emissions limit equivalent to the statewide GHG emission level in 1990 to be achieved by 2030. SB 32 requires ARB to prepare and approve a scoping plan for achieving the maximum technologically feasible and cost-effective reductions in GHG emissions. This bill would become operative only if SB 32 is enacted and becomes effective on or before January 1, 2017.

Title 24 Energy Efficiency Standards

Although not originally intended to reduce greenhouse gases, California Code of Regulations (CCR) Title 24 Part 6: California's Energy Efficiency Standards for Residential and Nonresidential Buildings, was first adopted in 1978 in response to a legislative mandate to reduce California's energy consumption. Since then, Title 24 has been amended with a distinction for energy-efficient buildings that require less electricity and reduce fuel consumption, which in turn decreases GHG emissions. The current 2016 Title 24 standards (effective as of January 1, 2017) were adopted to respond, amongst other reasons, to the requirements of AB 32. The 2016 Building Energy Efficiency Standards focus on several key areas to improve energy efficiency of newly constructed buildings and additions and alterations to existing buildings and include requirements that would enable both demand reductions during critical peak periods and future solar electric and thermal system installations. Specifically, new development projects constructed within California are subject to the mandatory planning and design, energy efficiency, water efficiency and conservation, material conservation and resources efficiency, and environmental quality measures of the California Green Building Standards ("CALGreen") Code (California Code of Regulations, Title 24, Part 11).

California's Building Energy Efficiency Standards are updated on an approximately three-year cycle. The 2016 update to the Building Energy Efficiency Standards focuses on several key areas to improve the energy efficiency of newly constructed buildings and additions and alterations to existing buildings. The most significant efficiency improvements to the residential Standards include improvements for attics, walls, water heating, and lighting. The most significant efficiency improvements to the nonresidential

Standards include alignment with the American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE) 90.1 2013 national standards.[15]

Local

County of Los Angeles General Plan

The Air Quality Element summarizes greenhouse gas issues and outlines the goals and policies that will improve and reduce greenhouse gas emissions. The Community Climate Action Plan is a sub-component of the Air Quality Element. The policies that are most relevant to greenhouse gas emissions include:

Policy AQ 3.1: Facilitate the implementation and maintenance of the Community Climate Action Plan to ensure that the County reaches its climate change and greenhouse gas emission reduction goals

Policy AQ 3.2: Reduce energy consumption in County operations by 20 percent by 2015

Policy AQ 3.3: Reduce water consumption in County operations

Policy AQ 3.4: Participate in local, regional and state programs to reduce greenhouse gas emissions

Policy AQ 3.5: Encourage energy conservation in new development and municipal operations

Policy AQ 3.6: Support rooftop solar facilities on new and existing buildings.

Los Angeles County Community Climate Action Plan

The Los Angeles County Community Climate Action Plan (CCAP) provides policy guidance for reducing GHG emissions generated within the unincorporated areas. The CCAP ensures that the County will be able to reduce its emissions to 1990 levels by 2020. The CCAP includes an emissions inventory for the unincorporated areas and an analysis of the reduction needed to achieve County goals. It analyzes specific actions that result in reduced emissions and lays out a plan for their use and implementation. It also provides a mechanism for tracking and evaluating the County's progress in achieving its climate change goals. The CCAP supports sustainable design and energy efficiency, as well as active and multi-modal transportation strategies to reduce VMT.

[15] 2016 Building Energy Efficiency Standards for Residential and Nonresidential Buildings

The purpose of the CCAP is to: (1) establish a baseline emissions inventory and reduction needed to meet County goals; (2) identify specific actions that will measurably reduce GHG emissions; (3) implement state and local level measures; and (4) provide a mechanism for ongoing tracking and updates to the CCAP.

ENVIRONMENTAL SETTING

Regional Air Quality

The USEPA is the federal agency responsible for overseeing the country's air quality and setting the NAAQS for the CAPs. The NAAQS were devised based on extensive modeling and monitoring of air pollution across the country; they are designed to protect public health and prevent the formation of atmospheric ozone. Air quality of a region is considered to be in attainment of the NAAQS if the measured ambient air pollutant levels do not exceed the applicable concentration threshold.

As noted previously, the CARB is the state agency responsible for setting the CAAQS. Air quality of a region is considered to be in attainment of the CAAQS if the measured ambient air pollutant levels for O3, CO, NO2, SO2, PM10, PM2.5, and Pb are not exceeded, and all other standards are not equaled or exceeded at any time in any consecutive 3-year period.

For evaluation purposes, the SCAQMD territory is divided into 38 source receptor areas (SRAs). These SRAs are designated to provide a general representation of the local meteorological, terrain, and air quality conditions within the particular geographical area.

The Project site is within SRA 12, South Central Los Angeles County.[16] The nearest air monitoring station SCAQMD operates is Compton-700 North Bullis Road station. This station monitors O3, NO2 and PM2.5. **Table 4: Air Quality Monitoring Summary** summarizes published monitoring data from 2016 through 2018, the most recent 3-year period available. The data show that during the past few years, the region has exceeded the O3 standards.

Table 4
Air Quality Monitoring Summary

Air Pollutant	Average Time (Units)	2016	2017	2018
Ozone (O3)	State Max 1 hour (ppm)	0.098	0.092	0.075
	Days > CAAQS threshold (0.09 ppm)	1	0	0
	National Max 8 hour (ppm)	0.071	0.076	0.063
	Days > NAAQS threshold (0.075 ppm)	1	5	0

16 SCAQMD, *General Forecast Areas and Air Monitoring Areas,* map, accessed April 2019, http://www.aqmd.gov/docs/default-source/default-document-library/map-of-monitoring-areas.pdf.

Air Pollutant	Average Time (Units)	2016	2017	2018
	State Max 8 hour (ppm)	0.071	0.076	0.064
	Days > CAAQS threshold (0.07 ppm)	1	5	0
Carbon monoxide (CO)		—	—	—
Nitrogen dioxide (NO2)	National Max 1 hour (ppm)	0.064	0.099	0.068
	Days > NAAQS threshold (0.100 ppm)	0	0	0
	State Max 1 hour (ppm)	0.063	0.099	0.068
	Days > CAAQS threshold (0.18 ppm)	0	0	0
Respirable particulate matter (PM10)	National Max (µg/m3)	—	—	—
	National Annual Average (µg/m3)	—	—	—
	Days > NAAQS threshold (150 µg/m3)	—	—	—
	State Max (µg/m3)	—	—	—
	State Annual Average (µg/m3)	—	—	—
	Days > CAAQS threshold (50 µg/m3)	—	—	—
Fine particulate matter (PM2.5)	National Max (µg/m3)	36.3	66.7	49.4
	National Annual Average (µg/m3)	11.0	13.2	13.2
	Days > NAAQS threshold (35 µg/m3)	1	5	2
	State Max (µg/m3)	36.3	66.7	49.4
	State Annual Average (µg/m3)	—	13.2	13.2

Source: CARB, iADAM: Air Quality Data Statistics.
Note: (—) = Data not available.

The USEPA and the CARB designate air basins where AAQS are exceeded as “nonattainment” areas. If standards are met, the area is designated as an “attainment” area. If there is inadequate or inconclusive data to make a definitive attainment designation, they are considered “unclassified.” Federal nonattainment areas are further designated as marginal, moderate, serious, severe, or extreme as a function of deviation from standards.

The current attainment designations for the Basin are shown in **Table 5: South Coast Air Basin Attainment Status**. The Basin is currently designated as being in nonattainment at the federal level for O3 and PM2.5; and at the state level for O3, PM10, and PM2.5.

Table 5
South Coast Air Basin Attainment Status

Pollutant	State Status	National Status
Ozone (O3)	Nonattainment	Nonattainment
Carbon monoxide (CO)	Attainment	Unclassified/Attainment
Nitrogen dioxide (NO2)	Attainment	Unclassified/Attainment
Sulfur dioxide (SO2)	Attainment	Attainment
Respirable particulate matter (PM10)	Nonattainment	Attainment
Fine particulate matter (PM2.5)	Nonattainment	Nonattainment

Source: California Air Resources Board (CARB) Area Designation Maps / State and National, accessed February 2019, http://www.arb.ca.gov/desig/adm/adm.htm, last reviewed May 5, 2016.

Sensitive Receptors

The SCAQMD considers a sensitive receptor to be a person in the population who is particularly susceptible to health effects due to exposure to an air contaminant. Sensitive receptors are identified near sources of air pollution to determine the potential for health hazards. Locations evaluated for exposure to air pollution include but are not limited to residences, schools, hospitals, and convalescent facilities. The Project site is bound by Rosecrans Avenue to the north and Avalon Boulevard to the west. Nexfil USA is located to the south, McKinley Elementary School to the southwest, and single-family residences border the east side of the Project site. The nearest sensitive receptors are the single-family residential homes located approximately 10 feet east of the Project site.

Greenhouse Gas

State Greenhouse Gas Inventory

In 2016, California produced 429.4 million metric tons of carbon dioxide equivalents (MMTCO2e), including imported electricity and excluding combustion of international fuels and carbon sinks or storage. The major source of GHGs in California is transportation, contributing to 37 percent of the State's total GHG emissions. Industrial generation is the second largest source, contributing to 21 percent of the State's GHG emissions. The Statewide inventory of GHGs by sector is shown in **Table 6: California GHG Inventory 2008–2016.**

Table 6
California GHG Inventory 2008–2016

	Emissions (MMTCO2e)								
Main Sector	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**
Transportation[a]	188.59	188.53	177.58	170.40	165.07	161.51	161.22	157.99	159.53
Industrial[b]	90.54	87.90	91.50	90.94	91.07	93.73	93.96	91.58	89.61
Electric power	120.14	101.37	90.34	88.06	95.09	89.65	88.24	83.67	68.58
Commercial and residential	43.52	43.63	45.05	45.50	42.89	43.54	37.37	37.94	39.36
Agriculture	35.79	33.50	34.27	34.89	36.08	34.61	35.95	34.41	33.84
High GWP[c,d]	11.65	12.29	13.52	14.54	15.54	16.65	17.70	18.93	19.78
Recycled and waste	8.11	8.27	8.37	8.47	8.49	8.52	8.59	8.73	8.81
Total Emissions	**487.3**	**457.3**	**448.1**	**443.9**	**450.4**	**447.6**	**444.1**	**441.4**	**429.4**

Source: CARB (2016), https://www.arb.ca.gov/cc/inventory/data/tables/ghg_inventory_scopingplan_sum_2000-16.pdf

[an] Includes equipment used in construction, mining, oil drilling, industrial and airport ground operations.

[b] Reflects emissions from combustion of natural gas, diesel, and lease fuel plus fugitive emissions.

[c] These categories are listed in the Industrial sector of CARB's GHG Emission Inventory sectors.

[d] This category is listed in the Electric Power sector of CARB's GHG Emission Inventory sectors.

METHODOLOGY

Construction

Construction of the Project has the potential to generate temporary criteria pollutant emissions through the use of heavy-duty construction equipment, such as excavators and forklifts, and through vehicle trips generated from workers and haul trucks traveling to and from the Project site. In addition, fugitive dust emissions would result from various soil-handling activities. Mobile-source emissions, primarily NOx, would result from the use of construction equipment, such as dozers and loaders. Construction emissions can vary substantially from day to day, depending on the level of activity, the specific type of construction activity, and prevailing weather conditions. The assessment of construction air quality impacts considers each of these potential sources.

Daily regional emissions during construction are forecasted by assuming a conservative estimate of construction activities (i.e., assuming all construction occurs at the earliest feasible date) and applying the mobile source and fugitive dust emissions factors. The emissions are estimated using the SCAQMD-recommended CalEEMod software. CalEEMod is based on outputs from the CARB off-road emissions model (OFFROAD) and the CARB on-road vehicle emissions model (EMFAC), which are emissions estimation models developed by CARB and used to calculate emissions from construction activities, including on- and off-road vehicles. The input values used in this analysis are based on conservative

assumptions in CalEEMod, with appropriate, Project-specific adjustments based on equipment types and expected construction activities. These values were then applied to the construction phasing assumptions used in the criteria pollutant analysis to generate criteria pollutant emissions values for each construction activity. Detailed construction equipment lists, construction scheduling, and emissions calculations are provided in **Appendix B**.

Operation

Operation of the Project has the potential to generate criteria pollutant emissions through vehicle trips traveling to and from the Project site. In addition, emissions would result from area sources on site, such as natural gas combustion, landscaping equipment, and use of consumer products.

Operational emissions were estimated using the CalEEMod software, which was used to forecast the daily regional emissions from area sources that would occur during long-term Project operations. In calculating mobile-source emissions, trip-length values were based on the distances provided in CalEEMod.

Area-source emissions are based on natural gas (building heating and water heaters), landscaping equipment, and consumer product (including paint) usage rates provided in CalEEMod. Natural gas usage factors in CalEEMod are based on the California Energy Commission's California Commercial End Use Survey data set, which provides energy demand by building type and climate zone.

SCAQMD AIR QUALITY SIGNIFICANCE THRESHOLDS

Significance Criteria

Under CEQA, SCAQMD is a commenting agency on air quality within its jurisdiction or impacting is jurisdiction. Under the Federal CAA, SCAQMD has adopted federal attainment plans for O3 and PM10. SCAQMD reviews projects to ensure that they would not: (1) cause or contribute to any new violation of any quality standard; (2) increase the frequency or severity of any existing violation of any air quality standard; or (3) delay timely attainment of any air quality standard or any required interim emission reductions or other milestones of any federal attainment plan.

The thresholds for determining the significance of impacts are set forth by the SCAQMD for both construction and operational emissions. These thresholds are described below.

Construction Emission Thresholds

The Project will have a significant impact if it exceeds the construction thresholds listed in **Table 7: Construction Thresholds**.

Table 7
Construction Thresholds

Pollutant	Construction Emissions (pounds/day)
Volatile organic compounds (VOCs)	75
Nitrogen dioxide (NO2)	100
Carbon monoxide (CO)	550
Sulfur dioxide (SO2)	150
Respirable particulate matter (PM10)	150
Fine particulate matter (PM2.5)	55

Construction and Operational Localized Significance Thresholds

The local significance thresholds are based on the SCAQMD's Final *Localized Significance Threshold (LST) Methodology* (LST Methodology)[17] guidance document for short-duration construction activities. The SCAQMD recommends the evaluation of localized air quality impacts to sensitive receptors in the immediate vicinity of the Project site because of construction activities. The SCAQMD provides voluntary guidance on the evaluation of localized air quality impacts to public agencies conducting environmental review of projects located within its jurisdiction. Localized air quality impacts are evaluated by examining the on-site generation of pollutants and their resulting downwind concentrations. For construction, pollutant concentrations are compared to significance thresholds for particulates (PM10 and PM2.5), CO, and NO2. The significance threshold for PM10 represents compliance with SCAQMD Rule 403 (Fugitive Dust). The threshold for PM2.5 is designed to limit emissions and to allow progress toward attainment of the AAQS. Thresholds for CO and NO2 represent the allowable increase in concentrations above background levels that would not cause or contribute to an exceedance of their respective AAQS.

The LST Methodology provides lookup tables of emissions that are based on construction projects of up to 5 acres in size. These LST lookup tables were developed to assist lead agencies with a simple tool for evaluating the impacts from small typical projects. Ambient conditions for the South Central Los Angeles County, as recorded in SRA 12 by the SCAQMD, were used for ambient conditions in determining appropriate threshold levels. Thresholds for each criteria pollutant for construction activity and Project operation of the 5-acre Project site are listed in **Table 8: Localized Significance Thresholds**.

17 South Coast Air Quality Management District, *Final Localized Significance Threshold (LST) Methodology,* (June 2003, rev. July 2008).

Table 8
Localized Significance Thresholds

Pollutant	Construction	Operational
	pounds/day	
Nitrogen dioxide (NO2)	98	98
Carbon monoxide (CO)	630	630
Respirable particulate matter (PM10)	13	4
Fine particulate matter (PM2.5)	7	2

Notes:
Based on a distance to sensitive receptors of 25 meters (82 feet). SCAQMD's Localized Significance Threshold (LST) Methodology for CEQA Evaluations *guidance document provides that projects with boundaries located closer than 25 meters to the nearest receptor should use the LSTs for receptors located at 25 meters.*
LST values for 5-acre site.

Operational Thresholds

Based on the SCAQMD Handbook, thresholds for each criteria pollutant for the operations of the Project are provided in **Table 9: Operational Thresholds**.

Table 9
Operational Thresholds

Pollutant	Operational Emissions (pounds/day)
Volatile organic compounds (VOCs)	55
Nitrogen dioxide (NO2)	55
Carbon monoxide (CO)	550
Sulfur dioxide (SO2)	150
Respirable particulate matter (PM10)	150
Fine particulate matter (PM2.5)	55

Toxic Air Contaminants

The determination of significance of a project with respect TACs shall be made on a case-by-case basis, considering the following factors:

- Regulatory framework for toxic materials and process involved;
- Proximity of TACs to sensitive receptors;

- Quantity, volume, and toxicity of the contaminants expected to be emitted;
- Likelihood and potential level of exposure; and
- Degree to which project design will reduce risk of exposure.

Consistency with Applicable Air Quality Plans

Section 15125 of the State CEQA Guidelines requires an analysis of project consistency with applicable governmental plans and policies. In accordance with the SCAQMD Handbook, the following criteria were used to evaluate the Project's consistency with SCAQMD and SCAG regional plans and policies, including the AQMP:

- Will the Project result in any of the following:
  - Increase the frequency or severity of existing air quality violations?
  - Cause or contribute to new air quality violations?
  - Delay the timely attainment of the air quality standards or the interim emission reductions specified in the AQMP?
- Will the Project exceed the assumptions utilized in preparing the AQMP?
  - Is the Project consistent with the population and employment growth projections upon which AQMP forecasted emission levels are based?
  - Does the Project include air quality mitigation measures?
  - To what extent is Project development consistent with the AQMP land use policies?

Cumulative Threshold

SCAQMD recommends that a project be considered to result in a cumulatively considerable impact to air quality if any construction-related emissions and operational emissions from individual development projects exceed the mass daily emissions thresholds for individual projects**.**[18]

The SCAQMD neither recommends quantified analyses of the emissions generated by a set of cumulative development projects nor provides thresholds of significance to be used to assess the impacts associated with these emissions.

18 SCAQMD, *White Paper on Regulatory Options for Addressing Cumulative Impacts from Air Pollution Emissions*, board meeting, Agenda No. 29 (September 5, 2003), Appendix D, p. D-3.

A project is also considered to result in a cumulatively considerable contribution to significant impacts if the population and employment projections for the project exceed the rate of growth defined in SCAQMD's AQMP.

IMPACT ANALYSIS

As noted previously, emissions of air pollutants were estimated for construction and operation of the Project using CalEEMod. Information needed to parameterize the Project in CalEEMod was obtained from the construction engineer and the Project architect. **Table 10: Project Construction Diesel Equipment Inventory** displays the construction equipment required for each activity. It was assumed that all construction activities have adhered or would adhere to SCAQMD Rule 403 (Fugitive Dust) and Rule 1113 (Architectural Coatings).

Table 10
Project Construction Diesel Equipment Inventory

Phase	Off-Road Equipment Type	Amount	Daily Hours	Horsepower [HP] (Load Factor)
Demolition	Concrete/Industrial Saws	1	8	81 (0.73)
	Rubber Tired Dozers	1	1	247 (0.4)
	Tractors/Loaders/Backhoes	2	6	97 (0.37)
Grading	Concrete/Industrial saws	1	8	81 (0.73)
	Rubber Tired Dozers	1	1	247 (0.40)
	Tractors/Loaders/Backhoes	2	6	97 (0.37)
Building Construction	Cranes	1	4	226 (0.29)
	Forklifts	2	6	89 (0.20)
	Tractors/Loaders/Backhoes	2	8	97 (0.37)
Architectural Coating	Air compressors	1	6	78 (0.48)
Paving	Cement and mortar mixers	4	6	9 (0.56)
	Pavers	1	7	130 (0.42)
	Rollers	1	7	80 (0.38)
	Tractors/Loaders/Backhoes	1	7	97 (0.37)

*Refer to **Appendix B.2 (Proposed Summer)** and **Appendix B.3 (Proposed Winter),** Section 3.0: Construction Detail, for equipment inventory information.*

Air Quality

Construction

Construction would occur over between six and nine months over five phases: (1) demolition; (2) grading; (3) building construction; (4) paving; and (5) architectural coating. Each phase of construction would result in varying levels of intensity and a number of construction personnel. The construction workforce would consist of approximately 10 worker trips per day during demolition, 10 worker trips per day and 40 total hauling trips during grading, 4 worker trips per day and 2 vendor trips per day during building construction, 18 worker trips per day during paving, and 1 worker trip per day during architectural coating. It is important to note that no square footage would be removed during the demolition phases, as this phase would involve current tenant improvements in the building. In addition, approximately 800 cubic yards of soil would be exported off the site during the grading phase, with a maximum of 5 truck trips per day. The export is expected to be taken to United Landfill, 1245 Arrow Highway, Irwindale, with a round trip of approximately 54 miles.

Maximum daily emissions of air pollutants during construction and operation of the Project were calculated using CalEEMod. **Table 11: Maximum Construction Emissions** identifies daily emissions that are estimated for peak construction days for each construction year. Based on the modeling, construction of the Project would not exceed regional VOC, NOx, CO, SOx, PM10, and PM2.5 concentration thresholds. All criteria air pollutants have been or would be below SCAQMD construction thresholds. Construction of the Project would not generate any significant environmental impacts associated with air quality compliance.

Table 11
Maximum Construction Emissions

Source	VOC	NOx	CO	SOx	PM10	PM2.5
	pounds/day					
Unmitigated Maximum	26	19	17	<1	2	<1
SCAQMD Mass Daily Threshold	75	100	550	150	150	55
Threshold exceeded?	**No**	**No**	**No**	**No**	**No**	**No**

Source: CalEEMod.
Notes:
CO = carbon monoxide; NOx = nitrogen oxides; PM10 = particulate matter less than 10 microns; PM2.5 = particulate matter less than 2.5 microns; SOx = sulfur oxides; VOC = volatile organic compounds.
*Refer to **Appendix B.2 (Proposed Summer)** and **Appendix B.3 (Proposed Winter),** Sections 3.2 through 3.7, for maximum on-site plus off-site emissions during both the summer and winter seasons.*

Operation

Operation of the Project has the potential to generate criteria pollutant emissions through vehicle trips traveling to and from the Project site. In addition, emissions would result from area sources on site, such as natural gas combustion, landscaping equipment, and use of consumer products.

Operational emissions were estimated using the CalEEMod software, which was used to forecast the daily regional emissions from area sources that would occur during long-term Project operations. In calculating mobile-source emissions, trip-length values were based on the distances provided in CalEEMod.

Area-source emissions are based on natural gas (building heating and water heaters), landscaping equipment, and consumer product (including paint) usage rates provided in CalEEMod. Natural gas usage factors in CalEEMod are based on the California Energy Commission's California Commercial End Use Survey data set, which provides energy demand by building type and climate zone. Emissions from area sources will result primarily from the CNG fueling facility for the bus fleet.

Emissions from mobile sources will result primarily from buses, employees (passenger cars, light-duty trucks, SUVs) and maintenance vehicles/other trucks traveling to and from the Project site. The Project is expected to generate 443 daily trips which includes 157 daily trips by buses, 284 daily trips by employees (passenger cars, light-duty trucks, SUVs), and 2 daily trips from maintenance vehicles/other trucks.

As shown in **Table 12: Maximum Operational Emissions** the operational emissions would not exceed the regional VOC, NOx, CO, SOx, PM10, and PM2.5 concentration thresholds.

Table 12
Maximum Operational Emissions

	VOC	NOx	CO	SOx	PM10	PM 2.5
Source			**pounds/day**			
Area	<1	<1	<1	<1	0	0
Energy	<1	<1	<1	<1	<1	<1
Mobile	1	4	10	<1	3	1
Total	1	4	10	<1	3	1
SCAQMD Mass Daily Threshold	55	55	550	150	150	55
Threshold exceeded?	**No**	**No**	**No**	**No**	**No**	**No**

Source: CalEEMod.
Notes: Totals in table may not appear to add exactly due to rounding in the computer model calculations.
CO = carbon monoxide; NOx = nitrogen oxides; PM10 = particulate matter less than 10 microns; PM2.5 = particulate matter less than 2.5 microns; SOx = sulfur oxides; VOC = volatile organic compounds.
*Refer to **Appendix B.2 (Proposed Summer)** and **Appendix B.3 (Proposed Winter),** Section 2.2, for maximum operational emissions during both the summer and winter seasons.*

Localized Significance Thresholds

The result of the LST analysis are provided in **Table 13: Localized Construction and Operational Emissions**. These estimates assume the maximum area that would be disturbed during construction on any given day during Project buildout. Construction would comply with the SCAQMD's Rule 403 (Fugitive Dust), which requires watering of the site during dust-generating construction activities, stabilizing disturbed areas with water or chemical stabilizers, and preventing track-out dust from construction vehicles. As shown in **Table 13**, emissions would not exceed the localized significance construction and operational thresholds.

Table 13
Localized Construction and Operational Emissions

	NOx	CO	PM10	PM2.5
Source	**On-Site Emissions (pounds/day)**			
Construction				
Total maximum emissions	9	7	1	1
LST threshold	98	630	13	7
Threshold Exceeded?	**No**	**No**	**No**	**No**
Operational				
Project area/energy emissions	<1	<1	<1	<1
LST threshold	98	630	4	2
Threshold Exceeded?	**No**	**No**	**No**	**No**

Notes:
Totals in table may not appear to add exactly due to rounding in the computer model calculations.
CO = carbon monoxide; NOx = nitrogen oxide; PM10 = particulate matter less than 10 microns; PM2.5 = particulate matter less than 2.5 microns.
*Refer to **Appendix B.2 (Proposed Summer)** and **Appendix B.3 (Proposed Winter),** Sections 3.2 through 3.7, for maximum on-site emissions during both the summer and winter seasons.*

Toxic Air Contaminants

Project construction would result in short-term emissions of diesel particulate matter, which is a TAC. Off-road heavy-duty diesel equipment would emit diesel particulate matter over the course of the construction period. Localized diesel particulate emissions (strongly correlated with PM2.5 emissions) would be minimal and would be substantially below localized thresholds, as shown in **Table 13**. Project compliance with the CARB anti-idling measure, which limits idling to no more than 5 minutes at any location for diesel-fueled commercial vehicles, would further minimize diesel particulate matter emissions in the Project area.

Project operations would generate only minor amounts of diesel emissions from residential delivery trucks and incidental maintenance activities. Trucks would comply with the applicable provisions of the

CARB Truck and Bus regulation to minimize and reduce emission from existing diesel trucks. In addition, Project operations would only result in minimal emissions of air toxics from maintenance or other ongoing activities, such as from the use of architectural coatings or household cleaning products. As a result, toxic or carcinogenic air pollutants are not expected to occur in any meaningful amounts in conjunction with operation of the proposed residential uses within the Project site. Based on the uses expected on the Project site, potential long-term operational impacts associated with the release of TACs would be minimal and would not be expected to exceed the SCAQMD thresholds of significance.

Odors

As shown in **Table 13,** the construction of the Project would result in emissions below the localized significance thresholds. Mandatory compliance with SCAQMD Rule 1113 would limit the amount of VOCs in architectural coatings and solvents. According to the SCAQMD, while almost any source may emit objectionable odors, some land uses are more likely to produce odors because of their operation. Land uses more likely to produce odors include agriculture, chemical plants, composting operations, dairies, fiberglass molding manufacturing, landfills, refineries, rendering plants, rail yards, and wastewater treatment plants. The Project does not contain any active manufacturing activities and would not convert current agricultural land to residential land uses. Therefore, objectionable odors would not be emitted by the residential uses.

Any unforeseen odors generated by the Project will be controlled in accordance with SCAQMD Rule 402. As previously noted, Rule 402 prohibits the discharge of air contaminants that harm, endanger, or annoy individuals or the public; endanger the comfort, health or safety of individuals or the public; or cause injury or damage to business or property. Failure to comply with Rule 402 could subject the offending facility to possible fines and/or operational limitations in an approved odor control or odor abatement plan.

Consistency with AQMP

The Basin is designated nonattainment at the federal and State level for ozone and PM2.5. SCAQMD developed regional emissions thresholds, as shown in **Table 7** and **Table 9**, to determine whether a project would contribute to air pollutant violations. If a project exceeds the regional air pollutant thresholds, then it would significantly contribute to air quality violations in the Basin.

As shown in **Table 11**, temporary emissions associated with construction of the Project would fall below SCAQMD thresholds for VOCs, NOx, CO, SOx, PM10, and PM2.5.

As shown in **Table 12**, long-term emissions associated with operation of the Project would not exceed SCAQMD thresholds for VOCs, NOx, CO, SOx, PM10, and PM2.5.

The Project's maximum potential NOx, CO, PM10, and PM2.5 daily emissions during construction and operation were analyzed to determine potential effects on localized concentrations and to determine if the potential exists for such emissions to cause or affect a violation of an applicable AAQS. As shown in **Table 13**, NOx, CO, PM10, and PM2.5 emissions would not exceed the SCAQMD localized significance thresholds.

The Project is also located in an urban area, which would reduce vehicle trips and vehicle miles traveled due to the Project's urban infill characteristic and proximity to public transit stops. These measures and features are consistent with existing recommendations to reduce air emissions.

Cumulative

Development of the Project in conjunction with the related projects near the Project would result in an increase in construction and operational emissions in an already urbanized area of the City. However, cumulative air quality impacts from construction, based on SCAQMD guidelines, are not analyzed in a manner similar to project-specific air quality impacts. Instead, the SCAQMD recommends that a project's potential contribution to cumulative impacts should be assessed utilizing the same significance criteria as those for project-specific impacts. According to the SCAQMD, individual development projects that generate construction or operational emissions that exceed the SCAQMD recommended daily regional or localized thresholds for project-specific impacts would also cause a cumulatively considerable increase in emissions for those pollutants for which the Basin is in nonattainment.

With the implementation of regulatory compliance measures such as Rule 403 (Fugitive Dust) and Rule 1113 (Architectural Coating), the Project's construction and operational emissions are not expected to significantly contribute to cumulative emissions for CO, NOx, PM10, and PM2.5. As such, the Project's contribution to cumulative air quality emissions in combination with the related projects would not be cumulatively considerable.

As discussed previously, the Project would not jeopardize the attainment of air quality standards in the 2016 AQMP for the South Coast Air Basin and the Los Angeles County portion of the South Coast Air Basin. As such, the Project would not have a cumulatively considerable contribution to a potential conflict with or obstruction of the implementation of the AQMP regional reduction plans.

Greenhouse Gases

The total GHG emissions from the Project were quantified to determine the level of the Project's estimated annual GHG emissions. Construction emissions were estimated using CalEEMod by assuming a conservative estimate of construction activities (i.e., assuming all construction occurs at the earliest feasible date) and applying the mobile source emissions factors. The SCAQMD guidance, Draft Guidance Document – Interim CEQA Greenhouse Gas (GHG) Significance Threshold, recognizes that construction-

related GHG emissions from project "occur over a relatively short-term period of time" and that "they contribute a relatively small portion of the overall lifetime project GHG emissions. A project's lifetime has generally been defined as 30 years. In accordance with this methodology, the estimated Proposed Project's construction GHG emissions have been annualized over a 30-year period and are included in the annualized operational GHG emissions.

CalEEMod was also used to estimate operational GHG emission from electricity, natural gas, solid waste, water and wastewater, fireplaces, and landscaping equipment. Building electricity and natural gas usage rates account for current Title 24 Building Energy Efficiency Standards. Mobile source emissions were estimated based on the CARB EMFAC model. For mobile sources, CalEEMod was used to generate the vehicle miles traveled (VMT) based on the Project traffic impact analysis.

With regard to energy demand, the consumption of fossil fuels to generate electricity and to provide heating and hot water generates GHG emissions. Energy demand rates were estimated based on square footage, as well as predicted water supply needs for these uses. Energy demand (off-site electricity generation and on-site natural gas consumption) for the Project was calculated within CalEEMod using the CEC CEUS data set, which provides energy demand by building type and climate zone.

Emissions of GHGs from solid waste disposal were also calculated using CalEEMod software. The emissions are based on the waste disposal rate for the land uses, the waste diversion rate, and the GHG emission factors for solid waste decomposition. The GHG emission factors, particularly for CH4, depend on characteristics of the landfill, such as the presence of a landfill gas capture system and subsequent flaring or energy recovery. The default values, as provided in CalEEMod, for landfill gas capture (e.g., no capture, flaring, energy recovery), which are statewide averages, were used in this assessment.

Emissions of GHGs from water and wastewater result from the required energy to supply and distribute the water and treat the wastewater. Wastewater also results in emissions of GHGs from wastewater treatment systems. Emissions are calculated using CalEEMod, and are based on the water usage, electrical intensity factors for water supply, treatment, and distribution and for wastewater treatment, the GHG emission factors for the electricity utility provider, and the emission factors for the wastewater treatment process.

SCAQMD has not adopted recommended numeric CEQA significance thresholds for GHG emissions for lead agencies to use in assessing GHG impacts of development projects. The Working Group released draft guidance regarding interim CEQA GHG indicators of significance in October 2008, proposing a tiered approach. Under Tier 1, projects that are exempt from CEQA would be less than significant. Under Tier 2, projects that are consistent with an adopted GHG reduction plan would be less than significant. Under Tier 3, non-industrial projects with 3,000 metric tons of CO2e per year or less would be less than significant. It should be noted that the SCAQMD has formally adopted a GHG significance thresholds of

10,000 MTCO2e per year for industrial/stationary source projects where the SCAQMD is the lead agency based on a 90 percent capture rate for the industrial/stationary source sector. However, given the lack of a formally adopted numerical significance threshold or a formally adopted local plan for reducing GHG emission applicable to this project, the significance of the project is evaluated based on the SCAQMD's proposed screening level of 3,000 MTCO2e.

A summary of the GHG emissions for the construction phases is provided in **Table 14: Estimated Greenhouse Gas Emissions.** Total construction emissions would be approximately 66 MTCO2e. Construction emissions amortized over 30 years would be approximately 2 MTCO2e/year.

The majority of GHG emissions from operation of the Project involves mobile sources traveling to and from the Project site. Daily trips include: buses, employees (passenger cars/light duty trucks/SUVs), and maintenance vehicles/other trucks. The proposed Project is projected to generate a total of approximately 443 trip-ends per day. Project operations would occur during a 24-hour period, thus would result in evenly dispersed trips throughout the day and the majority of buses and employees traveling to and from the Project site are outside of the typical morning and evening peak hours. The annual GHG emissions associated with the operation of the project are provided in **Table 14**. The sum of the direct and indirect emissions associated with the Project is compared with SCAQMD's screening threshold of 3,000 MTCO2e/year. As shown in **Table 14,** the increase in GHG emissions generated by the Project would be 691 MTCO2e per year, below the recommended SCAQMD screening threshold of 3,000 MTCO2e per year.

Table 14
Estimated Greenhouse Gas Emissions

GHG Emissions Source	Emissions ($MTCO_2e$/year)
Construction (amortized)	2
Operational (mobile) sources	608
Area sources	<1
Energy	60
Waste	7
Water	14
Total	**691**

Source: CalEEMod
Totals in table may not appear to add exactly due to rounding in the computer model calculations.
$MTCO_2e$ = metric tons of carbon dioxide emissions.
*Refer to **Appendix B1 (Proposed Annual)** Section 2.2 Overall Operational.*

APPENDIX B

CalEEMod Air Quality Emission Output Files

APPENDIX B.1

Proposed Annual

Transdev Facility

Los Angeles-South Coast County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Office Building	12.14	1000sqft	0.28	12,137.00	0
Gasoline/Service Station	5.00	Pump	0.00	705.87	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	33
Climate Zone	9			**Operational Year**	2021
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	702.44	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Transdev Facility - Los Angeles-South Coast County, Annual

Project Characteristics - Construction on site will take between six and nine months

Land Use - Building area of office and administrative use
Vehicle maintenance bays equipped for providing service to revenue and non-revenue vehicles

Demolition - No square footage will be removed during the demolition phase, the only demolition will be of the current tenant improvements in the building

Grading - Grading operation to result in approximately 500 cy from Parcel -027
Grading operation to result in approximately 300 cy from Parcel -037

Vehicle Trips - Expected to generate 443 trips which includes buses (157), employees (284) and Maintenance Vehicles/Other Trucks (2)

Construction Off-road Equipment Mitigation - As recommended by SCAQMD, alternative applicable strategies include construction equipment with Tier 3 emissions standards.

Area Mitigation -

Water Mitigation -

Construction Phase - Export operations for Parcel -027 to last approximately a week.
Export operations for Parcel -037 to last 3 to 4 days

Trips and VMT - 5 truck trips per day over one week for Parcel -027 (500 cy) = 25 total trips
5 truck trips per day over 3 days for Parcel -037 (300 cy) = 15 total trips
Haul Route to 636 Rosecrans Avenue Via 605, 105, 710 Freeways

Energy Use -

Table Name	Column Name	Default Value	New Value
tblAreaMitigation	UseLowVOCPaintParkingCheck	False	True
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	0	15
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	4.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	7.00

tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstructionPhase	NumDays	100.00	175.00
tblConstructionPhase	NumDays	2.00	8.00
tblGrading	MaterialExported	0.00	800.00
tblLandUse	LandUseSquareFeet	12,140.00	12,137.00
tblLandUse	LotAcreage	0.02	0.00
tblTripsAndVMT	HaulingTripLength	20.00	54.00
tblTripsAndVMT	HaulingTripNumber	100.00	40.00
tblVehicleTrips	ST_TR	168.56	0.00
tblVehicleTrips	ST_TR	2.46	36.50
tblVehicleTrips	SU_TR	168.56	0.00
tblVehicleTrips	SU_TR	1.05	36.50
tblVehicleTrips	WD_TR	168.56	0.00
tblVehicleTrips	WD_TR	11.03	36.50

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2020	0.1486	0.9013	0.7656	1.2800e-003	0.0104	0.0514	0.0618	3.6500e-003	0.0474	0.0511	0.0000	113.0585	113.0585	0.0315	0.0000	113.8457
Maximum	**0.1486**	**0.9013**	**0.7656**	**1.2800e-003**	**0.0104**	**0.0514**	**0.0618**	**3.6500e-003**	**0.0474**	**0.0511**	**0.0000**	**113.0585**	**113.0585**	**0.0315**	**0.0000**	**113.8457**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2020	0.0904	0.6389	0.8183	1.2800e-003	8.5600e-003	0.0385	0.0471	2.6400e-003	0.0385	0.0411	0.0000	113.0584	113.0584	0.0315	0.0000	113.8456
Maximum	**0.0904**	**0.6389**	**0.8183**	**1.2800e-003**	**8.5600e-003**	**0.0385**	**0.0471**	**2.6400e-003**	**0.0385**	**0.0411**	**0.0000**	**113.0584**	**113.0584**	**0.0315**	**0.0000**	**113.8456**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**39.18**	**29.11**	**-6.87**	**0.00**	**17.93**	**25.06**	**23.85**	**27.67**	**18.87**	**19.50**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	1-2-2020	4-1-2020	0.3614	0.2490
2	4-2-2020	7-1-2020	0.3239	0.2165
3	7-2-2020	9-30-2020	0.3588	0.2591
		Highest	0.3614	0.2591

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.0524	0.0000	2.2000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	4.3000e-004	4.3000e-004	0.0000	0.0000	4.5000e-004
Energy	7.5000e-004	6.8200e-003	5.7300e-003	4.0000e-005		5.2000e-004	5.2000e-004		5.2000e-004	5.2000e-004	0.0000	60.1543	60.1543	2.3200e-003	5.9000e-004	60.3871
Mobile	0.1446	0.7428	1.9692	6.7600e-003	0.5418	5.7900e-003	0.5476	0.1452	5.4000e-003	0.1506	0.0000	623.5352	623.5352	0.0335	0.0000	624.3725
Waste						0.0000	0.0000		0.0000	0.0000	2.8378	0.0000	2.8378	0.1677	0.0000	7.0306
Water						0.0000	0.0000		0.0000	0.0000	0.7056	14.0527	14.7583	0.0731	1.8300e-003	17.1303
Total	**0.1977**	**0.7496**	**1.9751**	**6.8000e-003**	**0.5418**	**6.3100e-003**	**0.5481**	**0.1452**	**5.9200e-003**	**0.1512**	**3.5434**	**697.7426**	**701.2861**	**0.2766**	**2.4200e-003**	**708.9209**

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.0524	0.0000	2.2000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	4.3000e-004	4.3000e-004	0.0000	0.0000	4.5000e-004
Energy	7.5000e-004	6.8200e-003	5.7300e-003	4.0000e-005		5.2000e-004	5.2000e-004		5.2000e-004	5.2000e-004	0.0000	60.1543	60.1543	2.3200e-003	5.9000e-004	60.3871
Mobile	0.1446	0.7428	1.9692	6.7600e-003	0.5418	5.7900e-003	0.5476	0.1452	5.4000e-003	0.1506	0.0000	623.5352	623.5352	0.0335	0.0000	624.3725
Waste						0.0000	0.0000		0.0000	0.0000	2.8378	0.0000	2.8378	0.1677	0.0000	7.0306
Water						0.0000	0.0000		0.0000	0.0000	0.5645	11.9129	12.4774	0.0585	1.4700e-003	14.3774
Total	**0.1977**	**0.7496**	**1.9751**	**6.8000e-003**	**0.5418**	**6.3100e-003**	**0.5481**	**0.1452**	**5.9200e-003**	**0.1512**	**3.4023**	**695.6028**	**699.0051**	**0.2620**	**2.0600e-003**	**706.1680**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**3.98**	**0.31**	**0.33**	**5.27**	**14.88**	**0.39**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	1/2/2020	1/15/2020	5	10	
2	Grading	Grading	1/6/2020	1/15/2020	5	8	
3	Building Construction	Building Construction	1/16/2020	9/16/2020	5	175	
4	Paving	Paving	9/10/2020	9/16/2020	5	5	
5	Architectural Coating	Architectural Coating	9/10/2020	9/16/2020	5	5	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 19,264; Non-Residential Outdoor: 6,421; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Demolition	Rubber Tired Dozers	1	1.00	247	0.40
Demolition	Tractors/Loaders/Backhoes	2	6.00	97	0.37
Grading	Concrete/Industrial Saws	1	8.00	81	0.73
Grading	Rubber Tired Dozers	1	1.00	247	0.40
Grading	Tractors/Loaders/Backhoes	2	6.00	97	0.37
Building Construction	Cranes	1	4.00	231	0.29
Building Construction	Forklifts	2	6.00	89	0.20
Building Construction	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Paving	Cement and Mortar Mixers	4	6.00	9	0.56
Paving	Pavers	1	7.00	130	0.42
Paving	Rollers	1	7.00	80	0.38
Paving	Tractors/Loaders/Backhoes	1	7.00	97	0.37
Architectural Coating	Air Compressors	1	6.00	78	0.48

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	4	10.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Grading	4	10.00	0.00	40.00	14.70	6.90	54.00	LD_Mix	HDT_Mix	HHDT
Building Construction	5	4.00	2.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Paving	7	18.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	1.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Water Exposed Area

Reduce Vehicle Speed on Unpaved Roads

3.2 Demolition - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	4.3400e-003	0.0394	0.0381	6.0000e-005		2.3400e-003	2.3400e-003		2.2300e-003	2.2300e-003	0.0000	5.2038	5.2038	9.8000e-004	0.0000	5.2284
Total	**4.3400e-003**	**0.0394**	**0.0381**	**6.0000e-005**		**2.3400e-003**	**2.3400e-003**		**2.2300e-003**	**2.2300e-003**	**0.0000**	**5.2038**	**5.2038**	**9.8000e-004**	**0.0000**	**5.2284**

3.2 Demolition - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.3000e-004	1.9000e-004	2.0600e-003	1.0000e-005	5.5000e-004	0.0000	5.5000e-004	1.5000e-004	0.0000	1.5000e-004	0.0000	0.5107	0.5107	2.0000e-005	0.0000	0.5111
Total	**2.3000e-004**	**1.9000e-004**	**2.0600e-003**	**1.0000e-005**	**5.5000e-004**	**0.0000**	**5.5000e-004**	**1.5000e-004**	**0.0000**	**1.5000e-004**	**0.0000**	**0.5107**	**0.5107**	**2.0000e-005**	**0.0000**	**0.5111**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	1.3300e-003	0.0298	0.0397	6.0000e-005		2.0100e-003	2.0100e-003		2.0100e-003	2.0100e-003	0.0000	5.2038	5.2038	9.8000e-004	0.0000	5.2284
Total	**1.3300e-003**	**0.0298**	**0.0397**	**6.0000e-005**		**2.0100e-003**	**2.0100e-003**		**2.0100e-003**	**2.0100e-003**	**0.0000**	**5.2038**	**5.2038**	**9.8000e-004**	**0.0000**	**5.2284**

3.2 Demolition - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.3000e-004	1.9000e-004	2.0600e-003	1.0000e-005	5.5000e-004	0.0000	5.5000e-004	1.5000e-004	0.0000	1.5000e-004	0.0000	0.5107	0.5107	2.0000e-005	0.0000	0.5111
Total	**2.3000e-004**	**1.9000e-004**	**2.0600e-003**	**1.0000e-005**	**5.5000e-004**	**0.0000**	**5.5000e-004**	**1.5000e-004**	**0.0000**	**1.5000e-004**	**0.0000**	**0.5107**	**0.5107**	**2.0000e-005**	**0.0000**	**0.5111**

3.3 Grading - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					3.0600e-003	0.0000	3.0600e-003	1.6600e-003	0.0000	1.6600e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	3.4700e-003	0.0315	0.0305	5.0000e-005		1.8700e-003	1.8700e-003		1.7800e-003	1.7800e-003	0.0000	4.1630	4.1630	7.9000e-004	0.0000	4.1827
Total	**3.4700e-003**	**0.0315**	**0.0305**	**5.0000e-005**	**3.0600e-003**	**1.8700e-003**	**4.9300e-003**	**1.6600e-003**	**1.7800e-003**	**3.4400e-003**	**0.0000**	**4.1630**	**4.1630**	**7.9000e-004**	**0.0000**	**4.1827**

3.3 Grading - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	4.2000e-004	0.0128	3.0600e-003	4.0000e-005	9.3000e-004	5.0000e-005	9.8000e-004	2.5000e-004	5.0000e-005	3.0000e-004	0.0000	3.8257	3.8257	2.4000e-004	0.0000	3.8316
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.8000e-004	1.5000e-004	1.6500e-003	0.0000	4.4000e-004	0.0000	4.4000e-004	1.2000e-004	0.0000	1.2000e-004	0.0000	0.4085	0.4085	1.0000e-005	0.0000	0.4089
Total	**6.0000e-004**	**0.0130**	**4.7100e-003**	**4.0000e-005**	**1.3700e-003**	**5.0000e-005**	**1.4200e-003**	**3.7000e-004**	**5.0000e-005**	**4.2000e-004**	**0.0000**	**4.2342**	**4.2342**	**2.5000e-004**	**0.0000**	**4.2405**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					1.1900e-003	0.0000	1.1900e-003	6.5000e-004	0.0000	6.5000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.0600e-003	0.0239	0.0318	5.0000e-005		1.6100e-003	1.6100e-003		1.6100e-003	1.6100e-003	0.0000	4.1630	4.1630	7.9000e-004	0.0000	4.1827
Total	**1.0600e-003**	**0.0239**	**0.0318**	**5.0000e-005**	**1.1900e-003**	**1.6100e-003**	**2.8000e-003**	**6.5000e-004**	**1.6100e-003**	**2.2600e-003**	**0.0000**	**4.1630**	**4.1630**	**7.9000e-004**	**0.0000**	**4.1827**

3.3 Grading - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	4.2000e-004	0.0128	3.0600e-003	4.0000e-005	9.3000e-004	5.0000e-005	9.8000e-004	2.5000e-004	5.0000e-005	3.0000e-004	0.0000	3.8257	3.8257	2.4000e-004	0.0000	3.8316
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.8000e-004	1.5000e-004	1.6500e-003	0.0000	4.4000e-004	0.0000	4.4000e-004	1.2000e-004	0.0000	1.2000e-004	0.0000	0.4085	0.4085	1.0000e-005	0.0000	0.4089
Total	**6.0000e-004**	**0.0130**	**4.7100e-003**	**4.0000e-005**	**1.3700e-003**	**5.0000e-005**	**1.4200e-003**	**3.7000e-004**	**5.0000e-005**	**4.2000e-004**	**0.0000**	**4.2342**	**4.2342**	**2.5000e-004**	**0.0000**	**4.2405**

3.4 Building Construction - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0754	0.7746	0.6464	1.0000e-003		0.0457	0.0457		0.0421	0.0421	0.0000	87.5529	87.5529	0.0283	0.0000	88.2608
Total	**0.0754**	**0.7746**	**0.6464**	**1.0000e-003**		**0.0457**	**0.0457**		**0.0421**	**0.0421**	**0.0000**	**87.5529**	**87.5529**	**0.0283**	**0.0000**	**88.2608**

3.4 Building Construction - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	6.3000e-004	0.0190	5.1300e-003	4.0000e-005	1.1000e-003	9.0000e-005	1.1900e-003	3.2000e-004	8.0000e-005	4.0000e-004	0.0000	4.3475	4.3475	2.8000e-004	0.0000	4.3544
Worker	1.6200e-003	1.3000e-003	0.0144	4.0000e-005	3.8400e-003	3.0000e-005	3.8700e-003	1.0200e-003	3.0000e-005	1.0500e-003	0.0000	3.5747	3.5747	1.1000e-004	0.0000	3.5775
Total	**2.2500e-003**	**0.0203**	**0.0195**	**8.0000e-005**	**4.9400e-003**	**1.2000e-004**	**5.0600e-003**	**1.3400e-003**	**1.1000e-004**	**1.4500e-003**	**0.0000**	**7.9222**	**7.9222**	**3.9000e-004**	**0.0000**	**7.9319**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0244	0.5363	0.6967	1.0000e-003		0.0337	0.0337		0.0337	0.0337	0.0000	87.5528	87.5528	0.0283	0.0000	88.2607
Total	**0.0244**	**0.5363**	**0.6967**	**1.0000e-003**		**0.0337**	**0.0337**		**0.0337**	**0.0337**	**0.0000**	**87.5528**	**87.5528**	**0.0283**	**0.0000**	**88.2607**

3.4 Building Construction - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	6.3000e-004	0.0190	5.1300e-003	4.0000e-005	1.1000e-003	9.0000e-005	1.1900e-003	3.2000e-004	8.0000e-005	4.0000e-004	0.0000	4.3475	4.3475	2.8000e-004	0.0000	4.3544
Worker	1.6200e-003	1.3000e-003	0.0144	4.0000e-005	3.8400e-003	3.0000e-005	3.8700e-003	1.0200e-003	3.0000e-005	1.0500e-003	0.0000	3.5747	3.5747	1.1000e-004	0.0000	3.5775
Total	**2.2500e-003**	**0.0203**	**0.0195**	**8.0000e-005**	**4.9400e-003**	**1.2000e-004**	**5.0600e-003**	**1.3400e-003**	**1.1000e-004**	**1.4500e-003**	**0.0000**	**7.9222**	**7.9222**	**3.9000e-004**	**0.0000**	**7.9319**

3.5 Paving - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	1.9300e-003	0.0181	0.0178	3.0000e-005		9.9000e-004	9.9000e-004		9.2000e-004	9.2000e-004	0.0000	2.3482	2.3482	6.8000e-004	0.0000	2.3653
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**1.9300e-003**	**0.0181**	**0.0178**	**3.0000e-005**		**9.9000e-004**	**9.9000e-004**		**9.2000e-004**	**9.2000e-004**	**0.0000**	**2.3482**	**2.3482**	**6.8000e-004**	**0.0000**	**2.3653**

3.5 Paving - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.1000e-004	1.7000e-004	1.8500e-003	1.0000e-005	4.9000e-004	0.0000	5.0000e-004	1.3000e-004	0.0000	1.3000e-004	0.0000	0.4596	0.4596	1.0000e-005	0.0000	0.4600
Total	**2.1000e-004**	**1.7000e-004**	**1.8500e-003**	**1.0000e-005**	**4.9000e-004**	**0.0000**	**5.0000e-004**	**1.3000e-004**	**0.0000**	**1.3000e-004**	**0.0000**	**0.4596**	**0.4596**	**1.0000e-005**	**0.0000**	**0.4600**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	5.6000e-004	0.0119	0.0173	3.0000e-005		7.3000e-004	7.3000e-004		7.3000e-004	7.3000e-004	0.0000	2.3482	2.3482	6.8000e-004	0.0000	2.3653
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**5.6000e-004**	**0.0119**	**0.0173**	**3.0000e-005**		**7.3000e-004**	**7.3000e-004**		**7.3000e-004**	**7.3000e-004**	**0.0000**	**2.3482**	**2.3482**	**6.8000e-004**	**0.0000**	**2.3653**

3.5 Paving - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.1000e-004	1.7000e-004	1.8500e-003	1.0000e-005	4.9000e-004	0.0000	5.0000e-004	1.3000e-004	0.0000	1.3000e-004	0.0000	0.4596	0.4596	1.0000e-005	0.0000	0.4600
Total	**2.1000e-004**	**1.7000e-004**	**1.8500e-003**	**1.0000e-005**	**4.9000e-004**	**0.0000**	**5.0000e-004**	**1.3000e-004**	**0.0000**	**1.3000e-004**	**0.0000**	**0.4596**	**0.4596**	**1.0000e-005**	**0.0000**	**0.4600**

3.6 Architectural Coating - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.0595					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	6.1000e-004	4.2100e-003	4.5800e-003	1.0000e-005		2.8000e-004	2.8000e-004		2.8000e-004	2.8000e-004	0.0000	0.6383	0.6383	5.0000e-005	0.0000	0.6396
Total	**0.0601**	**4.2100e-003**	**4.5800e-003**	**1.0000e-005**		**2.8000e-004**	**2.8000e-004**		**2.8000e-004**	**2.8000e-004**	**0.0000**	**0.6383**	**0.6383**	**5.0000e-005**	**0.0000**	**0.6396**

3.6 Architectural Coating - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.0000e-005	1.0000e-005	1.0000e-004	0.0000	3.0000e-005	0.0000	3.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0255	0.0255	0.0000	0.0000	0.0256
Total	**1.0000e-005**	**1.0000e-005**	**1.0000e-004**	**0.0000**	**3.0000e-005**	**0.0000**	**3.0000e-005**	**1.0000e-005**	**0.0000**	**1.0000e-005**	**0.0000**	**0.0255**	**0.0255**	**0.0000**	**0.0000**	**0.0256**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.0595					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.5000e-004	3.3900e-003	4.5800e-003	1.0000e-005		2.4000e-004	2.4000e-004		2.4000e-004	2.4000e-004	0.0000	0.6383	0.6383	5.0000e-005	0.0000	0.6396
Total	**0.0597**	**3.3900e-003**	**4.5800e-003**	**1.0000e-005**		**2.4000e-004**	**2.4000e-004**		**2.4000e-004**	**2.4000e-004**	**0.0000**	**0.6383**	**0.6383**	**5.0000e-005**	**0.0000**	**0.6396**

3.6 Architectural Coating - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.0000e-005	1.0000e-005	1.0000e-004	0.0000	3.0000e-005	0.0000	3.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0255	0.0255	0.0000	0.0000	0.0256
Total	**1.0000e-005**	**1.0000e-005**	**1.0000e-004**	**0.0000**	**3.0000e-005**	**0.0000**	**3.0000e-005**	**1.0000e-005**	**0.0000**	**1.0000e-005**	**0.0000**	**0.0255**	**0.0255**	**0.0000**	**0.0000**	**0.0256**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.1446	0.7428	1.9692	6.7600e-003	0.5418	5.7900e-003	0.5476	0.1452	5.4000e-003	0.1506	0.0000	623.5352	623.5352	0.0335	0.0000	624.3725
Unmitigated	0.1446	0.7428	1.9692	6.7600e-003	0.5418	5.7900e-003	0.5476	0.1452	5.4000e-003	0.1506	0.0000	623.5352	623.5352	0.0335	0.0000	624.3725

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Gasoline/Service Station	0.00	0.00	0.00		
General Office Building	443.11	443.11	443.11	1,427,462	1,427,462
Total	443.11	443.11	443.11	1,427,462	1,427,462

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Gasoline/Service Station	16.60	8.40	6.90	2.00	79.00	19.00	14	27	59
General Office Building	16.60	8.40	6.90	33.00	48.00	19.00	77	19	4

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Gasoline/Service Station	0.547192	0.045177	0.202743	0.121510	0.016147	0.006143	0.019743	0.029945	0.002479	0.002270	0.005078	0.000682	0.000891
General Office Building	0.547192	0.045177	0.202743	0.121510	0.016147	0.006143	0.019743	0.029945	0.002479	0.002270	0.005078	0.000682	0.000891

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	52.7302	52.7302	2.1800e-003	4.5000e-004	52.9188
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	52.7302	52.7302	2.1800e-003	4.5000e-004	52.9188
NaturalGas Mitigated	7.5000e-004	6.8200e-003	5.7300e-003	4.0000e-005		5.2000e-004	5.2000e-004		5.2000e-004	5.2000e-004	0.0000	7.4241	7.4241	1.4000e-004	1.4000e-004	7.4682
NaturalGas Unmitigated	7.5000e-004	6.8200e-003	5.7300e-003	4.0000e-005		5.2000e-004	5.2000e-004		5.2000e-004	5.2000e-004	0.0000	7.4241	7.4241	1.4000e-004	1.4000e-004	7.4682

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Gasoline/Service Station	12776.2	7.0000e-005	6.3000e-004	5.3000e-004	0.0000		5.0000e-005	5.0000e-005		5.0000e-005	5.0000e-005	0.0000	0.6818	0.6818	1.0000e-005	1.0000e-005	0.6858
General Office Building	126346	6.8000e-004	6.1900e-003	5.2000e-003	4.0000e-005		4.7000e-004	4.7000e-004		4.7000e-004	4.7000e-004	0.0000	6.7423	6.7423	1.3000e-004	1.2000e-004	6.7824
Total		**7.5000e-004**	**6.8200e-003**	**5.7300e-003**	**4.0000e-005**		**5.2000e-004**	**5.2000e-004**		**5.2000e-004**	**5.2000e-004**	**0.0000**	**7.4241**	**7.4241**	**1.4000e-004**	**1.3000e-004**	**7.4682**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Gasoline/Service Station	12776.2	7.0000e-005	6.3000e-004	5.3000e-004	0.0000		5.0000e-005	5.0000e-005		5.0000e-005	5.0000e-005	0.0000	0.6818	0.6818	1.0000e-005	1.0000e-005	0.6858
General Office Building	126346	6.8000e-004	6.1900e-003	5.2000e-003	4.0000e-005		4.7000e-004	4.7000e-004		4.7000e-004	4.7000e-004	0.0000	6.7423	6.7423	1.3000e-004	1.2000e-004	6.7824
Total		**7.5000e-004**	**6.8200e-003**	**5.7300e-003**	**4.0000e-005**		**5.2000e-004**	**5.2000e-004**		**5.2000e-004**	**5.2000e-004**	**0.0000**	**7.4241**	**7.4241**	**1.4000e-004**	**1.3000e-004**	**7.4682**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Gasoline/Service Station	7835.16	2.4965	1.0000e-004	2.0000e-005	2.5054
General Office Building	157660	50.2337	2.0700e-003	4.3000e-004	50.4135
Total		**52.7302**	**2.1700e-003**	**4.5000e-004**	**52.9188**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Gasoline/Service Station	7835.16	2.4965	1.0000e-004	2.0000e-005	2.5054
General Office Building	157660	50.2337	2.0700e-003	4.3000e-004	50.4135
Total		**52.7302**	**2.1700e-003**	**4.5000e-004**	**52.9188**

6.0 Area Detail

6.1 Mitigation Measures Area

Use Low VOC Paint - Residential Interior

Use Low VOC Paint - Residential Exterior

Use Low VOC Paint - Non-Residential Interior

Use Low VOC Paint - Non-Residential Exterior

Use Low VOC Cleaning Supplies

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.0524	0.0000	2.2000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	4.3000e-004	4.3000e-004	0.0000	0.0000	4.5000e-004
Unmitigated	0.0524	0.0000	2.2000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	4.3000e-004	4.3000e-004	0.0000	0.0000	4.5000e-004

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	5.9500e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.0464					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	2.0000e-005	0.0000	2.2000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	4.3000e-004	4.3000e-004	0.0000	0.0000	4.5000e-004
Total	**0.0524**	**0.0000**	**2.2000e-004**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**4.3000e-004**	**4.3000e-004**	**0.0000**	**0.0000**	**4.5000e-004**

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	5.9500e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.0464					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	2.0000e-005	0.0000	2.2000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	4.3000e-004	4.3000e-004	0.0000	0.0000	4.5000e-004
Total	**0.0524**	**0.0000**	**2.2000e-004**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**4.3000e-004**	**4.3000e-004**	**0.0000**	**0.0000**	**4.5000e-004**

7.0 Water Detail

7.1 Mitigation Measures Water

Install Low Flow Bathroom Faucet

Install Low Flow Kitchen Faucet

Install Low Flow Toilet

Install Low Flow Shower

Use Water Efficient Irrigation System

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	12.4774	0.0585	1.4700e-003	14.3774
Unmitigated	14.7583	0.0731	1.8300e-003	17.1303

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Gasoline/Service Station	0.0664094 / 0.0407026	0.4407	2.1800e-003	5.0000e-005	0.5115
General Office Building	2.15769 / 1.32245	14.3176	0.0709	1.7800e-003	16.6188
Total		**14.7583**	**0.0731**	**1.8300e-003**	**17.1303**

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Gasoline/Service Station	0.0531276 / 0.0382197	0.3726	1.7500e-003	4.0000e-005	0.4293
General Office Building	1.72615 / 1.24178	12.1048	0.0567	1.4300e-003	13.9481
Total		**12.4774**	**0.0585**	**1.4700e-003**	**14.3774**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	2.8378	0.1677	0.0000	7.0306
Unmitigated	2.8378	0.1677	0.0000	7.0306

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Gasoline/Service Station	2.69	0.5461	0.0323	0.0000	1.3528
General Office Building	11.29	2.2918	0.1354	0.0000	5.6778
Total		**2.8378**	**0.1677**	**0.0000**	**7.0306**

8.2 Waste by Land Use

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Gasoline/Service Station	2.69	0.5461	0.0323	0.0000	1.3528
General Office Building	11.29	2.2918	0.1354	0.0000	5.6778
Total		**2.8378**	**0.1677**	**0.0000**	**7.0306**

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

APPENDIX B.2

Proposed Summer

Transdev Facility

Los Angeles-South Coast County, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Office Building	12.14	1000sqft	0.28	12,137.00	0
Gasoline/Service Station	5.00	Pump	0.00	705.87	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	33
Climate Zone	9			**Operational Year**	2021
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	702.44	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Transdev Facility - Los Angeles-South Coast County, Summer

Project Characteristics - Construction on site will take between six and nine months

Land Use - Building area of office and administrative use
Vehicle maintenance bays equipped for providing service to revenue and non-revenue vehicles

Demolition - No square footage will be removed during the demolition phase, the only demolition will be of the current tenant improvements in the building

Grading - Grading operation to result in approximately 500 cy from Parcel -027
Grading operation to result in approximately 300 cy from Parcel -037

Vehicle Trips - Expected to generate 443 trips which includes buses (157), employees (284) and Maintenance Vehicles/Other Trucks (2)

Construction Off-road Equipment Mitigation - As recommended by SCAQMD, alternative applicable strategies include construction equipment with Tier 3 emissions standards.

Area Mitigation -

Water Mitigation -

Construction Phase - Export operations for Parcel -027 to last approximately a week.
Export operations for Parcel -037 to last 3 to 4 days

Trips and VMT - 5 truck trips per day over one week for Parcel -027 (500 cy) = 25 total trips
5 truck trips per day over 3 days for Parcel -037 (300 cy) = 15 total trips
Haul Route to 636 Rosecrans Avenue Via 605, 105, 710 Freeways

Energy Use -

Table Name	Column Name	Default Value	New Value
tblAreaMitigation	UseLowVOCPaintParkingCheck	False	True
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	0	15
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	4.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	7.00

tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstructionPhase	NumDays	100.00	175.00
tblConstructionPhase	NumDays	2.00	8.00
tblGrading	MaterialExported	0.00	800.00
tblLandUse	LandUseSquareFeet	12,140.00	12,137.00
tblLandUse	LotAcreage	0.02	0.00
tblTripsAndVMT	HaulingTripLength	20.00	54.00
tblTripsAndVMT	HaulingTripNumber	100.00	40.00
tblVehicleTrips	ST_TR	168.56	0.00
tblVehicleTrips	ST_TR	2.46	36.50
tblVehicleTrips	SU_TR	168.56	0.00
tblVehicleTrips	SU_TR	1.05	36.50
tblVehicleTrips	WD_TR	168.56	0.00
tblVehicleTrips	WD_TR	11.03	36.50

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2020	25.7984	18.8754	17.3945	0.0361	1.2235	1.0315	2.1718	0.5394	0.9613	1.4440	0.0000	3,587.0610	3,587.0610	0.6920	0.0000	3,599.7084
Maximum	**25.7984**	**18.8754**	**17.3945**	**0.0361**	**1.2235**	**1.0315**	**2.1718**	**0.5394**	**0.9613**	**1.4440**	**0.0000**	**3,587.0610**	**3,587.0610**	**0.6920**	**0.0000**	**3,599.7084**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2020	24.4856	15.0585	17.7604	0.0361	0.7574	0.8173	1.5747	0.2860	0.8166	1.1026	0.0000	3,587.0610	3,587.0610	0.6920	0.0000	3,599.7084
Maximum	**24.4856**	**15.0585**	**17.7604**	**0.0361**	**0.7574**	**0.8173**	**1.5747**	**0.2860**	**0.8166**	**1.1026**	**0.0000**	**3,587.0610**	**3,587.0610**	**0.6920**	**0.0000**	**3,599.7084**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**5.09**	**20.22**	**-2.10**	**0.00**	**38.09**	**20.77**	**27.49**	**46.99**	**15.05**	**23.64**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	0.2871	2.0000e-005	1.7600e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005		3.7500e-003	3.7500e-003	1.0000e-005		4.0000e-003
Energy	4.1100e-003	0.0374	0.0314	2.2000e-004		2.8400e-003	2.8400e-003		2.8400e-003	2.8400e-003		44.8420	44.8420	8.6000e-004	8.2000e-004	45.1085
Mobile	0.8372	3.9075	11.2197	0.0385	3.0354	0.0318	3.0671	0.8124	0.0297	0.8420		3,913.8243	3,913.8243	0.2043		3,918.9320
Total	**1.1283**	**3.9449**	**11.2528**	**0.0387**	**3.0354**	**0.0346**	**3.0700**	**0.8124**	**0.0325**	**0.8449**		**3,958.6701**	**3,958.6701**	**0.2052**	**8.2000e-004**	**3,964.0445**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	0.2871	2.0000e-005	1.7600e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005		3.7500e-003	3.7500e-003	1.0000e-005		4.0000e-003
Energy	4.1100e-003	0.0374	0.0314	2.2000e-004		2.8400e-003	2.8400e-003		2.8400e-003	2.8400e-003		44.8420	44.8420	8.6000e-004	8.2000e-004	45.1085
Mobile	0.8372	3.9075	11.2197	0.0385	3.0354	0.0318	3.0671	0.8124	0.0297	0.8420		3,913.8243	3,913.8243	0.2043		3,918.9320
Total	**1.1283**	**3.9449**	**11.2528**	**0.0387**	**3.0354**	**0.0346**	**3.0700**	**0.8124**	**0.0325**	**0.8449**		**3,958.6701**	**3,958.6701**	**0.2052**	**8.2000e-004**	**3,964.0445**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	1/2/2020	1/15/2020	5	10	
2	Grading	Grading	1/6/2020	1/15/2020	5	8	
3	Building Construction	Building Construction	1/16/2020	9/16/2020	5	175	
4	Paving	Paving	9/10/2020	9/16/2020	5	5	
5	Architectural Coating	Architectural Coating	9/10/2020	9/16/2020	5	5	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 19,264; Non-Residential Outdoor: 6,421; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Demolition	Rubber Tired Dozers	1	1.00	247	0.40
Demolition	Tractors/Loaders/Backhoes	2	6.00	97	0.37
Grading	Concrete/Industrial Saws	1	8.00	81	0.73
Grading	Rubber Tired Dozers	1	1.00	247	0.40
Grading	Tractors/Loaders/Backhoes	2	6.00	97	0.37
Building Construction	Cranes	1	4.00	231	0.29
Building Construction	Forklifts	2	6.00	89	0.20
Building Construction	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Paving	Cement and Mortar Mixers	4	6.00	9	0.56
Paving	Pavers	1	7.00	130	0.42
Paving	Rollers	1	7.00	80	0.38
Paving	Tractors/Loaders/Backhoes	1	7.00	97	0.37
Architectural Coating	Air Compressors	1	6.00	78	0.48

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	4	10.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Grading	4	10.00	0.00	40.00	14.70	6.90	54.00	LD_Mix	HDT_Mix	HHDT
Building Construction	5	4.00	2.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Paving	7	18.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	1.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Water Exposed Area

Reduce Vehicle Speed on Unpaved Roads

3.2 Demolition - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.8674	7.8729	7.6226	0.0120		0.4672	0.4672		0.4457	0.4457		1,147.2352	1,147.2352	0.2169		1,152.6578
Total	**0.8674**	**7.8729**	**7.6226**	**0.0120**		**0.4672**	**0.4672**		**0.4457**	**0.4457**		**1,147.2352**	**1,147.2352**	**0.2169**		**1,152.6578**

3.2 Demolition - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0460	0.0327	0.4378	1.1800e-003	0.1118	9.3000e-004	0.1127	0.0296	8.6000e-004	0.0305		117.6113	117.6113	3.7100e-003		117.7040
Total	**0.0460**	**0.0327**	**0.4378**	**1.1800e-003**	**0.1118**	**9.3000e-004**	**0.1127**	**0.0296**	**8.6000e-004**	**0.0305**		**117.6113**	**117.6113**	**3.7100e-003**		**117.7040**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.2652	5.9644	7.9381	0.0120		0.4017	0.4017		0.4017	0.4017	0.0000	1,147.2352	1,147.2352	0.2169		1,152.6578
Total	**0.2652**	**5.9644**	**7.9381**	**0.0120**		**0.4017**	**0.4017**		**0.4017**	**0.4017**	**0.0000**	**1,147.2352**	**1,147.2352**	**0.2169**		**1,152.6578**

3.2 Demolition - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0460	0.0327	0.4378	1.1800e-003	0.1118	9.3000e-004	0.1127	0.0296	8.6000e-004	0.0305		117.6113	117.6113	3.7100e-003		117.7040
Total	**0.0460**	**0.0327**	**0.4378**	**1.1800e-003**	**0.1118**	**9.3000e-004**	**0.1127**	**0.0296**	**8.6000e-004**	**0.0305**		**117.6113**	**117.6113**	**3.7100e-003**		**117.7040**

3.3 Grading - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.7641	0.0000	0.7641	0.4155	0.0000	0.4155			0.0000			0.0000
Off-Road	0.8674	7.8729	7.6226	0.0120		0.4672	0.4672		0.4457	0.4457		1,147.2352	1,147.2352	0.2169		1,152.6578
Total	**0.8674**	**7.8729**	**7.6226**	**0.0120**	**0.7641**	**0.4672**	**1.2313**	**0.4155**	**0.4457**	**0.8612**		**1,147.2352**	**1,147.2352**	**0.2169**		**1,152.6578**

3.3 Grading - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.1036	3.0642	0.7581	9.7600e-003	0.2359	0.0120	0.2479	0.0646	0.0115	0.0762		1,057.3680	1,057.3680	0.0647		1,058.9848
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0460	0.0327	0.4378	1.1800e-003	0.1118	9.3000e-004	0.1127	0.0296	8.6000e-004	0.0305		117.6113	117.6113	3.7100e-003		117.7040
Total	**0.1496**	**3.0970**	**1.1960**	**0.0109**	**0.3476**	**0.0130**	**0.3606**	**0.0943**	**0.0124**	**0.1067**		**1,174.9793**	**1,174.9793**	**0.0684**		**1,176.6888**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.2980	0.0000	0.2980	0.1620	0.0000	0.1620			0.0000			0.0000
Off-Road	0.2652	5.9644	7.9381	0.0120		0.4017	0.4017		0.4017	0.4017	0.0000	1,147.2352	1,147.2352	0.2169		1,152.6578
Total	**0.2652**	**5.9644**	**7.9381**	**0.0120**	**0.2980**	**0.4017**	**0.6997**	**0.1620**	**0.4017**	**0.5637**	**0.0000**	**1,147.2352**	**1,147.2352**	**0.2169**		**1,152.6578**

3.3 Grading - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.1036	3.0642	0.7581	9.7600e-003	0.2359	0.0120	0.2479	0.0646	0.0115	0.0762		1,057.3680	1,057.3680	0.0647		1,058.9848
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0460	0.0327	0.4378	1.1800e-003	0.1118	9.3000e-004	0.1127	0.0296	8.6000e-004	0.0305		117.6113	117.6113	3.7100e-003		117.7040
Total	**0.1496**	**3.0970**	**1.1960**	**0.0109**	**0.3476**	**0.0130**	**0.3606**	**0.0943**	**0.0124**	**0.1067**		**1,174.9793**	**1,174.9793**	**0.0684**		**1,176.6888**

3.4 Building Construction - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.8617	8.8523	7.3875	0.0114		0.5224	0.5224		0.4806	0.4806		1,102.9781	1,102.9781	0.3567		1,111.8962
Total	**0.8617**	**8.8523**	**7.3875**	**0.0114**		**0.5224**	**0.5224**		**0.4806**	**0.4806**		**1,102.9781**	**1,102.9781**	**0.3567**		**1,111.8962**

3.4 Building Construction - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	7.1100e-003	0.2127	0.0557	5.2000e-004	0.0128	1.0000e-003	0.0138	3.6900e-003	9.6000e-004	4.6400e-003		55.4049	55.4049	3.3800e-003		55.4895
Worker	0.0184	0.0131	0.1751	4.7000e-004	0.0447	3.7000e-004	0.0451	0.0119	3.4000e-004	0.0122		47.0445	47.0445	1.4800e-003		47.0816
Total	**0.0255**	**0.2258**	**0.2309**	**9.9000e-004**	**0.0575**	**1.3700e-003**	**0.0589**	**0.0156**	**1.3000e-003**	**0.0168**		**102.4495**	**102.4495**	**4.8600e-003**		**102.5711**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.2793	6.1296	7.9624	0.0114		0.3855	0.3855		0.3855	0.3855	0.0000	1,102.9781	1,102.9781	0.3567		1,111.8962
Total	**0.2793**	**6.1296**	**7.9624**	**0.0114**		**0.3855**	**0.3855**		**0.3855**	**0.3855**	**0.0000**	**1,102.9781**	**1,102.9781**	**0.3567**		**1,111.8962**

3.4 Building Construction - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	7.1100e-003	0.2127	0.0557	5.2000e-004	0.0128	1.0000e-003	0.0138	3.6900e-003	9.6000e-004	4.6400e-003		55.4049	55.4049	3.3800e-003		55.4895
Worker	0.0184	0.0131	0.1751	4.7000e-004	0.0447	3.7000e-004	0.0451	0.0119	3.4000e-004	0.0122		47.0445	47.0445	1.4800e-003		47.0816
Total	**0.0255**	**0.2258**	**0.2309**	**9.9000e-004**	**0.0575**	**1.3700e-003**	**0.0589**	**0.0156**	**1.3000e-003**	**0.0168**		**102.4495**	**102.4495**	**4.8600e-003**		**102.5711**

3.5 Paving - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.7716	7.2266	7.1128	0.0113		0.3950	0.3950		0.3669	0.3669		1,035.3926	1,035.3926	0.3016		1,042.9323
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.7716**	**7.2266**	**7.1128**	**0.0113**		**0.3950**	**0.3950**		**0.3669**	**0.3669**		**1,035.3926**	**1,035.3926**	**0.3016**		**1,042.9323**

3.5 Paving - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0828	0.0589	0.7881	2.1300e-003	0.2012	1.6800e-003	0.2029	0.0534	1.5500e-003	0.0549		211.7003	211.7003	6.6700e-003		211.8672
Total	**0.0828**	**0.0589**	**0.7881**	**2.1300e-003**	**0.2012**	**1.6800e-003**	**0.2029**	**0.0534**	**1.5500e-003**	**0.0549**		**211.7003**	**211.7003**	**6.6700e-003**		**211.8672**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.2239	4.7579	6.9028	0.0113		0.2908	0.2908		0.2908	0.2908	0.0000	1,035.3926	1,035.3926	0.3016		1,042.9323
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.2239**	**4.7579**	**6.9028**	**0.0113**		**0.2908**	**0.2908**		**0.2908**	**0.2908**	**0.0000**	**1,035.3926**	**1,035.3926**	**0.3016**		**1,042.9323**

3.5 Paving - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0828	0.0589	0.7881	2.1300e-003	0.2012	1.6800e-003	0.2029	0.0534	1.5500e-003	0.0549		211.7003	211.7003	6.6700e-003		211.8672
Total	**0.0828**	**0.0589**	**0.7881**	**2.1300e-003**	**0.2012**	**1.6800e-003**	**0.2029**	**0.0534**	**1.5500e-003**	**0.0549**		**211.7003**	**211.7003**	**6.6700e-003**		**211.8672**

3.6 Architectural Coating - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	23.8100					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2422	1.6838	1.8314	2.9700e-003		0.1109	0.1109		0.1109	0.1109		281.4481	281.4481	0.0218		281.9928
Total	**24.0522**	**1.6838**	**1.8314**	**2.9700e-003**		**0.1109**	**0.1109**		**0.1109**	**0.1109**		**281.4481**	**281.4481**	**0.0218**		**281.9928**

3.6 Architectural Coating - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	4.6000e-003	3.2700e-003	0.0438	1.2000e-004	0.0112	9.0000e-005	0.0113	2.9600e-003	9.0000e-005	3.0500e-003		11.7611	11.7611	3.7000e-004		11.7704
Total	**4.6000e-003**	**3.2700e-003**	**0.0438**	**1.2000e-004**	**0.0112**	**9.0000e-005**	**0.0113**	**2.9600e-003**	**9.0000e-005**	**3.0500e-003**		**11.7611**	**11.7611**	**3.7000e-004**		**11.7704**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	23.8100					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.0594	1.3570	1.8324	2.9700e-003		0.0951	0.0951		0.0951	0.0951	0.0000	281.4481	281.4481	0.0218		281.9928
Total	**23.8694**	**1.3570**	**1.8324**	**2.9700e-003**		**0.0951**	**0.0951**		**0.0951**	**0.0951**	**0.0000**	**281.4481**	**281.4481**	**0.0218**		**281.9928**

3.6 Architectural Coating - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	4.6000e-003	3.2700e-003	0.0438	1.2000e-004	0.0112	9.0000e-005	0.0113	2.9600e-003	9.0000e-005	3.0500e-003		11.7611	11.7611	3.7000e-004		11.7704
Total	**4.6000e-003**	**3.2700e-003**	**0.0438**	**1.2000e-004**	**0.0112**	**9.0000e-005**	**0.0113**	**2.9600e-003**	**9.0000e-005**	**3.0500e-003**		**11.7611**	**11.7611**	**3.7000e-004**		**11.7704**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.8372	3.9075	11.2197	0.0385	3.0354	0.0318	3.0671	0.8124	0.0297	0.8420		3,913.8243	3,913.8243	0.2043		3,918.9320
Unmitigated	0.8372	3.9075	11.2197	0.0385	3.0354	0.0318	3.0671	0.8124	0.0297	0.8420		3,913.8243	3,913.8243	0.2043		3,918.9320

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Gasoline/Service Station	0.00	0.00	0.00		
General Office Building	443.11	443.11	443.11	1,427,462	1,427,462
Total	443.11	443.11	443.11	1,427,462	1,427,462

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Gasoline/Service Station	16.60	8.40	6.90	2.00	79.00	19.00	14	27	59
General Office Building	16.60	8.40	6.90	33.00	48.00	19.00	77	19	4

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Gasoline/Service Station	0.547192	0.045177	0.202743	0.121510	0.016147	0.006143	0.019743	0.029945	0.002479	0.002270	0.005078	0.000682	0.000891
General Office Building	0.547192	0.045177	0.202743	0.121510	0.016147	0.006143	0.019743	0.029945	0.002479	0.002270	0.005078	0.000682	0.000891

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	4.1100e-003	0.0374	0.0314	2.2000e-004		2.8400e-003	2.8400e-003		2.8400e-003	2.8400e-003		44.8420	44.8420	8.6000e-004	8.2000e-004	45.1085
NaturalGas Unmitigated	4.1100e-003	0.0374	0.0314	2.2000e-004		2.8400e-003	2.8400e-003		2.8400e-003	2.8400e-003		44.8420	44.8420	8.6000e-004	8.2000e-004	45.1085

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Gasoline/Service Station	35.0034	3.8000e-004	3.4300e-003	2.8800e-003	2.0000e-005		2.6000e-004	2.6000e-004		2.6000e-004	2.6000e-004		4.1181	4.1181	8.0000e-005	8.0000e-005	4.1425
General Office Building	346.154	3.7300e-003	0.0339	0.0285	2.0000e-004		2.5800e-003	2.5800e-003		2.5800e-003	2.5800e-003		40.7240	40.7240	7.8000e-004	7.5000e-004	40.9660
Total		**4.1100e-003**	**0.0374**	**0.0314**	**2.2000e-004**		**2.8400e-003**	**2.8400e-003**		**2.8400e-003**	**2.8400e-003**		**44.8420**	**44.8420**	**8.6000e-004**	**8.3000e-004**	**45.1085**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Gasoline/Service Station	0.0350034	3.8000e-004	3.4300e-003	2.8800e-003	2.0000e-005		2.6000e-004	2.6000e-004		2.6000e-004	2.6000e-004		4.1181	4.1181	8.0000e-005	8.0000e-005	4.1425
General Office Building	0.346154	3.7300e-003	0.0339	0.0285	2.0000e-004		2.5800e-003	2.5800e-003		2.5800e-003	2.5800e-003		40.7240	40.7240	7.8000e-004	7.5000e-004	40.9660
Total		**4.1100e-003**	**0.0374**	**0.0314**	**2.2000e-004**		**2.8400e-003**	**2.8400e-003**		**2.8400e-003**	**2.8400e-003**		**44.8420**	**44.8420**	**8.6000e-004**	**8.3000e-004**	**45.1085**

6.0 Area Detail

6.1 Mitigation Measures Area

Use Low VOC Paint - Residential Interior

Use Low VOC Paint - Residential Exterior

Use Low VOC Paint - Non-Residential Interior

Use Low VOC Paint - Non-Residential Exterior

Use Low VOC Cleaning Supplies

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.2871	2.0000e-005	1.7600e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005		3.7500e-003	3.7500e-003	1.0000e-005		4.0000e-003
Unmitigated	0.2871	2.0000e-005	1.7600e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005		3.7500e-003	3.7500e-003	1.0000e-005		4.0000e-003

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0326					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.2543					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	1.6000e-004	2.0000e-005	1.7600e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005		3.7500e-003	3.7500e-003	1.0000e-005		4.0000e-003
Total	**0.2871**	**2.0000e-005**	**1.7600e-003**	**0.0000**		**1.0000e-005**	**1.0000e-005**		**1.0000e-005**	**1.0000e-005**		**3.7500e-003**	**3.7500e-003**	**1.0000e-005**		**4.0000e-003**

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0326					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.2543					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	1.6000e-004	2.0000e-005	1.7600e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005		3.7500e-003	3.7500e-003	1.0000e-005		4.0000e-003
Total	**0.2871**	**2.0000e-005**	**1.7600e-003**	**0.0000**		**1.0000e-005**	**1.0000e-005**		**1.0000e-005**	**1.0000e-005**		**3.7500e-003**	**3.7500e-003**	**1.0000e-005**		**4.0000e-003**

7.0 Water Detail

7.1 Mitigation Measures Water

Install Low Flow Bathroom Faucet

Install Low Flow Kitchen Faucet

Install Low Flow Toilet

Install Low Flow Shower

Use Water Efficient Irrigation System

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

APPENDIX B.3

Proposed Winter

Transdev Facility

Los Angeles-South Coast County, Winter

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Office Building	12.14	1000sqft	0.28	12,137.00	0
Gasoline/Service Station	5.00	Pump	0.00	705.87	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	33
Climate Zone	9			**Operational Year**	2021
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	702.44	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Transdev Facility - Los Angeles-South Coast County, Winter

Project Characteristics - Construction on site will take between six and nine months

Land Use - Building area of office and administrative use
Vehicle maintenance bays equipped for providing service to revenue and non-revenue vehicles

Demolition - No square footage will be removed during the demolition phase, the only demolition will be of the current tenant improvements in the building

Grading - Grading operation to result in approximately 500 cy from Parcel -027
Grading operation to result in approximately 300 cy from Parcel -037

Vehicle Trips - Expected to generate 443 trips which includes buses (157), employees (284) and Maintenance Vehicles/Other Trucks (2)

Construction Off-road Equipment Mitigation - As recommended by SCAQMD, alternative applicable strategies include construction equipment with Tier 3 emissions standards.

Area Mitigation -

Water Mitigation -

Construction Phase - Export operations for Parcel -027 to last approximately a week.
Export operations for Parcel -037 to last 3 to 4 days

Trips and VMT - 5 truck trips per day over one week for Parcel -027 (500 cy) = 25 total trips
5 truck trips per day over 3 days for Parcel -037 (300 cy) = 15 total trips
Haul Route to 636 Rosecrans Avenue Via 605, 105, 710 Freeways

Energy Use -

Table Name	Column Name	Default Value	New Value
tblAreaMitigation	UseLowVOCPaintParkingCheck	False	True
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	0	15
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	4.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	7.00

tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstructionPhase	NumDays	100.00	175.00
tblConstructionPhase	NumDays	2.00	8.00
tblGrading	MaterialExported	0.00	800.00
tblLandUse	LandUseSquareFeet	12,140.00	12,137.00
tblLandUse	LotAcreage	0.02	0.00
tblTripsAndVMT	HaulingTripLength	20.00	54.00
tblTripsAndVMT	HaulingTripNumber	100.00	40.00
tblVehicleTrips	ST_TR	168.56	0.00
tblVehicleTrips	ST_TR	2.46	36.50
tblVehicleTrips	SU_TR	168.56	0.00
tblVehicleTrips	SU_TR	1.05	36.50
tblVehicleTrips	WD_TR	168.56	0.00
tblVehicleTrips	WD_TR	11.03	36.50

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2020	25.8104	18.9646	17.3155	0.0359	1.2235	1.0315	2.1719	0.5394	0.9613	1.4440	0.0000	3,565.9536	3,565.9536	0.6917	0.0000	3,578.6161
Maximum	**25.8104**	**18.9646**	**17.3155**	**0.0359**	**1.2235**	**1.0315**	**2.1719**	**0.5394**	**0.9613**	**1.4440**	**0.0000**	**3,565.9536**	**3,565.9536**	**0.6917**	**0.0000**	**3,578.6161**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2020	24.4976	15.1477	17.6814	0.0359	0.7574	0.8174	1.5748	0.2860	0.8167	1.1027	0.0000	3,565.9536	3,565.9536	0.6917	0.0000	3,578.6161
Maximum	**24.4976**	**15.1477**	**17.6814**	**0.0359**	**0.7574**	**0.8174**	**1.5748**	**0.2860**	**0.8167**	**1.1027**	**0.0000**	**3,565.9536**	**3,565.9536**	**0.6917**	**0.0000**	**3,578.6161**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**5.09**	**20.13**	**-2.11**	**0.00**	**38.09**	**20.76**	**27.49**	**46.99**	**15.05**	**23.64**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	0.2871	2.0000e-005	1.7600e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005		3.7500e-003	3.7500e-003	1.0000e-005		4.0000e-003
Energy	4.1100e-003	0.0374	0.0314	2.2000e-004		2.8400e-003	2.8400e-003		2.8400e-003	2.8400e-003		44.8420	44.8420	8.6000e-004	8.2000e-004	45.1085
Mobile	0.8134	4.0061	10.6707	0.0366	3.0354	0.0319	3.0673	0.8124	0.0298	0.8422		3,723.8837	3,723.8837	0.2036		3,728.9745
Total	**1.1046**	**4.0435**	**10.7039**	**0.0368**	**3.0354**	**0.0348**	**3.0702**	**0.8124**	**0.0327**	**0.8450**		**3,768.7295**	**3,768.7295**	**0.2045**	**8.2000e-004**	**3,774.0870**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	0.2871	2.0000e-005	1.7600e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005		3.7500e-003	3.7500e-003	1.0000e-005		4.0000e-003
Energy	4.1100e-003	0.0374	0.0314	2.2000e-004		2.8400e-003	2.8400e-003		2.8400e-003	2.8400e-003		44.8420	44.8420	8.6000e-004	8.2000e-004	45.1085
Mobile	0.8134	4.0061	10.6707	0.0366	3.0354	0.0319	3.0673	0.8124	0.0298	0.8422		3,723.8837	3,723.8837	0.2036		3,728.9745
Total	**1.1046**	**4.0435**	**10.7039**	**0.0368**	**3.0354**	**0.0348**	**3.0702**	**0.8124**	**0.0327**	**0.8450**		**3,768.7295**	**3,768.7295**	**0.2045**	**8.2000e-004**	**3,774.0870**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	1/2/2020	1/15/2020	5	10	
2	Grading	Grading	1/6/2020	1/15/2020	5	8	
3	Building Construction	Building Construction	1/16/2020	9/16/2020	5	175	
4	Paving	Paving	9/10/2020	9/16/2020	5	5	
5	Architectural Coating	Architectural Coating	9/10/2020	9/16/2020	5	5	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 19,264; Non-Residential Outdoor: 6,421; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Demolition	Rubber Tired Dozers	1	1.00	247	0.40
Demolition	Tractors/Loaders/Backhoes	2	6.00	97	0.37
Grading	Concrete/Industrial Saws	1	8.00	81	0.73
Grading	Rubber Tired Dozers	1	1.00	247	0.40
Grading	Tractors/Loaders/Backhoes	2	6.00	97	0.37
Building Construction	Cranes	1	4.00	231	0.29
Building Construction	Forklifts	2	6.00	89	0.20
Building Construction	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Paving	Cement and Mortar Mixers	4	6.00	9	0.56
Paving	Pavers	1	7.00	130	0.42
Paving	Rollers	1	7.00	80	0.38
Paving	Tractors/Loaders/Backhoes	1	7.00	97	0.37
Architectural Coating	Air Compressors	1	6.00	78	0.48

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	4	10.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Grading	4	10.00	0.00	40.00	14.70	6.90	54.00	LD_Mix	HDT_Mix	HHDT
Building Construction	5	4.00	2.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Paving	7	18.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	1.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Water Exposed Area

Reduce Vehicle Speed on Unpaved Roads

3.2 Demolition - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.8674	7.8729	7.6226	0.0120		0.4672	0.4672		0.4457	0.4457		1,147.2352	1,147.2352	0.2169		1,152.6578
Total	**0.8674**	**7.8729**	**7.6226**	**0.0120**		**0.4672**	**0.4672**		**0.4457**	**0.4457**		**1,147.2352**	**1,147.2352**	**0.2169**		**1,152.6578**

3.2 Demolition - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0511	0.0363	0.4010	1.1100e-003	0.1118	9.3000e-004	0.1127	0.0296	8.6000e-004	0.0305		110.7420	110.7420	3.4900e-003		110.8293
Total	**0.0511**	**0.0363**	**0.4010**	**1.1100e-003**	**0.1118**	**9.3000e-004**	**0.1127**	**0.0296**	**8.6000e-004**	**0.0305**		**110.7420**	**110.7420**	**3.4900e-003**		**110.8293**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.2652	5.9644	7.9381	0.0120		0.4017	0.4017		0.4017	0.4017	0.0000	1,147.2352	1,147.2352	0.2169		1,152.6578
Total	**0.2652**	**5.9644**	**7.9381**	**0.0120**		**0.4017**	**0.4017**		**0.4017**	**0.4017**	**0.0000**	**1,147.2352**	**1,147.2352**	**0.2169**		**1,152.6578**

3.2 Demolition - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0511	0.0363	0.4010	1.1100e-003	0.1118	9.3000e-004	0.1127	0.0296	8.6000e-004	0.0305		110.7420	110.7420	3.4900e-003		110.8293
Total	**0.0511**	**0.0363**	**0.4010**	**1.1100e-003**	**0.1118**	**9.3000e-004**	**0.1127**	**0.0296**	**8.6000e-004**	**0.0305**		**110.7420**	**110.7420**	**3.4900e-003**		**110.8293**

3.3 Grading - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.7641	0.0000	0.7641	0.4155	0.0000	0.4155			0.0000			0.0000
Off-Road	0.8674	7.8729	7.6226	0.0120		0.4672	0.4672		0.4457	0.4457		1,147.2352	1,147.2352	0.2169		1,152.6578
Total	**0.8674**	**7.8729**	**7.6226**	**0.0120**	**0.7641**	**0.4672**	**1.2313**	**0.4155**	**0.4457**	**0.8612**		**1,147.2352**	**1,147.2352**	**0.2169**		**1,152.6578**

3.3 Grading - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.1046	3.1464	0.7750	9.6900e-003	0.2359	0.0121	0.2480	0.0646	0.0116	0.0762		1,049.9991	1,049.9991	0.0657		1,051.6419
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0511	0.0363	0.4010	1.1100e-003	0.1118	9.3000e-004	0.1127	0.0296	8.6000e-004	0.0305		110.7420	110.7420	3.4900e-003		110.8293
Total	**0.1557**	**3.1826**	**1.1760**	**0.0108**	**0.3476**	**0.0130**	**0.3607**	**0.0943**	**0.0124**	**0.1067**		**1,160.7412**	**1,160.7412**	**0.0692**		**1,162.4712**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.2980	0.0000	0.2980	0.1620	0.0000	0.1620			0.0000			0.0000
Off-Road	0.2652	5.9644	7.9381	0.0120		0.4017	0.4017		0.4017	0.4017	0.0000	1,147.2352	1,147.2352	0.2169		1,152.6578
Total	**0.2652**	**5.9644**	**7.9381**	**0.0120**	**0.2980**	**0.4017**	**0.6997**	**0.1620**	**0.4017**	**0.5637**	**0.0000**	**1,147.2352**	**1,147.2352**	**0.2169**		**1,152.6578**

3.3 Grading - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.1046	3.1464	0.7750	9.6900e-003	0.2359	0.0121	0.2480	0.0646	0.0116	0.0762		1,049.9991	1,049.9991	0.0657		1,051.6419
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0511	0.0363	0.4010	1.1100e-003	0.1118	9.3000e-004	0.1127	0.0296	8.6000e-004	0.0305		110.7420	110.7420	3.4900e-003		110.8293
Total	**0.1557**	**3.1826**	**1.1760**	**0.0108**	**0.3476**	**0.0130**	**0.3607**	**0.0943**	**0.0124**	**0.1067**		**1,160.7412**	**1,160.7412**	**0.0692**		**1,162.4712**

3.4 Building Construction - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.8617	8.8523	7.3875	0.0114		0.5224	0.5224		0.4806	0.4806		1,102.9781	1,102.9781	0.3567		1,111.8962
Total	**0.8617**	**8.8523**	**7.3875**	**0.0114**		**0.5224**	**0.5224**		**0.4806**	**0.4806**		**1,102.9781**	**1,102.9781**	**0.3567**		**1,111.8962**

3.4 Building Construction - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	7.4400e-003	0.2127	0.0615	5.0000e-004	0.0128	1.0200e-003	0.0138	3.6900e-003	9.7000e-004	4.6600e-003		53.8898	53.8898	3.6000e-003		53.9799
Worker	0.0204	0.0145	0.1604	4.4000e-004	0.0447	3.7000e-004	0.0451	0.0119	3.4000e-004	0.0122		44.2968	44.2968	1.4000e-003		44.3317
Total	**0.0279**	**0.2272**	**0.2219**	**9.4000e-004**	**0.0575**	**1.3900e-003**	**0.0589**	**0.0156**	**1.3100e-003**	**0.0169**		**98.1866**	**98.1866**	**5.0000e-003**		**98.3116**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.2793	6.1296	7.9624	0.0114		0.3855	0.3855		0.3855	0.3855	0.0000	1,102.9781	1,102.9781	0.3567		1,111.8962
Total	**0.2793**	**6.1296**	**7.9624**	**0.0114**		**0.3855**	**0.3855**		**0.3855**	**0.3855**	**0.0000**	**1,102.9781**	**1,102.9781**	**0.3567**		**1,111.8962**

3.4 Building Construction - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	7.4400e-003	0.2127	0.0615	5.0000e-004	0.0128	1.0200e-003	0.0138	3.6900e-003	9.7000e-004	4.6600e-003		53.8898	53.8898	3.6000e-003		53.9799
Worker	0.0204	0.0145	0.1604	4.4000e-004	0.0447	3.7000e-004	0.0451	0.0119	3.4000e-004	0.0122		44.2968	44.2968	1.4000e-003		44.3317
Total	**0.0279**	**0.2272**	**0.2219**	**9.4000e-004**	**0.0575**	**1.3900e-003**	**0.0589**	**0.0156**	**1.3100e-003**	**0.0169**		**98.1866**	**98.1866**	**5.0000e-003**		**98.3116**

3.5 Paving - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.7716	7.2266	7.1128	0.0113		0.3950	0.3950		0.3669	0.3669		1,035.3926	1,035.3926	0.3016		1,042.9323
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.7716**	**7.2266**	**7.1128**	**0.0113**		**0.3950**	**0.3950**		**0.3669**	**0.3669**		**1,035.3926**	**1,035.3926**	**0.3016**		**1,042.9323**

3.5 Paving - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0920	0.0652	0.7218	2.0000e-003	0.2012	1.6800e-003	0.2029	0.0534	1.5500e-003	0.0549		199.3357	199.3357	6.2800e-003		199.4927
Total	**0.0920**	**0.0652**	**0.7218**	**2.0000e-003**	**0.2012**	**1.6800e-003**	**0.2029**	**0.0534**	**1.5500e-003**	**0.0549**		**199.3357**	**199.3357**	**6.2800e-003**		**199.4927**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.2239	4.7579	6.9028	0.0113		0.2908	0.2908		0.2908	0.2908	0.0000	1,035.3926	1,035.3926	0.3016		1,042.9323
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.2239**	**4.7579**	**6.9028**	**0.0113**		**0.2908**	**0.2908**		**0.2908**	**0.2908**	**0.0000**	**1,035.3926**	**1,035.3926**	**0.3016**		**1,042.9323**

3.5 Paving - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0920	0.0652	0.7218	2.0000e-003	0.2012	1.6800e-003	0.2029	0.0534	1.5500e-003	0.0549		199.3357	199.3357	6.2800e-003		199.4927
Total	**0.0920**	**0.0652**	**0.7218**	**2.0000e-003**	**0.2012**	**1.6800e-003**	**0.2029**	**0.0534**	**1.5500e-003**	**0.0549**		**199.3357**	**199.3357**	**6.2800e-003**		**199.4927**

3.6 Architectural Coating - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	23.8100					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2422	1.6838	1.8314	2.9700e-003		0.1109	0.1109		0.1109	0.1109		281.4481	281.4481	0.0218		281.9928
Total	**24.0522**	**1.6838**	**1.8314**	**2.9700e-003**		**0.1109**	**0.1109**		**0.1109**	**0.1109**		**281.4481**	**281.4481**	**0.0218**		**281.9928**

3.6 Architectural Coating - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	5.1100e-003	3.6200e-003	0.0401	1.1000e-004	0.0112	9.0000e-005	0.0113	2.9600e-003	9.0000e-005	3.0500e-003		11.0742	11.0742	3.5000e-004		11.0829
Total	**5.1100e-003**	**3.6200e-003**	**0.0401**	**1.1000e-004**	**0.0112**	**9.0000e-005**	**0.0113**	**2.9600e-003**	**9.0000e-005**	**3.0500e-003**		**11.0742**	**11.0742**	**3.5000e-004**		**11.0829**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	23.8100					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.0594	1.3570	1.8324	2.9700e-003		0.0951	0.0951		0.0951	0.0951	0.0000	281.4481	281.4481	0.0218		281.9928
Total	**23.8694**	**1.3570**	**1.8324**	**2.9700e-003**		**0.0951**	**0.0951**		**0.0951**	**0.0951**	**0.0000**	**281.4481**	**281.4481**	**0.0218**		**281.9928**

3.6 Architectural Coating - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	5.1100e-003	3.6200e-003	0.0401	1.1000e-004	0.0112	9.0000e-005	0.0113	2.9600e-003	9.0000e-005	3.0500e-003		11.0742	11.0742	3.5000e-004		11.0829
Total	**5.1100e-003**	**3.6200e-003**	**0.0401**	**1.1000e-004**	**0.0112**	**9.0000e-005**	**0.0113**	**2.9600e-003**	**9.0000e-005**	**3.0500e-003**		**11.0742**	**11.0742**	**3.5000e-004**		**11.0829**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.8134	4.0061	10.6707	0.0366	3.0354	0.0319	3.0673	0.8124	0.0298	0.8422		3,723.8837	3,723.8837	0.2036		3,728.9745
Unmitigated	0.8134	4.0061	10.6707	0.0366	3.0354	0.0319	3.0673	0.8124	0.0298	0.8422		3,723.8837	3,723.8837	0.2036		3,728.9745

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Gasoline/Service Station	0.00	0.00	0.00		
General Office Building	443.11	443.11	443.11	1,427,462	1,427,462
Total	443.11	443.11	443.11	1,427,462	1,427,462

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Gasoline/Service Station	16.60	8.40	6.90	2.00	79.00	19.00	14	27	59
General Office Building	16.60	8.40	6.90	33.00	48.00	19.00	77	19	4

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Gasoline/Service Station	0.547192	0.045177	0.202743	0.121510	0.016147	0.006143	0.019743	0.029945	0.002479	0.002270	0.005078	0.000682	0.000891
General Office Building	0.547192	0.045177	0.202743	0.121510	0.016147	0.006143	0.019743	0.029945	0.002479	0.002270	0.005078	0.000682	0.000891

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	4.1100e-003	0.0374	0.0314	2.2000e-004		2.8400e-003	2.8400e-003		2.8400e-003	2.8400e-003		44.8420	44.8420	8.6000e-004	8.2000e-004	45.1085
NaturalGas Unmitigated	4.1100e-003	0.0374	0.0314	2.2000e-004		2.8400e-003	2.8400e-003		2.8400e-003	2.8400e-003		44.8420	44.8420	8.6000e-004	8.2000e-004	45.1085

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Gasoline/Service Station	35.0034	3.8000e-004	3.4300e-003	2.8800e-003	2.0000e-005		2.6000e-004	2.6000e-004		2.6000e-004	2.6000e-004		4.1181	4.1181	8.0000e-005	8.0000e-005	4.1425
General Office Building	346.154	3.7300e-003	0.0339	0.0285	2.0000e-004		2.5800e-003	2.5800e-003		2.5800e-003	2.5800e-003		40.7240	40.7240	7.8000e-004	7.5000e-004	40.9660
Total		**4.1100e-003**	**0.0374**	**0.0314**	**2.2000e-004**		**2.8400e-003**	**2.8400e-003**		**2.8400e-003**	**2.8400e-003**		**44.8420**	**44.8420**	**8.6000e-004**	**8.3000e-004**	**45.1085**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Gasoline/Service Station	0.0350034	3.8000e-004	3.4300e-003	2.8800e-003	2.0000e-005		2.6000e-004	2.6000e-004		2.6000e-004	2.6000e-004		4.1181	4.1181	8.0000e-005	8.0000e-005	4.1425
General Office Building	0.346154	3.7300e-003	0.0339	0.0285	2.0000e-004		2.5800e-003	2.5800e-003		2.5800e-003	2.5800e-003		40.7240	40.7240	7.8000e-004	7.5000e-004	40.9660
Total		**4.1100e-003**	**0.0374**	**0.0314**	**2.2000e-004**		**2.8400e-003**	**2.8400e-003**		**2.8400e-003**	**2.8400e-003**		**44.8420**	**44.8420**	**8.6000e-004**	**8.3000e-004**	**45.1085**

6.0 Area Detail

6.1 Mitigation Measures Area

Use Low VOC Paint - Residential Interior

Use Low VOC Paint - Residential Exterior

Use Low VOC Paint - Non-Residential Interior

Use Low VOC Paint - Non-Residential Exterior

Use Low VOC Cleaning Supplies

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.2871	2.0000e-005	1.7600e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005		3.7500e-003	3.7500e-003	1.0000e-005		4.0000e-003
Unmitigated	0.2871	2.0000e-005	1.7600e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005		3.7500e-003	3.7500e-003	1.0000e-005		4.0000e-003

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0326					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.2543					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	1.6000e-004	2.0000e-005	1.7600e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005		3.7500e-003	3.7500e-003	1.0000e-005		4.0000e-003
Total	**0.2871**	**2.0000e-005**	**1.7600e-003**	**0.0000**		**1.0000e-005**	**1.0000e-005**		**1.0000e-005**	**1.0000e-005**		**3.7500e-003**	**3.7500e-003**	**1.0000e-005**		**4.0000e-003**

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0326					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.2543					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	1.6000e-004	2.0000e-005	1.7600e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005		3.7500e-003	3.7500e-003	1.0000e-005		4.0000e-003
Total	**0.2871**	**2.0000e-005**	**1.7600e-003**	**0.0000**		**1.0000e-005**	**1.0000e-005**		**1.0000e-005**	**1.0000e-005**		**3.7500e-003**	**3.7500e-003**	**1.0000e-005**		**4.0000e-003**

7.0 Water Detail

7.1 Mitigation Measures Water

Install Low Flow Bathroom Faucet

Install Low Flow Kitchen Faucet

Install Low Flow Toilet

Install Low Flow Shower

Use Water Efficient Irrigation System

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

APPENDIX B-1

Cultural Resources Inventory

PALEOWEST archaeology

626.408.8006 | paleowest.com | 517 South Ivy Avenue | Monrovia, CA 91016

May 22, 2019

Ms. Kelene Strain
Senior Project Manager
Meridian Consultants, LLC
706 S. Hill Street, 11th Floor
Los Angeles, CA 90014
Transmitted via email to kstrain@meridianconsultantsllc.com

RE: Cultural Resource Inventory for the Transdev Facility Project in Compton, Los Angeles County, California

Dear Ms. Strain:

At the request of Meridian Consultants, LLC, PaleoWest Archaeology conducted a cultural resource inventory for the Transdev Facility Project in Compton, Los Angeles County, California. The cultural resource inventory was limited to a cultural resource literature review and records search of the California Historic Resource Information System (CHRIS) and a review of the Sacred Lands File (SLF) by the Native American Heritage Commission (NAHC). This memorandum summarizes the results of the cultural resource inventory efforts for the Project.

The literature review and records search was conducted by Roberta Thomas, Senior Archaeologist, on May 14, 2019 at the South Central Coastal Information Center (SCCIC) housed at California State University, Fullerton. The records search included the Project area as well as a quarter-mile radius. The purpose of the records search was to identify any known cultural resources within the immediate vicinity of the Project area. The records search also included a review of the Office of Historic Preservation Archaeological Determination of Eligibility and the Office of Historic Preservation Directory of Historic Properties Data File.

The records search indicated that one previous study has been conducted within a quarter-mile of the Project area since 1983 (Table 1). This study did not include the Project area. In addition, no prehistoric archaeological resources were identified as a result of the records search. However, one previously recorded historic-period built-environment resource was identified within a quarter-mile radius of the Project (Table 2). This built resource, McKinley Elementary School (19-190179) located at 14431 Stanford Avenue, is not located within the Project area; however, it is located immediately adjacent to the Project area. The resource was recorded by Christy J. McAvoy in 1994. The main building was completed in 1927 and was designed by T. C. Kistner (McAvoy 1994). A Kindergarten building was added to the campus in the 1940s. Both buildings were recorded as excellent examples of educational architecture from their respective periods (McAvoy 1994). According to the Historic Resource Inventory, the campus has been determined ineligible for listing on the National Register of Historic Places by consensus through the Section 106 process; however, it does not appear the campus has been evaluated for listing on the California Register of Historical Resources (CRHR). Based on the nature of the proposed Project, the campus may need to be evaluated for listing on the CRHR.

Table 1
Previous Cultural Resource Studies within a Quarter-Mile of the Project Area

Report No.	Year	Author(s)	Title
LA-01290	1983	David Chavez	Cultural Resources Evaluation for the Compton Co-Generation Plant, City of Compton, California

Table 2
Cultural Resources within a Quarter-Mile of the Project Area

Primary No.	Age	Type	Description
19-190179	Historical	Building	McKinley Elementary School

PaleoWest contacted the NAHC for a review of the SLF on May 10, 2019. The objective of the SLF search was to determine if the NAHC had any knowledge of Native American cultural resources (e.g., traditional use or gathering area, place of religious or sacred activity, etc.) within the immediate vicinity of the Project area. The NAHC has not responded to the SLF request to date.

It has been a pleasure working with you on this Project. If you have any questions, please do not hesitate to contact me at rthomas@paleowest.com.

Sincerely,

Roberta Thomas, MA, RPA
Senior Archaeologist
PaleoWest Archaeology

APPENDIX B-2

Paleontological Resources Inventory

Natural History Museum
of Los Angeles County
900 Exposition Boulevard
Los Angeles, CA 90007

tel 213.763.DINO
www.nhm.org

NATURAL HISTORY MUSEUM
LOS ANGELES COUNTY

Vertebrate Paleontology Section
Telephone: (213) 763-3325
Fax: (213) 746-7431
e-mail: smcleod@nhm.org

25 May 2016

CAJA Environmental Services, LLC
11990 West San Vicente Boulevard, Suite 200
Los Angeles, CA 90049

Attn: Andrea Schultz, Head of Operations

re: Paleontological resources for the proposed 3700 Wilshire Project, in the City of Los Angeles, Los Angeles County, project area

Dear Andrea:

I have conducted a thorough search of our paleontology collection records for the locality and specimen data for the proposed 3700 Wilshire Project, in the City of Los Angeles, Los Angeles County, project area as outlined on the portion of the Hollywood USGS topographic quadrangle map that you sent to me via e-mail on 11 May 2016. We have one vertebrate fossil locality that lies either adjacent to or directly within the proposed project boundaries, and we have other localities nearby from the same sedimentary deposits that occur in the proposed project area.

The entire proposed project area has surface deposits composed of older Quaternary Alluvium, derived as alluvial fan deposits from the elevated terrain to the northeast. The uppermost layers of Quaternary Alluvium in this general portion of Los Angeles usually do not contain significant vertebrate fossils, but vertebrate fossils do occur at varying depths. We have one vertebrate fossil locality from older Quaternary deposits, LACM 6204, that occurs either adjacent to or directly within the boundaries of the proposed project area. Locality LACM 6204 produced a fossil specimen of mammoth, *Mammuthus*, at a depth of 65 feet below grade near the intersection of Wilshire Boulevard and Serrano Avenue. Just west of north of the proposed project area, near the intersection of Western Avenue and Council Street, our locality LACM 5845, also from these older Quaternary sediments, produced a specimen of fossil mastodon,

Mammutidae, at a depth of only 5-6 feet below the surface. North-northeast of the proposed project area, at about the intersection of Madison Avenue and Middlebury Street, our locality LACM 3250, produced a fossil specimen of mammoth, *Mammuthus*, at a depth of about eight feet below street level.

Beginning east-northeast of the proposed project area, west of Vermont Avenue between 5th Street and 6th Street, there are exposures of the marine late Miocene Puente Formation (also sometimes referred to as the Upper Modelo Formation or as an unnamed shale in this area), and these deposits probably underlie the Quaternary Alluvium in the proposed project area at relatively shallow depth. East of the proposed project area, around the intersection of Vermont Avenue and Wilshire Boulevard, we have the vertebrate fossil localities LACM 6202 and 6203 from the Puente Formation discovered during excavation for the Meterorail Wilshire / Vermont station at a depth of 60 to 80 feet beneath the surface. Fossil specimens of eels, Anguilliformes, and needlefishes, Belonidae, were recovered at locality LACM 6203. Locality LACM 6202, however, was an extremely productive locality that contained an extensive fauna of fossil fish. A list of the fossil fish taxa from locality LACM 6202 is provided in the attached appendix.

Very shallow excavations of only a few feet in the older Quaternary Alluvium exposed throughout the proposed project area may not encounter any significant fossil vertebrate remains. Deeper excavations that extend down into older sedimentary deposits, particularly if they extend down into the Puente Formation, however, may very well uncover significant vertebrate fossils. Any substantial excavations in the proposed project area, therefore, should be monitored closely to quickly and professionally recover any fossil remains discovered while not impeding development. Also, sediment samples from the finer-grained deposits should be collected and processed to determine the small fossil potential in the proposed project area. Any fossils recovered during mitigation should be deposited in an accredited and permanent scientific institution for the benefit of current and future generations.

This records search covers only the vertebrate paleontology records of the Natural History Museum of Los Angeles County. It is not intended to be a thorough paleontological survey of the proposed project area covering other institutional records, a literature survey, or any potential on-site survey.

Sincerely,

Samuel A. McLeod

Samuel A. McLeod, Ph.D.
Vertebrate Paleontology

enclosures: appendix; invoice

Fossil fish taxa from LACM 6202, Metrorail Red Line Vermont / Wilshire Station

- Osteichthyes - bony fishes
  - Anguilliformes - eels
  - Atheriniformes
    - Belonidae - needlefishes
  - Beryciformes
    - Anoplogasteridae - fangtooths
      - *Anoplogaster*
    - Melamphaeidae - bigscales
      - *Scopelogadus*
  - Clupeiformes
    - Clupeidae - herrings
      - *Ganolytes cameo*
      - *Xyne grex*
  - Gadiformes
    - Gadidae - cods
      - *Physiculus*
    - Macrouridae - grenadiers
    - Merlucciidae - hakes
      - *Merluccius*
    - Moridae - flatnoses
  - Lophiiformes - frogfishes
    - Linophrynidae
    - Oneirodidae
      - *Oneirodes*
  - Myctophiformes
    - Myctophidae - lanternfishes
      - *Diaphus*
      - *Lampanyctus*
  - Perciformes
    - Carangidae - jacks
      - *Pseudoseriola*
    - Gempylidae - snake mackerals
      - *Thyrsocles*
    - Sciaenidae - croakers
      - *Lompoquia*
    - Scombridae - tunas & mackerals
      - *Sarda*
      - *Scomber*
    - Serranidae - groupers
    - Trichiuridae - cutlassfishes
  - Pleuronectiformes
    - Citharidae - sanddabs
      - *Citharichthys*
    - Pleuronectidae - fluonders & soles
      - *Hippoglossus*
      - *Pleuronichthys*
  - Salmoniformes
    - Alepocephalidae - slickheads
    - Argentinidae - argentinas
    - Bathylagidae - smoothtongues
      - *Bathylagus*
    - Opisthoproctidae - spookfishes
    - Searsiidae - tubeshoulders
  - Scorpaeniformes
    - Scorpaenidae - rockfishes
      - *Sebastes*
  - Stomiatiformes
    - Chauliodontidae - viperfishes
      - *Chauliodus eximius*
    - Gonostomidae - bristlemouths
      - *Cyclothone*
      - *Vinciguerria*
    - Sternoptychidae - hatchetfishes
      - *Argyropelecus*
    - Stomiatidae - dragonfishes
      - *Stomias*

APPENDIX C

Preliminary Geotechnical Investigation Report

Geotechnical
Environmental
Hydrogeology
Material Testing
Construction Inspection

November 1, 2018 Project No. 18-6799

Ibrahima Toure
Transdev North America
720 Butterfield Road, Suite 300
Lombard, Illinois 60148

Subject: Preliminary Geotechnical Investigation Report for 636 East Rosecrans Avenue, Gardena, California

Ibrahima,

In accordance with your request and authorization, TGR Geotechnical, Inc. (TGR) has completed the preliminary geotechnical investigation to provide pavement design recommendations for the proposed 92 space bus parking lot and concrete slab thickness for the improvements within Building 1 at the subject site.

SCOPE OF SERVICES

The scope of work for this geotechnical investigation included the following:

Task 1 (Bus Parking):

- Site reconnaissance to assess current site conditions and mark investigation locations for utility clearance.
- Excavation of six (6) hollow stem auger borings to a depth of 6.5 to 16.5 feet below existing grade in the western portion of the site (Avalon) for evaluation of pavement design for bus parking.
- Percolation testing in the upper 5 feet of onsite soils at two (2) locations for WQMP requirements for stormwater infiltration design.
- Laboratory testing of select samples for in situ moisture and density, maximum density and optimum moisture content, passing No. 200 sieve and R-value.
- Preparation of this report presenting recommendations for pavement design and infiltration rate.

Task 2 (Existing Building Slab Thickness):

- Concrete coring of the slab-on-grade at 2 locations in Building 1 and concrete core compression tests.
- This report presenting concrete slab thickness and concrete compressive strength.

TGR GEOTECHNICAL
DBE & 8(a) firm
3037 S. HARBOR BLVD
SANTA ANA, CA 92704
P 714.641.7189 F 714.641.7190
www.tgrgeotech.com

FIELD SAMPLING

Field exploration was performed on October 25, 2018 by representatives from our firm who logged the borings, obtained representative samples and conducted concrete slab coring. The samples obtained were subsequently transported to the laboratory for further review and testing. The approximate locations of the borings and corings are indicated on the enclosed Boring and Coring Location Map (Plate 1).

The subsurface conditions were explored by drilling, sampling, and logging six (6) borings with a hollow stem auger drill rig to approximate depths of 6.5 to 16.5 feet below existing grade. Two of the borings were used for percolation testing of the near surface soils. Subsequent to drilling, all borings were backfilled with soil cuttings and the surface repaired with cold patch asphalt, where appropriate. The logs of borings presenting soil conditions and descriptions are provided as Plates 2 through 7.

The drill rig was equipped with a sampling apparatus to allow for recovery of driven modified California Ring Sampler (CRS), 3-inch outside diameter, and 2.42-inch inside diameter samples. Driven samples and bulk samples of the earth materials encountered at selected intervals were recovered from the borings. The locations and depths of the soil samples recovered are indicated on the logs in Plates 2 through 7.

LABORATORY TESTING

Laboratory tests were performed on representative samples to verify the field classification of the recovered samples and to evaluate the geotechnical properties of the subsurface soils. The following tests were performed:

- In-situ moisture content (ASTM D2216) and dry density (ASTM D7263);
- Maximum Dry Density and Optimum Moisture Content (ASTM D1557);
- Passing No. 200 sieve (ASTM 1140);
- R-Value Determination (CAL 301); and
- Concrete Compressive Strength (ASTM C42).

Moisture and Density Determination Tests: Moisture content and dry density determinations were performed on relatively undisturbed samples obtained from the test borings. The results of these tests are presented in the boring logs. Where applicable, only moisture content was determined from "undisturbed" or disturbed samples.

Maximum Density Tests: The maximum dry density and optimum moisture content of typical materials were determined in accordance with ASTM Test Method D1557. The results of these tests are presented in the table below:

Sample Location	Sample Description	Maximum Dry Density (Pcf)	Optimum Moisture Content (%)
B-5 @ 0-5 feet	Sandy Clay	121.0	13.0

Wash Sieve Test: Typical materials were washed over No. 200 sieve (ASTM Test Method D1140). The test results are presented below:

Sample Location	% Passing No. 200 Sieve
B-5 @ 2 feet	72.4 %
B-6 @ 2 feet	68.4 %

R-Value: The resistance "R"-Value was determined by the California Materials Method No. 301 for subgrade soils. One sample was prepared, and exudation pressure and "R"-Value determined. The graphically determined "R"-Value at exudation pressure of 300 psi is presented on Plates 8 and 9 and is summarized in the table below:

Sample Location	Sample Description	R-Value
B-1 @ 0-5 feet	Clay	10

Concrete Compressive Strength: Compressive strength of concrete cores was evaluated based on the ASTM C42 procedure. Test results are presented on Plate 10 and summarized in the table below:

Core Location	Slab Thickness (inches)	Core Compressive Strength (psi)
C-1	7.42	5530
C-2	6.24	5590

PERCOLATION TESTING

Percolation testing was performed at borings B-5 and B-6 at the subject site to determine the suitability of storm water infiltration in the proposed parking areas. Presented below is the infiltration rate from the percolation tests performed at the subject site. These do not include any factor of safety. Calculations are shown on Table 1.

- B-5 at 0-6.5 feet 0.02 inches per hour
- B-6 at 0-6.5 feet 0.03 inches per hour

The infiltration test rates were determined utilizing the City of Los Angeles guidelines. Based on the test results and the referenced guideline, *the subject site is generally considered* ***not suitable*** *for storm water infiltration*.

FINDINGS AND RECOMMENDATIONS

Site Descriptions and Proposed Project Development

The subject site is located at 636 East Rosecrans Avenue (Figure 1) in Gardena, California. The subject site is a relatively flat asphalt parking lot with a 12,000 square foot building located

at the center portion of the north end of the property. The remainder of the site is an asphalt covered parking lot recently used for storage. The asphalt encountered during our field exploration was approximately 3 to 5 inches thick and underlain by approximately 3 to 12 inches of base. It is our understanding that the existing pavement will be removed, and that development will consist of the construction of a 92 space bus parking lot.

Existing Soil

Based on our subsurface investigation, the subject area is underlain by five feet of fill, which generally consists of dark brown to reddish brown clay and sandy clay in a moist condition. The underlying alluvium was present to the maximum depth explored of 16.5 feet below the existing grade. Generally, the alluvium consists of yellow to golden brown silt and sandy silt in a moist condition to the maximum depth explored of 16.5 feet below grade. Detailed descriptions of the earth units encountered in our borings are presented in the log of the borings.

Groundwater

Subsurface water was not encountered during the exploration to a maximum depth of 16.5 feet below existing ground surface. Based on our review of available historical groundwater information (CDMG, 1998) regional groundwater has been mapped in the general site area at approximately 50 feet below ground surface. Seasonal and long-term fluctuations in the groundwater may occur as a result of variations in subsurface conditions, rainfall, run-off conditions and other factors. Therefore, variations from our observations may occur. Static groundwater is not anticipated to impact the proposed development.

Earthwork and Demolition

Within the proposed development and demolition area, all foundations, slab-on-grade, vaults, utility lines, surface vegetation, trash, demolition debris, asphaltic concrete and portland cement concrete should be cleared and removed from the proposed site.

Depressions resulting from the removal of objects encountered as mentioned above should be backfilled with properly compacted engineered fill under the testing and observation of the geotechnical consultant of record.

At a minimum, the upper two (2) feet of fill should be removed and replaced as engineered fill, compacted to 90 percent relative compaction and moisture condition to at least 120 percent of optimum moisture content per ASTM D1557.

During earthwork construction, all site preparation and the general procedures of the contractor should be observed, and the fill and base selectively tested by a representative of TGR. If unusual or unexpected conditions are exposed in the field, they should be reviewed by this office and if warranted, modified and/or additional recommendations will be offered.

Grading

All grading should conform to the guidelines presented in the California Building Code (2016 edition) and the 2017 Los Angeles Building Code amendment, except where specifically superseded in the text of this report. Prior to grading, TGR's representative should be present at the pre-construction meeting to provide grading guidelines, if needed, and review any earthwork.

A minimum of two (2) feet of engineered fill is recommended under the asphalt or Portland cement concrete pavement. Site soils could be reused as engineered fill provided the recommendations presented in this report are implemented. Exposed bottoms should be scarified a minimum of 6-inches, moisture conditioned to at least 120 percent optimum moisture content and compacted to a minimum 90 percent relative compaction. Subsequently, site fill soils should be re-compacted to a minimum of ninety (90) percent relative compaction at near optimum moisture content.

The depth of over-excavation should be reviewed by the Geotechnical Consultant during the actual construction. Any subsurface obstruction buried structural elements, and unsuitable material encountered during grading, should be immediately brought to the attention of the Geotechnical Consultant for proper exposure, removal and processing, as recommended.

Pavement Design

Based on our field investigation and laboratory testing, presented below are the asphalt and Portland cement concrete pavement design recommendations for the proposed vehicular parking stalls. The pavement section is based on the tested R-value for the anticipated pavement subgrade soils.

ASPHALT PAVEMENT (R-Value = 10)		
Materials	**Thickness (inches)**	
	Bus Parking TI = 6.0	Bus Drive Lanes TI = 8.0
Asphalt Concrete	4	5
Aggregate Base	10	11

Aggregate base material for Asphalt Pavement should consist of CAB complying with the specifications in Section 200.2.2 of the current “Standard Specifications for Public Works Construction” and should be compacted to at least ninety-five (95) percent of the maximum dry density (ASTM D1557). If CMB is used, incorporate an additional inch of aggregate base into the design. The surface of the aggregate base should exhibit a firm and unyielding condition just prior to the placement of asphalt concrete paving.

PORTLAND CEMENT CONCRETE PAVEMENT (R-Value = 10)		
Materials	**Thickness (inches)**	
	Bus Parking TI = 6.0	Bus Drive Lanes TI = 8.0
PCC	7	8.5
Aggregate Base	6	6

An increase in the PCC pavement slab thickness, placement of steel reinforcement (or other alternatives such as Fibermesh) and joint spacing due to loading conditions and soil expansion may be necessary and should be incorporated by the structural engineer as necessary to prevent adverse impact on pavement performance and maintenance.

The pavement subgrade should be constructed in accordance with the recommendations presented in the grading section of this report.

The R-value and the associated pavement section should be confirmed at the completion of site grading.

Pole Foundation

Pole foundation for light poles consisting of drilled caissons shall be a minimum of 18-inch in diameter and 3 feet deep. The caisson allowable downward frictional capacity of 200 psf may be utilized in the design. The uplift capacity may be taken as one-half of downward capacity. The lateral resistance is estimated as 200 pounds per square foot per foot below to a maximum lateral resistance of 2000 psf. The caisson axial and lateral capacity in the upper one foot shall be ignored unless covered with hardscape.
The axial capacities may be increased by one-third when considering short duration seismic or wind loads. Foundation design details such as concrete strength, reinforcements, etc should be established by the Structural Engineer.

For caissons spaced at less than three (3) diameters on center, additional group capacity reduction effects should be taken into account on evaluating the allowable axial capacity of the pile groups. The drilling and installation of piles should be performed under the full-time observation of TGR Geotechnical. Precautions should be taken during installation of caissons to prevent caving/sloughing.

The caisson excavation should be filled with concrete as soon as possible after drilling is completed. The caisson excavation should not be left open for more than 48 hours. The concrete should not be allowed to fall freely more than five (5) feet; vibration should take place during concrete placement throughout the full length of the caisson to eliminate voids in either the caisson base or the shaft. Placement procedure such as tremie, should ensure that aggregate segregation does not occur. Where caisson spacing is less than three (3) diameters, caissons should be drilled and filled alternately, allowing the previously poured caisson concrete to set for at least twenty-four (24) hours, or as permitted by the geotechnical engineer.

Geotechnical Review of Plans

All grading plans and specifications should be reviewed and accepted by the geotechnical consultant before they are finalized to determine if the geotechnical and/or geologic information have been properly implemented. If this firm is not granted the privilege of reviewing the plans and specifications, this firm is not responsible for misinterpretation of the recommendations given in this report.

Geotechnical Observation/Testing During Construction

The geotechnical consultant should perform observation and/or testing at the following stages:

- During any grading and fill placement;
- Prior to asphalt or PCC paving;

- After foundation excavation and prior to placing concrete;
- When any unusual soil conditions are encountered during any construction operation subsequent to issuance of this report.

LIMITATIONS

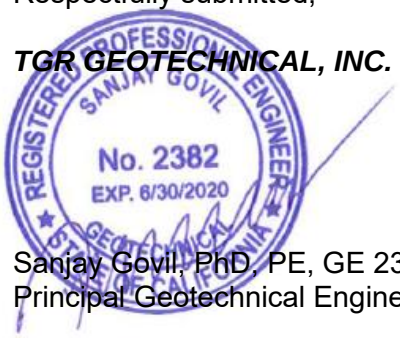
This report was prepared for the subject project based on the client's needs, directions and requirements at the time.

This report was necessarily based in part upon data obtained from a limited number of observances, site visits, soil and/or other samples, tests, analyses, histories of occurrences, spaced subsurface exploration and limited information on historical events and observations. Such information is necessarily incomplete. Variations can be experienced within small distances and under various climatic conditions. Changes in subsurface conditions can and do occur over time.

This report is not authorized for use by, and is not to be relied upon by, any party except the client with whom TGR contracted for the work. Use or reliance on this report by any other party is that party's sole risk. Unauthorized use of or reliance on this report constitutes and agreement to defend and indemnify TGR from and against any liability which may arise as a result of such use or reliance, regardless of any fault, negligence, or strict liability of TGR. If you have any questions regarding this report, please do not hesitate to contact this office. We appreciate this opportunity to be of service.

Respectfully submitted,

TGR GEOTECHNICAL, INC.



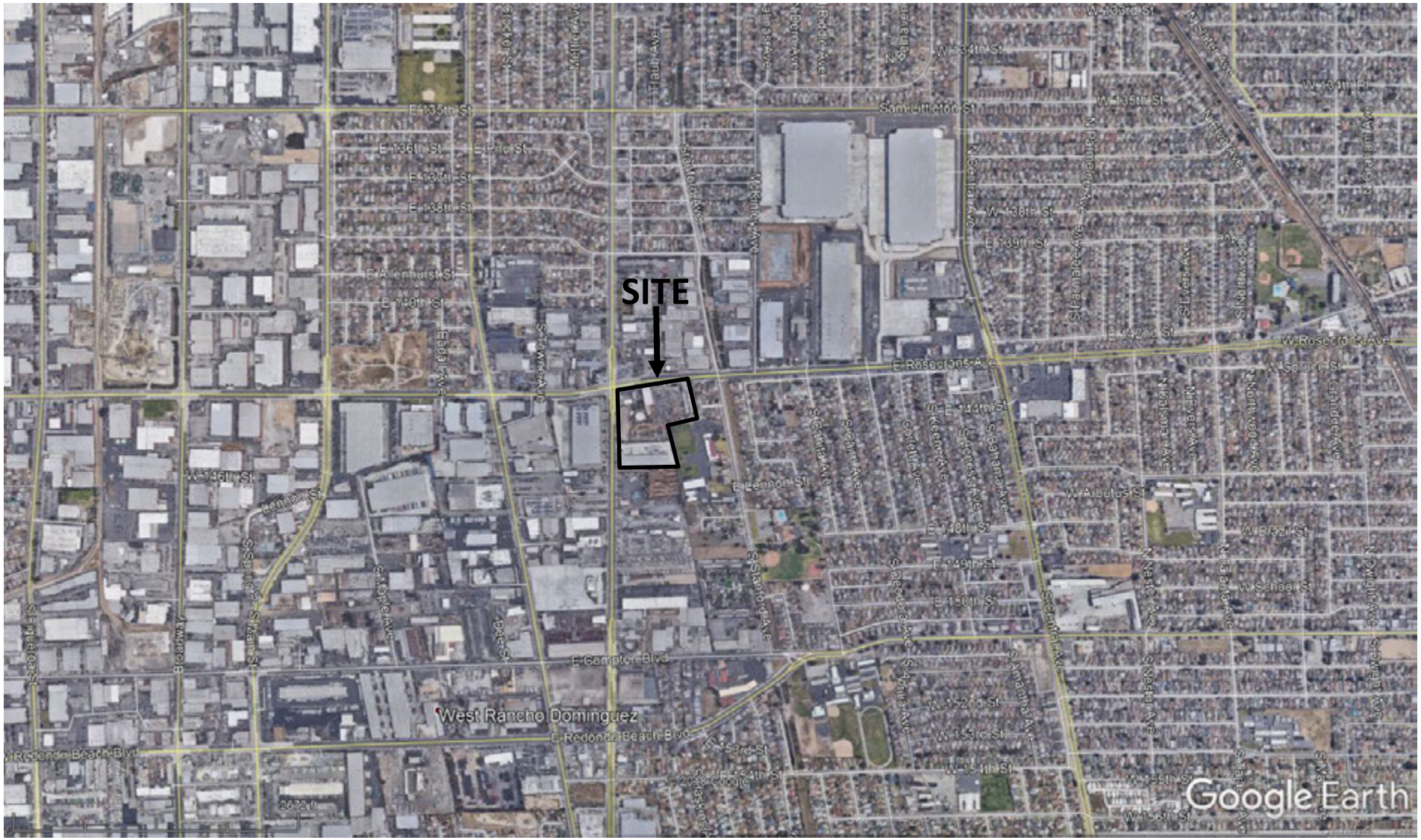
Sanjay Govil, PhD, PE, GE 2382
Principal Geotechnical Engineer

Attachments: Figure 1 – Site Location Map

Plate 1 – Boring Location Map
Plates 2 through 7 – Log of Exploratory Borings
Plates 8 and 9 – R-Value Test Results
Plate 10 – Concrete Core Compressive Strength Test Results

Table 1 – Percolation Test Worksheet

Distribution: (4) Addressee



TGR
Geotechnical
Environmental
Hydrogeology
Material Testing
Construction Inspection

SITE LOCATION MAP
636 EAST ROSECRANS AVENUE
GARDENA, CALIFORNIA

PROJECT NO. 18-6799

FIGURE 1

B-6 ● Approximate Location of Geotechnical Boring

C-2 ● Approximate Location of Concrete Slab Coring



TGR Geotechnical Environmental Hydrogeology Material Testing Construction Inspection	BORING AND CORING LOCATION MAP 636 EAST ROSECRANS AVENUE GARDENA, CALIFORNIA	Project No. 18-6799 PLATE 1

LOG OF EXPLORATORY BORING B-1

Sheet **1** of **1**

Project Number:	**18-6799**	Logged By:	**SH**
Project Name:	**636 E. Rosecrans Avenue, Gardena**	Project Engineer:	**SG**
Date Drilled:	**10/25/18 - 10/25/18**	Drill Type:	**Hollow Stem**
Ground Elev:		Drive Wt & Drop:	**140lbs / 30in**

Shelby Tube | Standard Split Spoon | No recovery | Modified California | Water Table ATD

Depth (ft)	Graphic Log	FIELD RESULTS: Bulk Sample	Drive Sample	SPT blows/ft (or equivalent N)	Pocket Pen (tsf)	USCS	SUMMARY OF SUBSURFACE CONDITIONS	LAB RESULTS: Moisture Content (%)	Dry Density, (pcf)	Other Tests
							Surface is 5 inches of asphalt over 12 inches of base.			
			■	47		CL	FILL: Clay- dark brown to reddish brown, moist, hard, some sand, gravel, construction debris and brick fragments.	17	110	R-Value
5			■	24		ML	NATIVE: Silt- tan, moist, very stiff, layered.	15	119	
10			■	27		SM	Sandy Silt- brown, moist, medium dense, fine grained, some pinhole porosity, some magnesium oxide staining.	15	105	
15			■	27		ML	Silt- light yellowish brown, moist, very stiff, layered, porous.	18	97	
							Total Depth: 16.5 feet. No groundwater encountered at time of drilling. No caving observed. Boring backfilled with soil cuttings upon completion and sealed with cold patch asphalt.			
20										
25										

LOG OF BORING 18-6799 636 E ROSECRANS AVENUE, GARDENA.GPJ TGR GEOTECH.GDT 11/1/18

This Boring Log should be evaluated in conjunction with the complete geotechnical report. This Boring Log represents conditions observed at the specific location and date indicated, it is not warranted to be representative of subsurface conditions at other locations and times.

PLATE 2

TGR GEOTECHNICAL, INC.

LOG OF EXPLORATORY BORING B-2

Project Number: **18-6799**
Project Name: **636 E. Rosecrans Avenue, Gardena**
Date Drilled: **10/25/18 - 10/25/18**
Ground Elev:

Logged By: **SH**
Project Engineer: **SG**
Drill Type: **Hollow Stem**
Drive Wt & Drop: **140lbs / 30in**

Shelby Tube | Standard Split Spoon | No recovery | Modified California | Water Table ATD

Depth (ft)	Graphic Log	FIELD RESULTS: Bulk Sample	Drive Sample	SPT blows/ft (or equivalent N)	Pocket Pen (tsf)	USCS	SUMMARY OF SUBSURFACE CONDITIONS	LAB RESULTS: Moisture Content (%)	Dry Density, (pcf)	Other Tests
							Surface is 4 inches of asphalt over 3 inches of base.			
							FILL: Sandy Clay- reddish brown, moist, hard, fine to medium sand, some gravel, blocky structure.			
			■	36		CL		15	119	
5							NATIVE: Sandy Silt- yellowish brown, moist, hard, fine grained, 1/8 inch to 1/4 inch layers, magnesium oxide staining.			
			■	35		ML		14	102	
							Total Depth: 6.5 feet. No groundwater encountered at time of drilling. No caving observed. Boring backfilled with soil cuttings upon completion and sealed with cold patch asphalt.			
10										

This Boring Log should be evaluated in conjunction with the complete geotechnical report. This Boring Log represents conditions observed at the specific location and date indicated, it is not warranted to be representative of subsurface conditions at other locations and times.

PLATE 3

TGR GEOTECHNICAL, INC.

LOG OF BORING 18-6799 636 E ROSECRANS AVENUE, GARDENA.GPJ TGR GEOTECH.GDT 10/31/18

LOG OF EXPLORATORY BORING B-3

Project Number: **18-6799**
Project Name: **636 E. Rosecrans Avenue, Gardena**
Date Drilled: **10/25/18 - 10/25/18**
Ground Elev:

Logged By: **SH**
Project Engineer: **SG**
Drill Type: **Hollow Stem**
Drive Wt & Drop: **140lbs / 30in**

Shelby Tube | Standard Split Spoon | No recovery | Modified California | Water Table ATD

Depth (ft)	Graphic Log	FIELD RESULTS: Bulk Sample	Drive Sample	SPT blows/ft (or equivalent N)	Pocket Pen (tsf)	USCS	SUMMARY OF SUBSURFACE CONDITIONS	LAB RESULTS: Moisture Content (%)	Dry Density, (pcf)	Other Tests
							Surface is 9 inches of gravel.			
							FILL: Sandy Clay- reddish brown, moist, stiff, fine grained sand.			
			■	36		CL	FILL: Clay with Gravel- dark brown, moist, hard.	12	111	
5			■	32		CL	...Same as above.	13	117	
							Total Depth: 6.5 feet. No groundwater encountered at time of drilling. No caving observed. Boring backfilled with soil cuttings upon completion.			
10										

LOG OF BORING 18-6799 636 E ROSECRANS AVENUE, GARDENA.GPJ TGR GEOTECH.GDT 10/31/18

This Boring Log should be evaluated in conjunction with the complete geotechnical report. This Boring Log represents conditions observed at the specific location and date indicated, it is not warranted to be representative of subsurface conditions at other locations and times.

PLATE 4

TGR GEOTECHNICAL, INC.

LOG OF EXPLORATORY BORING B-4

Project Number: **18-6799**
Project Name: **636 E. Rosecrans Avenue, Gardena**
Date Drilled: **10/25/18 - 10/25/18**
Ground Elev:

Logged By: **SH**
Project Engineer: **SG**
Drill Type: **Hollow Stem**
Drive Wt & Drop: **140lbs / 30in**

Shelby Tube | Standard Split Spoon | No recovery | Modified California | Water Table ATD

Depth (ft)	Graphic Log	FIELD RESULTS: Bulk Sample	Drive Sample	SPT blows/ft (or equivalent N)	Pocket Pen (tsf)	USCS	SUMMARY OF SUBSURFACE CONDITIONS	LAB RESULTS: Moisture Content (%)	Dry Density, (pcf)	Other Tests
							Surface is 2 inches of gravel/CMB over 3 inches of asphalt with no base.			
							FILL: Clay- reddish brown, moist, hard, some fine grained sand.			
			■	38		CL		10	123	
5							NATIVE: Sandy Silt- olive to yellow brown, moist, dense, fine grained sand, magnesium oxide staining.			
			■	33		ML		11	101	
							Total Depth: 6.5 feet. No groundwater encountered at time of drilling. No caving observed. Boring backfilled with soil cuttings upon completion and sealed with cold patch asphalt.			
10										

LOG OF BORING 18-6799 636 E ROSECRANS AVENUE, GARDENA.GPJ TGR GEOTECH.GDT 10/31/18

This Boring Log should be evaluated in conjunction with the complete geotechnical report. This Boring Log represents conditions observed at the specific location and date indicated, it is not warranted to be representative of subsurface conditions at other locations and times.

PLATE 5

TGR GEOTECHNICAL, INC.

LOG OF EXPLORATORY BORING B-5

Project Number: **18-6799**
Project Name: **636 E. Rosecrans Avenue, Gardena**
Date Drilled: **10/25/18 - 10/25/18**
Ground Elev:

Logged By: **SH**
Project Engineer: **SG**
Drill Type: **Hollow Stem**
Drive Wt & Drop: **140lbs / 30in**

Shelby Tube | Standard Split Spoon | No recovery | Modified California | Water Table ATD

Depth (ft)	Graphic Log	FIELD RESULTS: Bulk Sample	Drive Sample	SPT blows/ft (or equivalent N)	Pocket Pen (tsf)	USCS	SUMMARY OF SUBSURFACE CONDITIONS	LAB RESULTS: Moisture Content (%)	Dry Density, (pcf)	Other Tests
							Surface is 2 inches of asphalt over 4 inches of base.			
							FILL: Sandy Clay- reddish brown, moist, stiff, some gravel, fine to medium grained sand.			
			■	38		ML	NATIVE: Sandy Silt with Clay- olive brown, moist, hard, clay formation/blocky fracture, magnesium oxide staining.	16	115	Max -200= 72.4%
5			■	33		ML	...Same as above.	15	104	
							Total Depth: 6.5 feet. No groundwater encountered at time of drilling. No caving observed. Boring used for percolation testing. Boring backfilled with soil cuttings upon completion and sealed with cold patch asphalt.			
10										

This Boring Log should be evaluated in conjunction with the complete geotechnical report. This Boring Log represents conditions observed at the specific location and date indicated, it is not warranted to be representative of subsurface conditions at other locations and times.

PLATE 6

TGR GEOTECHNICAL, INC.

LOG OF BORING 18-6799 636 E ROSECRANS AVENUE, GARDENA.GPJ TGR GEOTECH.GDT 11/1/18

LOG OF EXPLORATORY BORING B-6

Project Number: **18-6799**
Project Name: **636 E. Rosecrans Avenue, Gardena**
Date Drilled: **10/25/18 - 10/25/18**
Ground Elev:

Logged By: **SH**
Project Engineer: **SG**
Drill Type: **Hollow Stem**
Drive Wt & Drop: **140lbs / 30in**

Shelby Tube | Standard Split Spoon | No recovery | Modified California | Water Table ATD

Depth (ft)	Graphic Log	FIELD RESULTS: Bulk Sample	Drive Sample	SPT blows/ft (or equivalent N)	Pocket Pen (tsf)	USCS	SUMMARY OF SUBSURFACE CONDITIONS	LAB RESULTS: Moisture Content (%)	Dry Density, (pcf)	Other Tests
							Surface is 5 inches of asphalt over 12 inches of base.			
				36		CL	FILL: Sandy Clay- reddish brown, moist, hard, some gravel, fine to medium grained sand.	13	95	-200= 68.4%
5				27		ML	NATIVE: Sandy Silt- olive to yellow brown, moist, very stiff, fine grained sand, magnesium oxide staining.	9	98	
							Total Depth: 6.5 feet. No groundwater encountered at time of drilling. No caving observed. Boring used for percolation testing. Boring backfilled with soil cuttings upon completion and sealed with cold patch asphalt.			
10										

LOG OF BORING 18-6799 636 E ROSECRANS AVENUE, GARDENA.GPJ TGR GEOTECH.GDT 11/1/18

This Boring Log should be evaluated in conjunction with the complete geotechnical report. This Boring Log represents conditions observed at the specific location and date indicated, it is not warranted to be representative of subsurface conditions at other locations and times.

PLATE 7

TGR GEOTECHNICAL, INC.

ANAHEIM TEST LAB, INC

196 Technology Drive, Unit D
Irvine, CA 92618
PHONE (949)336-6544

TO:

TGR GEOTECHNICAL
3037 S. HARBOR BLVD.
SANTA ANA, CA. 92704

DATE: 10/30/18

P.O. NO.: VERBAL

LAB NO.: C-2375-2

SPECIFICATION: CTM- 301

MATERIAL: Brown, Silty Clay

PROJECT#: 18-6799
Transdev

ANALYTICAL REPORT

"R" VALUE

	BY EXUDATION	BY EXPANSION
B-1 @ 0-5'	10	15

RESPECTFULLY SUBMITTED

WES BRIDGER CHEMIST

PLATE 8

"R" VALUE CA 301

Client: TGR **ATL No.:** C 2375-2 **Date:** 10/30/2018

Client Reference No.: 18-6499

Sample: B-1 @ 0 - 5' **Soil Type:** Brown, Silty Clay

TEST SPECIMEN		A	B	C	D
Compactor Air Pressure	psi	100	70	60	
Initial Moisture Content	%	5.2	5.2	5.2	
Moisture at Compaction	%	14.8	16.6	19.7	
Briquette Height	in.	2.47	2.40	2.46	
Dry Density	pcf	118.0	112.5	105.6	
EXUDATION PRESSURE	psi	646	498	272	
EXPANSION dial	(x .0001)	90	48	11	
Ph at 1000 pounds	psi	30	46	58	
Ph at 2000 pounds	psi	95	115	137	
Displacement	turns	3.29	3.68	4.19	
"R" Value		34	21	9	
CORRECTED "R" VALUE		34	21	9	

Final "R" Value	
BY EXUDATION: @ 300 psi	**10**
BY EXPANSION: TI = 5.0	**15**

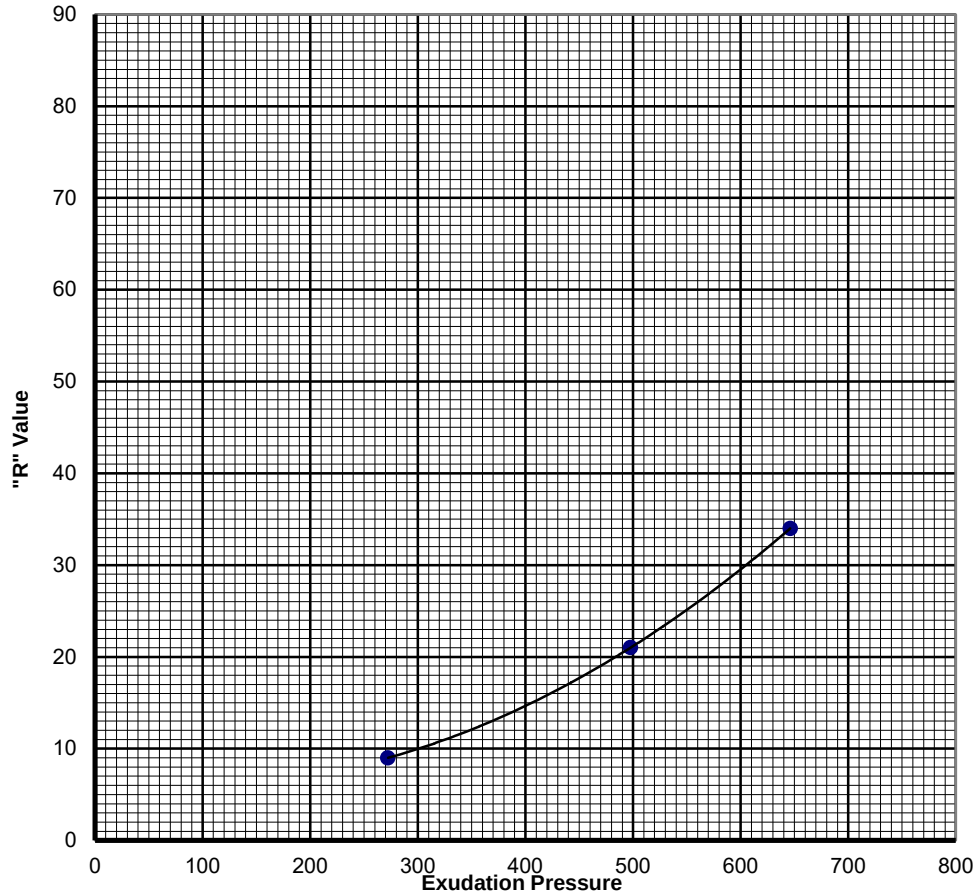


PLATE 9

Reliant
TESTING ENGINEERS

3035 S. Harbor Blvd
Santa Ana, CA 92704
714-556-5867 Voice
714-556-5868 Fax

JOB NO:	11-3212	LAB NO:	36089
CLIENT:	TGR Geotechnical	DSA FILE #	N/A
ATTN:	Sanjay Govil	DSA APPL #	N/A
ADDRESS:	3037 S. Harbor Blvd. Santa Ana, CA 92704	DSA / LEA #	N/A

COMPRESSION TEST REPORT

PROJECT NAME:	TRANSDEV	REPORT DATE:	11/1/2018
PROJECT ADDRESS:	636 E. Rosecrans Ave, Gardena, CA	SAMPLED BY:	NR
LOCATION IN STRUCTURE:	Slab		

SAMPLING INFORMATION

MATERIAL: CORES

	MEASURED	SPECIFIED
SLUMP, ASTM C143 (INCHES):	NR	NR
PERCENT AIR, ASTM C231 (%)	NR	NR
UNIT WEIGHT, ASTM C138 (PCF)	NR	NR
AIR TEMPERATURE (°f):	NR	NR
MIX TEMPERATURE, ASTM C1064 (°f):	NR	NR

NOTES: ALL ITEMS MUST BE FILLED IN

SET #	1
MIX #	NR
SPECIFIED PSI -28 days	NR
SUPPLIER:	NR
TRUCK #	NR
TICKET #	NR

Specimens were tested in accordance with ASTM C39 & C42

(✓) YES ( ) NO ( ) YES ( ) NO

TESTING INFORMATION: IDENTIFICATION

DATE RECEIVED	10/26/2018	10/26/2018				
DATE SAMPLED	10/25/2018	10/25/2018				
AGE IN DAYS	7	7				
DATE TESTED	11/1/2018	11/1/2018				
DIAMETER (in.)	3.96	3.96				
LENGTH (in.)	7.40	6.20				
L/D or hp/tp	1.86	1.56				
AREA (in.²)	12.31	12.31				
CORR. FACTOR	1.00	1.00				
MAXIMUM LOAD (lbs)	68390	73780				
COMPRESSIVE STRENGTH(psi)	5556	5994				
FRACTURE TYPE	3	3				

7 Day Average (PSI) 5775

☑ Compression tests were satisfactory and conform to the specifications of ASTM C39 & C42

☐ Compression test results were not satisfactory.

The Material ☐ WAS ☐ WAS NOT Sampled and Tested in Accordance with the Requirements of the DSA Approved Documents.

The Material ☐ MET ☐ DID NOT MEET The Requirements of the DSA Approved Documents.

REGISTERED PROFESSIONAL ENGINEER SANJAY GOVIL No. C51523 6/30/2020 CIVIL STATE OF CALIFORNIA

REMARKS: Received Height: C1 - 7.42, C2 - 6.24

cc: Project Architect, Structural Engineer, Project Inspector, DSA Regional Office

Sanjay Govil, PhD, Principal Engineer

Test Hole	Total Depth (in)	Initial Depth (in)	Final Depth (in)	∆Water Level (in)	Initial Time (min)	Final Time (min)	∆ Time (min)	Initial Height of Water (in)	Final Height of Water (in)	Average Height of Water (in)	Infiltration Rate (in/hr)
B-5	78	5	7.25	2.25	0.0	10.0	10.0	73	70.75	71.88	0.28
	78	7.25	7.375	0.125	10.0	20.0	10.0	70.75	70.625	70.69	0.02
	78	7.375	7.5	0.125	20.0	30.0	10.0	70.625	70.5	70.56	0.02
	78	7.5	8	0.5	30.0	60.0	30.0	70.5	70	70.25	0.02
	78	2.5	6.5	4	0.0	20.0	20.0	75.5	71.5	73.50	0.24
	78	6.5	6.75	0.25	20.0	30.0	10.0	71.5	71.25	71.38	0.03
	78	6.75	7	0.25	30.0	40.0	10.0	71.25	71	71.13	0.03
B-6	78	3	4.5	1.5	0.0	10.0	10.0	75	73.5	74.25	0.18
	78	4.5	4.75	0.25	10.0	20.0	10.0	73.5	73.25	73.38	0.03
	78	4.75	5	0.25	20.0	30.0	10.0	73.25	73	73.13	0.03
	78	5	5.375	0.375	30.0	50.0	20.0	73	72.625	72.81	0.02
	78	5.375	5.625	0.25	50.0	60.0	10.0	72.625	72.375	72.50	0.03
	78	1.5	1.75	0.25	0.0	10.0	10.0	76.5	76.25	76.38	0.03
	78	1.75	2	0.25	10.0	20.0	10.0	76.25	76	76.13	0.03
	78	2	2.25	0.25	20.0	30.0	10.0	76	75.75	75.88	0.03

$$I_t = \frac{\Delta H(60r)}{\Delta t(r + 2H_{avg})}$$

ΔH = Change in height

Δt = Time interval

r = Radius

I_t Infiltration Rate

H_{ave} Average Head Height over the time interval

APPENDIX D.1

Further Soil and Ground Assessment Investigation Report

ENCON

FURTHER SOIL AND GROUNDWATER UST SITE ASSESSMENT INVESTIGATION REPORT

Site:

Trench Shoring Company
636 East Rosecrans Avenue
Los Angeles, California 90059
UST Case No. R-13416A

Submitted to:

Los Angeles
Regional Water Quality Control Board
Underground Tanks Section
320 West 4th Street, 2nd Floor
Los Angeles, California 90013
Attention: Magdy Biady, Engineering Geologist

Prepared for:

Trench Shoring Company
Attention: Malloy Family Partners
636 East Rosecrans Avenue
Los Angeles, California 90059

Prepared by:

ENCON Technologies Inc.
Environmental and Engineering Services
12145 Mora Drive Suite #7
Santa Fe Springs, California 90670
Tel: (562) 777-2200, Fax: (562) 777-2201
Email:encon@encontech.net

August 20, 2019

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FIGURES

Figure 1	Site Vicinity Location Map
Figure 2	Site Plan Showing Proposed Boring Locations

EXHIBITS

Exhibit A	Regional Water Quality Control Board Directives, dated May 15, 2019 and June 20, 2019, and County of Los Angeles Environmental Health Work Plan Approval
Exhibit B	Soil and Groundwater Analytical Results
Exhibit C	Boring Logs
Exhibit D	ENCON Field Logs & Health and Safety Plan
Exhibit E	Waste Disposal Manifests

1.0 EXECUTIVE SUMMARY

1.1 Project UST Site Assessment Description

ENCON Technologies, Inc. (ENCON) was retained by the Property Owner, Trench Shoring Company, Mr. Kevin Malloy, Project Client, to perform an environmental UST Site assessment soil and groundwater investigation at the Subject Site located at 636 East Rosecrans Avenue in Los Angeles, California in accordance with the Regional Water Quality Control Board (RWQCB) approved ENCON Environmental Site Assessment (ESA) Work Plan, dated May 30, 2019 with the Regional Board directive conditions, dated June 20, 2019. Refer to Exhibit A for RWQCB directive. The primary objective of the proposed investigation was to define the soil and groundwater petroleum hydrocarbon conditions in the vicinity of UST tank and fuel dispenser system. The Subject Site previously operated a dual compartment diesel fuel storage and dispensing station operating one (1) 10,000 gallon fuel storage tank and one (1) dispenser, as shown in Figure 2. The Site Vicinity Map is shown in Figure 1.

In response to the RWQCB directive to take corrective action, dated May 15, 2019, provided in Exhibit A for reference, to the detection of elevated diesel fuel petroleum hydrocarbon constituents beneath the a former 10,000 gallon double walled (DW) plastic-coated steel UST tank during the closure and tank removal activities, ENCON prepared the Work Plan to determine the soil and groundwater conditions beneath the Subject Site UST Tank, as required in the CCR Title 23, Chapter 16, Sections 2725 and 2726. Elevated petroleum hydrocarbon concentrations were detected in soils beneath the UST tank during the removal and closure of the UST tank system by ENCON, dated September 20, 2018.

1.2 UST Environmental Background

The tank closure activities were conducted under the direction of the Los Angeles County Department of Public Works (DPW) and the procedures and confirmatory soil data were provided to the County in ENCON's UST Tank Closure Report. ENCON's UST Closure Report showed diesel (TPHd) contamination ranging up to 11,000 mg/kg, gasoline (TPHg) contamination ranging up to 500 mg/kg, and aromatic hydrocarbons and oxygenates were generally below detection limits. Since the UST Tank Site was a former LUST Site that previously reported these levels of gasoline and diesel fuel contaminants in soil and was formerly closed by the RWQCB on July 31, 2009, it is ENCON's professional opinion that these elevated petroleum hydrocarbon soil conditions are residual contaminants from the previous unauthorized release and not from the recent use of the diesel fuel UST tank since 2009. In addition, the groundwater data was previously found to be below detection limits for petroleum hydrocarbons and fuel additives, BTEX and oxygenates.

1.3 UST Tank Site Investigation Results and Conclusions

On July 25, 2019 and July 26, 2019, ENCON conducted the soil and hydropunch investigations field work. Yellow Jacket Drilling Company advanced three (3) exploratory soil borings (SB1, SB2, and SB3) and hydro-punch temporary wells (HP1 and HP2) under the direction of ENCON using a CME 85 truck-mounted drill rig equipped with 8-inch to 10-inch diameter hollow stem auger to first perched groundwater, as shown in Figure 2. The groundwater was encountered at approximately 87.7 feet below grade surface (bgs). Soil samples were collected in 5-foot intervals beginning at ground surface in the former UST tank and dispenser area (SB1/HP1) and down-gradient (SB2/HP2 and SB3) to determine the lateral extent of the petroleum hydrocarbon plume. Refer to Exhibit B for analytical results.

1.3.1 Groundwater Data

The laboratory data results showed that all of the groundwater data was below detection limits for the full range of petroleum hydrocarbon, benzene, and fuel additive oxygenate constituents beneath the former UST tank area in both HP1 and down gradient in HP2, as shown in Table 3. In HP1, slightly elevated aromatic hydrocarbons were detected to include: toluene (0.5 ug/L), ethylbenzene (1.4 ug/L), and xylenes (7.0 ug/L) that were all below State MCLs in groundwater of 40 ug/L, 3.5 ug/L, and 20 ug/L, respectively. Naphthalene was detected at 1.0 ug/L in HP1 which exceeds the 0.17 ug/L MCL. All of the groundwater data analyzed for naphthalene and aromatic hydrocarbons in HP2 were below detection limits. Down gradient well, HP3, encountered refusal at approximately 65 feet bgs and no groundwater data was obtained for analysis.

1.3.2 Soil Data

The laboratory data results showed that all of the soil data in SB1 within the vicinity of the former UST tank site were above detection limits for the gasoline and diesel ranges of petroleum hydrocarbons as well as toluene, ethylbenzene, xylenes, and naphthalene constituents from grade surface to a depth of 45 feet bgs, as shown in Table 2. A "*clean zone*", however, was found in SB1 between 50 feet bgs and the terminal depth of 90 feet bgs where all of the petroleum hydrocarbon and VOC hydrocarbon constituents were found to be below detection limits, also shown in Table 2. All of the soil data analyzed for petroleum hydrocarbons and volatile organic compounds (VOCs) constituents in down gradient borings, SB2 and SB3, were below detection limits.

1.3.3 Conclusions

The UST Site investigations confirmed that a gasoline and diesel product release had occurred in the past in the vicinity of the former UST tank and dispenser area, SB1. Based on the soil and groundwater data presented in this report, the release, however, appears to be limited to the former UST tank area and does not extend laterally down gradient further than the UST tank area to SB2/HP2 and SB3. In addition, the petroleum hydrocarbon contamination has not migrated vertically below 45 feet bgs and therefore poses a low threat to groundwater beneath the Subject Site. The groundwater data has not been affected by petroleum hydrocarbons, benzene, and fuel additive oxygenate constituents and the data showed trace levels for toluene (0.5 ug/L), ethylbenzene (1.4 ug/L), and xylenes (7.0 ug/L).

Based on the following findings: 1) limited vertical and lateral detections of gasoline and diesel constituents in soils beneath the former UST tanks and 2) >20 foot clean zone beneath the UST Site to a groundwater depth of approximately 87 feet bgs, the detected residual trace petroleum hydrocarbon contaminants in groundwater pose a low environmental threat to State groundwater or the environment and no significant threat to the public or worker health and safety. Therefore, ENCON respectfully requests case closure (no further action) be granted to the Site in regards to the diesel UST tank and former fueling operations.

2.0 HISTORICAL ENVIRONMENTAL SITE DESCRIPTION

Previous shallow soil investigations were performed at the Subject Site at the time the UST dispensing system was being upgraded to double wall product piping by Molina Engineering, Inc. (MEI), Signal Geoscience, Inc. (SGI) in 2003, and more recently by ENCON. Based on the results of confirmatory soil sampling performed by MEI and SGI, as part of the UST System product pipe upgrade and the initial site assessment, elevated concentrations of TPH-gasoline, TPH-diesel, BTEX and MtBE, were detected beneath the dispenser island and associated product piping between the UST tank farm and fuel dispensers. The corresponding fuel product contaminant concentrations were found in CB1 and CB2 as reported by ENCON in further site assessment investigation conducted November 11, 2008 at 1,881.9 mg/kg (TPH-g), 20,912 mg/kg (TPH-d), 243 ug/kg (benzene), 1,097 ug/kg (toluene), 3,042 ug/kg (ethylbenzene), 39,841 (xylenes), and 463 ug/kg (MtBE). The fuel dispenser location is adjacent to the UST tank, within 5 feet. All of the petroleum hydrocarbon data from step-out exploratory borings CB3, CB4, and CB5 were found to be below detection limits for TPH, BTEX and MtBE constituents.

ENCON conducted a further soil and groundwater investigations between 2007 and 2009 to determine the vertical and lateral extent of the petroleum hydrocarbon contamination. Based on the soil and groundwater data conducted in March 9, 2009 and reported in ENCON Further UST Tank Site Investigation Report, dated March 26, 2009, the petroleum hydrocarbon source in the fuel dispenser area appears to be limited to a 10 foot radius to a depth of approximately 40 feet bgs, and no detection of petroleum hydrocarbon or VOC constituents were found in the surrounding exploratory borings or down-gradient borings.

In addition, all of the groundwater samples in the UST tank site area were found to be below detection limits and not impacted by the constituents of concern in 2009. The groundwater appears to be protected by several silt/clay layers beneath the UST Tank Site which has restricted the migration of the TPH contamination in the deep vadose zone. The groundwater was encountered at approximately 65 feet bgs and the five (5) groundwater monitoring wells were screened between 60 feet bgs to 80 feet bgs. See ENCON reports: Further UST Tank Site Investigation Report, dated March 26, 2009 and 2nd Quarter 2009 GW Monitoring report, dated July 12, 2009 for additional information.

On July 31, 2009, the Regional Board notified the Property Owner, as it pertains to the Subject LUST Site, with a Case Closure letter that confirmed the completion of the required site assessment and corrective actions for the UST Tank Site, Case No. R-13416. The RWQCB agency found that the investigation and corrective action performed at the Subject Site were in compliance with the requirements of subdivision (a) and (b) of Section 25296.10 of the Health and Safety Code and pursuant to Section 25299.3 of the Health and safety Code and that no further action related to the petroleum release(s) at the Subject Site is required. All of the five (5) groundwater monitoring wells were properly abandoned and reported to the Regional Board by September 7, 2009.

3.0 UST TANK SITE INVESTIGATION RATIONALE

The ENCON Work Plan described the scope of work for an environmental site assessment at the Trench Shoring UST Fuel Tank and Dispenser Site Investigation. The proposed investigation involved collecting soil samples with a hollow stem auger and analyzing the samples to define the extent of the petroleum hydrocarbon contamination in soils and the distribution of the contamination between grade surface and the groundwater table. The groundwater aquifer is estimated at approximately 85 feet bgs and the direction of groundwater is southwest from the former UST Tank Site, based on historical groundwater monitoring reports conducted between 2007 and 2009.

The Subject Site historically operated one (1) split-compartment 10,000 gallon capacity diesel UST and one (1) diesel fuel dispenser located adjacent to the tank. The UST was separated into two (2) 5,000-gallon compartments by a bulkhead. Both 5,000-gallon compartments were reported to contain diesel fuel product. Following the removal of the UST, grab soil samples were collected from the soil beneath the UST, in accordance with the LA DPW permit requirements. A total of four (4) soil samples were collected for laboratory analyses, including two (2) samples from beneath the two (2) compartments of the UST. Since the dispenser and associated piping were located directly adjacent to the UST, and were underlain by pea-gravel associated with the tank pit, LA DPW did not require soil samples to be collected beneath these tank components. All samples were collected from two (2) to four (4) feet below the bottom of the tank pit in previously undisturbed and unexposed natural soil. An Extend-A-Hoe backhoe bucket was used to retrieve the soil from the bottom of the tank pit for sampling.

The collected soil samples were analyzed for TPHd and TPHg by EPA Method 8015 (M), and for BTEX, MtBE and fuel oxygenates using EPA Method 8260B. Although the UST was observed, and reported, to only contain diesel fuel, two (2) of the soil samples were analyzed for Organic Lead. Groundwater was not encountered during sampling and no free product was observed during the sampling event.

The analyses for the soil samples collected were found to contain elevated concentrations of total petroleum hydrocarbons in the diesel range (TPHd) in the two (2) samples collected near the center of the UST pit, in sample locations A-2 and B-1, and former fuel dispenser area. The maximum concentration of TPHd was 23,000 parts per million (ppm) in sample A-2 and 11,000 ppm in sample B1. To a lesser extent, TPHg was also detected in these two (2) samples, with the maximum concentration being 500 ppm in sample B-1 and 450 ppm in sample A-2. Sample A-1 contained trace detections of benzene and toluene at concentrations of 1.6 parts per billion (ppb) and 1.0 ppb, respectively. All other samples were non-detect for BTEX, MtBE, and fuel oxygenates. In addition, two (2) soil samples, collected from A-2 and B-2, were analyzed for Organic Lead and both samples were non-detect. Refer to Table 1 below for summary of analytical results, and ENCON UST Tank Closure Report, dated September 20, 2018.

Table 1: Soil Sample Analytical Results

Sample ID	TPHg, (mg/kg)	TPHd, (mg/kg)	Organic Lead (mg/kg)	B Benzene (ug/kg)	T Toluene (ug/kg)	E Ethylebenzene (ug/kg)	X Xylenes (ug/kg)	Other Oxygenates (ug/kg)
A-1	ND	**11.0**	NA	**1.6**	**1.0**	ND	ND	ND
A-2	**450**	**23,000**	ND	ND	ND	ND	ND	ND
B-1	**500**	**11,000**	NA	ND	ND	ND	ND	ND
B-2	ND	ND	ND	ND	ND	ND	ND	ND
RL	**1.0**	**5.0**	**1.0**	**100.0**	**100.0**	**100.0**	**200.0**	**100.0**

Note:
ND – Not detected above laboratory reporting limits; NA – Not analyzed for this constituent
RL – Laboratory reporting limit; TPHg – Total Petroleum Hydrocarbons in the gasoline range
TPHd - Total Petroleum Hydrocarbons in the diesel range

Based on the analytical results, it is ENCON's professional opinion that these levels of TPHd fuel product are elevated beneath the UST Tank in the vicinity of the former adjacent fuel dispenser. Therefore, a further subsurface investigation to evaluate the vertical and lateral extent of the gasoline and diesel fuel contamination was warranted as directed by the Los Angeles Regional Board in directive letter, dated May 15, 2019.

4.0 GEOLOGY AND HYDROGEOLOGY

The Site is located at the southwest boundary of the Central Basin with the West Coast Basin of the Los Angeles Coastal Plan (DWR Basin No. 4-11). The Los Angeles Coast Plain Basin extends over most of the southeastern Los Angeles County and northwestern Orange County. Ground water occurs in Recent alluvium and older deposits. Shallower semi-perched groundwater occurs above these main and deeper aquifers. The ground water in the Central Basin has designated existing beneficial uses for municipal and domestic supply, industrial process supply, industrial services supply, and agriculture.

The Site is at the boundary of the Central Hydrologic Sub-Area Split (HAS 405.15) and the West Coast Hydrologic Sub Area Split of (HAS 405.12)) of the Central Coastal Plain Hydrologic Area (HA 405.10) of the Los Angeles-San Gabriel Hydrologic Unit (HU 405.00) as defined in the Water Quality Control Plan, Los Angeles Region, 1994. Compton Creek is located approximately 7,500 feet east of the Site. The Dominguez Channel is located 3-1/2 miles west of the Site. The Los Angeles River is located 4-3/4 miles east of the Site.

Ground water was encountered in ENCON's November 2007 subsurface investigations at 76 feet bgs. This dynamic, intermittent perched layer subsequently drained off and the current first groundwater at the site most likely occurs at a depth of 120 feet to 140 feet below ground surface of the Site. Based on the historical groundwater monitoring events conducted between 2007 and 2009, the groundwater gradient flows in a southwest direction from the former UST Tank Site.

5.0 PROJECT SITE INVESTIGATION FIELD WORK

The field work and reporting will be performed under the supervision of a Professional Geologist (PG), Thomas Smith, licensed in California in compliance with the requirements of the Geologist and Geophysicists Act, Business and Professions Code sections 7800–7887.

5.1 Health and Safety Plan

A Health & Safety Plan (HSP) will be used for this project. The HSP was prepared by ENCON in accordance with the California Code of Regulations, Code of Federal Regulations, and the Occupational Health and Safety Administration (OSHA) Hazardous Waste Operations and Emergency Response Guidelines (29 CFR 1910.120). The plan addresses known and potential site hazards, protective measures, emergency routes, and other safety issues related to on-site personnel. The HSP will be reviewed and signed by ENCON personnel and all subcontractors performing work at the site. A copy of the HASP is included as Exhibit D.

5.2 Hollow-Stem Auger Exploratory Soil Boring Testing

ENCON advanced three (3) exploratory soil borings (SB1, SB2, and SB3) using a CME 85 truck-mounted drill rig equipped with 8-inch to 10-inch diameter hollow stem auger to first perched groundwater, as shown in Figure 2. The groundwater was encountered at 87 feet bgs. Soil samples were collected in 5-foot intervals beginning at ground surface in the former UST tank and dispenser areas. The soil matrix encountered during the drilling activities was classified according to the Unified Soil Classification System (USCS). Soil was screened in the field for the presence of petroleum hydrocarbons using a photo ionization detector (PID). Soil samples were collected by advancing a 2-inch diameter modified split-spoon sampler equipped with brass sleeves into the undisturbed soil beyond the auger. The sampler was driven to a maximum of 18-inches into the undisturbed soil using a 140-pound hammer with a 30-inch drop.

Each soil sample was were described in the field in accordance with the USCS and recorded on logs for boring data. Soil headspace measurements were taken from each soil sample using a photoionization detector (PID). Upon retrieval of the sleeve, a portion of the soil contained in the acetate sleeve was used for the 5035 sample and then labeled and placed in an ice cooler for storage. Soil samples were also logged according to the USCS by a Field Geologist. Volatile organic vapor concentrations were measured from each soil sample using a photo ionization detector (PID), calibrated to 50 parts per million (ppm) hexane or 100 ppm isobutylene. The samples were immediately placed in a plastic bag to allow organic vapors to volatize for several minutes prior to each field test measurement. The soil sample descriptions, exact sampling depths, and PID readings were documented on the boring logs, provided in Exhibit C for reference.

The 5035 soil samples were labeled, stored on ice at 4° C, and transported under a chain of custody record to Jones Environmental Laboratories, a state certified hazardous waste analytical laboratory located in Santa Fe Springs, California. A chain-of-custody was filled-out and the samples were delivered to the laboratory for analysis within on 7/26/19. The samples were analyzed for TPHg using EPA Method 8015 and BTEX, oxygenates, and naphthalene using EPA Method 8260B. The analytical reports are provided in Exhibit B for reference.

5.3 Hollow-Stem Auger Hydropunch Groundwater Investigation

The subsurface groundwater investigation involved three (3) exploratory soil borings (HP-1 through HP-3), as shown in Figure 2, with the hollow stem auger drill rig in order to collect one (1) groundwater hydropunch sample from each boring location. HP-1 and HP-2 groundwater hydropunch wells were successful in collecting groundwater samples. HP-3, downgradient well location, drilling encountered refusal at approximately 65 feet bgs and no groundwater sample was collected.

One (1) groundwater hydropunch sample was collected from first groundwater encountered in HP-1 and HP-2. No groundwater was collected from HP-3. A hydropunch sampling probe equipped with a stainless-steel screen will be used to collect groundwater samples. The pre-cleaned hydropunch tool was hydraulically driven to a total depth to groundwater, at which depth the bottom of the hydropunch tool was approximately 2 feet below the groundwater table at 87 feet bgs. The entire drill string was retracted 4 feet to remove the disposable driving point, and the 4-foot long screen was exposed to the formation as the external probe component was raised 4 feet.

Undisturbed water samples were collected from HP-1 and HP-2 using disposable polyethylene tubing equipped with a disposable check valve. The samples were placed in 40 ml liter VOA containers. The containers were labeled, placed in an ice cooler for storage and transportation to Jones Environmental Laboratories, a state certified hazardous waste analytical laboratory located in Santa Fe Springs, California. A chain-of-custody was filled-out and the samples were delivered to the laboratory for analysis on 7/26/19. The samples were analyzed for TPHg, using EPA Method 8015 and BTEX, oxygenates, and naphthalene using EPA Method 8260B.

5.4 Soil and Groundwater Sample Analysis Plan and Rationale

Soil and groundwater samples were collected and analyzed in accordance with the following table to evaluate the vertical extent of TPH and fuel additives detected beneath the former fuel dispenser. Refer to Figure 2 for locations of exploratory soil and groundwater borings.

Table 2 – Proposed Soil Sample Locations and Analysis

Boring Number	Proposed Sample Depths	Analytical Methods	Boring and Hydropunch Locations
SB1-HP1	5' intervals starting at grade surface to 90 ft-bgs	EPA 8260B, 8015M	SB1/HP1 boring location is located in the vicinity of the former fuel dispenser location on the east and up-gradient portion of UST Tank Site
SB2-HP2	5' intervals starting at grade surface to 90 ft-bgs	EPA 8260B, 8015M	SB2/HP2 boring location is located in the vicinity of the former UST Tank location on the south and down-gradient side of UST Tank Site
SB3-HP3	5' intervals starting at grade surface to 65 ft-bgs (drilling refusal)	EPA 8260B, 8015M	SB3/HP3 boring location is located in the down-gradient of the former UST Tank location on the southwest side of UST Tank Site

Notes:
BTEX, MTBE, ETBE, TAME, TBA, Naphthalene using EPA Method 8260B,
Total Petroleum Hydrocarbons as Gasoline (TPHg) and Diesel (TPHd) using EPA Method 8015M

5.5 Soil and Groundwater Sample Analysis

The soil and groundwater samples were submitted under standard chain-of-custody procedures for analysis to Jones Environmental Laboratories, a State-certified hazardous waste testing laboratory located in Santa Fe Springs, California on 7/26/19. Soil samples were analyzed for BTEX, MTBE, ETBE, TAME, TBA, Naphthalene using EPA Method 8260B and Total Petroleum Hydrocarbons as Gasoline (TPHg) and Diesel (TPHd) using EPA Method 8015M, full carbon chain. Refer to Exhibit B for Analytical Soil and Groundwater Reports.

5.6 Equipment Decontamination

The drilling rods were decontaminated before and after drilling each boring location. All reusable sampling equipment were decontaminated before and after each use to assure the quality of samples collected. Decontamination was performed using the following procedure:

- Washing in non-phosphate detergent and tap water wash, using a brush as necessary;
- Rinsing in clean tap water; and
- Final rinse in deionized/distilled water.

5.7 Disposal of Investigation Derived Waste

Soil cuttings and 8 gallons of decon water generated during direct-push operations were stored in fifteen (15) Department of Transportation-approved 55-gallon drums. All of the drums will be labeled as non-hazardous solid waste and stored at the site pending analytical waste profiling and disposal. Each drum was identified with non-hazardous labels including the name of waste generator, type of waste (soil testing), and accumulation date. The soil cuttings and wastewater drums were profiled and transported to Crosby & Overton permitted treatment disposal center for disposal on 8/14/19. Refer to Exhibit E for non-hazardous waste manifests.

5.8 Borehole Abandonment

As required by the LA County Environmental Health Agency (Permit No. SR0190867, dated July 18, 2019), after completion of soil and hydropunch groundwater hollow stem auger drilling and sampling, each boring was backfilled with cement grout. The backfill cement grout quantities were 120 gallons, 240 gallons, and 90 gallons, respectively, for HP-1, HP-2 and HP-3 with a trimie pipe under pressure proceeding upward from the bottom of the boring hole to surface grade. The boring surfaces were topped with cold patch asphalt and finished to match the surrounding asphalt surface. Refer to Exhibit A for Environmental Health Permit.

6.0 SOIL AND GROUNDWATER INVESTIGATION RESULTS

On July 25, 2019 and July 26, 2019, ENCON conducted the soil and hydropunch investigations field work. Yellow Jacket Drilling Company advanced three (3) exploratory soil borings (SB1, SB2, and SB3) and hydro-punch temporary wells (HP1 and HP2) under the direction of ENCON using a CME 85 truck-mounted drill rig equipped with 8-inch to 10-inch diameter hollow stem auger to first perched groundwater, as shown in Figure 2. The groundwater was encountered at approximately 87.7 feet bgs. Soil samples were collected in 5-foot intervals beginning at ground surface in the former UST tank and dispenser area (SB1/HP1) and downgradient (SB2/HP2 and SB3) to determine the lateral extent of the petroleum hydrocarbon plume.

6.1 Soil Boring Sampling Data

A total of four borings were advanced using a truck-mounted CME-95 drill rig to define the lateral extent of the off-site and onsite petroleum hydrocarbon soils beneath the subject site. Refer to Figure 2 for the boring sampling locations. Soil samples were collected in 5 foot intervals, starting at 5 feet bgs, to a maximum depth of 50 feet bgs. Table 3 summarizes all of the soil data for the three borings advanced in the public street along Camino Capistrano, MW-8, MW-9, and MW-10 located off-site east to southeast of the former UST tank area. These wells are situated upgradient of the onsite petroleum hydrocarbon onsite source area in the vicinity of the former fuel dispensers. MW-11 is located downgradient of the former UST tank area, approximately 40 feet south of the UST tank area and onsite.

The laboratory data results showed that all of the soil data in SB1 within the vicinity of the former UST tank site were above detection limits for the gasoline and diesel ranges of petroleum hydrocarbons as well as toluene, ethylbenzene, xylenes, and naphthalene constituents from grade surface to a depth of 45 ft-bgs as shown in Table 2. A "*clean zone*", however, was found in SB1 between 50 ft-bgs and the 90 ft-bgs where all of the petroleum hydrocarbon and VOC hydrocarbon constituents were found to be below detection limits as shown in Table 3. All of the soil data analyzed for petroleum hydrocarbons and volatile organic compounds, VOCs, constituents in downgradient borings, SB2 and SB3, were below detection limits.

Table 3a: SB-1 Soil Sample Analytical Results in the location of the UST/Fuel Dispenser Area, dated July 25-26, 2019

Sample ID/FT	TPHg, (mg/kg)	TPHd, (mg/kg)	B Benzene (ug/kg)	T Toluene (ug/kg)	E Ethylbenzene (ug/kg)	X Xylenes (ug/kg)	Naph thalene (ug/kg)	Fuel Oxygenates (ug/kg)
SB1-05	**64.1**	**393**	ND	**84.7**	**91.7**	**582**	**1,550**	ND
SB1-10	**5,600**	**26,500**	ND	ND	ND	**37.1**	**1,330**	**2,690** MtBE
SB1-15	**357**	**2,020**	ND	**93.8**	**262**	**1,917**	**657**	ND
SB1-20	**1,220**	**6,460**	ND	**64.4**	**351**	**1,854**	**2,180**	ND
SB1-25	**689**	**3,500**	ND	**350**	ND	**85.7**	**1,170**	ND
SB1-30	**41.0**	**234.0**	ND	ND	ND	ND	**375**	**27.8** MtBE **221** TBA
SB1-35	**7,010**	**34,600**	ND	ND	**234**	**1,670**	**1,790**	**423** TBA
SB1-40	**1,440**	**6,940**	ND	**81.6**	**1,290**	**6,150**	**4,160**	**369** TBA
SB1-45	**640**	**3,310**	ND	**302**	**1,490**	**8,590**	ND	**412** TBA
SB1-50	ND	ND	ND	ND	ND	ND	ND	ND
SB1-55	ND	ND	ND	ND	ND	ND	ND	ND
SB1-60	ND	ND	ND	ND	ND	ND	ND	ND
SB1-65	ND	ND	ND	ND	ND	**1.3**	ND	ND
SB1-70	ND	ND	ND	ND	ND	ND	ND	ND
SB1-75	ND	ND	ND	ND	ND	ND	**1.2**	ND
SB1-80	ND	ND	ND	ND	ND	ND	ND	ND
SB1-85	ND	ND	ND	ND	ND	ND	ND	ND
SB1-90	ND	ND	ND	ND	ND	ND	ND	ND
RL	**1.0**	**1.0**	**1.0**	**1.0**	**1.0**	**1.0-2.0**	**1.0**	**5.0**

Groundwater Table @ 87.7 ft-bgs

Table 3b: SB-2 Soil Sample Analytical Results in the location Downgradient and Adjacent to the UST Area, dated July 25-26, 2019

Sample ID/FT	TPHg, (mg/kg)	TPHd, (mg/kg)	B Benzene (ug/kg)	T Toluene (ug/kg)	E Ethylbenzene (ug/kg)	X Xylenes (ug/kg)	Naph thalene (ug/kg)	Fuel Oxygenates (ug/kg)
SB2-05	ND	ND	ND	ND	ND	ND	ND	ND
SB2-10	ND	ND	ND	ND	ND	ND	ND	ND
SB2-15	ND	ND	ND	ND	ND	ND	ND	ND
SB2-20	ND	ND	ND	ND	ND	ND	ND	ND
SB2-25	ND	ND	ND	ND	ND	ND	ND	ND
SB2-30	ND	ND	ND	ND	ND	ND	ND	ND
SB2-35	ND	ND	ND	ND	ND	ND	ND	ND
SB2-40	ND	ND	ND	ND	ND	ND	ND	ND
RL	**1.0**	**1.0**	**1.0**	**1.0**	**1.0**	**1.0-2.0**	**1.0**	**5.0**

Table 3c: SB-3 Soil Sample Analytical Results in the location Further Downgradient of the UST Area, dated July 25-26, 2019

Sample ID/FT	TPHg, (mg/kg)	TPHd, (mg/kg)	B Benzene (ug/kg)	T Toluene (ug/kg)	E Ethylbenzene (ug/kg)	X Xylenes (ug/kg)	Naph thalene (ug/kg)	Fuel Oxygenates (ug/kg)
SB3-05	ND	ND	ND	ND	ND	ND	ND	ND
SB3-10	ND	ND	ND	ND	ND	ND	ND	ND
SB3-15	ND	ND	ND	ND	ND	ND	ND	ND
SB3-20	ND	ND	ND	ND	ND	ND	ND	ND
SB3-25	ND	ND	ND	ND	ND	ND	ND	ND
SB3-30	ND	ND	ND	ND	ND	ND	ND	ND
SB3-35	ND	ND	ND	ND	ND	ND	ND	ND
SB3-40	ND	ND	ND	ND	ND	ND	ND	ND
RL	**1.0**	**1.0**	**1.0**	**1.0**	**1.0**	**1.0-2.0**	**1.0**	**5.0**

Groundwater Table @ 87.7 ft-bgs

6.2 Groundwater Hydropunch Grab Sampling Results

The laboratory data results showed that all of the groundwater data was below detection limits for the full range of petroleum hydrocarbon, benzene, and fuel additive oxygenate constituents beneath the former UST tank area in both HP1 and downgradient in HP2 as shown in Table 4. In HP1, slightly elevated aromatic hydrocarbons were detected to include: toluene (0.5 ug/L), ethylbenzene (1.4 ug/L), and xylenes (7.0 ug/L) that were all below State MCLs in groundwater of 40 ug/L, 3.5 ug/L, and 20 ug/L, respectively. Naphthalene was detected at 1.0 ug/L in HP1 that exceeded the 0.17 MCL. All of the groundwater data analyzed for naphthalene and aromatic hydrocarbons in HP2 were below detection limits. Downgradient well, HP3, encountered refusal at approximately 65 feet bgs and no groundwater data was obtained for analysis.

Table 4: Hydropunch Groundwater Sample Analytical Results in the Beneath the UST Area, dated July 25-26, 2019

Sample ID/FT	TPHg, (mg/L)	TPHd, (mg/L)	B Benzene (ug/L)	T Toluene (ug/L)	E Ethylbenzene (ug/L)	X Xylenes (ug/L)	Naph thalene (ug/L)	Fuel Oxygenates (ug/L)
HP1	ND	ND	ND	0.5	1.4	7.0	1.0	ND
HP2	ND	ND	ND	ND	ND	ND	ND	ND
MCL	100	100	0.42	40	3.5	20	0.17	Varies
RL	**0.2**	**0.2**	**0.5**	**0.5**	**0.5**	**0.5-1.0**	**0.5**	**2.5**

Groundwater Table @ 87.7 ft-bgs

Note: Hollow stem drilling encountered refusal in exploratory boring, HP3, at approximately 65 ft-bgs and therefore, no groundwater sample was collected in HP3

7.0 CONCLUSIONS AND RECOMMENDATIONS

The UST Site investigations confirmed that a gasoline and diesel product release had occurred in the past in the vicinity of the former UST tank and dispenser area, SB1. Based on the soil and groundwater data presented in this report, the release, however, appears to be limited to the former UST tank area and does not extend laterally downgradient further than the UST tank area to SB2/HP2 and SB3. In addition, the petroleum hydrocarbon contamination has not migrated vertically below 45 feet bgs and poses a low threat to groundwater beneath the Subject Property. The groundwater data has not been affected by petroleum hydrocarbon, benzene, and fuel additive oxygenate constituents and at trace levels for toluene (0.5 ug/L), ethylbenzene (1.4 ug/L), and xylenes (7.0 ug/L).

Based on the following findings: 1) limited vertical and lateral detections of gasoline and diesel constituents in soils beneath the former UST tanks and 2) >20-foot clean zone beneath the UST Site to a groundwater depth of approximately 87 feet bgs, the detected residual trace petroleum hydrocarbon contaminants in ground water pose a low environmental threat to State ground water or the environment and no significant threat to the public or worker health and safety. Therefore, ENCON respectfully requests case closure (no further action) be granted to the Site regarding the diesel UST tank and former fueling operations.

8.0 UST TANK SITE INVESTIGATION CONDITIONS

This UST Site Soil and Groundwater Investigation Report was prepared at the request of Mr. Kevin Malloy of Trench Shoring Company, Project Client, in response to the directive letter from the State regional Water Quality Control Board, dated May 15, 2019 and June 20, 2019 regarding the Subject Property site environmental assessment investigation, provided in Exhibit A for reference. The proposed Site investigation activities were performed under the direction Thomas Smith, Senior Geologist and California Professional Geologist and Joe Scatoloni, ENCON Senior Remedial Specialist and Registered Environmental Professional.

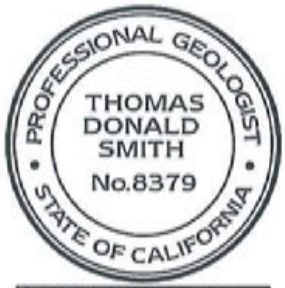
The professional services were performed in a manner generally consistent with industry practices at the time the services were provided using that degree of care and skill ordinarily exercised under similar circumstances by other professional geologists and engineers practicing in this field. No other warranty expressed or implied is made.

Opinions and recommendations contained in this report are based on information provided by others. ENCON is not responsible for the impacts of any changes in environmental standards, practices, or regulations subsequent to the performance of these services. ENCON does not warrant the accuracy of information supplied by others, or the use of segregated portions of this report, or the reliance of this report by a third party.

If there are any questions concerning any portions of this report, please contact Joe Scatoloni, Senior Environmental Manager at (562) 777-2200.

Prepared by,

ENCON Technologies, Inc.
Environmental & Engineering Services



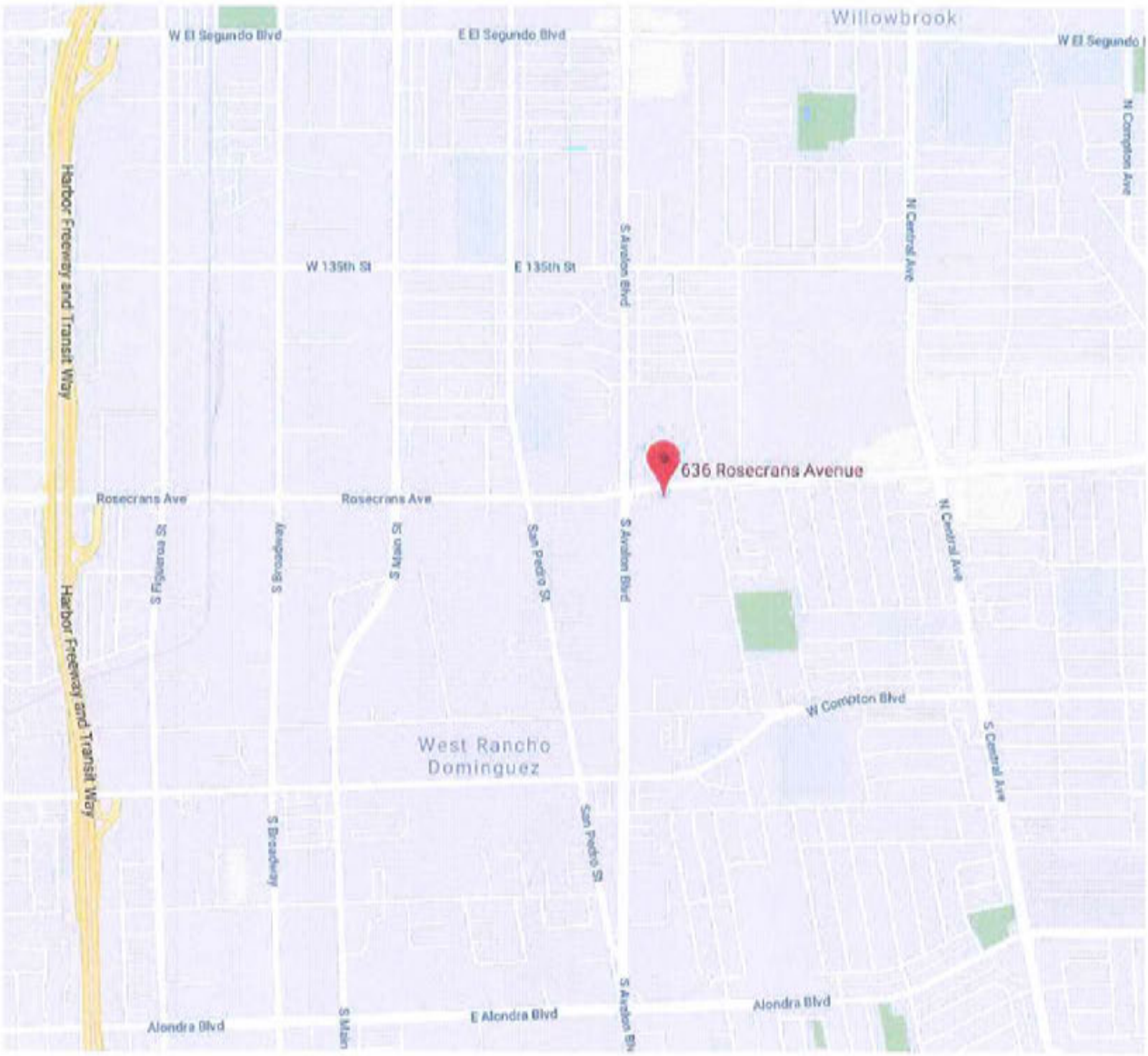
Expires June 30, 2020

G. Joseph Scatoloni, ENCON Principal
Senior Environmental Manager & REA II

Thomas Smith, Senior Geologist
California Professional Geologist, No. #8379

FIGURES

Figure 1 Site Vicinity Location Map
Figure 2 Site Plan Showing Proposed Boring Locations



ENCON **Technologies, Inc.** *12145 Mora Drive, Suite 7* *Santa Fe Springs, CA 90670*	***Site Vicinity Map*** ***636 East Rosecrans Avenue*** ***Los Angeles, California***	**LEGEND** Subject Site Boundary Lines North *Scale: NA* **August 20, 2019** **FIGURE 1**

ROSECRANS AVE

OFFICE

WAREHOUSE

USA GASOLINE STATION

121 TIRE & WHEEL SHOP

WELD SHOP

RESERVOIR

TRENCH PIT

TRENCH SHORING FACILITY
636 E ROSECRANS AVE

FORMER UST AREA

SB1/HP1

SB2/HP2

SB3

GW

RESIDENTIAL

PL

1 SITE PLAN
SCALE: 1"=25'-0"

0' 40' 80'
APPROXIMATE SCALE (11 X 17)

LEGEND

PLANTER AREA — FENCE/GATE — PROPERTY LINE — PROPOSED SOIL BORING LOCATION

ENCON TECHNOLOGIES INC.
12145 MORA DR. #7
SANTA FE SPRINGS, CA

CHKD: 748576 A.Haz Exp: 4/30/20
DRAWN BY: DANIEL AYALA
DATE: 5/30/2019
SCALE: PER PLAN

TRENCH SHORING UST REMOVAL
636 E. ROSECRANS AVE
LOS ANGELES, CA

DRAWING: PROPOSED SAMPLING PLAN

SHEET: FIG.2

Exhibit A

Regional Water Quality Control Board Directives, dated May 15, 2019 and June 20, 2019, and County of Los Angeles Environmental Health Work Plan Approval

June 20, 2019

Mr. Ramon Orozco
Malloy Family Partners
636 East Rosecrans Avenue
Los Angeles, CA 90059-3507

UNDERGROUND TANKS PROGRAM – DIRECTIVE TO TAKE CORRECTIVE ACTION IN RESPONSE TO UNAUTHORIZED UNDERGROUND STORAGE TANK RELEASE PURSUANT TO HEALTH AND SAFETY CODE SECTION 25296.10 AND TITLE 23, CALIFORNIA CODE OF REGULATIONS, SECTIONS 2720-2727
TRENCH SHORING FACILITY (UST CASE No. R-13416A) (PRIORTY D-1)
LOCATED AT 636 EAST ROSECRANS AVENUE, LOS ANGELES, CA

Dear Mr. Orozco:

Pursuant to Health and Safety Code Section 25296.10, you are required to take corrective action (i.e., Preliminary Site Assessment, Soil and Water Investigation, Corrective Action Plan Implementation, and Verification Monitoring) to ensure protection of human health, safety and the environment. Corrective action requirements are set forth in California Code of Regulations (CCR), Title 23, Sections 2720 through 2727.

We are in receipt of the "Environmental Site Assessment Workplan Report" (the Workplan) dated May 30, 2019, submitted by your consultant, Encon. The Workplan was prepared as a response to the Regional Board letter dated May 15, 2019.

This letter provides Regional Board staff comments regarding the Workplan.

Site Condition Update

In September 2018, one 10,000-gallon diesel underground storage tanks (UST) was removed from the Site. Four (4) soil samples were collected from beneath the USTs and detected maximum concentrations of total petroleum hydrocarbon as gasoline, (TPHg) at 500 mg/kg and total petroleum hydrocarbon as diesel (TPHd) at 11,000 mg/kg beneath the Site.

Workplan Approval (Per CCR Title 23, Chapter 16, §2725 and §2726)

In the Workplan, Encon proposed to drill three soil borings (SB1 through SB3) to a maximum depth of 100 feet bgs and collect soil and grab groundwater samples to define soil and/or groundwater contamination beneath the site. Groundwater level is expected between 80 feet to 100 feet bgs beneath the Site.

Regional Board staff has reviewed the proposed Workplan and concurs with its implementation provided the following conditions are met:

1. Soil samples shall be collected from each boring at a minimum of five-foot intervals, at changes in soil lithology, and at areas of obvious contamination. Soil samples taken during this event must be logged for lithology, prepared and preserved per **EPA Method 5035.**

2. You have proposed to collect soil samples at ten-foot intervals from all borings, however, soil samples must be collected at five-foot intervals and the first 40 feet samples must be analyzed. Soil samples collected from 40 feet to 100 feet bgs must be preserved and analyzed later if results from the first 40 feet sample analysis detected the presence of soil contamination.

3. Soil and groundwater samples must be analyzed by Cal-LUFT GC/FID or Cal-LUFT GC/MS Method for total petroleum hydrocarbons as gasoline (TPH_G), total petroleum hydrocarbons as diesel (TPH_D) when diesel is identified at the site; and by EPA Method 8260B for benzene, toluene, ethylbenzene and xylenes (BTEX), naphthalene, and fuel oxygenate compounds including methyl tertiary butyl ether (MTBE), di-isopropyl ether (DIPE), ethyl tertiary butyl ether (ETBE), tertiary amyl methyl ether (TAME), and tertiary butyl alcohol (TBA). Ethanol is also required and shall be analyzed by either method above. The analytical detection limits must conform to the Regional Board General Laboratory Testing Requirements (9/06) (http://www.waterboards.ca.gov/losangeles/publications_forms/forms/ust/lab_forms/labreq 9-06.pdf). All respective analytical methods must be certified by the California Environmental Laboratory Accreditation Program (ELAP). All analytical data must be reported by a California-certified laboratory.

4. A technical report detailing the results of the site assessment is due to this Regional Board by **September 15, 2019.** The report must include a scaled site map, conclusion, and recommendations.

Regulatory Requirement for Electronic Submission of Laboratory Data to the Geotracker Database

On September 30, 2004, the State Water Resources Control Board (SWRCB) adopted the resolution to revise regulations in Chapter 30, Division 3 of Title 23 of California Code of Regulations (CCR), which requires persons to ensure electronic submission of laboratory analytical data (i.e., soil or water chemical analysis) and locational data (i.e., location and elevation of groundwater monitoring wells), to the SWRCB's GeoTracker database. The regulations and other background information are available at http://geotracker.waterboards.ca.gov.

In accordance with the regulations, you must upload the following information to the State GeoTracker database: the report (in PDF format), laboratory analytical data (in electronic data format [EDF]), monitoring event information in GEO_WELL format, an updated site map (GEO_MAP) showing the new monitoring well locations, boring logs in PDF (GEO_BORE) to be used to link to well locations, monitoring well latitude and longitude (GEO_XY) survey data, and monitoring well elevation data (GEO_Z). Hard copy paper reports, which have already been electronically uploaded to GeoTracker, are no longer required to be submitted to the Regional Board.

General Requirements:

1. The contractor who conducts the environmental work as required in this directive shall, at all times, comply with all applicable State laws, rules, regulations, and local ordinances specifically including, but not limited to, environmental, procurement, and safety laws, rules, regulations, and ordinances. The contractor shall obtain the services of a Professional Geologist or Engineer, Civil (PG/PE-Civil) to comply with the applicable requirements of the Business and Professions Code, sections 6700 et seq. and/or 7800 et seq. implementing regulations for engineering or geological analysis and interpretation for this case. All documents prepared by the contractor that reflect or rely upon engineering or geological interpretations by the contractor shall be signed and stamped by the PE-Civil/PG indicating her/his responsibility for them, as required by the Business and Professions Code.

2. All necessary permits must be obtained from the appropriate agencies prior to the start of work.

3. Prior to commencing any fieldwork, Regional Board staff must be given a minimum of **15 days** advance notice in writing, so that one of our staff may be present.

If you have any questions on this matter, please call me at (213) 576-6699 or email me at Mbaiady@waterboards.ca.gov.

Sincerely,

Magdy Baiady
Engineering Geologist
Underground Tanks/Los Angeles River Unit

cc: Tim Smith, County of Los Angeles Department of Public Works
Joseph Scatoloni, Encon

CALIFORNIA
Water Boards

GAVIN NEWSOM
GOVERNOR

JARED BLUMENFELD
SECRETARY FOR
ENVIRONMENTAL PROTECTION

Los Angeles Regional Water Quality Control Board

May 15, 2019

Mr. Ramon Orozco
Malloy Family Partners
636 East Rosecrans Avenue
Los Angeles, CA 90059-3507

UNDERGROUND TANKS PROGRAM – DIRECTIVE TO TAKE CORRECTIVE ACTION IN RESPONSE TO UNAUTHORIZED UNDERGROUND STORAGE TANK RELEASE PURSUANT TO HEALTH AND SAFETY CODE SECTION 25296.10 AND TITLE 23, CALIFORNIA CODE OF REGULATIONS, SECTIONS 2720-2727
TRENCH SHORING FACILITY (UST CASE No. R-13416A) (PRIORTY D-1)
LOCATED AT 636 EAST ROSECRANS AVENUE, LOS ANGELES, CA

Dear Mr. Webb:

Pursuant to Health and Safety Code section 25296.10, you are required to take corrective action (i.e., Preliminary Site Assessment, Soil and Water Investigation, Corrective Action Plan Implementation, and/or Verification Monitoring) to ensure protection of human health, safety, and the environment. Corrective action requirements are set forth in California Code of Regulations (CCR), title 23, sections 2720 through 2727.

On May 1, 2019 the County of Los Angeles Department of Public Works transmitted this case to our agency due to concerns regarding soil and groundwater impacts from the subject site (Site). We received the copy of the "Final Closure Report" (Report) dated September 20, 2018, prepared by Encon Technologies Inc., (ENCON). According to the Report, elevated concentrations of fuel constituents were detected in the soil beneath the Site.

Site Condition Update

In September 2018, one 10,000-gallon diesel underground storage tanks (UST) was removed from the Site. Four (4) soil samples were collected from beneath the USTs and detected maximum concentrations of total petroleum hydrocarbon as gasoline, (TPHg) at 500 mg/kg and total petroleum hydrocarbon as diesel (TPHd) at 11,000 mg/kg beneath the Site.

Requirement for Site Assessment Workplan (Per CCR Title 23, Chapter 16, §2725 and §2726)

Based upon the above information and the fact that elevated concentrations of fuel constituents were present in the soil beneath the site, and the vertical extend of the impacted soil is not delineated, Regional Board staff believes that additional site assessment should be implemented at the site to determine soil and groundwater conditions beneath the site.

To address Regional Board staff concerns and recommendations, you are required to submit a site assessment workplan to include soil samples. The workplan is due to this Regional Boar by **June 15, 2019.**

Regulatory Requirement for Electronic Submission of Laboratory Data to the Geotracker Database

Chapter 30, Division 3 of Title 23 of California Code of Regulations (CCR) requires persons to ensure electronic submission of laboratory analytical data (i.e., soil or water chemical analysis) and locational data (i.e., location and elevation of groundwater monitoring wells), to the SWRCB's GeoTracker database. The regulations and other background information are available at http://geotracker.waterboards.ca.gov.

In accordance with the regulations, you must upload the following information to the State GeoTracker database: the report (in PDF format), laboratory analytical data (in electronic data format [EDF]), monitoring event information in GEO_WELL format, an updated site map (GEO_MAP) showing the new monitoring well locations, boring logs in PDF (GEO_BORE) to be used to link to well locations, monitoring well latitude and longitude (GEO_XY) survey data, and monitoring well elevation data (GEO_Z). Hard copy paper reports, which have already been electronically uploaded to GeoTracker, are no longer required to be submitted to the Regional Board.

General Requirements:

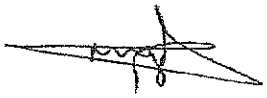
1. The contractor who conducts the environmental work as required in this directive shall, at all times, comply with all applicable State laws, rules, regulations, and local ordinances specifically including, but not limited to, environmental, procurement, and safety laws, rules, regulations, and ordinances. The contractor shall obtain the services of a Professional Geologist or Engineer, Civil (PG/PE-Civil) to comply with the applicable requirements of the Business and Professions Code, sections 6700 et seq. and/or 7800 et seq. implementing regulations for engineering or geological analysis and interpretation for this case. All documents prepared by the contractor that reflect or rely upon engineering or geological interpretations by the contractor shall be signed and stamped by the PE-Civil/PG indicating her/his responsibility for them, as required by the Business and Professions Code.

2. All necessary permits must be obtained from the appropriate agencies prior to the start of work.

3. Prior to commencing any fieldwork, Regional Board staff must be given a minimum of **15** days advance notice in writing, so that one of our staff may be present.

If you have any questions on this matter, please call me at (213) 576-6699 or email me at Mbaiady@waterboards.ca.gov.

Sincerely,



Magdy Baiady
Engineering Geologist
Underground Tanks Section/Los Angeles River Unit

cc: Tim Smith, County of Los Angeles Department of Public Works
Gregory Salley, ENCON

ENVIRONMENTAL HEALTH

Drinking Water Program
5050 Commerce Drive, Baldwin Park, CA 91706
Telephone: (626) 430-5420 • http://publichealth.lacounty.gov/eh/ep/dw/dw_main.htm

County of Los Angeles Public Health

Work Plan Approval

WORK SITE ADDRESS	CITY	ZIP	EMAIL ADDRESS
636 East Rosecrans Avenue	Los Angeles	90059	encon@encontech.net

NOTICE:

- WORK PLAN APPROVALS ARE VALID FOR 180 DAYS. 30 DAY EXTENSIONS OF WORK PLAN APPROVALS ARE CONSIDERED ON AN INDIVIDUAL (CASE-BY-CASE) BASIS AND MAY BE SUBJECT TO ADDITIONAL PLAN REVIEW FEES (HOURLY RATE AS APPLICABLE).
- WORK PLAN MODIFICATIONS MAY BE REQUIRED IF WELL AND GEOLOGIC CONDITIONS ENCOUNTERED AT THE SITE INSPECTION ARE FOUND TO DIFFER FROM THE SCOPE OF WORK PRESENTED TO THE DEPARTMENT OF PUBLIC HEALTH—DRINKING WATER PROGRAM.
- WORK PLAN APPROVALS ARE LIMITED TO COMPLIANCE WITH THE CALIFORNIA WELL STANDARDS AND THE LOS ANGELES COUNTY CODE AND DOES NOT GRANT ANY RIGHTS TO CONSTRUCT, RENOVATE, OR DECOMMISSION ANY WELL. THE APPLICANT IS RESPONSIBLE FOR SECURING ALL OTHER NECESSARY PERMITS SUCH AS WATER RIGHTS, PROPERTY RIGHTS, COASTAL COMMISSION APPROVALS, USE COVENANTS, ENCROACHMENT PERMISSIONS, UTILITY LINE SETBACKS, CITY/COUNTY PUBLIC WORKS RIGHTS OF WAY, ETC.
- THIS PERMIT IS NOT COMPLETE UNTIL ALL OF THE FOLLOWING REQUIREMENTS ARE SIGNED BY THE DEPUTY HEALTH OFFICER. WORK SHALL NOT BE INITIATED WITHOUT A WORK PLAN APPROVAL STAMPED BY THE DEPARTMENT OF PUBLIC HEALTH—DRINKING WATER PROGRAM.

TO BE COMPLETED BY DEPARTMENT OF PUBLIC HEALTH—DRINKING WATER PROGRAM:

X	WORK PLAN APPROVED FOR: 3 Soil Boring/Exp. Hole	**PERMIT NUMBER:**	SR0190867	**DATE:**	July 18, 2019

ADDITIONAL APPROVAL CONDITIONS:

- Work plan approval is issued for scope of work submitted to the Drinking Water Program. Any modifications to the scope of work will require additional work plan review.
- Ensure to backfill using a tremie pipe under pressure or equivalent equipment with cement grout, proceeding upward from the bottom of the boring/exploration hole.
- Sealing material must be mixed in accordance with the California Well Standards (Bulletins 74-81 and 74-90)
  - Cement grout mix ratio of 5-6 gallons of water per 94-pound bag of Portland cement.
  - Up to 6% of Bentonite may be added to the cement-based mix. The water demand of bentonite shall be taken into account when water is added to the mix.
  - Bentonite alone shall not be used as a sealing material.
- Borings/Exploration holes must comply with all applicable requirements published in the California Well Standards (Bulletins 74-81 and 74-90) and the Los Angeles County Code, Title 11.

APPROVED BY:

Yonas Taye, REHS

Yon Taye

7115

ENVIRONMENTAL HEALTH

Drinking Water Program
5050 Commerce Drive, Baldwin Park, CA 91706
Telephone: (626) 430-5420 • http://publichealth.lacounty.gov/eh/ep/dw/dw_main.htm

County of Los Angeles Public Health

Work Plan Approval

WORK SITE ADDRESS	CITY	ZIP	EMAIL ADDRESS
636 East Rosecrans Avenue	Los Angeles	90059	encon@encontech.net

NOTICE:

- WORK PLAN APPROVALS ARE VALID FOR 180 DAYS. 30 DAY EXTENSIONS OF WORK PLAN APPROVALS ARE CONSIDERED ON AN INDIVIDUAL (CASE-BY-CASE) BASIS AND MAY BE SUBJECT TO ADDITIONAL PLAN REVIEW FEES (HOURLY RATE AS APPLICABLE).
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TO BE COMPLETED BY DEPARTMENT OF PUBLIC HEALTH—DRINKING WATER PROGRAM:

X	WORK PLAN APPROVED FOR: 3 Soil Boring/Exp. Hole	**PERMIT NUMBER:**	SR0190867	**DATE:**	July 18, 2019

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  - Bentonite alone shall not be used as a sealing material.
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APPROVED BY:

Yonas Taye, REHS

Yon Taye

7115

Exhibit B

Soil and Groundwater Analytical Results

JONES ENVIRONMENTAL, INC.

714-449-9937
562-646-1611
805-399-0060

11007 FOREST PLACE
SANTA FE SPRINGS, CA 90670
WWW.JONESENV.COM

JONES ENVIRONMENTAL
LABORATORY RESULTS

Client:	Encon Technologies, Inc.	**Report date:**	8/1/2019
Client Address:	12145 Mora Drive #7 Santa Fe Springs, CA 90670	**JEL Ref. No.:**	ST-14062
Attn:	Joe Scatoloni	**Date Sampled:**	7/26/2019
		Date Received:	7/26/2019
Project:	Trench Shoring	**Date Analyzed:**	7/30/2019
Project Address:	636 E. Rosecrans Ave, Los Angeles, CA	**Physical State:**	Water

ANALYSES REQUESTED

1. EPA 8015M – Extended Range Hydrocarbons
2. EPA 8260B by 5030B – Volatile Organics by GC/MS + Oxygenates/Gasoline Range Organics

Approval: _____

Angela Haar, Ph.D.

JONES ENVIRONMENTAL, INC.

714-449-9937
562-646-1611
805-399-0060

11007 FOREST PLACE
SANTA FE SPRINGS, CA 90670
WWW.JONESENV.COM

JONES ENVIRONMENTAL
LABORATORY RESULTS

Client:	Encon Technologies, Inc.	**Report date:**	8/1/2019
Client Address:	12145 Mora Drive #7 Santa Fe Springs, CA 90670	**Jones Ref. No.:**	ST-14062
Attn:	Joe Scatoloni	**Date Sampled:**	7/26/2019
		Date Received:	7/26/2019
Project:	Trench Shoring	**Date Analyzed:**	7/26/2019
Project Address:	636 E. Rosecrans Ave, Los Angeles, CA	**Physical State:**	Water

EPA 8015M – Extended Range Hydrocarbons

Sample ID:	**HP1**	**HP2**		
Jones ID:	**ST-14062-01**	**ST-14062-02**	**Reporting Limit**	**Units**
Carbon Chain Range				
C10 - C11	ND	ND	0.2	mg/L
C12 - C13	ND	ND	0.2	mg/L
C14 - C15	ND	ND	0.2	mg/L
C16 - C17	ND	ND	0.2	mg/L
C18 - C19	ND	ND	0.2	mg/L
C20 - C23	ND	ND	0.2	mg/L
C24 - C27	ND	ND	0.2	mg/L
C28 - C31	ND	ND	0.2	mg/L
C32 - C35	ND	ND	0.2	mg/L
C36 - C39	ND	ND	0.2	mg/L
C40 - C43	ND	ND	0.2	mg/L
C13 - C22	ND	ND	1.0	mg/L
C23 - C40	ND	ND	1.0	mg/L
Dilution Factor	1	1		
Surrogate Recovery:			**QC Limits**	
Hexacosane	85%	78%	30 - 120	
Batch ID:	8015 _072619_02	8015 _072619_02		

ND = Value less than reporting limit

JONES ENVIRONMENTAL, INC.

714-449-9937
562-646-1611
805-399-0060

11007 FOREST PLACE
SANTA FE SPRINGS, CA 90670
WWW.JONESENV.COM

JONES ENVIRONMENTAL
LABORATORY RESULTS

Client:	Encon Technologies, Inc.	**Report date:**	8/1/2019
Client Address:	12145 Mora Drive #7 Santa Fe Springs, CA 90670	**Jones Ref. No.:**	ST-14062
Attn:	Joe Scatoloni	**Date Sampled:**	7/26/2019
		Date Received:	7/26/2019
Project:	Trench Shoring	**Date Analyzed:**	7/26/2019
Project Address:	636 E. Rosecrans Ave, Los Angeles, CA	**Physical State:**	Water

EPA 8015M – Extended Range Hydrocarbons

Sample ID:	**METHOD BLANK**		
Jones ID:	**MB-062619_02**	**Reporting Limit**	**Units**
Carbon Chain Range			
C10 - C11	ND	0.2	mg/L
C12 - C13	ND	0.2	mg/L
C14 - C15	ND	0.2	mg/L
C16 - C17	ND	0.2	mg/L
C18 - C19	ND	0.2	mg/L
C20 - C23	ND	0.2	mg/L
C24 - C27	ND	0.2	mg/L
C28 - C31	ND	0.2	mg/L
C32 - C35	ND	0.2	mg/L
C36 - C39	ND	0.2	mg/L
C40 - C43	ND	0.2	mg/L
C13 - C22	ND	1.0	mg/L
C23 - C40	ND	1.0	mg/L
Dilution Factor	1		
Surrogate Recovery:		**QC Limits**	
Hexacosane	85%	30 - 120	
Batch ID:	8015_072619_02		

ND = Value less than reporting limit

JONES ENVIRONMENTAL, INC.

714-449-9937
562-646-1611
805-399-0060

11007 FOREST PLACE
SANTA FE SPRINGS, CA 90670
WWW.JONESENV.COM

JONES ENVIRONMENTAL QUALITY CONTROL INFORMATION

Client:	Encon Technologies, Inc.	**Report date:**	8/1/2019
Client Address:	12145 Mora Drive #7 Santa Fe Springs, CA 90670	**Jones Ref. No.:**	ST-14062
Attn:	Joe Scatoloni	**Date Sampled:**	7/26/2019
		Date Received:	7/26/2019
Project:	Trench Shoring	**Date Analyzed:**	7/26/2019
Project Address:	636 E. Rosecrans Ave, Los Angeles, CA	**Physical State:**	Water

BATCH: 8015 _072619_02 **Prepared:** 7/26/2019 **Analyzed:** 7/26/2019

EPA 8015M – Extended Range Hydrocarbons

	Result	Spike Level	% Recovery	% RPD	% Recovery Limits	Units
LCS:	LCS-062619_02	**SAMPLE SPIKED:**	CLEAN WATER			
Analyte:						
Diesel	**904**	1000	90%		60 - 140	mg/L
Surrogate Recovery:						
Hexacosane			83%		30 - 120	
LCSD:	LCSD-062619_02	**SAMPLE SPIKED:**	CLEAN WATER			
Analyte:						
Diesel	**917**	1000	92%	1.4%	60 - 140	mg/L
Surrogate Recoveries:						
Hexacosane			92%		30 - 120	
CCV:	CCV-062619_02					
Analyte:						
Diesel	**1100**	1000	110%		80 - 120	mg/L

LCS = Laboratory Control Sample
LCSD= Laboratory Control Sample Duplicate
CCV = Continuing Calibration Verification
RPD = Relative Percent Difference

JONES ENVIRONMENTAL, INC.

714-449-9937
562-646-1611
805-399-0060

11007 FOREST PLACE
SANTA FE SPRINGS, CA 90670
WWW.JONESENV.COM

JONES ENVIRONMENTAL LABORATORY RESULTS

Client:	Encon Technologies, Inc.	**Report date:**	8/1/2019
Client Address:	12145 Mora Drive #7 Santa Fe Springs, CA 90670	**Jones Ref. No.:**	ST-14062
Attn:	Joe Scatoloni	**Date Sampled:**	7/26/2019
		Date Received:	7/26/2019
Project:	Trench Shoring	**Date Analyzed:**	7/30/2019
Project Address:	636 E. Rosecrans Ave, Los Angeles, CA	**Physical State:**	Water

EPA 8260B by 5035 – Volatile Organics by GC/MS + Oxygenates/Gasoline Range Organics

Sample ID:	**HP1**	**HP2**		
Jones ID:	**ST-14062-01**	**ST-14062-02**	**Reporting Limit**	**Units**
Analytes:				
Benzene	ND	ND	0.5	µg/L
Ethylbenzene	**1.4**	ND	0.5	µg/L
Naphthalene	**1.0**	ND	0.5	µg/L
Toluene	**0.5**	ND	0.5	µg/L
m,p-Xylene	**4.4**	ND	1.0	µg/L
o-Xylene	**2.6**	ND	0.5	µg/L
Methyl-tert-butylether	ND	ND	2.5	µg/L
Ethyl-tert-butylether	ND	ND	2.5	µg/L
Di-isopropylether	ND	ND	2.5	µg/L
tert-amylmethylether	ND	ND	2.5	µg/L
tert-Butylalcohol	ND	ND	25.0	µg/L
Gasoline Range Organics (C4-C12)	ND	ND	0.10	mg/L
TIC:				
Ethanol	ND	ND	50.0	µg/L
Dilution Factor	1	1		
Surrogate Recoveries:			**QC Limits**	
Dibromofluoromethane	95%	97%	60 - 140	
Toluene-d_8	99%	102%	60 - 140	
4-Bromofluorobenzene	102%	105%	60 - 140	
	VOC1-073019-02	VOC1-073019-02		

ND= Value less than reporting limit

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JONES ENVIRONMENTAL QUALITY CONTROL INFORMATION

Client:	Encon Technologies, Inc.	**Report date:**	8/1/2019
Client Address:	12145 Mora Drive #7 Santa Fe Springs, CA 90670	**Jones Ref. No.:**	ST-14062
Attn:	Joe Scatoloni	**Date Sampled:**	7/26/2019
		Date Received:	7/26/2019
Project:	Trench Shoring	**Date Analyzed:**	7/30/2019
Project Address:	636 E. Rosecrans Ave, Los Angeles, CA	**Physical State:**	Water

EPA 8260B by 5035 – Volatile Organics by GC/MS + Oxygenates/Gasoline Range Organics

Sample ID:	**METHOD BLANK**		
Jones ID:	**073019-V1MB2**	**Reporting Limit**	**Units**
Analytes:			
Benzene	ND	0.5	µg/L
Ethylbenzene	ND	0.5	µg/L
Naphthalene	ND	0.5	µg/L
Toluene	ND	0.5	µg/L
m,p-Xylene	ND	1.0	µg/L
o-Xylene	ND	0.5	µg/L
Methyl-tert-butylether	ND	2.5	µg/L
Ethyl-tert-butylether	ND	2.5	µg/L
Di-isopropylether	ND	2.5	µg/L
tert-amylmethylether	ND	2.5	µg/L
tert-Butylalcohol	ND	25.0	µg/L
Gasoline Range Organics (C4-C12)	ND	0.10	mg/L
TIC:			
Ethanol	ND	50.0	µg/L
Dilution Factor	1		
Surrogate Recoveries:		**QC Limits**	
Dibromofluoromethane	101%	60 - 140	
Toluene-d_8	112%	60 - 140	
4-Bromofluorobenzene	114%	60 - 140	
	VOC1-073019-02		

ND= Value less than reporting limit

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JONES ENVIRONMENTAL QUALITY CONTROL INFORMATION

Client:	Encon Technologies, Inc.	**Report date:**	8/1/2019
Client Address:	12145 Mora Drive #7 Santa Fe Springs, CA 90670	**Jones Ref. No.:**	ST-14062
Attn:	Joe Scatoloni	**Date Sampled:**	7/26/2019
		Date Received:	7/26/2019
Project:	Trench Shoring	**Date Analyzed:**	7/30/2019
Project Address:	636 E. Rosecrans Ave, Los Angeles, CA	**Physical State:**	Water

EPA 8260B by 5035 – Volatile Organics by GC/MS + Oxygenates/Gasoline Range Organics

Sample Spiked:	CLEAN WATER		**GC#:**	VOC1-073019-02		
Jones ID:	**073019-V1MS2**	**073019-V1MSD2**			**073019-V1CCV2**	
Parameter	MS Recovery (%)	MSD Recovery (%)	RPD	Acceptability Range (%)	CCV	Acceptability Range (%)
Benzene	115%	112%	2.6%	60 - 140	109%	80 - 120
Ethylbenzene	122%	113%	7.6%	60 - 140	118%	80 - 120
Naphthalene	127%	128%	1.1%	70 - 130	137%	80 - 120
Toluene	116%	111%	4.4%	70 - 130	109%	80 - 120
m,p-Xylene	126%	118%	6.8%	70 - 130	120%	80 - 120
o-Xylene	119%	114%	4.0%	70 - 130	115%	80 - 120
Methyl-tert-butylether	129%	132%	2.9%	70 - 130	123%	80 - 120
Gasoline Range Organics (C4-C12)	122%	118%	3.4%	70 - 130		
Surrogate Recovery:						
Dibromofluoromethane	93%	99%		60 - 140	100%	60 - 140
Toluene-d_8	100%	97%		60 - 140	106%	60 - 140
4-Bromofluorobenzene	99%	102%		60 - 140	119%	60 - 140

MS = Matrix Spike
MSD = Matrix Spike Duplicate
CCV = Continuing Calibration Verification
RPD = Relative Percent Difference; Acceptability range for RPD is ≤ 20%

Chain-of-Custody Record

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LAB USE ONLY
Jones Project # ST-14062
Page 1 of 1
Sample Condition as Recieved:
Chilled ☐ yes ☐ no
Sealed ☐ yes ☐ no

Client	ENCON TECHNOLOGIES INC.
Project Name	TRENCH SHORING
Project Address	636 E. ROSECRANS AVE.
	LOS ANGELES, CA.
Email	encon@encontech.net
Phone	(562) 777-2200
Report To	JOE SCATOLONI
Sampler	DAVID BALTAZAR
Date	7/26/19
Client Project #	

Turn Around Requested:
- ☐ Immediate Attention
- ☐ Rush 24 Hours
- ☐ Rush 48 Hours
- ☐ Rush 72 Hours
- X Normal

Report Options
EDD ____
EDF* - 10% Surcharge____
*Global ID _____

Sample Container / Preservative Abbreviations
AS - Acetate Sleeve
SS - Stainless Steel Sleeve
BS - Brass Sleeve
G - Glass
AB - Amber Bottle
P - Plastic
SOBI - Sodium Bisulfate
MeOH - Methanol
HCl - Hydrochloric Acid
HNO3 - Nitric Acid
O - Other (See Notes)

Analysis Requested

Sample ID	Date	Sample Collection Time	Laboratory Sample ID	Preservative	Sample Container	Sample Matrix: Soil (S), Sludge (SL), Aqueous (A), Free Product (FP)	CAL-LUFT GC/FID	TPH-g / TPH-d 8015	8260B (BTEX, NAPHTHALENE,	OXYS, MTBE, DIPE, ETBE,	TAME, TBA, ETHANOL)	Hold	Number of Containers	Notes & Special Instructions
HP1	7/26/19	0730	ST-14062-01	HCl/NONE	G/AB	A	X	X	X	X	X		4	
HP2	↓	1130	ST-14062-02	↓	↓	↓	X	X	X	X	X		↓	
[redacted] (DB)														

Relinquished By (Signature)	Printed Name: DAVID BALTAZAR	Received By (Signature)	Printed Name: Jonathan Zapata
Company: ENCON	Date: 7/26/19 Time: 1423	Company: JONES	Date: 7-26-19 Time: 1423
Relinquished By (Signature)	Printed Name	Received By Laboratory (Signature)	Printed Name
Company	Date: Time	Company	Date Time

8 Total Number of Containers

Client signature on this Chain of Custody form constitutes acknowledgement that the above analyses have been reqested, and the information provided herein is correct and accurate.

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JONES ENVIRONMENTAL
LABORATORY RESULTS

Client:	Encon Technologies, Inc.	**Report date:**	8/8/2019
Client Address:	12145 Mora Drive #7 Santa Fe Springs, CA 90670	**JEL Ref. No.:**	ST-14061
Attn:	Joe Scatoloni	**Date Sampled:**	7/25-26/2019
		Date Received:	7/26/2019
Project:	Trench Shoring	**Physical State:**	Soil
Project Address:	636 E. Rosecrans Ave, Los Angeles, CA		

ANALYSES REQUESTED

Soil:

1. EPA 8015M – Extended Range Hydrocarbons
2. EPA 8260B by 5035 – Volatile Organics by GC/MS + Oxygenates/Gasoline Range Organics

Approval: _____

Angela Haar, Ph.D.

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JONES ENVIRONMENTAL
LABORATORY RESULTS

Client:	Encon Technologies, Inc.	**Report date:**	8/8/2019
Client Address:	12145 Mora Drive #7 Santa Fe Springs, CA 90670	**Jones Ref. No.:**	ST-14061
Attn:	Joe Scatoloni	**Date Sampled:**	7/25-26/2019
		Date Received:	7/26/2019
Project:	Trench Shoring	**Date Analyzed:**	7/30-8/1/2019
Project Address:	636 E. Rosecrans Ave. Los Angeles, CA	**Physical State:**	Soil

EPA 8015M - Extended Range Hydrocarbons

Sample ID:	**SB1-5'**	**SB1-10'**	**SB1-15'**	**SB1-20'**	**SB1-25'**		
Jones ID:	**ST-14061-01**	**ST-14061-02**	**ST-14061-03**	**ST-14061-04**	**ST-14061-05**	**Reporting Limit**	**Units**
Carbon Chain Range							
C10 - C11	**64.1**	**5600**	**357**	**1220**	**689**	1.0	mg/kg
C12 - C13	**101**	**7810**	**535**	**1880**	**967**	1.0	mg/kg
C14 - C15	**106**	**7300**	**535**	**1790**	**944**	1.0	mg/kg
C16 - C17	**106**	**6820**	**541**	**1670**	**946**	1.0	mg/kg
C18 - C19	**75.3**	**4780**	**385**	**1160**	**655**	1.0	mg/kg
C20 - C23	**60.1**	**3930**	**305**	**938**	**492**	1.0	mg/kg
C24 - C27	**6.0**	**399**	**23.2**	**86.8**	**42.1**	1.0	mg/kg
C28 - C31	ND	ND	ND	ND	ND	1.0	mg/kg
C32 - C35	ND	ND	ND	ND	ND	1.0	mg/kg
C36 - C39	ND	ND	ND	ND	ND	1.0	mg/kg
C40 - C43	ND	ND	ND	ND	ND	1.0	mg/kg
C13 - C22	**393**	**26500**	**2020**	**6460**	**3500**	10.0	mg/kg
C23 - C40	**13.8**	**898**	**66.0**	**207**	**105**	10.0	mg/kg
Dilution Factor	1	20	10	10	10		
Surrogate Recovery:						**QC Limits**	
Hexacosane	98%	•	•	•	•	30 - 120	
Batch:	8015_073019_02	8015_073119_02	8015_073119_02	8015_073119_02	8015_073119_02		

ND = Value less than reporting limit
• = Hydrocarbon interference

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JONES ENVIRONMENTAL
LABORATORY RESULTS

Client:	Encon Technologies, Inc.	**Report date:**	8/8/2019
Client Address:	12145 Mora Drive #7 Santa Fe Springs, CA 90670	**Jones Ref. No.:**	ST-14061
Attn:	Joe Scatoloni	**Date Sampled:**	7/25-26/2019
		Date Received:	7/26/2019
Project:	Trench Shoring	**Date Analyzed:**	7/30-8/1/2019
Project Address:	636 E. Rosecrans Ave. Los Angeles, CA	**Physical State:**	Soil

EPA 8015M - Extended Range Hydrocarbons

Sample ID:	**SB1-30'**	**SB1-35'**	**SB1-40'**	**SB2-5'**	**SB2-10'**		
Jones ID:	**ST-14061-06**	**ST-14061-07**	**ST-14061-08**	**ST-14061-19**	**ST-14061-20**	**Reporting Limit**	**Units**
Carbon Chain Range							
C10 - C11	**41.0**	**7010**	**1440**	ND	ND	1.0	mg/kg
C12 - C13	**63.6**	**10100**	**1930**	ND	ND	1.0	mg/kg
C14 - C15	**61.6**	**9450**	**1870**	ND	ND	1.0	mg/kg
C16 - C17	**61.0**	**8940**	**1830**	ND	ND	1.0	mg/kg
C18 - C19	**43.6**	**6270**	**1040**	ND	ND	1.0	mg/kg
C20 - C23	**37.4**	**5160**	**99.3**	ND	ND	1.0	mg/kg
C24 - C27	**3.8**	**540**	ND	ND	ND	1.0	mg/kg
C28 - C31	ND	ND	ND	ND	ND	1.0	mg/kg
C32 - C35	ND	ND	ND	ND	ND	1.0	mg/kg
C36 - C39	ND	ND	ND	ND	ND	1.0	mg/kg
C40 - C43	ND	ND	ND	ND	ND	1.0	mg/kg
C13 - C22	**234**	**34600**	**6940**	ND	ND	10.0	mg/kg
C23 - C40	ND	**1220**	**235**	ND	ND	10.0	mg/kg
Dilution Factor	1	20	10	1	1		
Surrogate Recovery:						**QC Limits**	
Hexacosane	101%	•	•	82%	70%	30 - 120	
Batch:	8015 _073119_02	8015 _073119_02	8015 _073119_02	8015 _073019_02	8015 _073019_02		

ND = Value less than reporting limit
• = Hydrocarbon interference

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JONES ENVIRONMENTAL
LABORATORY RESULTS

Client:	Encon Technologies, Inc.	**Report date:**	8/8/2019
Client Address:	12145 Mora Drive #7 Santa Fe Springs, CA 90670	**Jones Ref. No.:**	ST-14061
Attn:	Joe Scatoloni	**Date Sampled:**	7/25-26/2019
		Date Received:	7/26/2019
Project:	Trench Shoring	**Date Analyzed:**	7/30-8/1/2019
Project Address:	636 E. Rosecrans Ave. Los Angeles, CA	**Physical State:**	Soil

EPA 8015M - Extended Range Hydrocarbons

Sample ID:	**SB2-15'**	**SB2-20'**	**SB2-25'**	**SB2-30'**	**SB2-35'**		
Jones ID:	**ST-14061-21**	**ST-14061-22**	**ST-14061-23**	**ST-14061-24**	**ST-14061-25**	**Reporting Limit**	**Units**
Carbon Chain Range							
C10 - C11	ND	ND	ND	ND	ND	1.0	mg/kg
C12 - C13	ND	ND	ND	ND	ND	1.0	mg/kg
C14 - C15	ND	ND	ND	ND	ND	1.0	mg/kg
C16 - C17	ND	ND	ND	ND	ND	1.0	mg/kg
C18 - C19	ND	ND	ND	ND	ND	1.0	mg/kg
C20 - C23	ND	ND	ND	ND	ND	1.0	mg/kg
C24 - C27	ND	ND	ND	ND	ND	1.0	mg/kg
C28 - C31	ND	ND	ND	ND	ND	1.0	mg/kg
C32 - C35	ND	ND	ND	ND	ND	1.0	mg/kg
C36 - C39	ND	ND	ND	ND	ND	1.0	mg/kg
C40 - C43	ND	ND	ND	ND	ND	1.0	mg/kg
C13 - C22	ND	ND	ND	ND	ND	10.0	mg/kg
C23 - C40	ND	ND	ND	ND	ND	10.0	mg/kg
Dilution Factor	1	1	1	1	1		
Surrogate Recovery:						**QC Limits**	
Hexacosane	76%	79%	72%	81%	90%	30 - 120	
Batch:	8015_073019_02	8015_073019_02	8015_073019_02	8015_073019_02	8015_073019_02		

ND = Value less than reporting limit

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JONES ENVIRONMENTAL
LABORATORY RESULTS

Client:	Encon Technologies, Inc.	**Report date:**	8/8/2019
Client Address:	12145 Mora Drive #7 Santa Fe Springs, CA 90670	**Jones Ref. No.:**	ST-14061
Attn:	Joe Scatoloni	**Date Sampled:**	7/25-26/2019
		Date Received:	7/26/2019
Project:	Trench Shoring	**Date Analyzed:**	7/30-8/1/2019
Project Address:	636 E. Rosecrans Ave. Los Angeles, CA	**Physical State:**	Soil

EPA 8015M - Extended Range Hydrocarbons

Sample ID:	SB2-40'	SB3-5'	SB3-10'	SB3-15'	SB3-20'		
Jones ID:	ST-14061-26	ST-14061-38	ST-14061-39	ST-14061-40	ST-14061-41	Reporting Limit	Units
Carbon Chain Range							
C10 - C11	ND	ND	ND	ND	ND	1.0	mg/kg
C12 - C13	ND	ND	ND	ND	ND	1.0	mg/kg
C14 - C15	ND	ND	ND	ND	ND	1.0	mg/kg
C16 - C17	ND	ND	ND	ND	ND	1.0	mg/kg
C18 - C19	ND	ND	ND	ND	ND	1.0	mg/kg
C20 - C23	ND	ND	ND	ND	ND	1.0	mg/kg
C24 - C27	ND	ND	ND	ND	ND	1.0	mg/kg
C28 - C31	ND	ND	ND	ND	ND	1.0	mg/kg
C32 - C35	ND	ND	ND	ND	ND	1.0	mg/kg
C36 - C39	ND	ND	ND	ND	ND	1.0	mg/kg
C40 - C43	ND	ND	ND	ND	ND	1.0	mg/kg
C13 - C22	ND	ND	ND	ND	ND	10.0	mg/kg
C23 - C40	ND	ND	ND	ND	ND	10.0	mg/kg
Dilution Factor	1	1	1	1	1		
Surrogate Recovery:						QC Limits	
Hexacosane	67%	84%	65%	71%	59%	30 - 120	
Batch:	8015_073019_02	8015_073019_02	8015_073019_02	8015_073019_02	8015_073019_02		

ND = Value less than reporting limit

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JONES ENVIRONMENTAL
LABORATORY RESULTS

Client:	Encon Technologies, Inc.	**Report date:**	8/8/2019
Client Address:	12145 Mora Drive #7 Santa Fe Springs, CA 90670	**Jones Ref. No.:**	ST-14061
Attn:	Joe Scatoloni	**Date Sampled:**	7/25-26/2019
		Date Received:	7/26/2019
Project:	Trench Shoring	**Date Analyzed:**	7/30-8/1/2019
Project Address:	636 E. Rosecrans Ave. Los Angeles, CA	**Physical State:**	Soil

EPA 8015M - Extended Range Hydrocarbons

Sample ID:	**SB3-25'**	**SB3-30'**	**SB3-35'**	**SB3-40'**		
Jones ID:	**ST-14061-42**	**ST-14061-43**	**ST-14061-44**	**ST-14061-45**	**Reporting Limit**	**Units**
Carbon Chain Range						
C10 - C11	ND	ND	ND	ND	1.0	mg/kg
C12 - C13	ND	ND	ND	ND	1.0	mg/kg
C14 - C15	ND	ND	ND	ND	1.0	mg/kg
C16 - C17	ND	ND	ND	ND	1.0	mg/kg
C18 - C19	ND	ND	ND	ND	1.0	mg/kg
C20 - C23	ND	ND	ND	ND	1.0	mg/kg
C24 - C27	ND	ND	ND	ND	1.0	mg/kg
C28 - C31	ND	ND	ND	ND	1.0	mg/kg
C32 - C35	ND	ND	ND	ND	1.0	mg/kg
C36 - C39	ND	ND	ND	ND	1.0	mg/kg
C40 - C43	ND	ND	ND	ND	1.0	mg/kg
C13 - C22	ND	ND	ND	ND	10.0	mg/kg
C23 - C40	ND	ND	ND	ND	10.0	mg/kg
Dilution Factor	1	1	1	1		
Surrogate Recovery:					**QC Limits**	
Hexacosane	88%	90%	92%	77%	30 - 120	
Batch:	8015_072919_01	8015_072919_01	8015_072919_01	8015_072919_01		

ND = Value less than reporting limit

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JONES ENVIRONMENTAL
LABORATORY RESULTS

Client:	Encon Technologies, Inc.	**Report date:**	8/8/2019
Client Address:	12145 Mora Drive #7 Santa Fe Springs, CA 90670	**Jones Ref. No.:**	ST-14061
Attn:	Joe Scatoloni	**Date Sampled:**	7/25-26/2019
		Date Received:	7/26/2019
Project:	Trench Shoring	**Date Analyzed:**	7/30-8/1/2019
Project Address:	636 E. Rosecrans Ave. Los Angeles, CA	**Physical State:**	Soil

EPA 8015M - Extended Range Hydrocarbons

Sample ID:	METHOD BLANK	METHOD BLANK	METHOD BLANK		
Jones ID:	MB-073019_02	MB-072919_01	MB-073119_02	Reporting Limit	Units
Carbon Chain Range					
C10 - C11	ND	ND	ND	1.0	mg/kg
C12 - C13	ND	ND	ND	1.0	mg/kg
C14 - C15	ND	ND	ND	1.0	mg/kg
C16 - C17	ND	ND	ND	1.0	mg/kg
C18 - C19	ND	ND	ND	1.0	mg/kg
C20 - C23	ND	ND	ND	1.0	mg/kg
C24 - C27	ND	ND	ND	1.0	mg/kg
C28 - C31	ND	ND	ND	1.0	mg/kg
C32 - C35	ND	ND	ND	1.0	mg/kg
C36 - C39	ND	ND	ND	1.0	mg/kg
C40 - C43	ND	ND	ND	1.0	mg/kg
C13 - C22	ND	ND	ND	10.0	mg/kg
C23 - C40	ND	ND	ND	10.0	mg/kg
Dilution Factor	1	1	1		
Surrogate Recovery:				**QC Limits**	
Hexacosane	65%	68%	78%	30 - 120	
Batch:	8015_073019_02	8015_072919_01	8015_073119_02		

ND = Value less than reporting limit

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JONES ENVIRONMENTAL QUALITY CONTROL INFORMATION

Client:	Encon Technologies, Inc.	**Report date:**	8/8/2019
Client Address:	12145 Mora Drive #7 Santa Fe Springs, CA 90670	**Jones Ref. No.:**	ST-14061
Attn:	Joe Scatoloni	**Date Sampled:**	7/25-26/2019
		Date Received:	7/26/2019
Project:	Trench Shoring	**Date Analyzed:**	7/30-8/1/2019
Project Address:	636 E. Rosecrans Ave. Los Angeles, CA	**Physical State:**	Soil

BATCH: 8015_073019_02 **Prepared:** 7/30/2019 **Analyzed:** 7/30-31/2019

EPA 8015M - Extended Range Hydrocarbons

	Result	Spike Level	% Recovery	% RPD	% Recovery Limits	Units
LCS:	LCS-073019_02	**SAMPLE SPIKED:**	CLEAN SOIL			
Analyte:						
Diesel	**339**	500	68%		60 - 140	mg/kg
Surrogate Recovery:						
Hexacosane			93%		30 - 120	
LCSD:	LCSD-073019_02	**SAMPLE SPIKED:**	CLEAN SOIL			
Analyte:						
Diesel	**316**	500	63%	7.0%	60 - 140	mg/kg
Surrogate Recoveries:						
Hexacosane			81%		30 - 120	
CCV:	CCV-073019_02					
Analyte:						
Diesel	**1070**	1000	107%		80 - 120	mg/kg

LCS = Laboratory Control Sample
LCSD= Laboratory Control Sample Duplicate
CCV = Continuing Calibration Verification
RPD = Relative Percent Difference

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JONES ENVIRONMENTAL
QUALITY CONTROL INFORMATION

Client:	Encon Technologies, Inc.	**Report date:**	8/8/2019
Client Address:	12145 Mora Drive #7 Santa Fe Springs, CA 90670	**Jones Ref. No.:**	ST-14061
Attn:	Joe Scatoloni	**Date Sampled:**	7/25-26/2019
		Date Received:	7/26/2019
Project:	Trench Shoring	**Date Analyzed:**	7/30-8/1/2019
Project Address:	636 E. Rosecrans Ave. Los Angeles, CA	**Physical State:**	Soil

BATCH: 8015_072919_01 **Prepared:** 7/29/2019 **Analyzed:** 7/30-31/2019

EPA 8015M - Extended Range Hydrocarbons

	Result	Spike Level	% Recovery	% RPD	% Recovery Limits	Units
LCS:	LCS-072919_01	**SAMPLE SPIKED:**	CLEAN SOIL			
Analyte:						
Diesel	**395**	500	79%		60 - 140	mg/kg
Surrogate Recovery:						
Hexacosane			86%		30 - 120	
LCSD:	LCSD-072919_01	**SAMPLE SPIKED:**	CLEAN SOIL			
Analyte:						
Diesel	**419**	500	84%	5.9%	60 - 140	mg/kg
Surrogate Recoveries:						
Hexacosane			86%		30 - 120	
CCV:	CCV-072919_01					
Analyte:						
Diesel	**1180**	1000	118%		80 - 120	mg/kg

LCS = Laboratory Control Sample
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RPD = Relative Percent Difference

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JONES ENVIRONMENTAL
QUALITY CONTROL INFORMATION

Client:	Encon Technologies, Inc.	**Report date:**	8/8/2019
Client Address:	12145 Mora Drive #7 Santa Fe Springs, CA 90670	**Jones Ref. No.:**	ST-14061
Attn:	Joe Scatoloni	**Date Sampled:**	7/25-26/2019
		Date Received:	7/26/2019
Project:	Trench Shoring	**Date Analyzed:**	7/30-8/1/2019
Project Address:	636 E. Rosecrans Ave. Los Angeles, CA	**Physical State:**	Soil

BATCH: 8015_073119_02 **Prepared:** 7/31/2019 **Analyzed:** 7/31/2019

EPA 8015M - Extended Range Hydrocarbons

	Result	Spike Level	% Recovery	% RPD	% Recovery Limits	Units
LCS:	LCS-073119_02	**SAMPLE SPIKED:**	CLEAN SOIL			
Analyte:						
Diesel	**487**	500	97%		60 - 140	mg/kg
Surrogate Recovery:						
Hexacosane			118%		30 - 120	
LCSD:	LCSD-073119_02	**SAMPLE SPIKED:**	CLEAN SOIL			
Analyte:						
Diesel	**515**	500	103%	5.6%	60 - 140	mg/kg
Surrogate Recoveries:						
Hexacosane			115%		30 - 120	
CCV:	CCV-073119_02					
Analyte:						
Diesel	**1070**	1000	107%		80 - 120	mg/kg

LCS = Laboratory Control Sample
LCSD= Laboratory Control Sample Duplicate
CCV = Continuing Calibration Verification
RPD = Relative Percent Difference

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JONES ENVIRONMENTAL LABORATORY RESULTS

Client:	Encon Technologies, Inc.	**Report date:**	8/8/2019
Client Address:	12145 Mora Drive #7 Santa Fe Springs, CA 90670	**Jones Ref. No.:**	ST-14061
Attn:	Joe Scatoloni	**Date Sampled:**	7/25-26/2019
		Date Received:	7/26/2019
Project:	Trench Shoring	**Date Analyzed:**	8/1,2,6/2019
Project Address:	636 E. Rosecrans Ave, Los Angeles, CA	**Physical State:**	Soil

EPA 8260B by 5035 – Volatile Organics by GC/MS + Oxygenates/Gasoline Range Organics

Sample ID:	**SB1-5'**	**SB1-10'**	**SB1-15'**	**SB1-20'**	**SB1-25'**		
Jones ID:	**ST-14061-01**	**ST-14061-02**	**ST-14061-03**	**ST-14061-04**	**ST-14061-05**	**Reporting Limit**	**Units**
Analytes:							
Benzene	ND	ND	ND	ND	ND	1.0	µg/kg
Ethylbenzene	**91.7**	ND	**262**	**351**	ND	1.0	µg/kg
Naphthalene	**1550**	**1330**	**657**	**2180**	**1170**	1.0	µg/kg
Toluene	**84.7**	ND	**93.8**	**64.4**	**350**	1.0	µg/kg
m,p-Xylene	**373**	**37.1**	**1210**	**1210**	**85.7**	2.0	µg/kg
o-Xylene	**209**	ND	**707**	**634**	ND	1.0	µg/kg
Methyl-tert-butylether	ND	**2690**	ND	ND	ND	5.0	µg/kg
Ethyl-tert-butylether	ND	ND	ND	ND	ND	5.0	µg/kg
Di-isopropylether	ND	ND	ND	ND	ND	5.0	µg/kg
tert-amylmethylether	ND	ND	ND	ND	ND	5.0	µg/kg
tert-Butylalcohol	ND	ND	ND	ND	ND	50.0	µg/kg
Gasoline Range Organics (C4-C12)	**1110**	**724**	**444**	**722**	**181**	0.20	mg/kg
TIC:							
Ethanol	ND	ND	ND	ND	ND	50.0	µg/kg
Dilution Factor	150	150	150	180	40		
Surrogate Recoveries:						**QC Limits**	
Dibromofluoromethane	97%	100%	103%	103%	105%	60 - 140	
Toluene-d_8	96%	100%	98%	98%	104%	60 - 140	
4-Bromofluorobenzene	95%	94%	93%	92%	106%	60 - 140	
	VOC4-080619-01	VOC4-080619-01	VOC4-080619-01	VOC4-080619-01	VOC4-080619-01		

ND = Value less than reporting limit

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Client:	Encon Technologies, Inc.	**Report date:**	8/8/2019
Client Address:	12145 Mora Drive #7 Santa Fe Springs, CA 90670	**Jones Ref. No.:**	ST-14061
Attn:	Joe Scatoloni	**Date Sampled:**	7/25-26/2019
		Date Received:	7/26/2019
Project:	Trench Shoring	**Date Analyzed:**	8/1,2,6/2019
Project Address:	636 E. Rosecrans Ave, Los Angeles, CA	**Physical State:**	Soil

EPA 8260B by 5035 – Volatile Organics by GC/MS + Oxygenates/Gasoline Range Organics

Sample ID:	**SB1-30'**	**SB1-35'**	**SB1-40'**	**SB2-5'**	**SB2-10'**		
Jones ID:	**ST-14061-06**	**ST-14061-07**	**ST-14061-08**	**ST-14061-19**	**ST-14061-20**	**Reporting Limit**	**Units**
Analytes:							
Benzene	ND	ND	ND	ND	ND	1.0	µg/kg
Ethylbenzene	ND	**234**	**1290**	ND	ND	1.0	µg/kg
Naphthalene	**375***	**1790**	**4160**	ND	ND	1.0	µg/kg
Toluene	ND	ND	**81.6**	ND	ND	1.0	µg/kg
m,p-Xylene	ND	**1010**	**3920**	ND	ND	2.0	µg/kg
o-Xylene	ND	**660**	**2230**	ND	ND	1.0	µg/kg
Methyl-tert-butylether	**27.8**	ND	ND	ND	ND	5.0	µg/kg
Ethyl-tert-butylether	ND	ND	ND	ND	ND	5.0	µg/kg
Di-isopropylether	ND	ND	ND	ND	ND	5.0	µg/kg
tert-amylmethylether	ND	ND	ND	ND	ND	5.0	µg/kg
tert-Butylalcohol	**221**	**423**	**369**	ND	ND	50.0	µg/kg
Gasoline Range Organics (C4-C12)	**133***	**390**	**657**	ND	ND	0.20	mg/kg
TIC:							
Ethanol	ND	ND	ND	ND	ND	50.0	µg/kg
Dilution Factor	1/200*	200	220	1	1		
Surrogate Recoveries:						**QC Limits**	
Dibromofluoromethane	99%	103%	103%	100%	102%	60 - 140	
Toluene-d_8	110%	97%	99%	98%	96%	60 - 140	
4-Bromofluorobenzene	96%*	94%	96%	90%	93%	60 - 140	
	VOC3-080119-01/*VOC4-080619-01	VOC4-080619-01	VOC4-080619-01	VOC4-080619-01	VOC4-080619-01		

ND = Value less than reporting limit

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JONES ENVIRONMENTAL LABORATORY RESULTS

Client:	Encon Technologies, Inc.	**Report date:**	8/8/2019
Client Address:	12145 Mora Drive #7 Santa Fe Springs, CA 90670	**Jones Ref. No.:**	ST-14061
Attn:	Joe Scatoloni	**Date Sampled:**	7/25-26/2019
		Date Received:	7/26/2019
Project:	Trench Shoring	**Date Analyzed:**	8/1,2,6/2019
Project Address:	636 E. Rosecrans Ave, Los Angeles, CA	**Physical State:**	Soil

EPA 8260B by 5035 – Volatile Organics by GC/MS + Oxygenates/Gasoline Range Organics

Sample ID:	**SB2-15'**	**SB2-20'**	**SB2-25'**	**SB2-30'**	**SB2-35'**		
Jones ID:	**ST-14061-21**	**ST-14061-22**	**ST-14061-23**	**ST-14061-24**	**ST-14061-25**	**Reporting Limit**	**Units**
Analytes:							
Benzene	ND	ND	ND	ND	ND	1.0	µg/kg
Ethylbenzene	ND	ND	ND	ND	ND	1.0	µg/kg
Naphthalene	ND	ND	ND	ND	ND	1.0	µg/kg
Toluene	ND	ND	ND	ND	ND	1.0	µg/kg
m,p-Xylene	ND	ND	ND	ND	ND	2.0	µg/kg
o-Xylene	ND	ND	ND	ND	ND	1.0	µg/kg
Methyl-tert-butylether	ND	ND	ND	ND	ND	5.0	µg/kg
Ethyl-tert-butylether	ND	ND	ND	ND	ND	5.0	µg/kg
Di-isopropylether	ND	ND	ND	ND	ND	5.0	µg/kg
tert-amylmethylether	ND	ND	ND	ND	ND	5.0	µg/kg
tert-Butylalcohol	ND	ND	ND	ND	ND	50.0	µg/kg
Gasoline Range Organics (C4-C12)	ND	ND	ND	ND	ND	0.20	mg/kg
TIC:							
Ethanol	ND	ND	ND	ND	ND	50.0	µg/kg
Dilution Factor	1	1	1	1	1		
Surrogate Recoveries:						**QC Limits**	
Dibromofluoromethane	104%	106%	105%	110%	101%	60 - 140	
Toluene-d_8	95%	94%	96%	95%	95%	60 - 140	
4-Bromofluorobenzene	94%	94%	95%	94%	94%	60 - 140	
	VOC4-080619-01	VOC4-080619-01	VOC4-080619-01	VOC4-080119-01	VOC4-080619-01		

ND= Value less than reporting limit

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JONES ENVIRONMENTAL LABORATORY RESULTS

Client:	Encon Technologies, Inc.	**Report date:**	8/8/2019
Client Address:	12145 Mora Drive #7 Santa Fe Springs, CA 90670	**Jones Ref. No.:**	ST-14061
Attn:	Joe Scatoloni	**Date Sampled:**	7/25-26/2019
		Date Received:	7/26/2019
Project:	Trench Shoring	**Date Analyzed:**	8/1,2,6/2019
Project Address:	636 E. Rosecrans Ave, Los Angeles, CA	**Physical State:**	Soil

EPA 8260B by 5035 – Volatile Organics by GC/MS + Oxygenates/Gasoline Range Organics

Sample ID:	SB2-40'	SB3-5'	SB3-10'	SB3-15'	SB3-20'		
Jones ID:	ST-14061-26	ST-14061-38	ST-14061-39	ST-14061-40	ST-14061-41	**Reporting Limit**	**Units**
Analytes:							
Benzene	ND	ND	ND	ND	ND	1.0	µg/kg
Ethylbenzene	ND	ND	ND	ND	ND	1.0	µg/kg
Naphthalene	ND	ND	ND	ND	ND	1.0	µg/kg
Toluene	ND	ND	ND	ND	ND	1.0	µg/kg
m,p-Xylene	ND	ND	ND	ND	ND	2.0	µg/kg
o-Xylene	ND	ND	ND	ND	ND	1.0	µg/kg
Methyl-tert-butylether	ND	ND	ND	ND	ND	5.0	µg/kg
Ethyl-tert-butylether	ND	ND	ND	ND	ND	5.0	µg/kg
Di-isopropylether	ND	ND	ND	ND	ND	5.0	µg/kg
tert-amylmethylether	ND	ND	ND	ND	ND	5.0	µg/kg
tert-Butylalcohol	ND	ND	ND	ND	ND	50.0	µg/kg
Gasoline Range Organics (C4-C12)	ND	ND	ND	ND	ND	0.20	mg/kg
TIC:							
Ethanol	ND	ND	ND	ND	ND	50.0	µg/kg
Dilution Factor	1	1	1	1	1		
Surrogate Recoveries:						**QC Limits**	
Dibromofluoromethane	102%	109%	107%	103%	107%	60 - 140	
Toluene-d_8	96%	94%	95%	97%	95%	60 - 140	
4-Bromofluorobenzene	90%	90%	94%	95%	94%	60 - 140	
	VOC4-080619-01	VOC4-080119-01	VOC4-080119-02	VOC4-080119-02	VOC4-080119-02		

ND= Value less than reporting limit

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JONES ENVIRONMENTAL LABORATORY RESULTS

Client:	Encon Technologies, Inc.	**Report date:**	8/8/2019
Client Address:	12145 Mora Drive #7 Santa Fe Springs, CA 90670	**Jones Ref. No.:**	ST-14061
Attn:	Joe Scatoloni	**Date Sampled:**	7/25-26/2019
		Date Received:	7/26/2019
Project:	Trench Shoring	**Date Analyzed:**	8/1,2,6/2019
Project Address:	636 E. Rosecrans Ave, Los Angeles, CA	**Physical State:**	Soil

EPA 8260B by 5035 – Volatile Organics by GC/MS + Oxygenates/Gasoline Range Organics

Sample ID:	SB3-25'	SB3-30'	SB3-35'	SB3-40'		
Jones ID:	ST-14061-42	ST-14061-43	ST-14061-44	ST-14061-45	**Reporting Limit**	**Units**
Analytes:						
Benzene	ND	ND	ND	ND	1.0	µg/kg
Ethylbenzene	ND	ND	ND	ND	1.0	µg/kg
Naphthalene	ND	ND	ND	ND	1.0	µg/kg
Toluene	ND	ND	ND	ND	1.0	µg/kg
m,p-Xylene	ND	ND	ND	ND	2.0	µg/kg
o-Xylene	ND	ND	ND	ND	1.0	µg/kg
Methyl-tert-butylether	ND	ND	ND	ND	5.0	µg/kg
Ethyl-tert-butylether	ND	ND	ND	ND	5.0	µg/kg
Di-isopropylether	ND	ND	ND	ND	5.0	µg/kg
tert-amylmethylether	ND	ND	ND	ND	5.0	µg/kg
tert-Butylalcohol	ND	ND	ND	ND	50.0	µg/kg
Gasoline Range Organics (C4-C12)	ND	ND	ND	ND	0.20	mg/kg
TIC:						
Ethanol	ND	ND	ND	ND	50.0	µg/kg
Dilution Factor	1	1	1	1		
Surrogate Recoveries:					**QC Limits**	
Dibromofluoromethane	105%	106%	106%	107%	60 - 140	
Toluene-d_8	96%	97%	96%	93%	60 - 140	
4-Bromofluorobenzene	94%	96%	94%	97%	60 - 140	
	VOC4-080119-02	VOC4-080119-02	VOC4-080119-02	VOC4-080119-02		

ND= Value less than reporting limit

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JONES ENVIRONMENTAL QUALITY CONTROL INFORMATION

Client:	Encon Technologies, Inc.	**Report date:**	8/8/2019
Client Address:	12145 Mora Drive #7 Santa Fe Springs, CA 90670	**Jones Ref. No.:**	ST-14061
Attn:	Joe Scatoloni	**Date Sampled:**	7/25-26/2019
		Date Received:	7/26/2019
Project:	Trench Shoring	**Date Analyzed:**	8/1,2,6/2019
Project Address:	636 E. Rosecrans Ave, Los Angeles, CA	**Physical State:**	Soil

EPA 8260B by 5035 – Volatile Organics by GC/MS + Oxygenates/Gasoline Range Organics

Sample ID:	METHOD BLANK	METHOD BLANK	METHOD BLANK	METHOD BLANK		
Jones ID:	080119-V4MB1	080119-V4MB2	080119-V3MB1	080619-V4MB1	Reporting Limit	Units
Analytes:						
Benzene	ND	ND	ND	ND	1.0	µg/kg
Ethylbenzene	ND	ND	ND	ND	1.0	µg/kg
Naphthalene	ND	ND	ND	ND	1.0	µg/kg
Toluene	ND	ND	ND	ND	1.0	µg/kg
m,p-Xylene	ND	ND	ND	ND	2.0	µg/kg
o-Xylene	ND	ND	ND	ND	1.0	µg/kg
Methyl-tert-butylether	ND	ND	ND	ND	5.0	µg/kg
Ethyl-tert-butylether	ND	ND	ND	ND	5.0	µg/kg
Di-isopropylether	ND	ND	ND	ND	5.0	µg/kg
tert-amylmethylether	ND	ND	ND	ND	5.0	µg/kg
tert-Butylalcohol	ND	ND	ND	ND	50.0	µg/kg
Gasoline Range Organics (C4-C12)	ND	ND	ND	ND	0.20	mg/kg
TIC:						
Ethanol	ND	ND	ND	ND	50.0	µg/kg
Dilution Factor	1	1	1	1		
Surrogate Recoveries:					**QC Limits**	
Dibromofluoromethane	101%	104%	96%	97%	60 - 140	
Toluene-d8	97%	98%	99%	98%	60 - 140	
4-Bromofluorobenzene	92%	94%	93%	90%	60 - 140	
	VOC4-080119-01	VOC4-080119-02	VOC3-080119-01	VOC4-080619-01		

ND= Value less than reporting limit

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JONES ENVIRONMENTAL QUALITY CONTROL INFORMATION

Client:	Encon Technologies, Inc.	**Report date:**	8/8/2019
Client Address:	12145 Mora Drive #7 Santa Fe Springs, CA 90670	**Jones Ref. No.:**	ST-14061
Attn:	Joe Scatoloni	**Date Sampled:**	7/25-26/2019
		Date Received:	7/26/2019
Project:	Trench Shoring	**Date Analyzed:**	8/1,2,6/2019
Project Address:	636 E. Rosecrans Ave, Los Angeles, CA	**Physical State:**	Soil

EPA 8260B by 5035 – Volatile Organics by GC/MS + Oxygenates/Gasoline Range Organics

Sample Spiked:	CLEAN SOIL		**GC#:**	VOC4-080119-01		
Jones ID:	**080119-V4MS1**	**080119-V4MSD1**			**080119-V4CCV1**	
Parameter	MS Recovery (%)	MSD Recovery (%)	RPD	Acceptability Range (%)	CCV	Acceptability Range (%)
Benzene	100%	98%	1.3%	60 - 140	106%	80 - 120
Ethylbenzene	106%	109%	2.9%	60 - 140	117%	80 - 120
Naphthalene	90%	103%	13.5%	70 - 130	101%	80 - 120
Toluene	86%	89%	2.9%	70 - 130	100%	80 - 120
m,p-Xylene	93%	94%	1.0%	70 - 130	104%	80 - 120
o-Xylene	93%	97%	3.8%	70 - 130	102%	80 - 120
Gasoline Range Organics (C4-C12)	93%	96%	3.3%	70 - 130		
Surrogate Recovery:						
Dibromofluoromethane	102%	106%		60 - 140	103%	60 - 140
Toluene-d_8	93%	98%		60 - 140	109%	60 - 140
4-Bromofluorobenzene	91%	99%		60 - 140	114%	60 - 140

MS = Matrix Spike
MSD = Matrix Spike Duplicate
CCV = Continuing Calibration Verification
RPD = Relative Percent Difference; Acceptability range for RPD is ≤ 20%

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JONES ENVIRONMENTAL QUALITY CONTROL INFORMATION

Client:	Encon Technologies, Inc.	**Report date:**	8/8/2019
Client Address:	12145 Mora Drive #7 Santa Fe Springs, CA 90670	**Jones Ref. No.:**	ST-14061
Attn:	Joe Scatoloni	**Date Sampled:**	7/25-26/2019
		Date Received:	7/26/2019
Project:	Trench Shoring	**Date Analyzed:**	8/1,2,6/2019
Project Address:	636 E. Rosecrans Ave, Los Angeles, CA	**Physical State:**	Soil

EPA 8260B by 5035 – Volatile Organics by GC/MS + Oxygenates/Gasoline Range Organics

Sample Spiked:	CLEAN SOIL		**GC#:**	VOC4-080119-02	
Jones ID:	**080119-V4MS2**	**080119-V4MSD2**		**080119-V4CCV2**	
Parameter	MS Recovery (%)	MSD Recovery (%)	RPD	Acceptability Range (%)	CCV	Acceptability Range (%)
Benzene	100%	96%	4.7%	60 - 140	112%	80 - 120
Ethylbenzene	92%	100%	9.0%	60 - 140	116%	80 - 120
Naphthalene	87%	89%	2.7%	70 - 130	91%	80 - 120
Toluene	80%	87%	7.3%	70 - 130	101%	80 - 120
m,p-Xylene	83%	92%	10.6%	70 - 130	105%	80 - 120
o-Xylene	88%	94%	6.2%	70 - 130	107%	80 - 120
Gasoline Range Organics (C4-C12)	88%	92%	5.1%	70 - 130		
Surrogate Recovery:						
Dibromofluoromethane	107%	105%		60 - 140	100%	60 - 140
Toluene-d_8	95%	99%		60 - 140	107%	60 - 140
4-Bromofluorobenzene	93%	95%		60 - 140	109%	60 - 140

MS = Matrix Spike
MSD = Matrix Spike Duplicate
CCV = Continuing Calibration Verification
RPD = Relative Percent Difference; Acceptability range for RPD is ≤ 20%

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JONES ENVIRONMENTAL QUALITY CONTROL INFORMATION

Client:	Encon Technologies, Inc.	**Report date:**	8/8/2019
Client Address:	12145 Mora Drive #7 Santa Fe Springs, CA 90670	**Jones Ref. No.:**	ST-14061
Attn:	Joe Scatoloni	**Date Sampled:**	7/25-26/2019
		Date Received:	7/26/2019
Project:	Trench Shoring	**Date Analyzed:**	8/1,2,6/2019
Project Address:	636 E. Rosecrans Ave, Los Angeles, CA	**Physical State:**	Soil

EPA 8260B by 5035 – Volatile Organics by GC/MS + Oxygenates/Gasoline Range Organics

Sample Spiked:	CLEAN SOIL		**GC#:**	VOC3-080119-01		
Jones ID:	**080119-V3MS1**	**080119-V3MSD1**			**080119-V3CCV1**	
Parameter	MS Recovery (%)	MSD Recovery (%)	RPD	Acceptability Range (%)	CCV	Acceptability Range (%)
Benzene	103%	101%	2.6%	60 - 140	117%	80 - 120
Ethylbenzene	100%	104%	3.5%	60 - 140	118%	80 - 120
Naphthalene	66%	64%	2.1%	70 - 130	73%	80 - 120
Toluene	101%	102%	1.2%	70 - 130	119%	80 - 120
m,p-Xylene	105%	105%	0.2%	70 - 130	117%	80 - 120
o-Xylene	102%	105%	3.1%	70 - 130	113%	80 - 120
Gasoline Range Organics (C4-C12)	85%	86%	1%	70 - 130		
Surrogate Recovery:						
Dibromofluoromethane	102%	102%		60 - 140	98%	60 - 140
Toluene-d_8	101%	100%		60 - 140	103%	60 - 140
4-Bromofluorobenzene	98%	97%		60 - 140	110%	60 - 140

MS = Matrix Spike
MSD = Matrix Spike Duplicate
CCV = Continuing Calibration Verification
RPD = Relative Percent Difference; Acceptability range for RPD is $\leq 20\%$

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Client Address:	12145 Mora Drive #7 Santa Fe Springs, CA 90670	**Jones Ref. No.:**	ST-14061
Attn:	Joe Scatoloni	**Date Sampled:**	7/25-26/2019
		Date Received:	7/26/2019
Project:	Trench Shoring	**Date Analyzed:**	8/1,2,6/2019
Project Address:	636 E. Rosecrans Ave, Los Angeles, CA	**Physical State:**	Soil

EPA 8260B by 5035 – Volatile Organics by GC/MS + Oxygenates/Gasoline Range Organics

Sample Spiked:	CLEAN SOIL		**GC#:**	VOC4-080619-01		
Jones ID:	**080619-V4MS1**	**080619-V4MSD1**			**080619-V4CCV1**	
Parameter	MS Recovery (%)	MSD Recovery (%)	RPD	Acceptability Range (%)	CCV	Acceptability Range (%)
Benzene	112%	102%	9.6%	60 - 140	117%	80 - 120
Ethylbenzene	108%	96%	11.4%	60 - 140	115%	80 - 120
Naphthalene	92%	92%	0.1%	70 - 130	102%	80 - 120
Toluene	101%	89%	12.6%	70 - 130	105%	80 - 120
m,p-Xylene	106%	95%	10.7%	70 - 130	109%	80 - 120
o-Xylene	108%	97%	11.1%	70 - 130	112%	80 - 120
Methyl-tert-butylether	92%	87%	5.2%	70 - 130	108%	80 - 120
Gasoline Range Organics (C4-C12)	103%	94%	9.1%	70 - 130		
Surrogate Recovery:						
Dibromofluoromethane	104%	100%		60 - 140	100%	60 - 140
Toluene-d_8	98%	97%		60 - 140	105%	60 - 140
4-Bromofluorobenzene	94%	93%		60 - 140	108%	60 - 140

MS = Matrix Spike
MSD = Matrix Spike Duplicate
CCV = Continuing Calibration Verification
RPD = Relative Percent Difference; Acceptability range for RPD is $\leq 20\%$

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Turn Around Requested:
- ☐ Immediate Attention
- ☐ Rush 24 Hours
- ☐ Rush 48 Hours
- ☐ Rush 72 Hours
- X Normal

Report Options
EDD _____
EDF* - 10% Surcharge____
*Global ID _____

LAB USE ONLY
Jones Project # ST-14061
Page 1 of 5

Sample Condition as Recieved:
Chilled ☐ yes ☐ no
Sealed ☐ yes ☐ no

Client: ENCON TECHNOLOGIES INC.
Date: 7/25/19
Project Name: TRENCH SHORING
Client Project #:
Project Address: 636 E. ROSECRANS AVE.
LOS ANGELES, CA.
Email: encon@encontech.net
Phone: (562) 777-2200
Report To: JOE SCATOLONI
Sampler: DAVID BALTAZAR

Sample Container / Preservative Abbreviations
AS - Acetate Sleeve
SS - Stainless Steel Sleeve
BS - Brass Sleeve
G - Glass
AB - Amber Bottle
P - Plastic
SOBI - Sodium Bisulfate
MeOH - Methanol
HCl - Hydrochloric Acid
HNO3 - Nitric Acid
O - Other (See Notes)

Analysis Requested

Sample ID	Date	Sample Collection Time	Laboratory Sample ID	Preservative	Sample Container	Sample Matrix: Soil (S), Sludge (SL), Aqueous (A), Free Product (FP)	CAL-LUFT GC/FID ■ 5035	TPH-g / TPH-d	8260 B (BTEX, NAPHTHALENE,	OXYS, MTBE, DIPE, ETBE	TAME, TBA, ETHANOL)						Hold	Number of Containers	Notes & Special Instructions
SB1-5'	7/25/19	0820	ST-14061-01	5035	5035/SS	S	X	X	X	X	X							4	
SB1-10'		0825	ST-14061-02				X	X	X	X	X								
SB1-15'		0835	ST-14061-03				X	X	X	X	X								
SB1-20'		0840	ST-14061-04				X	X	X	X	X								
SB1-25'		0845	ST-14061-05				X	X	X	X	X								
SB1-30'		0855	ST-14061-06				X	X	X	X	X								
SB1-35'		0900	ST-14061-07				X	X	X	X	X								
SB1-40'		0905	ST-14061-08				X	X	X	X	X								
SB1-45'		0915	ST-14061-09														X		
SB1-50'	↓	0930	ST-14061-10	↓	↓	↓											X	↓	

Relinquished By (Signature)	Printed Name: DAVID BALTAZAR	Received By (Signature)	Printed Name: Jonathan Zapata
Company: ENCON	Date: 7/26/19 Time: 1423	Company: JONES	Date: 7-26-19 Time: 1423
Relinquished By (Signature)	Printed Name	Received By Laboratory (Signature)	Printed Name
Company	Date: Time	Company	Date Time

40 Total Number of Containers

Client signature on this Chain of Custody form constitutes acknowledgement that the above analyses have been requested, and the information provided herein is correct and accurate.

Chain-of-Custody Record

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Jones Project # ST-14061

Page 2 of 5

Sample Condition as Recieved:
Chilled ☐ yes ☐ no
Sealed ☐ yes ☐ no

Client: ENCON TECHNOLOGIES INC.
Date: 7/25/19
Project Name:
Client Project #:
Project Address: SEE PAGE 1
Email:
Phone:
Report To: Sampler:

Turn Around Requested:
☐ Immediate Attention
☐ Rush 24 Hours
☐ Rush 48 Hours
☐ Rush 72 Hours
X Normal

Report Options
EDD ____
EDF* - 10% Surcharge____
*Global ID _____

Sample Container / Preservative Abbreviations
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SS - Stainless Steel Sleeve
BS - Brass Sleeve
G - Glass
AB - Amber Bottle
P - Plastic
SOBI - Sodium Bisulfate
MeOH - Methanol
HCl - Hydrochloric Acid
HNO3 - Nitric Acid
O - Other (See Notes)

Analysis Requested

Sample ID	Date	Sample Collection Time	Laboratory Sample ID	Preservative	Sample Container	Sample Matrix: Soil (S), Sludge (SL), Aqueous (A), Free Product (FP)	CAL-LUFT GC/FID 5035	TPH-g / TPH-d	8260B (BTEX, NAPHTHALENE,	OXYS, MTBE, DIPE, ETBE,	TAME, TBA, ETHANOL)	Hold	Number of Containers	Notes & Special Instructions
SB1-55'	7/25/19	0940	ST-14061-11	5035	5035/SS	S						X	4	
SB1-60'		0945	ST-14061-12									X		
SB1-65'		0955	ST-14061-13									X		
SB1-70'		1005	ST-14061-14									X		
SB1-75'		1015	ST-14061-15									X		
SB1-80'		1020	ST-14061-16									X		
SB1-85'		1025	ST-14061-17									X		
SB1-90'		1035	ST-14061-18									X		
SB2-5'		1300	ST-14061-19				X	X	X	X	X			
SB2-10'		1310	ST-14061-20				X	X	X	X	X			

Relinquished By (Signature)	Printed Name	Received By (Signature)	Printed Name		
	DAVID BALTAZAR		Jonathan Zapata	40	Total Number of Containers
Company: ENCON	Date: 7/26/19 Time: 1423	Company: JONES	Date: 7-26-19 Time: 1423		
Relinquished By (Signature)	Printed Name	Received By Laboratory (Signature)	Printed Name		
Company	Date: Time	Company	Date Time		

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Jones Project # ST-14061

Page 3 of 5

Sample Condition as Recieved:
Chilled ☐ yes ☐ no
Sealed ☐ yes ☐ no

Client: ENCON TECHNOLOGIES INC. Date: 7/25/19

Project Name: SEE PAGE 1 Client Project #:

Project Address:

Email:

Phone:

Report To: Sampler:

Turn Around Requested:
☐ Immediate Attention
☐ Rush 24 Hours
☐ Rush 48 Hours
☐ Rush 72 Hours
☒ Normal

Report Options
EDD ____
EDF* - 10% Surcharge____
*Global ID _____

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G - Glass
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P - Plastic
SOBI - Sodium Bisulfate
MeOH - Methanol
HCl - Hydrochloric Acid
HNO3 - Nitric Acid
O - Other (See Notes)

Analysis Requested

Sample ID	Date	Sample Collection Time	Laboratory Sample ID	Preservative	Sample Container	Sample Matrix: Soil (S), Sludge (SL), Aqueous (A), Free Product (FP)	GAS/BTEX GC/FID 5035	TPH-g / TPH-d	8260B (BTEX, NAPHTHALENE, OXYS, MTBE, DIPE, ETBE, TAME, TBA, ETHANOL)	Hold	Number of Containers	Notes & Special Instructions
SB2-15'	7/25/19	1315	(DB) ST-14061-21	5035	5035/SS	S	X	X	X		4	
SB2-20'		1325	ST-14061-22				X	X	X			
SB2-25'		1330	ST-14061-23				X	X	X			
SB2-30'		1340	ST-14061-24				X	X	X			
SB2-35'		1345	ST-14061-25				X	X	X			
SB2-40'		1350	ST-14061-26				X	X	X			
SB2-45'		1355	ST-14061-27							X		
SB2-50'		1410	ST-14061-28							X		
SB2-55'		1420	ST-14061-29							X		
SB2-60'		1430	ST-14061-30							X		

Relinquished By (Signature)	Printed Name: DAVID BALTAZAR	Received By (Signature)	Printed Name: Jonathan Zapata	40	Total Number of Containers
Company: ENCON	Date: 7/26/19 Time: 1423	Company: JONES	Date: 7-26-19 Time: 1423		
Relinquished By (Signature)	Printed Name	Received By Laboratory (Signature)	Printed Name		
Company	Date: Time	Company	Date Time		

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Jones Project # ST-14061

Page 4 of 5

Sample Condition as Recieved:
Chilled ☐ yes ☐ no
Sealed ☐ yes ☐ no

Client: ENCON TECHNOLOGIES INC.
Date: 7/25/19
Project Name:
Client Project #:
Project Address: SEE PAGE 1
Email:
Phone:
Report To: Sampler:

Turn Around Requested:
☐ Immediate Attention
☐ Rush 24 Hours
☐ Rush 48 Hours
☐ Rush 72 Hours
X Normal

Report Options
EDD ____
EDF* - 10% Surcharge____
*Global ID _____

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HCl - Hydrochloric Acid
HNO3 - Nitric Acid
O - Other (See Notes)

Analysis Requested

Sample ID	Date	Sample Collection Time	Laboratory Sample ID	Preservative	Sample Container	Sample Matrix: Soil (S), Sludge (SL), Aqueous (A), Free Product (FP)	CAL-LUFT GC/FID 5035	TPH-g / TPH-d	8260B (BTEX, NAPHTHALENE, DIPE, ETBE, TAME, TBA, ETHANOL)	Hold	Number of Containers	Notes & Special Instructions
SB2-65'	7/25/19	1440	ST-14061-31	5035	5035/SS	S				X	4	
SB2-70'		1445	ST-14061-32							X		
SB2-75'		[illegible]	ST-14061-33							X		
SB2-80'	↓	1505	ST-14061-34							X		
SB2-85'	7/26/19	0720	ST-14061-35							X		
SB2-90'		0730	ST-14061-36							X		
SB2-95'		0745	ST-14061-37							X		
SB3-5'		1015	ST-14061-38				X	X	X			
SB3-10'		1020	ST-14061-39				X	X	X			
SB3-15'	↓	1025	ST-14061-40	↓	↓	↓	X	X	X		↓	

Relinquished By (Signature)	Printed Name: DAVID BALTAZAR	Received By (Signature)	Printed Name: Jonathan Zapata	40 Total Number of Containers
Company: ENCON	Date: 7/26/19 Time: 1423	Company: JONES	Date: 7-26-19 Time: 1423	
Relinquished By (Signature)	Printed Name:	Received By Laboratory (Signature)	Printed Name:	Client signature on this Chain of Custody form constitutes acknowledgement that the above analyses have been reqested, and the information provided herein is correct and accurate.
Company	Date: Time:	Company	Date Time	

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LAB USE ONLY
Jones Project # ST-14061
Page 5 of 5
Sample Condition as Recieved:
Chilled ☐ yes ☐ no
Sealed ☐ yes ☐ no

Client: ENCON TECHNOLOGIES INC.
Date: 7/26/19
Project Name:
Client Project #:
Project Address: SEE PAGE 1
Email:
Phone:
Report To: Sampler:

Turn Around Requested:
☐ Immediate Attention
☐ Rush 24 Hours
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Report Options
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EDF* - 10% Surcharge____
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MeOH - Methanol
HCl - Hydrochloric Acid
HNO3 - Nitric Acid
O - Other (See Notes)

Analysis Requested

Sample ID	Date	Sample Collection Time	Laboratory Sample ID	Preservative	Sample Container	Sample Matrix: Soil (S), Sludge (SL), Aqueous (A), Free Product (FP)	CAL-LUFT GC/FID 5035	TPH-g/TPH-d	8260B (BTEX, NAPHTHALENE, OXYS, MTBE, DIPE, ETBE, TAME, TBA, ETHANOL)	Hold	Number of Containers	Notes & Special Instructions
SB3-20'	7/26/19	1035	ST-14061-41	5035		S	X	X	X		4	
SB3-25'		1040	ST-14061-42				X	X	X			
SB3-30'		1050	ST-14061-43				X	X	X			
SB3-35'		1100	ST-14061-44				X	X	X			
SB3-40'		1105	ST-14061-45				X	X	X			
SB3-45'		1115	ST-14061-46							X		
SB3-50'		1125	ST-14061-47							X		
SB3-55'		1135	ST-14061-48							X		
SB3-60'		1145	ST-14061-49							X		

Relinquished By (Signature)	Printed Name		Received By (Signature)	Printed Name		36	Total Number of Containers
Company: ENCON	Date: 7/26/19	Time: 1423	Company: JONES	Date: 7-26-19	Time: 1423		
Relinquished By (Signature)	Printed Name		Received By Laboratory (Signature)	Printed Name			
Company	Date:	Time	Company	Date	Time		

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805-399-0060

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SANTA FE SPRINGS, CA 90670
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JONES ENVIRONMENTAL
LABORATORY RESULTS

Client:	Encon Technologies, Inc.	**Report date:**	8/15/2019
Client Address:	12145 Mora Drive #7 Santa Fe Springs, CA 90670	**JEL Ref. No.:**	ST-14061
Attn:	Joe Scatoloni	**Date Sampled:**	7/25-26/2019
		Date Received:	7/26/2019
Project:	Trench Shoring	**Physical State:**	Soil
Project Address:	636 E. Rosecrans Ave, Los Angeles, CA		

ANALYSES REQUESTED

Soil:

1. EPA 8015M – Extended Range Hydrocarbons
2. EPA 8260B by 5035 – Volatile Organics by GC/MS + Oxygenates/Gasoline Range Organics

Approval:

David Mirakian, M.S.
Stationary Lab Chemist

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JONES ENVIRONMENTAL
LABORATORY RESULTS

Client:	Encon Technologies, Inc.	**Report date:**	8/15/2019
Client Address:	12145 Mora Drive #7 Santa Fe Springs, CA 90670	**Jones Ref. No.:**	ST-14061
Attn:	Joe Scatoloni	**Date Sampled:**	7/25-26/2019
		Date Received:	7/26/2019
Project:	Trench Shoring	**Date Analyzed:**	8/9,12/2019
Project Address:	636 E. Rosecrans Ave, Los Angeles, CA	**Physical State:**	Soil

EPA 8015M - Extended Range Hydrocarbons

Sample ID:	SB1-45'	SB1-50'	SB1-55'	SB1-60'	SB1-65'		
Jones ID:	ST-14061-09	ST-14061-10	ST-14061-11	ST-14061-12	ST-14061-13	Reporting Limit	Units
Carbon Chain Range							
C10 - C11	**640**	ND	ND	ND	ND	1.0	mg/kg
C12 - C13	**950**	ND	ND	ND	ND	1.0	mg/kg
C14 - C15	**923**	ND	ND	ND	ND	1.0	mg/kg
C16 - C17	**898**	ND	ND	ND	ND	1.0	mg/kg
C18 - C19	**589**	ND	ND	ND	ND	1.0	mg/kg
C20 - C23	**451**	ND	ND	ND	ND	1.0	mg/kg
C24 - C27	**51.2**	ND	ND	ND	ND	1.0	mg/kg
C28 - C31	**1.1**	ND	ND	ND	ND	1.0	mg/kg
C32 - C35	ND	ND	ND	ND	ND	1.0	mg/kg
C36 - C39	ND	ND	ND	ND	ND	1.0	mg/kg
C40 - C43	ND	ND	ND	ND	ND	1.0	mg/kg
C13 - C22	**3310**	ND	ND	ND	ND	10.0	mg/kg
C23 - C40	**114**	ND	ND	ND	ND	10.0	mg/kg
Dilution Factor	10	1	1	1	1		
Surrogate Recovery:						QC Limits	
Hexacosane	87%	52%	71%	63%	80%	30 - 120	
Batch:	8015_081219_01	8015_080919_01	8015_080919_01	8015_080919_01	8015_080919_01		

ND = Value less than reporting limit

JONES ENVIRONMENTAL, INC.

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LABORATORY RESULTS

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Client Address:	12145 Mora Drive #7 Santa Fe Springs, CA 90670	**Jones Ref. No.:**	ST-14061
Attn:	Joe Scatoloni	**Date Sampled:**	7/25-26/2019
		Date Received:	7/26/2019
Project:	Trench Shoring	**Date Analyzed:**	8/9,12/2019
Project Address:	636 E. Rosecrans Ave, Los Angeles, CA	**Physical State:**	Soil

EPA 8015M - Extended Range Hydrocarbons

Sample ID:	SB1-70'	SB1-75'	SB1-80'	SB1-85'	SB1-90'		
Jones ID:	ST-14061-14	ST-14061-15	ST-14061-16	ST-14061-17	ST-14061-18	Reporting Limit	Units
Carbon Chain Range							
C10 - C11	ND	ND	ND	ND	ND	1.0	mg/kg
C12 - C13	ND	ND	ND	ND	ND	1.0	mg/kg
C14 - C15	ND	ND	ND	ND	ND	1.0	mg/kg
C16 - C17	ND	ND	ND	ND	ND	1.0	mg/kg
C18 - C19	ND	ND	ND	ND	ND	1.0	mg/kg
C20 - C23	ND	ND	ND	ND	ND	1.0	mg/kg
C24 - C27	ND	ND	ND	ND	ND	1.0	mg/kg
C28 - C31	ND	ND	ND	ND	ND	1.0	mg/kg
C32 - C35	ND	ND	ND	ND	ND	1.0	mg/kg
C36 - C39	ND	ND	ND	ND	ND	1.0	mg/kg
C40 - C43	ND	ND	ND	ND	ND	1.0	mg/kg
C13 - C22	ND	ND	ND	ND	ND	10.0	mg/kg
C23 - C40	ND	ND	ND	ND	ND	10.0	mg/kg
Dilution Factor	1	1	1	1	1		
Surrogate Recovery:						QC Limits	
Hexacosane	105%	97%	77%	106%	95%	30 - 120	
Batch:	8015_080919_01	8015_080919_01	8015_080919_01	8015_080919_01	8015_080919_01		

ND = Value less than reporting limit

JONES ENVIRONMENTAL, INC.

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JONES ENVIRONMENTAL
LABORATORY RESULTS

Client:	Encon Technologies, Inc.	**Report date:**	8/15/2019
Client Address:	12145 Mora Drive #7 Santa Fe Springs, CA 90670	**Jones Ref. No.:**	ST-14061
Attn:	Joe Scatoloni	**Date Sampled:**	7/25-26/2019
		Date Received:	7/26/2019
Project:	Trench Shoring	**Date Analyzed:**	8/9,12/2019
Project Address:	636 E. Rosecrans Ave, Los Angeles, CA	**Physical State:**	Soil

EPA 8015M - Extended Range Hydrocarbons

Sample ID:	METHOD BLANK	METHOD BLANK		
Jones ID:	MB-080919_01	MB-081219_01	Reporting Limit	Units
Carbon Chain Range				
C10 - C11	ND	ND	1.0	mg/kg
C12 - C13	ND	ND	1.0	mg/kg
C14 - C15	ND	ND	1.0	mg/kg
C16 - C17	ND	ND	1.0	mg/kg
C18 - C19	ND	ND	1.0	mg/kg
C20 - C23	ND	ND	1.0	mg/kg
C24 - C27	ND	ND	1.0	mg/kg
C28 - C31	ND	ND	1.0	mg/kg
C32 - C35	ND	ND	1.0	mg/kg
C36 - C39	ND	ND	1.0	mg/kg
C40 - C43	ND	ND	1.0	mg/kg
C13 - C22	ND	ND	10.0	mg/kg
C23 - C40	ND	ND	10.0	mg/kg
Dilution Factor	1	1		
Surrogate Recovery:			QC Limits	
Hexacosane	79%	96%	30 - 120	
Batch:	8015_080919_01	8015_081219_01		

ND = Value less than reporting limit

JONES ENVIRONMENTAL, INC.

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JONES ENVIRONMENTAL QUALITY CONTROL INFORMATION

Client:	Encon Technologies, Inc.	**Report date:**	8/15/2019
Client Address:	12145 Mora Drive #7 Santa Fe Springs, CA 90670	**Jones Ref. No.:**	ST-14061
Attn:	Joe Scatoloni	**Date Sampled:**	7/25-26/2019
		Date Received:	7/26/2019
Project:	Trench Shoring	**Date Analyzed:**	8/9,12/2019
Project Address:	636 E. Rosecrans Ave, Los Angeles, CA	**Physical State:**	Soil

BATCH: 8015_080919_01 **Prepared:** 8/9/2019 **Analyzed:** 8/9/2019

EPA 8015M - Extended Range Hydrocarbons

	Result	Spike Level	% Recovery	% RPD	% Recovery Limits	Units
LCS:	LCS-080919_01	**SAMPLE SPIKED:**	CLEAN SOIL			
Analyte:						
Diesel	**348**	500	70%		60 - 140	mg/kg
Surrogate Recovery:						
Hexacosane			103%		30 - 120	
LCSD:	LCSD-080919_01	**SAMPLE SPIKED:**	CLEAN SOIL			
Analyte:						
Diesel	**351**	500	70%	0.9%	60 - 140	mg/kg
Surrogate Recoveries:						
Hexacosane			97%		30 - 120	
CCV:	CCV-080919_01					
Analyte:						
Diesel	**1080**	1000	108%		80 - 120	mg/kg

LCS = Laboratory Control Sample
LCSD= Laboratory Control Sample Duplicate
CCV = Continuing Calibration Verification
RPD = Relative Percent Difference

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JONES ENVIRONMENTAL
QUALITY CONTROL INFORMATION

Client:	Encon Technologies, Inc.	**Report date:**	8/15/2019
Client Address:	12145 Mora Drive #7 Santa Fe Springs, CA 90670	**Jones Ref. No.:**	ST-14061
Attn:	Joe Scatoloni	**Date Sampled:**	7/25-26/2019
		Date Received:	7/26/2019
Project:	Trench Shoring	**Date Analyzed:**	8/9,12/2019
Project Address:	636 E. Rosecrans Ave, Los Angeles, CA	**Physical State:**	Soil

BATCH: 8015_081219_01 **Prepared:** 8/12/2019 **Analyzed:** 8/12/2019

EPA 8015M - Extended Range Hydrocarbons

	Result	Spike Level	% Recovery	% RPD	% Recovery Limits	Units
LCS:	LCS-081219_01	**SAMPLE SPIKED:**	CLEAN SOIL			
Analyte:						
Diesel	**369**	500	74%		60 - 140	mg/kg
Surrogate Recovery:						
Hexacosane			98%		30 - 120	
LCSD:	LCSD-081219_01	**SAMPLE SPIKED:**	CLEAN SOIL			
Analyte:						
Diesel	**394**	500	79%	6.6%	60 - 140	mg/kg
Surrogate Recoveries:						
Hexacosane			99%		30 - 120	
CCV:	CCV-081219_01					
Analyte:						
Diesel	**1130**	1000	113%		80 - 120	mg/kg

LCS = Laboratory Control Sample
LCSD= Laboratory Control Sample Duplicate
CCV = Continuing Calibration Verification
RPD = Relative Percent Difference

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JONES ENVIRONMENTAL LABORATORY RESULTS

Client:	Encon Technologies, Inc.	**Report date:**	8/15/2019
Client Address:	12145 Mora Drive #7 Santa Fe Springs, CA 90670	**Jones Ref. No.:**	ST-14061
Attn:	Joe Scatoloni	**Date Sampled:**	7/25-26/2019
		Date Received:	7/26/2019
Project:	Trench Shoring	**Date Analyzed:**	8/12,13,14/2019
Project Address:	636 E. Rosecrans Ave, Los Angeles, CA	**Physical State:**	Soil

EPA 8260B by 5035 – Volatile Organics by GC/MS + Oxygenates/Gasoline Range Organics

Sample ID:	**SB1-45'**	**SB1-50'**	**SB1-55'**	**SB1-60'**	**SB1-65'**		
Jones ID:	**ST-14061-09**	**ST-14061-10**	**ST-14061-11**	**ST-14061-12**	**ST-14061-13**	**Reporting Limit**	**Units**
Analytes:							
Benzene	ND	ND	ND	ND	ND	1.0	µg/kg
Ethylbenzene	**1490**	ND	ND	ND	ND	1.0	µg/kg
Naphthalene	ND	ND	ND	ND	ND	1.0	µg/kg
Toluene	**302**	ND	ND	ND	ND	1.0	µg/kg
m,p-Xylene	**5760**	ND	ND	ND	**1.3**	2.0	µg/kg
o-Xylene	**2830**	ND	ND	ND	ND	1.0	µg/kg
Methyl-tert-butylether	**77.9**	ND	ND	ND	ND	5.0	µg/kg
Ethyl-tert-butylether	ND	ND	ND	ND	ND	5.0	µg/kg
Di-isopropylether	ND	ND	ND	ND	ND	5.0	µg/kg
tert-amylmethylether	ND	ND	ND	ND	ND	5.0	µg/kg
tert-Butylalcohol	**412**	ND	ND	ND	ND	50.0	µg/kg
Gasoline Range Organics (C4-C12)	**527**	ND	ND	ND	ND	0.20	mg/kg
TIC:							
Ethanol	ND	ND	ND	ND	ND	50.0	µg/kg
Dilution Factor	100	1	1	1	1		
Surrogate Recoveries:						**QC Limits**	
Dibromofluoromethane	103%	106%	92%	109%	109%	60 - 140	
Toluene-d_8	104%	98%	100%	96%	96%	60 - 140	
4-Bromofluorobenzene	101%	96%	94%	95%	94%	60 - 140	
	VOC4-081319-01	VOC4-081319-01	VOC3-081419-01	VOC4-081319-01	VOC4-081319-01		

ND= Value less than reporting limit

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JONES ENVIRONMENTAL LABORATORY RESULTS

Client:	Encon Technologies, Inc.	**Report date:**	8/15/2019
Client Address:	12145 Mora Drive #7 Santa Fe Springs, CA 90670	**Jones Ref. No.:**	ST-14061
Attn:	Joe Scatoloni	**Date Sampled:**	7/25-26/2019
		Date Received:	7/26/2019
Project:	Trench Shoring	**Date Analyzed:**	8/13/2019
Project Address:	636 E. Rosecrans Ave, Los Angeles, CA	**Physical State:**	Soil

EPA 8260B by 5035 – Volatile Organics by GC/MS + Oxygenates/Gasoline Range Organics

Sample ID:	**SB1-70'**	**SB1-75'**	**SB1-80'**	**SB1-85'**	**SB1-90'**		
Jones ID:	**ST-14061-14**	**ST-14061-15**	**ST-14061-16**	**ST-14061-17**	**ST-14061-18**	**Reporting Limit**	**Units**
Analytes:							
Benzene	ND	ND	ND	ND	ND	1.0	µg/kg
Ethylbenzene	ND	ND	ND	ND	ND	1.0	µg/kg
Naphthalene	ND	1.2	ND	ND	ND	1.0	µg/kg
Toluene	ND	ND	ND	ND	ND	1.0	µg/kg
m,p-Xylene	ND	ND	ND	ND	ND	2.0	µg/kg
o-Xylene	ND	ND	ND	ND	ND	1.0	µg/kg
Methyl-tert-butylether	ND	ND	ND	ND	ND	5.0	µg/kg
Ethyl-tert-butylether	ND	ND	ND	ND	ND	5.0	µg/kg
Di-isopropylether	ND	ND	ND	ND	ND	5.0	µg/kg
tert-amylmethylether	ND	ND	ND	ND	ND	5.0	µg/kg
tert-Butylalcohol	ND	ND	ND	ND	ND	50.0	µg/kg
Gasoline Range Organics (C4-C12)	ND	ND	ND	ND	ND	0.20	mg/kg
TIC:							
Ethanol	ND	ND	ND	ND	ND	50.0	µg/kg
Dilution Factor	1	1	1	1	1		
Surrogate Recoveries:						**QC Limits**	
Dibromofluoromethane	94%	108%	102%	106%	109%	60 - 140	
Toluene-d_8	101%	105%	100%	102%	101%	60 - 140	
4-Bromofluorobenzene	98%	100%	97%	95%	99%	60 - 140	
	VOC3-081419-01	VOC3-081219-01	VOC3-081219-01	VOC3-081219-01	VOC3-081219-01		

ND= Value less than reporting limit

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JONES ENVIRONMENTAL QUALITY CONTROL INFORMATION

Client:	Encon Technologies, Inc.	**Report date:**	8/15/2019
Client Address:	12145 Mora Drive #7 Santa Fe Springs, CA 90670	**Jones Ref. No.:**	ST-14061
Attn:	Joe Scatoloni	**Date Sampled:**	7/25-26/2019
		Date Received:	7/26/2019
Project:	Trench Shoring	**Date Analyzed:**	8/12,13,14/2019
Project Address:	636 E. Rosecrans Ave, Los Angeles, CA	**Physical State:**	Soil

EPA 8260B by 5035 – Volatile Organics by GC/MS + Oxygenates/Gasoline Range Organics

Sample ID:	METHOD BLANK	METHOD BLANK	METHOD BLANK	METHOD BLANK		
Jones ID:	081219-V3MB1	081319-V4MB1	081419-V3MB1		**Reporting Limit**	**Units**
Analytes:						
Benzene	ND	ND	ND	ND	1.0	µg/kg
Ethylbenzene	ND	ND	ND	ND	1.0	µg/kg
Naphthalene	ND	ND	ND	ND	1.0	µg/kg
Toluene	ND	ND	ND	ND	1.0	µg/kg
m,p-Xylene	ND	ND	ND	ND	2.0	µg/kg
o-Xylene	ND	ND	ND	ND	1.0	µg/kg
Methyl-tert-butylether	ND	ND	ND	ND	5.0	µg/kg
Ethyl-tert-butylether	ND	ND	ND	ND	5.0	µg/kg
Di-isopropylether	ND	ND	ND	ND	5.0	µg/kg
tert-amylmethylether	ND	ND	ND	ND	5.0	µg/kg
tert-Butylalcohol	ND	ND	ND	ND	50.0	µg/kg
Gasoline Range Organics (C4-C12)	ND	ND	ND	ND	0.20	mg/kg
TIC:						
Ethanol	ND	ND	ND	ND	50.0	µg/kg
Dilution Factor	1	1	1	1		
Surrogate Recoveries:					**QC Limits**	
Dibromofluoromethane	92%	99%			60 - 140	
Toluene-d8	99%	100%			60 - 140	
4-Bromofluorobenzene	95%	86%			60 - 140	
	VOC3-081219-01	VOC4-081319-01	VOC3-081419-01			

ND= Value less than reporting limit

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JONES ENVIRONMENTAL QUALITY CONTROL INFORMATION

Client:	Encon Technologies, Inc.	**Report date:**	8/15/2019
Client Address:	12145 Mora Drive #7 Santa Fe Springs, CA 90670	**Jones Ref. No.:**	ST-14061
Attn:	Joe Scatoloni	**Date Sampled:**	7/25-26/2019
		Date Received:	7/26/2019
Project:	Trench Shoring	**Date Analyzed:**	8/12,13,14/2019
Project Address:	636 E. Rosecrans Ave, Los Angeles, CA	**Physical State:**	Soil

EPA 8260B by 5035 – Volatile Organics by GC/MS + Oxygenates/Gasoline Range Organics

Sample Spiked:	CLEAN SOIL		**GC#:**	VOC3-081219-01		
Jones ID:	**081219-V3MS1**	**081219-V3MSD1**			**081219-V3CCV1**	
Parameter	MS Recovery (%)	MSD Recovery (%)	RPD	Acceptability Range (%)	CCV	Acceptability Range (%)
Benzene	118%	108%	8.5%	60 - 140	103%	80 - 120
Ethylbenzene	115%	110%	3.8%	60 - 140	108%	80 - 120
Naphthalene	73%	79%	7.1%	70 - 130	83%	80 - 120
Toluene	115%	113%	1.9%	70 - 130	107%	80 - 120
m,p-Xylene	116%	112%	3.7%	70 - 130	108%	80 - 120
o-Xylene	110%	109%	1.4%	70 - 130	103%	80 - 120
Methyl-tert-butylether	3%	10%	101.9%	70 - 130	18%	80 - 120
Gasoline Range Organics (C4-C12)	96%	94%	1.8%	70 - 130		
Surrogate Recovery:						
Dibromofluoromethane	102%	102%		60 - 140	94%	60 - 140
Toluene-d8	104%	101%		60 - 140	103%	60 - 140
4-Bromofluorobenzene	96%	101%		60 - 140	108%	60 - 140

MS = Matrix Spike
MSD = Matrix Spike Duplicate
CCV = Continuing Calibration Verification
RPD = Relative Percent Difference; Acceptability range for RPD is ≤ 20%

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JONES ENVIRONMENTAL QUALITY CONTROL INFORMATION

Client:	Encon Technologies, Inc.	**Report date:**	8/15/2019
Client Address:	12145 Mora Drive #7 Santa Fe Springs, CA 90670	**Jones Ref. No.:**	ST-14061
Attn:	Joe Scatoloni	**Date Sampled:**	7/25-26/2019
		Date Received:	7/26/2019
Project:	Trench Shoring	**Date Analyzed:**	8/12,13,14/2019
Project Address:	636 E. Rosecrans Ave, Los Angeles, CA	**Physical State:**	Soil

EPA 8260B by 5035 – Volatile Organics by GC/MS + Oxygenates/Gasoline Range Organics

Sample Spiked:	CLEAN SOIL		**GC#:**	VOC4-081319-01		
Jones ID:	**081319-V4MS1**	**081319-V4MSD1**			**081319-V4CCV1**	
Parameter	MS Recovery (%)	MSD Recovery (%)	RPD	Acceptability Range (%)	CCV	Acceptability Range (%)
Benzene	95%	94%	1.0%	60 - 140	101%	80 - 120
Ethylbenzene	91%	96%	4.8%	60 - 140	107%	80 - 120
Naphthalene	91%	84%	8.6%	70 - 130	85%	80 - 120
Toluene	80%	86%	7.2%	70 - 130	92%	80 - 120
m,p-Xylene	87%	90%	3.3%	70 - 130	99%	80 - 120
o-Xylene	88%	93%	5.3%	70 - 130	100%	80 - 120
Methyl-tert-butylether	85%	83%	2.1%	70 - 130	92%	80 - 120
Gasoline Range Organics (C4-C12)	88%	89%	1.5%	70 - 130		
Surrogate Recovery:						
Dibromofluoromethane	104%	103%		60 - 140	102%	60 - 140
Toluene-d8	98%	98%		60 - 140	109%	60 - 140
4-Bromofluorobenzene	94%	93%		60 - 140	110%	60 - 140

MS = Matrix Spike
MSD = Matrix Spike Duplicate
CCV = Continuing Calibration Verification
RPD = Relative Percent Difference; Acceptability range for RPD is ≤ 20%

Chain-of-Custody Record

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Jones Project # ST-14061
Page 1 of 5

Sample Condition as Recieved:
Chilled ☐ yes ☐ no
Sealed ☐ yes ☐ no

Client: ENCON TECHNOLOGIES INC.
Date: 7/25/19
Project Name: TRENCH SHORING
Client Project #:
Project Address: 636 E. ROSECRANS AVE.
LOS ANGELES, CA.
Email: encon@encontech.net
Phone: (562) 777-2200
Report To: JOE SCATOLONI
Sampler: DAVID BALTAZAR

Turn Around Requested:
☐ Immediate Attention
☐ Rush 24 Hours
☐ Rush 48 Hours
☐ Rush 72 Hours
X Normal

Report Options
EDD ____
EDF* - 10% Surcharge____
*Global ID _____

Sample Container / Preservative Abbreviations
AS - Acetate Sleeve
SS - Stainless Steel Sleeve
BS - Brass Sleeve
G - Glass
AB - Amber Bottle
P - Plastic
SOBI - Sodium Bisulfate
MeOH - Methanol
HCl - Hydrochloric Acid
HNO3 - Nitric Acid
O - Other (See Notes)

Analysis Requested

Sample ID	Date	Sample Collection Time	Laboratory Sample ID	Preservative	Sample Container	Sample Matrix: Soil (S), Sludge (SL), Aqueous (A), Free Product (FP)	CAL-LUFT GC/FID 5035	TPH-g / TPH-d	8260 B (BTEX, NAPHTHALENE, OXYS, MTBE, DIPE, ETBE, TAME, TBA, ETHANOL)	Hold	Number of Containers	Notes & Special Instructions
SB1-5'	7/25/19	0820	ST-14061-01	5035	5035 SS	S	X	X	X		4	
SB1-10'		0825	ST-14061-02				X	X	X			
SB1-15'		0835	ST-14061-03				X	X	X			
SB1-20'		0840	ST-14061-04				X	X	X			
SB1-25'		0845	ST-14061-05				X	X	X			
SB1-30'		0855	ST-14061-06				X	X	X			
SB1-35'		0900	ST-14061-07				X	X	X			
SB1-40'		0905	ST-14061-08				X	X	X			
SB1-45'		0915	ST-14061-09				✓	✓	✓	X		
SB1-50'	↓	0930	ST-14061-10	↓	↓	↓	✓	✓	✓	X	↓	

Relinquished By (Signature)	Printed Name: DAVID BALTAZAR	Received By (Signature)	Printed Name: Jonathan Zapata	40 Total Number of Containers
Company: ENCON	Date: 7/26/19 Time: 1423	Company: JONES	Date: 7-26-19 Time: 1423	
Relinquished By (Signature)	Printed Name	Received By Laboratory (Signature)	Printed Name	
Company	Date: Time	Company	Date Time	

Client signature on this Chain of Custody form constitutes acknowledgement that the above analyses have been reqested, and the information provided herein is correct and accurate.

Chain-of-Custody Record

JONES ENVIRONMENTAL, INC.
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Santa Fe Springs, CA 90670
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Jones Project # ST-14061

Page 2 of 5

Sample Condition as Recieved:
Chilled ☐ yes ☐ no
Sealed ☐ yes ☐ no

Client: ENCON TECHNOLOGIES INC.
Date: 7/25/19
Project Name:
Client Project #:
Project Address: SEE PAGE 1
Email:
Phone:
Report To: Sampler:

Turn Around Requested:
☐ Immediate Attention
☐ Rush 24 Hours
☐ Rush 48 Hours
☐ Rush 72 Hours
☒ Normal

Report Options
EDD ____
EDF* - 10% Surcharge____
*Global ID _____

Sample Container / Preservative Abbreviations
AS - Acetate Sleeve
SS - Stainless Steel Sleeve
BS - Brass Sleeve
G - Glass
AB - Amber Bottle
P - Plastic
SOBI - Sodium Bisulfate
MeOH - Methanol
HCl - Hydrochloric Acid
HNO3 - Nitric Acid
O - Other (See Notes)

Analysis Requested

Sample ID	Date	Sample Collection Time	Laboratory Sample ID	Preservative	Sample Container	Sample Matrix: Soil (S), Sludge (SL), Aqueous (A), Free Product (FP)	CAL-WFT GC/FID 5035	TPH-g / TPH-d	8260B (BTEX, NAPHTHALENE,	OXYS, MTBE, DIPE, ETBE,	TAME, TBA, ETHANOL)						Hold	Number of Containers	Notes & Special Instructions
SB1-55'	7/25/19	0940	ST-14061-11	5035	5035/SS	S	✓	✓	✓	✓	✓	go 8/8					X	4	
SB1-60'		0945	ST-14061-12				✓	✓	✓	✓	✓	↓					X		
SB1-65'		0955	ST-14061-13				✓	✓	✓	✓	✓						X		
SB1-70'		1005	ST-14061-14				✓	✓	✓	✓	✓	go 8/8					X		
SB1-75'		1015	ST-14061-15				✓	✓	✓	✓	✓	↓					X		
SB1-80'		1020	ST-14061-16				✓	✓	✓	✓	✓						X		
SB1-85'		1025	ST-14061-17				✓	✓	✓	✓	✓						X		
SB1-90'		1035	ST-14061-18				✓	✓	✓	✓	✓						X		
SB2-5'		1300	ST-14061-19				X	X	X	X	X								
SB2-10'	↓	1310	ST-14061-20	↓	↓	↓	X	X	X	X	X							↓	

Relinquished By (Signature)	Printed Name: DAVID BALTAZAR	Received By (Signature)	Printed Name: Jonathan Zapata	40	Total Number of Containers
Company: ENCON	Date: 7/26/19 Time: 1423	Company: JONES	Date: 7-26-19 Time: 1423		
Relinquished By (Signature)	Printed Name	Received By Laboratory (Signature)	Printed Name		
Company	Date: Time	Company	Date Time		

Client signature on this Chain of Custody form constitutes acknowledgement that the above analyses have been reqested, and the information provided herein is correct and accurate.

Chain-of-Custody Record

JONES ENVIRONMENTAL, INC.
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Santa Fe Springs, CA 90670
(714) 449-9937
Fax (714) 449-9685
www.jonesenv.com

Client: ENCON TECHNOLOGIES INC. | Date: 7/25/19

Project Name | Client Project #

Project Address

Email

Phone

Report To | Sampler

SEE PAGE 1

Turn Around Requested:
- ☐ Immediate Attention
- ☐ Rush 24 Hours
- ☐ Rush 48 Hours
- ☐ Rush 72 Hours
- X Normal

Report Options
EDD ____
EDF* - 10% Surcharge____
*Global ID _____

LAB USE ONLY
Jones Project # 8T-14061
Page 3 of 5
Sample Condition as Recieved:
Chilled ☐ yes ☐ no
Sealed ☐ yes ☐ no

Sample Container / Preservative Abbreviations
AS - Acetate Sleeve
SS - Stainless Steel Sleeve
BS - Brass Sleeve
G - Glass
AB - Amber Bottle
P - Plastic
SOBI - Sodium Bisulfate
MeOH - Methanol
HCl - Hydrochloric Acid
HNO3 - Nitric Acid
O - Other (See Notes)

Analysis Requested

Sample ID	Date	Sample Collection Time	Laboratory Sample ID	Preservative	Sample Container	Sample Matrix: Soil (S), Sludge (SL), Aqueous (A), Free Product (FP)	CAL LUFT GC/FID 5035	TPH-g / TPH-d	8260B (BTEX, NAPHTHALENE, OXYS, MTBE, DIPE, ETBE, TAME, TBA, ETHANOL)	Hold	Number of Containers	Notes & Special Instructions
SB2-15'	7/25/19	[illegible] (PB)	8T-14061-21	5035	5035/SS	S	X	X	X		4	
SB2-20'		[illegible]	8T-14061-22				X	X	X			
SB2-25'		1330	8T-14061-23				X	X	X			
SB2-30'		1340	8T-14061-24				X	X	X			
SB2-35'		1345	8T-14061-25				X	X	X			
SB2-40'		1350	8T-14061-26				X	X	X			
SB2-45'		1355	8T-14061-27							X		
SB2-50'		1410	8T-14061-28							X		
SB2-55'		1420	8T-14061-29							X		
SB2-60'		1430	8T-14061-30							X		

Relinquished By (Signature): [signature] | Printed Name: DAVID BALDAZAR
Company: ENCON | Date: 7/26/19 | Time: 1423

Received By (Signature): [signature] | Printed Name: Jonathan Zapata
Company: JONES | Date: 7-26-19 | Time: 1423

Relinquished By (Signature) | Printed Name
Company | Date: | Time

Received By Laboratory (Signature) | Printed Name
Company | Date | Time

40 Total Number of Containers

Client signature on this Chain of Custody form constitutes acknowledgement that the above analyses have been reqested, and the information provided herein is correct and accurate.

Chain-of-Custody Record

JONES ENVIRONMENTAL, INC.
11007 Forest Pl.
Santa Fe Springs, CA 90670
(714) 449-9937
Fax (714) 449-9685
www.jonesenv.com

LAB USE ONLY
Jones Project # ST-14061
Page 4 of 5
Sample Condition as Recieved:
Chilled ☐ yes ☐ no
Sealed ☐ yes ☐ no

Client: ENCON TECHNOLOGIES INC. | Date: 7/25/19
Project Name | Client Project #
Project Address: SEE PAGE 1
Email | Phone
Report To | Sampler

Turn Around Requested:
☐ Immediate Attention
☐ Rush 24 Hours
☐ Rush 48 Hours
☐ Rush 72 Hours
X Normal

Report Options
EDD ____
EDF* - 10% Surcharge ____
*Global ID ____

Sample Container / Preservative Abbreviations
AS - Acetate Sleeve
SS - Stainless Steel Sleeve
BS - Brass Sleeve
G - Glass
AB - Amber Bottle
P - Plastic
SOBI - Sodium Bisulfate
MeOH - Methanol
HCl - Hydrochloric Acid
HNO3 - Nitric Acid
O - Other (See Notes)

Analysis Requested

Sample ID	Date	Sample Collection Time	Laboratory Sample ID	Preservative	Sample Container	Sample Matrix: Soil (S), Sludge (SL), Aqueous (A), Free Product (FP)	CAL-LUFT GC/FID 5035	TPH-g/TPH-d	8260B (BTEX, NAPHTHALENE,	OXYS, MTBE, DIPE, ETBE,	TAME, TBA, ETHANOL)	Hold	Number of Containers	Notes & Special Instructions
SB2-65'	7/25/19	1440	ST-14061-31	5035	5035/5S	S						X	4	
SB2-70'	↓	1445	ST-14061-32	↓	↓	↓						X	↓	
SB2-75'		~~1455~~ 1505 DUP	ST-14061-33									X		
SB2-80'		1505	ST-14061-34									X		
SB2-85'	7/26/19	0720	ST-14061-35									X		
SB2-90'	↓	0730	ST-14061-36									X		
SB2-95'		0745	ST-14061-37									X		
SB3-5'		1015	ST-14061-38				X	X	X	X	X			
SB3-10'		1020	ST-14061-39				X	X	X	X	X			
SB3-15'	↓	1025	ST-14061-40	↓	↓	↓	X	X	X	X	X		↓	

Relinquished By (Signature)	Printed Name: DAVID BALTAZAR	Received By (Signature)	Printed Name: Jonathan Zapata	40	Total Number of Containers
Company: ENCON	Date: 7/26/19 Time: 1423	Company: JONES	Date: 7-26-19 Time: 1423		
Relinquished By (Signature)	Printed Name	Received By Laboratory (Signature)	Printed Name	Client signature on this Chain of Custody form constitutes acknowledgement that the above analyses have been reqested, and the information provided herein is correct and accurate.	
Company	Date: Time	Company	Date Time		

Chain-of-Custody Record

JONES ENVIRONMENTAL, INC.
11007 Forest Pl.
Santa Fe Springs, CA 90670
(714) 449-9937
Fax (714) 449-9685
www.jonesenv.com

LAB USE ONLY
Jones Project # ST-14061
Page 5 of 5
Sample Condition as Recieved:
Chilled ☐ yes ☐ no
Sealed ☐ yes ☐ no

Client: ENCON TECHNOLOGIES INC. | Date: 7/26/19
Project Name | Client Project #
Project Address: SEE PAGE 1
Email
Phone
Report To | Sampler

Turn Around Requested:
☐ Immediate Attention
☐ Rush 24 Hours
☐ Rush 48 Hours
☐ Rush 72 Hours
☒ Normal

Report Options
EDD ____
EDF* - 10% Surcharge ____
*Global ID ____

Sample Container / Preservative Abbreviations
AS - Acetate Sleeve
SS - Stainless Steel Sleeve
BS - Brass Sleeve
G - Glass
AB - Amber Bottle
P - Plastic
SOBI - Sodium Bisulfate
MeOH - Methanol
HCl - Hydrochloric Acid
HNO3 - Nitric Acid
O - Other (See Notes)

Analysis Requested

Sample ID	Date	Sample Collection Time	Laboratory Sample ID	Preservative	Sample Container	Sample Matrix: Soil (S), Sludge (SL), Aqueous (A), Free Product (FP)	CALUFT GC/FID 5035	TPH-g/TPH-d	8260B (BTEX, NAPHTHALENE,	OXYS, MTBE, DIPE, ETBE,	TAME, TBA, ETHANOL)	Hold	Number of Containers	Notes & Special Instructions
SB3-20'	7/26/19	1035	ST-14061-41	5035		S	X	X	X	X	X		4	
SB3-25'		1040	ST-14061-42				X	X	X	X	X			
SB3-30'		1050	ST-14061-43				X	X	X	X	X			
SB3-35'		1100	ST-14061-44				X	X	X	X	X			
SB3-40'		1105	ST-14061-45				X	X	X	X	X			
SB3-45'		1115	ST-14061-46									X		
SB3-50'		1125	ST-14061-47									X		
SB3-55'		1135	ST-14061-48									X		
SB3-60'	↓	1145	ST-14061-49	↓		↓						X	↓	

Relinquished By (Signature) | Printed Name: DAVID BALTAZAR | Received By (Signature) | Printed Name: Jonathan Zapata | 36 Total Number of Containers
Company: ENCON | Date: 7/26/19 | Time: 1423 | Company: JONES | Date: 7-26-19 | Time: 1423
Relinquished By (Signature) | Printed Name | Received By Laboratory (Signature) | Printed Name
Company | Date: | Time | Company | Date | Time

Client signature on this Chain of Custody form constitutes acknowledgement that the above analyses have been reqested, and the information provided herein is correct and accurate.

Exhibit C

Boring Logs

ENCON TECHNOLOGIES, INC.

PROJECT: TRENCH SHORING
PROJECT ADDRESS: 636 E. ROSECRANS AVE. LOS ANGELES, CA · 90059
PROJECT ID:

LOG OF BORING: SB1

SHEET 1 OF 3

DATE(S) DRILLED: 7/25/19	LOGGED BY: D. BALTAZAR	CHECKED BY: J. SCATOLONI
DRILLING METHOD: HSA	DRILL BIT SIZE/TYPE: 7" HSA	TOTAL DEPTH OF BOREHOLE: 91.5'
DRILL RIG TYPE: CME 85	DRILLING CONTRACTOR: YELLOW JACKET	APPROXIMATE SURFACE ELEVATION:
GROUNDWATER LEVEL AND DATE MEASURED: ≈87' BGS 7/26/19	SAMPLING METHOD(S): SS	HAMMER DATA: [redacted] DOWN HOLE
BOREHOLE BACKFILL: CEMENT GROUT [redacted] 1206	LOCATION: PID: RKI GX-6000 CALDATA: HEXANE 100PPM	

ELEVATION (FEET)	DEPTH (FEET)	SAMPLE TYPE	SAMPLE NUMBER	SAMPLING RESISTANCE (BLOWS/FT)	USCS SYMBOL	GRAPHIC LOG	MATERIAL DESCRIPTION	PID REMARKS AND OTHER TESTS
	0'						SLAB 5"	
	5'		SB1-5 0820	6 20 26	CL		CLAY (CL), DARK BROWN, VERY HARD, MED. PLASTICITY, MOIST, NO HC ODOR, NO HC STAINING	0.2
	10'		SB1-10 0825	9 12 16	CL		SOME SILT, LOW PLASTICITY	10.4
	15'		SB1-15 0835	10 22 35	ML		CLAYEY SILT (ML), OLIVE BROWN, MOIST, NON PLASTIC, HARD, STRONG HC ODOR, SLIGHT HC STAINING	478.2
	20'		SB1-20 0840	14 33 25	ML		SOME FINE SAND	512.2
	25'		SB1-25 0845	6 12 18	ML		[redacted] STIFF	483.5
	30'		SB1-30 0855	15 25 28	ML		HARD	533.6

ENCON TECHNOLOGIES, INC.

PROJECT: TRENCH SHORING
PROJECT ADDRESS: 636 E. ROSECRANS AVE. LOS ANGELES, CA. 90059
PROJECT ID:

LOG OF BORING: SB1
SHEET 2 OF 3

DATE(S) DRILLED 7/25/19	LOGGED BY D. BALTAZAR	CHECKED BY J. SCATOLONI
DRILLING METHOD	DRILL BIT SIZE/TYPE	TOTAL DEPTH OF BOREHOLE
DRILL RIG TYPE	DRILLING CONTRACTOR	APPROXIMATE SURFACE ELEVATION
GROUNDWATER LEVEL AND DATE MEASURED	SAMPLING METHOD(S)	HAMMER DATA
BOREHOLE BACKFILL	LOCATION	

SEE PAGE 1

ELEVATION (FEET)	DEPTH (FEET)	SAMPLE TYPE	SAMPLE NUMBER	SAMPLING RESISTANCE (BLOWS/FT)	USCS SYMBOL	GRAPHIC LOG	MATERIAL DESCRIPTION	PID REMARKS AND OTHER TESTS
	35'		SB1-35' 0900	7 14 20	ML		SAME AS ABOVE	802
	40'		SB1-40' 0905	11 17 24	SM		SANDY SILT (SM), FINE SAND, BROWN, HARD, MOIST, STRONG HC ODOR, NO HC STAINING	1066
	45'		SB1-45' 0915	7 24 32	SP		SAND (SP), TRACE SILT, FINE TO MED, GRAYISH BROWN, MOIST, VERY DENSE, STRONG HC ODOR NO HC STAINING	622
	50'		SB1-50' 0930	24 30 37	SP		OLIVE BROWN, SLIGHT HC ODOR, NO HC STAINING	42.9
	55'		SB1-55' 0940	24 50 5"	SP		FINE SAND, NO HC ODOR, NO HC STAINING	1.2
	60'		SB1-60' 0945	17 50 6"	SP		IRONOXIDE STAINING, FINE TO MEDIUM SAND	1.3
	65'		SB1-65' 0955	21 38 50 6"	SM		SILTY SAND (SM), FINE TO MED SAND, OLIVE BROWN, MOIST, VERY DENSE, NO HC ODOR, NO HC STAINING	0.0

ENCON TECHNOLOGIES, INC.

PROJECT: TRENCH SHORING
PROJECT ADDRESS: 636 E. ROSECRANS AVE. LOS ANGELES, CA. 90059
PROJECT ID:

LOG OF BORING: SB1
SHEET 3 OF 3

DATE(S) DRILLED 7/25/19	LOGGED BY D. BALTAZAR	CHECKED BY J. SCATOLONI
DRILLING METHOD SEE	DRILL BIT SIZE/TYPE PAGE	TOTAL DEPTH OF BOREHOLE 1
DRILL RIG TYPE	DRILLING CONTRACTOR	APPROXIMATE SURFACE ELEVATION
GROUNDWATER LEVEL AND DATE MEASURED	SAMPLING METHOD(S)	HAMMER DATA
BOREHOLE BACKFILL	LOCATION	

ELEVATION (FEET)	DEPTH (FEET)	SAMPLE TYPE	SAMPLE NUMBER	SAMPLING RESISTANCE (BLOWS/FT)	USCS SYMBOL	GRAPHIC LOG	MATERIAL DESCRIPTION	PID REMARKS AND OTHER TESTS
	70'		SB1-70 1005	9 18 31	ML		CLAYEY SILT (ML), GRAY, HARD, MOIST, NON PLASTIC, NO HC ODOR, NO HC STAINING	2.4
	75'		SB1-75 1015	10 17 28	ML		SAME AS ABOVE	0.0
	80'		SB1-80 1020	18 50 6"	ML		SAME AS ABOVE	0.2
	85'		SB1-85 1025	8 20 24	ML		WET	0.1
							GROUNDWATER	
	90'		SB1-90 1035	7 22 50. 3	CL		CLAY (CL), GRAY, WET, MOIST, LOW PLASTICITY, VERY HARD.	0.1
							TD = 91.5' GROUNDWATER ENCOUNTERED @ ≈ 87' BGS	
	95'						HP1 WATER SAMPLE COLLECTED 7/26/19 @ 0730	
	100'							

ENCON TECHNOLOGIES, INC.

PROJECT: TRENCH SHORING
PROJECT ADDRESS: 636 E. ROSECRANS AVE. LOS ANGELES, CA . 90059
PROJECT ID:

LOG OF BORING: SB2

SHEET 1 OF 3

DATE(S) DRILLED: 7/25/19	LOGGED BY: D. BALTAZAR	CHECKED BY: J. SCATOLONI
DRILLING METHOD: HSA	DRILL BIT SIZE/TYPE: 8" HSA	TOTAL DEPTH OF BOREHOLE: 96.5'
DRILL RIG TYPE: CME 85	DRILLING CONTRACTOR: YELLOW JACKET	APPROXIMATE SURFACE ELEVATION:
GROUNDWATER LEVEL AND DATE MEASURED: ≈92' BGS 7/26/19	SAMPLING METHOD(S): SS	HAMMER DATA: DOWN HOLE
BOREHOLE BACKFILL: CEMENT GROUT 240 G	LOCATION: PID: RKI GX-6000 CALDATA: HEXANE 100PPM	

ELEVATION (FEET)	DEPTH (FEET)	SAMPLE TYPE	SAMPLE NUMBER	SAMPLING RESISTANCE (BLOWS/FT)	USCS SYMBOL	GRAPHIC LOG	MATERIAL DESCRIPTION	PID REMARKS AND OTHER TESTS
	0'						SLAB 4"	
	5'		SB2-5' 1300	10 13 15	ML		SILT (ML), REDDISH BROWN, DRY, LOOSE, NO HC ODOR, NO HC STAINING	0.2
	10'		SB2-10' 1310	6 6 12	ML		BROWN	0.1
	15'		SB2-15' 1315	8 12 20	ML		SAME AS ABOVE	0.2
	20'		SB2-20' 1325	8 12 20	ML		SOME FINE SAND & GRAVEL UP TO 1/2" DIAM	0.0
	25'		SB2-25' 1330	9 13 20	SM		SILTY SAND (SM), FINE TO MEDIUM SAND, DENSE, MOIST, NO HC ODOR, NO HC STAINING BROWN	0.1
	30'		SB2-30' 1340	7 8 15			SILT (ML), BROWN, NON PLASTIC, MOIST, HARD, NO HC ODOR, NO HC STAINING	

ENCON TECHNOLOGIES, INC.

PROJECT: TRENCH SHORING
PROJECT ADDRESS: 636 E. ROSECRANS AVE. LOS ANGELES, CA. 90059
PROJECT ID:

LOG OF BORING: SB2
SHEET 2 OF 3

DATE(S) DRILLED 7/25/19	LOGGED BY D. BALTAZAR	CHECKED BY J. SCATOLONI
DRILLING METHOD	DRILL BIT SIZE/TYPE	TOTAL DEPTH OF BOREHOLE
DRILL RIG TYPE	DRILLING CONTRACTOR	APPROXIMATE SURFACE ELEVATION
GROUNDWATER LEVEL AND DATE MEASURED	SAMPLING METHOD(S)	HAMMER DATA
BOREHOLE BACKFILL	LOCATION	

SEE PAGE 1

ELEVATION (FEET)	DEPTH (FEET)	SAMPLE TYPE	SAMPLE NUMBER	SAMPLING RESISTANCE (BLOWS/FT)	USCS SYMBOL	GRAPHIC LOG	MATERIAL DESCRIPTION	PID REMARKS AND OTHER TESTS
	35'		SB2-35' 1345	7 15 16	ML		LIGHT BROWN, SLIGHT PLASTICITY	0.2
	40'		SB2-40' 1350	5 10 19	SM		SILTY SAND (SM), OLIVE BROWN, FINE SAND, MOIST, DENSE, NO HC ODOR, NO HC STAINING.	0.5
	45'		SB2-45' 1355	8 10 21	SM		SAME AS ABOVE	0.2
	50'		SB2-50' 1410	4 10 27	SM		SAME AS ABOVE	0.1
	55'		SB2-55' 1420	8 15 25	SM		SAME AS ABOVE	0.3
	60'		SB2-60' 1430	13 19 24	SP		SAND (SP), FINE, LIGHT BROWN, MOIST, MEDIUM DENSE, NO HC ODOR, NO HC STAINING	0.8
	65'		SB2-65' 1440	13 17 25	SP		OLIVE BROWN, DENSE	0.2

ENCON TECHNOLOGIES, INC.

PROJECT: TRENCH SHORING
PROJECT ADDRESS: 636 E. ROSECRANS AVE. LOS ANGELES, CA. 90059
PROJECT ID:

LOG OF BORING: SB2
SHEET 3 OF 3

DATE(S) DRILLED 7/25/19, 7/26/19	LOGGED BY D. BALTAZAR	CHECKED BY J. SCATOLONI
DRILLING METHOD SEE	DRILL BIT SIZE/TYPE PAGE	TOTAL DEPTH OF BOREHOLE 1
DRILL RIG TYPE	DRILLING CONTRACTOR	APPROXIMATE SURFACE ELEVATION
GROUNDWATER LEVEL AND DATE MEASURED	SAMPLING METHOD(S)	HAMMER DATA
BOREHOLE BACKFILL	LOCATION	

ELEVATION (FEET)	DEPTH (FEET)	SAMPLE TYPE	SAMPLE NUMBER	SAMPLING RESISTANCE (BLOWS/FT)	USCS SYMBOL	GRAPHIC LOG	MATERIAL DESCRIPTION	PID REMARKS AND OTHER TESTS
	70'		SB2-70 1445	6 16 28	ML		SILT(ML), DARK GRAY, MOIST, NON PLASTIC, HARD, NO HC ODOR, NO HC STAINING	0.8
	75'		SB2-75' 1455	10 18 22	ML		SOME CLAY	0.4
	80'		SB2-80' 1505	8 14 25	ML		SAME AS ABOVE	0.2
7/26/19	85'		SB2-85' 0720	6 20 31	ML		SAME AS ABOVE	0.1
	90'		SB2-90' 0730	8 19 21	CL	▽	CLAY(CL), GRAY, SLIGHT PLASTICITY, MOIST, HARD, NO HC ODOR, NO HC STAINING GROUNDWATER	0.1
	95'		SB2-95' 0745	8 12 15	CL		SAME AS ABOVE, VERY MOIST	
	100'						TD = 96.5' GROUNDWATER ENCOUNTERED @ 92' BGS HP2 COLLECTED @ 1130	

ENCON TECHNOLOGIES, INC.

PROJECT: TRENCH SHORING
PROJECT ADDRESS: 636 E. ROSECRANS AVE. LOS ANGELES, CA · 90059
PROJECT ID:

LOG OF BORING: SB3

SHEET 1 OF 2

DATE(S) DRILLED: 7/26/19	LOGGED BY: D. BALTAZAR	CHECKED BY: J. SCATOLONI
DRILLING METHOD: HSA	DRILL BIT SIZE/TYPE: 8" HSA	TOTAL DEPTH OF BOREHOLE: 62' REFUSAL
DRILL RIG TYPE: CME 85	DRILLING CONTRACTOR: YELLOW JACKET	APPROXIMATE SURFACE ELEVATION:
GROUNDWATER LEVEL AND DATE MEASURED: N/A	SAMPLING METHOD(S): SS	HAMMER DATA: DOWN HOLE
BOREHOLE BACKFILL: CEMENT GROUT 90%	LOCATION: PID: RKI GX-6000 CALDATA: HEXANE 100PPM	

ELEVATION (FEET)	DEPTH (FEET)	SAMPLE TYPE	SAMPLE NUMBER	SAMPLING RESISTANCE (BLOWS/FT)	USCS SYMBOL	GRAPHIC LOG	MATERIAL DESCRIPTION	PID REMARKS AND OTHER TESTS
	0'						SLAB 6"	
	5'		SB3-5' 1015	7 15 22	CL		SILTY CLAY (CL), BROWN, MOIST, SLIGHT PLASTICITY, HARD, NO HC ODOR, NO HC STAINING	0.2
	10'		SB3-10' 1020	7 18 29	ML		SILT (ML), BROWN, MOIST, NON PLASTIC, HARD NO HC ODOR, NO HC STAINING	0.1
	15'		SB3-15' 1025	8 16	ML		SOME SAND,	0.0
	20'		SB3-20' 1085	12 20 32	ML		SOME GRAVEL UP TO 1/2" DIAM, VERY HARD	0.2
	25'		SB3-25' 1040	14 24 55	ML		SOME CLAY	0.3
	30'		SB3-30' 1050	7 19 24	ML		HARD	0.1

ENCON TECHNOLOGIES, INC.

PROJECT: TRENCH SHORING
PROJECT ADDRESS: 636 E. ROSECRANS AVE. LOS ANGELES, CA. 90059
PROJECT ID:

LOG OF BORING: SB3
SHEET 2 OF 3

DATE(S) DRILLED 7/26/19	LOGGED BY D. BALTAZAR	CHECKED BY J. SCATOLONI
DRILLING METHOD	DRILL BIT SIZE/TYPE	TOTAL DEPTH OF BOREHOLE
DRILL RIG TYPE	DRILLING CONTRACTOR	APPROXIMATE SURFACE ELEVATION
GROUNDWATER LEVEL AND DATE MEASURED	SAMPLING METHOD(S)	HAMMER DATA
BOREHOLE BACKFILL	LOCATION	

SEE PAGE 1

ELEVATION (FEET)	DEPTH (FEET)	SAMPLE TYPE	SAMPLE NUMBER	SAMPLING RESISTANCE (BLOWS/FT)	USCS SYMBOL	GRAPHIC LOG	MATERIAL DESCRIPTION	PID REMARKS AND OTHER TESTS
	35'		SB3-35 1100	10 15 18	CL		SILTY CLAY (CL), MOIST, SLIGHT PLASTICITY, OLIVE BROWN, NO HC ODOR, NO HC STAINING, HARD	0.2
	40'		SB3-40 1105	12 15 30	CL		SAME AS ABOVE	0.1
	45'		SB3-45 1115	8 14 32	SP		SAND (SP), FINE, MOIST, VERY DENSE, BROWN, NO HC ODOR, NO HC STAINING	0.0
	50'		SB3-50 1125	10 20 33	SP		SAME AS ABOVE	0.3
	55'		SB3-55 1135	8 14 30	SP		TRACE SOME SILT	0.2
	60'		SB3-60 1145	19 24 50/2	SP		VERY DENSE	0.2
	65'		SB3-65				REFUSAL @ 62' NO GROUNDWATER ENCOUNTERED DURING DRILLING	

Exhibit D

ENCON Field Logs and Health and Safety Plan

ENCON Technologies, Inc.
Environmental, Consulting & Real Estate Services

Field Report

FLD-100

ENCON-2019

Field Office: ENCON Technologies, Inc.
12145 Mora Drive Ste.7
Santa Fe Springs, CA 90670

Date 7/25/19
Project TRENCH SHORING
Project No. | Task No.
Location 636 E. ROSECRANS AVE. LA, CA.
Weather P.CLOUDY HUMID | Temperature 90°
Client TRENCH SHORING
Contractor YELLOW JACKET DRILLING
ENCON Representative(s) D. BALTAZAR, A. BALTAZAR, A. BALTAZAR

Scope of Work:
___ Monitoring ___✓___ Assessment ___ Remediation

Page 1 of

0700 · ENCON, YJD ONSITE, CONDUCT TAILGATE SAFETY MEETING, REVIEW HASP, JSA's, ETC. SITE WALK.

0730 · YELLOW JACKET MOBS ONTO SB1.

0945 · CURRENTLY @ SB1-60'

1035 · SB1 COMPLETED TO 90', YELLOW JACKET WILL PULL OUT 10' HSA & SET STAINLESS SCREEN FOR WATER SAMPLE

1130 · TEMP WELL CHECKED MINIMAL WATER, MOB TO SB2 THICK CONCRETE.

1300 · YJD THROUGH CONCRETE @ SB2 BEGIN DRILLING.

1500 · YJD DRILLING COMPLETES SB2 TO 80', CLEANUP SECURE SITE.

1530 · ENCON & YJD OFFSITE.

Equipment Used:

Contractor Hours | Staff / Technician Hours: | Mileage:

Copies To: | Project Manager:

Reviewed By:

ENCON Technologies, Inc.
Environmental, Consulting & Real Estate Services

Field Report

FLD-100

ENCON-2019

Field Office: ENCON Technologies, Inc.
12145 Mora Drive Ste.7
Santa Fe Springs, CA 90670

Date 7/26/19
Project TRENCH SHORING
Project No. | Task No.
Location 636 E. ROSECRANS AVE. LA, CA.
Weather SUNNY & HOT | Temperature 90's
Client TRENCH SHORING
Contractor YELLOW JACKET DRILLING
ENCON Representative(s) D. BALTAZAR, A. BALTAZAR

Scope of Work:
___ Monitoring ✓ Assessment ___ Remediation

Page 1 of

0645. ENCON, YJD ONSITE. ENCON CONDUCTS TAILGATE SAFETY MEETING, REVIEW HASP, SOW, HEAT STRESS INDICATORS.

0730. ENCON COLLECTS WATER SAMPLE FROM SB1/HP1.

0800. YJD COMPLETES SB2 SOIL BORING TO 95' BGS.

0820. YJD MOBS BACK TO SB TO EXTRACT AUGERS & GROUT HOLE WITH PORTLAND GROUT.

0930. YJD BACKFILLS SB1 TO 5' BGS WITH TREMIE, MOBS TO SB3 LOCATION

1130. ENCON BEGINS LOADING DRUMS FOR DISPOSAL

1250. REFUSAL ENCOUNTERED @ 62' BGS. BEGIN EXTRACTING AUGER & BACKFILL WITH PORTLAND GROUT.

1345. SB1 GROUTED WITH 4 BATCHES. EACH BATCH 27 G WATER, 6 BAGS PORTLAND & 1/2 BAG BENTONITE GEL.
SB3 GROUTED WITH

1400. 10 DRUMS OF NON HAZ SOIL PICKUP BY ENCON (NATHAN, REYES)

1445. YELLOW JACKET DRILLING CONTINUES SB2 BACKFILL & SURFACE COMPLETION.

1530. SB2 BACKFILLED 8 BATCHES OF PORTLAND GROUT.

1630. CLEANUP, SECURE SITE.

Equipment Used:

Contractor Hours | Staff / Technician Hours: | Mileage:

Copies To: | Project Manager:

Reviewed By: [redacted]

Heavy Equipment Daily Inspection Checklist

Heavy equipment should be inspected daily to prevent costly maintenance or accidents. Use this checklist to verify that your equipment is evaluated daily. As you warm up your equipment to proper running temperature, inspect these important factors.

Tip: You also can use this checklist to prep equipment for long-term storage, if needed.

Inspection Date: 7 / 25 / 19 | 7/26/19 *Time:* 0700 (a.m./p.m.)
Location: 636 E. ROSECRANS AVE.
Equipment Type: CME 85 HSA RIG *Unit #:* EN8D85 (YELLOW JACKET)
Inspector's Name: DAVID BAUTZAR *Inspector's Signature:* DB

Inspection	Good	Need Repair	N/A
Cab, mirrors, seat belt, and glass	✓		
Horn and gauges	✓		
Lights	✓		
Turn signals	✓		
Backup lights and alarm	✓		
Fire extinguisher condition	✓		
Windshield wipers and fluid	✓		
Fuel levels	✓		
Battery (charge, connection, etc.)	✓		
Engine oil	✓		
Transmission fluid	✓		
Brake fluid	✓		
Cooling system fluid	✓		
Oil leak/lube	✓		
Brake condition (dynamic service, park, etc.)	✓		
Tires or tracks (inflation, damage, etc.)	✓		
Hydraulic oil	✓		
Hose condition	✓		
Coupling devices and connectors	✓		
Exhaust system	✓		
Blade/bloom/ripper condition	✓		

Notes: [redacted]

ENCON Technologies, Inc.
Environmental Construction and Engineering Services

HEALTH & SAFETY PLAN

Prepared for the Site Located at:

636 East Rosecrans Avenue
Los Angeles, California

ALL PERSONNEL PARTICIPATING IN THE FIELD MUST BE TRAINED IN THE GENERAL AND SPECIFIC HAZARDS UNIQUE TO THE JOB AND, IF APPLICABLE, MEET RECOMMENDED MEDICAL EXAMINATION REQUIREMENTS. ALL SITE PERSONNEL AND VISITORS SHALL FOLLOW THE GUIDELINES, RULES, AND PROCEDURES CONTAINED IN THIS SAFETY PLAN. THE PROJECT MANAGER OR SITE SAFETY OFFICER MAY IMPOSE ANY OTHER PROCEDURES OR PROHIBITIONS THAT THEY BELIEVE ARE NECESSARY FOR SAFE OPERATIONS.

THIS PLAN IS PREPARED TO INFORM ALL FIELD PERSONNEL, INCLUDING DAILY ENVIRONMENTAL CONTRACTORS AND SUBCONTRACTORS, OF THE POTENTIAL HAZARDS ON THE SITE. HOWEVER, EACH CONTRACTOR OR SUBCONTRACTOR MUST ASSUME DIRECT RESPONSIBILITY FOR THEIR OWN EMPLOYEES' HEALTH AND SAFETY.

May 30, 2019

12145 Mora Drive, Suite 7. Santa Fe Springs, California 90670. Tel. 562/777-2200. Fax. 562/777-2201

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HASP SIGNATURE SHEET

SAFETY MEETINGS

HEALTH & SAFETY PLAN

1.0 INTRODUCTION

Client:	Trench Shoring Company
Site Address:	636 East Rosecrans Avenue, Los Angeles, California
Project Engineer:	Joe Scatoloni
Project Manager:	David Baltazar
Plan Prepared by:	Elizabeth Bartley

This Health and Safety Plan describes the basic minimum procedural and equipment safety requirements for field activities for soil and groundwater sampling at the subject site located at 636 East Rosecrans Avenue in Los Angeles, California (Site).

The provisions herein shall apply to the employees of ENCON Technologies, Inc. (ENCON) and to any subcontractor providing services to ENCON on the site, and are provided for the protection of ENCON's employees, subcontractor's employees, and the public who may be affected by the work requirements.

The Health and Safety Plan will address the potential hazards that may be encountered in performing the activities at the project Site. Some modifications to the plan may be made as required, depending upon changing operating as the work progresses.

- The project manager or Site Safety Officer will hold daily on-site meetings to review site safety concerns, procedures, review key elements of the Site Health and Safety Plan with members of the field crew prior to the start of field work. Other site safety meetings will be held as necessary.

- All team members who may be exposed to site impacts during the course of work shall have completed OSHA 40-hour HAZWOPPER and annual refresher training (29 CFR 1910.120), CPR and First Aid training. Documentation of training shall be readily available.

- Each ENCON employee must review, sign and date the HASP at the end of this document. Each subcontractor and visitor must review the HASP and sign, date, and describe their affiliation at the end of this document.

- The HASP is kept in the field and readily available for the duration of field work and returned to the project file upon completion of field activities.

- This HASP shall be revised or re-written if site activities are changed significantly or if differing hazards are involved, or as information about contaminants or hazards changes.

- STOP WORK AUTHORITY – all workers have the authority and responsibility to stop any work, or refuse to do work, that they feel is unsafe

2.0 SITE DESCRIPTION

2.1 SITE LOCATION

The subject property is located at 636 East Rosecrans Avenue in Los Angeles, California. The Site is located on the south side of Rosecrans Avenue between South Avalon Boulevard and South Stanford Avenue.

2.2 SITE HISTORY & SCOPE OF WORK

The Subject Site historically operated one (1) split-compartment 10,000 gallon capacity diesel UST and one (1) diesel fuel dispenser located adjacent to the tank. The UST was separated into two (2) 5,000-gallon compartments by a bulkhead. Both 5,000-gallon compartments were reported to contain diesel fuel. Following the removal of the UST, grab soil samples were collected from the soil beneath the UST, in accordance with the LA DPW permit requirements. A total of four (4) soil samples were collected for laboratory analyses, including two (2) samples from beneath the two (2) compartments of the UST.

ENCON will advance three (3) exploratory soil borings (SB1, SB2, and SB3) using a CME 95 truck-mounted drill rig equipped with 8-inch to 10-inch diameter hollow stem auger to first perched groundwater. Soil samples will be collected in 10-foot intervals beginning at ground surface in the former UST tank and dispenser areas. Soil will be screened in the field for the presence of petroleum hydrocarbons using a photo ionization detector (PID). Soil headspace measurements will be taken from each soil sample using a photoionization detector (PID). Upon retrieval of the sleeve, a portion of the soil contained in the acetate sleeve will be cut, capped on both ends, labeled, and then placed in an ice cooler for storage. Volatile organic vapor concentrations will be measured from each soil sample using a photo ionization detector (PID), calibrated to 50 parts per million (ppm) hexane or 100 ppm isobutylene. The samples will be immediately placed in a plastic bag to allow organic vapors to volatize for several minutes prior to each field test measurement.

The subsurface groundwater investigation will involve advancing the three (3) exploratory soil borings (HP-1 through HP-3) with the hollow stem auger drill rig in order to collect one (1) groundwater hydropunch sample from each boring location. A hydropunch sampling probe equipped with a stainless-steel screen will be used to collect groundwater samples. Undisturbed water samples will be collected using disposable polyethylene tubing equipped with a disposable check valve. The samples will be placed in 40 ml liter VOA containers.

3.0 ON-SITE PROJECT SAFETY

3.1 SENIOR-LEVEL MANAGEMENT

Senior-Level Management: Joe Scatoloni
On-Site Management: Doug Thane / David Baltazar

Responsibilities of Senior Level Management

Define project objectives, allocates resources, determines the chain-of-command, and evaluates program outcome. It is also the responsibility of the Senior-Level Manager to provide appropriate disciplinary action when unsafe acts or practices occur.

3.2 PROJECT TEAM LEADER

Project Team Leader: David Baltazar
Project Team Leader: Douglas Thane

On-Site Project Team Leader Responsibilities

Reports to upper-level management. Has authority to direct response operations. Assumes total control over site activities.

Specific Responsibilities include:

1. Prepares and organizes the background review of the situation, the work plan, the site safety plan, and the field team.
2. Obtains permission for site access and coordinates activities with appropriate officials.
3. Ensures that the work plan is completed and on schedule
4. Briefs the field teams on their specific assignments.
5. Uses the Site Safety and Health Officer to ensure that safety and health requirements are met.
6. Prepares the final report and support files on the response activities.
7. Serves as the liaison with public officials.

3.3 SITE SAFETY OFFICER

Site Safety & Health Officer (SSO): David Baltazar

The Site Safety Office and project supervisor are responsible for ensuring compliance with the safety procedures established for the performance of the work. The project supervisor may modify work practices to meet safety requirements. The Site Safety Officer has the primary responsibility in determining the modifications of any safety procedures.

Responsibilities

Advises the Project Team Leader on all aspects of health and safety on site. Recommends stopping work if any operation threatens worker or public health and safety.

Specific Responsibilities include:

1. Ensuring that field personnel have adequate health and safety training;
2. Establishment of exclusion zone around work area;
3. Conducting site safety briefings for field personnel before beginning field activities;
4. Inspecting personnel protective equipment prior to on-site use;
5. Reporting any unsafe conditions, practices, equipment, malfunctions, or any other deficiencies;
6. Observing and monitoring onsite hazards and conditions;
7. Observing and monitoring the field personnel for signs of chemical exposure, heat stress, or other related conditions;
8. Stopping activities that endanger the health and safety of field personnel or the surrounding populace;
9. Reporting incidences which result in injury or exposure to toxic or hazardous materials;
10. Knows emergency procedures, evacuation routes, and the telephone numbers of the ambulance, local hospital, poison control center, fire department, and police department.
11. Documents compliance with this Health and Safety Plan by completing the attached safety training meeting forms
12. Updating field procedures used on-site if conditions change during field work;
13. Notifies, when necessary, local public emergency officials;
14. Coordinates emergency medical care.

4.0 GENERAL SITE SAFETY PROCEDURES

Field Safety Procedures

Field safety procedures will be employed during subsurface field work:

1. Determine the location of underground utilities, and notify owners (USA).
2. Inspect for overhead lines
3. Prior to work, REMOVE ANY LOOSE CLOTHING (ie, jackets with wide sleeves, etc).
4. Follow all proper lifting procedures to protect from back injury.
5. Wear work gloves to protect against injury to hands.

Safe Work Practices

Safe work practices, including personal sanitation measures, will be employed for the duration of the project. Among the specific activities which will be employed are:

1. Set up, assemble, and check out all equipment for integrity and proper function before entering the work area and before beginning work activities;
2. Faulty or suspect equipment will not be used;
3. Use only new and intact protective clothing. Personnel will change into new protective clothing once remove or if torn during use;
4. Do not use hands to wipe sweat away from face. Use clean towel or paper towels;
5. Practice contaminant avoidance at all times;
6. Do not eat, drink, or smoke while in the work area;
7. Wash hands, face, and arms as soon as possible upon leaving the work area and prior to taking rest breaks, lunch breaks, and leaving the site at the end of the workday;
8. Perform decontamination procedures as required by this health and safety plan;
9. Notify the Site Safety Officer immediately if there is an accident that causes injury or illness.

Safety procedures will comply with OSHA rules for standard engineering practices.

Personal Protective Equipment

All personnel must wear: long pants, sleeved shirt (short sleeves are acceptable), hardhat, high visibility traffic safety vests, safety glasses, and safety shoes. (Level D). Personnel may be required to wear additional protective eye, ear, and hand PPE appropriate to their tasks.

Optional – Tyvek or other overall to prevent dust accumulation on clothes.

In the event VOC concentrations exceed PELs, go to Level C – don respirators with organic-vapor cartridges.

5.0 HAZARD IDENTIFICATION

The potential hazards to personnel working at this site have been identified as physical hazards of working around drilling rigs, and on-site vehicle traffic and chemical hazards.

5.1 PHYSICAL HAZARDS

The work activities at the site have been assessed and the following table indicates physical hazards that may be present at the project site.

Table 1- Physical Hazards

	Physical Hazard	Health Hazards /Comments	Administrative Controls
X	Slips, Trips, and Falls	Cuts, Sprains, Broken Bones	Keep work areas clear of clutter and debris; Clean up spills right away; Use handrails when ascending or descending equipment, stairs, etc.
X	Back Injury	Back Pain, Strain caused from improper lifting techniques	Center yourself to loads to be lifted; Always bend at the knees and lift with your legs; Get help or use handcarts when necessary; Breakdown large load to smaller loads; Do not twist back while lifting or carrying; Note potential obstacles and clear pathways of trip hazards
X	Underground Utilities	Ruptured Underground gas lines may cause release of flammable liquids or vapors; Ruptured underground water lines may cause flooding; Electrocution from broken underground electric lines; Risk of arcing or ignition of flammable vapors.	Have all utilities marked by USA/Dig Alert prior to excavation or drilling operations; Use extreme care in vicinity of marked utility lines; Uncover by hand when necessary.

X	Overhead Utilities	Electrocution from broken overhead electric lines; Risk of arcing or ignition of flammable vapors	Observe overhead conditions and note location of overhead power and cable lines; Avoid lifting extension arms on excavation equipment and masts of drill rigs while under overhead utility lines.
X	Motor Vehicle / Traffic Hazards	Injury or Fatality and/or property damage may occur from Vehicle Accidents	Watch out from ground personnel and pedestrian traffic in vicinity of operation of motor vehicles; Make sure area around vehicle is clear before setting in motion; Use extreme caution while backing making certain of clearances; Always engage parking brake and turn the motor off when not in use.
X	Drill Rig Hazards	Injury or Fatality and/or property damage may occur from Drill Rig Accidents	Maintain proper clearances from overhead power lines; Do not move the rig with the mast elevated; Always assume power lines are energized; Contact Dig Alert to have underground utilities marked prior to drilling operations; Do not perform maintenance or repair of drilling equipment while equipment is running; Hydraulic fluid is under extreme pressure, check for fluid leaks with a piece of wood or cardboard; Do not refuel while the engine is running or hot.

X	Noise	Physical damage to the ear, temporary and/or permanent hearing loss	If noise levels are such that a worker must shout to be heard, hearing protection should be used. Wear ear plugs or over-the-head hearing protectors. Symptoms of overexposure to noise include ringing in the ears, slight deafness, nausea, loss of equilibrium
X	Heat Stress	Illness or death may result from heat-related illness Such as Heat Exhaustion or Heat Stroke	Keep hydrated, drink water or Gatoraid frequently; take breaks every hour to rest and cool off; Watch for symptoms such as weakness or dizziness, shortness of breath, fainting, headaches, and nausea; Workers experiencing these symptoms should move into the shade and apply cool, wet cloths
none	Cold Stress	Dehydration, numbness, frostbite, hypothermia	Select proper clothing for cold, wet, or windy conditions; Layer clothing; Wear a hat and gloves; Take frequent, short breaks in dry shelters to allow the body to warm up; Drink warm, sweet beverages; Avoid drinks with caffeine (Coffee, tea, hot chocolate); Eat warm, high-calorie foods; Watch for symptoms such as shivering, numbness, glassy state, apathy, loss of consciousness.

Slips, Trips and Falls

Sources of slips, trips and falls include:

- Steep slopes
- Vegetation on slope
- Debris on ground
- Pipes, wires and hoses
- Equipment on ground
- Cracks and breaks in ground surface.
- Wet surfaces
- Oily surfaces

Administrative Precautions:

- Setup staging area for pipes and equipment away from main work area, or place in conspicuous place outside main work/traffic area.
- Perform brief site-walk to identify potential slip/trip/fall hazards.
- Cleanup any oily stains – do not leave bentonite grout on ground as this becomes slimy and slippery when wet.
- If slopes with vegetation are repeatedly traversed, use wooden ramp to minimize slip hazards.
- Look where you are going. Pay attention to ground surface condition.
- If you have to go down a slope, make sure you are supported or go down on behind.

Possible results of slip, trip or falls: Cuts, broken bones, or worse.
Treatment: check for broken bones, abrasions, and concussion. Determine level of emergency.

If unconscious, get medical attention immediately.

Back Injury

Results from improper lifting of objects.

Administrative Prevention:

- Proper instruction in lifting: The proper method of lifting objects is to bend at your knees and squat down, keeping a straight back. Get a good firm grip on the object to be lifted. Hold the load close and lift by standing up, lifting with the legs. Do not attempt to lift objects of greater than 50 pounds by self.
- Provide back-support belt.

Treatment – Strained Lower Back

Apply first cold packs or ice to area. This will help to keep any swelling down and will numb pain. Provide support using support belt. Consult physician as soon as possible.

NOTE

IF YOU THINK THE VICTIM HAS A HEAD OR SPINE INJURY, CALL 911 AT ONCE. MINIMIZE VICTIMS MOVEMENT OF HEAD AND SPINE AS MUCH AS POSSIBLE. DO NOT STRAIGHTEN ANY LIMBS OR HEAD IF SHARPLY TURNED TO ONE SIDE, DO NOT TRY TO MOVE IT. SUPPORT HEAD AS YOU FOUND IT.

MAINTAIN OPEN AIRWAY.

Treat for shock if victim shows signs.

Electrical/Gas/Water Lines

Underground utilities can pose potential threat to worker safety. Ruptured water lines may have enough pressure to hit and injure a worker, or reach overhead electrical wires. Ruptured underground natural gas or flammable petroleum lines may ignite or explode. Electrical hazards include breaking electrical lines resulting in ignition of flammable materials (e.g gasoline vapors), arching and electrocution.

Safety precautions: Call USA / Dig Alert prior to all work – have all underground utility lines marked. Shut off electrical main prior to work. Shut off natural gas main and water main to site. Stay at least 15 to 30 feet away from overhead electrical lines (especially in wet weather).

Treatment for electrical burns:

- Do not touch victim until verifying electricity is off.
- If a power line is down, wait for the fire department and/or the Power Company.
- Do not move victim – check for other injuries such as possible fractures.
- Cover an electrical burn with a dry, sterile dressing. DO NOT cool the burn.
- Keep the victim from being chilled.
- Wait for ambulance.

Vehicle Safety

The work will be conducted on private property that is subject to on-site vehicular traffic. Traffic barricades will be utilized to block off work areas from vehicular traffic minimize potential traffic hazards. Additional personnel will be utilized to control traffic in work areas to provide additional visibility to on-site traffic as well as to provide safety protections for the sampling technicians obtaining soil samples.

Heavy equipment will be used at site. Drivers/operators should NOT back up until they verify no one is standing or crouching behind them. Drivers/operators of vehicles with high front ends must verify no one is standing/crouching if front of vehicle before moving vehicle.

Drill Rig Safety

Primary Hazards: Electrocution, Fire, or Explosion due to contact with overhead power lines or underground utilities and personnel struck by tools or debris during the drilling process.

Administrative Prevention:

- Always check for overhead lines or other obstructions before raising the mast or any elevated part. Maintain proper clearances from power lines, and do not move the rig with the mast elevated. Always assume a power line is energized.
- Designate a signal man when operating in the vicinity of power lines. Use a guide when backing the rig.
- Fully deploy all outriggers and place blocks under the pads in wet or unstable soil. Use heavy duty blocks appropriate for the weight of the rig. Level the rig as much as possible to provide a secure work platform.
- Do not perform any repairs, maintenance, or servicing while the machine is running. Lockout/tagout procedures must be used to ensure safety from any mechanical or electrical hazard.
- Contact utility locator at least 48 hours in advance of drilling activities. Carefully uncover and positively locate the exact position of the utility line by hand digging before performing machine operations when operating in the vicinity of marked utilities.
- Keep the rig clean and free of grease, oil spills, and drilling fluids. Keep work areas free of clutter and debris which might cause trip hazards.

Do not refuel while the engine is running or hot.

Noise

Work around large equipment often creates excessive noise. Effects of noise can include:

- Workers being startled, annoyed, or distracted;
- Physical damage to the ear, pain, and temporary and/or permanent hearing loss;
- Communication interference that may increase potential hazards due to inability to warn of danger and the proper safety precautions to be taken.

8-hr time-weighted limit for noise – 90 dBA. This is the limit above which administrative and/or engineering controls must be utilized. Whenever worker exposure to noise levels equal to or greater than the 8-hour TWA sound level of 85 dBA, workers must administer a continuing, effective hearing conservation program as described in OSHA regulation 29 CFR Part 1910.95.

- If noise levels are such that a worker must shout to be heard, noise levels are excessive and ear plugs or other equivalent hearing protection must be implemented.

Signs of overexposure to noise – ringing in ears, slight deafness, nausea, and loss of equilibrium.

Treatment: removal from immediate work area to support zone. Insert ear plugs and allow to rest. If bleeding occurs, this may be a sign of ear-drum rupture. Have victim see a physician as soon as possible.

Confined Space Entry

Confined space entries (CSE) shall be performed by OSHA trained and certified personnel in accordance with permit requirements. Copies of training certifications for individuals performing CSE shall be available on-Site while confined space entries are being conducted.

Confined space entry is not anticipated during the proposed drilling and investigation activities at the Site.

Heat Stress

Major hazard, especially for workers wearing protective clothing. Protective clothing limits the dissipation of body heat and moisture. Heat stress can occur rapidly *within as little as 15 minutes*.

Early signs of heat stress:

- Rashes;
- Cramps;
- Discomfort and drowsiness resulting in impaired functional ability that threatens the safety of both the worker and coworkers.

Second phase – heat exhaustion:

- Cool, moist, pale or flushed skin;
- Headache;
- Nausea;
- Dizziness;
- Weakness;
- Exhaustion

Last phase – Heat stroke occurs when people ignore the signals of heat exhaustion. The body systems are overwhelmed by heat and begin to stop functioning. Heat stroke can lead to **death**. Signs of last phase include:

- Red, hot, **dry** skin;
- Changes in consciousness;
- Rapid weak pulse;
- Rapid, shallow breathing.

Administrative Methods to Prevent Heat Stress:

- Require workers to take (at minimum) hourly breaks to rest and cool off.
- Provide shelter/shade using canopy or umbrella.
- Provide plenty of cool drinks.

If caught in the early stages, heat-related illness can be reversed using the following methods:

- GET VICTIM OUT OF HEAT
- Loosen any tight clothing and APPLY COOL, WET CLOTHS;
- If victim is conscious, give cool water to drink SLOWLY (about one 4 oz glass every 15 minutes.
- REST.

NOTE:

If victim REFUSES WATER, VOMITS and CHANGES IN CONSCIOUSNESS occur, victim's condition is getting worse. CALL FOR AMBULANCE. CALL 911.

If victim VOMITS, STOP GIVING FLUIDS to victim. Position victim on side. Watch for signals of breathing problems. KEEP VICTIM LYING DOWN and continue to COOL the body any way you can (ice packs or cold packs). DO NOT apply rubbing alcohol.

Cold Stress

If work is conducted during the winter, hypothermia may be a health hazard. Hypothermia occurs when the entire body cools because its ability to keep warm fails. The victim will die if not given care. People susceptible to hypothermia are those of ill health, drunk, or suffer from any medical condition that impairs circulation (diabetes or cardiovascular disease). ANYONE REMAINING IN COLD WATER OR WET CLOTHING FOR A LONG TIME MAY ALSO EASILY DEVELOP HYPOTHERMIA.

Symptoms: shivering, numbness, glassy stare, apathy, and loss of consciousness.

Administrative Methods to Protect against Cold Stress:

- Provide/require rain gear including rubber steel-toed boots.
- Provide overhead shelter i.e. umbrella or tent.
- Require workers to take rest every hour, drink hot liquids.
- Make sure everyone has a dry set of clothes and towel to dry off.

Treatment:

- Remove any wet clothing and dry the victim.
- Warm the body gradually by wrapping the victim in blankets or putting on dry clothing and moving the victim to a warm place.
- Apply heat pads or other heat sources to the body if available.
- Keep a barrier such as a blanket, between the heat source and to victim to avoid burning them.
- If the victim is alert, give warm liquids to drink.

- DO NOT WARM THE VICTIM TOO QUICKLY, such as by immersing the victim in warm water as this can cause dangerous heart problems.
- In case of severe hypothermia where the victim is unconscious, make sure victim is breathing and seek professional medical attention as soon as possible. Provide rescue breathing if necessary until help arrives.

5.2 CHEMICAL HAZARDS

It is not anticipated that personnel will come in contact with any significant quantities of contaminated soil. Therefore the risk associated with dermal or inhalation exposure is low and in minimal quantities.

6.0 PERSONAL PROTECTIVE EQUIPMENT

Level of Protection: B [ ] C [ ] D [X]

All personnel must wear: long pants, sleeved shirt (short sleeves are acceptable), hardhat, high visibility traffic safety vests, safety glasses, and safety shoes. Personnel may be required to wear additional protective eye, ear, and hand PPE appropriate to their tasks.

Nitrile gloves and tyvek suit should be worn if contact with contaminated water or soil is likely.

Hearing protection must be worn if noise levels prevent normal conversation at a distance of three feet or anytime noise levels are measured to be over 85 dB.

No smoking, eating or drinking is allowed in any exclusion or contamination reduction zones.

7.0 TRAINING REQUIREMENTS

All field personnel shall have completed training in hazard recognition and basic health and safety concerns as required by the Occupational Health and Safety Administration (OSHA) in 29 CFR 1910.120(e) and HSC 25200 1.5(g)(3)(A-E). In addition, each field person shall be familiar with this health and safety plan and will participate in site activity and safety briefings. Attendance at safety meetings will be documented on site, each day of activity. Direct contact with large quantities of hazardous materials is not anticipated.

Since chemical exposure on site could involve airborne vapors, all workers will be trained and prepared to wear respirators as per CCR, Title 8, Section 5144.

8.0 DECONTAMINATION PROCEDURES

Decontamination will take place in the decontamination zone, identified on-site in the support zone. All workers, personal protective equipment, sampling equipment, and heavy equipment leaving the work area will be decontaminated in the designated area to prevent the spread of contamination.

After leaving the exclusion zone, workers will remove all personal protective equipment. Boots, respirators, and other reusable personal protective equipment will be decontaminated using a mild detergent and water. Respirators, excluding cartridges, will be dismantled, and each part decontaminated by washing with mild detergent and clean water. Once clean, respirators will be allowed to air dry in a clean area before reassembling. When not in use, respirators will be kept in a clean, airtight, plastic bag, or similar container.

All workers will wash hands, arms, and face after removing personal protective equipment and prior to leaving the site. Two five-gallon buckets, one filled with a soap mixture and the other with clean water will be available for workers to wash with.

Sampling equipment shall be washed in non-phosphate soap and triple rinsed in distilled water. Support vehicles are to remain outside of the immediate work area and will not require decontamination procedures. There are no special emergency decontamination procedures anticipated for this site.

9.0 EMERGENCY PROCEDURES

The following standard emergency procedures will be used by on-site personnel. The Site Safety Officer shall be notified of any on-site emergencies and be responsible for ensuring that the appropriate procedures are followed.

In the event of emergency, the Site Safety Officer will direct the proper action to be taken. It may be necessary for the Site Safety Officer to depend on other on-site personnel for assistance. The Site Safety Officer will call for emergency help if necessary.

Emergency evacuation procedures will be implemented at the direction of the Site Safety Officer if necessary.

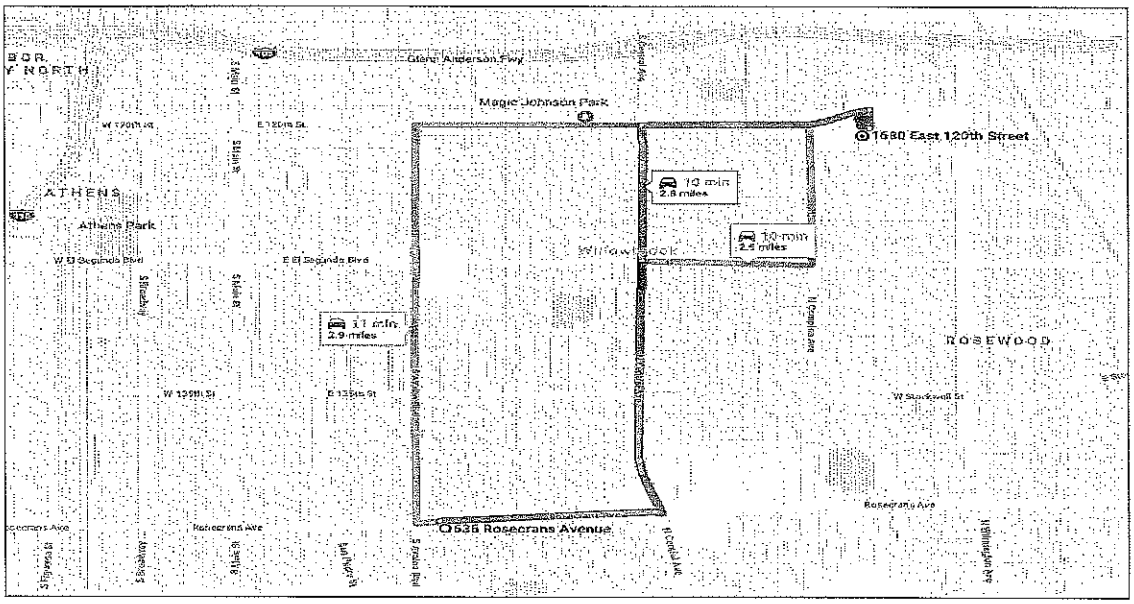
- Shut down drill rig and any ancillary equipment that may be operating
- In case of injury, the Site Safety Officer shall call 911
- Administer first aid / CPR as required. First aid kits, potable water and respirators are available on support vehicles.
- If toxic fumes are encountered as indicated by the PID, don respirators

9.1 LIST OF EMERGENCY TELEPHONE NUMBERS

Office/Agency/Facility	Telephone Number	Contact Person
Police	**911**	
Fire	**911**	
Office	(562) 777-2200	Joe Scatoloni
Cell Phone No.	(310) 629-8207	Joe Scatoloni
Cell Phone No.	(626) 806-8322	David Baltazar
Cell Phone No.	(562) 239-0542	Doug Thane

9.2 HOSPITAL LOCATION MAP AND DIRECTIONS

The nearest medical facility is: **Martin Luther King Jr.**
1680 East 120th Street
Los Angeles, California 90059



Directions: Head EAST on East Rosecrans Avenue
Head NORTH on North Central Avenue
Head EAST East 120th Street
Martin Luther King Jr. Community Hospital is located on the RIGHT

10.0 PUBLIC SAFETY

The work area will be secured using either caution tape or delineators.

Underground Services Alert will be notified at least 48 working hours prior to excavation. USA members will be requested to identify all underground utilities in vicinity of site (both off and on site).

Main water lines and natural gas lines entering site will be uncovered by hand shovel if in vicinity of excavations. Once uncovered, lines will be highlighted with paint and stakes.

HASP SIGNATURE SHEET

All site personnel have read the above plan and are familiar with its provisions.

Name	Company	Signature	Date
DAVID BALTAZAR	ENCON		7/5/19
Brian Hernandez	YSI	Brian Hernandez	7-5-19
Christian Villatoro	YSI	Christian Villatoro	7-25-19
Cory Hall	Hall YSI	Hall	7/25/19
Andrew Baltazar	Encon		7/25/19
Anthony Baltazar	Encon		7-25-19

VISITOR'S LOG

ENCON Tailgate Meeting Form

ENCON Site Name: TRENCH SHORING

Work Being Performed: SOIL/HYDRO PUNCH SAMPLING

Date & Time of Meeting: 7/25/19 0700

Name of Presenter: David Baltazar

NOTE: On the initial day of the project, the Project Manager or designee should conduct a visual inspection of the project site prior to the Tailgate Meeting. This inspection should include a review of project site equipment, hazards, and specific job tasks, activities or operations to be performed for that day. These specific items must be covered during the Tailgate Meeting.

Itemize the Specific Topics Discussed (if more space is needed use the back of this page):

Likely Site Hazards:

1. **Vehicular traffic** ✓
2. **trip/slip/fall** ✓
3. **possible insect/spider presence**
4. **Hospital Route** ✓
5. **Appropriate PPE (Hard hat, Z87 safety glasses, safety vests, hearing protection, cut resistant work gloves)**
6. **Medical access as detailed on the HASP** ✓
7. **Policy regarding notification requirements if an incident occurs** ✓
8. **Heavy equipment and drill rig inspections**

- HOSPITAL ROUTE ✓
- ENAC AREA ✓
- FIRST AID / CPR ✓

Participants (if needed, list additional participants on back of this page):

	Print Name	Signature	Company	Date
1	DAVID BALTAZAR		ENCON	7/25/19
2	Bryan Hernandez	Bryan Hernandez	YJD	7-25-19
3	Christian Villafana	Christian Villafana	YJD	7-25-19
4	Cory Hall	C Hall	YJD	7/25//9
5	DAVID BALTAZAR		ENCON	7/25/19
6	Andrew Baltazar		Encon	7/25/19
7	Anthony Baltazar		Encon	7-25-19
8				
9				
10				
11				
12				
13				
14.				
15				
16				

A Tailgate Safety Meeting must be conducted and documented at the beginning of each workday when two or more ENCON employees and/or subcontractor representatives are present on site. Employees, client representatives and subcontractors who arrive at the site after the Tailgate Safety Meeting has been conducted must be briefed on the topics and acknowledge by signing this form.

ENCON Tailgate Meeting Form

ENCON Site Name: TRENCH SHORING

Work Being Performed: SOIL/HYDRO PUNCH SAMPLING

Date & Time of Meeting: 7/26/19 0700

Name of Presenter: David Baltazar

NOTE: On the initial day of the project, the Project Manager or designee should conduct a visual inspection of the project site prior to the Tailgate Meeting. This inspection should include a review of project site equipment, hazards, and specific job tasks, activities or operations to be performed for that day. These specific items must be covered during the Tailgate Meeting.

Itemize the Specific Topics Discussed (if more space is needed use the back of this page):

Likely Site Hazards:

1. **Vehicular traffic**
2. **trip/slip/fall**
3. **possible insect/spider presence**
4. **Hospital Route**
5. **Appropriate PPE (Hard hat, Z87 safety glasses, safety vests, hearing protection, cut resistant work gloves)**
6. **Medical access as detailed on the HASP**
7. **Policy regarding notification requirements if an incident occurs**
8. **Heavy equipment and drill rig inspections**

- HOSPITAL ROUTE
- ENAC AREA
- FIRST AID/CPR

Participants (if needed, list additional participants on back of this page):

	Print Name	Signature	Company	Date
1	DAVID BALTAZAR		ENCON	7/26/19
2	Cory Hall		YJD	7/26/19
3	Christian Villatoro		YJD	7/26/19
4	Andrew Baltazar		ENCON	7/26/19
5	Brian Hernandez	Brian Hernandez	YJD	7-26-19
6	[redacted]		ENCON	7/26/19
7	Reyes J Ojeda		ENCON	7/26/19
8				
9				
10				
11				
12				
13				
14.				
15				
16				

A Tailgate Safety Meeting must be conducted and documented at the beginning of each workday when two or more ENCON employees and/or subcontractor representatives are present on site. Employees, client representatives and subcontractors who arrive at the site after the Tailgate Safety Meeting has been conducted must be briefed on the topics and acknowledge by signing this form.

Exhibit E

Waste Disposal Manifests

NON-HAZARDOUS WASTE MANIFEST

1. Generator ID Number	2. Page 1 of	3. Emergency Response Phone	4. Waste Tracking Number
		562 777 2200	

GENERATOR

5. Generator's Name and Mailing Address
TRENCH SHORING COMPANY
206 N. CENTRAL AVE.
COMPTON, CA. 90220
Generator's Phone:

Generator's Site Address (if different than mailing address)
6316 E. ROSECRANS AVE.
LOS ANGELES, CA. 90059

6. Transporter 1 Company Name: ENVIRON TECHNOLOGIES INC. — U.S. EPA ID Number:

7. Transporter 2 Company Name — U.S. EPA ID Number:

8. Designated Facility Name and Site Address — U.S. EPA ID Number:
CROSBY & OVERTON
1610 W. 17TH ST.
LONG BEACH, CA. 90813
Facility's Phone:

	9. Waste Shipping Name and Description	10. Containers No.	10. Containers Type	11. Total Quantity	12. Unit Wt./Vol.
1.	NON HAZ SOIL	10	DRUMS	3000 ~~55~~	LBS ~~G~~
2.					
3.					
4.					

13. Special Handling Instructions and Additional Information
PROFILE # 112669

14. GENERATOR'S/OFFEROR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations.

Generator's/Offeror's Printed/Typed Name: TRENCH SHORING COMPANY % DAVID BACHER — Signature — Month: 8 — Day: 14 — Year: 19

INT'L

15. International Shipments ☐ Import to U.S. ☐ Export from U.S. Port of entry/exit:
Transporter Signature (for exports only): Date leaving U.S.:

TRANSPORTER

16. Transporter Acknowledgment of Receipt of Materials

Transporter 1 Printed/Typed Name: ENVIRON TECHNOLOGIES INC. — Signature — Month: 8 — Day: 14 — Year: 19

Transporter 2 Printed/Typed Name — Signature — Month — Day — Year

DESIGNATED FACILITY

17. Discrepancy

17a. Discrepancy Indication Space ☐ Quantity ☐ Type ☐ Residue ☐ Partial Rejection ☐ Full Rejection

Manifest Reference Number:

17b. Alternate Facility (or Generator) — U.S. EPA ID Number
Facility's Phone:

17c. Signature of Alternate Facility (or Generator) — Month — Day — Year

H135

18. Designated Facility Owner or Operator: Certification of receipt of materials covered by the manifest except as noted in Item 17a

Printed/Typed Name — Signature — Month: 8 — Day: 14 — Year: 19

...OUS ...STE MANIFEST

1. Generator ID Number	2. Page 1 of	3. Emergency Response Phone	4. Waste Tracking Number
	1	(562) 777-2200	

GENERATOR

5. Generator's Name and Mailing Address
TRENCH SHORING COMPANY
206 N. CENTRAL AVE.
COMPTON, CA. 90220
Generator's Phone:

Generator's Site Address (if different than mailing address)
636 E. ROSECRANS AVE.
LOS ANGELES, CA. 90059

6. Transporter 1 Company Name: ENCON TECHNOLOGIES INC. — U.S. EPA ID Number:

7. Transporter 2 Company Name — U.S. EPA ID Number:

8. Designated Facility Name and Site Address
CROSBY & OVERTON
1610 W. 17TH ST.
LONG BEACH, CA. 90813
Facility's Phone: — U.S. EPA ID Number:

	9. Waste Shipping Name and Description	10. Containers No.	10. Containers Type	11. Total Quantity	12. Unit Wt./Vol.
1.	NON-HAZ SOIL	5	DRUMS	1500 ~~55~~	LBS ~~G~~
2.					
3.					
4.					

13. Special Handling Instructions and Additional Information
D76070
PROFILE # 112669

14. **GENERATOR'S/OFFEROR'S CERTIFICATION:** I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations.

Generator's/Offeror's Printed/Typed Name: TRENCH SHORING COMPANY C/O DAVID BALTAZAR — Signature — Month: 8 — Day: 14 — Year: 19

INT'L

15. International Shipments ☐ Import to U.S. ☐ Export from U.S. — Port of entry/exit:
Transporter Signature (for exports only): — Date leaving U.S.:

TRANSPORTER

16. Transporter Acknowledgment of Receipt of Materials

Transporter 1 Printed/Typed Name: ENCON TECHNOLOGIES INC. Mark Lambert — Signature — Month: 8 — Day: 14 — Year: 19

Transporter 2 Printed/Typed Name — Signature — Month — Day — Year

DESIGNATED FACILITY

17. Discrepancy

17a. Discrepancy Indication Space ☐ Quantity ☐ Type ☐ Residue ☐ Partial Rejection ☐ Full Rejection

Manifest Reference Number:

17b. Alternate Facility (or Generator) — U.S. EPA ID Number:

Facility's Phone:

17c. Signature of Alternate Facility (or Generator) — Month — Day — Year

18. Designated Facility Owner or Operator: Certification of receipt of materials covered by the manifest except as noted in Item 17a

Printed/Typed Name: Adriana Martin — Signature — Month: 8 — Day: 16 — Year: 19

UPLOADING A GEO_REPORT FILE

SUCCESS

Your GEO_REPORT file has been successfully submitted!

Submittal Type:	GEO_REPORT
Report Title:	ENCON Further Soil and Groundwater UST Tank Site Investigation
Report Type:	Site Investigation
Report Date:	8/20/2019
Facility Global ID:	T10000012966
Facility Name:	TRENCH SHORING COMPANY
File Name:	ENCON Further Soil and Groundwater UST Site Asessment Investigation Report - August 20, 2019.pdf
Organization Name:	ENCON Technologies
Username:	ENCON
IP Address:	74.212.228.234
Submittal Date/Time:	8/20/2019 7:54:30 PM
Confirmation Number:	3260064184

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APPENDIX D.2

Los Angeles Regional Water Quality Control Board Underground Storage Tank Program Closure Letter

California Water Boards

Gavin Newsom
Governor

Jared Blumenfeld
Secretary for
Environmental Protection

Los Angeles Regional Water Quality Control Board

February 20, 2020

Mr. Roger Egge
Malloy Family Partners LP
556 Malloy Ct
Corona, Ca 92880

UNDERGROUND STORAGE TANK PROGRAM – CASE CLOSURE LETTER

FORMER TRENCH SHORING COMPANY
636 EAST ROSECRANS AVE., LOS ANGELES, CALIFORNIA, CA (CASE NO.: R-13416A)

Dear Mr. Egge:

This letter confirms the completion of a site investigation and corrective action for the underground storage tank(s) located at the above-described location. Thank you for your cooperation throughout this investigation. Your willingness and promptness in responding to our inquiries concerning the former underground storage tank(s) are greatly appreciated.

Based on information in the above-referenced file and with the provision that the information provided to this agency was accurate and representative of site conditions, this agency finds that the site investigation and corrective action carried out at your underground tank(s) site is in compliance with the requirements of subdivision (a) and (b) of section 25296.10 of the Health and Safety Code and with corrective action regulations adopted pursuant to section 25299.3 of the Health and Safety Code and that no further action related to the petroleum release(s) at the site is required.

This notice is issued pursuant to subdivision (g) of section 25296.10 of the Health and Safety Code.

Claims for reimbursement of corrective action costs submitted to the Underground Storage Tank Cleanup Fund more than 365 days after the date of this letter or issuance or activation of the Fund's Letter of Commitment, whichever occurs later, will not be reimbursed unless one of the following exceptions applies:

- Claims are submitted pursuant to Section 25299.57, subdivision (k) (reopened UST case);

Or

- Submission within the timeframe was beyond the claimant's reasonable control, ongoing work is required for closure that will result in the submission of claims beyond that time period, or that under the circumstances of the case, it would be unreasonable or inequitable to impose the 365-day time period.

If you have any questions on this matter, please contact Mr. Magdy Baiady at (213) 576-6699 or Mbaiady@waterboards.ca.gov.

Sincerely,

Renee Purdy
Executive Officer

cc:

Raymond Chan, Los Angeles City Department of Building and Safety
William Gedney, Golden State Water Company
Adjacent Property Owners List Below

Adjacent Properties:

Phichai and Yuet P. Yip, TRS
Yip Family Trust
631 S Edenfield Ave
Covina, CA 91723

Manuel B & Asuncion Castaneda
618 E Rosecrans Ave
Los Angeles, CA 90059

Compton Unified School District
McKinley Elementary School
Dr. Jennifer Kang-Moon, Principal
14431 Stanford Avenue
Compton, CA 90220

Golden State Water Company
1920 West Corporate Way
Anaheim, CA 92801
Wcgedney@Gswater.Com

CALIFORNIA Water Boards

GAVIN NEWSOM GOVERNOR

JARED BLUMENFELD SECRETARY FOR ENVIRONMENTAL PROTECTION

Los Angeles Regional Water Quality Control Board

February 20, 2020

Mr. Roger Egge
Malloy Family Partners LP
556 Malloy Ct
Corona, Ca 92880

SUBJECT: Transmittal Of Closure Letter For The Former Trench Shoring Company Located at 636 East Rosecrans Ave., Los Angeles, California, Ca (Case No.: R-13416a)

Dear Mr. Egge:

Attached please find the closure letter for the subject site. The current record fee title owners were notified of the proposed closure in accordance with Section 25296.20 of Chapter 6.7 of the Health and Safety Code. The Regional Board sent a public notification of the proposed case closure to all interested parties, which included a 60-day public comment period. No comments were received.

Based on the site specific information and data available in GeoTracker and the Regional Water Board's case file, we conclude that this case meets all the criteria of the State Water Board's Low-Threat Underground Storage Tank Case Closure Policy and that a case closure determination is appropriate.

Site data indicate that there may be residual petroleum hydrocarbons in soil at this site that could pose an unacceptable risk as a result of future construction/redevelopment activities, such as on or off-site excavations, installation of water wells at or near the site, or change to a more sensitive land use from commercial use. Responsible parties, land owners, and contractors performing subsurface activities at the site should be prepared to encounter soil, groundwater, and/or vapor contaminated with petroleum hydrocarbons. Appropriate health and safety equipment and protocols should be used, and any encountered pollution should be managed properly to avoid threats to human health or the environment.

Please contact Magdy Baiady at 213-576-6699 or by email at mbaiady@waterboards.ca.gov if you have any questions regarding this matter.

Sincerely,

Renee Purdy
Executive Officer

cc:

- Raymond Chan, Los Angeles City Department of Building and Safety
  William Gedney, Golden State Water Company
  Adjacent Property Owners List Below

Adjacent Properties:

Phichai and Yuet P. Yip, TRS
Yip Family Trust
631 S Edenfield Ave
Covina, CA 91723

Manuel B & Asuncion Castaneda
618 E Rosecrans Ave
Los Angeles, CA 90059

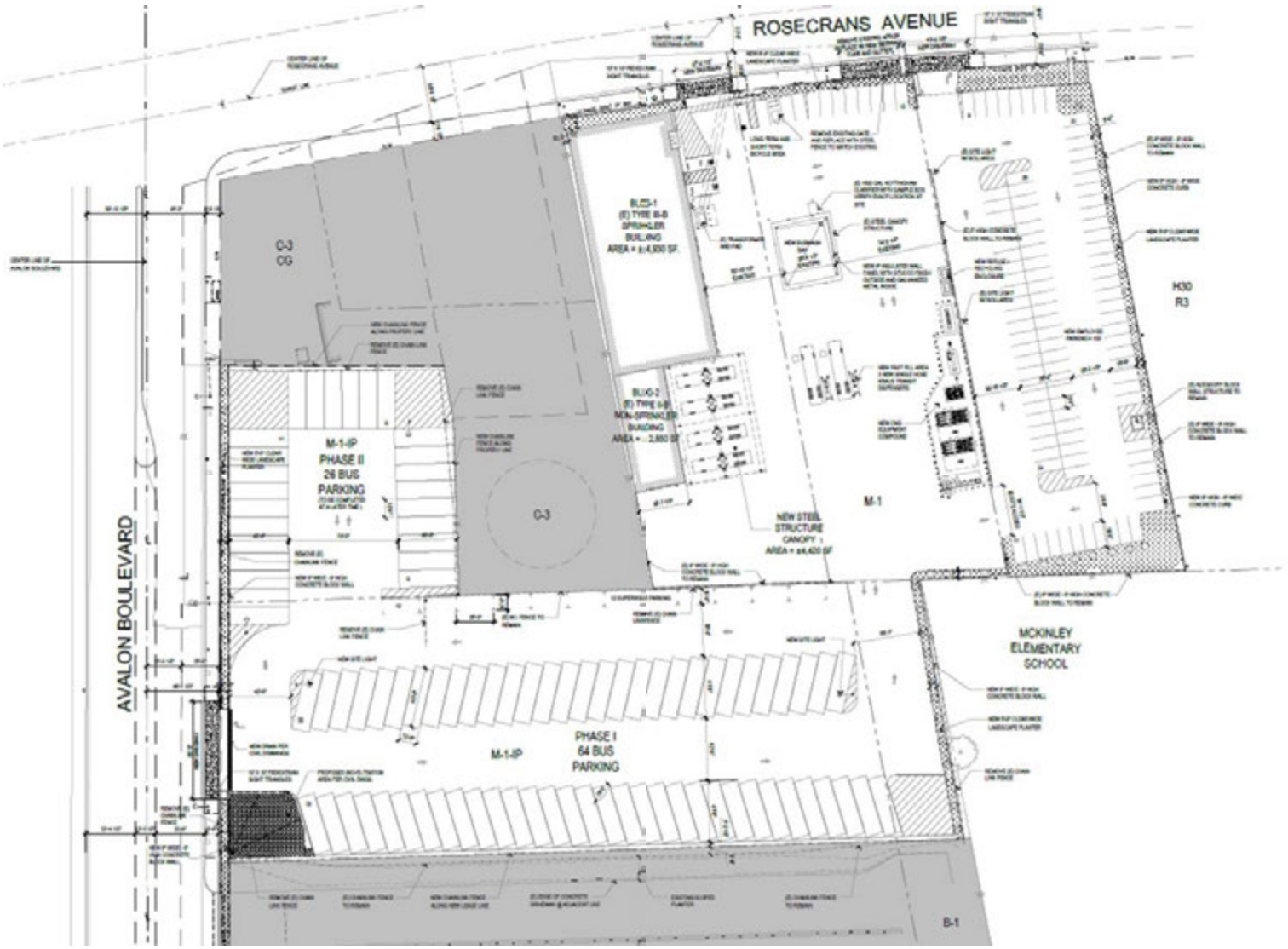
Compton Unified School District
McKinley Elementary School
Dr. Jennifer Kang-Moon, Principal
14431 Stanford Avenue
Compton, CA 90220

Golden State Water Company
1920 West Corporate Way
Anaheim, CA 92801
Wcgedney@Gswater.Com

APPENDIX E

Noise Impact Study

METRO BUS FACILITY ROSECRANS AND AVALON
NOISE IMPACT STUDY
County of Los Angeles, California



METRO BUS FACILITY ROSECRANS AND AVALON
NOISE IMPACT STUDY
County of Los Angeles, California

Prepared for:

TRANSDEV NORTH AMERICA
720 Butterfield Road, Suite 300
Lombard, IL 60148

Prepared by:

RK ENGINEERING GROUP, INC.
4000 Westerly Place, Suite 280
Newport Beach, CA 92660

Bryan Estrada, AICP, PTP
Darshan Shivaiah, M.S.

February 4, 2019

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1.0 Introduction

1.1 Purpose of Analysis and Study Objectives

The purpose of this report is to evaluate the potential noise impacts from the proposed Metro Bus Facility Development (project) and recommend mitigation measures, if necessary, to minimize any project noise impacts. The assessment was conducted within the context of the California Environmental Quality Act (CEQA) and utilizes the noise standards set forth by the Federal, State, and local agencies.

The following is provided in this report:

- A description of the study area and the proposed project
- Information regarding the fundamentals of noise
- Identification of the regulatory setting and applicable noise standards
- Analysis of the existing noise environment
- Analysis of the project's noise/land use compatibility
- Analysis of the project's operational noise impact to adjacent sensitive receptors
- Analysis of the project's construction noise and vibration impact to adjacent sensitive receptors
- Summary of recommended mitigation measures and project design features to reduce noise level impacts.

1.2 Site Location

The proposed project is located at 636 East Rosecrans Avenue and 14110-14438 South Avalon Boulevard, in unincorporated County of Los Angeles. The project site is bounded by Rosecrans Avenue to the north, existing industrial to the southwest, institutional use to the southeast, existing residential land uses to the east, and Avalon Ave to the west.

The project site is located approximately 121 feet above sea level and the topography is relatively flat, sloping downward at approximately 1% from north to south.

The project site is currently vacant and is zoned for Light Manufacturing (M-1-IP) uses in the County of Los Angeles Zoning Map and located in West Rancho Dominguez-Victoria Community Service District.

Existing land uses surrounding the proposed project site include; Industrial uses to the north, west and southwest, and Elementary School to the southeast, and residential uses

to the east. The nearest noise-sensitive land uses are considered the residential property located at the east property line and McKinley Elemntary School to the south of the site. There is an existing 8-foot CMU block along the eastern property line and a 5-foot wall along portions the Southern property line.

The project site location map is provided in Exhibit A.

1.3 Project Description

The project consists of constructing and operating a bus operations and maintenance facility for the Los Angeles County Metropolitan Transportation Authority (Metro). The project will include parking for buses, support vehicles, bus drivers, and Metro employees, bus maintenance and service facilities, an automated bus washing bay, Compressed Natural Gas (CNG) fueling pumps for the bus fleet, and approximately 12,137 square feet of building area of office and administrative uses.

The total combined site area is approximately 5.35 acres in size. The existing site includes approximately 17,137 square feet of existing building structures that will be preserved for use within the proposed project.

The site plan used for this analysis, provided by RS Herman Architects., is illustrated in Exhibit B.

Project construction and operational activities are analyzed for both short-term and long-term noise impacts. Short-term noise impacts may occur from construction activities, including; demolition, site preparation, grading, building construction, paving, and architectural coating. The primary sources of long-term noise impacts would be associated with on-site bus operations, bus and vehicular traffic along surrounding roadways, the automated bus wash and dryers, bus repair garage, and the CNG compressors.

1.4 Summary of Analysis Results

Table 2 provides a summary of the noise analysis results, per the CEQA impact criteria checklist. The results of the on-site operational noise analysis are shown graphically on Exhibits E, F and G.

Table 1
CEQA Noise Impact Criteria

Noise Impact Criteria	Potentially Significant	Potentially Significant Unless Mitigated	Less Than Significant Impact	No Impact
Would the project result in?				
a) Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies.			X	
b) Exposure of persons to or generation of excessive ground-borne vibration or ground-borne noise levels.			X	
c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project.		X		
d) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project.		X		
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose the people residing or working in the project area to excessive noise levels?				X
f) For a project within the vicinity of a private airstrip, would the project expose the people residing or working in the project area to excessive noise levels?				X

1.5 Recommended Mitigations Measures (MM)

The following recommended mitigation measures are provided to reduce potential project impacts identified in the CEQA Noise Impact Criteria Checklist to be less than significant.

MM-1 The bus wash bay and equipment tunnel should be enclosed to shield automated equipment and dryers/blower noise.

MM-2 A noise monitoring program shall be implemented during construction. The monitoring program will alert construction management personnel when noise levels approach the upper limits of the residential noise threshold near the property line. Construction activity will cease prior to noise levels exceeding the residential threshold.

1.6 Recommended Project Design Features (DF)

The following recommended project design features include standard rules and requirements, best practices and recognized design guidelines for reducing noise levels. Design features are assumed to be part of the conditions of the project and integrated into the site design and construction management plan.

DF-1 Provide an eight (8) foot high CMU block or tilt-up concrete wall along the south and east property line, adjacent to the residential and school uses.

DF-2 CNG compressor equipment should be enclosed and shielded by 5-foot CMU block wall.

DF-3 Bus wash bay and equipment should be enclosed within a bus wash tunnel.

DF-4 All rooftop mounted HVAC equipment should be fully shielded or enclosed from the line of sight of adjacent residential uses. Shielding/parapet wall should be at least as high as the equipment.

DF-5 Limit engine idling time for all buses/trucks to 5 minutes or less.

DF-6 Construction-related noise activities shall comply with the requirements set forth in the County of Los Angeles Municipal Code Section 12.08.430.

a. Operating or causing the operation of any tools or equipment used in construction, drilling, repair, alteration or demolition work between weekday hours of 7:00 p.m. and 7:00 a.m., or at any time on Sundays or holidays, such that the sound therefrom creates a noise disturbance across a residential or commercial real-property line, except for emergency work of public service utilities or by variance issued by the health officer is prohibited.

DF-7 Project should construct the 8-foot property line CMU block wall during the first phase of construction

DF-8 No impact pile driving activities shall be allowed on the project site.

DF-9 During construction, the contractor shall ensure all construction equipment is equipped with appropriate noise attenuating devices and equipment shall be

maintained so that vehicles and their loads are secured from rattling and banging. Idling equipment should be turned off when not in use.

DF-10 Locate staging area, generators and stationary construction equipment as far from the northwest property line, as reasonably feasible.

DF-11 Obtain a construction work permit from the County of Los Angeles prior to starting construction.

2.0 Fundamentals of Noise and Vibration

This section of the report provides basic information about noise and vibration and presents some of the terms used in the report.

2.1 Sound, Noise, and Acoustics

The sound is a disturbance created by a moving or vibrating source and is capable of being detected by the hearing organs. The sound may be thought of as mechanical energy of a moving object transmitted by pressure waves through a medium to a human ear. For traffic or stationary noise, the medium of concern is air. *Noise* is defined as sound that is loud, unpleasant, unexpected, or unwanted.

2.2 Frequency and Hertz

A continuous sound is described by its *frequency* (pitch) and its *amplitude* (loudness). Frequency relates to the number of pressure oscillations per second. Low-frequency sounds are low in pitch (bass sounding) and high-frequency sounds are high in pitch (squeak). These oscillations per second (cycles) are commonly referred to as Hertz (Hz). The human ear can hear from the bass pitch starting out at 20 Hz all the way to the high pitch of 20,000 Hz.

2.3 Sound Pressure Levels and Decibels

The *amplitude* of a sound determines its loudness. The loudness of sound increases or decreases, as the amplitude increases or decreases. Sound pressure amplitude is measured in units of micro-Newton per square inch meter (N/m2), also called micro-Pascal (μPa). One μPa is approximately one hundred billionths (0.00000000001) of normal atmospheric pressure. Sound pressure level (SPL or L_p) is used to describe in logarithmic units the ratio of actual sound pressures to a reference pressure squared. These units are called decibels and abbreviated as dB.

2.4 Addition of Decibels

Because decibels are on a logarithmic scale, sound pressure levels cannot be added or subtracted by simple plus or minus addition. When two (2) sounds or equal SPL are combined, they will produce an SPL 3 dB greater than the original single SPL. In other words, sound energy must be doubled to produce a 3dB increase.

If two (2) sounds differ by approximately 10 dB the higher sound level is the predominant sound.

2.5 Human Response to Changes in Noise Levels

In general, the healthy human ear is most sensitive to sounds between 1,000 Hz and 5,000 Hz, (A-weighted scale) and it perceives a sound within that range as being more intense than a sound with a higher or lower frequency with the same magnitude. For purposes of this report as well as with most environmental documents, the A-scale weighing is typically reported in terms of A-weighted decibel (dBA). Typically, the human ear can barely perceive the change in the noise level of 3 dB. A change in 5 dB is readily perceptible, and a change in 10 dB is perceived as being twice or half as loud. As previously discussed, a doubling of sound energy results in a 3 dB increase in sound, which means that a doubling of sound energy (e.g. doubling the volume of traffic on a highway), would result in a barely perceptible change in sound level.

2.6 Noise Descriptors

Noise in our daily environment fluctuates over time. Some noise levels occur in regular patterns, others are random. Some noise levels are constant, while others are sporadic. Noise descriptors were created to describe the different time-varying noise levels. Following are the most commonly used noise descriptors along with brief definitions.

A-Weighted Sound Level

The sound pressure level in decibels as measured on a sound level meter using the A-weighted filter network. The A-weighting filter de-emphasizes the very low and very high-frequency components of the sound in a manner similar to the response of the human ear. A numerical method of rating human judgment of loudness.

Ambient Noise Level

The composite of noise from all sources, near and far. In this context, the ambient noise level constitutes the normal or existing level of environmental noise at a given location.

Community Noise Equivalent Level (CNEL)

The average equivalent A-weighted sound level during a 24-hour day, obtained after addition of five (5) decibels to sound levels in the evening from 7:00 to 10:00 PM and after addition of ten (10) decibels to sound levels in the night before 7:00 AM and after 10:00 PM.

Decibel (dB)

A unit for measuring the amplitude of a sound, equal to 20 times the logarithm to the base 10 of the ratio of the pressure of the sound measured to the reference pressure, which is 20 micro-pascals.

dB(A)

A-weighted sound level (see definition above).

Equivalent Sound Level (LEQ)

The sound level corresponding to a steady noise level over a given sample period with the same amount of acoustic energy as the actual time-varying noise level. The energy average noise level during the sample period.

Habitable Room

Any room meeting the requirements of the Uniform Building Code or other applicable regulations which is intended to be used for sleeping, living, cooking or dining purposes, excluding such enclosed spaces as closets, pantries, bath or toilet rooms, service rooms, connecting corridors, laundries, unfinished attics, foyers, storage spaces, cellars, utility rooms, and similar spaces.

L(n)

The A-weighted sound level exceeded during a certain percentage of the sample time. For example, L10 in the sound level exceeded 10 percent of the sample time. Similarly, L50, L90, and L99, etc.

Noise

Any unwanted sound or sound which is undesirable because it interferes with speech and hearing, or is intense enough to damage hearing, or is otherwise annoying. The State Noise Control Act defines noise as "...excessive undesirable sound...".

Outdoor Living Area

Outdoor spaces that are associated with residential land uses typically used for passive recreational activities or other noise-sensitive uses. Such spaces include patio areas, barbecue areas, jacuzzi areas, etc. associated with residential uses; outdoor patient recovery or resting areas associated with hospitals, convalescent hospitals, or rest homes; outdoor areas associated with places of worship which have a significant role in services or other noise-sensitive activities; and outdoor school facilities routinely used for educational purposes which may be adversely impacted by noise. Outdoor areas usually not included in this definition are: front yard areas, driveways, greenbelts, maintenance areas and storage areas associated with residential land uses; exterior areas at hospitals that are not used for patient activities; outdoor areas associated with places of worship and principally used for short-term social gatherings; and, outdoor areas associated with school facilities that are not typically associated with educational uses prone to adverse noise impacts (for example, school play yard areas).

Percent Noise Levels

See L(n).

Sound Level (Noise Level)

The weighted sound pressure level obtained by use of a sound level meter having a standard frequency-filter for attenuating part of the sound spectrum.

Sound Level Meter

An instrument, including a microphone, an amplifier, an output meter, and frequency weighting networks for the measurement and determination of noise and sound levels.

Single Event Noise Exposure Level (SENEL)

The dBA level which, if it lasted for one (1) second, would produce the same A-weighted sound energy as the actual event.

2.7 Traffic Noise Prediction

Noise levels associated with traffic depends on a variety of factors: (1) volume of traffic, (2) speed of traffic, (3) auto, medium truck (2 – 6 wheels) and heavy truck percentage (3 axles and greater), and sound propagation. The greater the volume of traffic, higher speeds and truck percentages equate to a louder volume of noise. A doubling of the Average Daily Traffic (ADT) along a roadway will increase noise levels by approximately 3 dB; reasons for this are discussed in the sections above.

2.8 Sound Propagation

As sound propagates from a source it spreads geometrically. The sound from a small, localized source (i.e., a point source) radiates uniformly outward as it travels away from the source in a spherical pattern. The sound level attenuates at a rate of 6 dB per doubling of distance. The movement of vehicles down a roadway makes the source of the sound appear to propagate from a line (i.e., line source) rather than a point source. This line source results in the noise propagating from a roadway in a cylindrical spreading versus a spherical spreading that results from a point source. The sound level attenuates for a line source at a rate of 3 dB per doubling of distance.

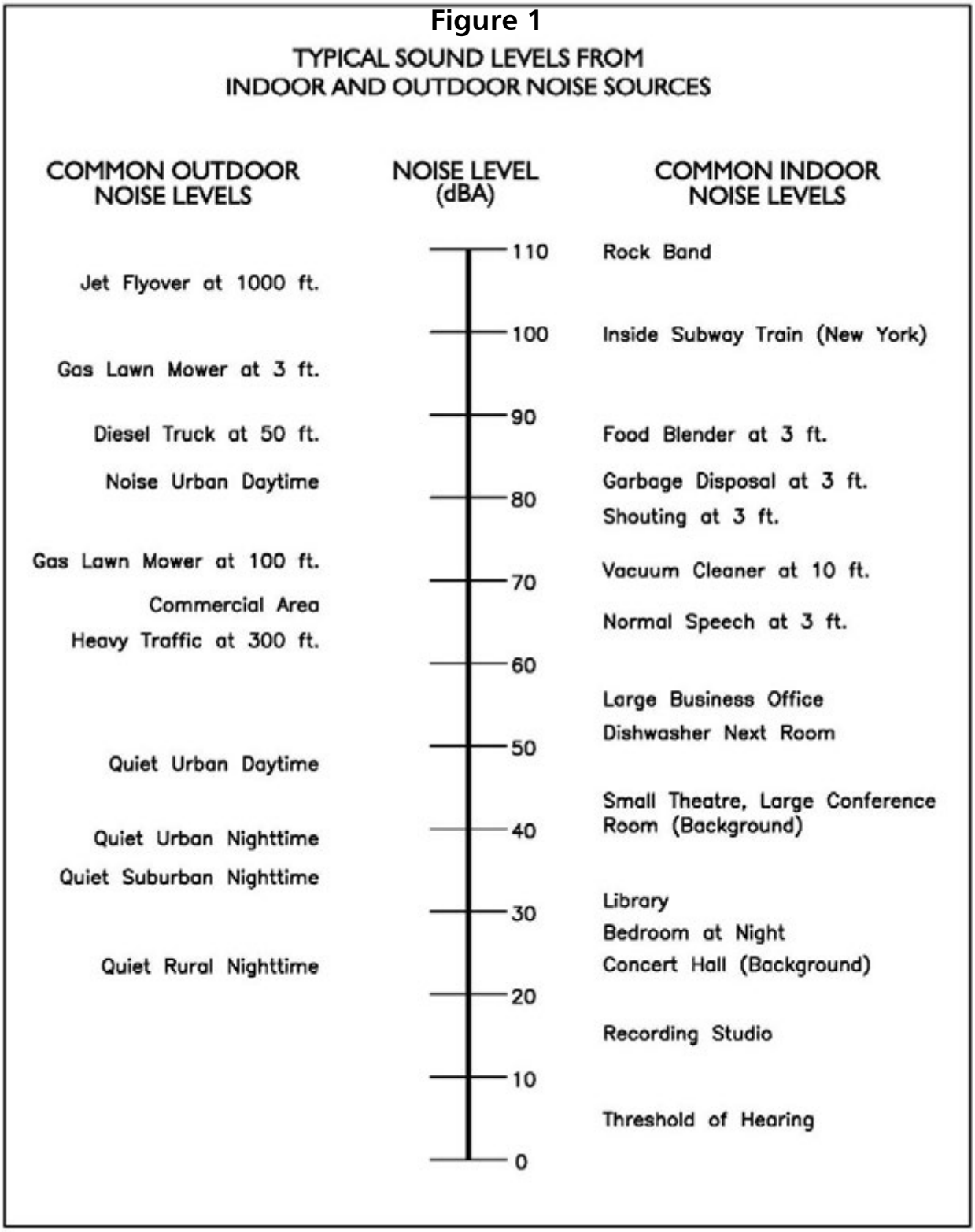
As noise propagates from the source, it is affected by the ground and atmosphere. Noise models use the hard site (reflective surfaces) and soft site (absorptive surfaces) to help calculate predicted noise levels. Hard site conditions assume no excessive ground absorption between the noise source and the receiver. Soft site conditions such as grass, soft dirt or landscaping attenuate noise at an additional rate of 1.5 dB per doubling of distance. When added to the geometric spreading, the excess ground attenuation results in an overall noise attenuation of 4.5 dB per doubling of distance for a line source and 6.0 dB per doubling of distance for a point source.

Research has demonstrated that atmospheric conditions can have a significant effect on noise levels when noise receivers are located 200 feet from a noise source. Wind, temperature, air humidity, and turbulence can further impact how far sound can travel.

Figure 1 shows typical sound levels from indoor and outdoor noise sources.

Figure 1

TYPICAL SOUND LEVELS FROM
INDOOR AND OUTDOOR NOISE SOURCES



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2.9 Vibration Descriptors

Ground-borne vibrations consist of rapidly fluctuating motions within the ground that have an average motion of zero. The effects of ground-borne vibrations typically only cause a nuisance to people, but at extreme vibration levels, damage to buildings may occur. Although ground-borne vibration can be felt outdoors, it is typically only an annoyance to people indoors where the associated effects of the shaking of a building can be notable. Ground-borne noise is an effect of ground-borne vibration and only exists indoors since it is produced from noise radiated from the motion of the walls and floors of a room and may also consist of the rattling of windows or dishes on shelves.

Several different methods are used to quantify vibration amplitude.

PPV

Known as the peak particle velocity (PPV) which is the maximum instantaneous peak in vibration velocity, typically given in inches per second.

RMS

Known as the root mean squared (RMS) can be used to denote vibration amplitude.

VdB

A commonly used abbreviation to describe the vibration level (VdB) for a vibration source.

2.10 Vibration Perception

Typically, developed areas are continuously affected by vibration velocities of 50 VdB or lower. These continuous vibrations are not noticeable to humans whose threshold of perception is around 65 VdB. Outdoor sources that may produce perceptible vibrations are usually caused by construction equipment, steel-wheeled trains, and traffic on rough roads, while smooth roads rarely produce perceptible ground-borne noise or vibration. To counter the effects of ground-borne vibration, the Federal Transit Administration (FTA) has published guidance relative to vibration impacts. According to the FTA, fragile buildings can be exposed to ground-borne vibration levels of 0.3 inches per second without experiencing structural damage.

2.11 Vibration Propagation

There are three main types of vibration propagation: surface, compression, and shear waves. Surface waves, or Rayleigh waves, travel along the ground's surface. These waves carry most of their energy along an expanding circular wavefront, similar to ripples produced by throwing a rock into a pool of water. P-waves, or compression waves, are body waves that carry their energy along an expanding spherical wavefront. The particle motion in these waves is longitudinal (i.e., in a "push-pull" fashion). P-waves are analogous to airborne sound waves. S-waves, or shear waves, are also body waves that carry energy along an expanding spherical wavefront. However, unlike P-waves, the particle motion is transverse, or side-to-side and perpendicular to the direction of propagation.

As vibration waves propagate from a source, the vibration energy decreases in a logarithmic nature and the vibration levels typically decrease by 6 VdB per doubling of the distance from the vibration source. As stated above, this drop-off rate can vary greatly depending on the soil but has been shown to be effective enough for screening purposes, in order to identify potential vibration impacts that may need to be studied through actual field tests.

2.12 Construction Related Vibration Level Prediction

Operational activities are separated into two different categories. The vibration can be transient or continuous in nature. Each category can result in varying degrees of ground vibration, depending on the equipment used on the site. Operation of equipment causes ground vibrations that spread through the ground and diminish in strength with distance. Buildings in the vicinity of the project area site respond to these vibrations with varying results ranging from no perceptible effects at the low levels to slight damage at the highest levels. The thresholds from Caltrans Transportation and Construction Induced Vibration Guidance Manual in the table below provide general guidelines as to the maximum vibration limits for when vibration becomes potentially annoying.

Table 2
Vibration Annoyance Potential Criteria

Human Response	PPV (in/sec)	
	Transient Sources	Continuous/Frequent Intermittent Sources
Barely perceptible	0.04	0.01
Distinctly perceptible	0.25	0.04
Strongly perceptible	0.90	0.10
Severe	2.00	0.40

Note: Transient sources create a single isolated vibration event, such as blasting or drop balls. Continuous/frequent intermittent sources include impact pile drivers, pogo-stick compactors, crack-and-seat equipment, vibratory pile drivers, and vibratory compaction equipment.

The Caltrans Transportation and Construction Induced Vibration Guidance Manual provides general thresholds and guidelines as to the vibration damage potential from vibratory impacts. The table below provides general vibration damage potential thresholds:

Table 3
Vibration Damage Potential Threshold Criteria

Structure and Condition	PPV (in/sec)	
	Transient Sources	Continuous/Frequent Intermittent Sources
Extremely fragile historic buildings ruin ancient monuments	0.12	0.08
Fragile buildings	0.20	0.10
Historic and some old buildings	0.50	0.25
Older residential structures	0.50	0.30
New residential structures	1.00	0.50
Modern industrial/commercial buildings	2.00	0.50

Soil conditions have an impact on how vibration propagates through the ground. The Caltrans Transportation and Construction Induced Vibration Guidance Manual provides suggested "n" values based on soil class. The table below outlines the manual's suggested values and description.

Table 4
Suggested "n" Values Based on Soil Classes

Soil Class	Description of Soil Material	Suggested Value of "n"
I	Weak or soft soils: loose soils, dry or partially saturated peat and muck, mud, loose beach sand, and dune sand.	1.4
II	Most sands, sandy clays, silty clays, gravel, silts, weathered rock.	1.3
III	Hard soils: densely compacted sand, dry consolidated clay, consolidated glacial till, some exposed rock.	1.1
IV	Hard, component rock: bedrock, freshly exposed hard rock.	1.0

3.0 Regulatory Setting

The proposed project is located in the County of Los Angeles and noise regulations are addressed through the various federal, state, and local government agencies. The agencies responsible for regulating noise are discussed below.

3.1 Federal Regulations

The adverse impact of noise was officially recognized by the federal government in the Noise Control Act of 1972, which serves three (3) purposes:

- Publicize noise emission standards for interstate commerce
- Assist state and local abatement efforts
- Promote noise education and research

The Federal Office of Noise Abatement and Control (ONAC) was originally tasked with implementing the Noise Control Act. However, it was eventually eliminated leaving other federal agencies and committees to develop noise policies and programs. Some examples of these agencies are as follows: The Department of Transportation (DOT) assumed a significant role in noise control through its various agencies. The Federal Aviation Agency (FAA) is responsible to regulate noise from aircraft and airports. The Federal Highway Administration (FHWA) is responsible to regulate noise from the interstate highway system. The Occupational Safety and Health Administration (OSHA) is responsible for the prohibition of excessive noise exposure to workers.

The Federal government and the State advocate that local jurisdiction use their land use regulatory authority to arrange new development in such a way that "noise sensitive" uses are either prohibited from being constructed adjacent to a highway or, or alternatively that the developments are planned and constructed in such a manner that potential noise impacts are minimized.

Since the Federal government and the State have preempted the setting of standards for noise levels that can be emitted by the transportation source, the County is restricted to regulating the noise generated by the transportation system through nuisance abatement ordinances and land use planning.

3.2 State Regulations

Established in 1973, the California Department of Health Services Office of Noise Control (ONC) was instrumental in developing regularity tools to control and abate noise for use by local agencies. One significant model is the "Land Use Compatibility for Community Noise Environments Matrix." The matrix allows the local jurisdiction to clearly delineate compatibility of sensitive uses with various incremental levels of noise.

The State of California has established noise insulation standards as outlined in Title 24 and the Uniform Building Code (UBC) which in some cases requires acoustical analyses to outline exterior noise levels and to ensure interior noise levels do not exceed the interior threshold. The State mandates that the legislative body of each county and city adopt a noise element as part of its comprehensive general plan. The local noise element must recognize the land use compatibility guidelines published by the State Department of Health Services. The guidelines rank noise land use compatibility in terms of normally acceptable, conditionally acceptable, normally unacceptable, and clearly unacceptable.

3.3 County of Los Angeles Noise Regulations

The County of Los Angeles outlines their noise regulations and standards within the Chapter 11 Noise Element of the General Plan and Chapter 12.08- Noise Control of the Municipal Code. The noise standards from the General Plan and Municipal code are provided in Appendix A.

3.3.1 General Plan Noise Standards

The County of Los Angeles establishes planning criteria for determining a development's noise/land use compatibility based on the community noise equivalent level (CNEL). Table 5 summarizes the County's Noise/Land Use Compatibility guidelines for land uses applicable to this project:

Table 5
Noise/Land Use Compatibility Guidelines

Land Use	Noise Limit (CNEL)			
	Normally Acceptable	Conditionally Acceptable	Normally Unacceptable	Clearly Unacceptable
Residential	50 – 60	55 – 70	70 – 75	>75
Industrial	50 - 75	70 - 80	>75	--

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Normally Acceptable: Specified land use is satisfactory, based upon the assumption that any buildings involved are of normal conventional construction without any special noise insulation requirements.

Conditionally Acceptable: New construction or development should be undertaken only after detailed analysis of the noise reduction requirements are made and needed noise insulation features in the design. Conventional construction, but with closed windows and fresh air supply systems or air conditioning, will normally suffice.

Normally Unacceptable: New construction or development should generally be discouraged. If new construction or development does proceed, a detailed analysis of noise reduction requirements must be made and needed noise insulation features included in the design.

Clearly Unacceptable: New construction or development should generally not be undertaken.

3.3.2 Municipal Code Noise Standards

Chapter 12.08, Noise Control, of the County of Los Angeles Municipal Code serves as the Noise Ordinance for the County and establishes noise standards to control unnecessary, excessive, and annoying noise and vibration in the County. The project must not exceed the residential noise limit at the nearest adjacent residential property line.

Table 6 shows the Los Angeles County exterior noise standards for residential properties.

Table 6
County of Los Angeles Exterior Noise Standards

Location	Time Period	Leq	L_{50} (30-min)	L_{25} (15-min)	L_8 (5-min)	L_2 (1-min)	L_{MAX} (any time)
Residential	Daytime (7am - 10pm)	50 dBA	50 dBA	55 dBA	70 dBA	65 dBA	70 dBA
	Nighttime (10pm – 7am)	45 dBA	45 dBA	50 dBA	65 dBA	60 dBA	65 dBA
Industrial	Anytime	70 dBA	70 dBA	75 dBA	90 dBA	85 dBA	90 dBA

Construction Noise Regulation

Section 12.08.430 of the County's municipal code describes the noise standards and requirements for construction activities.

1. Operating or causing the operation of any tools or equipment used in construction, drilling, repair, alteration or demolition work between weekday hours of 7:00 p.m. and 7:00 a.m., or at any time on Sundays or holidays, such that the sound therefrom creates a noise disturbance across a residential or commercial real-property line, except for emergency work of public service utilities or by variance issued by the health officer is prohibited.

2. Noise Restrictions at Affected Structures. The contractor shall conduct construction activities in such a manner that the maximum noise levels at the affected buildings will not exceed those listed in the following schedule:

   a. At Residential Structures.

Table 7
Maximum Noise Levels for Nonscheduled, Intermittent, Short-Term Operation (Less than 10 Days) of Mobile Equipment

Time	Single-family Residential	Multi-family Residential	Semi-residential/ Commercial
Daily, except Sundays and legal holidays, 7:00 a.m. to 8:00 p.m.	75 dBA	80 dBA	85 dBA
Daily, except Sundays and legal holidays, 7:00 a.m. to 8:00 p.m.	60 dBA	64 dBA	70 dBA

Table 8
Maximum Noise Level for Repetitively Scheduled and Relatively Long-Term Operation (Periods of 10 days or More) of Stationary

Time	Single-family Residential	Multi-family Residential	Semi-residential/ Commercial
Daily, except Sundays and legal holidays, 7:00 a.m. to 8:00 p.m.	60 dBA	65 dBA	70 dBA
Daily, except Sundays and legal holidays, 7:00 a.m. to 8:00 p.m.	50 dBA	55 dBA	60 dBA

b. At Business Structures.

Mobile equipment. Maximum noise levels for nonscheduled, intermittent, short-term operation of mobile equipment:

Daily, including Sunday and legal holidays, all hours: maximum of 85dBA.

3. All mobile or stationary internal-combustion-engine powered equipment or machinery shall be equipped with suitable exhaust and air-intake silencers in proper working order.

4. In case of a conflict between this chapter and any other ordinance regulating construction activities, provisions of any specific ordinance regulating construction activities shall control.

4.0 Study Method and Procedures

The following section describes the measurement procedures, measurement locations, and noise modeling procedures and assumptions used in the noise analysis.

4.1 Measurement Procedures and Criteria

Noise measurements are taken to determine the existing noise levels. A noise receiver or receptor is any location in the noise analysis in which noise might produce an impact. The following criteria are used to select measurement locations and receptors:

- Locations expected to receive the highest noise impacts, such as the first row of houses
- Locations that are acoustically representative and equivalent of the area of concern
- Human land usage
- Sites clear of major obstruction and contamination

RK conducted the sound level measurements in accordance with Caltrans technical noise specifications. All measurement equipment meets American National Standards Institute (ANSI) specifications for sound level meters (S1.4-1983 identified in Chapter 19.68.020.AA).

A Larson Davis 712 Type 2 sound level meter was used to conduct short-term (10-minute) noise measurements and a Piccolo-II Type 2 integrating-averaging sound level meter was used to collect 24-Hour noise measurement data.

The Leq, Lmin, Lmax, L2, L8, L25, and L50 statistical data were recorded over the measurement time period intervals and the information was utilized to define the noise characteristics for the project. The following gives a brief description of the Caltrans Technical Noise Supplement procedures for sound level measurements:

- Microphones for sound level meters were placed five (5) feet above the ground for all short-term noise measurements
- Microphones for sound level meters were placed ten (10) feet above the ground for all 24-hour noise measurements
- Sound level meters were calibrated before and after each measurement
- Following the calibration of equipment, a windscreen was placed over the microphone
- Frequency weighting was set on "A" and slow response

- Results of the short-term noise measurements were recorded on field data sheets
- During any short-term noise measurements, any noise contaminations such as barking dogs, local traffic, lawn mowers, or aircraft fly-overs were noted
- Temperature and sky conditions were observed and documented

Appendix B includes photos, field sheets, and measured noise data.

4.2 Traffic Noise Modeling

Traffic noise from vehicular traffic was projected using a version of the FHWA Traffic Noise Prediction Model (FHWA-RD-77-108). The FHWA model arrives at the predicted noise level through a series of adjustments to the key input parameters. The following outlines the key adjustments made to the computer model for the roadway inputs:

- Roadway classification – (e.g. freeway, major arterial, arterial, secondary, collector, etc),
- Roadway Active Width – (distance between the center of the outer most travel lanes on each side of the roadway)
- Average Daily Traffic (ADT) Volumes, Travel Speeds, Percentages of automobiles, medium trucks, and heavy trucks
- Roadway grade and angle of view
- Site Conditions (e.g. soft vs. hard)
- Percentage of total ADT which flows each hour throughout a 24-hour period.

The following outlines key adjustments to the computer model for the project site parameter inputs:

- Vertical and horizontal distances (Sensitive receptor distance from noise source)
- Noise barrier vertical and horizontal distances (Noise barrier distance from sound source and receptor).
- Traffic noise source spectra
- Topography

Traffic noise levels are projected at 100 feet from the centerline of the roadway. The traffic noise levels do not take into account the effect of any noise barriers or topography that may reduce traffic noise levels. Traffic volumes are referenced from the *Metro Bus Facility Rosecrans and Avalon Traffic Impact Analysis*, prepared by RK, January 2019.

Table 9 indicates the roadway parameters utilized for this study.

Table 9
Roadway Parameters[1]

Roadway	Segment	Classification	Lanes	Existing ADT	Existing Plus Project ADT	Cumulative Without Project ADT	Cumulative With Project ADT
Rosecrans Avenue	East of Avalon Blvd	Major 100' Roadways	6	26,526	26,780	29,297	29,551
Avalon Boulevard	South of Rosecrans Ave	Major 100' Roadways	4	20,500	20,687	21,828	22,015
Rosecrans Avenue	West of Avalon Blvd	Major 100' Roadways	6	24,838	25,195	26,620	26,977

[1] Traffic volumes obtained from the Metro Bus Facility Rosecrans and Avalon Traffic Impact Analysis.

Table 10 indicates the vehicle distribution and truck mix utilized for all surface streets in the study area.

Table 10
Vehicle Distribution (Truck Mix)[1]

Motor-Vehicle Type	Daytime % (7 AM - 7 PM)	Evening % (7 PM - 10 PM)	Night % (10 PM - 7 AM)	Total % of Traffic Flow
Automobiles	73.54	14.02	8.43	90.00
Medium Trucks	48.00	2.00	50.00	3.00
Heavy Trucks	50.00	2.00	52.00	7.00

[1] Estimated truck mix based on Southern California roadway mix.

4.3 Stationary Noise Modeling

On-site stationary noise sources were analyzed using SoundPLAN™ noise modeling software. SoundPLAN™ is a standards-based program that incorporates more than twenty national and international noise modeling guidelines. The following noise prediction standards were used during the performance of this project:

- TNM 3.0 (TNM 2.5)
- FTA/FRA - HSGT: 2005 (FTA/FRA – HSGT;2005)
- RMR 2002 (EU-Interim) (RMR 2002)
- ISO 9613-2: 1996
- Nord2000

Projected noise levels from SoundPLAN™ are based on the following key parameters:

- Developing three-dimensional noise models of the project,
- Predicting the project noise levels at the selected community locations and
- Comparing the predicted noise with the existing community ambient noise levels at the receptor locations.

The sides of the residential uses, walls, tanks, containers, buildings, etc. were modeled as reflective surfaces and also as diffractive bodies. The noise sources are shown as red spheres (point sources) and red surfaces (area sources). A light blue line outlines the perimeter of each operation. The surrounding roads are displayed as grey surfaces. Most of the ground within the project site and adjacent areas are covered with gravel, concrete or asphalt.

The main sources of potential on-site stationary noise impacts to adjacent land uses would include noise from the parking lot/on-site bus activity, bus wash, CNG compressors, and a bus repair garage.

4.3.1 Parking Lot /On-site Bus Activity Noise

Parking lot noise would occur from buses and vehicle engine idling and exhaust, doors slamming, tires screeching, people talking, and the occasional horn honking. Parking lot noise would occur throughout the site and is assessed by using referenced noise levels in the SoundPLAN model. Parking lot noise is based on the type of vehicle and number of movements per hour. There are approximately 126 employee parking spaces located adjacent to the eastern property line and 88 bus parking spaces located at the southwest corner of the site.

Referenced noise levels for parking lot activities, including bus activity, are based on the SoundPLAN™ standard *Parkplatzlärmstudie 2007*. Key inputs for parking lot noise include size of area source, number of movements per hour, type of vehicles, and number of parking spaces.

4.3.2 Automated Bus Wash Noise

Automated bus wash equipment and facilities have several potential noise generating sources associated with their general operation; including pumps, compressors, high-pressure applicators and spray nozzles, scrubbers, and dryers. The bus wash mechanical equipment (pumps, compressors, blowers, etc.) can generate a substantial amount of noise. The bus wash is located at approximately 200 feet from the residential property line

and 78 feet from the school property line. The bus wash tunnel is not expected to be fully enclosed.

Table 11 shows the referenced noise levels for the bus wash.

4.3.3 CNG Compressor Noise

The main source of noise produced from the CNG fueling pumps will come from the mechanical compressor equipment during operation. The reference noise for the CNG compressor is obtained from the *Field Study - Pulsation Vibration Report for GE Oil and Gas by BETA Machinery Analysis*. The CNG compressor will be placed at approximately 120 feet from the residential property line and 20 feet from the school property line. The compressor package is within a concrete block wall enclosure with doors, but with no roof.

Table 11 shows the referenced noise levels for the CNG Compressors.

4.3.3 Bus Repair Garage Noise

Noise from bus repair garage would include the use of pneumatic tools, lifts, air compressors, alarms, dropped tools, and other typical auto shop activities. The bus repair garage is located at approximately 300 feet from the residential property line and 58 feet from the school property line.

Table 11 shows the referenced noise levels for the Bus Repair Garage.

4.3.4 Referenced Stationary Noise Sources

To estimate noise level impacts from on-site noise sources, reference noise levels are utilized. Referenced noise levels represent similar noise sources operating under similar conditions as would be found on the project site. Table 11 indicates the referenced noise levels for on-site stationary noise sources. The noise measurement data indicates the distance the microphone was placed from the noise source and the statistical data.

Table 11
Referenced Noise Levels[1]

Source[1]	Distance from Source (feet)	Noise Levels (dBA)	
		L_{eq}	L_{max}
Bus Wash	3.0	99.2	100.0
Bus Repair Garage	6.0	78.1	79.5
CNG Compressor	3.0	88.5	88.5

[1] Referenced noise levels measured by RK over a 10-minute period.

To estimate the future noise levels during typical operational conditions, referenced noise levels are input into SoundPLAN and projected to the nearest sensitive receptor locations. Adjusted noise levels are based on the distance of the receptor location relative to the noise source, local topography and physical barriers including buildings and sound walls. The noise levels assume that the stationary sources are operating continuously when in reality all noise sources will operate intermittently throughout the daily operation.

4.4 Construction Noise Modeling

The construction noise analysis utilizes the Federal Highway Administration (FHWA) Roadway Construction Noise Model Version 1.1, together with several key construction parameters, to estimate future construction noise impacts. Key inputs include distance to the sensitive receiver, equipment usage, and baseline parameters for the project site.

Construction noise impacts are analyzed for each phase of construction anticipated for the project. Noise levels are calculated based on the average distance of equipment over an 8-hour period to the property line.

4.5 Construction Vibration Modeling

The construction vibration assessment utilizes referenced worst-case vibration levels and methodology set-forth within the Caltrans Transportation and Construction Induced Vibration Guidance Manual.

The main sources of vibration impacts during construction of the project would be from bulldozer activity during site preparation and loading trucks during construction activities.

Vibration impacts are assessed from the project site to the nearest adjacent structures. The nearest adjacent structures are the residential structures located east of the property line. In order to be conservative, the vibration analysis for the receptors is done at 10 feet from the

source. All buildings within the study area are considered to be new residential structures and/or modern commercial buildings.

Vibratory impacts were calculated using the reference vibration levels, soil conditions and the reference equation *PPV= PPV ref (25/D)^n (in/sec)* (from Caltrans Manual) where:

PPV = reference measurement at 25 feet from the vibration source
D = distance from equipment to the property line
n= vibration attenuation rate through the ground (n=1.0 was utilized for this study)

5.0 Existing Noise Environment

The existing noise environment for the project site and surrounding areas has been established based on noise measurement data collected by RK. Existing roadway noise has also been modeled based on existing roadway characteristics and traffic volume. Noise measurement data indicates that traffic noise propagating from the adjacent roadways, as well as activities from the surrounding commercial land uses, are the main sources of ambient noise at the project site and surrounding area.

5.1 Short-Term (10-Minute) Noise Measurement Results

Using a Larson Davis 712 Type 2 sound level meter, two (2) short-term 10-minute noise measurements were recorded at the adjacent property lines. The noise monitoring locations were selected based on locations that are representative of the existing noise environment and exposure to sensitive noise areas. Short term noise measurements are conducted during normal daytime hours and considered samples of typical ambient conditions. The Leq, Lmin, Lmax, L2, L8, L25, and L50, statistical data were reported over the 10-minute period. The information was utilized to define the noise characteristics for the project.

The following details and observations are provided for the short-term noise measurements. The results of the short-term (ST) measurements are presented in Table 12.

Table 12
Short-Term Noise Measurement Results[1]

Site No.	Time Started	Leq	Lmin	Lmax	L_2	L_8	L_{25}	L_{50}
ST-1	1:27 PM	56.0	56.8	48	66.7	61.5	59.9	58.0
ST-2	1:40 PM	62.4	52.5	78.3	69.5	65.4	62.5	59.6

[1] Noise measurements conducted for 10-minute intervals during normal daytime conditions.

ST-1 Measurement taken at approximately 10ft from the eastern wall adjacent to the residential P/L to the east and 60ft from the southern P/L. Ambient noise includes traffic noise from Rosecrans and Avalon Ave and School.

ST-2 Measurement taken at approximately 10ft from the eastern wall adjacent to the residential P/L to the east and 20ft from the northern P/L. Ambient noise includes traffic noise from Rosecrans and Avalon Ave.

Exhibit C shows the noise measurement locations. Appendix B includes photos, field sheets, and measured noise data.

5.2 Long Term (24-Hour) Noise Measurement Results

Using a Piccolo-II Type 2 integrating-averaging sound level meter, one (1) 24-Hour noise measurements were recorded at the nearest adjacent residential property line. The Leq, Lmin, Lmax, L2, L8, L25, and L50 statistical data were recorded on an hourly basis over the 24-hour period. The information was utilized to define the noise characteristics for the project during daytime and nighttime hours. Table 13 shows the results of the 24-hour noise measurement.

Table 13
24-Hour Noise Measurement Results

Time	Leq	Lmin	Lmax	L_2	L_8	L_{25}	L_{50}
Daytime (7am – 10pm)	57.4	49.4	76.9	63.4	59.7	57.1	55.2
Nighttime (10pm – 7 am)	54.4	48.0	71.8	60.6	57.2	54.3	52.4
24-Hour CNEL	61.8						

Exhibit C shows the 24-Hour noise measurement locations. The following details and observations are provided for the 24-hour noise measurement:

24-Hr Noise meter placed at approximately 10ft from the eastern wall adjacent to the residential P/L to the east and 60ft from the southern P/L. Ambient noise includes traffic noise from Rosecrans Avenue, Avalon Boulevard and the school.

Appendix B includes photos, field sheets, and measured noise data.

5.3 Existing Roadway Noise Levels

Table 14 shows the modeled existing traffic related CNEL noise levels calculated at 100 feet from the centerline of roadway segments adjacent to the site. The distances to the 55, 60, 65, and 70 dBA CNEL noise contours are also shown. The noise levels were calculated using traffic volumes presented from the *Metro Bus Facility Rosecrans and Avalon Traffic Impact Analysis*, prepared by RK, January 2019.

The traffic noise levels do not take into account the effect of any noise barriers or topography that may reduce traffic noise levels. The existing roadway noise levels provide a baseline of the existing traffic noise environment.

Table 14
Existing Roadway Noise Levels (dBA CNEL)[1]

Roadway[2]	Segment	CNEL at 100 Feet	Distance to Contour (Ft)[3]			
			70 dBA CNEL	65 dBA CNEL	60 dBA CNEL	55 dBA CNEL
Rosecrans Avenue	East of Avalon Blvd	74.7	296	936	2959	9356
Avalon Boulevard	South of Rosecrans Ave	73.8	223	706	2232	7059
Rosecrans Avenue	West of Avalon Blvd	74.4	277	876	2770	8760

6.0 Operational Noise Impacts

This assessment analyzes the change in the ambient environment as a result of operational noise impacts generated by the project. The main sources of noise generated by the project would include increases in auto/bus traffic along adjacent roadways and on-site operational activities. Noise level impacts are compared to the County of Los Angeles noise standards in the General Plan Noise Element and Municipal Code. Mitigation measures are provided, as needed, to ensure the project's noise impact is less than significant.

6.1 Traffic Source Noise Impacts

The potential off-site noise impacts caused by the increase in vehicular traffic from the operation of the proposed project on the nearby roadways were calculated for direct and cumulative project conditions.

6.1.1 Existing Plus Project Conditions

The direct impact of project traffic added to the surrounding roadway network is shown in Table 15 for existing plus project conditions. See Appendix C for roadway noise calculation worksheets.

Table 15 shows that the project has the potential to increase traffic noise along East Rosecrans Avenue by 0.1 dBA CNEL. Typically, a noise level increase of 3 dBA or more is perceptible to the human ear, and therefore the change as a result of the project would be considered an imperceptible increase and the project impact is less than significant.

Table 15
Roadway Noise Impact Analysis – Existing Plus Project Conditions

Roadway	Segment	CNEL at 100 Feet (dBA)			Significant Impact?
		Existing Without Project	Existing With Project	Change as a Result of Project	
Rosecrans Avenue	East of Avalon Blvd	74.7	74.8	0.1	No
Avalon Boulevard	South of Rosecrans Ave	73.5	73.5	0.0	No
Rosecrans Avenue	West of Avalon Blvd	74.4	74.5	0.1	No

Roadway noise calculation worksheets are provided in Appendix C.

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6.1.2 Cumulative Conditions

The cumulative impact of project traffic added to the surrounding roadway network with the addition of other potential cumulative development projects and area-wide growth is shown in Table 16 for project cumulative conditions. See Appendix C for roadway noise calculation worksheets.

Table 16 shows that the project has the potential to increase traffic noise along East Rosecrans Avenue by 0.1 dBA CNEL. Typically, a noise level increase of 3 dBA or more is perceptible to the human ear, and therefore the change as a result of the project would be considered an imperceptible increase and the project impact is less than significant.

Table 16
Roadway Noise Impact Analysis – Cumulative Conditions

Roadway	Segment	CNEL at 100 Feet (dBA)			Significant Impact?
		Cumulative Without Project	Cumulative With Project	Change as a Result of Project	
Rosecrans Avenue	East of Avalon Blvd	75.1	75.2	0.1	No
Avalon Boulevard	South of Rosecrans Ave	73.8	73.8	0.0	No
Rosecrans Avenue	West of Avalon Blvd	74.7	74.8	0.1	No

Roadway noise calculation worksheets are provided in Appendix C.

6.2 Stationary Source Noise Impacts

The main sources of potential on-site stationary noise impacts to adjacent land uses would include noise from the parking lot/on-site bus activity, bus wash, CNG compressors, and a bus repair garage. On-site stationary noise impacts are assessed at the adjacent sensitive land uses which include residential uses to the east of the site and the McKinley Elementary School located to the south of the site. The results of the on-site operational noise analysis are shown graphically on Exhibits E, F and G.

6.2.1 Residential Land Use to the East

Table 17 shows the stationary noise impact analysis results for all sources operating simultaneously during daytime hours (7 a.m. to 10 p.m.) and nighttime (10:00 p.m. to

7:00 a.m.) at the nearest residential homes to the east of the site with the implementation of following mitigation measure.

MM-1 The bus wash bay and equipment tunnel should be enclosed with a 12-foot CMU wall for possible noise reduction.

As shown in Table 17, the noise level impacts from the project would be below the County's daytime noise standard for residential uses. However, the project is expected to exceed the nighttime standard. The change in existing daytime and nighttime ambient noise levels at the residential homes, as a result of the project's stationary noise sources, would be approximately 0.6 dBA and 1 dBA Leq respectively.

Table 17
Stationary Noise Impact Analysis - Residential

Source	Exterior Noise Level (Leq) dBA	
	Daytime 7:00 a.m. to 10:00 p.m.	Nighttime 10:00 p.m. to 7:00 a.m.
Employee Parking Lot	38.3	33.5
Bus Parking Lot	24.0	21.1
Bus Wash	45.2	45.2
CNG Compressors[1]	45.9	45.9
Bus Repair Garage	28.1	28.1
Total Project Noise Level	48.9	48.7
L.A. Co. Noise Level Criteria	50.0	45.0
Noise Level Exceeds Standard (?)	No	Yes
Existing Ambient Noise Level	57.4	54.4
Combined (Ambient + Project) Noise Level	58.0	55.4
Change as a Result of Project	0.6	1.0
Significant Impact?[2]	**No**	**No**

[1] Includes noise from two (2) CNG compressors.
[2]A significant noise impact is considered to occur when the project causes a 3 dBA or more increase in noise level above ambient without project conditions.

As shown in Table 17, existing ambient noise levels near the residential homes currently exceed the daytime and nighttime noise standard for existing conditions. Therefore, the existing ambient noise is considered the baseline and the project should not further increase ambient noise levels by a significant amount.

A significant noise impact is considered to occur when the project causes a 3 dBA or more increase in noise levels above ambient without project conditions, which is typically considered the threshold for the human ear to perceive a noise level change. Therefore, during daytime hours at the nearest adjacent residential homes, the project would not result in the exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies.

The project would not result in a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project.

6.2.2 Elementary School Land Use to the South

The McKinley Elementary School is located to the southeast side of the project site and the school site is zoned R-1 (residential) in the County's Zoning Map.

Table 18 shows the stationary noise impact analysis results for all sources operating simultaneously during daytime (7 a.m. to 10 p.m.) at the McKinley Elementary School to the southeast of the site with the implementation of the following mitigation measure.

MM-1 The bus wash bay and equipment tunnel should be enclosed with a 12-foot CMU wall for possible noise reduction.

The change in existing daytime ambient noise levels at the school, as a result of the project's stationary noise sources, would be approximately 0.8 dBA Leq. The school is not expected to be in operation during the nighttime hours.

As shown in Table 18, existing ambient noise levels near the school currently exceed the daytime noise standard for existing conditions. Therefore, the existing ambient noise is considered the baseline and the project should not further increase noise levels by a significant amount.

A significant noise impact is considered to occur when the project causes a 3 dBA or more increase in noise levels above ambient without project conditions, which is typically considered the threshold for the human ear to perceive a noise level change. Therefore,

during daytime hours at the school, the project would not result in the exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies.

The project would not result in a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project.

Table 18
Stationary Noise Impact Analysis - School

Source	Noise Level (Leq) dBA Daytime 7:00 a.m. to 10:00 p.m.
Employee Parking Lot	32.0
Bus Parking Lot	29.4
Bus Wash	46.2
CNG Compressors[1]	47.8
Bus Repair Garage	30.5
Total Project Noise Level	50.2
L.A. Co. Noise Level Criteria	50.0
Noise Level Exceeds Standard (?)	Yes
Existing Ambient Noise Level	57.4
Combined (Ambient + Project) Noise Level	58.2
Change as a Result of Project	0.8
Significant Impact?[2]	**No**

[1] Includes noise from two (2) CNG compressors.
[2]A significant noise impact is considered to occur when the project causes a 3 dBA or more increase in noise levels above ambient without project conditions.

The results of the on-site operational noise analysis are shown graphically on Exhibits E, F and G.

6.3 Operational Project Design Recommendation

The following operational project design recommendations are provided to help further reduce the potential project noise impacts to the surrounding sensitive land uses and community. Recommended project design features include standard rules and requirements, best practices and recognized design guidelines for reducing noise levels. Design features are assumed to be part of the conditions of the project and integrated into the site's design.

DF-1 Provide an eight (8) foot high CMU block or tilt-up concrete wall along the south and east property line, adjacent to the residential and school uses.

DF-2 CNG compressor equipment should be enclosed and shielded by 5-foot CMU block wall.

DF-3 Bus wash bay and equipment should be enclosed within a bus wash tunnel.

DF-4 All rooftop mounted HVAC equipment should be fully shielded or enclosed from the line of sight of adjacent residential uses. Shielding/parapet wall should be at least as high as the equipment.

DF-5 Limit engine idling time for all buses/trucks to 5 minutes or less.

Recommendations are graphically shown on Exhibit D.

7.0 Construction Noise and Vibration Impacts

Temporary construction noise and vibration impacts have been assessed from the project site to the surrounding adjacent land uses.

7.1 Construction Noise

Table 19 shows typical construction noise levels for different types of equipment. This data was compiled by the Environmental Protection Agency (EPA).

Table 19
Typical Construction Noise Levels[1]

Type	Noise Levels (dBA) at 50 Feet
Earth Moving	
Compactors (Rollers)	73 - 76
Front Loaders	73 - 84
Backhoes	73 - 92
Tractors	75 - 95
Scrapers, Graders	78 - 92
Pavers	85 - 87
Trucks	81 - 94
Materials Handling	
Concrete Mixers	72 - 87
Concrete Pumps	81 - 83
Cranes (Movable)	72 - 86
Cranes (Derrick)	85 - 87
Stationary	
Pumps	68 - 71
Generators	71 - 83
Compressors	75 - 86
Impact Equipment	
Pneumatic Wrenches	82 - 87
Jack Hammers, Rock Drills	80 - 99
Pile Drivers (Peak)	95-105
Other	
Vibrators	68 - 82
Saws	71 - 82

[1] Referenced Noise Levels from the Environmental Protection Agency (EPA)

The degree of construction noise will vary for different areas of the project site and also vary depending on the construction activities. This assessment analyzes potential noise impacts during site preparation, grading, building construction, paving, and architectural coating. Noise levels are calculated based on a minimum average distance of equipment over an 8-hour period at 100 feet from property line.

During the construction period, the contractors would be required to comply with the Los Angeles noise standards in the municipal code. Section 17.66.050(D)(4) of the Los Angeles municipal code states that the following activities shall be exempted from the provisions of the noise code;

Noise sources associated with, or vibration created by, construction, repair, remodeling, or grading of any real property or during authorized seismic surveys, provided said activities:

1. Operating or causing the operation of any tools or equipment used in construction, drilling, repair, alteration or demolition work between weekday hours of 7:00 p.m. and 7:00 a.m., or at any time on Sundays or holidays, such that the sound therefrom creates a noise disturbance across a residential or commercial real-property line, except for emergency work of public service utilities or by variance issued by the health officer is prohibited.

2. Noise Restrictions at Affected Structures. The contractor shall conduct construction activities in such a manner that the maximum noise levels at the affected buildings will not exceed those listed in the following schedule at residential structures:

Table 20
Maximum Noise Levels for Nonscheduled, Intermittent, Short-Term Operation (Less than 10 Days) of Mobile Equipment

Time	Single-family Residential	Multi-family Residential	Semi-residential/ Commercial
Daily, except Sundays and legal holidays, 7:00 a.m. to 8:00 p.m.	75 dBA	80 dBA	85 dBA
Daily, except Sundays and legal holidays, 7:00 a.m. to 8:00 p.m.	60 dBA	64 dBA	70 dBA

Table 21
Maximum Noise Level for Repetitively Scheduled and Relatively Long-Term Operation (Periods of 10 days or More) of Stationary

Time	Single-family Residential	Multi-family Residential	Semi-residential/ Commercial
Daily, except Sundays and legal holidays, 7:00 a.m. to 8:00 p.m.	60 dBA	65 dBA	70 dBA
Daily, except Sundays and legal holidays, 7:00 a.m. to 8:00 p.m.	50 dBA	55 dBA	60 dBA

7.2 Construction Noise Impact Analysis

Table 22 shows the estimated construction noise levels calculated using the Federal Highway Administration Roadway Construction Noise Model Version 1.1.

As shown in Table 22, the project has the potential to exceed the residential noise standards for construction activities at the school. In order to mitigate the short-term construction noise levels, a noise monitoring program shall be implemented during construction. The monitoring program will alert construction management personnel when noise levels approach the upper limits of the 8-hour Leq exceedance threshold (65 dBA) along the adjacent residential uses and 70 dBA at the adjacent industrial uses. Construction activity should cease prior to noise levels exceeding the 8-hour threshold.

< Table 22 shown on the following page>

Table 22
Construction Noise Impact Analysis

Phase	Equipment	Quantity	Calculated Noise Level at 50 ft (dBA)		Maximum Noise Level (Lmax) (dBA)
			Lmax	Leq	Lmax
Demolition	Concrete/Industrial Saws	1	89.6	82.6	89.6
	Rubber Tired Dozers	1	81.7	77.7	
	Tractors/Loaders/Backhoes	2	84.0	80.0	
Site Preparation	Graders	1	85.0	81.0	85.0
	Tractors/Loaders/Backhoes	1	84.0	80.0	
Grading	Concrete/Industrial Saws	1	89.6	82.6	89.6
	Rubber Tired Dozers	1	81.7	77.7	
	Tractors/Loaders/Backhoes	2	84.0	80.0	
Building Construction	Cranes	1	80.6	72.6	84.0
	Forklifts	2	75.0	71.0	
	Tractors/Loaders/Backhoes	2	84.0	80.0	
Paving	Cement and Mortar Mixers	4	78.8	74.8	84.0
	Pavers	1	77.2	74.2	
	Rollers	1	80.0	73.0	
	Tractors/Loaders/Backhoes	1	84.0	80.0	
Architectural Coating	Air Compressors	1	77.7	73.7	77.7
Maximum Construction Phase Noise Level - Leq (dBA)					89.6
County of Los Angeles Construction Noise Standards – Residential					75
Potentially Significant Short-Term Noise Impact (Yes/No?)					Yes

See Section 7.3 for recommended noise control mitigation measures. Construction noise calculation worksheets are provided in Appendix E.

7.3 Construction Vibration

To determine the vibratory impacts during construction, reference construction equipment vibration levels were utilized and then extrapolated to the façade of the nearest adjacent structure. For this project, the nearest sensitive receptors are residential homes located approximately ten (10) feet east of the site. For purposes of assessing structural impacts from vibration, the nearest sensitive receptors are considered "new residential structures". No historical or fragile buildings are known to be located within the vicinity of the site.

The construction of the proposed project is not expected to require the use of substantial vibration inducing equipment or activities, such as pile drivers or blasting. The main sources of vibration impacts during construction of the project would be the operation of equipment such as bulldozer activity during site preparation and grading and loading trucks during excavation.

The construction vibration assessment utilizes the referenced vibration levels and methodology set-forth within the Caltrans Transportation and Construction Induced Vibration Guidance Manual. Table 23 shows the referenced vibration levels.

Table 23
Typical Construction Vibration Levels[1]

Equipment	Peak Particle Velocity (PPV) (inches/second) at 25 feet	Approximate Vibration Level (LV) at 25 feet
Piledriver (impact)	1.518 (upper range)	112
	0.644 (typical)	104
Piledriver (sonic)	0.734 upper range	105
	0.170 typical	93
Clam shovel drop (slurry wall)	0.202	94
Hydromill	0.008 in soil	66
(slurry wall)	0.017 in rock	75
Vibratory Roller	0.210	94
Hoe Ram	0.089	87
Large bulldozer	0.089	87
Caisson drill	0.089	87
Loaded trucks	0.076	86
Jackhammer	0.035	79
Small bulldozer	0.003	58

[1] Transit Noise and Vibration Impact Assessment, Federal Transit Administration, May 2006.

Table 24 shows the project's construction-related vibration analysis at the residential structures to the north.

Table 24
Construction Vibration Impact Analysis

Construction Activity	Distance to Nearest Structure (ft)	Duration	Calculated Vibration Level - PPV (in/sec)	Damage Potential Level	Annoyance Criteria Level
Small Bulldozer	10 ft.	Continuous/Frequent	0.008	No Impact	Barely Perceptible
Loaded Trucks	10 ft.	Continuous/Frequent	0.040	No Impact	Distinctly Perceptible

The estimated vibration noise levels at the nearest sensitive receptors are compared to the Caltrans Vibration Manual thresholds. The worst case vibratory impact from the site is estimated to be 0.04 PPV (in/sec) at the residential structures to the east. The annoyance potential of vibration from construction activities would range from "barely perceptible" to "distinctly perceptible" and there in no damage potential to the nearest structures. No potential damage would be expected to the newer residential structures and modern commercial/industrial buildings in the nearby vicinity.

Construction vibration calculation worksheets are shown in Appendix E.

7.4 Construction Mitigations Measures (MM)

The following recommended mitigation measures are provided to reduce potential project impacts identified in the CEQA Noise Impact Criteria Checklist to be less than significant.

MM-2 A noise monitoring program shall be implemented during construction. The monitoring program will alert construction management personnel when noise levels approach the upper limits of the residential noise threshold (65 dBA) near the northwest property line. Construction activity will cease prior to noise levels exceeding the residential threshold.

7.5 Construction Project Design Features (DF)

The following recommended project design features include standard rules and requirements, best practices and recognized design guidelines for reducing noise levels. Design features are assumed to be part of the conditions of the project and integrated into the construction management plan.

DF-6 Construction-related noise activities shall comply with the requirements set forth in the County of Los Angeles Municipal Code Section 12.08.430.

a. Operating or causing the operation of any tools or equipment used in construction, drilling, repair, alteration or demolition work between weekday hours of 7:00 p.m. and 7:00 a.m., or at any time on Sundays or holidays, such that the sound therefrom creates a noise disturbance across a residential or commercial real-property line, except for emergency work of public service utilities or by variance issued by the health officer is prohibited.

DF-7 Project should construct the eight (8) foot property line CMU block wall during the first phase of construction

DF-8 No impact pile driving activities shall be allowed on the project site.

DF-9 During construction, the contractor shall ensure all construction equipment is equipped with appropriate noise attenuating devices and equipment shall be maintained so that vehicles and their loads are secured from rattling and banging. Idling equipment should be turned off when not in use.

DF-10 Locate staging area, generators and stationary construction equipment as far from the northwest property line, as reasonably feasible.

DF-11 Obtain a construction work permit from the County of Los Angeles prior to starting construction.

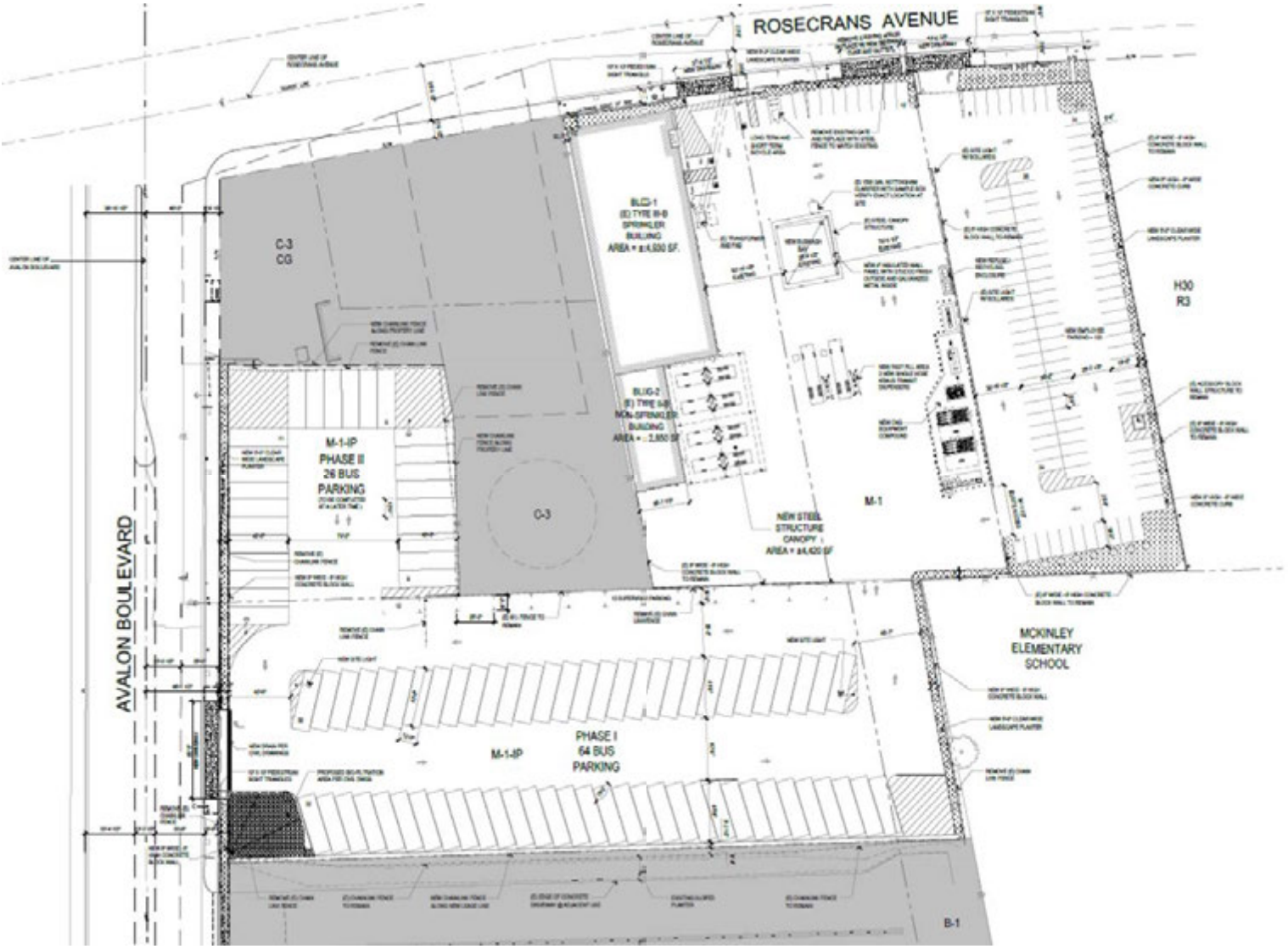
Exhibits

Exhibit A
Location Map



N

Exhibit B
Site Plan



N

Exhibit C

Monitoring Locations



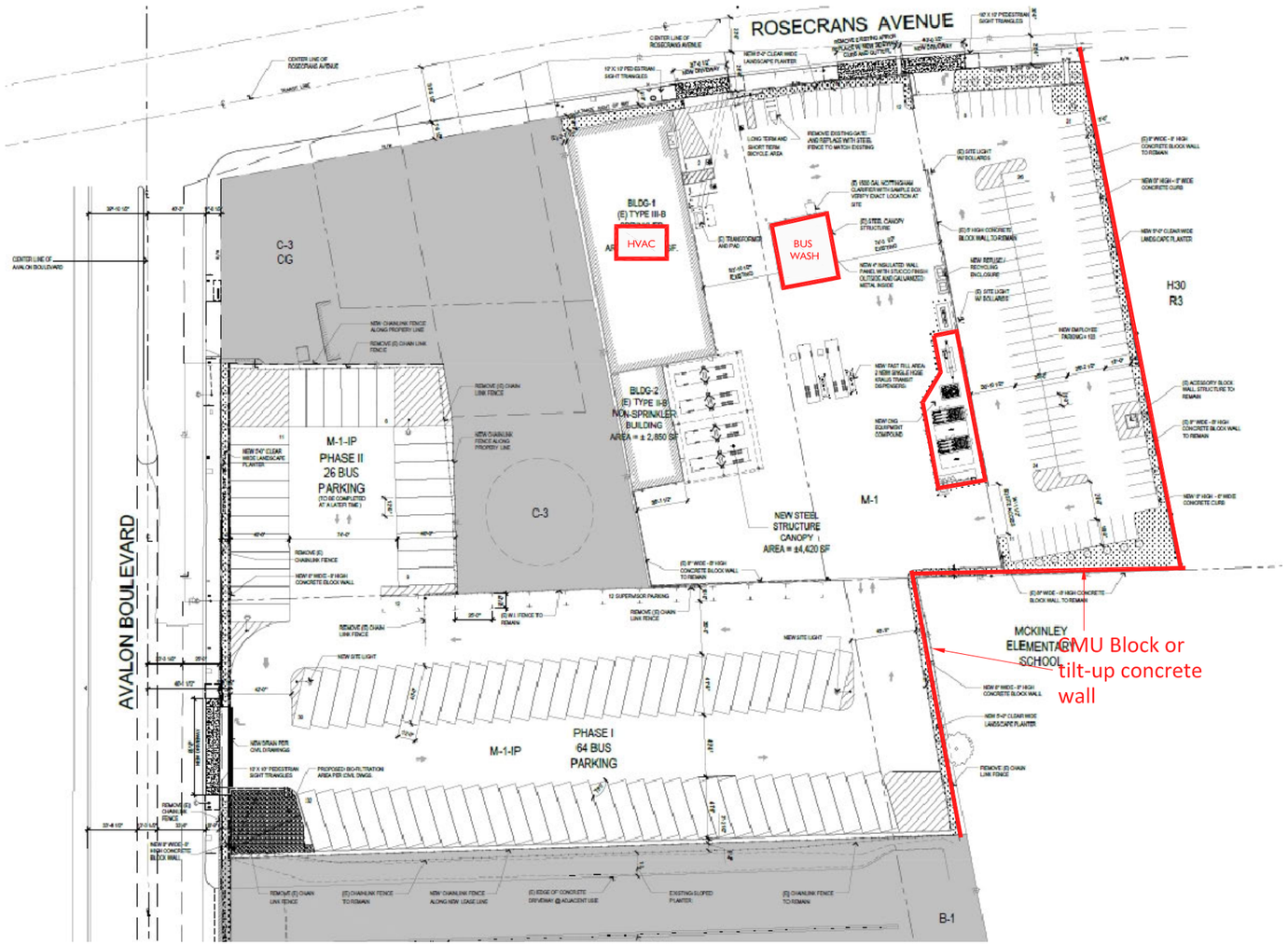
Legend:

1 = Short Term (10-min) Noise Monitoring Location

24 = Long-Term (24-hr) Noise Monitoring Location

N

Recommendations



Legend:

HVAC = Rooftop HVAC equipment should be shielded by parapet wall

= Noise Barrier Wall

N

CONSTRUCTION MITIGATION MEASURES (MM)

MM-1 The bus wash bay and equipment tunnel should be enclosed to shield automated equipment and dryers/blower noise.

MM-2 A noise monitoring program shall be implemented during construction. The monitoring program will alert construction management personnel when noise levels approach the upper limits of the residential noise threshold (65 dBA) near the northwest property line. Construction activity will cease prior to noise levels exceeding the residential threshold.

OPERATIONAL PROJECT DESIGN FEATURES (DF)

DF-1 Provide an eight (8) foot high CMU block or tilt-up concrete wall along the south and east property line, adjacent to the residential and school uses.

DF-2 CNG compressor equipment should be enclosed and shielded by 5 foot CMU block wall.

DF-3 Bus wash bay and equipment should be enclosed within car wash tunnel.

DF-4 All rooftop mounted HVAC equipment should be fully shielded or enclosed from the line of sight of adjacent residential uses. Shielding/parapet wall should be at least as high as the equipment.

DF-5 Limit engine idling time for all buses/trucks to five (5) minutes or less.

CONSTRUCTION PROJECT DESIGN FEATURES (DF)

DF-6 Construction-related noise activities shall comply with the requirements set forth in the County of Los Angeles Municipal Code Section 12.08.430.

a. Operating or causing the operation of any tools or equipment used in construction, drilling, repair, alteration or demolition work between weekday hours of 7:00 p.m. and 7:00 a.m., or at any time on Sundays or holidays, such that the sound therefrom creates a noise disturbance across a residential or commercial real-property line, except for emergency work of public service utilities or by variance issued by the health officer is prohibited.

DF-7 Project should construct the eight (8) foot property line CMU block wall during the first phase of construction.

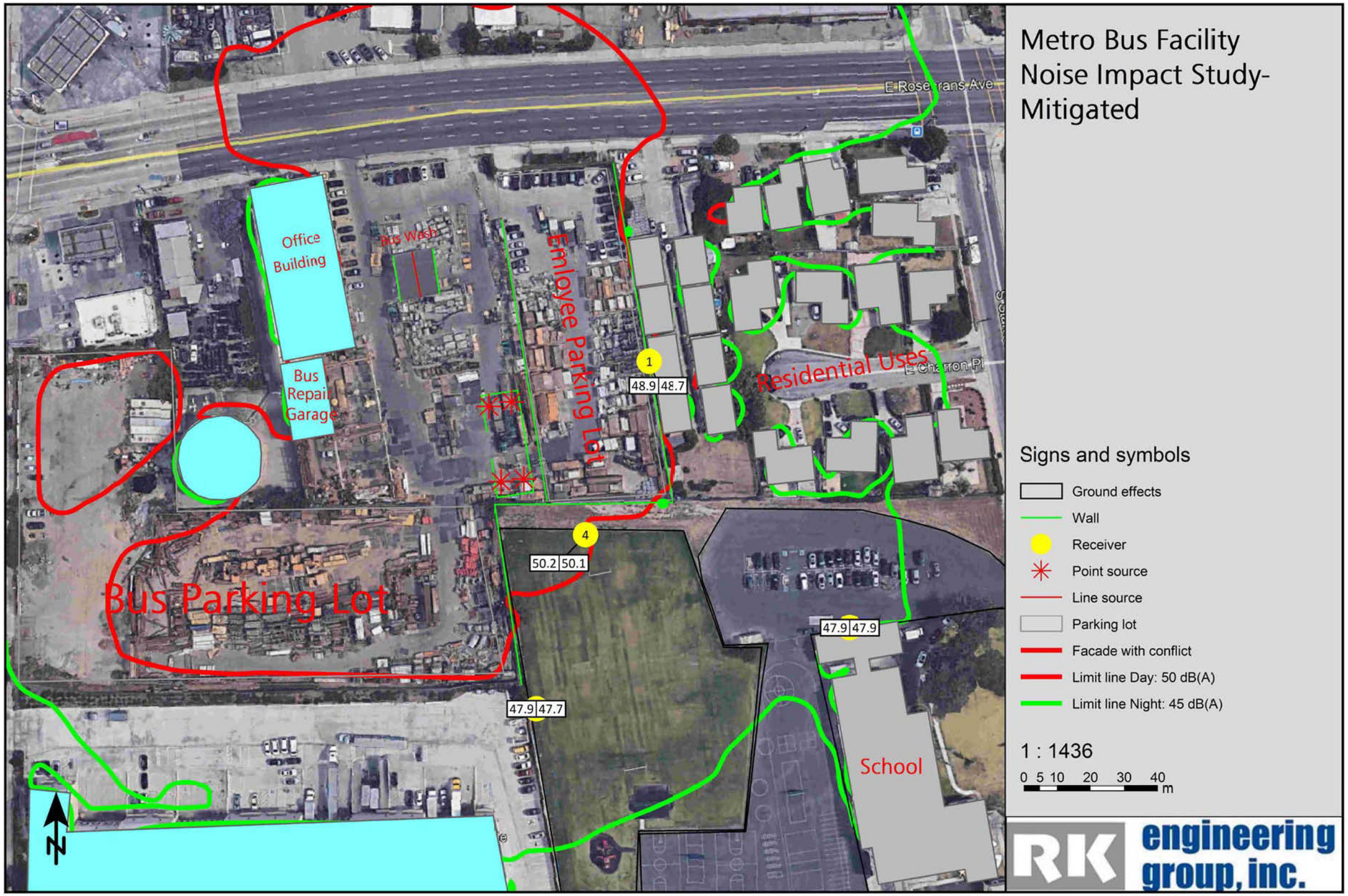
DF-8 No impact pile driving activities shall be allowed on the project site.

DF-9 During construction, the contractor shall ensure all construction equipment is equipped with appropriate noise attenuating devices and equipment shall be maintained so that vehicles and their loads are secured from rattling and banging. Idling equipment should be turned off when not in use.

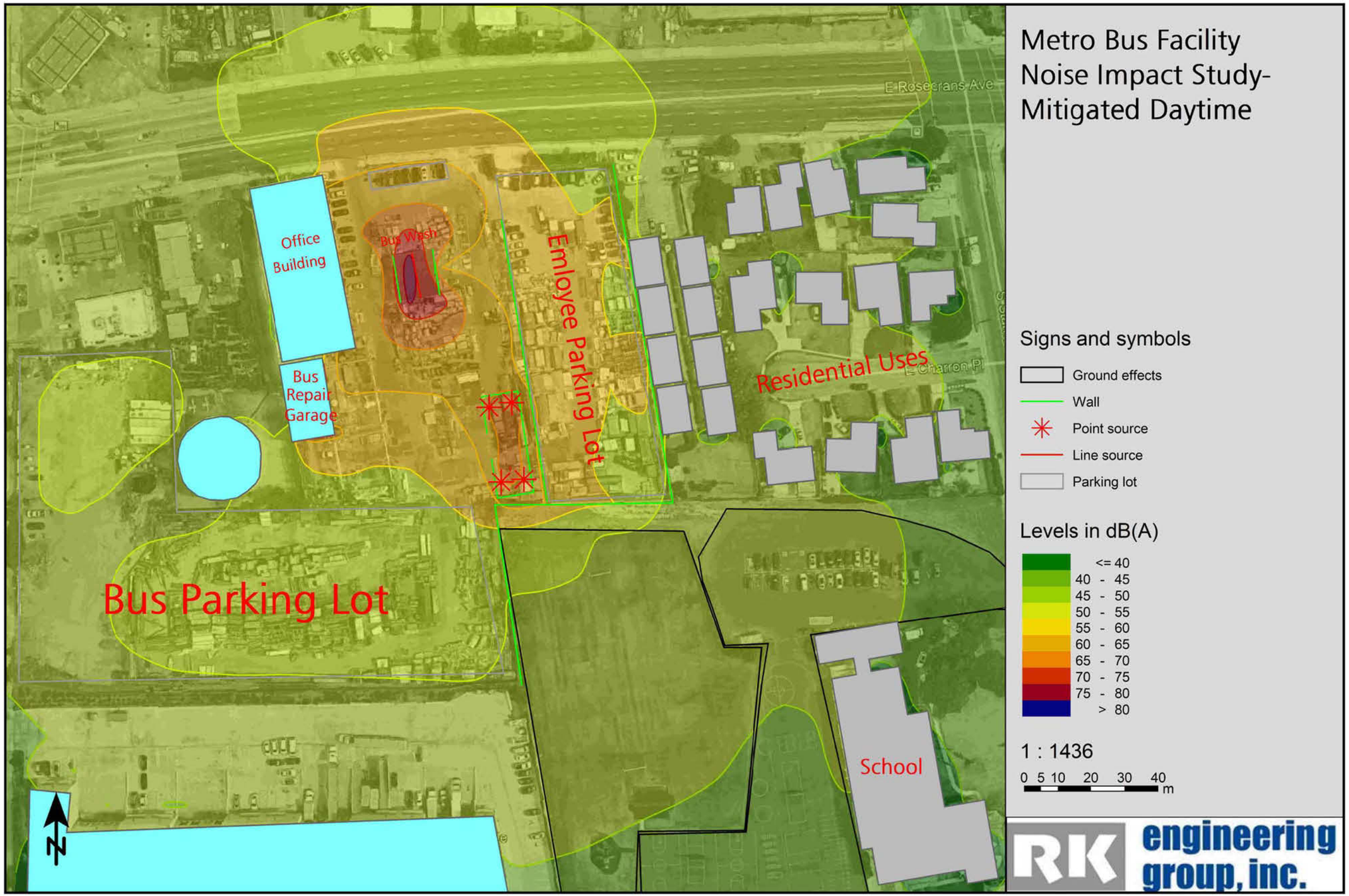
DF-10 Locate staging area, generators and stationary construction equipment as far from the northwest property line, as reasonably feasible.

DF-11 Obtain a construction work permit from the County of Los Angeles prior to starting construction.

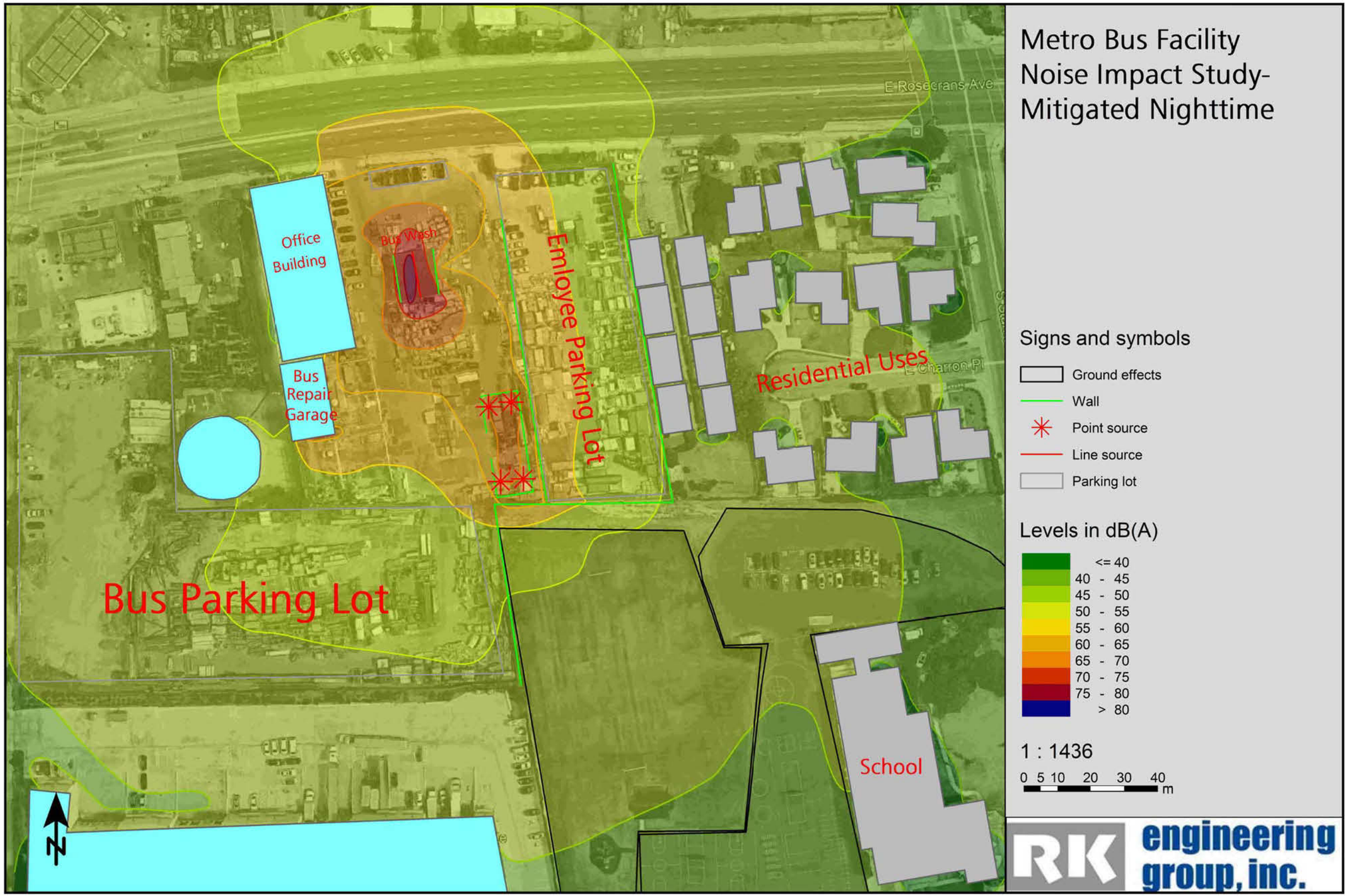
SoundPLAN Project Noise Level Results



Project Noise Level Contours - Daytime



Project Noise Level Contours - Nighttime



Appendices

Appendix A

County of Los Angeles
General Plan and
Municipal Code Noise Control

Chapter 12.08 - NOISE CONTROL

Parts:

Part 1 - GENERAL PROVISIONS

12.08.010 - Title for citation.

12.08.020 - Declaration of policy—Nuisances deemed misdemeanors.

Part 2 - DEFINITIONS

12.08.030 - Terminology—Conformity with ANSI standards.

12.08.040 - Definitions applicable.

12.08.050 - Agricultural property.

12.08.060 - Ambient noise histogram.

Part 1 - GENERAL PROVISIONS

12.08.010 - Title for citation.

The ordinance codified in this chapter may be cited as the "noise control ordinance of the county of Los Angeles."

(Ord. 11778 § 2 (Art. 1 § 101), 1978: Ord. 11773 § 2 (Art. 1 § 101), 1978.)

12.08.020 - Declaration of policy—Nuisances deemed misdemeanors.

A. In order to control unnecessary, excessive and annoying noise and vibration in the county of Los Angeles, it is declared to be the policy of the county to prohibit such noise and vibration generated from any sources as specified in this chapter. It shall be the policy of the county to maintain quiet in those areas which exhibit low noise levels and to implement programs aimed at reducing noise in those areas within the county where noise levels are above acceptable values.

B. It is determined that certain noise levels and vibration are detrimental to the public health, welfare and safety and contrary to public interest, and therefore the board of supervisors of the county does ordain and declare that creating, maintaining, causing or allowing to be created, caused or maintained any noise or vibration in a manner prohibited by or not in conformity with the provisions of this chapter is a public nuisance and shall be punishable as such.

(Ord. 11778 § 2 (Art. 2 § 201), 1978: Ord. 11773 § 2 (Art. 2 § 201), 1978.)

Part 2 - DEFINITIONS

12.08.030 - Terminology—Conformity with ANSI standards.

All terminology used in this chapter, not defined in this Part 2, shall be in conformance with applicable publications of the American National Standards Institute (ANSI) or its successor body.

(Ord. 11778 § 2 (Art. 3 § 301), 1978: Ord. 11773 § 2 (Art. 3 § 301), 1978.)

12.08.040 - Definitions applicable.

The following words, phrases and terms as used in this chapter shall have the meanings as indicated in this Part 2.

(Ord. 11778 § 2 (Art. 3 § 302 (part)), 1978: Ord. 11773 § 2 (Art. 3 § 302 (part)), 1978.)

12.08.050 - Agricultural property.

"Agricultural property" means a parcel of real property which is undeveloped for any use other than agricultural purposes.

(Ord. 11778 § 2 (Art. 3 § 302(a)), 1978: Ord. 11773 § 2 (Art. 3 § 302(a)), 1978.)

12.08.060 - Ambient noise histogram.

"Ambient noise histogram" means the composite of all noise from sources near and far, excluding the alleged intrusive noise source. In this context, the ambient noise histogram shall constitute the normal or existing level of environmental noise at a given location.

(Ord. 11778 § 2 (Art. 3 § 302(b)), 1978: Ord. 11773 § 2 (Art. 3 § 302(b)), 1978.)

12.08.070 - A-weighted sound level.

"A-weighted sound level" means the sound level in decibels as measured on a soundlevel meter using the A-weighting network. The level so read is designated dB (A) or dBA.

(Ord. 11778 § 2 (Art. 3 § 302(c)), 1978: Ord. 11773 § 2 (Art. 3 § 302(c)), 1978.)

12.08.080 - Commercial property.

"Commercial property" means a parcel of real property which is developed and used either in part or in whole for commercial purposes. In cases of multiple land uses of any property, the county zoning classification of such property pursuant to county Ordinance 1494, as amended, shall be applicable. (See Title 22 of this code.)

(Ord. 11778 § 2 (Art. 3 § 302(d)), 1978: Ord. 11773 § 2 (Art. 3 § 302(d)), 1978.)

12.08.090 - Construction.

"Construction" means any site preparation, assembly, erection, substantial repair, alteration, or similar action, for or of public or private rights-of-way, structures, utilities, or similar property.

(Ord. 11778 § 2 (Art. 3 § 302(e)), 1978: Ord. 11773 § 2 (Art. 3 § 302(e)), 1978.)

12.08.100 - Cumulative period.

"Cumulative period" means an additive period of time composed of individual time segments which may be continuous or interrupted.

(Ord. 11778 § 2 (Art. 3 § 302(f)), 1978: Ord. 11773 § 2 (Art. 3 § 302(f)), 1978.)

12.08.110 - Decibel.

"Decibel" means a unit for measuring the amplitude of a sound, equal to 20 times the logarithm to the base of 10 of the ratio of the pressure of the sound measured to the reference pressure, which is 20 micropascals.

(Ord. 11778 § 2 (Art. 3 § 302(g)), 1978: Ord. 11773 § 2 (Art. 3 § 302(g)), 1978.)

12.08.120 - Dwelling unit.

"Dwelling unit" means a single unit providing complete independent living facilities for one or more persons, including permanent provisions for living, sleeping, eating, cooking and sanitation.

(Ord. 11778 § 2 (Art. 3 § 302(h)), 1978: Ord. 11773 § 2 (Art. 3 § 302(h)), 1978.)

12.08.130 - Emergency machinery, vehicle or alarm.

"Emergency machinery, vehicle or alarm" means any machinery, vehicle or alarm used, employed, performed or operated in an effort to protect, provide or restore safe conditions in the community or for the citizenry, or work by private or public utilities when restoring utility service.

(Ord. 11778 § 2 (Art. 3 § 302(i)), 1978: Ord. 11773 (Art. 3 § 302(i)), 1978.)

12.08.140 - Emergency work.

"Emergency work" means any work performed for the purpose of preventing or alleviating the physical trauma or property damage threatened or caused by an emergency.

(Ord. 11778 § 2 (Art. 3 § 302(j)), 1978: Ord. 11773 (Art. 3 § 302(j)), 1978.)

12.08.150 - Fixed noise source.

"Fixed noise source" means a stationary device which creates sounds while fixed or motionless, including but not limited to residential, agricultural, industrial and commercial machinery and equipment, pumps, fans, compressors, air conditioners and refrigeration equipment.

(Ord. 11778 § 2 (Art. 3 § 302(k)), 1978: Ord. 11773 (Art. 3 § 302(k)), 1978.)

12.08.160 - Grading.

"Grading" means any excavating or filling of earth material or any combination thereof conducted at a site to prepare said site for construction or other improvements thereon.

(Ord. 11778 § 2 (Art. 3 § 302(1)), 1978: Ord. 11773 (Art. 3 § 302(1)), 1978.)

12.08.170 - Health care institution.

"Health care institution" means any hospital, convalescent home, or other similar facilities which provide health care, medical treatment, room, board or other services for the ill, retarded or convalescent.

(Ord. 11778 § 2 (Art. 3 § 302(m)), 1978: Ord. 11773 (Art. 3 § 302(m)), 1978.)

12.08.180 - Health officer.

"Health officer" means the director of the department of public health of the county of Los Angeles, or his duly authorized representative.

(Ord. 2006-0040 § 106, 2006: Ord. 11778 § 2 (Art. 3 § 302(n)), 1978: Ord. 11773 (Art. 3 § 302(n)), 1978.)

12.08.190 - Impulsive noise.

"Impulsive noise" means a sound of short duration, usually less than one second and of high intensity, with an abrupt onset and rapid decay.

(Ord. 11778 § 2 (Art. 3 § 302(o)), 1978: Ord. 11773 (Art. 3 § 302 (o)), 1978.)

12.08.200 - Industrial property.

"Industrial property" means property which is developed and used either in part or in whole for manufacturing purposes. In cases of multiple land uses of any property, the county zoning classification of such property pursuant to county Ordinance 1494, as amended, shall be applicable. (See Title 22 of this code.)

(Ord. 11778 § 2 (Art. 3 § 302(p)), 1978: Ord. 11773 § 2 (Art. 3 § 302(p)), 1978.)

12.08.210 - Intrusive noise.

"Intrusive noise" means that alleged offensive noise which intrudes over and above the existing ambient noise at the receptor property.

(Ord. 11778 § 2 (Art. 3 § 302(q)), 1978: Ord. 11773 § 2 (Art. 3 § 302(q)), 1978.)

12.08.220 - Mobile noise source.

"Mobile noise source" means any noise source other than a fixed noise source.

(Ord. 11778 § 2 (Art. 3 § 302(r)), 1978: Ord. 11773 § 2 (Art. 3 § 302(r)), 1978.)

12.08.230 - Noise disturbance.

"Noise disturbance" means an alleged intrusive noise which violates an applicable noise standard as set forth in this chapter.

(Ord. 11778 § 2 (Art. 3 § 302(s)), 1978: Ord. 11773 § 2 (Art. 3 § 302(s)), 1978.)

12.08.240 - Noise histogram.

"Noise histogram" means a graphical representation of the distribution of frequency of occurrence of all noise levels near and far measured over a given period of time.

(Ord. 11778 § 2 (Art. 3 § 302(u)), 1978: Ord. 11773 § 2 (Art. 3 § 302(u)), 1978.)

12.08.250 - Noise level (L).

"Noise level (L_N)" means that noise level expressed in decibels which exceeds the specified (L_N) value as a percentage of total time measured. For instance, an L_{25} noise level means that noise level which is exceeded 25 percent of the time measured.

(Ord. 11778 § 2 (Art. 3 § 302 (v)), 1978: Ord. 11773 § 2 (Art. 3 § 302(v)), 1978.)

12.08.260 - Noise-sensitive zone.

"Noise-sensitive zone" means any area designated pursuant to Part 4 of this chapter for the purpose of ensuring exceptional quiet.

(Ord. 11778 § 2 (Art. 3 § 302(t)), 1978: Ord. 11773 § 2 (Art. 3 § 302(t)), 1978.)

12.08.270 - Noise zone.

"Noise zone" means any defined area or region of a generally consistent land use, as described in Section 12.08.380.

(Ord. 11778 § 2 (Art. 3 § 302(w)), 1978: Ord. 11773 § 2 (Art. 3 § 302(w)), 1978.)

12.08.280 - Person.

"Person" means any individual, firm, association, partnership, joint venture, or corporation.

(Ord. 11778 § 2 (Art. 3 § 302(x)), 1978: Ord. 11773 § 2 (Art. 3 § 302(x)), 1978.)

12.08.290 - Powered model vehicle.

"Powered model vehicle" means any self-propelled airborne, waterborne or landborne plane, vessel or vehicle which is not designed to carry individuals, including but not limited to any model airplane, boat, car or rocket.

(Ord. 11778 § 2 (Art. 3 § 302(y)), 1978: Ord. 11773 § 2(Art. 3 § 302(y)), 1978.)

12.08.300 - Public right-of-way.

"Public right-of-way" means any street, avenue, boulevard, highway, sidewalk or alley, or similar place, which is owned or controlled by a governmental entity.

(Ord. 11778 § 2 (Art. 3 § 302(z)), 1978: Ord. 11773 § 2 (Art. 3 § 302(z)), 1978.)

12.08.310 - Pure tone noise.

"Pure tone noise" means any sound which can be judged as audible as a single pitch or a set of single pitches by the health officer, for the purposes of this chapter, a pure tone shall exist if the one-third octave band sound-pressure level in the band with the tone exceeds the arithmetic average of the sound-pressure levels of the two contiguous one-third octave bands by 5 dB for center frequencies of 500 Hertz and above, and by 8 dB for center frequencies between 160 and 400 Hertz, and by 15 dB for center frequencies less than or equal to 125 Hertz.

(Ord. 11778 § 2 (Art. 3 § 302(aa)), 1978: Ord. 11773 § 2 (Art. 3 § 302(aa)), 1978.)

12.08.320 - Real property boundary.

"Real property boundary" means an imaginary line along the ground surface, and its vertical extension, which separates the real property owned by one person from that owned by another person, but not including intra-building real property divisions.

(Ord. 11778 § 2 (Art. 3 § 302(bb)), 1978: Ord. 11773 § 2 (Art. 3 § 302(bb)), 1978.)

12.08.330 - Residential property.

"Residential property" means a parcel of real property which is developed and used either in part or in whole for residential purposes, other than transient uses such as hotels and motels. In cases of multiple land uses of any property, the county zoning classification of such property pursuant to county Ordinance 1494, as amended, shall be applicable.

(Ord. 11778 § 2 (Art. 3 § 302(cc)), 1978: Ord. 11773 § 2 (Art. 3 § 302(cc)), 1978.)

12.08.340 - Sound level meter.

"Sound level meter" means an instrument, including a microphone, an amplifier, an output meter and frequency weighting network, for the measurement of sound levels, which satisfies the requirements pertinent for Type S2A meters in American National Standards Institute specifications for sound level meters, S1.4-1971, or the most recent revision thereof.

(Ord. 11778 § 2 (Art. 3 § 302(dd)), 1978: Ord. 11773 § 2 (Art. 3 § 302(dd)), 1978.)

12.08.350 - Vibration.

"Vibration" means the minimum ground or structure-borne vibrational motion necessary to cause a normal person to be aware of the vibration by such direct means as, but not limited to, sensation by touch or visual observations of moving objects. The perception threshold shall be presumed to be a motion velocity of 0.01 in/sec over the range of 1 to 100 Hertz.

(Ord. 11778 § 2 (Art. 3. § 302(ee)), 1978: Ord. 11773 § 2 (Art. 3 § 302(ee)), 1978.)

12.08.360 - Weekday.

"Weekday" means any day, Monday through Friday, which is not a legal holiday.

(Ord. 11778 § 2 (Art. 3 § 302(ff)), 1978: Ord. 11773 § 2 (Art. 3 § 302(ff), 1978.)

Part 3 - COMMUNITY NOISE CRITERIA

12.08.370 - Decibel measurement—Basis.

Any decibel measurement made pursuant to the provisions of this chapter shall be based on a reference sound-pressure of 20 micropascals, as measured with a sound level meter using the A-weighted network (scale) at slow response, or at the fast response when measuring impulsive sound levels and vibrations.

(Ord. 11778 § 2 (Art. 4 § 401), 1978: Ord. 11773 § 2 (Art. 4 § 401), 1978.)

12.08.380 - Noise zones designated.

Receptor properties described hereinafter in this chapter are hereby assigned to the following noise zones:

Noise Zone I—Noise-sensitive area; Noise Zone II—Residential properties; Noise Zone III—Commercial properties; Noise Zone IV—Industrial properties.

(Ord. 11778 § 2 (Art. 4 § 402), 1978: Ord. 11773 § 2 (Art. 4 § 402), 1978.)

12.08.390 - Exterior noise standards—Citations for violations authorized when.

A. Unless otherwise herein provided, the following exterior noise levels shall apply to all receptor properties within a designated noise zone:

Noise Zone	Designated Noise Zone Land Use (Receptor property)	Time Interval	Exterior Noise Level (dB)
I	Noise-sensitive area	Anytime	45
II	Residential properties	10:00 pm to 7:00 am (nighttime)	45
		7:00 am to 10:00 pm (daytime)	50
III	Commercial properties	10:00 pm to 7:00 am (nighttime)	55
		7:00 am to 10:00 pm (daytime)	60
IV	Industrial properties	Anytime	70

B. Unless otherwise herein provided, no person shall operate or cause to be operated, any source of sound at any location within the unincorporated county, or allow the creation of any noise on property owned, leased, occupied or otherwise controlled by such person which causes the noise level, when measured on any other property either incorporated or unincorporated, to exceed any of the following exterior noise standards:

Standard No. 1 shall be the exterior noise level which may not be exceeded for a cumulative period of more than 30 minutes in any hour. Standard No. 1 shall be the applicable noise level from subsection A of this section; or, if the ambient L50 exceeds the foregoing level, then the ambient L50 becomes the exterior noise level for Standard No. 1.

Standard No. 2 shall be the exterior noise level which may not be exceeded for a cumulative period of more than 15 minutes in any hour. Standard No. 2 shall be the applicable noise level from subsection A of this section plus 5dB; or, if the ambient L25 exceeds the foregoing level, then the ambient L25 becomes the exterior noise level for Standard No. 2.

Standard No. 3 shall be the exterior noise level which may not be exceeded for a cumulative period of more than five minutes in any hour. Standard No. 3 shall be the applicable noise level from subsection A of this section plus 20dB; or, if the ambient L8.3 exceeds the foregoing level, then the ambient L8.3 becomes exterior noise level for Standard No. 3.

Standard No. 4 shall be the exterior noise level which may not be exceeded for a cumulative period of more than one minute in any hour. Standard No. 4 shall be the applicable noise level from subsection A of this section plus 15dB; or, if the ambient L1.7 exceeds the foregoing level, then the ambient L1.7 becomes the exterior noise level for Standard No. 4.

Standard No. 5 shall be the exterior noise level which may not be exceeded for any period of time. Standard No. 5 shall be the applicable noise level from subsection A of this section plus 20dB; or, if the ambient L0 exceeds the foregoing level then the ambient L0 becomes the exterior noise level for Standard No. 5.

C. If the measurement location is on a boundary property between two different zones, the exterior noise level utilized in subsection B of this section to determine the exterior standard shall be the arithmetic mean of the exterior noise levels in subsection A of the subject zones. Except as provided for above in this subsection C, when an intruding noise source originates on an industrial property and is impacting another noise zone, the applicable exterior noise level as designated in subsection A shall be the daytime exterior noise level for the subject receptor property.

D. The ambient noise histogram shall be measured at the same location along the property line utilized in subsection B of this section, with the alleged intruding noise source inoperative. If for any reason the alleged intruding noise source cannot be turned off, the ambient noise histogram will be estimated by performing a measurement in the same general area of the alleged intruding noise source but at a sufficient distance such that the noise from the alleged intruding noise source is at least 10dB below the ambient noise histogram in order that only the actual ambient noise histogram be measured. If the difference between the ambient noise histogram and the alleged intruding noise source is 5 to 10dB, then the level of the ambient noise histogram itself can be reasonably determined by subtracting a one-decibel correction to account for the contribution of the alleged intruding noise source.

E. In the event the intrusive exceeds the exterior noise standards as set forth in subsections B and C of this section at a specific receptor property and the health officer has reason to believe that this violation at said specific receptor property was unanticipated and due to abnormal atmospheric conditions, the health officer shall issue an abatement notice in lieu of a citation. If the specific violation is abated, no citation shall be issued therefor. If, however, the specific violation is not abated, the health officer may issue a citation.

(Ord. 11778 § 2 (Art. 4 § 403), 1978: Ord. 11773 § 2 (Art. 4 § 403), 1978.)

12.08.400 - Interior noise standards.

A. No person shall operate or cause to be operated within a dwelling unit, any source of sound, or allow the creation of any noise, which causes the noise level when measured inside a neighboring receiving dwelling unit to exceed the following standards:

Standard No. 1 The applicable interior noise level for cumulative period of more than five minutes in any hour; or

Standard No. 2 The applicable interior noise level plus 5dB for a cumulative period of more than one minute in any hour; or

Standard No. 3 The applicable interior noise level plus 10dB or the maximum measured ambient noise level for any period of time.

B. The following interior noise levels for multifamily residential dwellings shall apply, unless otherwise specifically in within all such dwellings with windows in their normal seasonal configuration.

Noise Zone	Designated Land Use	Time Interval	Allowable Interior Noise Level (dB)
All	Multifamily	10 pm—7 am	40
	Residential	7 am—10 pm	45

C. If the measured ambient noise level reflected by the L50 exceeds that permissible within any of the interior noise standards in subsection A of Section 12.08.390, the allowable interior noise level shall be increased in 5dB increments in each standard as appropriate to reflect said ambient noise level (L50).

(Ord. 11778 § 2(Art. 4 § 404), 1978: Ord. 11773 § 2 (Art. 4 § 404), 1978.)

12.08.410 - Correction for certain types of sounds.

For any source of sound which emits a pure tone or impulsive noise, the noise levels as set forth in Sections 12.08.390 and 12.08.400 shall be reduced by five decibels.

(Ord. 11778 § 2 (Art. 4 § 405), 1978: Ord. 11773 § 2 (Art. 4 § 405), 1978.)

12.08.420 - Measurement methods.

A. Utilizing the A-weighting scale of the sound-level meter and the "slow" meter response (use "fast" response for impulsive type sounds), the noise level shall be measured at a position or positions at any point on the receiver's property.

B. In general, the microphone shall be located four to five feet above the ground; 10 feet or more from the nearest reflective surface, where possible. However, in those cases where another elevation is deemed appropriate, the latter shall be utilized.

C. Interior noise measurements shall be made within the affected residential unit. The measurements shall be made at a point at least four feet from the wall, ceiling or floor nearest the noise source, with windows in the normal seasonal configuration. Calibration of the measurement equipment, utilizing an acoustic calibrator, shall be performed immediately prior to recording any noise data.

(Ord. 11778 § 2 (Art. 4 § 406), 1978: Ord. 11773 § 2 (Art. 4 § 406), 1978.)

Part 4 - SPECIFIC NOISE RESTRICTIONS

12.08.430 - Acts deemed violations when.

Notwithstanding any other provisions of this chapter, the acts set out in this Part 4, and the causing or permitting thereof, are declared to be in violation of this chapter.

(Ord. 11778 § 2 (Art. 5 § 501 (part)), 1978: Ord. 11773 § 2 (Art. 5 § 501 (part)), 1978.)

12.08.440 - Construction noise.

A. Operating or causing the operation of any tools or equipment used in construction, drilling, repair, alteration or demolition work between weekday hours of 7:00 p.m. and 7:00 a.m., or at any time on Sundays or holidays, such that the sound therefrom creates a noise disturbance across a residential or commercial real-property line, except for emergency work of public service utilities or by variance issued by the health officer is prohibited.

B. Noise Restrictions at Affected Structures. The contractor shall conduct construction activities in such a manner that the maximum noise levels at the affected buildings will not exceed those listed in the following schedule:

1. At Residential Structures.

a. Mobile Equipment. Maximum noise levels for nonscheduled, intermittent, short-term operation (less than 10 days) of mobile equipment:

	Single-family Residential	Multi-family Residential	Semiresidential/ Commercial
Daily, except Sundays and legal holidays, 7:00 a.m. to 8:00 p.m.	75dBA	80dBA	85dBA
Daily, 8:00 p.m. to 7:00 a.m. and all day Sunday and legal holidays	60dBA	64dBA	70dBA

b. Stationary Equipment. Maximum noise level for repetitively scheduled and relatively long-term operation (periods of 10 days or more) of stationary equipment:

	Single-family Residential	Multi-family Residential	Semiresidential/ Commercial
Daily, except Sundays and legal holidays, 7:00 a.m. to 8:00 p.m.	60dBA	65dBA	70dBA
Daily, 8:00 p.m. to 7:00 a.m. and all day Sunday and legal holidays	50dBA	55dBA	60dBA

2. At Business Structures.
    a. Mobile equipment. Maximum noise levels for nonscheduled, intermittent, short-term operation of mobile equipment:

Daily, including Sunday and legal holidays, all hours: maximum of 85dBA.

C. All mobile or stationary internal-combustion-engine powered equipment or machinery shall be equipped with suitable exhaust and air-intake silencers in proper working order.

D. In case of a conflict between this chapter and any other ordinance regulating construction activities, provisions of any specific ordinance regulating construction activities shall control.

(Ord. 11778 § 2 (Art. 5 § 501(c)), 1978: Ord. 11778 § 2 (Art. 5 § 501(c)), 1978.)

12.08.450 - Forced-air blowers in tunnel car washes.

Operating or permitting the operation of any forced-air blower in a tunnel car wash between the hours of 7:00 a.m. and 8:00 p.m. in such a manner as to exceed any of the following sound levels is prohibited:

	Units Installed	
Measurement Location	Before 1-1-80 dB	On or After 1-1-80 dB
Any point on contiguous receptor property, five feet above grade level, no closer than three feet from any wall		
Residential	70	60
Commercial/Industrial	75	65

(Ord. 11778 § 2 (Art. 5 § 501(m)), 1978: Ord. 11773 § 2 (Art. 5 § 501(m)), 1978.)

12.08.460 - Loading and unloading operations.

Loading, unloading, opening, closing or other handling of boxes, crates, containers, building materials, garbage cans or similar objects between the hours of 10:00 p.m. and 6:00 a.m. in such a manner as to cause noise disturbance is prohibited.

(Ord. 11778 § 2 (Art. 5 § 501(b)), 1978: Ord. 11773 § 2 (Art. 5 § 501(b)), 1978.)

12.08.470 - Noise disturbances in noise-sensitive zones.

A. Creating or causing the creation of any noise disturbance within any noise-sensitive zone, as designated by the health officer, is prohibited, provided that conspicuous signs are displayed indicating the presence of the zone.

B. Noise-sensitive zones must be indicated by the display of conspicuous signs in at least three separate locations within 164 meters (one-tenth mile) of the institution or facility.

(Ord. 11778 § 2 (Art. 5 § 501(k)), 1978: Ord. 11773 § 2(Art. 5 § 501(k)), 1978.)

12.08.480 - Places of public entertainment.

Operating, playing or permitting the operation or playing of any radio, television, phonograph, drum, musical instrument, sound amplifier or similar device which produces, reproduces or amplifies sound in any place of public entertainment at a sound level greater than 95dBA, as read by the slow response on a soundlevel meter at any point that is normally occupied by a customer is prohibited, unless a conspicuous and legible sign is located outside such place, near each public entrance, stating "WARNING: SOUND LEVELS WITHIN MAY CAUSE HEARING IMPAIRMENT."

(Ord. 11778 § 2 (Art. 5 § 501(f)), 1978: Ord. 11773 § 2 (Art. 5 § 501(f)), 1978.)

12.08.490 - Powered model vehicles.

Operating or permitting the operation of powered model vehicles so as to create a noise disturbance across a residential real-property boundary, or within a noise-sensitive zone between the hours of 8:00 p.m. and 7:00 a.m. the following day is prohibited.

(Ord. 11778 § 2 (Art. 5 § 501(g)), 1978: Ord. 11773 § 2 (Art. 5 § 501(g)) 1978.)

12.08.500 - Emergency signaling devices.

A. The intentional sounding or permitting the sounding outdoors of any emergency signaling device, including fire, burglar or civil-defense alarm, siren, whistle, or similar stationary emergency signaling device, except for emergency purposes or for testing, as provided in subsection B2 below, is prohibited.

B. 1. Testing of a stationary emergency signaling device shall not occur before 7:00 a.m. or after 7:00 p.m. Any such testing shall use only the minimum cycle test time. In no case shall such test time exceed 60 seconds.

2. Testing of the complete emergency signaling system, including the functioning of the signaling device, and the personnel response to the signaling device, shall not occur more than once in each calendar month. Such testing shall not occur before 7:00 a.m. or after 10:00 p.m. The time limit specified in subsection B1 above shall not apply to such complete-system testing.

C. Sounding or permitting the sounding of any exterior burglar or fire alarm, or any motor-vehicle burglar alarm is prohibited, unless such alarm is terminated within 15 minutes of activation.

(Ord. 11778 § 2 (Art. 5 § 501(i)), 1978: Ord. 11773 § 2 (Art. 5 § 501(i)), 1978.)

12.08.510 - Stationary nonemergency signaling devices.

A. Sounding or permitting the sounding of any electronically amplified signal from any stationary bell, chime, siren, whistle, or similar device intended primarily for nonemergency purposes, from any place, for more than 10 consecutive seconds in any hourly period is prohibited.

B. Houses of religious worship shall be exempt for the operation of this provision.

C. Sound sources covered by this provision and not exempted under subsection B may be exempted by a variance issued by the health officer.

(Ord. 11778 § 2 (Art. 5 § 501(h)), 1978: Ord. 11773 § 2(Art. 5 § 501(h)), 1978.)

12.08.520 - Refuse collection vehicles.

A. On or after three years following August 17, 1978, the effective date of the ordinance codified in this chapter, operating or permitting the operation of the compacting mechanism of any motor vehicle which compacts refuse and which creates, during the compacting cycle, a sound level in excess of 86dBA when measured at 50 feet from any point of the vehicle is prohibited.

B. Operating or permitting the operation of the compacting mechanism of any motor vehicle which compacts refuse between the hours of 10:00 p.m. and 6:00 a.m. the following day in a residential area or noise-sensitive zone, or within 500 feet thereof is prohibited.

C. Collecting refuse with collection vehicle between the hours of 10:00 p.m. and 6:00 a.m. the following day in a residential area or noise-sensitive zone or within 500 feet thereof.

D. In the case of conflict between this chapter and any other ordinance regulating refuse collection, provisions of

any specific ordinance regulating refuse collection shall control.

(Ord. 11778 § 2 (Art. 5 § 501(j)), 1978: Ord. 11773 § 2 (Art. 5 § 501(j)), 1978.)

12.08.530 - Residential airconditioning or refrigeration equipment.

Operating or permitting the operation of any airconditioning or refrigeration equipment in such a manner as to exceed any of the following sound levels is prohibited.

Measurement Location	Units Installed Before 1-1-80 dBA	Units Installed On or After 1-1-80 dBA
Any point on neighboring property line, 5 feet above grade level, no closer than 3 feet from any wall.	60	55
Center of neighboring patio, 5 feet above grade level, no closer than 3 feet from any wall.	55	50

Outside the neighboring living area window nearest the equipment location, not more than 3 feet from the window opening, but at least 3 feet from any other surface.	55	50

(Ord. 11778 § 2 (Art. 5 § 501(1)), 1978: Ord. 11773 § 2 (Art. 5 § 501(1)), 1978.)

12.08.540 - Street sales.

Offering for sale, selling anything, or advertising by shouting or outcry within any residential or commercial area or noise-sensitive zone of the unincorporated areas of the county is prohibited except by variance issued by the health officer. The provisions of this section shall not be construed to prohibit the selling by outcry of merchandise, food and beverages at licensed sporting events, parades, fairs, circuses, or other similar licensed public-entertainment events.

(Ord. 11778 § 2 (Art 5 § 501(a)), 1978: Ord. 11773 § 2 (Art. 5 § 501(a)), 1978.)

12.08.541 - Street sales—Restrictions on sound system speakers.

A person offering for sale, selling or advertising anything edible shall not emit music or other sounds from an external speaker affixed to a motor vehicle between the hours of 8:00 p.m. and 6:00 a.m. within any residential, commercial or noise sensitive-zone of the unincorporated area of the County. The provisions of this section shall not be construed to prohibit the selling by outcry of merchandise, food and beverages, at licensed sporting events, parades, fairs, circuses, or other similar licensed-entertainment events.

(Ord. 2002-0028 § 2, 2002)

12.08.550 - Vehicle or motorboat repairs and testing.

Repairing, rebuilding, modifying or testing any motor vehicle, motorcycle or motorboat in such a manner as to cause a noise disturbance across a real-property boundary or within a noisesensitive zone is prohibited.

(Ord. 11778 § 2 (Art. 5 § 501(e)), 1978: Ord. 11773 § 2 (Art. 5 § 501(e)), 1978.)

12.08.560 - Vibration.

Operating or permitting the operation of any device that creates vibration which is above the vibration perception threshold of any individual at or beyond the property boundary of the source if on private property, or at 150 feet (46 meters) from the source if on a public space or public right-of-way is prohibited. The perception threshold shall be a motion velocity of 0.01 in/sec over the range of 1 to 100 Hertz.

(Ord. 11778 § 2 (Art. 5 § 501(d)), 1978: Ord. 11773 § 2 (Art. 5 § 501(d)), 1978.)

Part 5 - EXEMPTIONS

12.08.570 - Activities exempt from chapter restrictions.

The following activities set out in this chapter shall be exempted from the provisions of this chapter:

A. Emergency Exemption. The emission of sound for the purpose of alerting persons to the existence of an emergency, or the emission of sound in the performance of emergency work;

B. Warning Devices. Warning devices necessary for the protection of public safety, as for example police, fire and ambulance sirens, and train horns;

C. Outdoor Activities. Activities conducted on public playgrounds and public or private school grounds, including but not limited to school athletic and school entertainment events;

D. Exemption from Exterior Noise Standards. The following activities are exclusively regulated by the prohibitions of Part 4 of this chapter:

1. Construction,
2. Stationary nonemergency signaling devices,
3. Emergency signaling devices,
4. Refuse collection vehicles,
5. Residential air-conditioning or refrigeration equipment,
6. Forced-air blowers;

E. Motion Picture Production and Related Activities;

F. Railroad Activities. All locomotives and rail cars operated by any railroad which is regulated by the California Public Utilities Commission;

G. Federal or State Preexempted Activities. Any activity, to the extent regulation thereof has been preempted by state or federal law;

H. Public Health and Safety Activities. All transportation, flood control, and utility company maintenance and construction operations at any time on public right-of-way, and those situations which may occur on private real property deemed necessary to serve the best interest of the public and to protect the public's health and well being, including but not limited to street sweeping, debris and limb removal, removal of downed wires, restoring electrical service, repairing traffic signals, unplugging sewers, snow removal, house moving, vacuuming catchbasins, removal of damaged poles and vehicles, repair of water hydrants and mains, gas lines, oil lines, sewers, etc.;

I. Motor Vehicles on Private Right-of-way and Private Property. Except as provided in Section 12.08.550, all legal vehicles of transportation operating in a legal manner in accordance with local, state and federal vehicle-noise regulations within the public right-of-way or air space, or on private property;

J. Seismic Surveys Authorized by the State Land Commission;

K. Agricultural Operations. All mechanical devices, apparatus or equivalent associated with agricultural operations conducted on agricultural property, unless if in the vicinity of residential land uses, in which case a variance permit is required to operate noise-producing devices, with the following stipulations:

1. Operations do not take place between 8:00 p.m. and 6:00 a.m., or
2. Such operations and equipment are utilized for the protection or salvage of agricultural crops during periods of potential or actual frost damage or other adverse weather conditions, or
3. Such operations and equipment are associated with agricultural pest-control through pesticide application, provided the application is made in accordance with permits issued by or regulations enforced by the county agricultural commissioner,
4. Such devices utilized for pest control which incorporate stationary or mobile noise sources (electro-mechanical birdscare devices, etc.) are operated only by permit issued by the health officer. The allowable hours and days for operation of these devices will be specified in the permit,
5. All equipment and machinery powered by internal combustion engines shall be equipped with a proper muffler and air-intake silencer in good working order;

L. Minor Maintenance to Residential Real Property. Noise sources associated with the minor maintenance of residential real property, provided said activities take place as follows:

1. During Pacific Standard Time between the hours of 8:00 a.m. and 6:00 p.m. on any day except Sunday, when such activities may take place between the hours of 9:00 a.m. and 6:00 p.m., and
2. During Daylight Savings Time between the hours of 8:00 a.m. and 7:00 p.m. on any day except Sunday, when such activities may take place between the hours of 9:00 a.m. and 6:00 p.m.;

M. Operation of Oil and Gas Wells.

1. Normal well servicing, remedial or maintenance work performed within an existing well which does not involve drilling or redrilling and which is restricted to the hours between 7:00 a.m. and 10:00 p.m., and
2. Drilling or redrilling work which is done in full compliance with the conditions of permits issued under Chapter 5, Article 1, of the County Zoning Ordinance, as amended, as set out in Title 22 of this code.

(Ord. 97-0007 § 1, 1997: Ord. 11778 § 2(Art. 6 § 601), 1978: Ord. 11773 § 2 (Art. 6 § 601), 1978.)

Part 6 - VARIANCES

12.08.580 - Conditions for granting variances—Health officer authority.

A. Variances from the requirements of this chapter may be granted by the health officer for a period of not to exceed two years, subject to such terms, conditions and requirements as he may deem reasonable. A variance may be granted only if the health officer makes the findings that:

1. Additional time is necessary for the applicant to alter or modify his activity, operation or noise source to comply with this chapter; or
2. The activity, operation or noise source cannot feasibly be done in a manner that would comply with the provisions of this chapter, and no other reasonable alternative is available to the applicant.

B. In granting a variance, the health officer may prescribe any conditions or requirements he deems necessary to minimize adverse effects upon the community or the surrounding neighborhood.

C. In granting variances, the health officer shall consider the magnitude of nuisance caused by the offensive noise, t property within the area of impingement by the noise, operations carried on under existing nonconforming right conditional use permits or zone variances, the time factors related to study, design, financing and construction o work, the economic factors related to age and useful life of the equipment, the general public interest, health an the feasibility of plans submitted for correction, and the effect on the community if the variance was refused.

(Ord. 11778 § 2 (Art. 7 § 701), 1978: Ord. 11773 § 2 (Art. 7 § 701), 1978.)

12.08.590 - Application—Contents.

Every applicant for a variance shall file with the health officer a written application on a form prescribed by the health officer. The application shall state the name and address of the applicant, the nature of the noise source involved, and such other information as the health officer may require.

(Ord. 11778 § 2 (Art. 7 § 702), 1978: Ord. 11773 § 2 (Art. 7 § 702), 1978.)

12.08.600 - Application—Fee.

Every applicant shall pay a fee of $25.00 for each application for variance.

(Ord. 11778 § 2 (Art. 7 § 703), 1978: Ord. 11773 § 2 (Art. 7 § 703), 1978.)

12.08.610 - Application—Action by health officer.

A. The health officer shall act, within 30 days, if possible, on an application for a variance, and shall notify the applicant of the action taken, namely, approval, conditional approval, or denial. Before acting on an application for a variance, the health officer may require the applicant to furnish further information. Failure of the applicant to provide such further information may be grounds for denial of the variance.

B. In the event of denial of an application for a variance, the health officer shall notify the applicant in writing of the reasons therefor. The health officer shall not accept a further application unless the applicant has complied with the objections specified by the health officer as his reasons for denial.

(Ord. 11778 § 2 (Art. 7 § 704), 1978: Ord. 11773 § 2 (Art. 7 § 704), 1978.)

12.08.620 - Application—Denial conditions.

The applicant may at his option deem the variance denied if the health officer fails to act on the application within 30 days after filing or within 10 days after applicant furnishes the further information requested by the health officer, whichever is later.

(Ord. 11778 § 2 (Art. 7 § 705), 1978: Ord. 11773 § 2 (Art. 7 § 705), 1978.)

12.08.630 - Public hearing—For reconsideration of health officer decision.

Within 10 days after notice by the health officer of the decision on application for variance, any interested party may petition the health officer in writing for a public hearing to reconsider the decision. The health officer shall thereupon appoint a hearing officer to conduct said hearing.

(Ord. 11778 § 2 (Art. 7 § 706), 1978: Ord. 11773 § 2 (Art. 7 § 706), 1978.)

12.08.640 - Public hearing—Decision and findings—Appeals.

A. Based upon the evidence presented at the public hearing, the hearing officer may affirm, modify or reverse the previous determination subject to such terms, conditions and requirements as he may deem necessary. The hearing officer shall be guided by the same considerations as set forth in Section 12.08.580.

B. A decision by the hearing officer to grant a variance may be made only if the hearing officer makes the findings that:

1. Additional time is necessary for the applicant to alter or modify his activity, operation or noise source to comply with this chapter; or

2. The activity, operation or noise source cannot feasibly be done in a manner that would comply with the provisions of this chapter, and no other reasonable alternative is available to the applicant.

C. The decision of the hearing officer shall be by written order, and shall be final. Appeals from an adverse decision shall be made to a court of competent jurisdiction.

(Ord. 11778 § 2 (Art. 7 § 707), 1978: Ord. 11773 § 2 (Art. 7 § 707), 1978.)

Part 7 - VIOLATIONS AND ENFORCEMENT

12.08.650 - Enforcement—Health officer powers and duties.

The health officer shall have primary responsibility for the enforcement of the noise regulations contained in this chapter. The health officer shall make all noise-level measurements required for the enforcement of this chapter. Nothing in this chapter shall prevent the health officer from efforts to obtain voluntary compliance by way of warning, notice, or educational means.

(Ord. 11778 § 2 (Art. 8 § 801), 1978: Ord. 11773 § 2 (Art. 8 § 801), 1978.)

12.08.660 - Initial violations.

In the event of an initial violation of the provisions of this chapter a written notice of violation shall be given the alleged violator, specifying the time by which the condition shall be corrected or an application for permit or variance shall be received by the health officer. The health officer shall take no further action in the event the cause of the violation has been removed, the condition abated or fully corrected within the time period specified in the written notice.

(Ord. 11778 § 2 (Art. 8 § 802), 1978: Ord. 11773 § 2 (Art. 8 § 802), 1978.)

12.08.670 - Violation—Penalty.

Any person violating any of the provisions of this chapter shall be deemed guilty of a misdemeanor and, upon conviction thereof, shall be punished by a fine of not more than $500.00 or be imprisoned in the County Jail for a period not exceeding six months or by both such fine and imprisonment. Each day such violation is committed or permitted to continue shall constitute a separate offense and shall be punishable as such.

(Ord. 11778 § 2 (Art. 8 § 803), 1978: Ord. 11773 § 2 (Art. 8 § 803, 1978.)

12.08.680 - Severability.

If any provision, clause, sentence or paragraph of this chapter or the application thereof to any person or circumstances shall be held invalid, such invalidity shall not affect the other provisions or application of the provisions of this chapter which can be given effect without the invalid provisions or application and, to this end, the provisions of this chapter are hereby declared to be severable.

(Ord. 11778 § 2 (Art. 8 § 804), 1978: Ord. 11773 § 2 (Art. 8 § 804), 1978.)

Chapter 12.12 - BUILDING CONSTRUCTION NOISE

12.12.010 - Definitions.

A. "Board" means the board of supervisors of the county of Los Angeles.

B. "Person" means an individual, partnership, firm or corporation.

C. "Section" means a section of the ordinance codified in this chapter.

(Ord. 8594 §§ 1, 2 and 3, 1964.)

12.12.020 - References to provisions.

Whenever any reference is made to the ordinance codified in this chapter or any other ordinance, or to any statute, such reference shall apply to all amendments and additions thereto now or hereafter made.

(Ord. 8594 § 4, 1964.)

12.12.030 - Construction noise prohibited when.

Except as otherwise provided in this chapter, a person, on any Sunday, or at any other time between the hours of 8:00 p.m. and 6:30 a.m. the following day, shall not perform any construction or repair work of any kind upon any building or structure, or perform any earth excavating, filling or moving, where any of the foregoing entails the use of any air compressors; jackhammers; power-driven drill; riveting machine; excavator, diesel-powered truck, tractor or other earth moving equipment; hand hammers on steel or iron, or any other machine, tool, device or equipment which makes loud noises to the disturbance of persons occupying sleeping quarters in a dwelling, apartment, hotel, mobilehome, or other place of residence.

(Ord. 9818 § 1, 1969: Ord. 8594 § 6, 1964.)

12.12.040 - Exemptions—Certain zoned areas.

The provisions of this chapter do not apply in any territory which is in a zone in which the Zoning Ordinance, codified in Title 22 of this code, prohibits any residential use and which is not less than 500 feet from any territory in any residential zone as defined in Section 201 of Ordinance 1494, or any territory in a residential zone in any city.

(Ord. 8594 § 11, 1964.)

12.12.050 - Exemptions—Work performed with county engineer's permission.

The provisions of Section 12.12.030 do not apply to any person who performs the construction, repair, excavation or earthmoving work involved pursuant to the express written permission of the county engineer to perform such work at times prohibited in Section 12.12.030. Upon receipt of an application in writing therefor, stating the reasons for the request and the

facts upon which such reasons are based, the county engineer may grant such permission if he finds that:

A. The work proposed to be done is effected with a public interest; or

B. Hardship or injustice, or unreasonable delay, would result from the interruption thereof during the hours and days specified in Section 12.12.030; or

C. The building or structure involved is devoted or intended to be devoted to a use immediately incident to public defense.

(Ord. 9818 § 2, 1969: Ord. 8594 § 7, 1964.)

12.12.060 - Exemptions—Work by public utilities—Conditions.

The provisions of Section 12.12.030 do not apply to the construction, repair or excavation by a public utility which is subject to the jurisdiction of the Public Utilities Commission as may be necessary for the preservation of life or property, and where such necessity makes it necessary to construct, repair or excavate during the prohibited hours.

(Ord. 8594 § 10, 1964.)

12.12.070 - Exemptions—Emergency work—Permit requirements.

The provisions of Section 12.12.030 do not apply to such construction, repair or excavation during prohibited hours as may be necessary for the preservation of life or property when such necessity arises during such hours as the offices of the county are closed or where such necessity requires immediate action prior to the time at which it would be possible to obtain a permit pursuant to Section 12.12.050, if the person doing such construction, repair or excavation obtains a permit therefor within one day after the offices of the county engineer are first opened subsequent to the making of such construction, repair or excavation.

(Ord. 8594 § 9, 1964.)

12.12.080 - Appeals from county engineer's decision.

Any person dissatisfied with the decision of the county engineer may appeal to the business license commission as provided in Ordinance 5860, on business licenses, set out at Title 7 of this code, including the appointment of and reference to a referee, as in the case of a notification by the tax collector that he intends to deny a license.

(Ord. 9849 § 1, 1969: Ord. 8594 § 8, 1964.)

12.12.090 - Violation—Penalty.

Any person violating any provision of this chapter is guilty of a misdemeanor punishable by a fine of not more than $500.00 or by imprisonment in the County Jail for not more than six months, or by both such fine and imprisonment. Every such person is guilty of a separate offense for every day during any portion of which any violation or any of the provisions of this chapter is committed, continued or permitted by such person, and shall be punished as provided by this chapter.

(Ord. 8594 § 12, 1964.)

12.12.100 - Severability.

If any provision of the ordinance codified in this chapter or the application thereof to any person or circumstance is held invalid, the remainder of the ordinance, and the application of such provision to other persons or circumstances, shall not be affected thereby.

(Ord. 8594 § 5, 1964.)

3.10 Noise

This section evaluates the potential for noise and groundborne vibration impacts to result from implementation of the proposed Enhanced Watershed Management Program (EWMP). This includes the potential for the proposed program to result in impacts associated with a substantial temporary and/or permanent increase in ambient noise levels in the vicinity of the proposed program; exposure of people in the vicinity of the proposed program to excessive noise and groundborne vibration levels; and whether this exposure is in excess of applicable, established standards in the EWMP areas of Los Angeles County (County). Mitigation measures to reduce potential noise and vibration impacts are identified, where warranted.

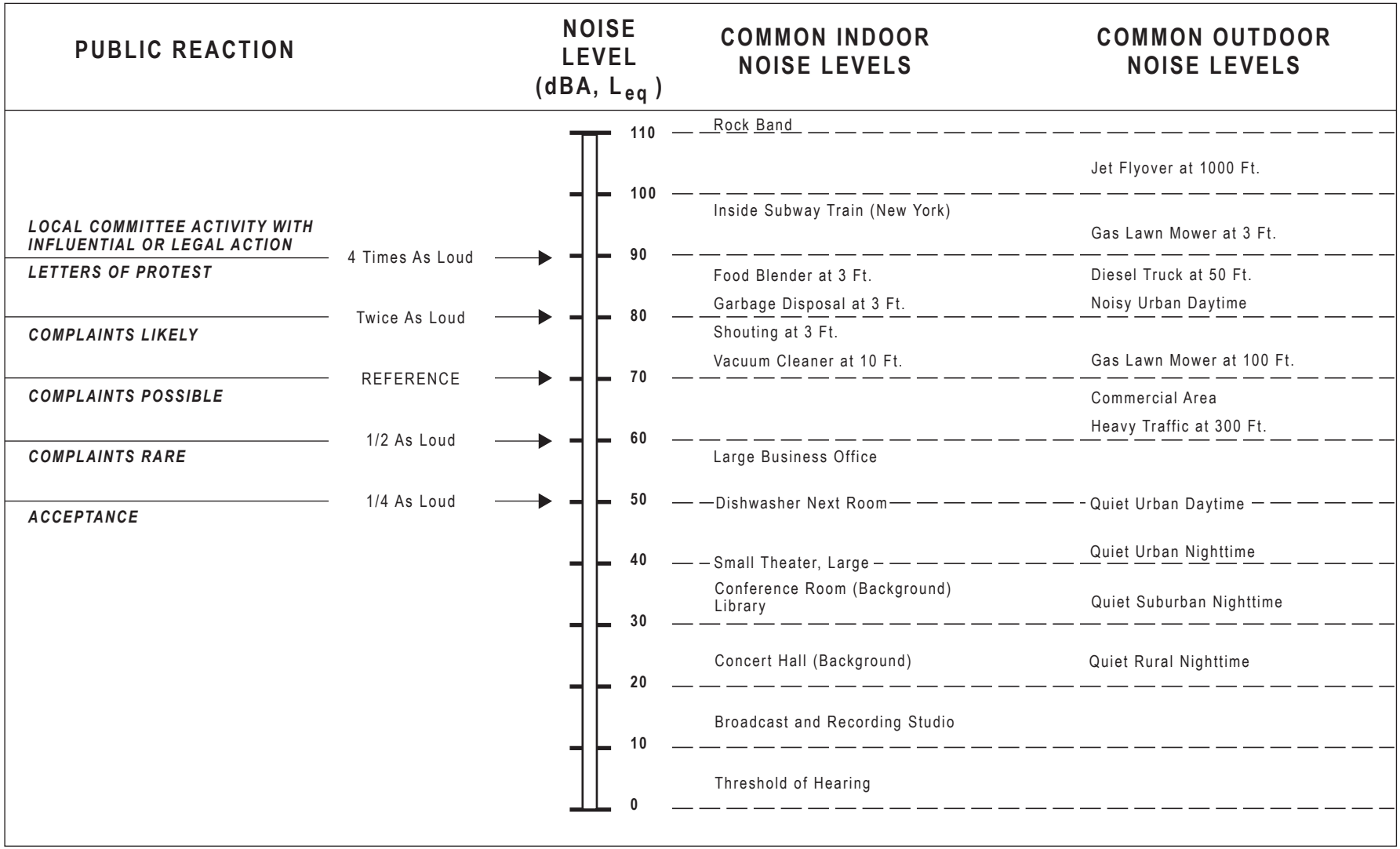
3.10.1 Principles of Noise and Vibration

Noise Principles and Descriptors

Noise is generally defined as unwanted sound, traveling in the form of waves from a source and exerting a sound pressure level (referred to as sound level) that is measured in decibels (dB), which is the standard unit of sound amplitude measurement. The dB scale is a logarithmic scale that describes the physical intensity of the pressure vibrations that make up any sound, with 0 dB corresponding roughly to the threshold of human hearing and 120 to 140 dB corresponding to the threshold of pain. Pressure waves traveling through air exert a force registered by the human ear as sound.

Sound pressure fluctuations can be measured in units of hertz (Hz), which correspond to the frequency of a particular sound. Typically, sound does not consist of a single frequency, but rather a broad band of frequencies varying in levels of magnitude. When all the audible frequencies of a sound are measured, a sound spectrum is plotted consisting of a range of frequency spanning 20 to 20,000 Hz. The sound pressure level, therefore, constitutes the additive force exerted by a sound corresponding to the sound frequency/sound power level spectrum.

The typical human ear is not equally sensitive to all frequencies of the audible sound spectrum. As a consequence, when assessing potential noise impacts, sound is measured using an electronic filter that deemphasizes the frequencies below 1,000 Hz and above 5,000 Hz in a manner corresponding to the human ear's decreased sensitivity to extremely low and extremely high frequencies. This method of frequency weighting is referred to as A-weighting and is expressed in units of A-weighted decibels (dBA). A-weighting follows an international standard methodology of frequency deemphasis and is typically applied to community noise measurements. Some representative noise sources and their corresponding A-weighted noise levels are shown in **Figure 3.10-1**.



SOURCE: ESA

LA County PEIR EWMP . 140474

Figure 3.10-1
Effects of Noise on People

Noise Exposure and Community Noise

An individual's noise exposure is a measure of noise over a period of time. A noise level is a measure of noise at a given instant in time. The noise levels presented in Figure 3.10-1 are representative of measured noise at a given instant in time; however, they rarely persist consistently over a long period of time. Rather, community noise varies continuously over a period of time with respect to the contributing sound sources of the community noise environment. Community noise is primarily the product of many distant noise sources, which constitute a relatively stable background noise exposure, with the individual contributors unidentifiable. The background noise level changes throughout a typical day, but does so gradually, corresponding with the addition and subtraction of distant noise sources such as traffic. What makes community noise constantly variable throughout a day, besides the slowly changing background noise, is the addition of short duration, single-event noise sources (e.g., aircraft flyovers, motor vehicles, sirens), which are readily identifiable to the individual.

These successive additions of sound to the community noise environment change the community noise level from instant to instant, thus requiring that noise exposure be measured over a period of time to legitimately characterize a community noise environment and evaluate cumulative noise impacts. This time-varying characteristic of environmental noise is described using statistical noise descriptors. The most frequently used noise descriptors are summarized below:

L_{eq}: The L_{eq}, or equivalent sound level, is used to describe noise over a specified period of time in terms of a single numerical value; the L_{eq} of a time-varying signal and that of a steady signal are the same if they deliver the same acoustic energy over a given time. The L_{eq} may also be referred to as the average sound level.

L_{max}: The maximum, instantaneous noise level experienced during a given period of time.

L_{min}: The minimum, instantaneous noise level experienced during a given period of time.

L_{50}: The noise level that is equaled or exceeded 50 percent of the specified time period. The L_{50} represents the median sound level.

L_{90}: The noise level that is equaled or exceeded 90 percent of the specified time period. The L_{90} is generally considered to be representing the background or ambient level of a noise environment.

L_{dn}: Also termed the day-night average noise level (DNL), the L_{dn} is the average A-weighted noise level during a 24-hour day, obtained after an addition of 10 dBA to measured noise levels between the hours of 10:00 P.M. and 7:00 A.M. to account nighttime noise sensitivity.

CNEL: CNEL, or Community Noise Equivalent Level, is the average A-weighted noise level during a 24-hour day that is obtained after an addition of 5 dBA to measured noise levels between the hours of 7:00 P.M. and 10:00 P.M. and after an addition of 10 dBA to noise levels between the hours of 10:00 P.M. and 7:00 A.M. to account for noise sensitivity in the evening and nighttime, respectively.

Effects of Noise on People

Noise is generally loud, unpleasant, unexpected, or undesired sound that is typically associated with human activity that is a nuisance or disruptive. The effects of noise on people can be placed into four general categories:

- Subjective effects (e.g., dissatisfaction, annoyance)
- Interference effects (e.g., communication, sleep, and learning interference)
- Physiological effects (e.g., startle response)
- Physical effects (e.g., hearing loss)

Although exposure to high noise levels has been demonstrated to cause physical and physiological effects, the principal human responses to typical environmental noise exposure are related to subjective effects and interference with activities. Interference effects of environmental noise refer to those effects that interrupt daily activities and include interference with human communication activities, such as normal conversations, watching television, telephone conversations, and interference with sleep. Sleep interference effects can include both awakening and arousal to a lesser state of sleep. With regard to the subjective effects, the responses of individuals to similar noise events are diverse and are influenced by many factors, including the type of noise, the perceived importance of the noise, the appropriateness of the noise to the setting, the duration of the noise, the time of day and the type of activity during which the noise occurs, and individual noise sensitivity.

Overall, there is no completely satisfactory way to measure the subjective effects of noise, or the corresponding reactions of annoyance and dissatisfaction on people. A wide variation in individual thresholds of annoyance exists, and different tolerances to noise tend to develop based on an individual's past experiences with noise. Thus, an important way of predicting a human reaction to a new noise environment is the way it compares to the existing environment to which one has adapted (i.e., comparison to the ambient noise environment). In general, the more a new noise level exceeds the previously existing ambient noise level, the less acceptable the new noise level will be judged by those hearing it. With regard to increases in A-weighted noise level, the following relationships generally occur:

- Except in carefully controlled laboratory experiments, a change of 1 dBA cannot be perceived.
- Outside of the laboratory, a 3 dBA change in noise levels is considered to be a barely perceivable difference.
- A change in noise levels of 5 dBA is considered to be a readily perceivable difference.
- A change in noise levels of 10 dBA is subjectively heard as doubling of the perceived loudness.

These relationships occur in part because of the logarithmic nature of sound and the decibel system. The human ear perceives sound in a nonlinear fashion; hence, the decibel scale was developed.

Because the decibel scale is based on logarithms, two noise sources do not combine in a simple additive fashion, but rather logarithmically. For example, if two identical noise sources produce noise levels of 50 dBA, the combined sound level would be 53 dBA, not 100 dBA.

Noise Attenuation

Stationary point sources of noise, including stationary mobile sources such as idling vehicles, attenuate (lessen) at a rate between 6 dBA for hard sites and 7.5 dBA for soft sites for each doubling of distance from the reference measurement. Hard sites are those with a reflective surface between the source and the receiver, such as asphalt or concrete surfaces or smooth bodies of water. No excess ground attenuation is assumed for hard sites and the change in noise levels with distance (drop-off rate) is simply the geometric spreading of the noise from the source. Soft sites have an absorptive ground surface such as soft dirt, grass, or scattered bushes and trees. In addition to geometric spreading, an excess ground attenuation value of 1.5 dBA (per doubling distance) is normally assumed for soft sites. Line sources (such as traffic noise from vehicles) attenuate at a rate between 3 dBA for hard sites and 4.5 dBA for soft sites for each doubling of distance from the reference measurement (Caltrans, 1998).

Fundamentals of Vibration

As described in the Federal Transit Administration's (FTA's) *Transit Noise and Vibration Impact Assessment* (FTA, 2006), groundborne vibration can be a serious concern for nearby neighbors of a transit system route or maintenance facility, causing buildings to shake and rumbling sounds to be heard. In contrast to airborne noise, groundborne vibration is not a common environmental problem. It is unusual for vibration from sources such as buses and trucks to be perceptible, even in locations close to major roads. Some common sources of groundborne vibration are trains, buses on rough roads, and construction activities such as blasting, pile-driving, and operation of heavy earthmoving equipment.

There are several different methods that are used to quantify vibration. The peak particle velocity (PPV) is defined as the maximum instantaneous peak of the vibration signal. The PPV is most frequently used to describe vibration impacts to buildings. The root mean square (RMS) amplitude is most frequently used to describe the effect of vibration on the human body. The RMS amplitude is defined as the average of the squared amplitude of the signal. Decibel notation (VdB) is commonly used to measure RMS. The relationship of PPV to RMS velocity is expressed in terms of the "crest factor," defined as the ratio of the PPV amplitude to the RMS amplitude. PPV is typically a factor of 1.7 to 6 times greater than RMS vibration velocity (FTA, 2006). The decibel notation acts to compress the range of numbers required to describe vibration. Typically, groundborne vibration generated by man-made activities attenuates rapidly with distance from the source of the vibration. Sensitive receptors for vibration include structures (especially older masonry structures), people (especially residents, the elderly, and sick), and vibration-sensitive equipment.

The effects of groundborne vibration include movement of the building floors, rattling of windows, shaking of items on shelves or hanging on walls, and rumbling sounds. In extreme cases, the vibration can cause damage to buildings. Building damage is not a factor for most

projects, with the occasional exception of blasting and pile-driving during construction. Annoyance from vibration often occurs when the vibration levels exceed the threshold of perception by only a small margin. A vibration level that causes annoyance will be well below the damage threshold for normal buildings. The FTA measure of the threshold of architectural damage for conventional sensitive structures is 0.2 in/sec PPV (FTA, 2006).

In residential areas, the background vibration velocity level is usually around 50 VdB (approximately 0.0013 in/sec PPV). This level is well below the vibration velocity level threshold of perception for humans, which is approximately 65 VdB. A vibration velocity level of 75 VdB is considered to be the approximate dividing line between barely perceptible and distinctly perceptible levels for many people (FTA, 2006).

3.10.2 Environmental Setting

Existing Noise Sources

As the EWMP areas are located throughout Los Angeles County, existing noise levels in the EWMP areas would consist of various noise sources typically associated with highly urbanized environments. These noise sources commonly include, but are not limited to, traffic, construction work, commercial operations, human activities, emergency vehicles, aircraft overflights, etc. Of these sources, transportation-related noise associated with vehicular traffic is generally the constant, dominating noise source that comprises an urban environment's ambient noise levels. Vehicular traffic creates noise on roads and highways in residential, commercial, industrial, and mixed-use areas. Aside from vehicular traffic on roadways, other transportation-related noise sources include rail/urban transit systems and airports, which are also located throughout the County. Noise generated by stationary sources in an urban environment are generally associated with heating, ventilating, and air conditioning (HVAC) equipment for residential and commercial uses as well as other similar and larger mechanical stationary equipment for industrial uses. The use of larger-capacity stationary mechanical equipment by industrial uses generally results in higher noise levels in industrial-zoned areas when compared with residential or retail areas.

Existing Groundborne Vibration Levels

Aside from periodic construction work that may occur throughout the County where the EWMP areas are located, other sources of groundborne vibration in the County include heavy-duty vehicular travel (e.g., refuse trucks, delivery trucks, and transit buses) on local roadways. Trucks and buses traveling at a distance of 50 feet typically generate groundborne vibration velocity levels of around 63 VdB (approximately 0.006 in/sec PPV), and these levels could reach 72 VdB (approximately 0.016 in/sec PPV) where trucks pass over bumps in the road (FTA, 2006). In terms of PPV levels, a heavy-duty vehicle traveling at a distance of 50 feet can result in a vibration level of approximately 0.001 inch per second.

Sensitive Receptors

Noise-sensitive receptors are locations where people reside or where the presence of unwanted sound could adversely affect or disrupt the types of activities associated with the land use at the

location. Land uses such as residences, hotels, schools, rest homes, libraries, churches, and hospitals are generally more sensitive to noise than commercial and industrial land uses. As such, these types of land uses are considered to be noise-sensitive receptors. Given that the majority of the County is highly urbanized with a variety of land use types (e.g., open space, residential, commercial, mixed-use, public and semi-public, and industrial uses), and that the proposed program would be located in various watersheds across the County that span multiple jurisdictions, existing noise-sensitive uses such as residences, schools, guest lodging, hospitals, churches, parks, etc. would be located within and in proximity to the EWMP areas. As described in Section 3.9, *Land Use and Agriculture,* of this Program Environmental Impact Report (PEIR), many of the EWMP areas, including Ballona Creek, Beach Cities, Dominguez Channel, and Marina del Rey, have residential uses as the predominant land use.

3.10.3 Regulatory Setting

Federal

Federal Noise Standards

There are no federal noise standards that directly regulate environmental noise related to the construction or operation of the proposed program. With regard to noise exposure and workers, the Office of Safety and Health Administration (OSHA) regulations safeguard the hearing of workers exposed to occupational noise. Federal regulations also establish noise limits for medium and heavy trucks (more than 4.5 tons, gross vehicle weight rating) under 40 Code of Federal Regulations (CFR), Part 205, Subpart B. The federal truck pass-by noise standard is 80 dBA at 15 meters from the vehicle pathway centerline. These controls are implemented through regulatory controls on truck manufacturers.

Federal Transit Authority Vibration Standards

The FTA has adopted vibration standards that are used to evaluate potential building damage impacts related to construction activities. The vibration damage criteria adopted by the FTA are shown in **Table 3.10-1**.

TABLE 3.10-1
CONSTRUCTION VIBRATION DAMAGE CRITERIA

Building Category	PPV (in/sec)
I. Reinforced concrete, steel or timber (no plaster)	0.5
II. Engineered concrete and masonry (no plaster)	0.3
III. Non-engineered timber and masonry buildings	0.2
IV. Buildings extremely susceptible to vibration damage	0.12

SOURCE: FTA, 2006.

In addition, the FTA has also adopted standards associated with human annoyance for groundborne vibration impacts for the following three land-use categories: Vibration Category 1 – High Sensitivity, Vibration Category 2 – Residential, and Vibration Category 3 – Institutional.

The FTA defines Category 1 as buildings where vibration would interfere with operations within the building, including vibration-sensitive research and manufacturing facilities, hospitals with vibration-sensitive equipment, and university research operations. Vibration-sensitive equipment includes, but is not limited to, electron microscopes, high-resolution lithographic equipment, and normal optical microscopes. Category 2 refers to all residential land uses and any buildings where people sleep, such as hotels and hospitals. Category 3 refers to institutional land uses such as schools, churches, other institutions, and quiet offices that do not have vibration-sensitive equipment, but still have the potential for activity interference.

Under conditions where there are an infrequent number of events per day, the FTA has established thresholds of 65 VdB for Category 1 buildings, 80 VdB for Category 2 buildings, and 83 VdB for Category 3 buildings.[1] Under conditions where there are an occasional number of events per day, the FTA has established thresholds of 65 VdB for Category 1 buildings, 75 VdB for Category 2 buildings, and 78 VdB for Category 3 buildings.[2] No thresholds have been adopted or recommended for commercial and office uses.

State

California Department of Health Services Noise Standards

The California Department of Health Services (DHS) has established guidelines for evaluating the compatibility of various land uses as a function of community noise exposure. These guidelines for land use and noise exposure compatibility are shown in **Table 3.10-2**. In addition, Section 65302(f) of the California Government Code requires each county and city in the State to prepare and adopt a comprehensive long-range general plan for its physical development, with Section 65302(g) requiring a noise element to be included in the general plan. The noise element must: (1) identify and appraise noise problems in the community; (2) recognize Office of Noise Control guidelines; and (3) analyze and quantify current and projected noise levels.

The State of California also establishes noise limits for vehicles licensed to operate on public roads. For heavy trucks, the State pass-by standard is consistent with the federal limit of 80 dBA. The State pass-by standard for light trucks and passenger cars (less than 4.5 tons, gross vehicle rating) is also 80 dBA at 15 meters from the centerline. These standards are implemented through controls on vehicle manufacturers and by legal sanction of vehicle operators by state and local law enforcement officials.

1 "Infrequent events" is defined by the FTA as being fewer than 30 vibration events of the same kind per day.
2 "Occasional events" is defined by the FTA as between 30 and 70 vibration events of the same source per day.

TABLE 3.10-2
COMMUNITY NOISE EXPOSURE (L_{dn} OR CNEL)

Land Use	Normally Acceptable[a]	Conditionally Acceptable[b]	Normally Unacceptable[c]	Clearly Unacceptable[d]
Single-family, Duplex, Mobile Homes	50 - 60	55 - 70	70 - 75	above 75
Multi-Family Homes	50 - 65	60 - 70	70 - 75	above 75
Schools, Libraries, Churches, Hospitals, Nursing Homes	50 - 70	60 - 70	70 - 80	above 80
Transient Lodging – Motels, Hotels	50 - 65	60 - 70	70 - 80	above 75
Auditoriums, Concert Halls, Amphitheaters	---	50 - 70	---	above 70
Sports Arena, Outdoor Spectator Sports	---	50 - 75	---	above 75
Playgrounds, Neighborhood Parks	50 - 70	---	67 - 75	above 75
Golf Courses, Riding Stables, Water Recreation, Cemeteries	50 - 75	---	70 - 80	above 80
Office Buildings, Business and Professional Commercial	50 - 70	67 - 77	above 75	---
Industrial, Manufacturing, Utilities, Agriculture	50 - 75	70 - 80	above 75	---

[a] Normally Acceptable: Specified land use is satisfactory, based upon the assumption that any buildings involved are of normal conventional construction without any special noise insulation requirements.

[b] Conditionally Acceptable: New construction or development should be undertaken only after a detailed analysis of the noise reduction requirements is made and needed noise insulation features included in the design. Conventional construction, but with closed windows and fresh air supply systems or air conditioning will normally suffice.

[c] Normally Unacceptable: New construction or development should generally be discouraged. If new construction or development does proceed, a detailed analysis of the noise reduction requirements must be made and needed noise insulation features included in the design.

[d] Clearly Unacceptable: New construction or development should generally not be undertaken.

SOURCE: Office of Planning and Research, State of California Genera Plan Guidelines, October 2003 (in coordination with the California Department of Health Services).

State Vibration Standards

There are no state vibration standards applicable to the proposed program. Moreover, according to the California Department of Transportation's (Caltrans') *Transportation and Construction Vibration Guidance Manual* (2013), there are no official Caltrans standards for vibration. However, this manual provides guidelines for assessing vibration damage potential to various types of buildings, ranging from 0.08 to 0.12 in/sec PPV for extremely fragile historic buildings, ruins, and ancient monuments to 0.50 to 2.0 in/sec PPV for modern industrial/commercial buildings. The vibration criteria for structural damage and human annoyance established in Caltrans' *Transportation and Construction Vibration Guidance Manual* (2013) are shown in **Tables 3.10-3** and **3.10-4**, respectively.

TABLE 3.10-3
CALTRANS VIBRATION DAMAGE POTENTIAL THRESHOLD CRITERIA

	Maximum PPV (in/sec)	
Structure and Condition	**Transient Sources**	**Continuous/Frequent Intermittent Sources**
Extremely fragile historic buildings, ruins, ancient monuments	0.12	0.08
Fragile buildings	0.2	0.1
Historic and some old buildings	0.5	0.25
Older residential structures	0.5	0.3
New residential structures	1.0	0.5
Modern industrial/commercial buildings	2.0	0.5

NOTE: Transient sources create a single isolated vibration event, such as blasting or drop balls. Continuous/frequent intermittent sources include impact pile-drivers, pogo-stick compactors, crack and-seat equipment, vibratory pile drivers, and vibratory compaction equipment.

SOURCE: Caltrans, Transportation and Construction Vibration Guidance Manual, September 2013.

TABLE 3.10-4
CALTRANS VIBRATION ANNOYANCE POTENTIAL CRITERIA

	Maximum PPV (in/sec)	
Structure and Condition	**Transient Sources**	**Continuous/Frequent Intermittent Sources**
Barely perceptible	0.04	0.01
Distinctly perceptible	0.25	0.04
Strongly perceptible	0.9	0.10
Severe	2.0	0.4

NOTE: Transient sources create a single isolated vibration event, such as blasting or drop balls. Continuous/frequent intermittent sources include impact pile-drivers, pogo-stick compactors, crack and-seat equipment, vibratory pile drivers, and vibratory compaction equipment.

SOURCE: Caltrans, Transportation and Construction Vibration Guidance Manual, September 2013.

Local

County of Los Angeles General Plan Noise Element

The California Government Code Section 65302(g) requires that a noise element be included in the General Plan of each county and city in the state. The Noise Element of the County of Los Angeles General Plan was established as a planning tool to develop strategies and action programs that address the multitude of noise sources and issues throughout the County. The noise guidelines used by the County are based on the community noise compatibility guidelines established by the State of California DHS (refer to Table 3.10-2), as described above. Specific regulations that implement these guidelines are set forth in the Los Angeles County Municipal Code as discussed below.

County of Los Angeles Municipal Code

Chapter 12.08, Noise Control, of the County of Los Angeles Municipal Code serves as the Noise Ordinance for the County and establishes noise standards to control unnecessary, excessive, and annoying noise and vibration in the County. Within Chapter 12.08 of the Los Angeles County Code, Section 12.08.380 assigned the following noise zones for receptor properties in the County:

1. Noise Zone 1 – Noise-sensitive areas
2. Noise Zone 2 – Residential properties
3. Noise Zone 3 – Commercial properties
4. Noise Zone 4 – Industrial properties

With respect to operational noise, Section 12.08.390 of the Noise Ordinance established exterior noise levels that should be applied to all receptor properties within a designated noise zone in the County. These exterior noise levels are shown in **Table 3.10-5**.

TABLE 3.10-5
COUNTY OF LOS ANGELES EXTERIOR NOISE STANDARDS BY NOISE ZONES

Noise Zone	Designated Noise Zone Land Use (Receptor Property)	Time Interval	Exterior Noise Level (dBA)
I	Noise-sensitive area	Anytime	45
II	Residential properties	10:00 P.M. to 7:00 A.M. (nighttime)	45
		7:00 A.M. to 10:00 P.M. (daytime)	50
III	Commercial properties	10:00 P.M. to 7:00 A.M. (nighttime)	55
		7:00 A.M. to 10:00 P.M. (daytime)	60
IV	Industrial properties	Anytime	70

SOURCE: County of Los Angeles Ordinance No. 11743, Section 12.08.390.

The exterior noise levels shown in Table 3.10-5 are meant to be further applied as noise standards based on the duration of the noise; i.e., the louder the noise, the shorter the time it is allowed to last. The Noise Ordinance uses a number of noise metrics to define the permissible noise levels. These metrics include L_{50}, L_{25}, $L_{8.3}$, $L_{1.7}$, and L_{max}, and are based upon a 1-hour timeframe which indicates exceedances of 50, 25, 8.3, and 1.7 percent of the time, plus the maximum sound level during that time period. The following noise standards should be applied to the exterior noise levels provided in Table 3.10-5:

- Standard No. 1 shall be the exterior noise level that may not be exceeded for a cumulative period of more than 30 minutes in any hour. Standard No. 1 shall be the applicable noise

level from Table 3.10-5; or, if the ambient L_{50} exceeds the forgoing level, then the ambient L_{50} becomes the exterior noise level for Standard No. 1.

- Standard No. 2 shall be the exterior noise level that may not be exceeded for a cumulative period of more than 15 minutes in any hour. Standard No. 2 shall be the applicable noise level from Table 3.10-5 plus 5 dB(A); or, if the ambient L_{25} exceeds the forgoing level, then the ambient L_{25} becomes the exterior noise level for Standard No. 2.
- Standard No. 3 shall be the exterior noise level that may not be exceeded for a cumulative period of more than 5 minutes in any hour. Standard No. 3 shall be the applicable noise level from Table 3.10-5 plus 20 dB(A); or, if the ambient $L_{8.3}$ exceeds the forgoing level, then the ambient $L_{8.3}$ becomes the exterior noise level for Standard No. 3.
- Standard No. 4 shall be the exterior noise level that may not be exceeded for a cumulative period of more than one minute in any hour. Standard No. 4 shall be the applicable noise level from Table 3.10-5 plus 15 dB(A); or, if the ambient $L_{1.7}$ exceeds the forgoing level, then the ambient $L_{1.7}$ becomes the exterior noise level for Standard No. 4.
- Standard No. 5 shall be the exterior noise level that may not be exceeded for any period of time. Standard No. 5 shall be the applicable noise level from Table 3.10-5 plus 20 dB(A); or, if the ambient L_0 exceeds the forgoing level, then the ambient L_0 becomes the exterior noise level for Standard No. 5.

Section 12.08.400 of the Noise Ordinance also established interior noise standards for dwelling units in the County based on the allowable interior noise levels shown in **Table 3.10-6**.

TABLE 3.10-6
COUNTY OF LOS ANGELES INTERIOR NOISE STANDARDS FOR DWELLING UNITS

Noise Zone	Designated Land Use	Time Interval	Allowable Interior Noise Level (dBA)
All	Multifamily	10:00 P.M. to 7:00 A.M.	40
	Residential	7:00 A.M. to 10:00 P.M.	45

SOURCE: County of Los Angeles Ordinance No. 11743, Section 12.08.400.

As indicated in Section 12.08.400, no person is allowed to operate or cause to be operated within a dwelling unit any source of sound, or allow the creation of any noise, that causes the noise level when measured inside a neighboring receiving dwelling unit to exceed the following standards:

- Standard No. 1. The applicable interior noise level from Table 3.10-6 for cumulative period of more than 5 minutes in any hour.
- Standard No. 2. The applicable interior noise level from Table 3.10-6 plus 5 dB(A) for a cumulative period of more than 1 minute in any hour.
- Standard No. 3. The applicable interior noise level from Table 3.10-6 plus 10 dB(A) or the maximum measured ambient noise level for any period of time.

With respect to construction noise in the County, Section 12.08.440 of the Noise Ordinance prohibits the operation of any tools or equipment used between weekday hours of 7:00 P.M. and 7:00 A.M., or at any time on Sundays or holidays, that will create a noise disturbance across a residential or commercial real-property line. The only exceptions would be emergency work or public safety projects (Section 12.08.0570, part 5, exemption H, Public Health and Safety Activities) or by variance issued by the health officer. Additionally, both the working hours and maximum levels of equipment and activity noise that are allowable from both mobile and stationary equipment in the County are defined by land use and shown in **Table 3.10-7**.

TABLE 3.10-7
COUNTY OF LOS ANGELES CONSTRUCTION NOISE STANDARDS

Allowable Work Dates & Hours	Residential Structures					
	Single-Family		Multi-Family		Semi-Residential/Commercial	
	Mobile Equipment [a]	Stationary Equipment [b]	Mobile Equipment [a]	Stationary Equipment [b]	Mobile Equipment [a]	Stationary Equipment [b]
Daily 7:00 A.M. to 8:00 P.M.[c]	75 dBA	60 dBA	80 dBA	65 dBA	85 dBA	70 dBA
Daily 8:00 P.M. to 7:00 A.M.[d]	60 dBA	50 dBA	64 dBA	55 dBA	70 dBA	60 dBA
	Business Structures					
Daily[d]	85 dBA					

[a] Represents maximum noise levels for nonscheduled, intermittent, short-term operation (less than 10 days).
[b] Represents maximum noise level for repetitively scheduled and relatively long-term operation (periods of 10 days or more).
[c] Exception for Sundays and legal holidays.
[d] Includes all day Sunday and legal holidays.

SOURCE: County of Los Angeles Ordinance No. 11743, Section 12.08.440.

County of Los Angeles Groundborne Vibration Regulation

With respect to vibration, the County Noise Ordinance identifies a presumed perception threshold of 0.01 inches per second over the range of 1 to 100 hertz . Section 12.08.560 of the County Noise Ordinance prohibits the operation of any device that creates vibration above the vibration perception threshold of any individual at or beyond the property boundary of the source if on private property, or at 150 feet (46 meters) from the source if on a public space or public right-of-way.

City General Plans and Municipal Codes

The EWMP areas associated with the proposed program are located in multiple jurisdictions of Los Angeles County, which aside from the County also includes 46 cities. Each of these cities has their own independent General Plan and municipal code that regulates noise levels from various sources within their jurisdictional boundaries. Given that a project-level analysis for each structural BMP proposed in the EWMPs is beyond the scope of this PEIR, an extensive listing of

the noise policies and regulations of each of the participating Permittees is not provided in this PEIR.

3.10.4 Impact Assessment

The proposed program's potential impacts have been assessed using the California Environmental Quality Act (CEQA) Guidelines Appendix G Checklist. The following sections discuss the key issue areas identified in the CEQA Guidelines with respect to the proposed program's potential effect due to noise and vibration.

Thresholds of Significance

For the purposes of this PEIR and consistency with Appendix G of the CEQA Guidelines, the proposed program would have a significant noise impact if it would:

- Result in exposure of persons to, or generation of, noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies.
- Result in exposure of persons to, or generation of, excessive groundborne vibration or groundborne noise levels.
- Result in a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project.
- Result in a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project.
- For a project located within an airport land use plan area, or, where such a plan has not been adopted, in an area within 2 miles of a public airport or public use airport, expose people residing or working in the area to excessive noise levels.
- For a project located in the vicinity of a private airstrip, expose people residing or working in the project area to excessive noise levels.

Program Impact Discussion

Noise Levels Standard Exceedance

Impact 3.10-1: The proposed program could result in exposure of persons to, or generation of, noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies.

Structural (Regional, Centralized, and Distributed) BMPs

Construction

Implementation of the proposed program would involve the installation of structural control measures that would be constructed as BMPs to reduce the impact of stormwater and non-stormwater on receiving water quality within the EWMP areas. Construction of the various structural BMPs proposed in the EWMP is anticipated to occur intermittently over the program implementation period. The proposed locations of individual BMPs are subject to change throughout the EWMP planning process. Definitive construction equipment lists, material lists,

construction methods, construction schedules, and workforce details would be developed in the future as specific structural BMP projects are finalized according to the EWMPs.

The construction noise impacts associated with each individual structural BMP project would be short-term in nature and limited to the period of time when construction activity is taking place for that particular project. Construction activity noise levels at and near each structural BMP construction site would fluctuate depending on the particular type, number, and duration of usage of various pieces of construction equipment. Generally, development at each BMP construction site may require the use of heavy construction equipment for activities such as site preparation, grading and excavation, and the physical development of the structural BMP. Development activities could also involve the use of smaller power tools, generators, and other sources of noise. During each stage of development for each individual structural BMP project, there would be a different mix of equipment operating and noise levels would vary based on the amount and type of equipment in operation and the location of the activity.

The USEPA has compiled data for outdoor noise levels for typical construction activities. These data are presented in **Table 3.10-8**. The noise levels shown in Table 3.10-8 represent composite noise levels associated with typical construction activities, which take into account both the number of pieces and spacing of heavy construction equipment that are typically used during each phase of construction. These noise levels would diminish rapidly with distance from the construction site at a rate of approximately 6 dBA per doubling of distance. For example, a noise level of 84 dBA L_{eq} measured at 50 feet from the noise source to the receptor would reduce to 78 dBA L_{eq} at 100 feet from the source to the receptor, and reduce by another 6 dBA L_{eq} to 72 dBA L_{eq} at 200 feet from the source to the receptor. **Table 3.10-9** shows the typical maximum and average noise levels produced by various types of construction equipment.

TABLE 3.10-8
TYPICAL OUTDOOR CONSTRUCTION NOISE LEVELS

Construction Phase	Noise Level (dBA, $_{Leq}$)[a]
Ground Clearing	84
Excavation	89
Foundations	78
Erection	85
Finishing	89

[a] Average noise levels correspond to a distance of 50 feet from the noisiest piece of equipment associated with a given phase of construction and 200 feet from the rest of the equipment associated with that phase.

SOURCE: USEPA, 1971.

TABLE 3.10-9
TYPICAL NOISE LEVELS FROM CONSTRUCTION EQUIPMENT

Construction Equipment	Maximum Noise Level (dBA, L_{max} at 50 feet)	Average Noise Level (dBA, L_{eq} at 50 feet)[a]
Air Compressor	78	74
Backhoe	78	74
Chain Saw	84	77
Compactor (Ground)	83	76
Concrete Mixer Truck	79	75
Concrete Pump Truck	81	74
Concrete Saw	90	83
Crane	81	73
Dozer	82	78
Dump Truck	77	73
Excavator	81	77
Generator	82	79
Flat-Bed Truck	74	70
Front End Loader	79	75
Grader	85	81
Jack Hammer	89	82
Pavement Scarafier	90	83
Paver	77	74
Pneumatic Tool	85	82
Pumps	81	78
Roller	80	73
Scraper	84	80
Tractor	84	80
Vacuum Street Sweeper	82	72
Vibratory Concrete Mixer	80	73
Welder/Torch	74	70

[a] The average noise levels for the construction equipment at 50 feet were calculated from the maximum noise levels using the usage factors for each piece of equipment provided in the FHWA's RCNM.

SOURCE: FHWA, 2006.

As shown in Table 3.10-8, excavation activities can typically generate noise levels of 89 dBA L_{eq} at 50 feet from the construction noise source. Given the urbanized environment of many of the EWMP areas, many of the structural BMP projects would be constructed in proximity or adjacent to existing land uses, including those that are noise-sensitive uses. The construction activities for each structural BMP project would temporarily expose their respective existing off-site surrounding land uses to increased noise levels while construction activities are ongoing. This would be most applicable to the distributed BMPs, which are most likely to be implemented in

high-density urban, commercial, industrial, and transportation areas where they will either replace or improve upon existing stormwater infrastructure. While the larger centralized and regional structural BMP projects (which require a larger footprint than the distributed BMPs) would occur mostly in existing open space areas that may have greater buffer distances to nearby surrounding land uses, there may still be incidences where a proposed centralized or regional structural BMP site could be located directly adjacent to an existing noise-sensitive land use. Where a proposed structural BMP site is located adjacent or in proximity to existing land uses, the construction activities at the structural BMP site would expose these off-site land uses to increased temporary and intermittent noise levels that are substantially greater than existing ambient noise levels in the area.

While construction noise levels may be exempt from the noise regulations of most of the implementing agencies, there may also be instances where some of the implementing agencies have their own established numerical noise standard for construction noise levels, such as the County of Los Angeles, City of Los Angeles, and the City of El Segundo. Although it is generally anticipated that construction of the structural BMPs would comply with such construction noise standards, there may be scenarios where these local numerical noise standards could potentially be exceeded. As a result, under these conditions, construction noise impacts would be potentially significant.

Mitigation Measure NOISE-1 would reduce construction noise impacts, requiring construction activities to be conducted in accordance with the applicable local noise regulations and standards, the implementation of noise reduction devices and techniques during construction activities, and advance notification to the surrounding noise-sensitive receptors of a structural BMP site about upcoming construction activities and their hours of operation. This would serve to reduce the construction-related noise levels at nearby receptors to the maximum extent feasible. However, as discussed previously, for implementing agencies that have established numerical noise standards for construction activities, there may be circumstances where the construction activities for a particular structural BMP project may exceed established thresholds. . Because of the possibility that certain structural BMP projects may exceed noise levels established by their respective local jurisdictions, this impact would be significant and unavoidable.

Operation

As discussed previously, the majority of the distributed, centralized, and regional structural BMPs would operate passively in the sense that they would not require the use of mechanized stationary equipment for their operation; however, it is anticipated that some of the centralized and regional structural BMPs would require the use of irrigation pump stations and associated components to divert the collected stormwater. At these structural BMP sites, operational noise levels would result from operation of the pumps and associated components. However, as a stationary noise source, the pumping equipment used at a structural BMP site would be required to comply with the applicable exterior noise standards and/or regulations established by the implementing agency that has jurisdiction over the site. Additionally, it is anticipated that many of the irrigation pumps would be located belowground and all other noise-producing components (e.g., generators) would be enclosed. As such, the noise levels generated by on-site pumps and associated components at structural BMP sites associated with the project would not exceed or violate noise standards and regulations established by implementing agencies in the EWMP areas. **Mitigation Measure NOISE-2** would be implemented to ensure that the operational noise levels occurring at structural

BMP sites that employ stationary mechanized equipment would be required to adhere and comply with the local noise standards established by the responsible implementing agency. Thus, with implementation of Mitigation Measure NOISE-2, operational noise impacts would be less than significant.

Mitigation Measures:

NOISE-1: The implementing agencies shall implement the following measures during construction as needed:

- Include design measures necessary to reduce the construction noise levels to where feasible. These measures may include noise barriers, curtains, or shields.
- Place noise-generating construction activities (e.g., operation of compressors and generators, cement mixing, general truck idling) as far as possible from the nearest noise-sensitive land uses.
- Locate stationary construction noise sources as far from adjacent noise-sensitive receptors as possible.
- If construction is to occur near a school, the construction contractor shall coordinate the with school administration in order to limit disturbance to the campus. Efforts to limit construction activities to non-school days shall be encouraged.
- For the centralized and regional BMP projects located adjacent to noise-sensitive land uses, identify a liaison for these off-site sensitive receptors, such as residents and property owners, to contact with concerns regarding construction noise and vibration. The liaison's telephone number(s) shall be prominently displayed at construction locations.
- For the centralized and regional BMP projects located adjacent to noise-sensitive land uses, notify in writing all landowners and occupants of properties adjacent to the construction area of the anticipated construction schedule at least 2 weeks prior to groundbreaking.

NOISE-2: All structural BMPs that employ mechanized stationary equipment that generate noise levels shall comply with the applicable noise standards established by the implementing agency with jurisdiction over the structural BMP site. The equipment shall be designed with noise-attenuating features (e.g., enclosures) and/or located at areas (e.g., belowground) where nearby noise-sensitive land uses would not be exposed to a perceptible noise increase in their noise environment.

Significance Determination: Significant and unavoidable with mitigation for construction; less than significant with mitigation for operations. (The application of these mitigation measures to specific BMP types and categories are identified in Table 3.10-11.)

Non-Structural (Institutional) BMPs

As discussed in Chapter 2.0, *Project Description*, non-structural/institutional BMPs do not include the construction of new facilities. Consequently, there would be no impacts related to construction noise.

Mitigation Measures: None required

Significance Determination: No impact

Groundborne Vibration

Impact 3.10-2: The proposed program could result in exposure of persons to, or generation of, excessive groundborne vibration.

Structural (Regional, Centralized, and Distributed) BMPs

Construction of many of the structural BMP projects would include activities such as site preparation, grading, and excavation, which would have the potential to generate low levels of groundborne vibration. Persons residing and working in an area located in proximity to a structural BMP site could be exposed to some degree of groundborne vibration or groundborne noise levels related to construction activities. Ground vibrations from construction activities only rarely reach the levels that can damage structures, but they can be perceived in the audible range and be felt in buildings very close to a construction site.

Construction activities for the various structural BMP projects would have the potential to impact their respective nearby land uses. Given the urbanized environment of the County, the potential exists for construction of a structural BMP project, especially the distributed structural BMPs that would most likely be implemented in existing high-density areas, to be located within 25 feet of an adjacent noise-sensitive land use. Consequently, existing off-site receptors that are located immediately adjacent to these structural BMP sites could be exposed to some degree of groundborne vibration. The various PPV and RMS velocity (in VdB) levels for the types of construction equipment that could operate during the construction of the structural BMP projects are identified in **Table 3.10-10**. Based on the information presented in Table 3.10-11, vibration velocities could reach as high as approximately 0.089-inch-per-second PPV at 25 feet from the operation of a large bulldozer. This corresponds to an RMS velocity level (in VdB) of 87 VdB at 25 feet from the large bulldozer.

For the types of construction methods required to construct the various structural BMPs, vibration levels at nearby sensitive receptors would not approach the Caltrans damage thresholds presented in Table 3.10-3. Although some vibration may be experienced locally, vibration-related impacts from implementation of structural BMPs would be less than significant.

TABLE 3.10-10
VIBRATION VELOCITIES FOR CONSTRUCTION EQUIPMENT

Construction Equipment	PPV at 25 feet (inches/second)	RMS at 25 feet (VdB)
Large Bulldozer	0.089	87
Loaded Trucks	0.076	86
Jackhammer	0.035	79
Small Bulldozer	0.003	58

SOURCE: FTA, 2006.

Mitigation Measures: None required

Significance Determination: Less than significant

Non-Structural (Institutional) BMPs

As discussed in Chapter 2.0, *Project Description*, non-structural/institutional BMPs do not include the construction of new facilities. Consequently, there would be no impacts related to groundborne vibration or noise.

Mitigation Measures: None required

Significance Determination: No impact

Permanent Ambient Noise Levels Increase

Impact 3.10-3: The proposed program could result in a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project.

Structural (Regional, Centralized, and Distributed) BMPs

Given that the majority of the distributed, centralized, and regional structural BMPs would operate in a passive manner (i.e., would not require the use of mechanized stationary equipment) after their construction, no operational noise levels would be generated by these structural BMPs. However, it is anticipated that that some of the centralized and regional structural BMPs would require the use of irrigation pump stations and associated components to divert the collected stormwater. At these structural BMP sites, noise levels generated from the long-term operation of the pumps and associated components could result in increased noise levels in the surrounding noise environment. However, as discussed under Impact 3.10-1, the pumping equipment used at a structural BMP site would be required to comply with the applicable exterior noise standards and/or regulations established by the implementing agency that has jurisdiction over the site. In addition, many of the irrigation pumps would primarily be located belowground and all other noise-producing components (e.g., generators) would be enclosed. Furthermore, with implementation of **Mitigation Measure NOISE-1**,which would require the stationary mechanized equipment employed at each structural BMP site to comply with the local noise

standards established by the responsible implementing agency with jurisdiction over the site, and for the equipment to be designed and located in a manner such that neighboring sensitive land uses would not be exposed to a perceptible noise increase in their environment (**Mitigation Measure NOISE-2)**, this impact would be less than significant.

Mitigation Measures: Implementation of **Mitigation Measures NOISE-1** and **NOISE-2**

Significance Determination: Less than significant with mitigation (The application of these mitigation measures to specific BMP types and categories are identified in Table 3.10-11.)

Non-Structural (Institutional) BMPs

As discussed in Chapter 2.0, *Project Description*, non-structural/institutional BMPs do not include the operation of new facilities. Consequently, there would be no impacts related to a substantial permanent increase in ambient noise levels resulting from implementation of the non-structural BMPs.

Mitigation Measures: None required

Significance Determination: No impact

Temporary Ambient Noise Levels Increase

Impact 3.10-4: The proposed program could result in a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project.

Structural (Regional, Centralized, and Distributed) BMPs

During construction of the distributed, centralized, and regional structural BMPs, temporary or periodic increases in noise levels in and around each structural BMP site would result from the operation of construction equipment. As discussed in Impact 3.10-1, the construction activities for each individual structural BMP project would expose their respective nearby existing land uses to increased noise levels. Where a structural BMP site is located within 25 feet of an existing noise-sensitive land use, the resulting construction noise levels at that existing land use could reach as high as 95 dBA L_{eq} during excavation activities, which would result in a substantial noise increase over existing ambient noise levels at that existing land use. Although implementation of **Mitigation Measure NOISE-1** would reduce construction noise levels associated with the proposed program to the maximum extent feasible, under circumstances where future structural BMP sites are located immediately adjacent to existing sensitive land uses, the noise impacts related to a substantial temporary or periodic increase in ambient noise levels above levels existing without the structural BMPs would remain significant. Therefore, this impact for the proposed program would be significant and unavoidable. The identification of a significant and unavoidable program-level impact in this PEIR for the proposed program, however, does not preclude the finding of future less-than-significant impacts for individual structural BMP projects.

Mitigation Measures: Implementation of **Mitigation Measure NOISE-1**

Significance Determination: Significant and unavoidable with mitigation (The application of this mitigation measure to specific BMP types and categories are identified in Table 3.10-11.)

Non-Structural (Institutional) BMPs

As discussed in Chapter 2.0, *Project Description*, non-structural/institutional BMPs do not include the construction of new facilities. Consequently, there would be no impacts related to a substantial temporary or periodic increase in ambient noise levels resulting from implementation of the non-structural BMPs.

Mitigation Measures: None required

Significance Determination: No impact

Exposure of Excessive Airport Noise Levels

Impact 3.10-5: For a project located within an airport land use plan area, or, where such a plan has not been adopted, in an area within 2 miles of a public airport or public use airport, implementation of the proposed program could expose people residing or working in the area to excessive noise levels.

Structural (Regional, Centralized, and Distributed) BMPs

The Distributed, Centralized, and Regional structural BMPs that would be implemented as part of the proposed program would serve to reduce the impact of stormwater and non-stormwater on receiving water quality and address the water quality priorities as defined by the MS4 Permit. While some of these structural BMPs could potentially occur at paved areas of airports (excluding the landing areas and taxiways, which have specific aircraft support requirements) and the undeveloped buffer zones around airports, no permanent residents or workers would be introduced to these areas under the proposed program. While maintenance and inspection of the structural BMPs would occur, these activities would only occur periodically and would be minimal during project operations. Therefore the proposed program would not introduce permanent future residents or workers to the structural BMP areas and as such would not expose persons to excessive airport-related noise levels. Exposure to airport noise would be a less than significant impact.

Mitigation Measures: None required

Significance Determination: Less than significant

Non-Structural (Institutional) BMPs

As discussed in Chapter 2.0, *Project Description*, non-structural/institutional BMPs do not include the construction of new facilities. Consequently, there would be no impacts related to the exposure of people to excessive noise levels associated with a public airport or public use airport.

Mitigation Measures: None required

Significance Determination: No impact

Exposure of Persons to Excessive Private Airstrip Noise Levels

Impact 3.10-6: For a project located in the vicinity of a private airstrip, the proposed program could expose people residing or working in the project area to excessive noise levels.

Structural (Regional, Centralized, and Distributed) BMPs

As discussed under Impact 3.10-5 above, the proposed program would not introduce permanent future residents or workers to the structural BMP areas. Thus, while future structural BMP sites could be located in the vicinity of private airstrips, no persons would be exposed to excessive airstrip-related noise levels. Exposure to airstrip-related noise would be a less than significant impact.

Mitigation Measures: None required

Significance Determination: Less than significant

Non-Structural (Institutional) BMPs

As discussed in Chapter 2.0, *Project Description*, non-structural/institutional BMPs do not include the construction of new facilities. Consequently, there would be no impacts related to the exposure of people to excessive noise levels associated with a private airstrip.

Mitigation Measures: None required

Significance Determination: No impact

Cumulative Impact Discussion

Structural (Regional, Centralized, and Distributed) BMPs

Noise and vibration are both defined as localized phenomena that significantly reduce in magnitude as distance from the source increases. The structural BMPs associated with the proposed program would be constructed in multiple jurisdictions of Los Angeles County, which aside from the County also includes 46 cities and LACFCD. As such, these structural BMP projects would be generally spread over a large geographic area within the County. These structural BMPs in combination with other current and planned projects in the County would result in an increase in construction-related noise levels, which would temporarily increase the ambient noise levels of the existing noise environment in areas where a construction project would occur. This would result in significant and unavoidable impacts for construction, but less than significant for operation.

Mitigation Measures: Implementation of **Mitigation Measures NOISE-1** and **NOISE-2**

Significance Determination: Significant and unavoidable with mitigation for construction; Less than significant for operation. (The application of these mitigation measures to specific BMP types and categories are identified in Table 3.10-11.)

Non-Structural (Institutional) BMPs

As discussed in Chapter 2.0, *Project Description*, non-structural/institutional BMPs do not include the construction of new facilities. Consequently, there would be no new facilities that would contribute to cumulative noise impacts. As such, no impacts related to cumulative noise would occur.

Mitigation Measures: None required

Significance Determination: No impact

Summary of Impact Assessment

Table 3.10-11 shows a summary of the structural BMPs requiring mitigation.

TABLE 3.10-11
SUMMARY OF NOISE IMPACTS REQUIRING MITIGATION MEASURES

	Thresholds of Significance				
Regional BMPs	**Exceed Noise Standards**	**Vibration**	**Ambient Noise**	**Exposure to Airport Noise**	**Cumulative Impacts**
Applicable Mitigation Measures:	**NOISE-1; NOISE-2**	**None Required**	**NOISE-1**	**None Required**	**NOISE-1; NOISE-2**
Regional Detention and Infiltration	Yes	Yes	Yes	No	Yes
Regional Capture, Detention and Use	Yes	Yes	Yes	No	Yes
Centralized BMP					
Bioinfiltration	Yes	Yes	Yes	No	Yes
Constructed Wetlands	No	No	No	No	No
Treatment/Low Flow Diversions	No	No	No	No	No
Creek, River, Estuary Restoration	No	No	No	No	No
Distributed BMPs					
Site Scale Detention	No	No	No	No	No
LID – Infiltration/Filtration BMPs – Porous Pavement, Green Streets, Bioswale/Filter Strips, downspout disconnects	No	No	No	No	No
LID – Green Infrastructure – Capture and Use – Cisterns, Rain Barrels, Green roofs, Planter Boxes	No	No	No	No	No
Flow through Treatment BMPs	No	No	No	No	No
Source Control Treatment BMPs (catch basin inserts/screens, hydrodynamic separators, gross solids removal devices)	No	No	No	No	No
Low Flow Diversions	No	No	No	No	No

NOTE: These conclusions are based on typical size and function of BMPs.

Appendix B

Field Data and Photos

Field Sheet

Project:	Metro Bus Facility Rosecrans and Avalon	**Engineer:** D. Shivaiah	**Date:** 11/2/2018
			JN: 2775-2018-02
Measurement Address: Rosecrans and Avalon Avenue		**City:** LA County	**Site No.:** 1

Sound Level Meter:
LD-712
Serial # A0520

Calibrator:
LD-250 250
Serial # 1322

Calibration Record:

	Input, dB/	Reading, dB/	Offset, dB/	Time
Before				
After				
Before	94.0	94.0	0.0	7:30 AM
After	/	/	/	

Notes:
Temp: 65
Windspeed: 5 MPH
Direction: SWE
Skies: Clear
Camera:
Photo Nos.

Meter Settings:
☒ A-WTD ☐ LINEAR ☒ SLOW ☐ 1/1 OCT ☒ INTERVALS ___15____- MINUTE
☐ C-WTD ☐ IMPULSE ☐ FAST ☐ 1/3 OCT ☒ L_N PERCENTILE VALUES

Notes:

Measurement Type:
Long-term
Short-term X

Locations		Start Time	Stop Time	Leq	Lmin	Lmax	L2	L8	L25	L50
	1	1:27 PM	1:37 PM	56.8	48	66.7	61.5	59.9	58.0	55.7
		Noise meter was placed at approximately 10ft from the eastern wall adjacent to the residential P/L to the east and 60ft from the southern P/L. Ambient noise includes traffic noise from Rosecrans and Avalon Ave and School Students.								
	2	1.:40 PM	1:50 PM	62.4	52.5	78.3	69.5	65.4	62.5	59.6
		Noise meter was placed at approximately 10ft from the eastern wall adjacent to the residential P/L to the east and 20ft from the northern P/L. Ambient noise includes traffic noise from Rosecrans and Avalon Ave.								
	3									
	4									



RK engineering group, inc.

Field Sheet - ST1 Location Photos

Project: Metro Bus Facility Rosecrans and Avalon	**Engineer:** D. Shivaiah	**Date:**	11/2/2018
		JN:	2775-2018-02
Measurement Address: Rosecrans and Avalon Avenue	**City:** LA County	**Site No.:**	1



RK engineering group, inc.

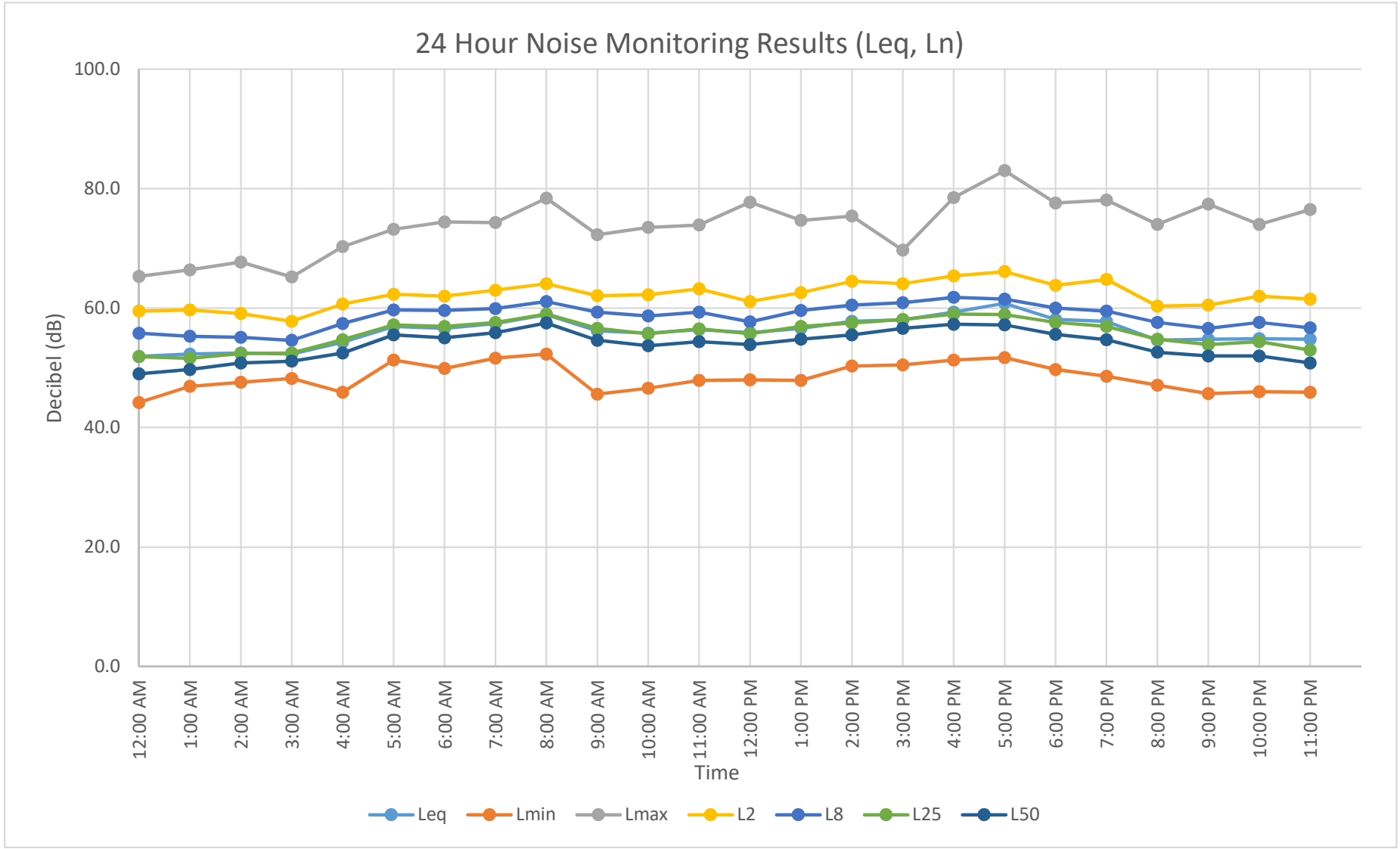
Field Sheet - ST2 Location Photos

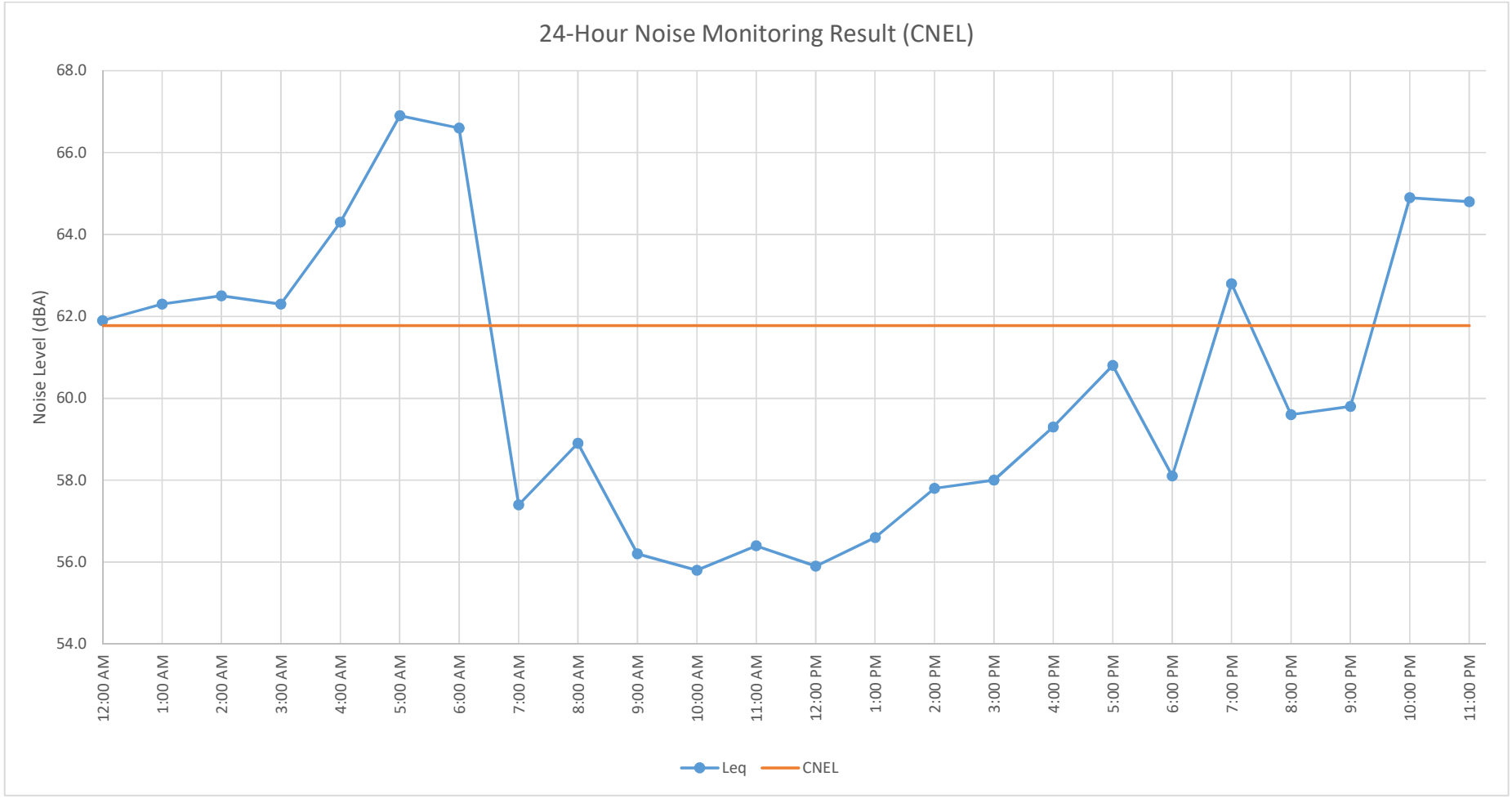
Project: Metro Bus Facility Rosecrans and Avalon	**Engineer:** D. Shivaiah	**Date:**	11/2/2018
		JN:	2775-2018-02
Measurement Address: Rosecrans and Avalon Avenue	**City:** LA County	**Site No.:**	2



RK engineering group, inc.

PROJECT:	Metro Bus Facility					JOB #:	2775-2018-02
NOISE METER	Piccolo II SLM, 24-Hour Measurement					DATE:	31-Jan-19
LOCATION:	RESIDENTIAL PROPERTY LINE TO THE EAST					BY:	D. Shivaiah
Time	Leq	Lmin	Lmax	L2	L8	L25	L50
12:00 AM	51.9	44.2	65.3	59.5	55.8	51.9	49.0
1:00 AM	52.3	46.9	66.4	59.7	55.3	51.6	49.7
2:00 AM	52.5	47.6	67.7	59.1	55.1	52.4	50.8
3:00 AM	52.3	48.2	65.2	57.8	54.6	52.5	51.1
4:00 AM	54.3	45.9	70.3	60.7	57.4	54.7	52.5
5:00 AM	56.9	51.3	73.2	62.3	59.7	57.2	55.5
6:00 AM	56.6	49.9	74.4	62	59.6	56.9	55
7:00 AM	57.4	51.6	74.3	63	59.9	57.6	55.9
8:00 AM	58.9	52.3	78.4	64.1	61.1	59	57.5
9:00 AM	56.2	45.6	72.3	62.1	59.3	56.6	54.6
10:00 AM	55.8	46.6	73.5	62.2	58.7	55.7	53.7
11:00 AM	56.4	47.9	73.9	63.2	59.3	56.5	54.4
12:00 PM	55.9	48	77.7	61.1	57.7	55.7	53.9
1:00 PM	56.6	47.9	74.7	62.6	59.6	56.9	54.8
2:00 PM	57.8	50.3	75.4	64.5	60.5	57.5	55.5
3:00 PM	58	50.5	69.7	64.1	60.9	58.1	56.6
4:00 PM	59.3	51.3	78.5	65.4	61.8	59	57.3
5:00 PM	60.8	51.7	83	66.1	61.5	58.9	57.2
6:00 PM	58.1	49.7	77.6	63.8	60	57.6	55.6
7:00 PM	57.8	48.6	78.1	64.8	59.5	56.9	54.7
8:00 PM	54.6	47.1	74	60.3	57.6	54.8	52.6
9:00 PM	54.8	45.7	77.4	60.5	56.6	53.9	52
10:00 PM	54.9	46	74	62	57.6	54.4	52
11:00 PM	54.8	45.9	76.5	61.5	56.7	53	50.8
Daytime	57.4	49.4	76.9	63.4	59.7	57.1	55.2
Nighttime	54.4	48.0	71.8	60.6	57.2	54.3	52.4


24 Hour Noise Monitoring Results (Leq, Ln)
100.0
80.0
60.0
40.0
20.0
0.0
Decibel (dB)
12:00 AM
1:00 AM
2:00 AM
3:00 AM
4:00 AM
5:00 AM
6:00 AM
7:00 AM
8:00 AM
9:00 AM
10:00 AM
11:00 AM
12:00 PM
1:00 PM
2:00 PM
3:00 PM
4:00 PM
5:00 PM
6:00 PM
7:00 PM
8:00 PM
9:00 PM
10:00 PM
11:00 PM
Time
Leq
Lmin
Lmax
L2
L8
L25
L50


24-Hour Noise Monitoring Result (CNEL)
Noise Level (dBA)
68.0
66.0
64.0
62.0
60.0
58.0
56.0
54.0
12:00 AM
1:00 AM
2:00 AM
3:00 AM
4:00 AM
5:00 AM
6:00 AM
7:00 AM
8:00 AM
9:00 AM
10:00 AM
11:00 AM
12:00 PM
1:00 PM
2:00 PM
3:00 PM
4:00 PM
5:00 PM
6:00 PM
7:00 PM
8:00 PM
9:00 PM
10:00 PM
11:00 PM
Leq
CNEL

Appendix C

Roadway Noise Calculation Worksheets

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO)

PROJECT: Metro Bus Facility
ROADWAY: Rosecrans Ave- East of Avalon Blvd
SCENARIO: Existing Condition

JOB #: 2775-18-02
DATE: 31-Jan-19
ENGINEER: D Shivaiah

NOISE INPUT DATA

ROADWAY CONDITIONS

ADT =	26,526	
SPEED =	40	
PK HR % =	10	
NEAR LANE/FAR LANE DIST :	66	
ROAD ELEVATION =	0.0	
GRADE =	0.0	%
PK HR VOL =	2,653	

RECEIVER INPUT DATA

RECEIVER DISTANCE =		100
DIST C/L TO WALL =		0
RECEIVER HEIGHT =		5.0
WALL DISTANCE FROM RECEIVER =		100
PAD ELEVATION =		0.0
ROADWAY VIEW:	LF ANGLE=	-90
	RT ANGLE=	90
	DF ANGLE=	180

SITE CONDITIONS

AUTOMOBILES =	10	
MEDIUM TRUCKS =	10	(10 = HARD SITE, 15 = SOFT SITE)
HEAVY TRUCKS =	10	

WALL INFORMATION

HTH WALL=	0.0	
AMBIENT=	0.0	
BARRIER =	0	(0 = WALL, 1 = BERM)

VEHICLE MIX DATA

VEHICLE TYPE	DAY	EVENING	NIGHT	DAILY
AUTOMOBILES	0.7354	0.1402	0.0843	0.9000
MEDIUM TRUCKS	0.4800	0.0200	0.5000	0.0300
HEAVY TRUCKS	0.5000	0.0200	0.5200	0.0700

MISC. VEHICLE INFO

VEHICLE TYPE	HEIGHT	SLE DISTANCE	GRADE ADJUSTMENT
AUTOMOBILES	2.0	94.45	- -
MEDIUM TRUCKS	4.0	94.40	- -
HEAVY TRUCKS	8.0	94.45	0.00

NOISE OUTPUT DATA

NOISE IMPACTS (WITHOUT TOPO OR BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	67.0	64.9	63.7	56.7	65.5	66.2
MEDIUM TRUCKS	61.2	57.2	49.4	58.6	64.8	64.8
HEAVY TRUCKS	69.7	65.9	57.9	67.3	73.5	73.5
NOISE LEVELS (dBA)	71.9	68.7	64.8	68.2	74.6	74.7

NOISE IMPACTS (WITH TOPO AND BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	67.0	64.9	63.7	56.7	65.5	66.2
MEDIUM TRUCKS	61.2	57.2	49.4	58.6	64.8	64.8
HEAVY TRUCKS	69.7	65.9	57.9	67.3	73.5	73.5
NOISE LEVELS (dBA)	71.9	68.7	64.8	68.2	74.6	74.7

NOISE CONTOUR (FT)				
NOISE LEVELS	70 dBA	65 dBA	60 dBA	55 dBA
CNEL	296	936	2959	9356
LDN	288	910	2876	9096

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO)

PROJECT: Metro Bus Facility
ROADWAY: Rosecrans Ave- East of Avalon Blvd
SCENARIO: Existing plus Project

JOB #: 2775-18-02
DATE: 31-Jan-19
ENGINEER: D Shivaiah

NOISE INPUT DATA

ROADWAY CONDITIONS

ADT =	26,780	
SPEED =	40	
PK HR % =	10	
NEAR LANE/FAR LANE DIST :	66	
ROAD ELEVATION =	0.0	
GRADE =	0.0	%
PK HR VOL =	2,678	

RECEIVER INPUT DATA

RECEIVER DISTANCE =		100
DIST C/L TO WALL =		0
RECEIVER HEIGHT =		5.0
WALL DISTANCE FROM RECEIVER =		100
PAD ELEVATION =		0.0
ROADWAY VIEW:	LF ANGLE=	-90
	RT ANGLE=	90
	DF ANGLE=	180

SITE CONDITIONS

AUTOMOBILES =	10	
MEDIUM TRUCKS =	10	(10 = HARD SITE, 15 = SOFT SITE)
HEAVY TRUCKS =	10	

WALL INFORMATION

HTH WALL=	0.0	
AMBIENT=	0.0	
BARRIER =	0	(0 = WALL, 1 = BERM)

VEHICLE MIX DATA

VEHICLE TYPE	DAY	EVENING	NIGHT	DAILY
AUTOMOBILES	0.7354	0.1402	0.0843	0.9000
MEDIUM TRUCKS	0.4800	0.0200	0.5000	0.0300
HEAVY TRUCKS	0.5000	0.0200	0.5200	0.0700

MISC. VEHICLE INFO

VEHICLE TYPE	HEIGHT	SLE DISTANCE	GRADE ADJUSTMENT
AUTOMOBILES	2.0	94.45	- -
MEDIUM TRUCKS	4.0	94.40	- -
HEAVY TRUCKS	8.0	94.45	0.00

NOISE OUTPUT DATA

NOISE IMPACTS (WITHOUT TOPO OR BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	67.0	64.9	63.7	56.7	65.6	66.3
MEDIUM TRUCKS	61.2	57.2	49.4	58.7	64.8	64.8
HEAVY TRUCKS	69.7	65.9	58.0	67.3	73.5	73.5
NOISE LEVELS (dBA)	72.0	68.8	64.9	68.2	74.6	74.8

NOISE IMPACTS (WITH TOPO AND BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	67.0	64.9	63.7	56.7	65.6	66.3
MEDIUM TRUCKS	61.2	57.2	49.4	58.7	64.8	64.8
HEAVY TRUCKS	69.7	65.9	58.0	67.3	73.5	73.5
NOISE LEVELS (dBA)	72.0	68.8	64.9	68.2	74.6	74.8

NOISE CONTOUR (FT)				
NOISE LEVELS	70 dBA	65 dBA	60 dBA	55 dBA
CNEL	299	945	2987	9445
LDN	290	918	2904	9183

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO)

PROJECT: Metro Bus Facility
ROADWAY: Rosecrans Ave- East of Avalon Blvd
SCENARIO: Cumulative Condition without Project

JOB #: 2775-18-02
DATE: 31-Jan-19
ENGINEER: D Shivaiah

NOISE INPUT DATA

ROADWAY CONDITIONS

ADT =	29,297	
SPEED =	40	
PK HR % =	10	
NEAR LANE/FAR LANE DIST :	66	
ROAD ELEVATION =	0.0	
GRADE =	0.0	%
PK HR VOL =	2,930	

RECEIVER INPUT DATA

RECEIVER DISTANCE =		100
DIST C/L TO WALL =		0
RECEIVER HEIGHT =		5.0
WALL DISTANCE FROM RECEIVER =		100
PAD ELEVATION =		0.0
ROADWAY VIEW:	LF ANGLE=	-90
	RT ANGLE=	90
	DF ANGLE=	180

SITE CONDITIONS

AUTOMOBILES =	10	
MEDIUM TRUCKS =	10	(10 = HARD SITE, 15 = SOFT SITE)
HEAVY TRUCKS =	10	

WALL INFORMATION

HTH WALL=	0.0	
AMBIENT=	0.0	
BARRIER =	0	(0 = WALL, 1 = BERM)

VEHICLE MIX DATA

VEHICLE TYPE	DAY	EVENING	NIGHT	DAILY
AUTOMOBILES	0.7354	0.1402	0.0843	0.9000
MEDIUM TRUCKS	0.4800	0.0200	0.5000	0.0300
HEAVY TRUCKS	0.5000	0.0200	0.5200	0.0700

MISC. VEHICLE INFO

VEHICLE TYPE	HEIGHT	SLE DISTANCE	GRADE ADJUSTMENT
AUTOMOBILES	2.0	94.45	- -
MEDIUM TRUCKS	4.0	94.40	- -
HEAVY TRUCKS	8.0	94.45	0.00

NOISE OUTPUT DATA

NOISE IMPACTS (WITHOUT TOPO OR BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	67.4	65.3	64.1	57.1	66.0	66.7
MEDIUM TRUCKS	61.6	57.6	49.8	59.0	65.2	65.2
HEAVY TRUCKS	70.1	66.3	58.4	67.7	73.9	73.9
NOISE LEVELS (dBA)	72.4	69.2	65.3	68.6	75.0	75.1

NOISE IMPACTS (WITH TOPO AND BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	67.4	65.3	64.1	57.1	66.0	66.7
MEDIUM TRUCKS	61.6	57.6	49.8	59.0	65.2	65.2
HEAVY TRUCKS	70.1	66.3	58.4	67.7	73.9	73.9
NOISE LEVELS (dBA)	72.4	69.2	65.3	68.6	75.0	75.1

NOISE CONTOUR (FT)				
NOISE LEVELS	70 dBA	65 dBA	60 dBA	55 dBA
CNEL	327	1033	3268	10333
LDN	318	1005	3177	10046

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO)

PROJECT:	Metro Bus Facility	JOB #:	2775-18-02
ROADWAY:	Rosecrans Ave- East of Avalon Blvd	DATE:	31-Jan-19
SCENARIO:	Cumulative Condition with Project	ENGINEER:	D Shivaiah

NOISE INPUT DATA

ROADWAY CONDITIONS

ADT =	29,551	
SPEED =	40	
PK HR % =	10	
NEAR LANE/FAR LANE DIST :	66	
ROAD ELEVATION =	0.0	
GRADE =	0.0	%
PK HR VOL =	2,955	

RECEIVER INPUT DATA

RECEIVER DISTANCE =		100
DIST C/L TO WALL =		0
RECEIVER HEIGHT =		5.0
WALL DISTANCE FROM RECEIVER =		100
PAD ELEVATION =		0.0
ROADWAY VIEW:	LF ANGLE=	-90
	RT ANGLE=	90
	DF ANGLE=	180

SITE CONDITIONS

AUTOMOBILES =	10	
MEDIUM TRUCKS =	10	(10 = HARD SITE, 15 = SOFT SITE)
HEAVY TRUCKS =	10	

WALL INFORMATION

HTH WALL=	0.0	
AMBIENT=	0.0	
BARRIER =	0	(0 = WALL, 1 = BERM)

VEHICLE MIX DATA

VEHICLE TYPE	DAY	EVENING	NIGHT	DAILY
AUTOMOBILES	0.7354	0.1402	0.0843	0.9000
MEDIUM TRUCKS	0.4800	0.0200	0.5000	0.0300
HEAVY TRUCKS	0.5000	0.0200	0.5200	0.0700

MISC. VEHICLE INFO

VEHICLE TYPE	HEIGHT	SLE DISTANCE	GRADE ADJUSTMENT
AUTOMOBILES	2.0	94.45	- -
MEDIUM TRUCKS	4.0	94.40	- -
HEAVY TRUCKS	8.0	94.45	0.00

NOISE OUTPUT DATA

NOISE IMPACTS (WITHOUT TOPO OR BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	67.5	65.3	64.1	57.2	66.0	66.7
MEDIUM TRUCKS	61.6	57.7	49.9	59.1	65.2	65.3
HEAVY TRUCKS	70.2	66.4	58.4	67.8	73.9	74.0
NOISE LEVELS (dBA)	72.4	69.2	65.3	68.6	75.1	75.2

NOISE IMPACTS (WITH TOPO AND BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	67.5	65.3	64.1	57.2	66.0	66.7
MEDIUM TRUCKS	61.6	57.7	49.9	59.1	65.2	65.3
HEAVY TRUCKS	70.2	66.4	58.4	67.8	73.9	74.0
NOISE LEVELS (dBA)	72.4	69.2	65.3	68.6	75.1	75.2

NOISE CONTOUR (FT)				
NOISE LEVELS	70 dBA	65 dBA	60 dBA	55 dBA
CNEL	330	1042	3296	10423
LDN	320	1013	3204	10133

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO)

PROJECT: Metro Bus Station
ROADWAY: South Avalon Boulevard
SCENARIO: Cumulative with Project

JOB #: 2775-18-01
DATE: 31-Jan-19
ENGINEER: D Shivaiah

NOISE INPUT DATA

ROADWAY CONDITIONS

ADT =	22,015	
SPEED =	40	
PK HR % =	10	
NEAR LANE/FAR LANE DIST :	51	
ROAD ELEVATION =	0.0	
GRADE =	0.0	%
PK HR VOL =	2,202	

RECEIVER INPUT DATA

RECEIVER DISTANCE =		100
DIST C/L TO WALL =		0
RECEIVER HEIGHT =		5.0
WALL DISTANCE FROM RECEIVER =		100
PAD ELEVATION =		0.0
ROADWAY VIEW:	LF ANGLE=	-90
	RT ANGLE=	90
	DF ANGLE=	180

SITE CONDITIONS

AUTOMOBILES =	10	
MEDIUM TRUCKS =	10	(10 = HARD SITE, 15 = SOFT SITE)
HEAVY TRUCKS =	10	

WALL INFORMATION

HTH WALL=	0.0	
AMBIENT=	0.0	
BARRIER =	0	(0 = WALL, 1 = BERM)

VEHICLE MIX DATA

VEHICLE TYPE	DAY	EVENING	NIGHT	DAILY
AUTOMOBILES	0.7354	0.1402	0.0843	0.9000
MEDIUM TRUCKS	0.4800	0.0200	0.5000	0.0300
HEAVY TRUCKS	0.5000	0.0200	0.5200	0.0700

MISC. VEHICLE INFO

VEHICLE TYPE	HEIGHT	SLE DISTANCE	GRADE ADJUSTMENT
AUTOMOBILES	2.0	96.74	- -
MEDIUM TRUCKS	4.0	96.70	- -
HEAVY TRUCKS	8.0	96.74	0.00

NOISE OUTPUT DATA

NOISE IMPACTS (WITHOUT TOPO OR BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	66.1	63.9	62.8	55.8	64.6	65.3
MEDIUM TRUCKS	60.3	56.3	48.5	57.7	63.9	63.9
HEAVY TRUCKS	68.8	65.0	57.0	66.4	72.5	72.6
NOISE LEVELS (dBA)	71.0	67.8	63.9	67.3	73.7	73.8

NOISE IMPACTS (WITH TOPO AND BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	66.1	63.9	62.8	55.8	64.6	65.3
MEDIUM TRUCKS	60.3	56.3	48.5	57.7	63.9	63.9
HEAVY TRUCKS	68.8	65.0	57.0	66.4	72.5	72.6
NOISE LEVELS (dBA)	71.0	67.8	63.9	67.3	73.7	73.8

NOISE CONTOUR (FT)				
NOISE LEVELS	70 dBA	65 dBA	60 dBA	55 dBA
CNEL	240	758	2397	7581
LDN	233	737	2331	7370

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO)

PROJECT: Metro Bus Facility
ROADWAY: Rosecrans Ave- West of Avalon Blvd
SCENARIO: Cumulative with Project

JOB #: 2775-18-02
DATE: 31-Jan-19
ENGINEER: D Shivaiah

NOISE INPUT DATA

ROADWAY CONDITIONS

ADT =	26,977	
SPEED =	40	
PK HR % =	10	
NEAR LANE/FAR LANE DIST :	66	
ROAD ELEVATION =	0.0	
GRADE =	0.0	%
PK HR VOL =	2,698	

RECEIVER INPUT DATA

RECEIVER DISTANCE =		100
DIST C/L TO WALL =		0
RECEIVER HEIGHT =		5.0
WALL DISTANCE FROM RECEIVER =		100
PAD ELEVATION =		0.0
ROADWAY VIEW:	LF ANGLE=	-90
	RT ANGLE=	90
	DF ANGLE=	180

SITE CONDITIONS

AUTOMOBILES =	10	
MEDIUM TRUCKS =	10	(10 = HARD SITE, 15 = SOFT SITE)
HEAVY TRUCKS =	10	

WALL INFORMATION

HTH WALL=	0.0	
AMBIENT=	0.0	
BARRIER =	0	(0 = WALL, 1 = BERM)

VEHICLE MIX DATA

VEHICLE TYPE	DAY	EVENING	NIGHT	DAILY
AUTOMOBILES	0.7354	0.1402	0.0843	0.9000
MEDIUM TRUCKS	0.4800	0.0200	0.5000	0.0300
HEAVY TRUCKS	0.5000	0.0200	0.5200	0.0700

MISC. VEHICLE INFO

VEHICLE TYPE	HEIGHT	SLE DISTANCE	GRADE ADJUSTMENT
AUTOMOBILES	2.0	94.45	- -
MEDIUM TRUCKS	4.0	94.40	- -
HEAVY TRUCKS	8.0	94.45	0.00

NOISE OUTPUT DATA

NOISE IMPACTS (WITHOUT TOPO OR BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	67.1	64.9	63.8	56.8	65.6	66.3
MEDIUM TRUCKS	61.2	57.3	49.5	58.7	64.8	64.9
HEAVY TRUCKS	69.8	66.0	58.0	67.4	73.5	73.6
NOISE LEVELS (dBA)	72.0	68.8	64.9	68.3	74.7	74.8

NOISE IMPACTS (WITH TOPO AND BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	67.1	64.9	63.8	56.8	65.6	66.3
MEDIUM TRUCKS	61.2	57.3	49.5	58.7	64.8	64.9
HEAVY TRUCKS	69.8	66.0	58.0	67.4	73.5	73.6
NOISE LEVELS (dBA)	72.0	68.8	64.9	68.3	74.7	74.8

NOISE CONTOUR (FT)				
NOISE LEVELS	70 dBA	65 dBA	60 dBA	55 dBA
CNEL	301	951	3009	9515
LDN	293	925	2925	9251

Appendix D

Stationary Noise Calculation Worksheets

Metro Bus Facility Noise Impact Study
Noise emissions of stationary sources

Source name	Reference	Level		Corrections		
		Day dB(A)	Night dB(A)	Cwall dB(A)	CI dB(A)	CT dB(A)
Bus Repair-1	Lw/unit	78.1	78.1	-	-	-
Bus Repair-2	Lw/unit	78.1	78.1	-	-	-
Bus wash equipment tunnel	Lw/unit	99.2	99.2	-	-	-
CNG Compressor	Lw/unit	93.0	93.0	-	-	-
CNG Compressor	Lw/unit	93.3	93.3	-	-	-
CNG Compressor	Lw/unit	83.7	83.7	-	-	-
CNG Compressor	Lw/unit	91.3	91.3	-	-	-

Metro Bus Facility Noise Impact Study
Noise emissions of parking lot traffic

Name	Parking lot type	Low noise trolleys	Size	Movements per hour		Road surface	Separated method	Lw,ref
				Day	Night			dB(A)
Bus Parking Bays	Central bus stops (Gas)	-	92 Parking bays	0.070	0.036	Asphaltic driving lane	no	94.4
Employee Parking-1	Visitors and staff	-	9 Parking bays	0.070	0.036	Asphaltic driving lane	no	72.5
Employee Parking-2	Visitors and staff	-	100 Parking bays	0.150	0.050	Asphaltic driving lane	no	87.9

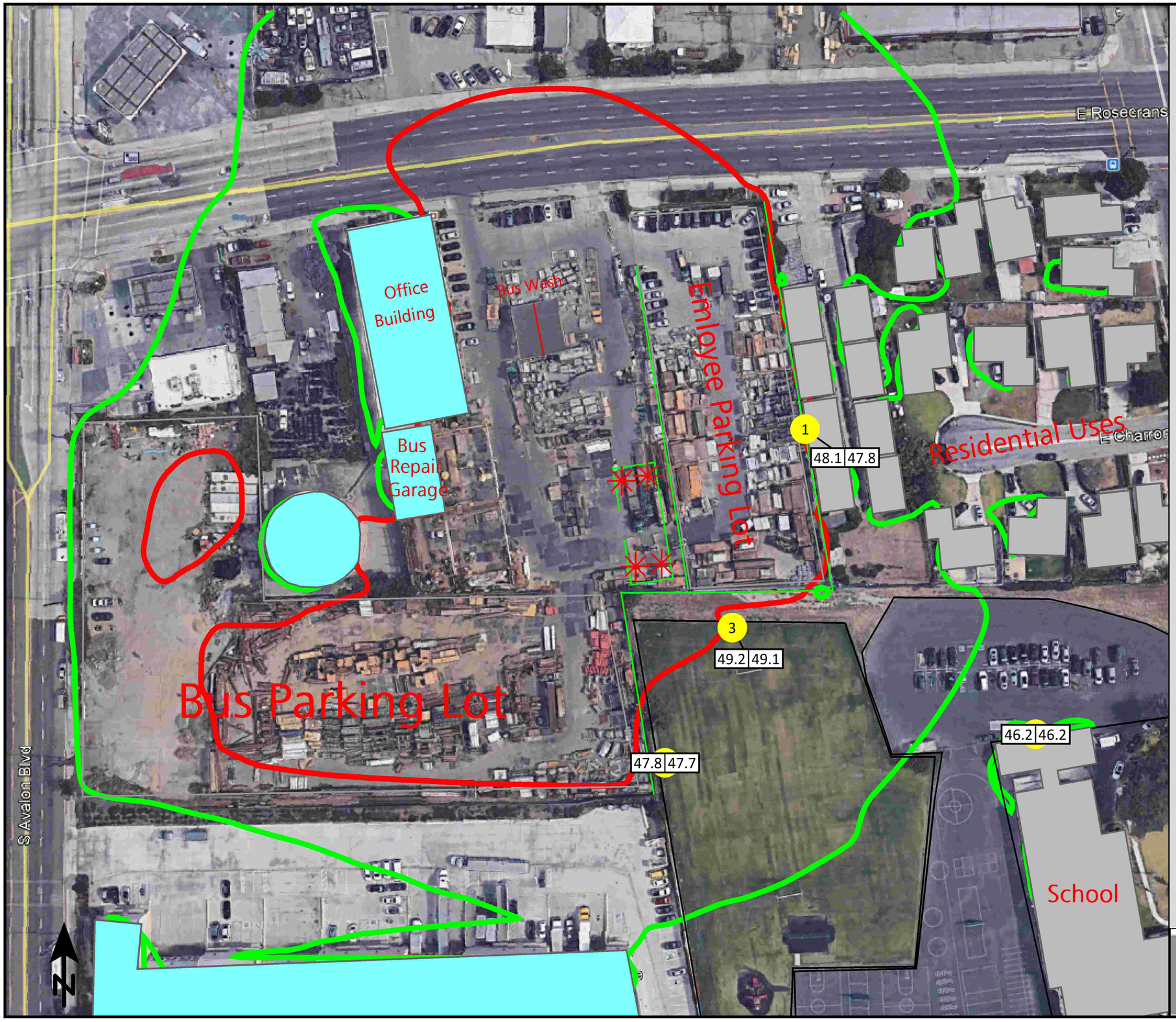
Metro Bus Facility Noise Impact Study
Receiver list

No.	Receiver name	Building side	Floor	Limit		Level w/o NP		Level w NP		Difference		Conflict	
				Day	Night	Day	Night	Day	Night	Day	Night	Day	Night
				dB(A)		dB(A)		dB(A)		dB		dB	
1	Residential Building	-	GF	50	45	56.9	56.6	48.9	48.7	-8.0	-7.9	-	3.7
2	School Building	-	GF	50	45	49.0	48.9	47.9	47.9	-1.1	-1.0	-	2.9
3	School Building1	-	GF	50	45	49.3	49.1	47.9	47.7	-1.4	-1.4	-	2.7
4	School Property Line	-	GF	50	45	55.4	55.3	50.2	50.1	-5.2	-5.2	0.2	5.1

Metro Bus Facility Noise Impact Study
Contribution levels of the receivers

Source name		Traffic lane	Level w/o NP Day	Level w/o NP Night	Level w NP Day	Level w NP Night
			dB(A)		dB(A)	
Residential Building	GF		56.9	56.6	48.9	48.7
Bus Parking Bays		-	32.3	29.4	24.0	21.1
Bus Repair-1		-	31.2	31.2	24.3	24.3
Bus Repair-2		-	22.4	22.4	12.3	12.3
Bus wash equipment tunnel		-	53.1	53.1	45.2	45.2
CNG Compressor		-	50.1	50.1	38.6	38.6
CNG Compressor		-	47.8	47.8	44.4	44.4
CNG Compressor		-	39.2	39.2	28.2	28.2
CNG Compressor		-	47.8	47.8	34.9	34.9
Employee Parking-1		-	15.8	12.9	6.2	3.3
Employee Parking-2		-	47.3	42.6	38.3	33.5
School Building	GF		49.0	48.9	47.9	47.9
Bus Parking Bays		-	31.1	28.2	26.1	23.2
Bus Repair-1		-	25.2	25.2	25.2	25.2
Bus Repair-2		-	25.5	25.5	24.9	24.9
Bus wash equipment tunnel		-	44.5	44.5	45.1	45.1
CNG Compressor		-	40.9	40.9	35.9	35.9
CNG Compressor		-	43.5	43.5	43.5	43.5
CNG Compressor		-	32.3	32.3	25.9	25.9
CNG Compressor		-	40.4	40.4	29.8	29.8
Employee Parking-1		-	8.8	5.9	5.0	2.1
Employee Parking-2		-	31.6	26.9	26.6	21.8
School Building1	GF		49.3	49.1	47.9	47.7
Bus Parking Bays		-	35.8	33.0	35.6	32.7
Bus Repair-1		-	28.6	28.6	28.3	28.3
Bus Repair-2		-	27.6	27.6	27.6	27.6
Bus wash equipment tunnel		-	44.2	44.2	44.2	44.2
CNG Compressor		-	41.5	41.5	39.5	39.5
CNG Compressor		-	42.5	42.5	42.5	42.5
CNG Compressor		-	34.6	34.6	27.5	27.5
CNG Compressor		-	42.2	42.2	33.9	33.9
Employee Parking-1		-	7.9	5.0	4.7	1.8
Employee Parking-2		-	31.4	26.6	26.1	21.3
School Property Line	GF		55.4	55.3	50.2	50.1
Bus Parking Bays		-	35.3	32.4	29.4	26.5
Bus Repair-1		-	28.7	28.7	27.2	27.2
Bus Repair-2		-	29.3	29.3	27.8	27.8
Bus wash equipment tunnel		-	47.9	47.9	46.2	46.2
CNG Compressor		-	47.5	47.5	41.5	41.5
CNG Compressor		-	44.7	44.7	44.7	44.7
CNG Compressor		-	42.7	42.7	34.2	34.2
CNG Compressor		-	52.3	52.3	41.3	41.3
Employee Parking-1		-	10.3	7.4	4.5	1.6
Employee Parking-2		-	39.5	34.7	32.0	27.2

Metro Bus Facility
Noise Impact Study - Single Point Noise Impact With the Existing Design Features



Signs and symbols

- Ground effects
- Wall
- Receiver
- Point source
- Line source
- Parking lot
- Facade with conflict
- Limit line Day: 50 dB(A)
- Limit line Night: 45 dB(A)

1 : 1458

0 5 10 20 30 40 m

RK engineering group, inc.

Metro Bus Facility Noise Impact Study - Daytime Noise Impact With the Existing Design Features

Office Building

Bus Wash

Bus Repair Garage

Emloyee Parking Lot

Residential Uses

Bus Parking Lot

School

N

Signs and symbols

- Ground effects
- Wall
- Point source
- Line source
- Parking lot

Levels in dB(A)

<= 40	
40	45
45	50
50	55
55	60
60	65
65	70
70	75
75	80
> 80	

1 : 1366

0 5 10 20 30 40 m

RK engineering group, inc.

Metro Bus Facility
Noise Impact Study - Nighttime Noise Impact With the Existing Design Features

Office Building

Bus Wash

Bus Repair Garage

Emloyee Parking Lot

Residential Uses

Bus Parking Lot

School

N

Signs and symbols

- Ground effects
- Wall
- Point source
- Line source
- Parking lot

Levels in dB(A)

<= 40	
40	45
45	50
50	55
55	60
60	65
65	70
70	75
75	80
> 80	

1 : 1366

0 5 10 20 30 40 m

RK engineering group, inc.

Metro Bus Facility
Noise Impact Study-
Mitigated



Signs and symbols

- Ground effects
- Wall
- Receiver
- Point source
- Line source
- Parking lot
- Facade with conflict
- Limit line Day: 50 dB(A)
- Limit line Night: 45 dB(A)

1 : 1436

0 5 10 20 30 40 m

RK engineering group, inc.

Metro Bus Facility Noise Impact Study- Mitigated Daytime



Signs and symbols

- Ground effects
- Wall
- Point source
- Line source
- Parking lot

Levels in dB(A)

	<= 40
	40 - 45
	45 - 50
	50 - 55
	55 - 60
	60 - 65
	65 - 70
	70 - 75
	75 - 80
	> 80

1 : 1436

0 5 10 20 30 40 m

RK engineering group, inc.

Metro Bus Facility
Noise Impact Study-
Mitigated Nighttime

E Rosecrans Ave

Office Building

Bus Wash

Bus Repair Garage

Emloyee Parking Lot

Residential Uses

E Charron Pl

Bus Parking Lot

School

N

Signs and symbols

- Ground effects
- Wall
- Point source
- Line source
- Parking lot

Levels in dB(A)

<= 40
40 - 45
45 - 50
50 - 55
55 - 60
60 - 65
65 - 70
70 - 75
75 - 80
> 80

1 : 1436

0 5 10 20 30 40 m

RK engineering group, inc.

Appendix E

Construction Noise and Vibration Calculation Worksheets

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 11/8/2018
Case Description: Metro Bus Facility Noise Impact Study

		Baselines (dBA)		---- Receptor #1 ----
Description	Land Use	Daytime	Evening	Night
Architectural Coating	Commercial	65	65	60

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Compressor (air)	No	40		77.7	50	0

Results

		Calculated (dBA)	
Equipment		*Lmax	Leq
Compressor (air)		77.7	73.7
	Total	77.7	73.7

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 11/8/2018
Case Description: Metro Bus Facility Noise Impact Study

				---- Receptor #1 ----
		Baselines (dBA)		
Description	Land Use	Daytime	Evening	Night
Building Construction	Commercial	65	65	60

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Crane	No	16		80.6	50	0
Pickup Truck	No	40		75	50	0
Tractor	No	40	84		50	0
Pickup Truck	No	40		75	50	0
Tractor	No	40	84		50	0

Results

		Calculated (dBA)	
Equipment		*Lmax	Leq
Crane		80.6	72.6
Pickup Truck		75	71
Tractor		84	80
Pickup Truck		75	71
Tractor		84	80
	Total	84	83.9

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 11/8/2018
Case Description: Metro Bus Facility Noise Impact Study

		Baselines (dBA)		---- Receptor #1 ----
Description	Land Use	Daytime	Evening	Night
Demolition	Commercial	65	65	60

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Concrete Saw	No	20		89.6	50	0
Dozer	No	40		81.7	50	0
Tractor	No	40	84		50	0
Tractor	No	40	84		50	0

Results

		Calculated (dBA)	
Equipment		*Lmax	Leq
Concrete Saw		89.6	82.6
Dozer		81.7	77.7
Tractor		84	80
Tractor		84	80
	Total	89.6	86.4

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 11/8/2018
Case Description: Metro Bus Facility Noise Impact Study

				---- Receptor #1 ----			
		Baselines (dBA)					
Description	Land Use	Daytime	Evening	Night			
Grading	Commercial	65	65	60			

			Equipment			
	Impact		Spec Lmax	Actual Lmax	Receptor Distance	Estimated Shielding
Description	Device	Usage(%)	(dBA)	(dBA)	(feet)	(dBA)
Concrete Saw	No	20		89.6	50	0
Dozer	No	40		81.7	50	0
Tractor	No	40	84		50	0
Tractor	No	40	84		50	0

		Results	
		Calculated (dBA)	
Equipment		*Lmax	Leq
Concrete Saw		89.6	82.6
Dozer		81.7	77.7
Tractor		84	80
Tractor		84	80
	Total	89.6	86.4

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 11/8/2018
Case Description: Metro Bus Facility Noise Impact Study

		Baselines (dBA)		---- Receptor #1 ----
Description	Land Use	Daytime	Evening	Night
Paving	Commercial	65	65	60

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Concrete Mixer Truck	No	40		78.8	50	0
Paver	No	50		77.2	50	0
Roller	No	20		80	50	0
Tractor	No	40	84		50	0
Concrete Mixer Truck	No	40		78.8	50	0
Concrete Mixer Truck	No	40		78.8	50	0
Concrete Mixer Truck	No	40		78.8	50	0

Results

		Calculated (dBA)	
Equipment		*Lmax	Leq
Concrete Mixer Truck		78.8	74.8
Paver		77.2	74.2
Roller		80	73
Tractor		84	80
Concrete Mixer Truck		78.8	74.8
Concrete Mixer Truck		78.8	74.8
Concrete Mixer Truck		78.8	74.8
	Total	84	84.3

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 11/8/2018
Case Description: Metro Bus Facility Noise Impact Study

				---- Receptor #1 ----			
		Baselines (dBA)					
Description	Land Use	Daytime	Evening	Night			
Site Preparation	Commercial	65	65	60			

			Equipment			
			Spec	Actual	Receptor	Estimated
	Impact		Lmax	Lmax	Distance	Shielding
Description	Device	Usage(%)	(dBA)	(dBA)	(feet)	(dBA)
Grader	No	40	85		50	0
Tractor	No	40	84		50	0

Results

	Calculated (dBA)	
Equipment	*Lmax	Leq
Grader	85	81
Tractor	84	80
Total	85	83.6

*Calculated Lmax is the Loudest value.

VIBRATION IMPACTS FROM CONSTRUCTION AND OPERATIONS

PROJECT:	Metro Bus Facility Rosecrans and Avalon	JOB #:	2775-2018-02
ACTIVITY:	Small Bulldozer	DATE:	30-Nov-18
LOCATION:	Residential Unit to the East	ENGINEER:	Darshan Shivaiah

VIBRATION INPUT/OUTPUT DATA

OTHER CONSTRUCTION EQUIPMENT

$$PPV = PPV_{ref}(25/D)^{n} \text{ (in/sec)}$$

PPV =	**0.008 in/sec**

Equipment Type =	6	Small Bulldozer
PPV_{ref} =	0.003	Reference PPV at 25 ft.
D =	10.00	Distance from Equipment to receiver in ft.
n =	1.10	Vibration attenuation rate through the ground

EQUIPMENT PPV REFERENCE LEVELS

Type	Equipment	Reference PPV
1	Vibratory Roller	0.210
2	Large Bulldozer	0.089
3	Caisson Drilling	0.089
4	Loaded Trucks	0.076
5	Jackhammer	0.035
6	Small Bulldozer	0.003
7	Crack and Seat	2.400

VIBRATION IMPACTS FROM CONSTRUCTION AND OPERATIONS

PROJECT:	Metro Bus Facility Rosecrans and Avalon	JOB #:	2775-2018-02
ACTIVITY:	Loaded Truck	DATE:	30-Nov-18
LOCATION:	Residential Unit to the East	ENGINEER:	Darshan Shivaiah

VIBRATION INPUT/OUTPUT DATA

OTHER CONSTRUCTION EQUIPMENT

$$PPV = PPV_{ref}(25/D)^{n} \text{ (in/sec)}$$

PPV =	**0.040 in/sec**

Equipment Type =	4	Loaded Trucks
PPV_{ref} =	0.076	Reference PPV at 25 ft.
D =	45.00	Distance from Equipment to receiver in ft.
n =	1.10	Vibration attenuation rate through the ground

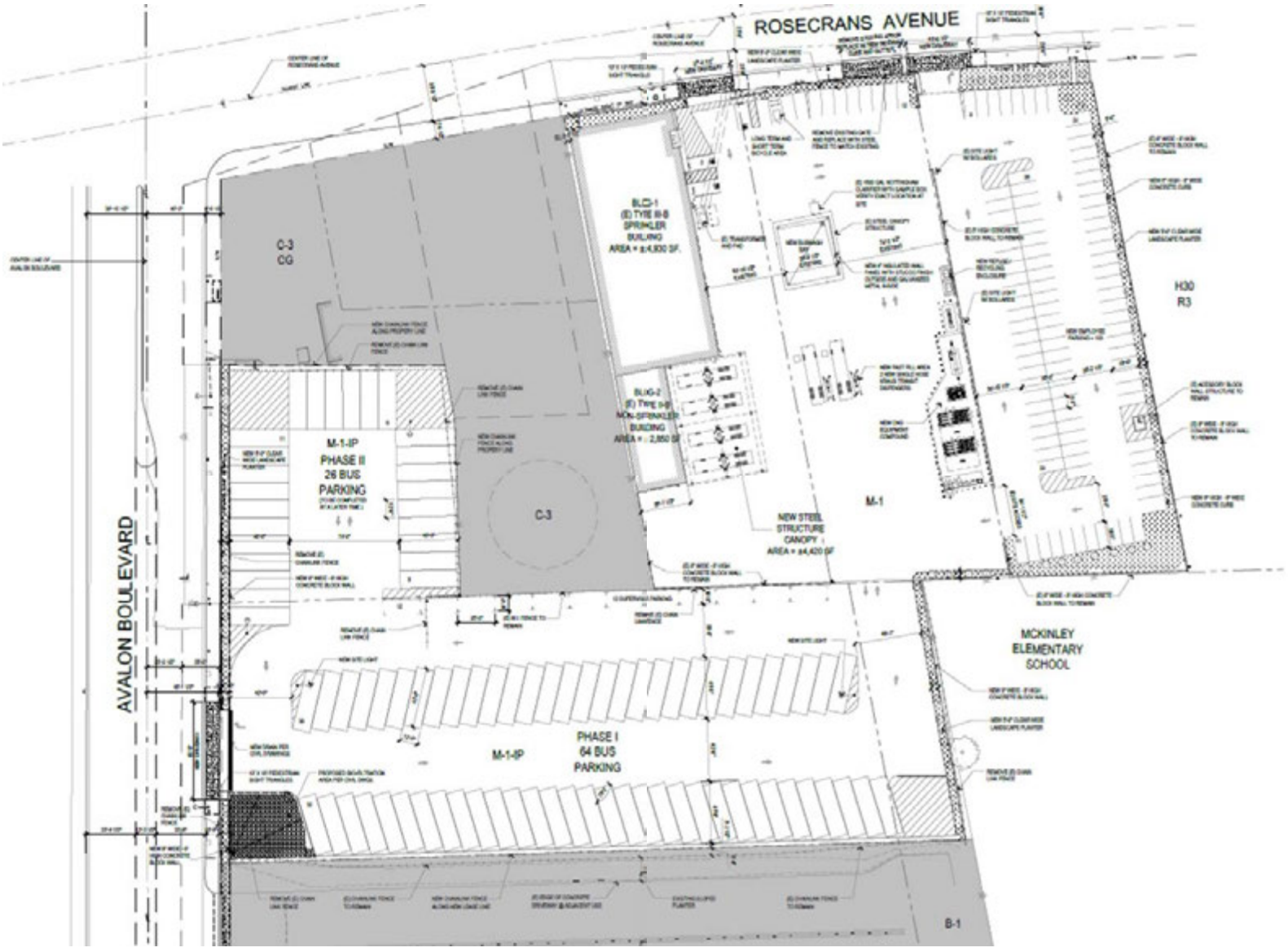
EQUIPMENT PPV REFERENCE LEVELS

Type	Equipment	Reference PPV
1	Vibratory Roller	0.210
2	Large Bulldozer	0.089
3	Caisson Drilling	0.089
4	Loaded Trucks	0.076
5	Jackhammer	0.035
6	Small Bulldozer	0.003
7	Crack and Seat	2.400

APPENDIX F.1

Traffic Impact Analysis

METRO BUS FACILITY ROSECRANS AND AVALON
TRAFFIC IMPACT ANALYSIS
County of Los Angeles, California



METRO BUS FACILITY ROSECRANS AND AVALON
TRAFFIC IMPACT ANALYSIS
County of Los Angeles, California

Prepared for:

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February 4, 2019

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1.0 Introduction

1.1 Purpose of Report and Study Objectives

The purpose of this traffic impact analysis is to evaluate the proposed Metro Bus Facility Development Rosecrans Avenue and Avalon Boulevard Site (hereinafter referred to as project) from a transportation/traffic standpoint and determine whether the proposed project will have a significant impact on the environment. This study has been conducted pursuant to the County of Los Angeles Department of Public Works Traffic Impact Analysis Report Guidelines (December 2013) and the California Environmental Quality Act (CEQA) requirements.

Study objectives include:

- Preparation of a traffic impact study scoping agreement with the County of Los Angeles.
- Identification of the project and study area.
- Identification of applicable plans, ordinances and policies that establish the measures of effectiveness for the performance criteria of the study area.
- Evaluation of existing baseline traffic conditions in the study area.
- Evaluation of project impacts for Existing Plus Project traffic conditions.
- Evaluation of project impacts for Cumulative traffic conditions.
- Determination of on-site and off-site improvements and system management actions needed to achieve County of Los Angeles level of service and roadway design requirements.

The County of Los Angeles Department of Public Work approved the scope of work for this traffic study prior to initiating the analysis. The approved scoping agreement is provided in Appendix A.

1.2 Site Location

The proposed project is located at 636 East Rosecrans Avenue and 14110-14438 South Avalon Boulevard, in the unincorporated County of Los Angeles. The project site is bounded by Rosecrans Avenue to the north, existing industrial uses to the south and west, institutional uses to the south and east, existing residential land uses to the east, and Avalon Avenue to the west.

The project site is currently vacant and is zoned for Light Manufacturing (M-1-IP) uses in the County of Los Angeles Zoning Map and located in West Rancho Dominguez-Victoria Community Service District.

The project site location map is shown on Exhibit 1-1.

1.3 Project Description

The project consists of constructing and operating a bus operations and maintenance facility for the Los Angeles County Metropolitan Transportation Authority (Metro). The project will include parking for buses, support vehicles, bus drivers, and Metro employees, bus maintenance and service facilities, an automated bus washing bay, Compressed Natural Gas (CNG) fueling pumps for the bus fleet, and approximately 12,137 square feet of building area for office/administrative use.

The total combined site area is approximately 5.35 acres in size. The existing site includes approximately 17,137 square feet of existing building structures that will be preserved for use within the proposed project.

Access to the project site is provided via one (1) existing driveway on Avalon Boulevard and three (3) existing driveways on Rosecrans Avenue. Per the development plan's project description, all bus traffic will utilize the Avalon Boulevard Driveway only. The project is expected to replace an existing Metro Bus Facility located at 1611 Naud Street, in the City of Los Angeles, and will continue to operate the same bus schedule at the proposed Rosecrans and Avalon site.

The site plan used for this analysis, provided by RS Herman Architects, is illustrated in Exhibit 1-2.

1.4 Summary of Analysis Results

The project is not expected to result in significant adverse environmental impacts related to traffic and no mitigation is required.

The following is a summary of the transportation/traffic analysis impact criteria per the Association of Environmental Professionals 2018 CEQA Statute and Guidelines Appendix G Environmental Checklist Form.

Table 1-1
CEQA Impact Criteria

Transportation/Traffic Impact Criteria	Potentially Significant	Potentially Significant Unless Mitigated	Less Than Significant Impact	No Impact
Would the project:				
a) Conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit?			X	
b) Conflict with an applicable congestion management program, including, but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways?			X	
c) Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?				X
d) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?			X	
e) Result in inadequate emergency access?			X	
f) Conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities?			X	

1.5 Recommended Project Design Features

The following recommended design features (DF) are considered standard measures to be included in the final project design. Recommended design features are provided to improve on-site accessibility, reduce potential roadway and design hazards, and ensure the project is consistent with the County's established policies and ordinances concerning traffic and transportation.

DF-1. Install stop signs, stop bars and stop legends at all project access driveways.

DF-2. Restrict bus access on Rosecrans Avenue. All buses should utilize the Avalon Boulevard Driveway only.

DF-3. Close the center project driveway on Avalon Boulevard.

DF-4. Adequate sight distance should be provided and maintained at all project access driveways per County of Los Angeles standards.

a. The limited use area shall be used for the purpose of prohibiting or clearing obstructions to maintain adequate sight distance at intersections.

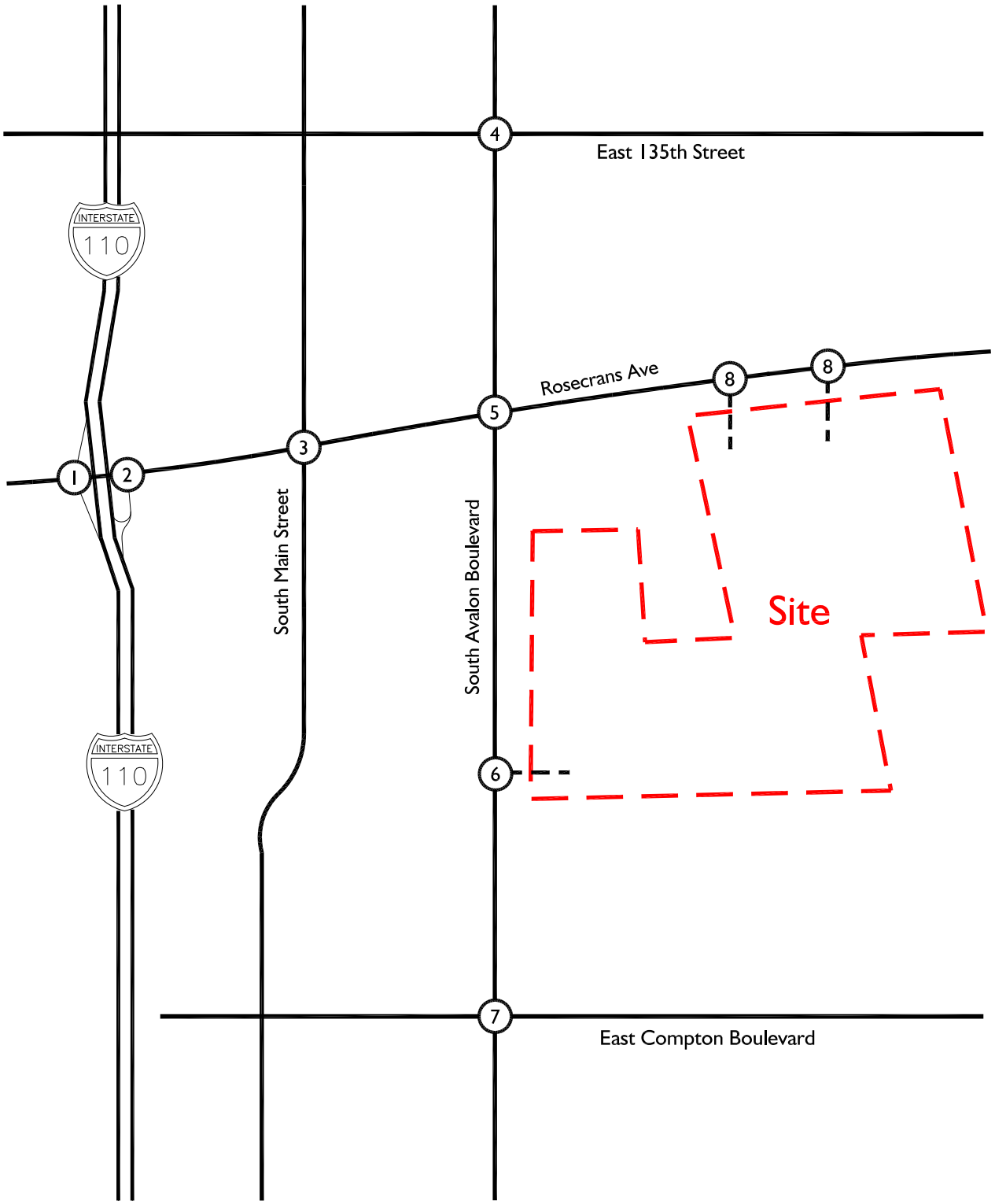
b. Limited use area to be kept clear of all obstructions over 30 inches high, including vegetation.

c. No trees, walls, or any obstructions shall be allowed in the limited use area.

DF-5. The final on-site circulation system shall be reviewed and approved by the Los Angeles County Fire Department and local waste provider to ensure adequate access is provided.

Exhibit 1-1

Location Map



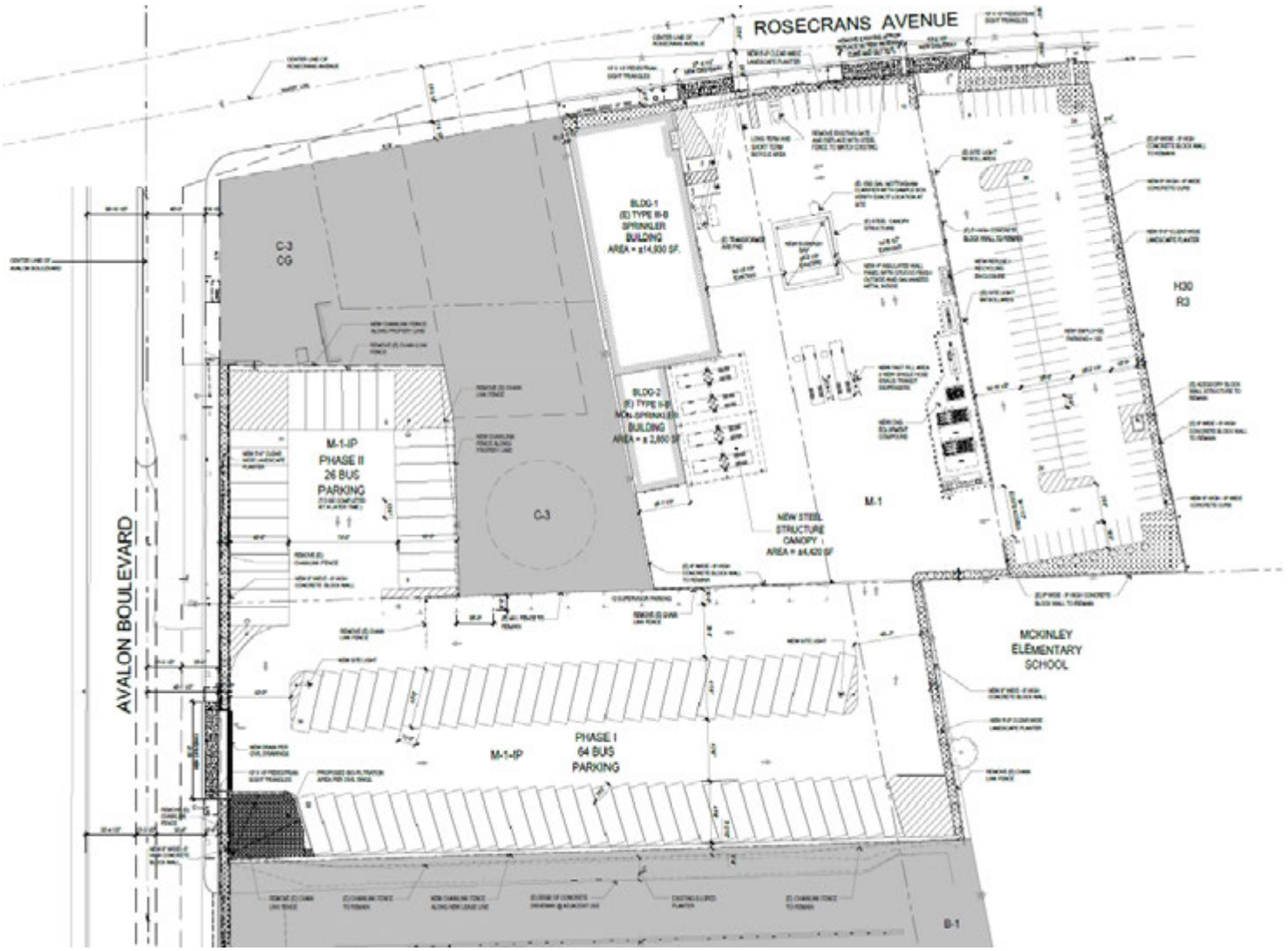
Legend:

(1) = Study Area Intersection

= Existing Driveway

N

Exhibit 1-2
Site Plan



N

2.0 Study Area and Analysis Methodology

2.1 Study Area Intersections

The study area included in this analysis has been determined based upon existing and future transportation facilities within the vicinity of the site where the project may contribute a significant amount of traffic. The study area was reviewed and approved by the County of Los Angeles Department of Public Work during the scoping agreement process. A copy of the approved scoping agreement is provided in Appendix A.

Table 2-1 lists the study area intersections that are included in this analysis.

Table 2-1
Study Area Intersections

Int. #	North-South Street	East-West Street
1.	I – 110 SB Ramps	Rosecrans Avenue
2.	I – 110 NB Ramps	Rosecrans Avenue
3.	South Main Street	Rosecrans Avenue
4.	South Avalon Boulevard	East 135th Avenue
5.	South Avalon Boulevard	Rosecrans Avenue
6.	South Avalon Boulevard	Project Driveway
7.	South Avalon Boulevard	East Compton Avenue
8.	Project Driveway[1]	Rosecrans Avenue

[1] As described in Section 1.5, part of the project design will include closing the middle driveway on Rosecrans Avenue, resulting in only two future project driveways on Rosecrans Avenue. For a worst case assessment of level of service, vehicle delay and queuing, this study considers the impact all traffic accessing the site via Rosecrans using only one driveway. However, for design and circulation and purposes, both project driveways on Rosecrans are reviewed.

2.2 Intersection Capacity Utilization (ICU) Methodology

The Intersection Capacity Utilization (ICU) methodology is used for analyzing level of service (LOS) at signalized intersections within the County of Los Angeles. To calculate the ICU, the volume of traffic using the intersection is compared with the capacity of the intersection; this is referred to as the volume-to-capacity (V/C) ratio. The V/C ratio represents the portion of the hour required to provide sufficient capacity to accommodate all intersection traffic if all approaches operate at capacity.

A saturation flow value of 1,600 vehicles per lane per hour for all lanes is used and 2,880 vehicles per hour for dual left turns is used, per the County of Los Angeles TIA Guidelines. A clearance interval factor of 10% is applied to the ICU calculations.

Table 2-2 shows the level of service criteria based on the V/C ratio of an intersection.

Table 2-2
ICU Level of Service - Volume to Capacity (V/C)

Level of Service (LOS)	Critical V/C Ratio
A	0.00 - 0.60
B	0.61 - 0.70
C	0.71 - 0.80
D	0.81 - 0.90
E	0.91 - 1.00
F	>1.00

2.3 Highway Capacity Manual (HCM) Methodology

For signalized intersections that are within Caltrans jurisdiction, level of service is calculated using the Highway Capacity Manual (HCM 2010) methodology. HCM defines level of service at signalized intersections based upon the average vehicle delay, reported in seconds, for all approach movements. Synchro analysis software is used for calculating HCM and utilizes optimized signal timing and default HCM lane saturation factors.

HCM methodology is also used to calculate level of service at unsignalized study area intersections. For intersections with stop control on the minor street only, the calculation of level of service is dependent on the occurrence of gaps occurring in the traffic flow of the main street, and the level of service is determined based on the vehicle delay of the worst individual movement or movements sharing a single lane.

Table 2-3 shows the level of service criteria based on the HCM methodology.

Table 2-3
HCM Level of Service - Vehicle Delay

LOS	Vehicle Delay (Seconds)	
	Signalized	Unsignalized
A	0.00 - 10.00	0.00 - 10.00
B	10.01 - 20.00	10.01 - 15.00
C	20.01 - 35.00	15.01 - 25.00
D	35.01 - 55.00	25.01 - 35.00
E	55.01 - 80.00	35.01 - 50.00
F	>80.01	>50.01

2.4 Los Angeles County Level of Service Performance Criteria and Significant Impact Thresholds

The following is a summary of the performance standards and thresholds of significance adopted by the County of Los Angeles.

Performance Criteria:

Maintain a minimum LOS D, where feasible; however, allow LOS below D on a case by case basis in order to further other General Plan goals and policies, such as those related to environmental protection, infill development, and active transportation.

Significant Impact Thresholds:

The Los Angeles County TIA Guidelines define the significant traffic impacts for a project. For intersections, the impact is considered significant if the project related increase in the volume to capacity (v/c) ratio equals or exceeds the threshold shown in Table 2-4.

Table 2-4
Los Angeles County Significant Impact Criteria

Pre-project		Project V/C Increase
LOS	V/C	
C	0.71 to 0.80	0.04 or more
D	0.81 to 0.90	0.02 or more
E/F	0.91 or more	0.01 or more

2.5 Los Angeles County Congestion Management Program

The Los Angeles County Metropolitan Transportation Authority 2010 Congestion Management Program (CMP), Appendix D – Guidelines for CMP Transportation Impact Analysis (TIA) describe the requirements for determining traffic impacts to CMP facilities.

A CMP TIA is required for the following projects:

i. Projects that add 50 or more trips during either AM or PM weekday peak hours of adjacent street traffic on any CMP arterial monitoring intersection, including monitored freeway ramps.

ii. Projects that add 50 or more trips during either AM or PM weekday peak hours to any CMP arterial roadway.

iii. Projects that add 150 or more trips during either AM or PM weekday peak hours to mainline freeway monitoring location.

The nearest CMP facility located near the project site is the I-110 Freeway, located approximately 1.2 miles west of the site. The project does not exceed the established thresholds for requiring further analysis of level of service impacts to CMP facilities. The project impact to the CMP is considered less than significant.

3.0 Existing Conditions and Setting

3.1 Existing Traffic Controls and Intersection Geometrics

RK conducted a field review of the study area in November 2018 to determine the existing traffic controls and intersection geometrics for roadway facilities near the site. Exhibit 3-1 identifies the existing roadway conditions within the study. The number of through traffic lanes for existing roadways and the existing intersection controls are identified. The type of traffic control and number of lanes at an intersection are key inputs for the calculation of level of service.

3.2 Existing Traffic Volumes

Traffic volumes within the study area were counted in November 2018 and represent the existing baseline traffic conditions for the analysis. Peak hour vehicle turning movements at all study intersections and 24-hour 2-way average daily traffic (ADT) along roadway segments adjacent to the site were counted.

The morning peak hour of traffic was counted from 7:00 AM to 9:00 AM and the evening peak hour of traffic was counted from 4:00 PM to 6:00 PM. To minimize the potential of reporting non-typical peak hour conditions, traffic counts are taken during normal weekday conditions and clear weather. No counts are taken on Mondays, Fridays, holidays, or weekends. The traffic counts were conducted when local schools were in session in order to capture peak traffic demand. By measuring the peak traffic demand, this analysis is considered a worst case assessment of traffic operations in the study area.

Existing traffic volumes within the study area are shown on Exhibit 3-2. The traffic count worksheets are included in Appendix B.

3.3 Existing Level of Service

Existing intersection level of service calculations are shown in Table 3-1 and are based upon the AM and PM peak hour turning movement counts and existing roadway configurations. The County of Los Angeles requires Level of Service D or better for all study area intersections.

As shown in Table 3-1 all intersections are currently operating at acceptable levels of service, D or better.

Intersection analysis calculation worksheets for existing conditions are provided in Appendix C.

3.4 Los Angeles County General Plan Mobility Element

The project's setting, within the context of the County of Los Angeles's Highway Plan, is shown in Exhibit 3-3. The project is located adjacent to the following classified roadways

- Rosecrans Avenue - Major Highway (100 ft. ROW)
- Avalon Boulevard - Major Highway (100ft. ROW)

The Mobility Map is provided for informational purposes and shows the location of the project within the context of the planned circulation system of the County.

3.5 Los Angeles County Metro Transit Service

The County of Los Angeles Metro Bus and Rail System Map is provided in Exhibit 3-4. Public transit service in the vicinity of the project is provided by the Los Angeles County Metropolitan Transportation Authority. The site is served by the following Metro bus lines:

- Rosecrans Avenue - Metro local line 125
- Avalon Boulevard - Metro local line 52, 352 and late night line 45.

3.6 Los Angeles County Bicycle Master Plan

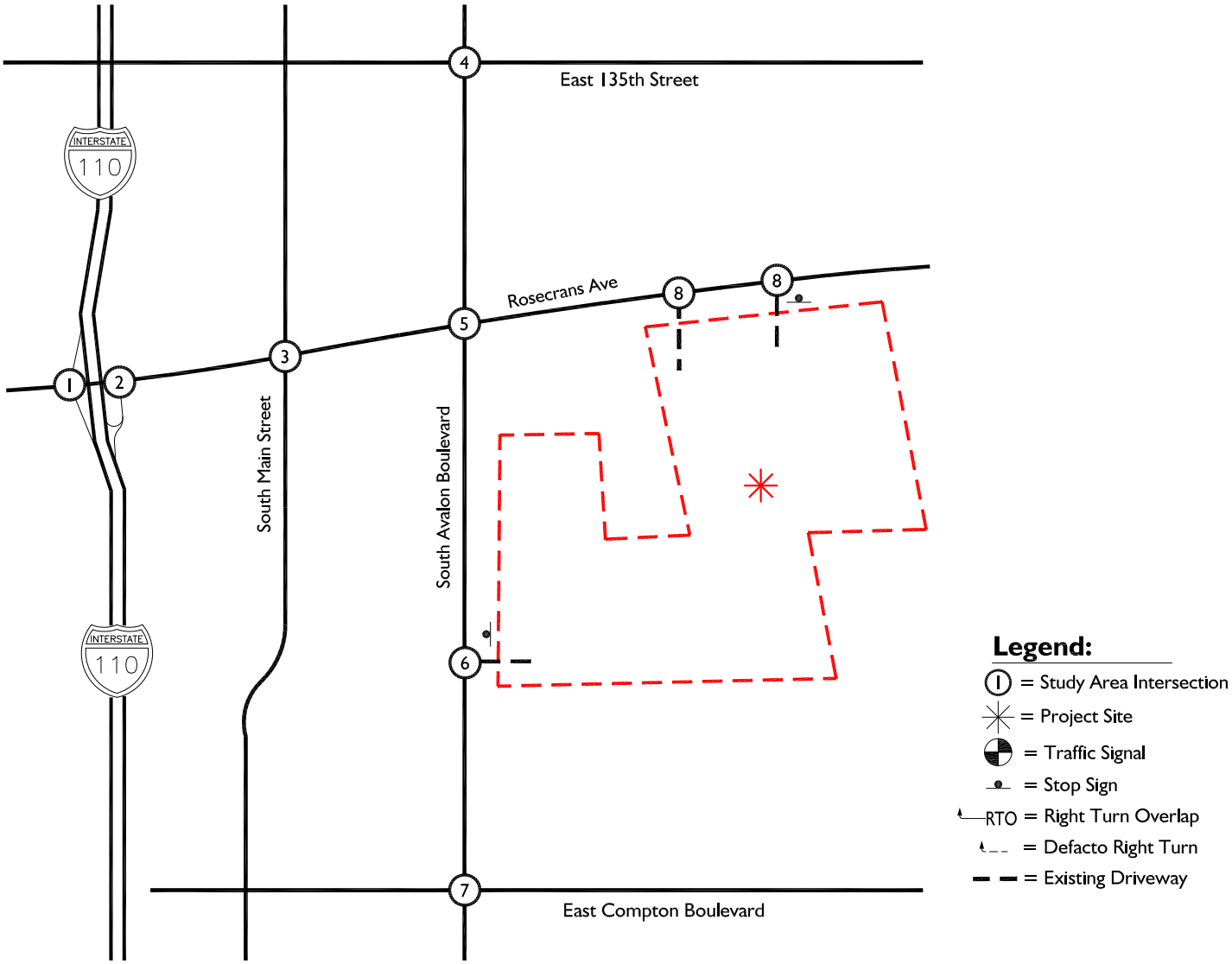
The Los Angeles County Bicycle Master Plan provides direction for improving mobility of bicyclists and encouraging more bicycle ridership within the County by expanding the existing bikeway network, connecting gaps, addressing constrained areas, providing for greater local and regional connectivity, and encouraging more residents to bicycle more often.

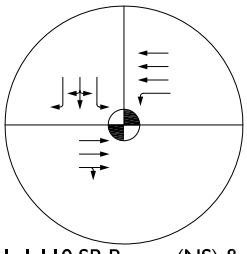
The project location within the context of the Los Angeles County Bicycle Master Plan of is shown on Exhibit 3-5. The project is located adjacent to the following classified bike routes:

- Rosecrans Avenue - Proposed Class II
- Avalon Boulevard - Proposed Class II

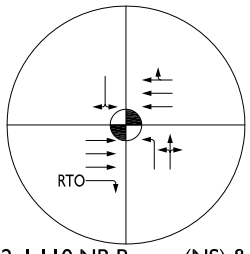
Exhibit 3-1

Existing Lane Geometry and Intersection Controls

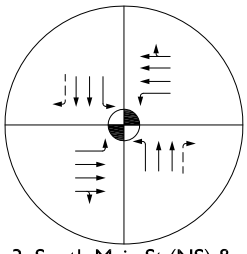




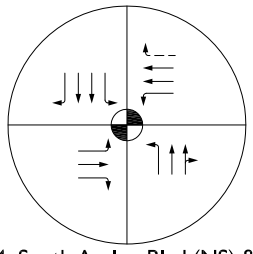
1. I-110 SB Ramps (NS) & Rosecrans Ave (EW)



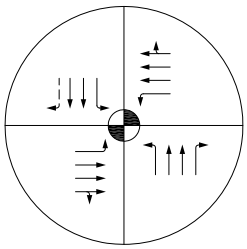
2. I-110 NB Ramps (NS) & Rosecrans Ave (EW)



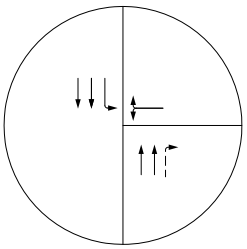
3. South Main St (NS) & Rosecrans Ave (EW)



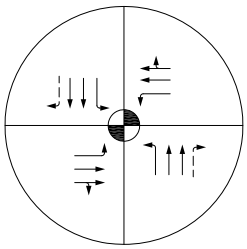
4. South Avalon Blvd (NS) & East 135th Street (EW)



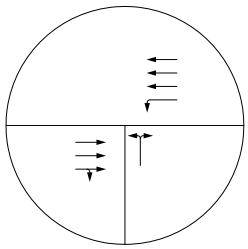
5. South Avalon Blvd (NS) & Rosecrans Ave (EW)



6. South Avalon Blvd (NS) & Project Driveway (EW)



7. South Avalon Blvd (NS) & East Compton Blvd (EW)

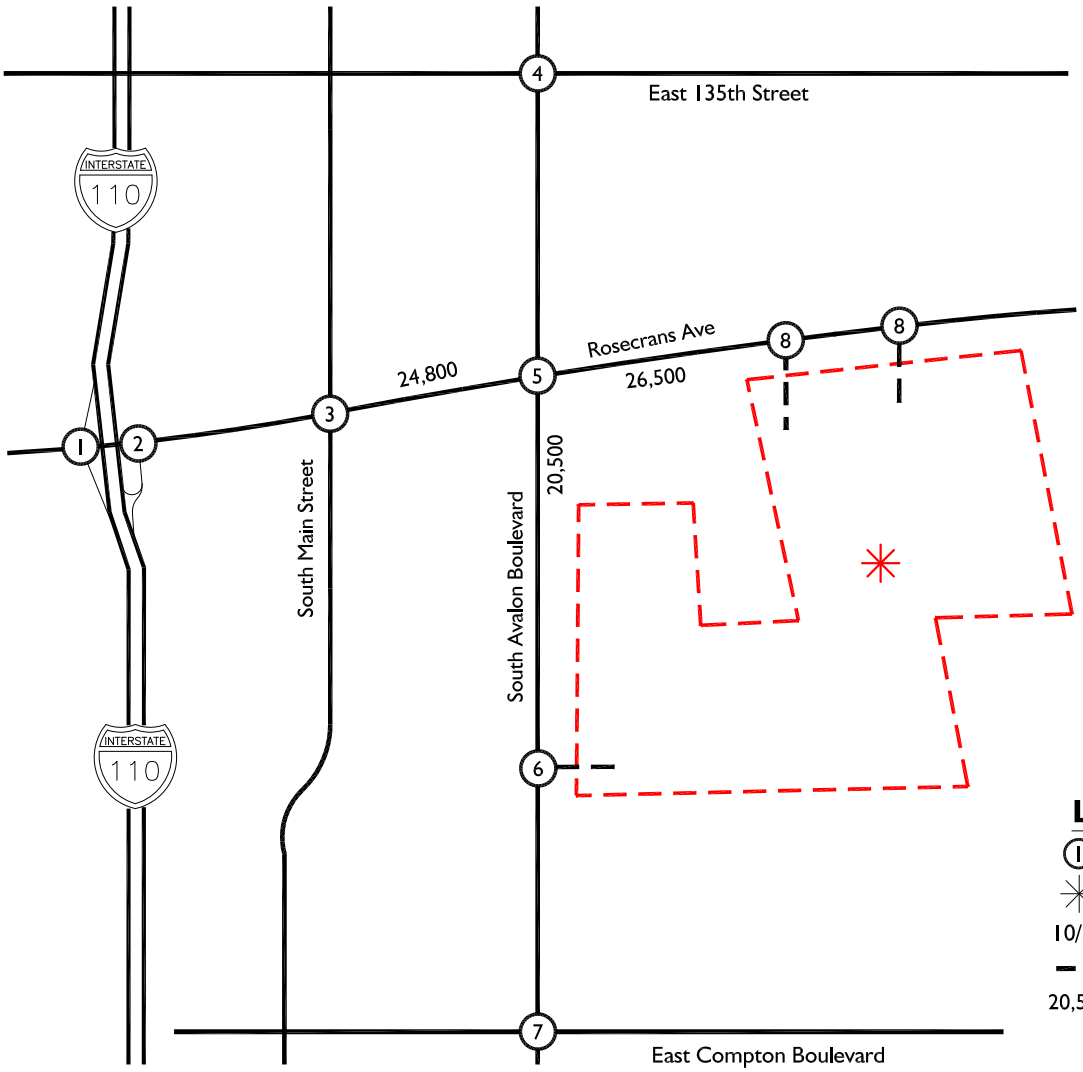


8. Project Driveway (NS) & Rosecrans Ave (EW)

N

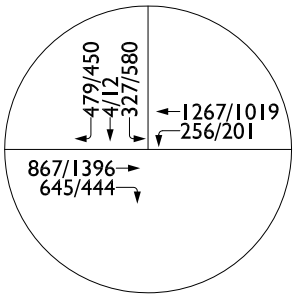
Exhibit 3-2

Existing Traffic Volumes

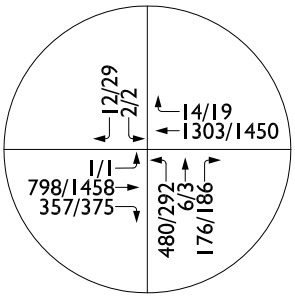


Legend:

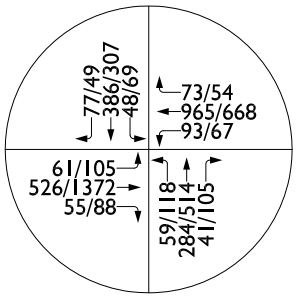
(1)	= Study Area Intersection
✳	= Project Site
10/20	= AM/PM Peak Hour Volumes
- -	= Existing Driveway
20,500	= 24-Hour ADT (Average Daily Traffic)



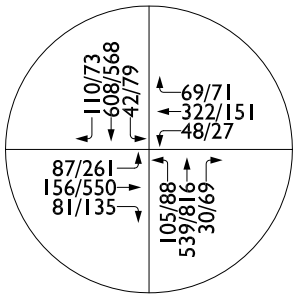
1. I-110 SB Ramps (NS) & Rosecrans Ave (EW)



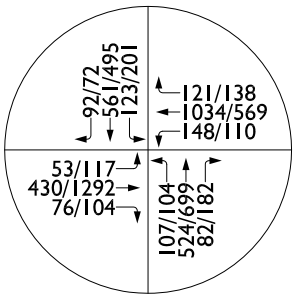
2. I-110 NB Ramps (NS) & Rosecrans Ave (EW)



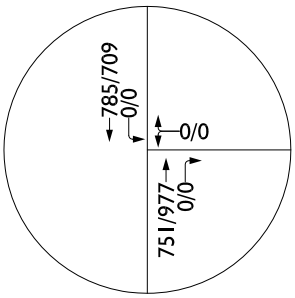
3. South Main St (NS) & Rosecrans Ave (EW)



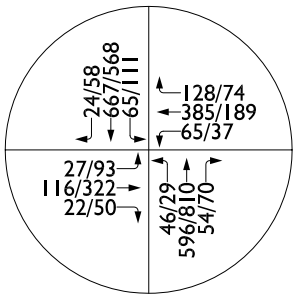
4. South Avalon Blvd (NS) & East 135th Street (EW)



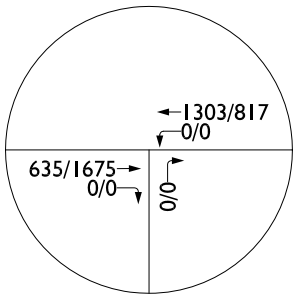
5. South Avalon Blvd (NS) & Rosecrans Ave (EW)



6. South Avalon Blvd (NS) & Project Driveway (EW)



7. South Avalon Blvd (NS) & East Compton Blvd (EW)

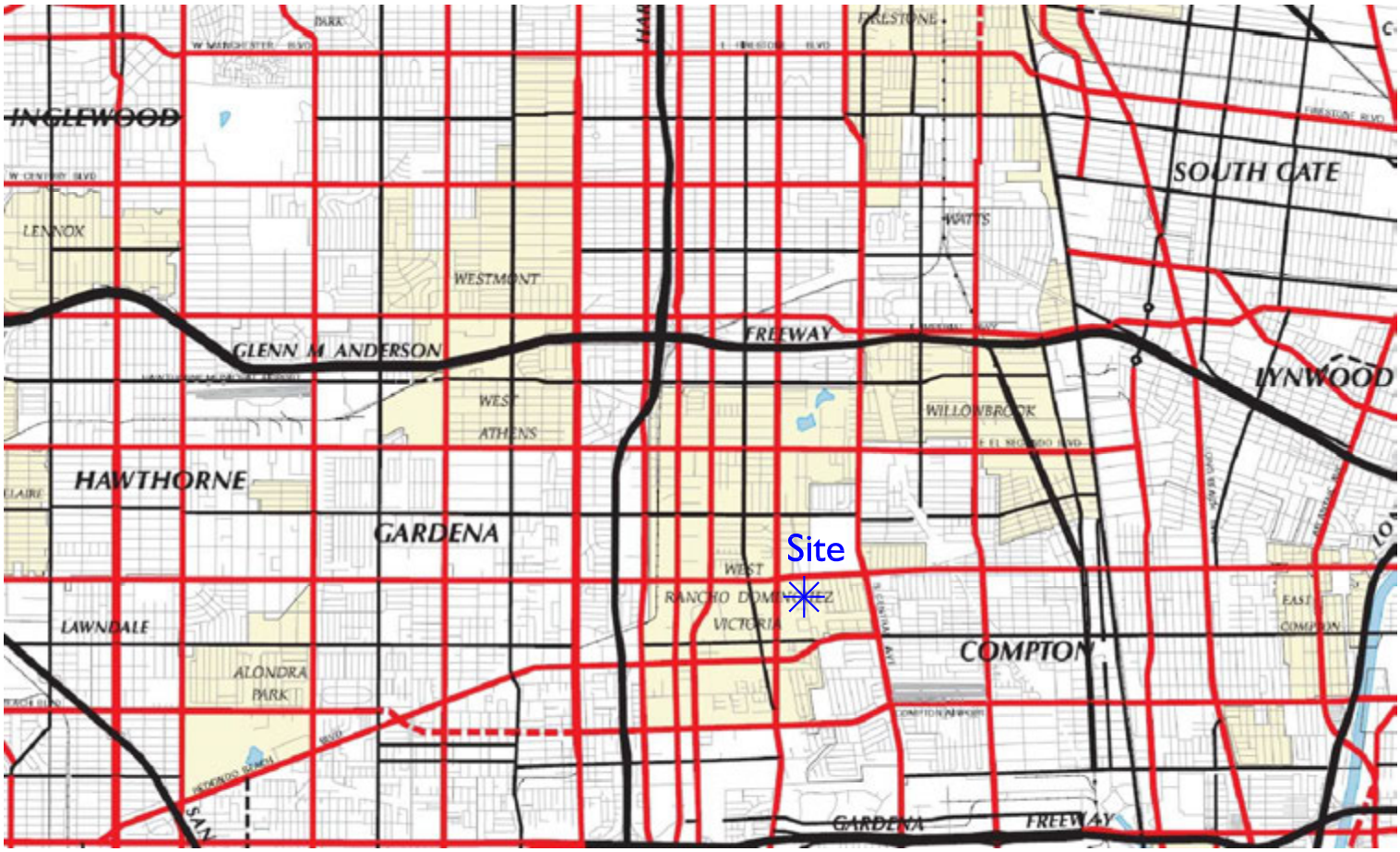


8. Project Driveway (NS) & Rosecrans Ave (EW)

N

Exhibit 3-3

County of Los Angeles Highway Plan



Legend:

MAJOR HIGHWAY
100 feet standard right of way width
- Existing
- Proposed

SECONDARY HIGHWAY
80 feet standard right of way width
- Existing
- Proposed

LIMITED SECONDARY HIGHWAY
64 to 80 feet standard right of way width
- Existing
- Proposed

PARKWAY
Right of way width variable - 80 feet minimum
- Existing
- Proposed

EXPRESSWAY
Right of way width variable - 100 feet maximum
- Existing
- Proposed

FREEWAY
Right of way width variable
- Existing
- Proposed

OTHER MAP FEATURES
- National Forest Boundary
- Unincorporated Area of Los Angeles County

N

Exhibit 3-4

County of Los Angeles Metro Bus and Rail System Map



Metro Rail



Metro Liner



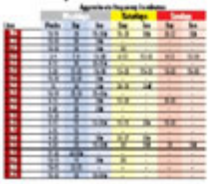
Transitways



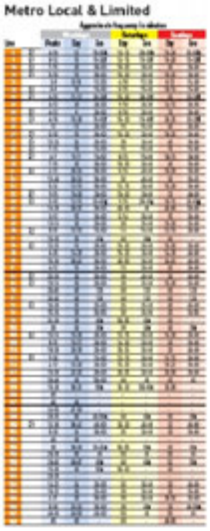
Metro Express



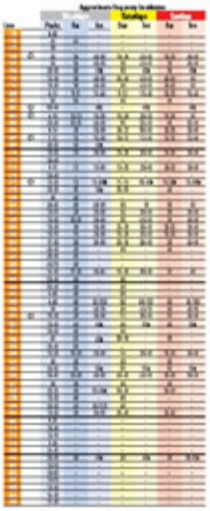
Metro Rapid



Metro Local & Limited



Metro Local & Limited



Metro Shuttles & Circulators



Municipal Bus Operators

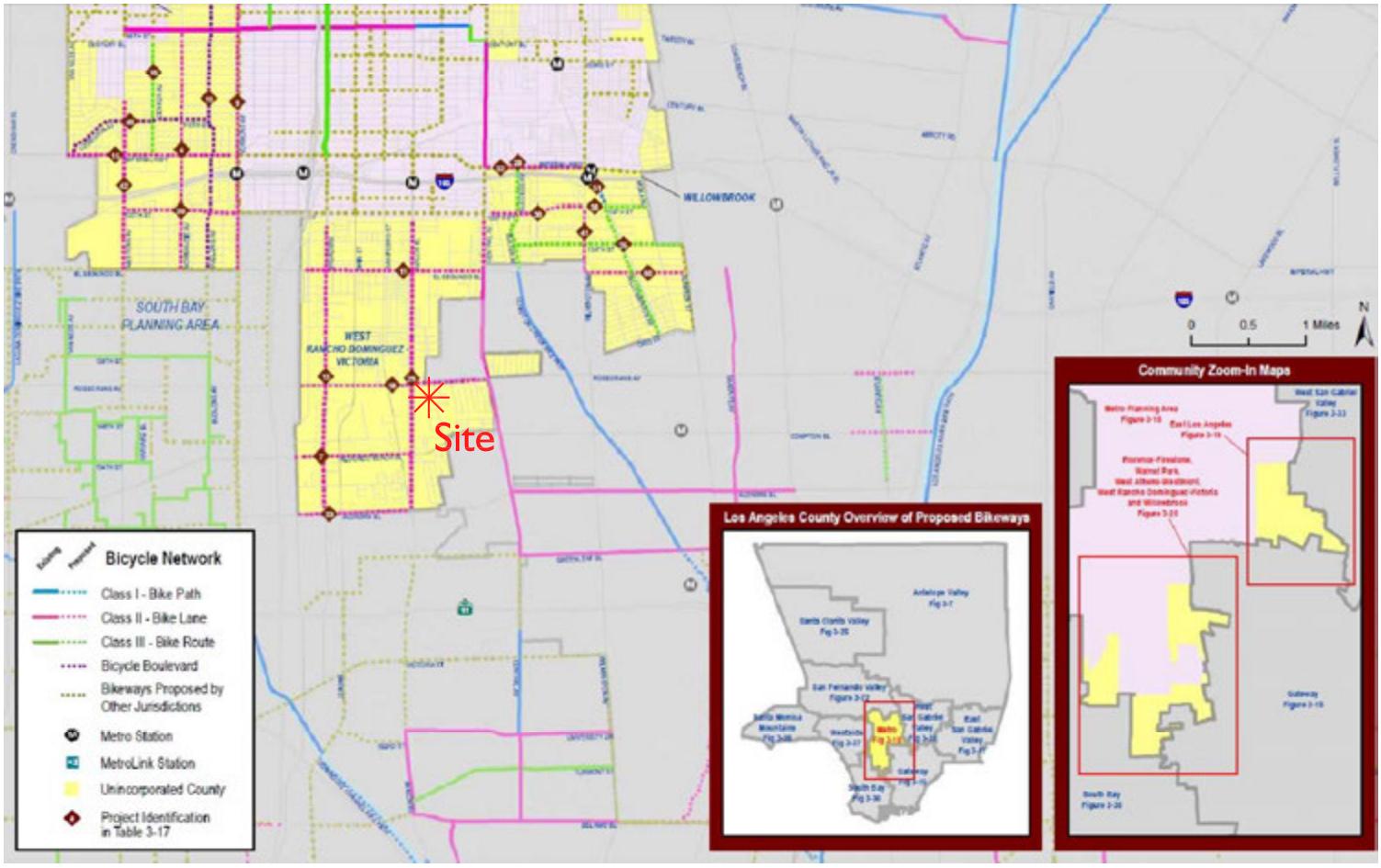


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RK engineering group, inc.

Exhibit 3-5

County of Los Angeles Bicycle Master Plan



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TABLE 3-1

Existing Conditions
Intersection Level of Service Analysis

Intersection	Traffic Control[1]	Intersection Approach Lane(s)[2,3]												Existing Conditions[4,5]			
		Northbound			Southbound			Eastbound			Westbound			AM Peak Hour		PM Peak Hour	
		L	T	R	L	T	R	L	T	R	L	T	R	Delay - LOS	V/C - LOS	Delay - LOS	V/C - LOS
1. I-110 SB Ramp / Rosecrans Ave	TS	- -	- -	- -	1.0	1.0!	1.0	0.0	2.5	0.5	1.0	3.0	0.0	52.9 - D	0.832 - D	45.5 - D	0.826 - D
2. I-110 NB Ramp / Rosecrans Ave	TS	1.0	1.0!	0.0	0.5	0.0	0.5	0.0	3.0	1.0>	0.0	2.5	0.5	17.8 - B	0.591 - A	17.8 - B	0.576 - A
3. S Main St / Rosecrans Ave	TS	1.0	2.0	1.0*	1.0	2.0	1.0*	1.0	2.5	0.5	1.0	2.5	0.5	--	0.512 - A	--	0.650 - B
4. S Avalon Blvd / E 135th St	TS	1.0	1.5	0.5	1.0	2.0	1.0	1.0	1.0	1.0	1.0	2.0	1.0*	--	0.511 - A	--	0.787 - C
5. S Avalon Blvd / Rosecrans Ave	TS	1.0	2.0	1.0	1.0	2.0	1.0*	1.0	2.5	0.5	1.0	2.5	0.5	--	0.616 - B	--	0.804 - D
6. Avalon Blvd / Project Dwy	CSS	0.0	2.0	1.0*	1.0	2.0	0.0	- -	- -	- -	0.0	0.0	1.0	0.0 - A	--	0.0 - A	--
7. S Avalon Blvd / E Compton Blvd	TS	1.0	2.0	1.0*	1.0	2.0	1.0*	1.0	1.5	0.5	1.0	1.5	0.5	--	0.514 - A	--	0.563 - A
8. Project Dwy / Rosecrans Ave	CSS	0.5	0.0	0.5	- -	- -	- -	0.0	2.5	0.5	1.0	3.0	0.0	0.0 - A	--	0.0 - A	--

[1] TS = Traffic Signal; CSS = Cross-Street Stop.

[2] When a right turn lane is designated, the lane can either be striped or unstriped. To function as a right turn lane there must be sufficient width for right turning vehicles to travel outside the through lanes. Where "1!" is indicated for the through movement and "0"s are indicated for R/L movements, the R and/or L turns are shared with the through movement.

[3] L = Left; T = Through; R = Right; > = Right Turn Overlap; >> = Free Right Turn; ! = Indicates general purpose lane; * = Defacto right turn lane.

[4] Analysis Software: Delay (HCM 2010 Methodology) based on Synchro, Version 10.0; and V/C (ICU Methodology) based on Traffix, Version 8.0.

[5] HCM level of service is calculated for Caltrans controlled intersections and unsignalized intersections. Delay is based on average vehicle approach delay for signalized intersections and worst leg/approach delay for cross-street stop-controlled intersections. Delay measured in seconds. V/C = Volume to Capacity Ratio. V/C calculated for all signalized intersections.

4.0 Project Traffic

4.1 Project Trip Generation

Trip generation represents the amount of traffic that is attracted and produced by a development. To determine the expected trip generation of the project, RK performed an observed trip generation survey at the 1611 Naud Street Metro Bus Facility on Tuesday, October 30, 2018. The results of the observed traffic survey at the Naud Street Metro Bus Facility are shown in Appendix D.

The Naud Street facility currently serves as Metro's bus maintenance and storage facility for the same routes that the project will serve in the future. The Naud Street facility will be closed down and replaced by the proposed project. Site operations and personnel are expected to remain the same at the new Rosecrans and Avalon site as they are currently being carried out at the Naud Street facility. Therefore, the existing trip generation from the Naud Street site is demonstrative of the future trip generation at the Rosecrans and Avalon site and used for analysis purposes for estimating traffic impacts.

Table 4-1 shows the daily and peak-hour trip generation for the project. Trip generation is classified by vehicle type; buses, employees (passenger cars/light duty trucks/SUVs), and maintenance vehicles/other trucks. The proposed project is projected to generate a total of approximately 443 trip-ends per day, with 16 total trips per hour during the AM peak hour and 10 total trips per hour during the PM peak hour.

The peak hour trip generation represents the amount of traffic generated by the project during the typical morning and evening peak hours (7 AM to 9 AM and 4 PM to 6 PM), when traffic congestion and level of service is usually at its worst. As shown in Table 4-1, the project is not a significant generator of traffic during the typical peak hours. This is due to the nature of the use, which requires buses to be in transit during peak commute times. The rotation of shifts and 24-hour site operations result in project trip generation being more evenly dispersed throughout the day and the majority of buses and employees traveling to and from the site outside of the typical morning and evening peak hours.

4.2 Project Trip Distribution

Trip distribution represents the directional orientation of traffic to and from the project site. Trip distribution is heavily influenced by the geographical location of the site, the specific Metro transit routes the site will serve, and the proximity to the regional freeway system.

The directional orientation of traffic was determined by evaluating the types of trips generated by the proposed land use and the probable routes that buses and employees will use to get to and from the site.

The project trip distribution patterns for buses traveling to and from the project site are graphically depicted on Exhibit 4-1 and the trip distribution patterns for passenger vehicles traveling to and from the project site are graphically depicted on Exhibit 4-2.

The existing Metro bus schedule and transit routes currently served by the Naud Street facility, and which are expected to continue to be served by the project site, are provided in Appendix D.

4.3 Project Traffic Assignment and Volume

The assignment of project traffic to the adjoining roadway system is based upon the project's trip generation, trip distribution, and proposed arterial highway and local street systems that would be in place by the time of initial occupancy of the site. The project's peak hour turning movement volumes and average daily traffic within the study area is shown on Exhibit 4-3.

4.4 Cumulative Project Traffic

Table 4-2 lists other proposed development projects located near the site that would be expected to contribute new traffic to the study area for cumulative conditions. RK contacted the County of Los Angeles, City of Gardena, and City of Compton to obtain information on future development projects near the site. All approved and reasonably foreseeable projects that may contribute a significant amount of traffic to the study area are included in this analysis.

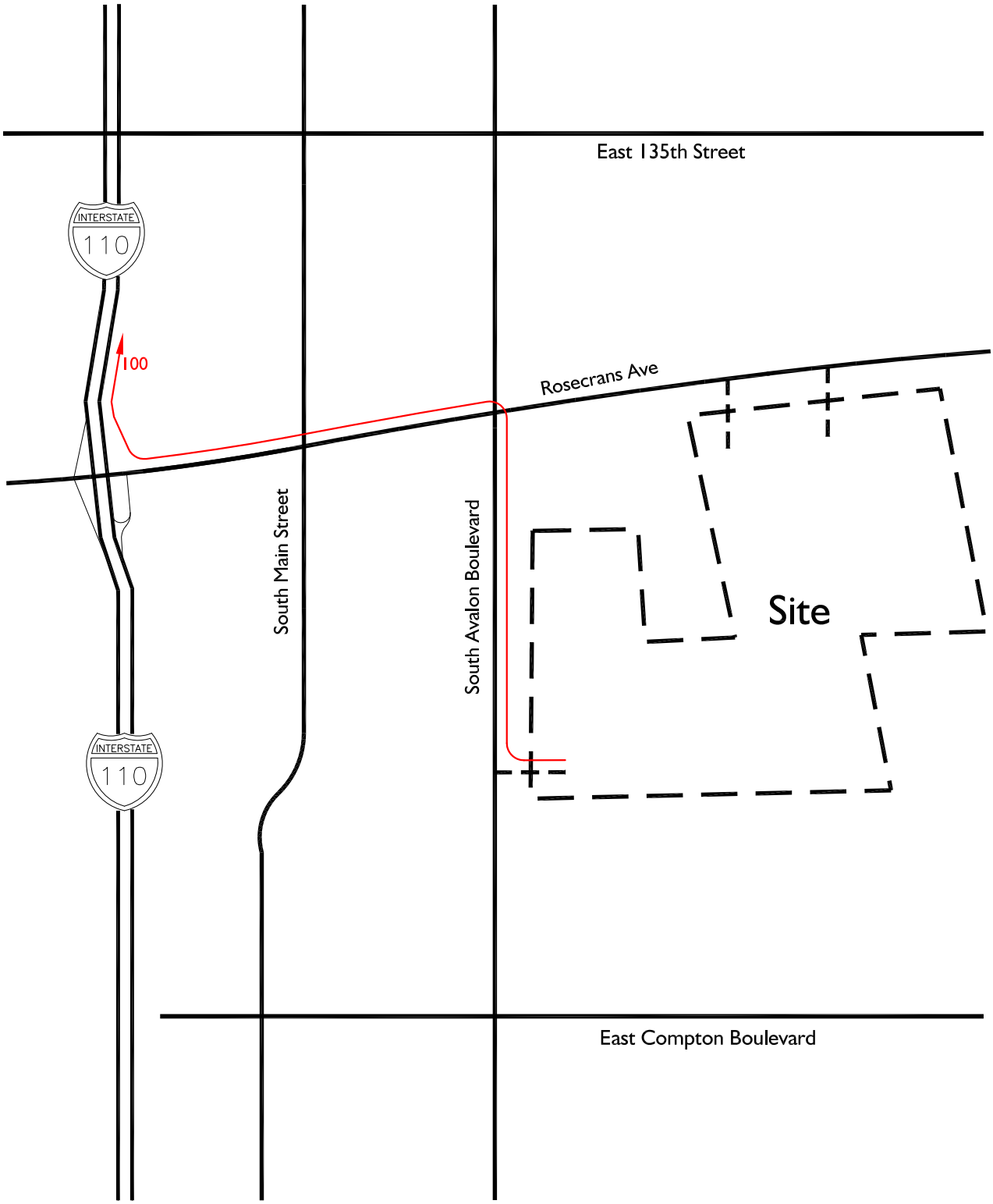
Future traffic volume projections from cumulative projects have been conservatively assessed. This is due to the fact that not all projects may be developed within the opening year time frame of the project, and site-specific mitigation measures may further reduce cumulative impacts which are not accounted for in this study. Additionally, new developments will also interact and complement each other by retaining trips amongst the various proposed uses. For example, a residential development may generate an outbound trip destined for a commercial use, which would then be subsequently received by the commercial site as an inbound trip. In this example, the cumulative analysis accounts for both trips, adding two new trips to the roadway network, but in fact only one new trip is

generated. Therefore, the cumulative analysis has the potential to double count trips and, as a result, a worst case estimate of traffic is presented.

A map showing the location of the cumulative projects is provided on Exhibit 4-4. The cumulative project's AM and PM peak hour intersection turning movement volumes and average daily traffic are shown on Exhibit 4-5.

Exhibit 4-1

Project Trip Distribution - Buses



Legend:

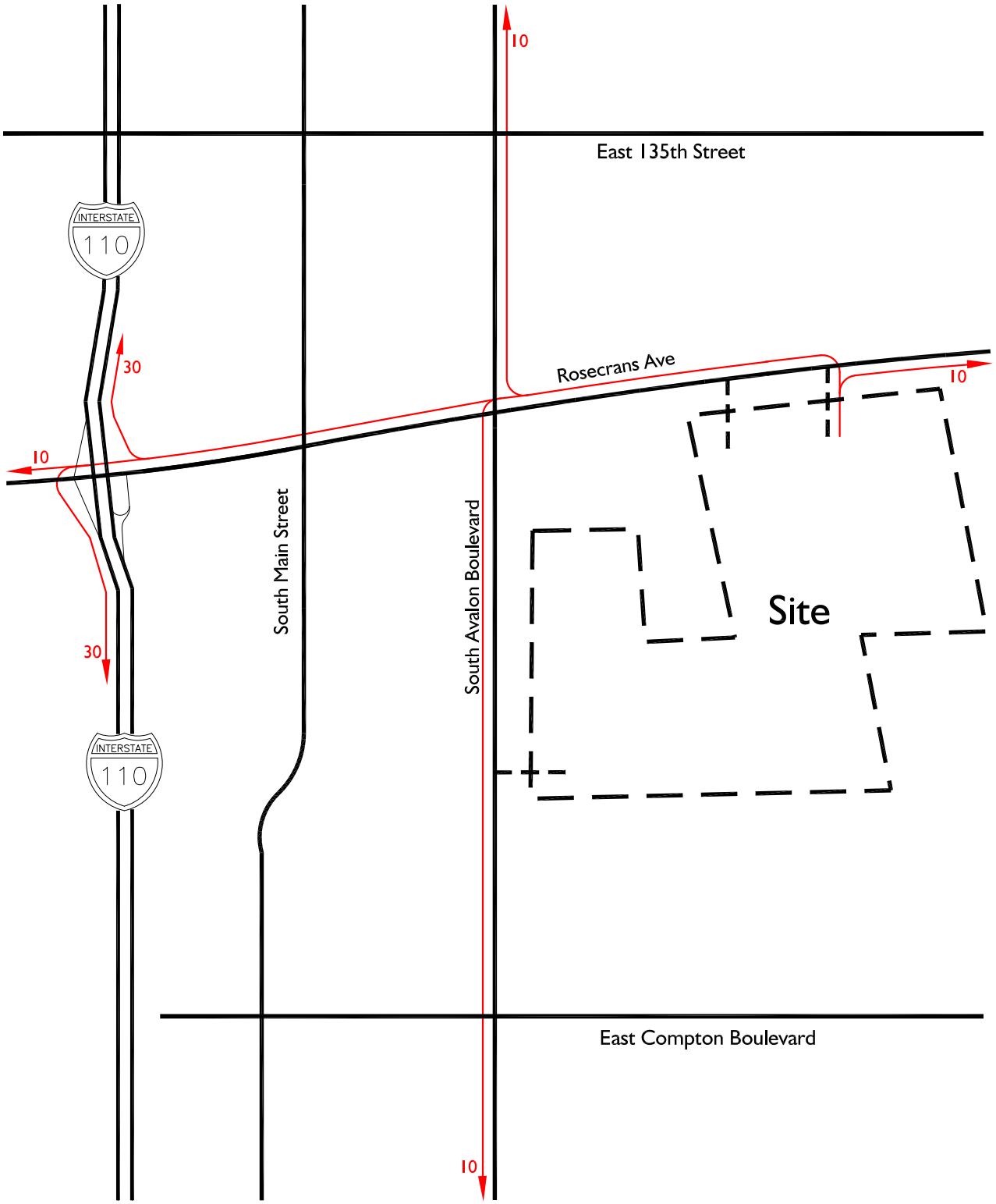
= Existing Driveway

100 = Percent to/from Zone

N

Exhibit 4-2

Project Trip Distribution - Passenger Cars



Legend:

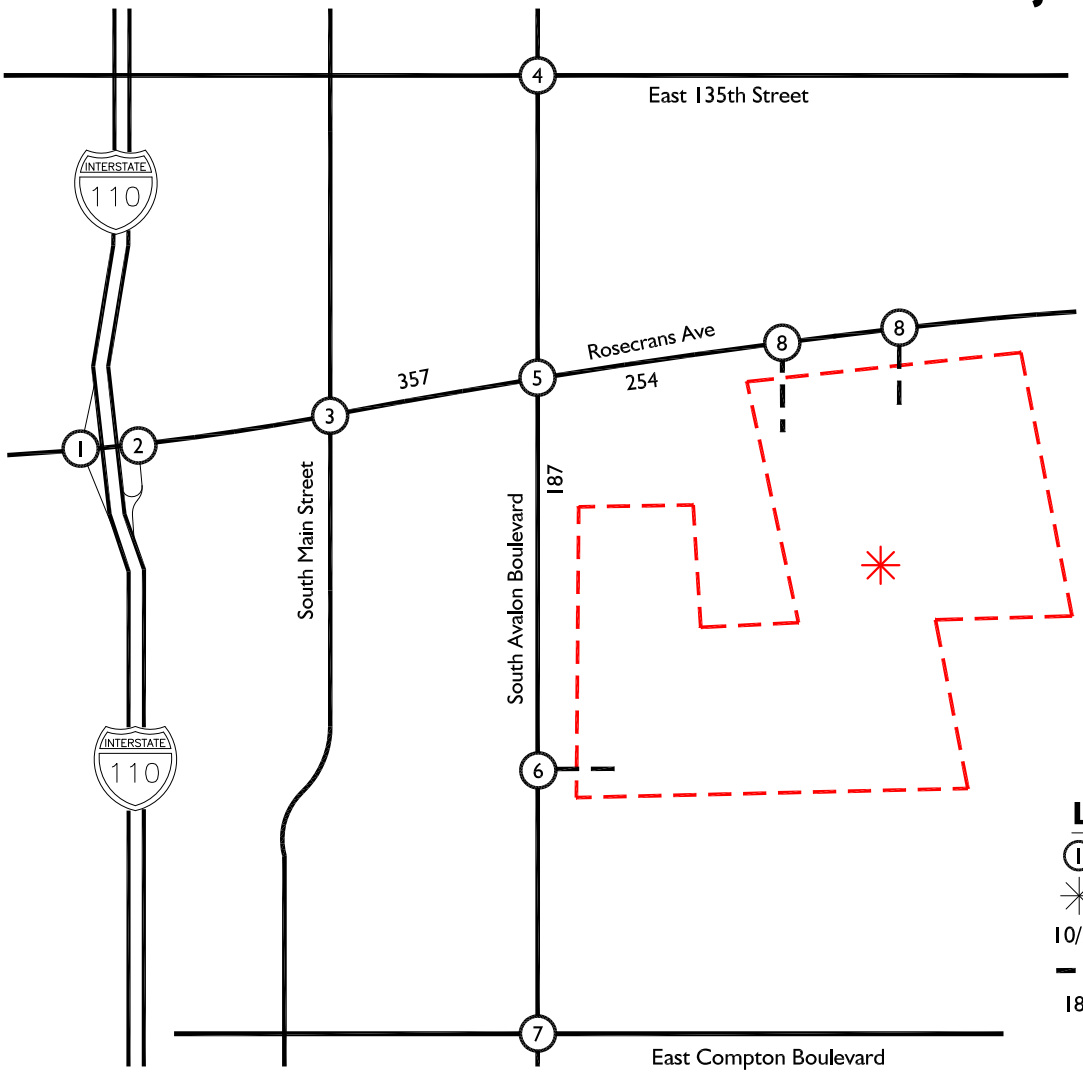
= Existing Driveway

100 = Percent to/from Zone

N

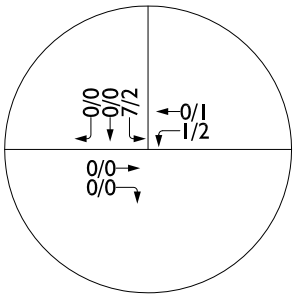
Exhibit 4-3

Project Traffic Volumes

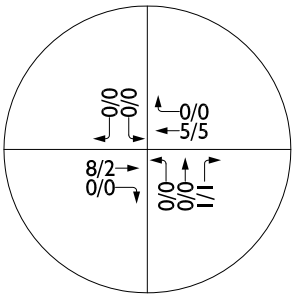


Legend:

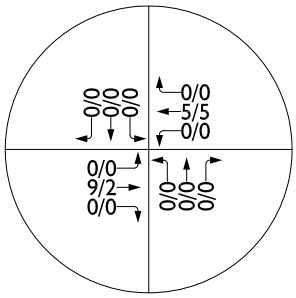
(1)	= Study Area Intersection
✳	= Project Site
10/20	= AM/PM Peak Hour Volumes
- -	= Existing Driveway
187	= 24-Hour ADT (Average Daily Traffic)



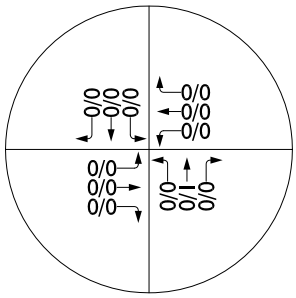
1. I-110 SB Ramps (NS) & Rosecrans Ave (EW)



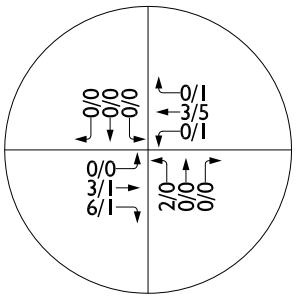
2. I-110 NB Ramps (NS) & Rosecrans Ave (EW)



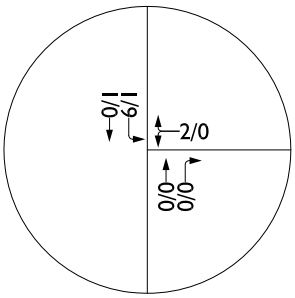
3. South Main St (NS) & Rosecrans Ave (EW)



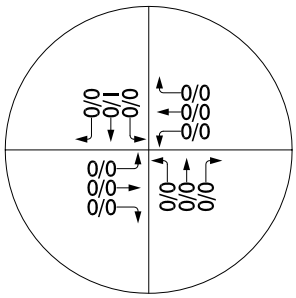
4. South Avalon Blvd (NS) & East 135th Street (EW)



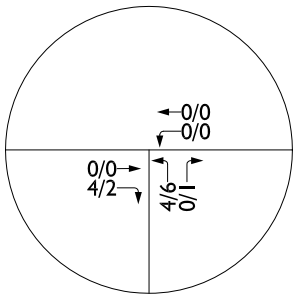
5. South Avalon Blvd (NS) & Rosecrans Ave (EW)



6. South Avalon Blvd (NS) & Project Driveway (EW)



7. South Avalon Blvd (NS) & East Compton Blvd (EW)

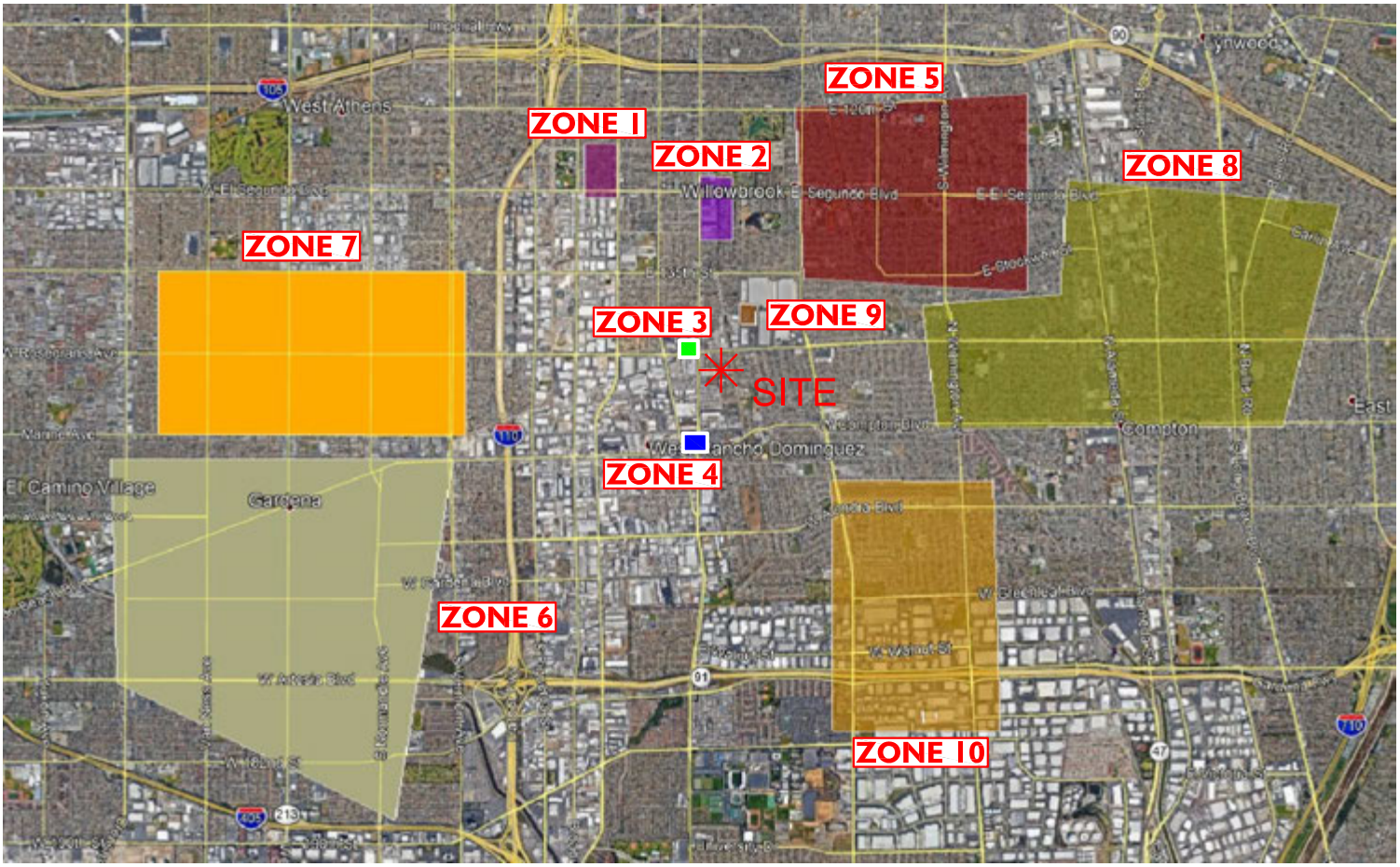


8. Project Driveway (NS) & Rosecrans Ave (EW)

N

Exhibit 4-4

Cumulative Developments Location Map

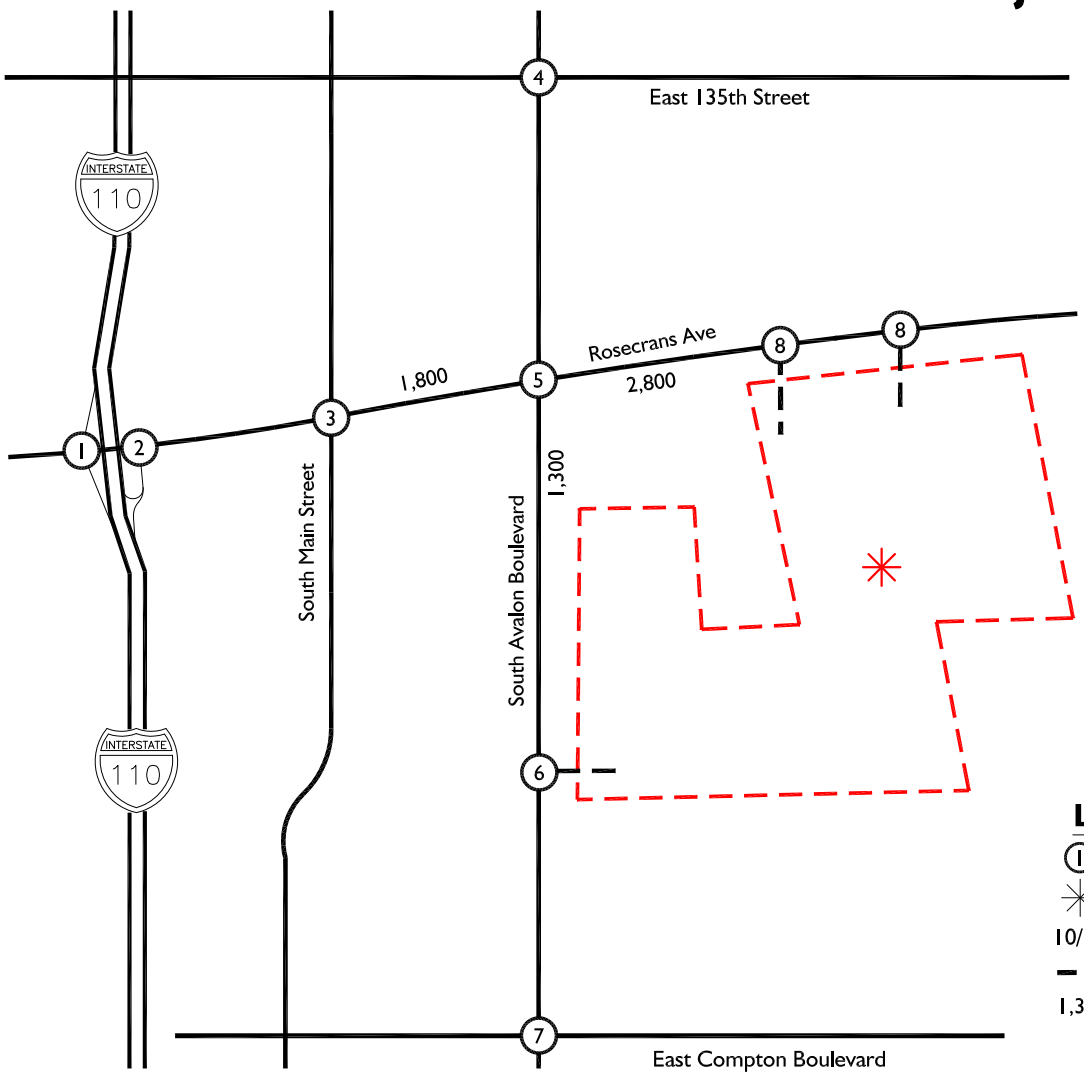


NOTE: For a complete list of cumulative projects in each zone, please see Table 4-2.

N

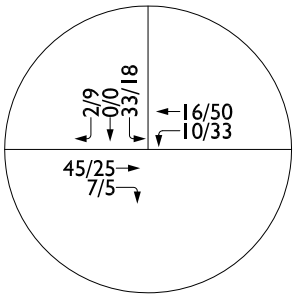
Exhibit 4-5

Cumulative Projects Traffic Volumes

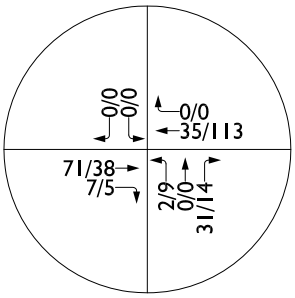


Legend:

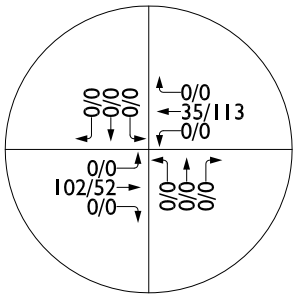
(1)	= Study Area Intersection
✳	= Project Site
10/20	= AM/PM Peak Hour Volumes
- -	= Existing Driveway
1,300	= 24-Hour ADT (Average Daily Traffic)



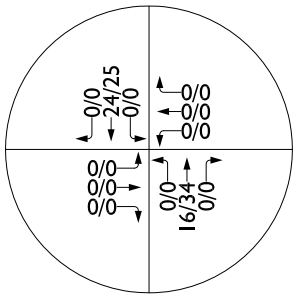
1. I-110 SB Ramps (NS) & Rosecrans Ave (EW)



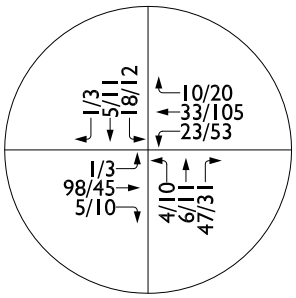
2. I-110 NB Ramps (NS) & Rosecrans Ave (EW)



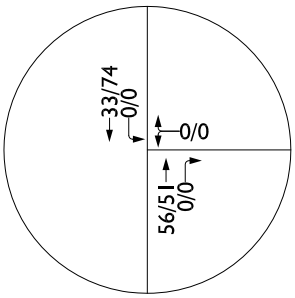
3. South Main St (NS) & Rosecrans Ave (EW)



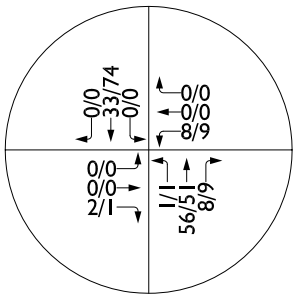
4. South Avalon Blvd (NS) & East 135th Street (EW)



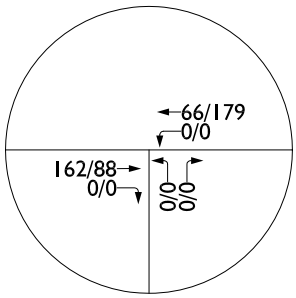
5. South Avalon Blvd (NS) & Rosecrans Ave (EW)



6. South Avalon Blvd (NS) & Project Driveway (EW)



7. South Avalon Blvd (NS) & East Compton Blvd (EW)



8. Project Driveway (NS) & Rosecrans Ave (EW)

N

TABLE 4-1

Project Trip Generation

Project Trips	Peak Hour						Daily
	AM			PM			
	In	Out	Total	In	Out	Total	
Buses	6	2	8	1	0	1	157
Employees (Passenger cars, light-duty trucks, SUVs)	4	4	8	2	7	9	284
Maintenance Vehciles/Other Trucks	0	0	0	0	0	0	2
Total	**10**	**6**	**16**	**3**	**7**	**10**	**443**

[1] Source: Observed Traffic Survey conducted by RK Engineering Group, Inc. 10/30/18 at Transdev Metro Bus Facility Operations, 1611 Naud Street, Los Angeles.

TABLE 4-2

Cumulative Projects Trip Generation

TAZ	Jurisdiction[1]	Project	Land Use	Quantity	Units[2]	Peak Hour[3]						Daily[3]
						AM			PM			
						In	Out	Total	In	Out	Total	
1	Los Angeles Co.	RPPL2015000193	Single Family Home	1	DU	0	1	1	1	0	1	9
	Los Angeles Co.	RPPL2015000326	Warehouse	4.067	TSF	1	0	1	0	1	1	7
						1	**1**	**2**	**1**	**1**	**2**	**16**
2	Los Angeles Co.	RPPL2017008645	Park Improvements	19.801	TSF	23	12	35	21	24	45	571
						23	**12**	**35**	**21**	**24**	**45**	**571**
3	Los Angeles Co.	RPPL2018001550	Commercial	6.221	TSF	4	2	6	11	12	23	235
						4	**2**	**6**	**11**	**12**	**23**	**235**
4	Los Angeles Co.	RPPL2016001599	Fast Food w/o Drive Thru	1.020	TSF	15	10	25	14	14	28	353
						15	**10**	**25**	**14**	**14**	**28**	**353**
5	Los Angeles Co.	RPPL2017011125	Medical Office	52.000	TSF	113	32	145	50	130	180	1,810
	Los Angeles Co.	RPPL2016004514	Multi-Family (Low-Rise)	9	DU	1	3	4	3	2	5	66
	Los Angeles Co.	RPPL2016003845	Single Family Home	1	DU	0	1	1	1	0	1	9
	Los Angeles Co.	RPPL2018001384	Single Family Home	1	DU	0	1	1	1	0	1	9
	Los Angeles Co.	RPPL2016000677	Single Family Home	1	DU	0	1	1	1	0	1	9
	Los Angeles Co.	RPPL2016005218	Single Family Home	1	DU	0	1	1	1	0	1	9
	Compton	2409 N Wilmington Ave	Residential Development	3	DU	0	1	1	1	1	2	22
						114	**40**	**154**	**58**	**133**	**191**	**1,934**
6	Gardena	1333 W. 168th St.	Condominium	4	DU	0	1	1	1	1	2	29
	Gardena	1348 W. 168th St.	Condominium	10	DU	1	4	5	4	2	6	73
	Gardena	1112 Gardena Blvd.	Mixed Use Development	32.944	TSF	26	9	35	33	49	82	784
	Gardena	1515 W. 178th St.	Residential Development	114	DU	12	40	52	40	24	64	834
	Gardena	16819 Normandie Ave.	Single Room Occupancy	69	DU	7	24	31	24	14	38	505
	Gardena	15930 S. Western Ave.	Medical Office Building	6.430	TSF	14	4	18	6	16	22	224
	Gardena	16210 Crenshaw Blvd	Drive-Thru Restrauant	4.860	TSF	100	96	196	83	76	159	2,289
	Gardena	1420 W. Redondo Beach Blvd.	Retail Building	4.053	TSF	2	1	3	7	8	15	153
	Gardena	1399 W. Artesia Blvd.	Gas Staion with Sam's Club	16	VFP	82	82	164	112	112	224	2,752
	Gardena	1147 W. Gardena Blvd.	Apartment	4	DU	0	1	1	1	1	2	29
	Gardena	16958 S. Western Ave.	Townhomes	46	DU	5	16	21	16	10	26	337
	Gardena	15927 S. Brighton Ave.	Apartment	2	DU	0	1	1	1	0	1	15
						249	**279**	**528**	**328**	**313**	**641**	**8,024**
7	Gardena	1417 W. 141st St.	Townhomes	63	DU	7	22	29	22	13	35	461
	Gardena	13919 Normandie Ave.	Single Room Occupancy	21	DU	2	7	9	7	4	11	154
	Gardena	1715 W. 149th St.	Townhomes	5	DU	1	2	3	2	1	3	37
	Gardena	14105 S. Vermont Ave.	Restrauant (Fast Casual Restaurant)	1.500	TSF	2	1	3	12	10	22	473
	Gardena	14321 Van Ness Ave.	Townhomes	40	DU	4	14	18	14	8	22	293
						16	**46**	**62**	**57**	**36**	**93**	**1,418**
8	Compton	2001 E Rosecrans Ave	Condominium	62	DU	7	22	29	22	13	35	454
	Compton	809 E Pine Street	Condominium	6	DU	1	2	3	2	1	3	44
	Compton	1901 W El Segundo Blvd	Self Storage Facility	186.432	TSF	11	3	14	5	13	18	261
	Compton	821 W Rosecrans Ave	Commercial Center	15.500	TSF	9	6	15	28	31	59	585
	Compton	106 N Long Beach Blvd	Gas Station W Convinience Store	3.00	TSF	61	61	122	74	74	148	1,873
	Compton	126 E Oris St	Industrial Building	95.000	TSF	59	8	67	8	52	60	471
						148	**102**	**250**	**139**	**184**	**323**	**3,688**
9	Compton	1420 N McKinley Ave	Industrial Building	139.675	TSF	86	12	98	11	77	88	693
						86	**12**	**98**	**11**	**77**	**88**	**693**
10	Compton	2200 W Artesia Blvd	Commercial Center	36.500	TSF	21	13	34	67	72	139	1,378
	Compton	961 S Wilmington Ave	Car Wash	2.959	TSF	0	0	0	21	21	42	0
						21	**13**	**34**	**88**	**93**	**181**	**1,378**
						677	**517**	**1,194**	**728**	**887**	**1,615**	**18,310**

[1] Cumulative project information was obtained from local City/County Planning Departments and represent all reasonably foreseeable development projects disclosed to RK at the time this analysis was prepared.

[2] DU = Dwelling Unit
TSF = Thousand Square Feet

[3] Trip Generation calculated based on ITE Trip Generation Manual, 10th Edition, 2017.

BE:av/RK12774TB
JN:2216-2017-01

5.0 Existing Plus Project Traffic Conditions

5.1 Method of Projection

To assess Existing Plus Project traffic conditions, project traffic is added to existing conditions in the vicinity of the project as they exist currently at the time this traffic analysis is being commenced. Existing conditions are based on Year 2018 traffic volumes and roadway configuration.

5.2 Existing Plus Project Traffic Volumes

Existing Plus Project conditions AM and PM peak hour intersection turning movement volumes and average daily traffic are shown on Exhibit 5-1.

5.3 Existing Plus Project Intersection Level of Service Analysis

The intersection level of service analysis for Existing Plus Project conditions is shown in Table 5-1. The level of service analysis compares without project conditions to with project conditions. The level of service calculation worksheets for Existing Plus Project conditions are provided in Appendix E.

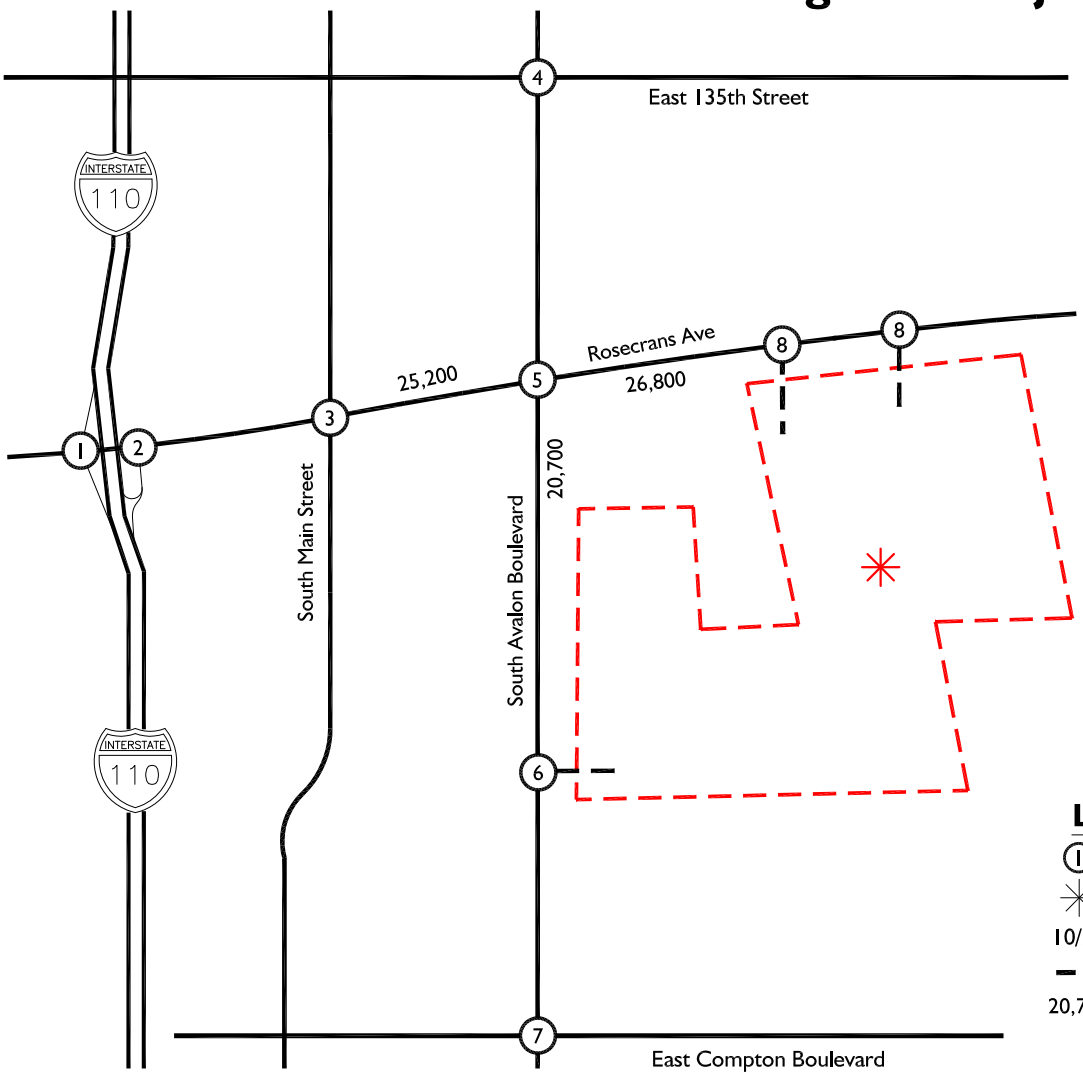
As shown in Table 5-1, all off-site intersections are currently operating at acceptable levels of service, D or better.

The project driveways at Rosecrans Avenue is expected to experience potential vehicle delay of up to 58.3 seconds during PM peak hour conditions, which corresponds to level of service F based on HCM criteria. This is caused by a relatively small number of vehicles (6 cars) attempting to make a northbound left-turn out of the site and onto Rosecrans Avenue during the PM peak hour. The level of service deficiency is not considered a significant traffic impact because the vehicle delay would occur on the project site and not impact the public right-of-way, planned circulation system or CMP network for which performance criteria has been established.

Furthermore, the delay would not result in a substantial increase in hazards due to a design feature. The 95th percentile queue for traffic exiting the site is only one (1) vehicle or less; thus indicating no significant on-site queuing or disruption to on-site circulation would occur. The project driveways do not warrant a traffic signal and no additional mitigation measures are recommended.

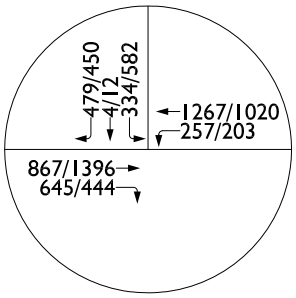
Exhibit 5-1

Existing Plus Project Traffic Volumes

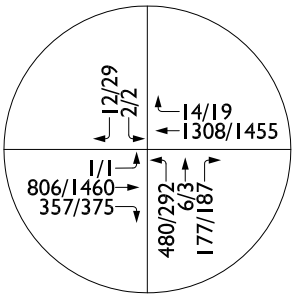


Legend:

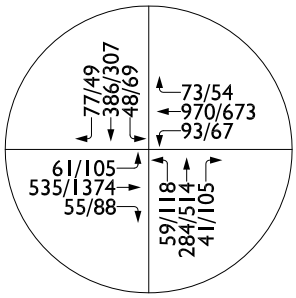
(1)	= Study Area Intersection
✳	= Project Site
10/20	= AM/PM Peak Hour Volumes
- -	= Existing Driveway
20,700	= 24-Hour ADT (Average Daily Traffic)



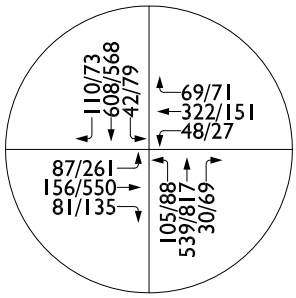
1. I-110 SB Ramps (NS) & Rosecrans Ave (EW)



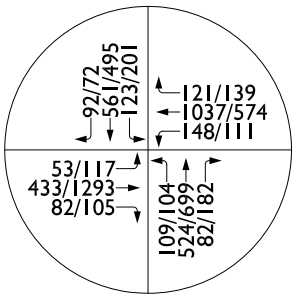
2. I-110 NB Ramps (NS) & Rosecrans Ave (EW)



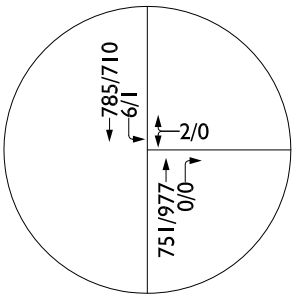
3. South Main St (NS) & Rosecrans Ave (EW)



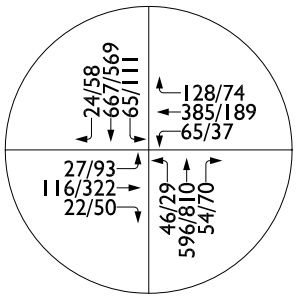
4. South Avalon Blvd (NS) & East 135th Street (EW)



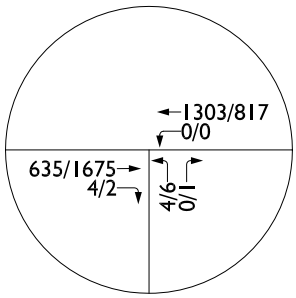
5. South Avalon Blvd (NS) & Rosecrans Ave (EW)



6. South Avalon Blvd (NS) & Project Driveway (EW)



7. South Avalon Blvd (NS) & East Compton Blvd (EW)



8. Project Driveway (NS) & Rosecrans Ave (EW)

N

TABLE 5-1

Existing Plus Project Conditions
Intersection Level of Service Analysis

Intersection	Traffic Control[6]	Existing Conditions[1,2]				Existing Plus Project[1,2]				Project V/C Ratio Increase			
		AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
		Delay - HCM	V/C - ICU	Delay - LOS	V/C - LOS	Delay - LOS	V/C - LOS	Delay - LOS	V/C - LOS	Delta	Significant Impact?	Delta	Significant Impact?
1. I-110 SB Ramp / Rosecrans Ave	TS	52.9 - D	0.832 - D	45.5 - D	0.826 - D	52.7 - D	0.834 - D	45.7 - D	0.828 - D	0.002	No	0.002	No
2. I-110 NB Ramp / Rosecrans Ave	TS	17.8 - B	0.591 - A	17.8 - B	0.576 - A	17.7 - B	0.592 - A	17.8 - B	0.578 - A	0.001	No	0.002	No
3. S Main St / Rosecrans Ave	TS	--	0.512 - A	--	0.650 - B	--	0.513 - A	--	0.650 - B	0.001	No	0.000	No
4. S Avalon Blvd / E 135th St	TS	--	0.511 - A	--	0.787 - C	--	0.511 - A	--	0.787 - C	0.000	No	0.000	No
5. S Avalon Blvd / Rosecrans Ave	TS	--	0.616 - B	--	0.804 - D	--	0.618 - B	--	0.805 - D	0.002	No	0.001	No
6. Avalon Blvd / Project Dwy	CSS	0.0 - A	--	0.0 - A	--	11.1 - B	--	10.5 - B	--	--	--	--	--
7. S Avalon Blvd / E Compton Blvd	TS	--	0.514 - A	--	0.563 - A	--	0.514 - A	--	0.563 - A	0.000	No	0.000	No
8. Project Dwy / Rosecrans Ave	CSS	0.0 - A	--	0.0 - A	--	17.5 - C	--	58.3 - F	--	--	--	--	--

[1] Analysis Software: Delay (HCM 2010 Methodology) based on Synchro, Version 10.0; and V/C (ICU Methodology) based on Traffix, Version 8.0.

[2] HCM level of service is based on average vehicle approach delay for signalized intersections and worst leg/approach delay for cross-street stop-controlled intersections. Delay measured in seconds.
V/C = Volume to Capacity Ratio. It should be noted that the V/C is not calculated for unsignalized intersections.

6.0 Cumulative Traffic Conditions

6.1 Method of Projection

Cumulative traffic conditions include existing conditions in the vicinity of the project as they exist currently at the time this traffic analysis is being commenced plus the addition of traffic from other reasonably foreseeable cumulative development projects in the vicinity of the analysis study area. Cumulative project traffic is further discussed in Section 4.4.

Project related traffic impacts for Cumulative traffic conditions are analyzed by comparing the "without" and "with" project scenarios.

6.2 Cumulative Conditions Traffic Volumes

Cumulative Conditions without Project AM and PM peak hour intersection turning movement volumes and average daily traffic are shown on Exhibit 6-1.

Cumulative Conditions with Project AM and PM peak hour intersection turning movement volumes and average daily traffic are shown on Exhibit 6-2.

6.3 Cumulative Conditions Intersection Level of Service Analysis

The intersection level of service analysis for Cumulative Conditions is shown in Table 6-1. The level of service analysis compares without project conditions to with project conditions. The level of service calculation worksheets for Cumulative conditions without and with Project are provided in Appendix F and Appendix G, respectively.

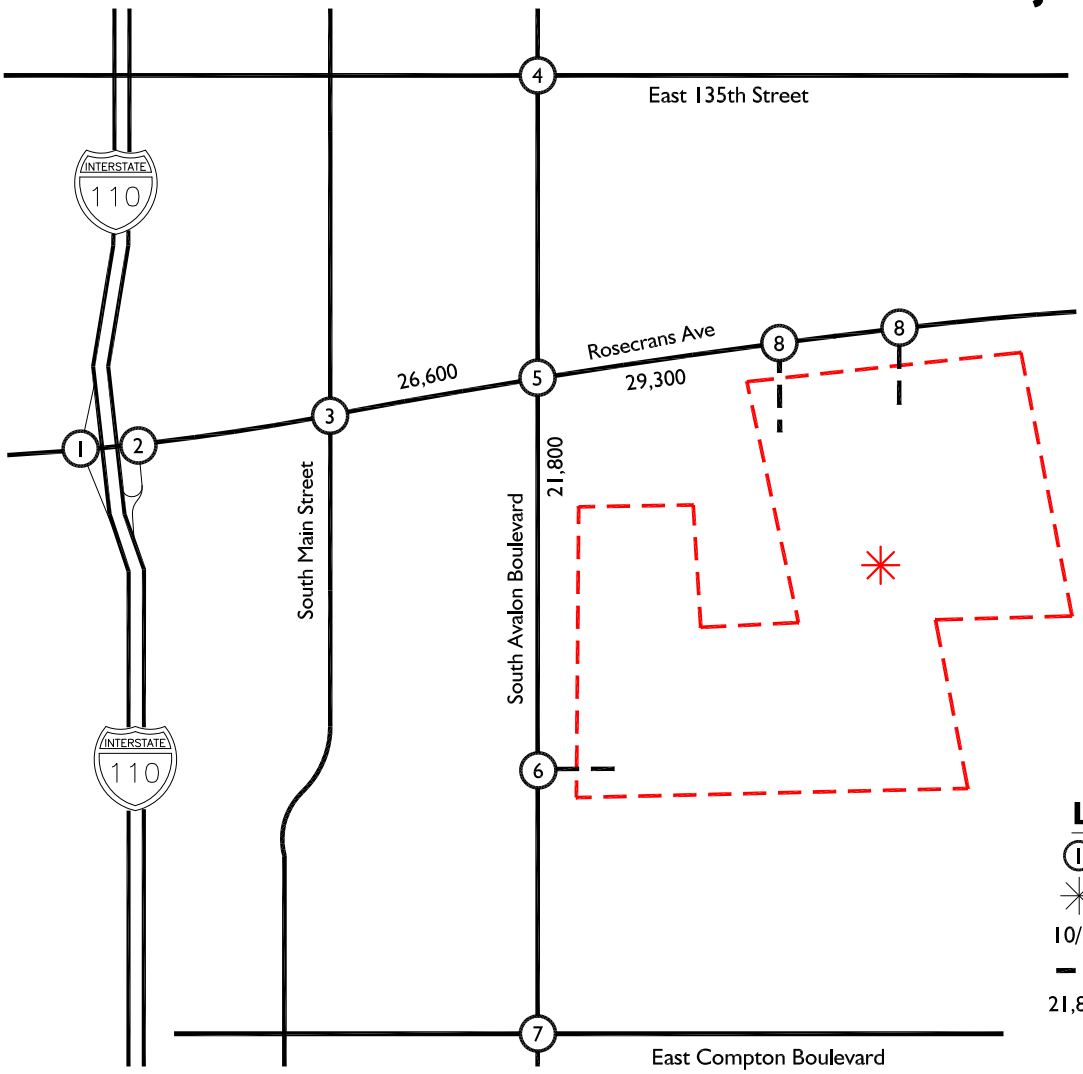
As shown in Table 6-1, all off-site intersections are expected to continue to operate at acceptable levels of service, D or better.

The project driveways at Rosecrans Avenue are expected to experience potential vehicle delay of up to 67.6 seconds during PM peak hour conditions, which corresponds to level of service F based on HCM criteria. This is caused by a relatively small number of vehicles (6 cars) attempting to make a northbound left-turn out of the site and onto Rosecrans Avenue during the PM peak hour. The level of service deficiency is not considered a significant traffic impact because the vehicle delay would occur on the project site and not impact the public right-of-way, planned circulation system or CMP network for which performance criteria has been established.

Furthermore, the delay would not result in a substantial increase in hazards due to a design feature. The 95th percentile queue for traffic exiting the site is only one (1) vehicle or less; thus indicating no significant on-site queuing or disruption to on-site circulation would occur. The project driveways do not warrant a traffic signal and no additional mitigation measures are recommended.

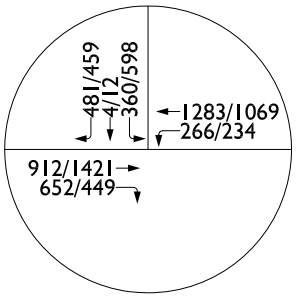
Exhibit 6-1

Cumulative Conditions Without Project Traffic Volumes

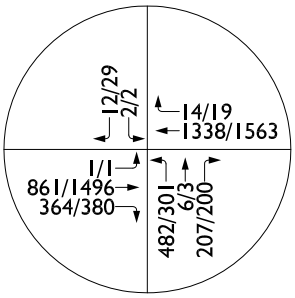


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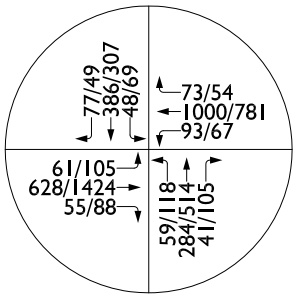
(1)	= Study Area Intersection
✳	= Project Site
10/20	= AM/PM Peak Hour Volumes
- -	= Existing Driveway
21,800	= 24-Hour ADT (Average Daily Traffic)



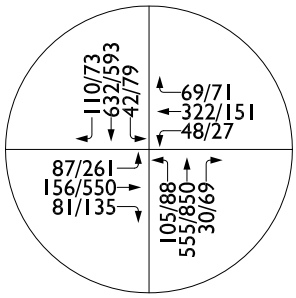
1. I-110 SB Ramps (NS) & Rosecrans Ave (EW)



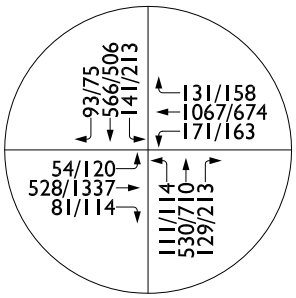
2. I-110 NB Ramps (NS) & Rosecrans Ave (EW)



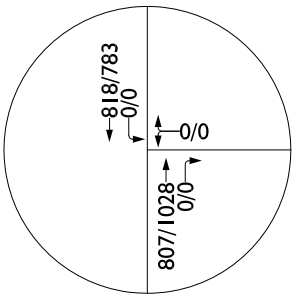
3. South Main St (NS) & Rosecrans Ave (EW)



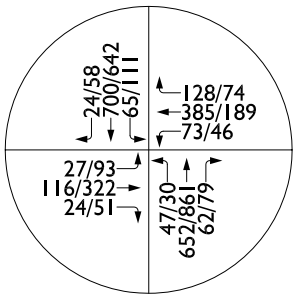
4. South Avalon Blvd (NS) & East 135th Street (EW)



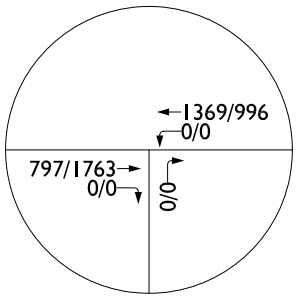
5. South Avalon Blvd (NS) & Rosecrans Ave (EW)



6. South Avalon Blvd (NS) & Project Driveway (EW)



7. South Avalon Blvd (NS) & East Compton Blvd (EW)

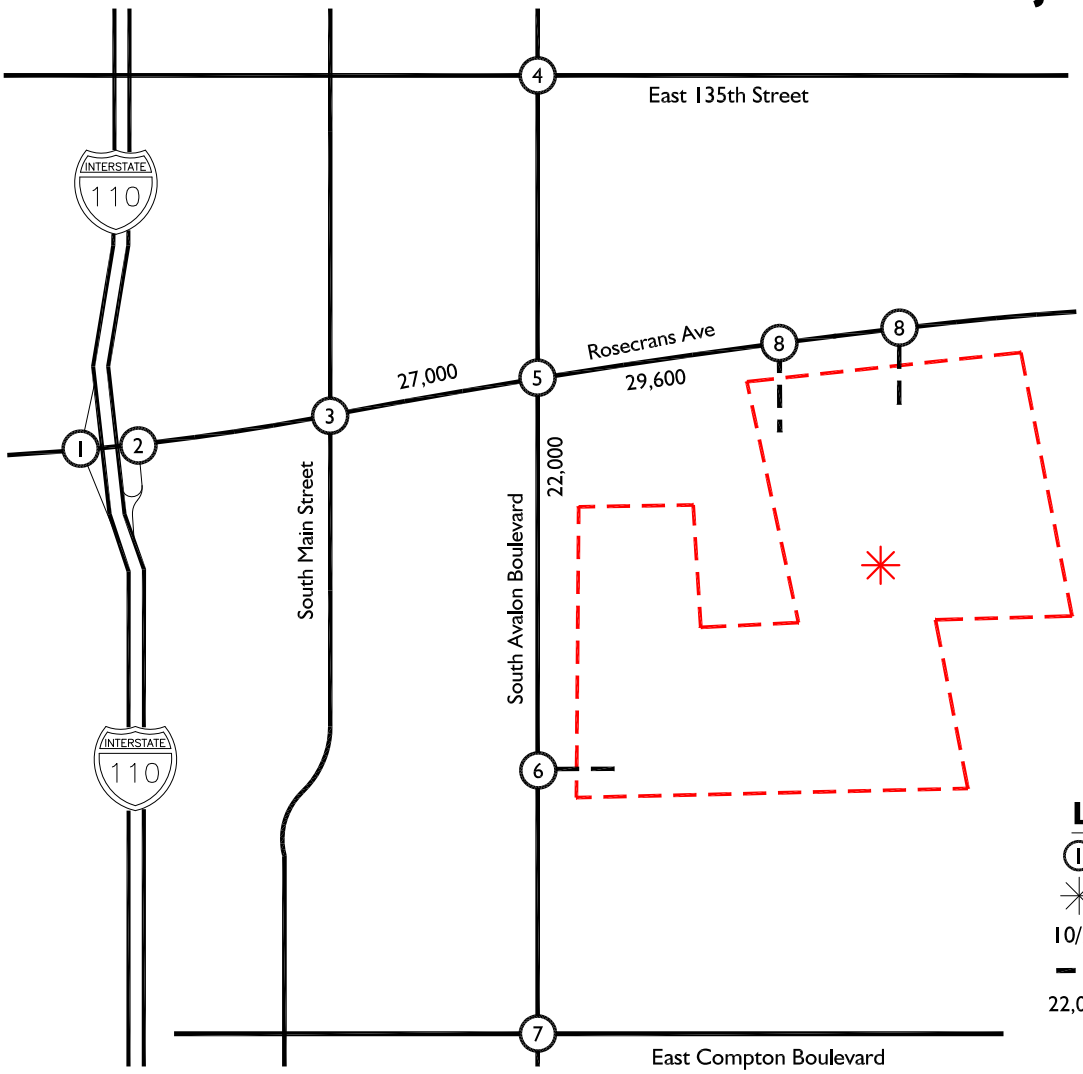


8. Project Driveway (NS) & Rosecrans Ave (EW)

N

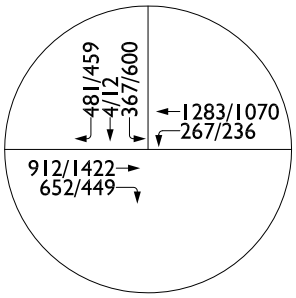
Exhibit 6-2

Cumulative Conditions With Project Traffic Volumes

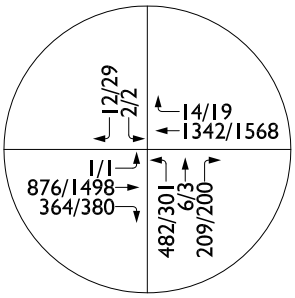


Legend:

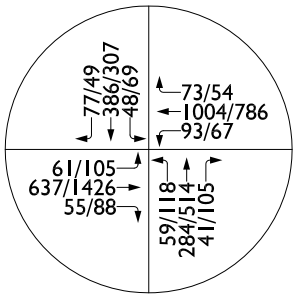
(1)	= Study Area Intersection
✳	= Project Site
10/20	= AM/PM Peak Hour Volumes
- -	= Existing Driveway
22,000	= 24-Hour ADT (Average Daily Traffic)



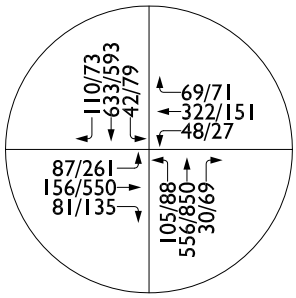
1. I-110 SB Ramps (NS) & Rosecrans Ave (EW)



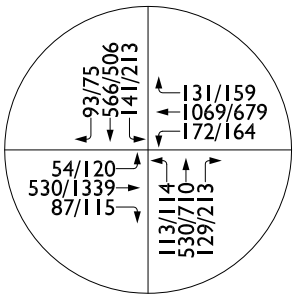
2. I-110 NB Ramps (NS) & Rosecrans Ave (EW)



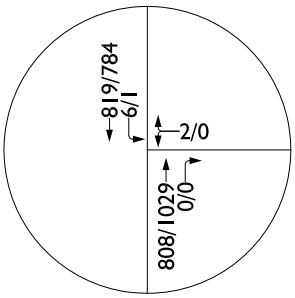
3. South Main St (NS) & Rosecrans Ave (EW)



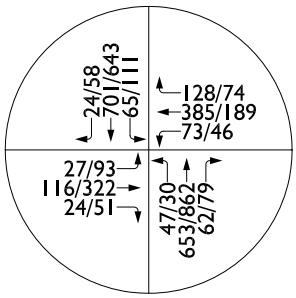
4. South Avalon Blvd (NS) & East 135th Street (EW)



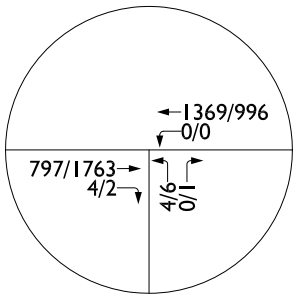
5. South Avalon Blvd (NS) & Rosecrans Ave (EW)



6. South Avalon Blvd (NS) & Project Driveway (EW)



7. South Avalon Blvd (NS) & East Compton Blvd (EW)



8. Project Driveway (NS) & Rosecrans Ave (EW)

N

TABLE 6-1

Cumulative Conditions
Intersection Level of Service Analysis

Intersection	Traffic Control[6]	Cumulative Conditions Without Project[1,2]				Cumulative Conditions With Project[1,2]				Project V/C Ratio Increase			
		AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
		Delay - LOS	V/C - LOS	Delay - LOS	V/C - LOS	Delay - LOS	V/C - LOS	Delay - LOS	V/C - LOS	Delta	Significant Impact?	Delta	Significant Impact?
1. I-110 SB Ramp / Rosecrans Ave	TS	45.8 - D	0.850 - D	50.1 - D	0.859 - D	45.8 - D	0.852- D	50.9 - D	0.860 - D	0.002	No	0.001	No
2. I-110 NB Ramp / Rosecrans Ave	TS	18.1 - B	0.608 - B	18.9 - B	0.607 - B	18.1 - B	0.610 - B	19.0 - B	0.608 - B	0.002	No	0.001	No
3. S Main St / Rosecrans Ave	TS	--	0.519 - A	--	0.661 - B	--	0.520 - A	--	0.661 - B	0.001	No	0.000	No
4. S Avalon Blvd / E 135th St	TS	--	0.518 - A	--	0.797 - C	--	0.518 - A	--	0.797 - C	0.000	No	0.000	No
5. S Avalon Blvd / Rosecrans Ave	TS	--	0.637 - B	--	0.859 - D	--	0.637 - B	--	0.860 - D	0.000	No	0.001	No
6. Avalon Blvd / Project Dwy	CSS	0.0 - A	--	0.0 - A	--	11.4 - B	--	10.8 - B	--	--	--	--	--
7. S Avalon Blvd / E Compton Blvd	TS	--	0.525 - A	--	0.584 - A	--	0.526 - A	--	0.584 - A	0.001	No	0.000	No
8. Project Dwy / Rosecrans Ave	CSS	0.0 - A	--	0.0 - A	--	20.5 - C	--	67.6 - F	--	--	--	--	--

[1] Analysis Software: Delay (HCM 2010 Methodology) based on Synchro, Version 10.0; and V/C (ICU Methodology) based on Traffix, Version 8.0.

[2] HCM level of service is based on average vehicle approach delay for signalized intersections and worst leg/approach delay for cross-street stop-controlled intersections. Delay measured in seconds.
V/C = Volume to Capacity Ratio. It should be noted that the V/C is not calculated for unsignalized intersections.

7.0 Recommendations

7.1 Project Access and Circulation Recommendations

DF-1 Install stop signs, stop bars and stop legends at all project access driveways.

DF-2 Restrict bus access on Rosecrans Avenue. All buses should utilize the Avalon Boulevard Driveway only.

DF-3 Close the center project driveway on Rosecrans Avenue.

DF-4 Adequate sight distance should be provided and maintained at all project access driveways per County of Los Angeles standards.

a. The limited use area shall be used for the purpose of prohibiting or clearing obstructions to maintain adequate sight distance at intersections.

b. Limited use area to be kept clear of all obstructions over 30 inches high, including vegetation.

c. No trees, walls, or any obstructions shall be allowed in the limited use area.

d. An illustration of sight distance requirements has been provided in Exhibit 7-1a, 7-1b and 7-1c.

DF-5 The final on-site circulation system shall be reviewed and approved by the Los Angeles County Fire Department and local waste provider to ensure adequate access is provided.

Recommendations are graphically shown on Exhibit 7-2.

7.2 Conclusions

Based upon this traffic impact analysis, the project would not conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system. Nor would the project conflict with an applicable congestion management program, including, but not limited to level of service standards and travel

demand measures, or other standards established by the county congestion management agency for designated roads or highways. Several recommended project design features have been highlighted in this study to ensure the project does not substantially increase design hazards.

The scope of work for this study effort was prepared in conjunction with the County of Los Angeles Public Works Department and follows the standards described in the County's Traffic Impact Analysis Guidelines.

Exhibit 7-1a

Sight Distance - South Avalon Boulevard / Project Driveway



Legend:

= Limited Use Area

N

Exhibit 7-1b

Sight Distance - West Project Driveway / Rosecrans Avenue



Legend:

= Limited Use Area

N

Exhibit 7-1c

Sight Distance - East Project Driveway / Rosecrans Avenue

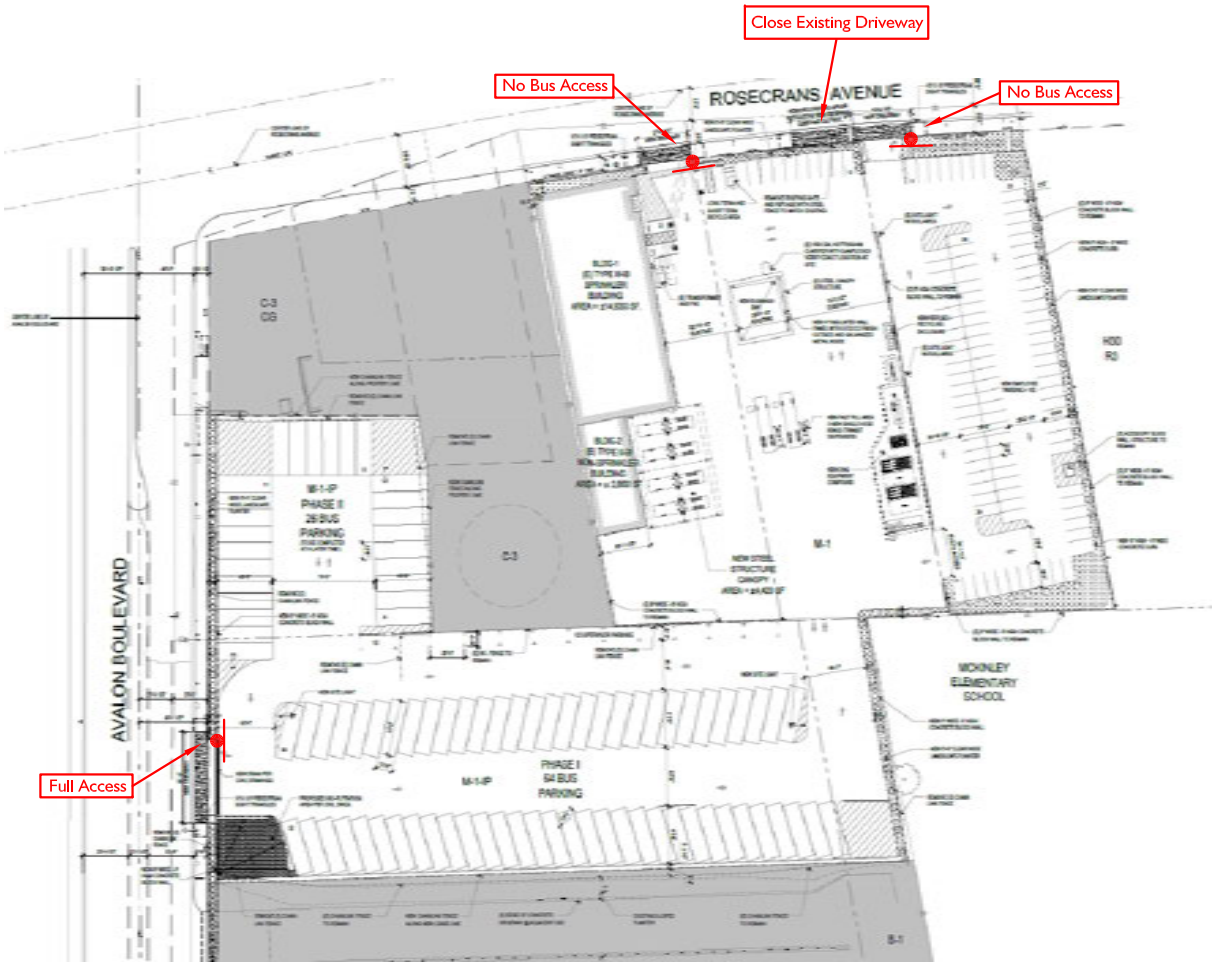


N

Legend:

= Limited Use Area

Recommendations



Access and Circulation Recommendations

i. Install stop signs, stop bars and stop legends at all project access driveways.

ii. Restrict bus access on Rosecrans Avenue. All buses should utilize the Avalon Boulevard Driveway only.

iii. Close the center project driveway on Rosecrans Avenue.

iv. Adequate sight distance should be provided and maintained at all project access driveways per County of Los Angeles standards. An illustration of sight distance requirements has been provided in Exhibit 7-1a, 7-1b and 7-1c.

   a. The limited use area shall be used for the purpose of prohibiting or clearing obstructions to maintain adequate sight distance at intersections.

   b. Limited use area to be kept clear of all obstructions over 30 inches high, including vegetation.

   c. No trees, walls, or any obstructions shall be allowed in the limited use area.

v. The final on-site circulation system shall be reviewed and approved by the Los Angeles County Fire Department and local waste provider to ensure adequate access is provided.

Legend:

= Install stop sign, stop bar and stop legend

N

Appendices

Appendix A

Approved Scoping Agreement with
Los Angeles County Public Works Department

SCOPING FOR TRAFFIC STUDY

Project Name:	METRO BUS FACILITY - ROSECRANS & AVALON

This Memorandum of Understanding (MOU) acknowledges Los Angeles County Department of Public Works, Traffic and Lighting Division (TLD) requirements of traffic impact analysis for the project and is subject to change:

Project Address:	636 East Rosecrans Avenue, Los Angeles, CA 90059		
Project Description:	5.35 acre site for Metro bus facility with CNG fueling, repair, wash, parking, and 12,236 sf office building.		
City:	Unincorporated County of Los Angeles		
Project Build-out Year:	2019	**Notice of Preparation/Start of Env. Analysis:**	
Closest Intersection (Xtn) to the Project			
Xtn N/S Street Name:	Avalon Boulevard		
Xtn E/W Street Name:	Rosecrans Avenue		
Thomas Guide Pg+Grid:	734-E3, E4	**Los Angeles County Supervisorial District:**	2

	Consultant	**Developer**
Company:	RK Engineering Group, Inc.	Transdev
Name:	Bryan Estrada	Ibrahima Toure
Address:	4000 Westerly Place, #280	720 Butterfield Road, #300
City, State, Zip Code:	Newport Beach, CA 92660	Lombard, IL 90148
Phone #:	949-474-0809	530-321-0345
Fax #:	949-474-0902	
Email:	be@rkengineer.com	Ibrahima.Toure@transdev.com

By: RK Engineering Group, Inc.	**Reviewed By:**
Print Name: Bryan Estrada	**Print Name:**
Phone: 949-474-0809	**Phone:**
Email: be@rkengineer.com	**Email:**
Bryan Estrada **11/13/18**	Sean Ryan 11/13/2018
Consultant/Developer's Representative **Date**	**TLD's Representative** **Date**

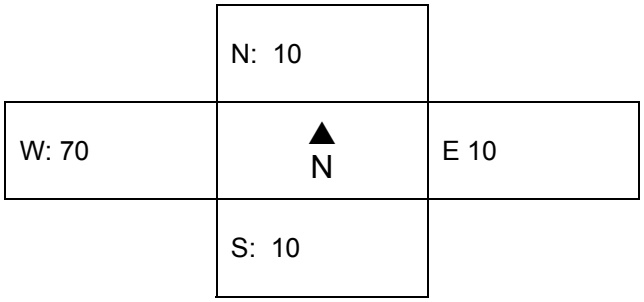
For General Questions, please contact Traffic Studies Section at (626) 300-4740

By:_____
Date:_____

SCOPING FOR TRAFFIC STUDY

Project Name:	METRO BUS FACILITY - ROSECRANS & AVALON

1. Traffic Distribution: Figure(s) illustrating project trip distribution in percentages and volumes at the studied intersections analyzed.



*See attached project trip distribution exhibit.

Trip Credit/Reduction: Exact amount of credit subject to approval by TLD.

Existing Active Land Use Credit	Yes/no	No
Previous Land Use Credit	Yes/no	No
Internal Trip Reduction	Yes/no	No
Retail Pass-by Trip Reduction (10%)	Yes/no	No

Based on the project information provided to RK, buses would primarily service routes in the LA Metro and Valley Regions. Therefore, the most direct route to and from the site would be via Rosecrans Avenue and the I-110 Freeway. Bus and passenger car trip distributions are shown on attached exhibits.

SCOPING FOR TRAFFIC STUDY

Project Name:	METRO BUS FACILITY - ROSECRANS & AVALON

2. Trip Generation

Trip Generation Rate(s) Source: ITE Trip Generation	**I – Institute of Transportation Engineers; S – San Diego Traffic Generators; C – County; O – Other:**		

	Land Use Description (Code)	**Trip Generation Source**	***AVTE vs.**	**Quantity**	**Daily Trips Generated**	**Weekday a.m. peak**		**Weekday p.m. peak**		**Weekend peak hour**	
						In	**Out**	**In**	**Out**	**In**	**Out**
	Buses (No PCE)	O	Buses	--	157	6	2	1	0		
	Employees/Passenger Cars	O	Employees	--	284	4	4	2	7		
	Maintenance Vehicles/Other Trucks	O	Maintenance	--	2	0	0	0	0		
	Total				443	10	6	3	7		
Project trip generation is estimated based on observed trip generation counts at the existing 1611 Naud Street facility. Operational characteristics, including number of buses and employees, of the new project site are expected to remain the same at the new project location.											

By:_____
Date:_____

* - Average Vehicle Trip Ends.

3. Study Intersections: At minimum, the study shall include the following intersections. The list is subject to change after related projects, trip generation and distribution are determined. Consultant should check with adjoining Cities regarding their requirements in addition to the following County/City intersections. Documentation of the consultation from these agencies shall be included in the traffic study.

Xtn #	Jurisdictional Split	Thomas Guide Page+Grid	N/S and E/W Street Names	Signalized	CMP
1	County	734-E3	Avalon Boulevard (NS) at Rosecrans Avenue (EW)	Yes	No
2	County	734-E3	Avalon Boulevard (NS) at Project Driveway (EW) (bus access)	No	No
3	County	734-E3	Project Driveway (NS) at Rosecrans (EW) (Employees only. No buses will access site via Rosecrans).	No	No
4	County	734-E4	Avalon Boulevard (NS) at Compton Boulevard (EW)	Yes	No
5	County	734-E2	Avalon Boulevard (NS) at 135th Street (EW)	Yes	No
6	County	734-E3	Main Street (NS) at Rosecrans Avenue (EW)	Yes	No
7	LADOT/ Caltrans	734-E3	I-110 Freeway Northbound Ramps (NS) at Rosecrans Ave (EW)	Yes	No
8	LADOT/ Caltrans	734-E3	I-110 Freeway Southbound Ramps (NS) at Rosecrans Avenue (EW)	Yes	No
9				Yes	No

4. Related Projects: Project Consultant shall consultant with Los Angeles County Department of Regional Planning and planning departments of adjoining Cities to identify planned development in the vicinity of the project site.

5. Congested Management Program (CMP): Project Consultant shall conduct CMP analysis in accordance with the County's Traffic Impact Analysis Report Guidelines.

6. Freeway Analysis: Project Consultant shall consult with the State of California Department of Transportation (Caltrans) to determine the California Environmental Quality Act levels of significance with regard to traffic impacts on Caltrans' freeway facilities. This consultation shall also include a determination of Caltrans requirements for the study of traffic impacts to its facilities and the mitigation of any such impacts. This analysis must follow the most current Caltrans' Guide for the Preparation of Traffic Impact Studies (December 2002). If Caltrans finds that the project has a significant impact on the freeway, Caltrans shall be requested to include the basis for this finding in their response. If fees are proposed to mitigate the freeway impact, Caltrans shall be requested to identify the specific project to which the fees will apply. These written comments from Caltrans shall be included with the traffic study and submitted to Public Works for review and approval. If a documented good faith effort is made to consult with Caltrans and written comments cannot be obtained from within a reasonable amount of time, an analysis of the freeway impact shall be made using the County of Los Angeles' CMP Land Use Analysis Guidelines.

7. Site Access Analysis: Project's in rural areas shall conduct a site access analysis in accordance with the County's Access Management for Private Developments Guidelines Manual. All schools, waste/recycling collection or other projects as determined by TLD shall conduct a queuing analysis to ensure queues do not spill-over onto County roads. For schools, provide boundary map and information on neighboring schools including day care facilities. The traffic study will also document pick-up and drop-off procedures.

8. Other Instructions:

Traffic counts may be conducted immediately per the following:
• Must be taken on Tuesdays, Wednesdays or Thursdays.
• Must exclude holidays, and the first weekdays before and after the holiday.
• Must be taken on days when local schools or colleges are in session.
• Must be taken on days of good weather, and avoid atypical conditions (e.g., road construction, detours, or major traffic incidents).
• Traffic counts used for other traffic studies in the area shall **NOT** be reused again, unless 25% of the counts conducted for that particular traffic study are validated with new counts. The difference in volumes between the old and new counts at each corresponding movement should not be more than 10%.
• New traffic counts shall be checked to ensure the difference in volumes at corresponding approaches, if applicable, between two adjacent intersections is no more than 10% unless the difference can be justified.
For all proposed mitigation measures to address project specific impacts, the project shall include conceptual plans for the improvements in the traffic study which shall be made part of the review and approval of the traffic study. All proposed improvements

shall be within public the right-of-way.
For all proposed mitigation measures to address cumulative impacts, the project shall include conceptual plans and cost estimates for the improvements in the traffic study which shall be made part of the review and approval of the traffic study.
Unless otherwise approved by TLD, level-of-service analysis shall be performed based on the following scenarios: (a) Traffic conditions in the vicinity of the project as they exist at the time the notice of preparation (NOP) is published, or if no NOP is published, at the time environmental analysis is commenced; (b) Traffic in (a) plus project traffic; (c) Traffic in (b) with the proposed mitigation measures (if necessary); (d) Traffic in (b) plus the cumulative traffic that includes project and other known developments at the time the notice of preparation (NOP) is published, or if no NOP is published, at the time environmental analysis is commenced; and (e) Traffic in (d) with the proposed mitigation measures (if necessary).
Any required Traffic Index calculations shall be prepared in accordance with the latest version of the Caltrans Highway Design Manual

LOS ANGELES COUNTY DEPARTMENT OF PUBLIC WORKS
TRAFFIC AND LIGHTING DIVISION
APPLICATION FOR ENVIRONMENTAL IMPACT REPORT
TRAFFIC STUDY REVIEW SERVICES, ORDINANCE NO. 91-0101

Road Fund No:	B03	Revenue Source	9254	Program No:	R297

Department Receipt No.:		**Date:**	
Project No.:	T4000300	**Studies No.:**	
Project Name:			
Applicant/Engineer:		**Telephone No.:**	
Company:		**Fax No.:**	
Address:			
City, State:		**Zip:**	

The traffic study (TS), required as part of the environmental review process, has been received. **Before a traffic study review can begin, the indicated fee must be paid to this Department.** The fee may be paid in person or mailed to:

In Person	By Mail
Cashier, Mezzanine Level (626) 458-6399 **Los Angeles County Department of Public Works** **900 South Fremont Avenue** **Alhambra, CA 91803-1331**	**Cashier, Mezzanine Level** **Los Angeles County Department of Public Works** **P.O. Box 1460** **Alhambra, CA 91802-1460**

Please **return this form** along with your payment to insure proper credit to your account. Make check payable to the **Los Angeles County Department of Public Works.**

TS review fees are based on the number of Average Daily Trips (ADT's) generated by the project as follows:

ADT's		**FEE (Effective March 1, 2018)*	
1 - 1,000		**$1,859**	
1,001 - 5,000		**$3,719**	
5,001 - 10,000		**$4,650**	
10,001 and over		**$5,578**	
ADT For This Project:		Fee:	

* For additional information, go to http://planning.lacounty.gov/
** Additional fee is required for additional traffic conditions/phases

Cashier, upon processing of payment, please notify: _____
TLD Representative Email

Updated 03/20/14

FOR PROJECTS IN MARINA DEL REY ONLY

Road Fund No:	B03	Revenue Source	9254	Program No:	R297

Department Receipt No.:		**Date:**	
Project No.:	T9420071	**Studies No.:**	
Project Name:			
Applicant/Engineer:		**Telephone No.:**	
Company:		**Fax No.:**	
Address:			
City, State:		**Zip:**	

The traffic study (TS), required as part of the environmental review process, has been received. **Before a traffic study review can begin, the indicated fee must be paid to this Department.** The fee may be paid in person or mailed to:

In Person	By Mail
Cashier, Mezzanine Level (626) 458-6399 **Los Angeles County Department of Public Works** **900 South Fremont Avenue** **Alhambra, CA 91803-1331**	**Cashier, Mezzanine Level** **Los Angeles County Department of Public Works** **P.O. Box 1460** **Alhambra, CA 91802-1460**

Please **return this form** along with your payment to insure proper credit to your account. Make check payable to the **Los Angeles County Department of Public Works.**

TS review fees are based on the number of Average Daily Trips (ADT's) generated by the project as follows:

ADT's		**FEE (Effective March 1, 2014)*	
1 - 1,000		**$1,713**	
1,001 - 5,000		**$3,425**	
5,001 - 10,000		**$4,282**	
10,001 and over		**$5,138**	
ADT For This Project:		Fee:	

* For additional information, go to http://planning.lacounty.gov/
** Additional fee is required for additional traffic conditions/phases

Cashier, upon processing of payment, please notify: _____
TLD Representative Email

Updated 03/20/14

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PROPOSED SITE PLAN

1" = 30' - 0"

1

SITE DATA

PROJECT INFORMATION:

THE PROJECT RENOVATIONS WILL INCLUDE CONVERTING THE CURRENT STORAGE,ASSEMBLY,MANUFACTURING, AND WAREHOUSE AREAS TO 5 INTERIOR MAINTENANCE BAYS FOR THE LIGHT DUTY REPAIR AND MAINTENANCE OF THE THE METRO BUS FLEET. MAINTENANCE WILL SUPPORT APPROXIMATELY 20 EMPLOYEES AND INCLUDE PARTS STORAGE, FLUID STORAGE AND DISTRIBUTION, COMPRESSED AIR, BATHROOM IMPROVEMENTS AND MAINTENANCE OFFICES.

THE PROJECT WILL ALSO INCLUDE 3 TO 4 OUTDOOR AND COVERED MAINTENANCE BAYS, A CNG FUELING STATION AND A BUS WASH.

SITE DATA:

TOTAL SITE AREA:	± 233,430 SF (5.35 ACRES)
ASSESSOR PARCEL NUMBERS:	
APN # - 6137-006-033	LOT C, PARCEL -1 = ± 39,840 SF
APN # - 6137-006-034	LOT D, PARCEL - 2 = ± 41,040 SF
APN # - 6137-006-043	LOT E, PARCEL - 3 = ± 41,530 SF
APN # - 6137-005-027	LOT 32, PARCEL - 4 = ± 111,020 SF
ZONING:	M-1
PROPOSED PARKING:	EMPLOYEE PARKING = 111 STALLS SUPERVISOR PARKING = 13 STALLS PHASE I BUS PARKING = 66 STALLS PHASE II BUS PARKING = 26 STALLS TOTAL BUS PARKING = 92 STALLS
ACCESSIBLE PARKING:	4 STALLS

BUILDING DATA:

CONSTRUCTION TYPE:	(E) BUILDING 1 - TYPE III-B (FULLY SPRINKLERED) (E) BUILDING 2 - TYPE II-B (NON SPRINKLERED)
ACTUAL STORIES OF BUILDING:	(E) BUILDING 1 - 2 STORIES = ±23'-6" (E) BUILDING 2 - 1 STOREY = ±30'-6" NEW STEEL CANOPY STRUCTURE = ±21'-0"
TENANT IMPROVEMENT AREA:	(E) BUILDING 1 = ± 14,930 SF (E) BUILDING 2 = ± 2,850 SF

RSHA
ARCHITECTURE and planning
RS HERMAN ARCHITECTS
1725 GARDENA AVENUE
GLENDALE, CA 91204
PH No. (323) 465-7066
Fax No. (323) 465-8066
www.rsharch.com

SEAL

LICENSED ARCHITECT RICHARD S. HERMAN No. C-9727 REN. 3-31-2019 STATE OF CALIFORNIA

CONSULTANT

TRANSDEV LACMTA BUS FACILITY
REMODEL AND TENANT IMPROVEMENT
636 E. ROSECRANS AVENUE, CITY OF GARDENA CA. 90059

transdev

PROPOSED SITE PLAN

PLAN CHECK NUMBER:	00000
PROJECT NUMBER:	18-397
DRAWN BY:	AS
CHECKED BY:	AS
ISSUE FOR:	PLAN CHECK 2018-00-00

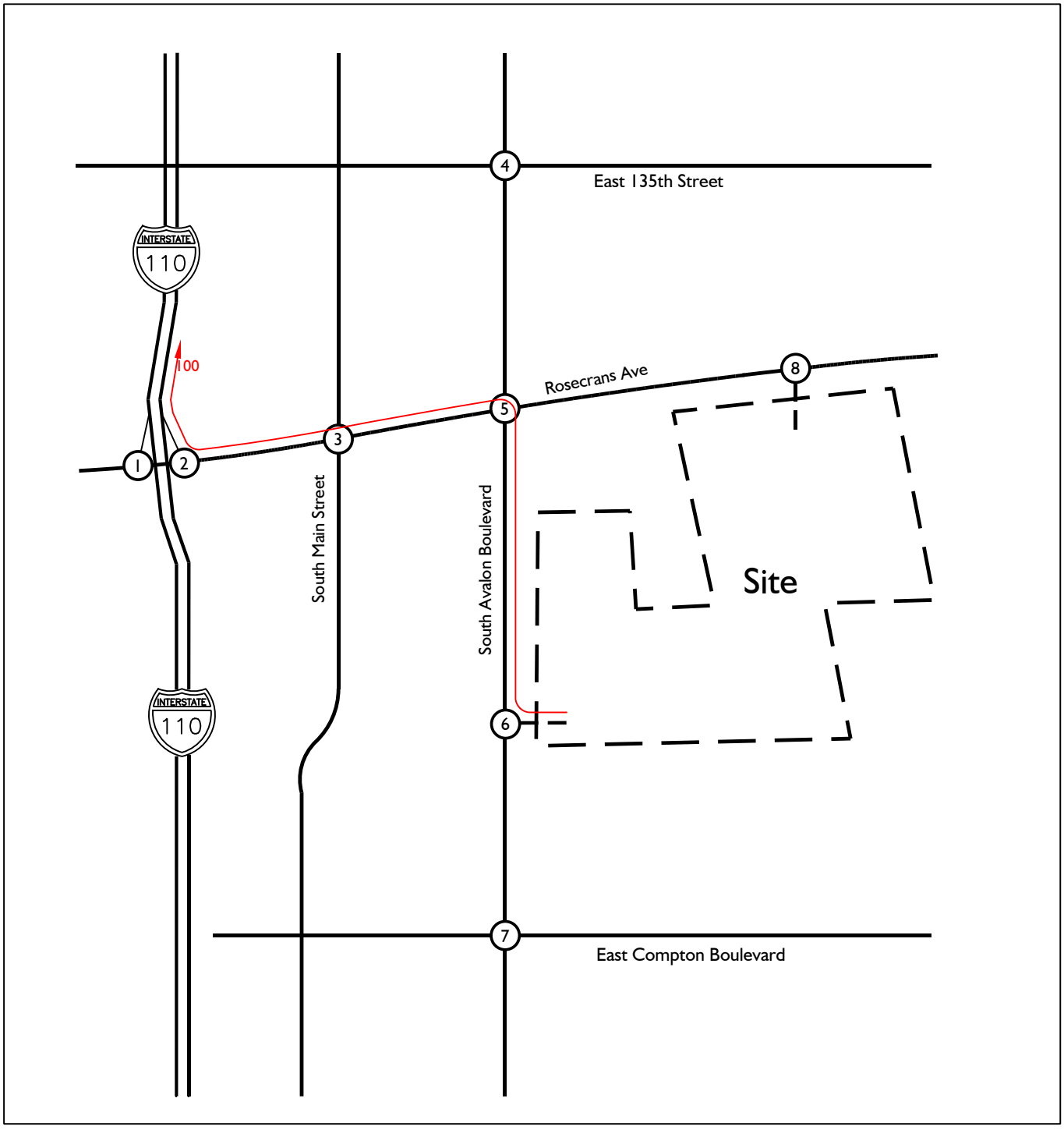
SHEET
A1-0

9/27/2018 - FOR COORDINATION

dwf
bcrider last saved: Sep/27/2018 10:13 AM by rsh architects 02

Exhibit B

Project Trip Distribution-Buses



Legend:

(1) = Study Area Intersection

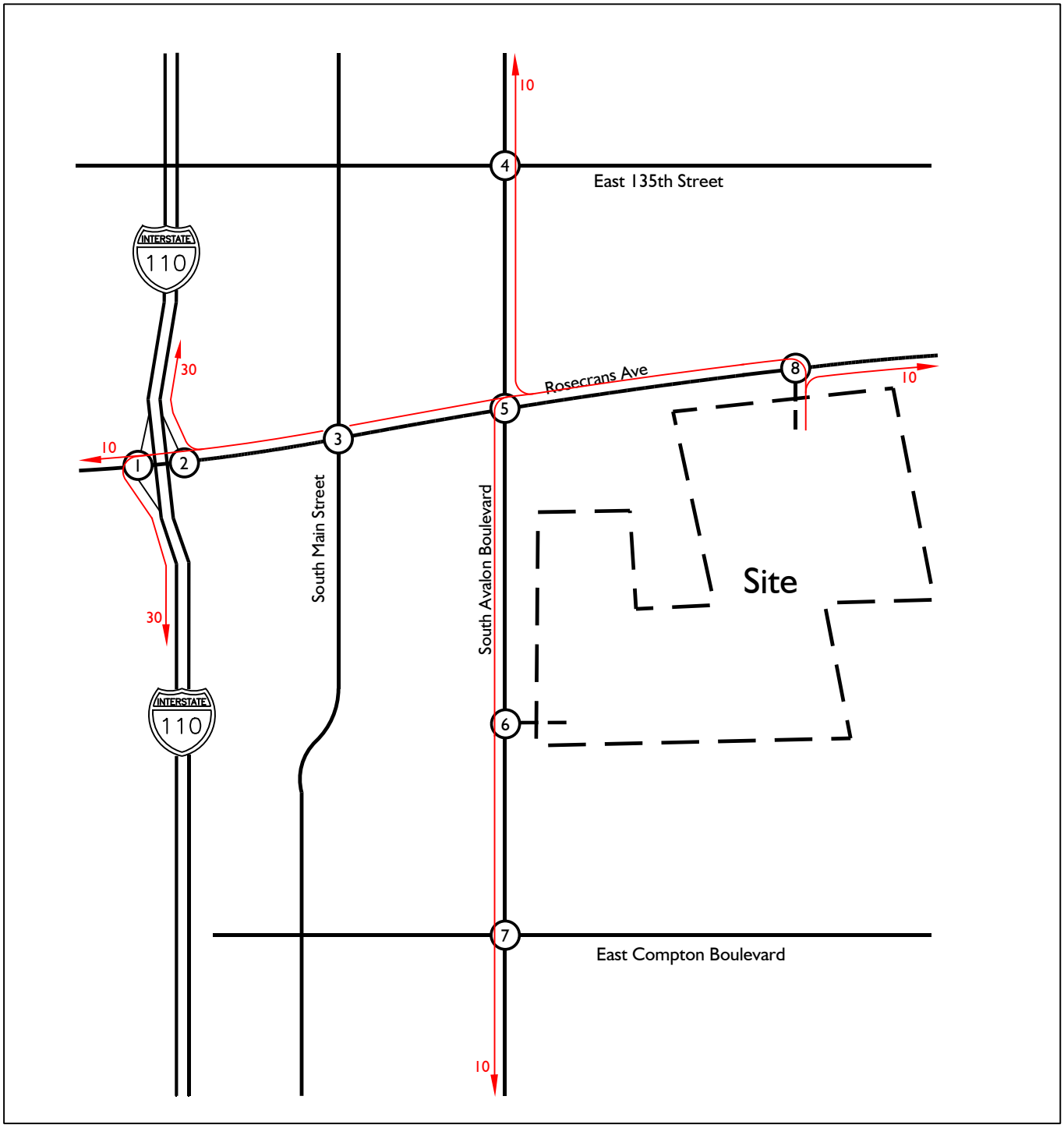
= Existing Driveway

100 = Percent to/fro Zone

N

Exhibit C

Project Trip Distribution-Cars



Legend:

(1) = Study Area Intersection

= Existing Driveway

100 = Percent to/fro Zone

N

Appendix B

Traffic County Worksheets

Counts Unlimited
PO Box 1178
Corona, CA 92878
(951) 268-6268

City of Los Angeles
N/S: I-110 Southbound Ramps
E/W: Rosecrans Avenue
Weather: Clear

File Name : 02_LAC_110S_Rosecrans AM
Site Code : 10518875
Start Date : 11/15/2018
Page No : 1

Groups Printed- Total Volume

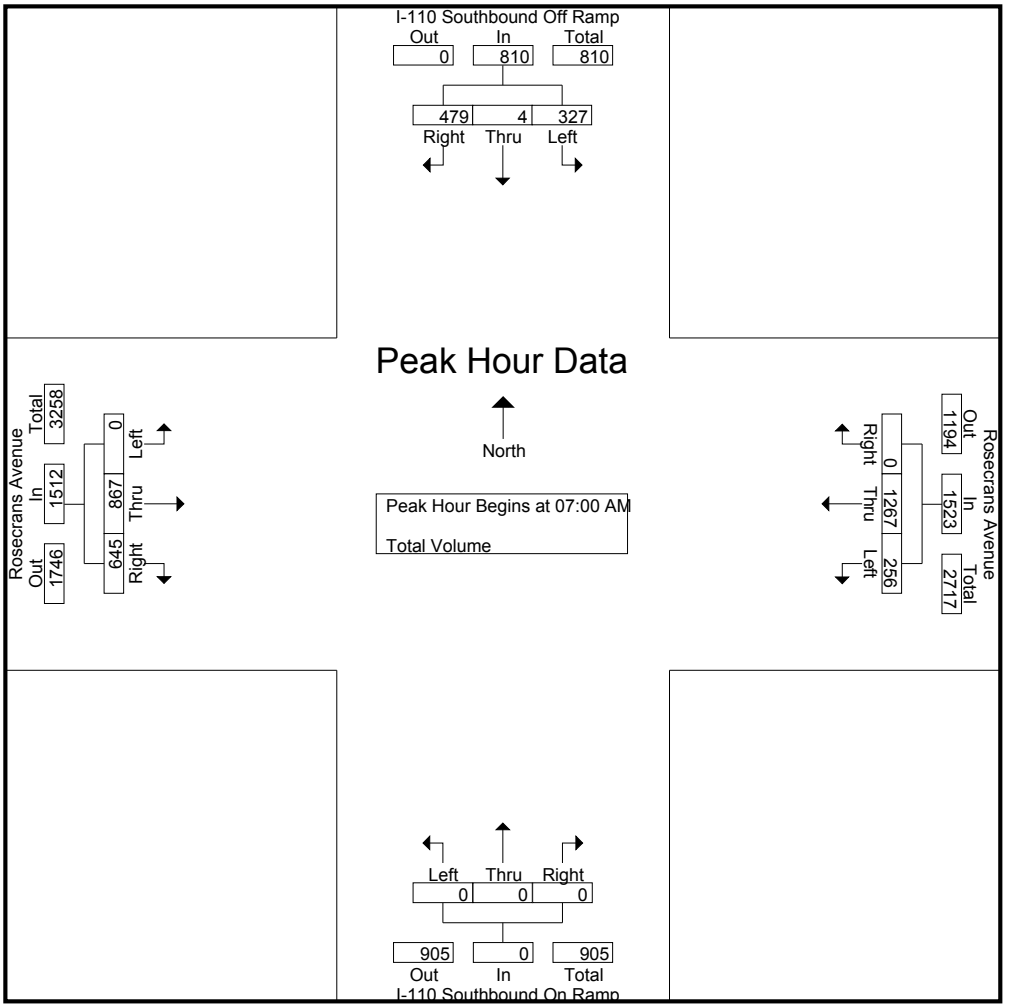
	I-110 Southbound Off Ramp Southbound				Rosecrans Avenue Westbound				I-110 Southbound On Ramp Northbound				Rosecrans Avenue Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00 AM	73	3	121	197	66	333	0	399	0	0	0	0	0	218	160	378	974
07:15 AM	64	0	111	175	60	308	0	368	0	0	0	0	0	208	158	366	909
07:30 AM	92	0	117	209	66	316	0	382	0	0	0	0	0	219	164	383	974
07:45 AM	98	1	130	229	64	310	0	374	0	0	0	0	0	222	163	385	988
Total	327	4	479	810	256	1267	0	1523	0	0	0	0	0	867	645	1512	3845
08:00 AM	112	0	122	234	63	250	0	313	0	0	0	0	0	233	148	381	928
08:15 AM	101	0	111	212	70	253	0	323	0	0	0	0	0	215	127	342	877
08:30 AM	110	0	125	235	66	244	0	310	0	0	0	0	0	158	110	268	813
08:45 AM	106	1	137	244	38	236	0	274	0	0	0	0	0	193	115	308	826
Total	429	1	495	925	237	983	0	1220	0	0	0	0	0	799	500	1299	3444
Grand Total	756	5	974	1735	493	2250	0	2743	0	0	0	0	0	1666	1145	2811	7289
Apprch %	43.6	0.3	56.1		18	82	0		0	0	0		0	59.3	40.7		
Total %	10.4	0.1	13.4	23.8	6.8	30.9	0	37.6	0	0	0	0	0	22.9	15.7	38.6	

	I-110 Southbound Off Ramp Southbound				Rosecrans Avenue Westbound				I-110 Southbound On Ramp Northbound				Rosecrans Avenue Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	73	**3**	121	197	**66**	**333**	0	**399**	0	0	0	0	0	218	160	378	974
07:15 AM	64	0	111	175	60	308	0	368	0	0	0	0	0	208	158	366	909
07:30 AM	92	0	117	209	66	316	0	382	0	0	0	0	0	219	**164**	383	974
07:45 AM	**98**	1	**130**	**229**	64	310	0	374	0	0	0	0	0	**222**	163	**385**	**988**
Total Volume	327	4	479	810	256	1267	0	1523	0	0	0	0	0	867	645	1512	3845
% App. Total	40.4	0.5	59.1		16.8	83.2	0		0	0	0		0	57.3	42.7		
PHF	.834	.333	.921	.884	.970	.951	.000	.954	.000	.000	.000	.000	.000	.976	.983	.982	.973

Counts Unlimited
PO Box 1178
Corona, CA 92878
(951) 268-6268

City of Los Angeles
N/S: I-110 Southbound Ramps
E/W: Rosecrans Avenue
Weather: Clear

File Name : 02_LAC_110S_Rosecrans AM
Site Code : 10518875
Start Date : 11/15/2018
Page No : 2



Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	08:00 AM				07:00 AM				07:00 AM				07:15 AM			
+0 mins.	**112**	0	122	234	**66**	**333**	0	**399**	0	0	0	0	0	208	158	366
+15 mins.	101	0	111	212	60	308	0	368	0	0	0	0	0	219	**164**	383
+30 mins.	110	0	125	235	66	316	0	382	0	0	0	0	0	222	163	**385**
+45 mins.	106	**1**	**137**	**244**	64	310	0	374	0	0	0	0	0	**233**	148	381
Total Volume	429	1	495	925	256	1267	0	1523	0	0	0	0	0	882	633	1515
% App. Total	46.4	0.1	53.5		16.8	83.2	0		0	0	0		0	58.2	41.8	
PHF	.958	.250	.903	.948	.970	.951	.000	.954	.000	.000	.000	.000	.000	.946	.965	.984

Counts Unlimited
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City of Los Angeles
N/S: I-110 Southbound Ramps
E/W: Rosecrans Avenue
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File Name : 02_LAC_110S_Rosecrans PM
Site Code : 10518875
Start Date : 11/15/2018
Page No : 1

Groups Printed- Total Volume

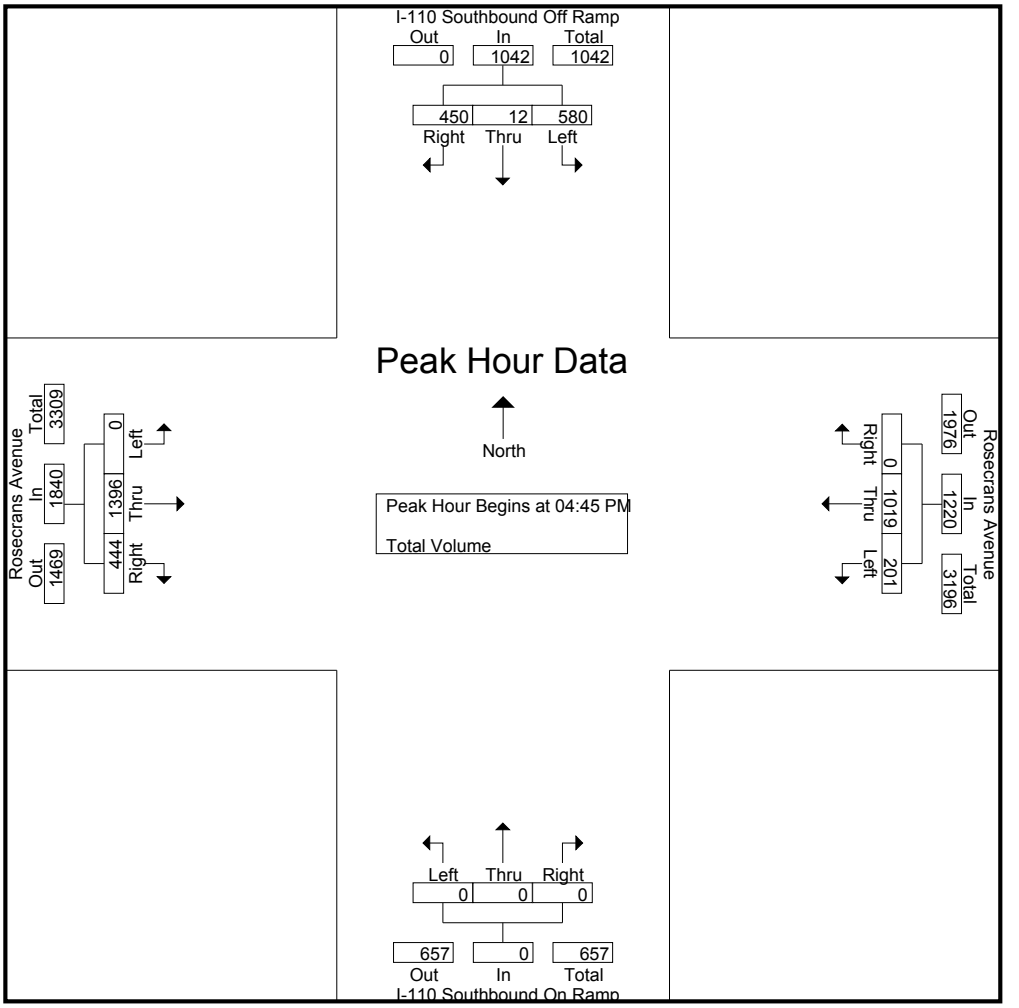
	I-110 Southbound Off Ramp Southbound				Rosecrans Avenue Westbound				I-110 Southbound On Ramp Northbound				Rosecrans Avenue Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
04:00 PM	83	1	93	177	77	254	0	331	0	0	0	0	0	339	124	463	971
04:15 PM	123	3	95	221	67	218	0	285	0	0	0	0	0	337	87	424	930
04:30 PM	125	2	87	214	47	205	0	252	0	0	0	0	0	338	106	444	910
04:45 PM	136	0	105	241	38	235	0	273	0	0	0	0	0	307	121	428	942
Total	467	6	380	853	229	912	0	1141	0	0	0	0	0	1321	438	1759	3753
05:00 PM	146	3	93	242	47	267	0	314	0	0	0	0	0	303	99	402	958
05:15 PM	159	5	119	283	52	226	0	278	0	0	0	0	0	331	92	423	984
05:30 PM	139	4	133	276	64	291	0	355	0	0	0	0	0	455	132	587	1218
05:45 PM	95	1	105	201	40	183	0	223	0	0	0	0	0	324	88	412	836
Total	539	13	450	1002	203	967	0	1170	0	0	0	0	0	1413	411	1824	3996
Grand Total	1006	19	830	1855	432	1879	0	2311	0	0	0	0	0	2734	849	3583	7749
Apprch %	54.2	1	44.7		18.7	81.3	0		0	0	0		0	76.3	23.7		
Total %	13	0.2	10.7	23.9	5.6	24.2	0	29.8	0	0	0	0	0	35.3	11	46.2	

	I-110 Southbound Off Ramp Southbound				Rosecrans Avenue Westbound				I-110 Southbound On Ramp Northbound				Rosecrans Avenue Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:45 PM																	
04:45 PM	136	0	105	241	38	235	0	273	0	0	0	0	0	307	121	428	942
05:00 PM	146	3	93	242	47	267	0	314	0	0	0	0	0	303	99	402	958
05:15 PM	**159**	**5**	119	**283**	52	226	0	278	0	0	0	0	0	331	92	423	984
05:30 PM	139	4	**133**	276	**64**	**291**	0	**355**	0	0	0	0	0	**455**	**132**	**587**	**1218**
Total Volume	580	12	450	1042	201	1019	0	1220	0	0	0	0	0	1396	444	1840	4102
% App. Total	55.7	1.2	43.2		16.5	83.5	0		0	0	0		0	75.9	24.1		
PHF	.912	.600	.846	.920	.785	.875	.000	.859	.000	.000	.000	.000	.000	.767	.841	.784	.842

Counts Unlimited
PO Box 1178
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City of Los Angeles
N/S: I-110 Southbound Ramps
E/W: Rosecrans Avenue
Weather: Clear

File Name : 02_LAC_110S_Rosecrans PM
Site Code : 10518875
Start Date : 11/15/2018
Page No : 2



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:45 PM				04:45 PM				04:00 PM				04:45 PM			
+0 mins.	136	0	105	241	38	235	0	273	0	0	0	0	0	307	121	428
+15 mins.	146	3	93	242	47	267	0	314	0	0	0	0	0	303	99	402
+30 mins.	**159**	**5**	119	**283**	52	226	0	278	0	0	0	0	0	331	92	423
+45 mins.	139	4	**133**	276	**64**	**291**	0	**355**	0	0	0	0	0	**455**	**132**	**587**
Total Volume	580	12	450	1042	201	1019	0	1220	0	0	0	0	0	1396	444	1840
% App. Total	55.7	1.2	43.2		16.5	83.5	0		0	0	0		0	75.9	24.1	
PHF	.912	.600	.846	.920	.785	.875	.000	.859	.000	.000	.000	.000	.000	.767	.841	.784

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City of Los Angeles
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E/W: Rosecrans Avenue
Weather: Clear

File Name : 01_LAC_110N_Rosecrans AM
Site Code : 10518875
Start Date : 11/15/2018
Page No : 1

Groups Printed- Total Volume

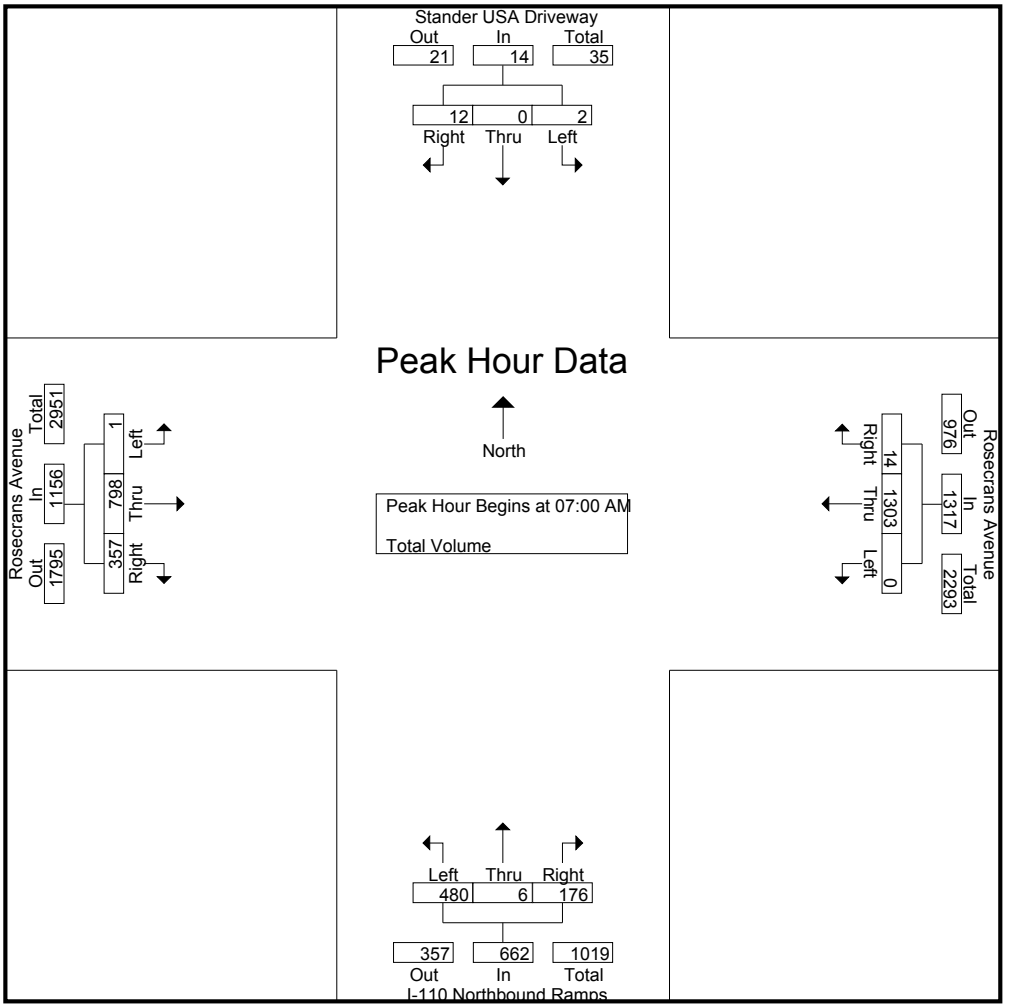
	Stander USA Driveway Southbound				Rosecrans Avenue Westbound				I-110 Northbound Ramps Northbound				Rosecrans Avenue Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00 AM	0	0	2	2	0	344	2	346	105	1	54	160	0	181	102	283	791
07:15 AM	1	0	4	5	0	363	6	369	105	2	38	145	0	165	91	256	775
07:30 AM	0	0	5	5	0	303	4	307	133	1	38	172	1	209	86	296	780
07:45 AM	1	0	1	2	0	293	2	295	137	2	46	185	0	243	78	321	803
Total	2	0	12	14	0	1303	14	1317	480	6	176	662	1	798	357	1156	3149
08:00 AM	1	0	2	3	0	265	1	266	90	3	57	150	0	227	101	328	747
08:15 AM	0	0	4	4	0	273	1	274	98	2	51	151	1	205	87	293	722
08:30 AM	0	0	1	1	0	275	1	276	116	3	50	169	0	226	69	295	741
08:45 AM	1	0	1	2	0	247	8	255	112	2	44	158	1	193	76	270	685
Total	2	0	8	10	0	1060	11	1071	416	10	202	628	2	851	333	1186	2895
Grand Total	4	0	20	24	0	2363	25	2388	896	16	378	1290	3	1649	690	2342	6044
Apprch %	16.7	0	83.3		0	99	1		69.5	1.2	29.3		0.1	70.4	29.5		
Total %	0.1	0	0.3	0.4	0	39.1	0.4	39.5	14.8	0.3	6.3	21.3	0	27.3	11.4	38.7	

	Stander USA Driveway Southbound				Rosecrans Avenue Westbound				I-110 Northbound Ramps Northbound				Rosecrans Avenue Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	0	0	2	2	0	344	2	346	105	1	**54**	160	0	181	**102**	283	791
07:15 AM	**1**	0	4	**5**	0	**363**	**6**	**369**	105	**2**	38	145	0	165	91	256	775
07:30 AM	0	0	**5**	5	0	303	4	307	133	1	38	172	**1**	209	86	296	780
07:45 AM	1	0	1	2	0	293	2	295	**137**	2	46	**185**	0	**243**	78	**321**	**803**
Total Volume	2	0	12	14	0	1303	14	1317	480	6	176	662	1	798	357	1156	3149
% App. Total	14.3	0	85.7		0	98.9	1.1		72.5	0.9	26.6		0.1	69	30.9		
PHF	.500	.000	.600	.700	.000	.897	.583	.892	.876	.750	.815	.895	.250	.821	.875	.900	.980

Counts Unlimited
PO Box 1178
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City of Los Angeles
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File Name : 01_LAC_110N_Rosecrans AM
Site Code : 10518875
Start Date : 11/15/2018
Page No : 2



Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:15 AM				07:00 AM				07:00 AM				07:30 AM			
+0 mins.	**1**	0	4	**5**	0	344	2	346	105	1	**54**	160	**1**	209	86	296
+15 mins.	0	0	**5**	5	0	**363**	**6**	**369**	105	**2**	38	145	0	**243**	78	321
+30 mins.	1	0	1	2	0	303	4	307	133	1	38	172	0	227	**101**	**328**
+45 mins.	1	0	2	3	0	293	2	295	**137**	2	46	**185**	1	205	87	293
Total Volume	3	0	12	15	0	1303	14	1317	480	6	176	662	2	884	352	1238
% App. Total	20	0	80		0	98.9	1.1		72.5	0.9	26.6		0.2	71.4	28.4	
PHF	.750	.000	.600	.750	.000	.897	.583	.892	.876	.750	.815	.895	.500	.909	.871	.944

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E/W: Rosecrans Avenue
Weather: Clear

File Name : 01_LAC_110N_Rosecrans PM
Site Code : 10518875
Start Date : 11/15/2018
Page No : 1

Groups Printed- Total Volume

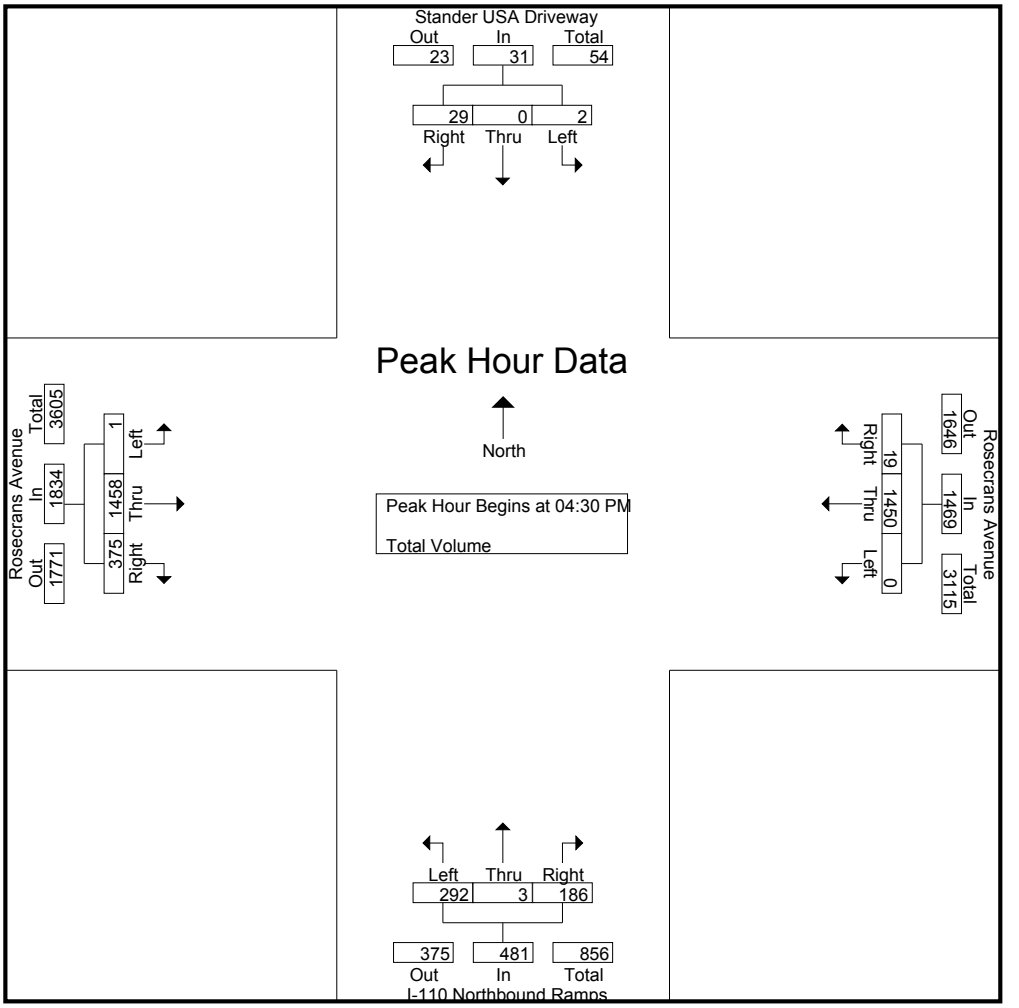
	Stander USA Driveway Southbound				Rosecrans Avenue Westbound				I-110 Northbound Ramps Northbound				Rosecrans Avenue Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
04:00 PM	1	0	11	12	0	372	3	375	86	1	51	138	2	282	101	385	910
04:15 PM	3	0	16	19	0	321	9	330	69	0	52	121	1	373	86	460	930
04:30 PM	1	0	4	5	0	392	4	396	66	1	57	124	0	375	113	488	1013
04:45 PM	1	0	10	11	0	307	7	314	80	1	40	121	1	335	79	415	861
Total	6	0	41	47	0	1392	23	1415	301	3	200	504	4	1365	379	1748	3714
05:00 PM	0	0	9	9	0	416	3	419	79	1	37	117	0	369	85	454	999
05:15 PM	0	0	6	6	0	335	5	340	67	0	52	119	0	379	98	477	942
05:30 PM	0	0	5	5	0	328	3	331	63	1	42	106	0	368	77	445	887
05:45 PM	0	0	10	10	0	290	2	292	60	0	41	101	0	346	105	451	854
Total	0	0	30	30	0	1369	13	1382	269	2	172	443	0	1462	365	1827	3682
Grand Total	6	0	71	77	0	2761	36	2797	570	5	372	947	4	2827	744	3575	7396
Apprch %	7.8	0	92.2		0	98.7	1.3		60.2	0.5	39.3		0.1	79.1	20.8		
Total %	0.1	0	1	1	0	37.3	0.5	37.8	7.7	0.1	5	12.8	0.1	38.2	10.1	48.3	

	Stander USA Driveway Southbound				Rosecrans Avenue Westbound				I-110 Northbound Ramps Northbound				Rosecrans Avenue Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:30 PM																	
04:30 PM	**1**	0	4	5	0	392	4	396	66	**1**	**57**	**124**	0	375	**113**	**488**	**1013**
04:45 PM	1	0	**10**	**11**	0	307	**7**	314	**80**	1	40	121	**1**	335	79	415	861
05:00 PM	0	0	9	9	0	**416**	3	**419**	79	1	37	117	0	369	85	454	999
05:15 PM	0	0	6	6	0	335	5	340	67	0	52	119	0	**379**	98	477	942
Total Volume	2	0	29	31	0	1450	19	1469	292	3	186	481	1	1458	375	1834	3815
% App. Total	6.5	0	93.5		0	98.7	1.3		60.7	0.6	38.7		0.1	79.5	20.4		
PHF	.500	.000	.725	.705	.000	.871	.679	.876	.913	.750	.816	.970	.250	.962	.830	.940	.942

Counts Unlimited
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City of Los Angeles
N/S: I-110 Northbound Ramps
E/W: Rosecrans Avenue
Weather: Clear

File Name : 01_LAC_110N_Rosecrans PM
Site Code : 10518875
Start Date : 11/15/2018
Page No : 2



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:00 PM				04:30 PM				04:00 PM				04:30 PM			
+0 mins.	1	0	11	12	0	392	4	396	**86**	**1**	51	**138**	0	375	**113**	**488**
+15 mins.	**3**	0	**16**	**19**	0	307	**7**	314	69	0	52	121	**1**	335	79	415
+30 mins.	1	0	4	5	0	**416**	3	**419**	66	1	**57**	124	0	369	85	454
+45 mins.	1	0	10	11	0	335	5	340	80	1	40	121	0	**379**	98	477
Total Volume	6	0	41	47	0	1450	19	1469	301	3	200	504	1	1458	375	1834
% App. Total	12.8	0	87.2		0	98.7	1.3		59.7	0.6	39.7		0.1	79.5	20.4	
PHF	.500	.000	.641	.618	.000	.871	.679	.876	.875	.750	.877	.913	.250	.962	.830	.940

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County of Los Angeles
N/S: Main Street
E/W: Rosecrans Avenue
Weather: Clear

File Name : 03_CLA_Main_Rosecrans AM
Site Code : 10518875
Start Date : 11/15/2018
Page No : 1

Groups Printed- Total Volume

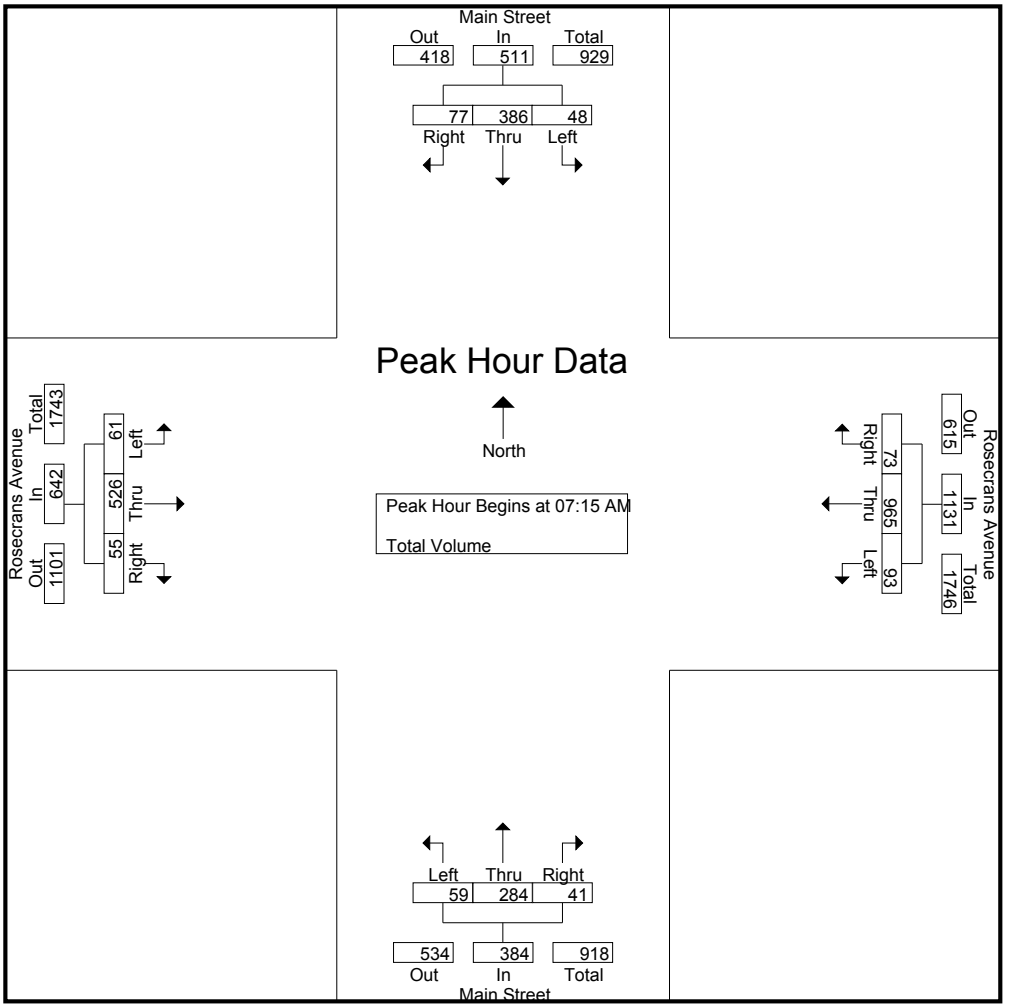
	Main Street Southbound				Rosecrans Avenue Westbound				Main Street Northbound				Rosecrans Avenue Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00 AM	8	73	20	101	24	249	10	283	13	68	10	91	8	96	14	118	593
07:15 AM	9	101	25	135	27	273	10	310	19	64	7	90	11	107	15	133	668
07:30 AM	9	100	19	128	26	244	23	293	8	75	8	91	11	113	11	135	647
07:45 AM	17	110	19	146	16	228	23	267	12	68	12	92	20	150	10	180	685
Total	43	384	83	510	93	994	66	1153	52	275	37	364	50	466	50	566	2593
08:00 AM	13	75	14	102	24	220	17	261	20	77	14	111	19	156	19	194	668
08:15 AM	9	70	11	90	19	195	10	224	16	75	12	103	12	132	21	165	582
08:30 AM	9	53	15	77	22	198	14	234	18	72	10	100	18	150	22	190	601
08:45 AM	11	41	12	64	22	162	11	195	19	50	3	72	8	122	25	155	486
Total	42	239	52	333	87	775	52	914	73	274	39	386	57	560	87	704	2337
Grand Total	85	623	135	843	180	1769	118	2067	125	549	76	750	107	1026	137	1270	4930
Apprch %	10.1	73.9	16		8.7	85.6	5.7		16.7	73.2	10.1		8.4	80.8	10.8		
Total %	1.7	12.6	2.7	17.1	3.7	35.9	2.4	41.9	2.5	11.1	1.5	15.2	2.2	20.8	2.8	25.8	

	Main Street Southbound				Rosecrans Avenue Westbound				Main Street Northbound				Rosecrans Avenue Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	9	101	**25**	135	**27**	**273**	10	**310**	19	64	7	90	11	107	15	133	668
07:30 AM	9	100	19	128	26	244	**23**	293	8	75	8	91	11	113	11	135	647
07:45 AM	**17**	**110**	19	**146**	16	228	23	267	12	68	12	92	**20**	150	10	180	**685**
08:00 AM	13	75	14	102	24	220	17	261	**20**	**77**	**14**	**111**	19	**156**	**19**	**194**	668
Total Volume	48	386	77	511	93	965	73	1131	59	284	41	384	61	526	55	642	2668
% App. Total	9.4	75.5	15.1		8.2	85.3	6.5		15.4	74	10.7		9.5	81.9	8.6		
PHF	.706	.877	.770	.875	.861	.884	.793	.912	.738	.922	.732	.865	.763	.843	.724	.827	.974

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County of Los Angeles
N/S: Main Street
E/W: Rosecrans Avenue
Weather: Clear

File Name : 03_CLA_Main_Rosecrans AM
Site Code : 10518875
Start Date : 11/15/2018
Page No : 2



Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:15 AM				07:00 AM				07:45 AM				07:45 AM			
+0 mins.	9	101	**25**	135	24	249	10	283	12	68	12	92	**20**	150	10	180
+15 mins.	9	100	19	128	**27**	**273**	10	**310**	**20**	**77**	**14**	**111**	19	**156**	19	**194**
+30 mins.	**17**	**110**	19	**146**	26	244	**23**	293	16	75	12	103	12	132	21	165
+45 mins.	13	75	14	102	16	228	23	267	18	72	10	100	18	150	**22**	190
Total Volume	48	386	77	511	93	994	66	1153	66	292	48	406	69	588	72	729
% App. Total	9.4	75.5	15.1		8.1	86.2	5.7		16.3	71.9	11.8		9.5	80.7	9.9	
PHF	.706	.877	.770	.875	.861	.910	.717	.930	.825	.948	.857	.914	.863	.942	.818	.939

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County of Los Angeles
N/S: Main Street
E/W: Rosecrans Avenue
Weather: Clear

File Name : 03_CLA_Main_Rosecrans PM
Site Code : 10518875
Start Date : 11/15/2018
Page No : 1

Groups Printed- Total Volume

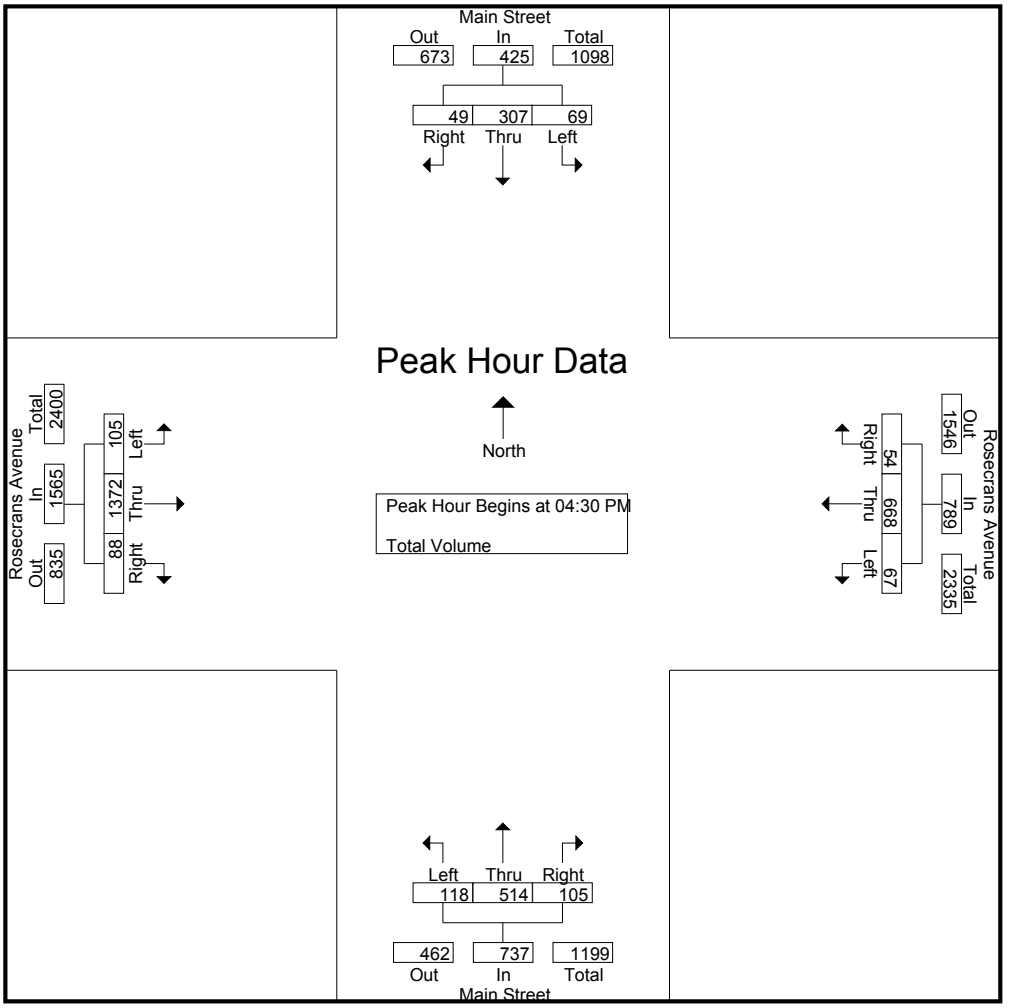
	Main Street Southbound				Rosecrans Avenue Westbound				Main Street Northbound				Rosecrans Avenue Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
04:00 PM	14	88	18	120	22	175	21	218	35	105	17	157	34	310	18	362	857
04:15 PM	19	75	28	122	18	162	11	191	31	98	19	148	27	312	12	351	812
04:30 PM	7	71	14	92	11	162	14	187	30	104	26	160	26	374	18	418	857
04:45 PM	12	82	12	106	16	156	20	192	32	131	27	190	24	330	29	383	871
Total	52	316	72	440	67	655	66	788	128	438	89	655	111	1326	77	1514	3397
05:00 PM	20	89	13	122	20	182	14	216	28	156	27	211	28	339	22	389	938
05:15 PM	30	65	10	105	20	168	6	194	28	123	25	176	27	329	19	375	850
05:30 PM	31	84	15	130	12	140	6	158	23	132	20	175	26	341	13	380	843
05:45 PM	20	70	12	102	11	156	16	183	20	95	16	131	19	330	17	366	782
Total	101	308	50	459	63	646	42	751	99	506	88	693	100	1339	71	1510	3413
Grand Total	153	624	122	899	130	1301	108	1539	227	944	177	1348	211	2665	148	3024	6810
Apprch %	17	69.4	13.6		8.4	84.5	7		16.8	70	13.1		7	88.1	4.9		
Total %	2.2	9.2	1.8	13.2	1.9	19.1	1.6	22.6	3.3	13.9	2.6	19.8	3.1	39.1	2.2	44.4	

	Main Street Southbound				Rosecrans Avenue Westbound				Main Street Northbound				Rosecrans Avenue Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:30 PM																	
04:30 PM	7	71	**14**	92	11	162	14	187	30	104	26	160	26	**374**	18	**418**	857
04:45 PM	12	82	12	106	16	156	**20**	192	**32**	131	**27**	190	24	330	**29**	383	871
05:00 PM	20	**89**	13	**122**	**20**	**182**	14	**216**	28	**156**	27	**211**	**28**	339	22	389	**938**
05:15 PM	**30**	65	10	105	20	168	6	194	28	123	25	176	27	329	19	375	850
Total Volume	69	307	49	425	67	668	54	789	118	514	105	737	105	1372	88	1565	3516
% App. Total	16.2	72.2	11.5		8.5	84.7	6.8		16	69.7	14.2		6.7	87.7	5.6		
PHF	.575	.862	.875	.871	.838	.918	.675	.913	.922	.824	.972	.873	.938	.917	.759	.936	.937

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County of Los Angeles
N/S: Main Street
E/W: Rosecrans Avenue
Weather: Clear

File Name : 03_CLA_Main_Rosecrans PM
Site Code : 10518875
Start Date : 11/15/2018
Page No : 2



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:45 PM				04:30 PM				04:45 PM				04:30 PM			
+0 mins.	12	82	12	106	11	162	14	187	**32**	131	**27**	190	26	**374**	18	**418**
+15 mins.	20	**89**	13	122	16	156	**20**	192	28	**156**	27	**211**	24	330	**29**	383
+30 mins.	30	65	10	105	**20**	**182**	14	**216**	28	123	25	176	**28**	339	22	389
+45 mins.	**31**	84	**15**	**130**	20	168	6	194	23	132	20	175	27	329	19	375
Total Volume	93	320	50	463	67	668	54	789	111	542	99	752	105	1372	88	1565
% App. Total	20.1	69.1	10.8		8.5	84.7	6.8		14.8	72.1	13.2		6.7	87.7	5.6	
PHF	.750	.899	.833	.890	.838	.918	.675	.913	.867	.869	.917	.891	.938	.917	.759	.936

Counts Unlimited
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County of Los Angeles
N/S: South Avalon Boulevard
E/W: East 135th Street
Weather: Clear

File Name : 04_CLA_S Avalon_E 135th AM
Site Code : 10518875
Start Date : 11/15/2018
Page No : 1

Groups Printed- Total Volume

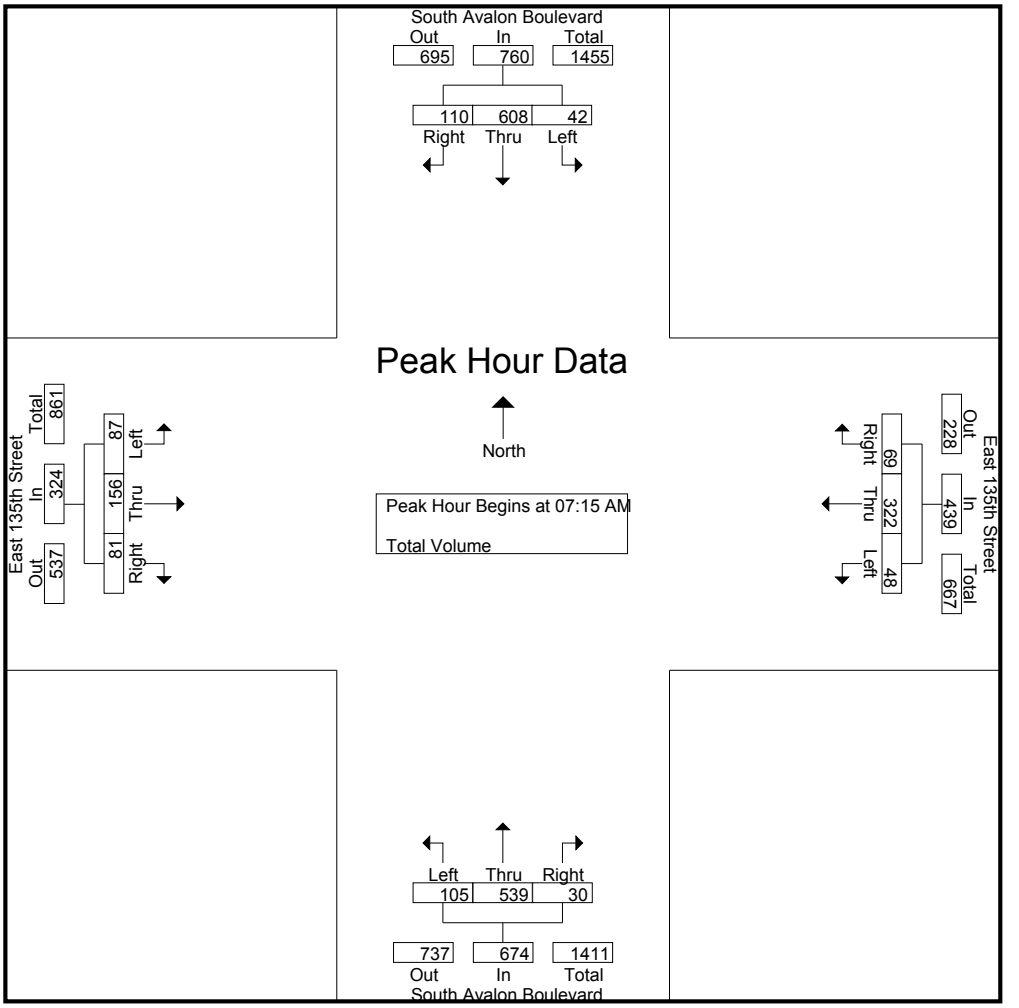
	South Avalon Boulevard Southbound				East 135th Street Westbound				South Avalon Boulevard Northbound				East 135th Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00 AM	5	99	29	133	8	75	17	100	27	89	3	119	17	24	11	52	404
07:15 AM	7	124	37	168	11	80	18	109	32	114	4	150	19	25	14	58	485
07:30 AM	10	180	23	213	13	93	24	130	28	149	5	182	19	33	25	77	602
07:45 AM	11	140	18	169	15	86	11	112	28	118	10	156	35	50	27	112	549
Total	33	543	107	683	47	334	70	451	115	470	22	607	90	132	77	299	2040
08:00 AM	14	164	32	210	9	63	16	88	17	158	11	186	14	48	15	77	561
08:15 AM	9	123	20	152	8	49	14	71	13	123	5	141	22	18	19	59	423
08:30 AM	10	132	14	156	5	30	18	53	22	109	13	144	8	29	17	54	407
08:45 AM	9	88	11	108	5	36	16	57	21	108	2	131	11	21	14	46	342
Total	42	507	77	626	27	178	64	269	73	498	31	602	55	116	65	236	1733
Grand Total	75	1050	184	1309	74	512	134	720	188	968	53	1209	145	248	142	535	3773
Apprch %	5.7	80.2	14.1		10.3	71.1	18.6		15.6	80.1	4.4		27.1	46.4	26.5		
Total %	2	27.8	4.9	34.7	2	13.6	3.6	19.1	5	25.7	1.4	32	3.8	6.6	3.8	14.2	

	South Avalon Boulevard Southbound				East 135th Street Westbound				South Avalon Boulevard Northbound				East 135th Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	7	124	**37**	168	11	80	18	109	**32**	114	4	150	19	25	14	58	485
07:30 AM	10	**180**	23	**213**	13	**93**	**24**	**130**	28	149	5	182	19	33	25	77	**602**
07:45 AM	11	140	18	169	**15**	86	11	112	28	118	10	156	**35**	**50**	**27**	**112**	549
08:00 AM	**14**	164	32	210	9	63	16	88	17	**158**	**11**	**186**	14	48	15	77	561
Total Volume	42	608	110	760	48	322	69	439	105	539	30	674	87	156	81	324	2197
% App. Total	5.5	80	14.5		10.9	73.3	15.7		15.6	80	4.5		26.9	48.1	25		
PHF	.750	.844	.743	.892	.800	.866	.719	.844	.820	.853	.682	.906	.621	.780	.750	.723	.912

Counts Unlimited
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County of Los Angeles
N/S: South Avalon Boulevard
E/W: East 135th Street
Weather: Clear

File Name : 04_CLA_S Avalon_E 135th AM
Site Code : 10518875
Start Date : 11/15/2018
Page No : 2



Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:15 AM				07:00 AM				07:15 AM				07:30 AM			
+0 mins.	7	124	**37**	168	8	75	17	100	**32**	114	4	150	19	33	25	77
+15 mins.	10	**180**	23	**213**	11	80	18	109	28	149	5	182	**35**	**50**	**27**	**112**
+30 mins.	11	140	18	169	13	**93**	**24**	**130**	28	118	10	156	14	48	15	77
+45 mins.	**14**	164	32	210	**15**	86	11	112	17	**158**	**11**	**186**	22	18	19	59
Total Volume	42	608	110	760	47	334	70	451	105	539	30	674	90	149	86	325
% App. Total	5.5	80	14.5		10.4	74.1	15.5		15.6	80	4.5		27.7	45.8	26.5	
PHF	.750	.844	.743	.892	.783	.898	.729	.867	.820	.853	.682	.906	.643	.745	.796	.725

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County of Los Angeles
N/S: South Avalon Boulevard
E/W: East 135th Street
Weather: Clear

File Name : 04_CLA_S Avalon_E 135th PM
Site Code : 10518875
Start Date : 11/15/2018
Page No : 1

Groups Printed- Total Volume

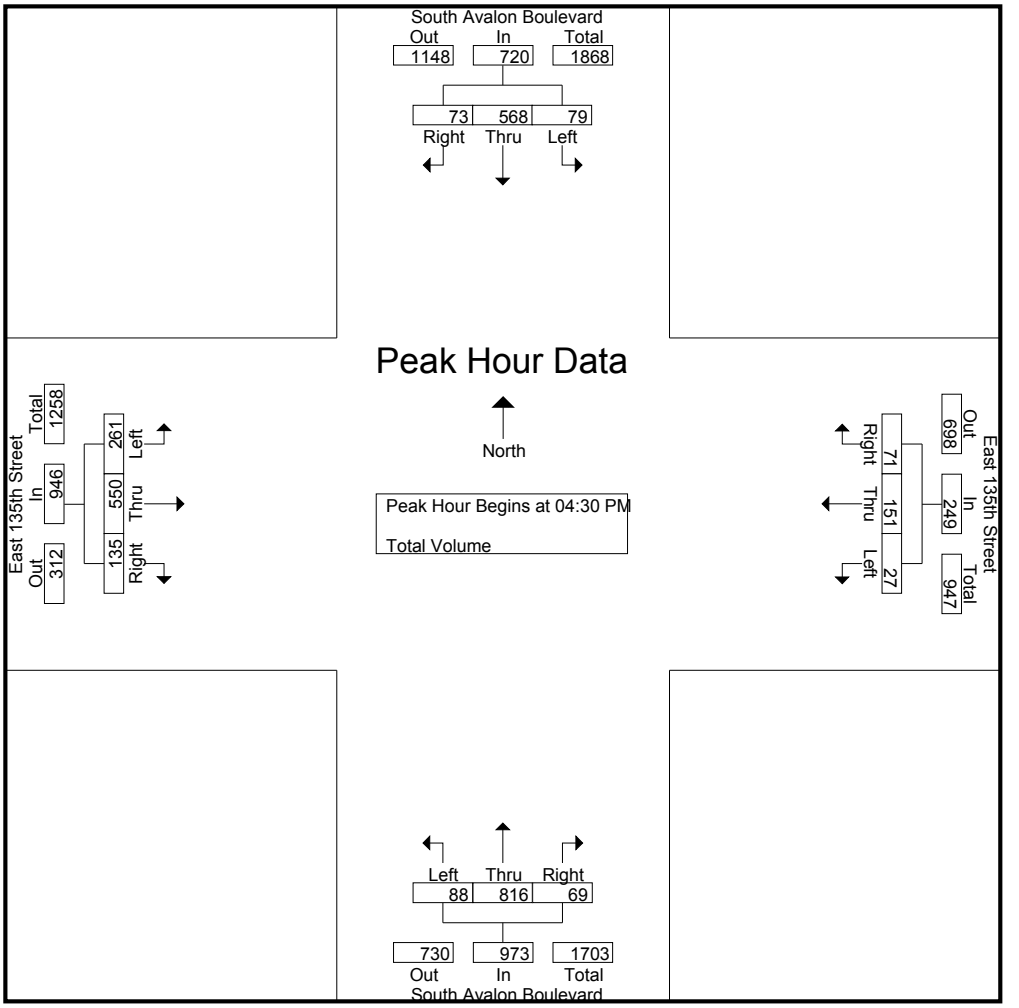
	South Avalon Boulevard Southbound				East 135th Street Westbound				South Avalon Boulevard Northbound				East 135th Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
04:00 PM	14	90	19	123	14	1	40	55	12	173	10	195	8	100	81	189	562
04:15 PM	22	120	23	165	3	6	50	59	2	210	18	230	15	57	98	170	624
04:30 PM	23	149	24	196	2	31	25	58	18	217	15	250	37	129	43	209	713
04:45 PM	19	126	18	163	10	41	19	70	25	182	14	221	63	137	33	233	687
Total	78	485	84	647	29	79	134	242	57	782	57	896	123	423	255	801	2586
05:00 PM	19	138	16	173	7	47	15	69	18	210	19	247	82	138	27	247	736
05:15 PM	18	155	15	188	8	32	12	52	27	207	21	255	79	146	32	257	752
05:30 PM	18	119	17	154	5	33	15	53	18	194	20	232	79	127	27	233	672
05:45 PM	22	114	16	152	12	33	15	60	18	204	19	241	71	104	23	198	651
Total	77	526	64	667	32	145	57	234	81	815	79	975	311	515	109	935	2811
Grand Total	155	1011	148	1314	61	224	191	476	138	1597	136	1871	434	938	364	1736	5397
Apprch %	11.8	76.9	11.3		12.8	47.1	40.1		7.4	85.4	7.3		25	54	21		
Total %	2.9	18.7	2.7	24.3	1.1	4.2	3.5	8.8	2.6	29.6	2.5	34.7	8	17.4	6.7	32.2	

	South Avalon Boulevard Southbound				East 135th Street Westbound				South Avalon Boulevard Northbound				East 135th Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:30 PM																	
04:30 PM	**23**	149	**24**	**196**	2	31	**25**	58	18	**217**	15	250	37	129	**43**	209	713
04:45 PM	19	126	18	163	**10**	41	19	**70**	25	182	14	221	63	137	33	233	687
05:00 PM	19	138	16	173	7	**47**	15	69	18	210	19	247	**82**	138	27	247	736
05:15 PM	18	**155**	15	188	8	32	12	52	**27**	207	**21**	**255**	79	**146**	32	**257**	**752**
Total Volume	79	568	73	720	27	151	71	249	88	816	69	973	261	550	135	946	2888
% App. Total	11	78.9	10.1		10.8	60.6	28.5		9	83.9	7.1		27.6	58.1	14.3		
PHF	.859	.916	.760	.918	.675	.803	.710	.889	.815	.940	.821	.954	.796	.942	.785	.920	.960

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County of Los Angeles
N/S: South Avalon Boulevard
E/W: East 135th Street
Weather: Clear

File Name : 04_CLA_S Avalon_E 135th PM
Site Code : 10518875
Start Date : 11/15/2018
Page No : 2



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:30 PM				04:15 PM				05:00 PM				04:45 PM			
+0 mins.	**23**	149	**24**	**196**	3	6	**50**	59	18	**210**	19	247	63	137	**33**	233
+15 mins.	19	126	18	163	2	31	25	58	**27**	207	**21**	**255**	**82**	138	27	247
+30 mins.	19	138	16	173	**10**	41	19	**70**	18	194	20	232	79	**146**	32	**257**
+45 mins.	18	**155**	15	188	7	**47**	15	69	18	204	19	241	79	127	27	233
Total Volume	79	568	73	720	22	125	109	256	81	815	79	975	303	548	119	970
% App. Total	11	78.9	10.1		8.6	48.8	42.6		8.3	83.6	8.1		31.2	56.5	12.3	
PHF	.859	.916	.760	.918	.550	.665	.545	.914	.750	.970	.940	.956	.924	.938	.902	.944

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County of Los Angeles
N/S: South Avalon Boulevard
E/W: Rosecrans Avenue
Weather: Clear

File Name : 05_CLA_S Avalon_Rosecrans AM
Site Code : 10518875
Start Date : 11/15/2018
Page No : 1

Groups Printed- Total Volume

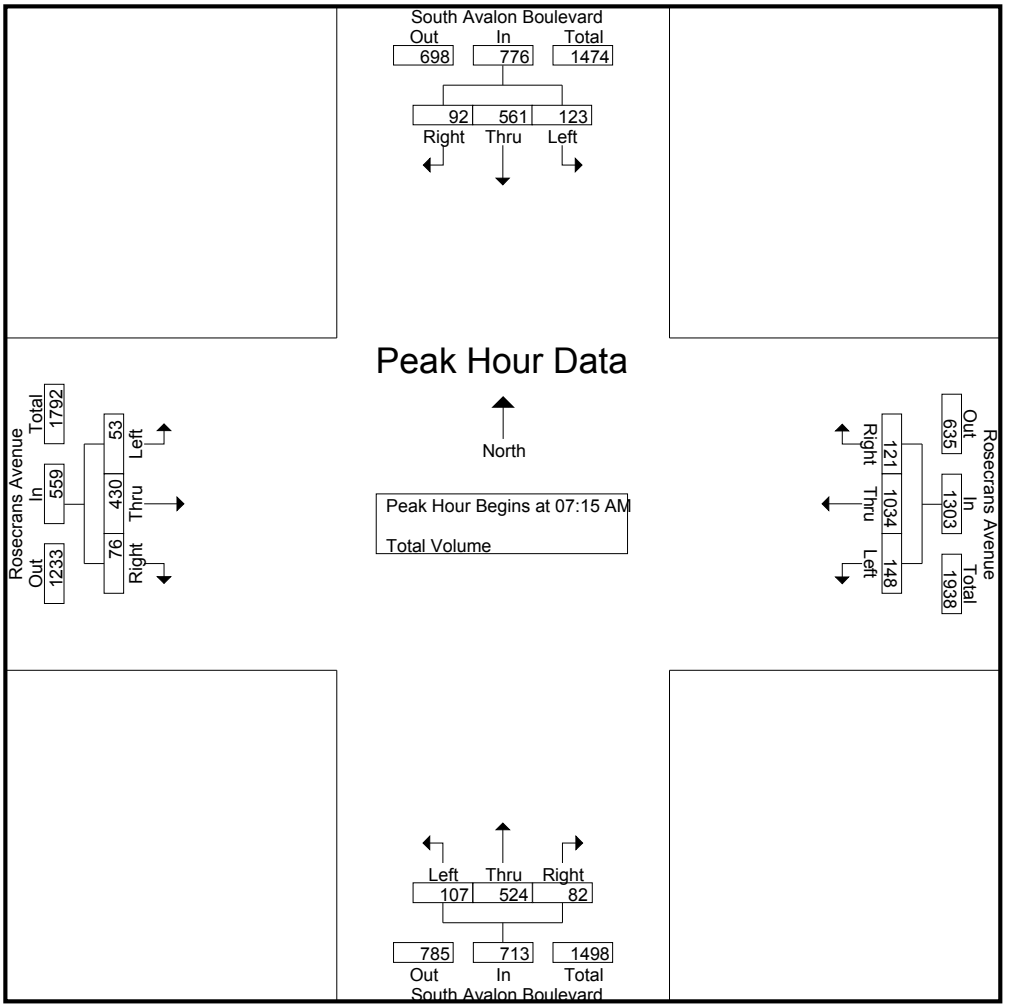
	South Avalon Boulevard Southbound				Rosecrans Avenue Westbound				South Avalon Boulevard Northbound				Rosecrans Avenue Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00 AM	14	73	15	102	19	171	12	202	16	86	10	112	10	56	11	77	493
07:15 AM	19	92	15	126	33	289	28	350	32	112	8	152	8	77	15	100	728
07:30 AM	32	191	25	248	44	277	37	358	27	143	30	200	19	117	18	154	960
07:45 AM	29	141	22	192	42	266	34	342	21	124	23	168	16	110	18	144	846
Total	94	497	77	668	138	1003	111	1252	96	465	71	632	53	360	62	475	3027
08:00 AM	43	137	30	210	29	202	22	253	27	145	21	193	10	126	25	161	817
08:15 AM	34	111	18	163	37	172	25	234	17	95	28	140	13	99	21	133	670
08:30 AM	33	97	11	141	17	196	41	254	22	98	31	151	14	122	19	155	701
08:45 AM	39	80	16	135	26	145	25	196	33	102	23	158	9	99	24	132	621
Total	149	425	75	649	109	715	113	937	99	440	103	642	46	446	89	581	2809
Grand Total	243	922	152	1317	247	1718	224	2189	195	905	174	1274	99	806	151	1056	5836
Apprch %	18.5	70	11.5		11.3	78.5	10.2		15.3	71	13.7		9.4	76.3	14.3		
Total %	4.2	15.8	2.6	22.6	4.2	29.4	3.8	37.5	3.3	15.5	3	21.8	1.7	13.8	2.6	18.1	

	South Avalon Boulevard Southbound				Rosecrans Avenue Westbound				South Avalon Boulevard Northbound				Rosecrans Avenue Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	19	92	15	126	33	**289**	28	350	**32**	112	8	152	8	77	15	100	728
07:30 AM	32	**191**	25	**248**	**44**	277	**37**	**358**	27	143	**30**	**200**	**19**	117	18	154	**960**
07:45 AM	29	141	22	192	42	266	34	342	21	124	23	168	16	110	18	144	846
08:00 AM	**43**	137	**30**	210	29	202	22	253	27	**145**	21	193	10	**126**	**25**	**161**	817
Total Volume	123	561	92	776	148	1034	121	1303	107	524	82	713	53	430	76	559	3351
% App. Total	15.9	72.3	11.9		11.4	79.4	9.3		15	73.5	11.5		9.5	76.9	13.6		
PHF	.715	.734	.767	.782	.841	.894	.818	.910	.836	.903	.683	.891	.697	.853	.760	.868	.873

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County of Los Angeles
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E/W: Rosecrans Avenue
Weather: Clear

File Name : 05_CLA_S Avalon_Rosecrans AM
Site Code : 10518875
Start Date : 11/15/2018
Page No : 2



Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:30 AM				07:15 AM				07:15 AM				07:45 AM			
+0 mins.	32	**191**	25	**248**	33	**289**	28	350	**32**	112	8	152	**16**	110	18	144
+15 mins.	29	141	22	192	**44**	277	**37**	**358**	27	143	**30**	**200**	10	**126**	**25**	**161**
+30 mins.	**43**	137	**30**	210	42	266	34	342	21	124	23	168	13	99	21	133
+45 mins.	34	111	18	163	29	202	22	253	27	**145**	21	193	14	122	19	155
Total Volume	138	580	95	813	148	1034	121	1303	107	524	82	713	53	457	83	593
% App. Total	17	71.3	11.7		11.4	79.4	9.3		15	73.5	11.5		8.9	77.1	14	
PHF	.802	.759	.792	.820	.841	.894	.818	.910	.836	.903	.683	.891	.828	.907	.830	.921

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County of Los Angeles
N/S: South Avalon Boulevard
E/W: Rosecrans Avenue
Weather: Clear

File Name : 05_CLA_S Avalon_Rosecrans PM
Site Code : 10518875
Start Date : 11/15/2018
Page No : 1

Groups Printed- Total Volume

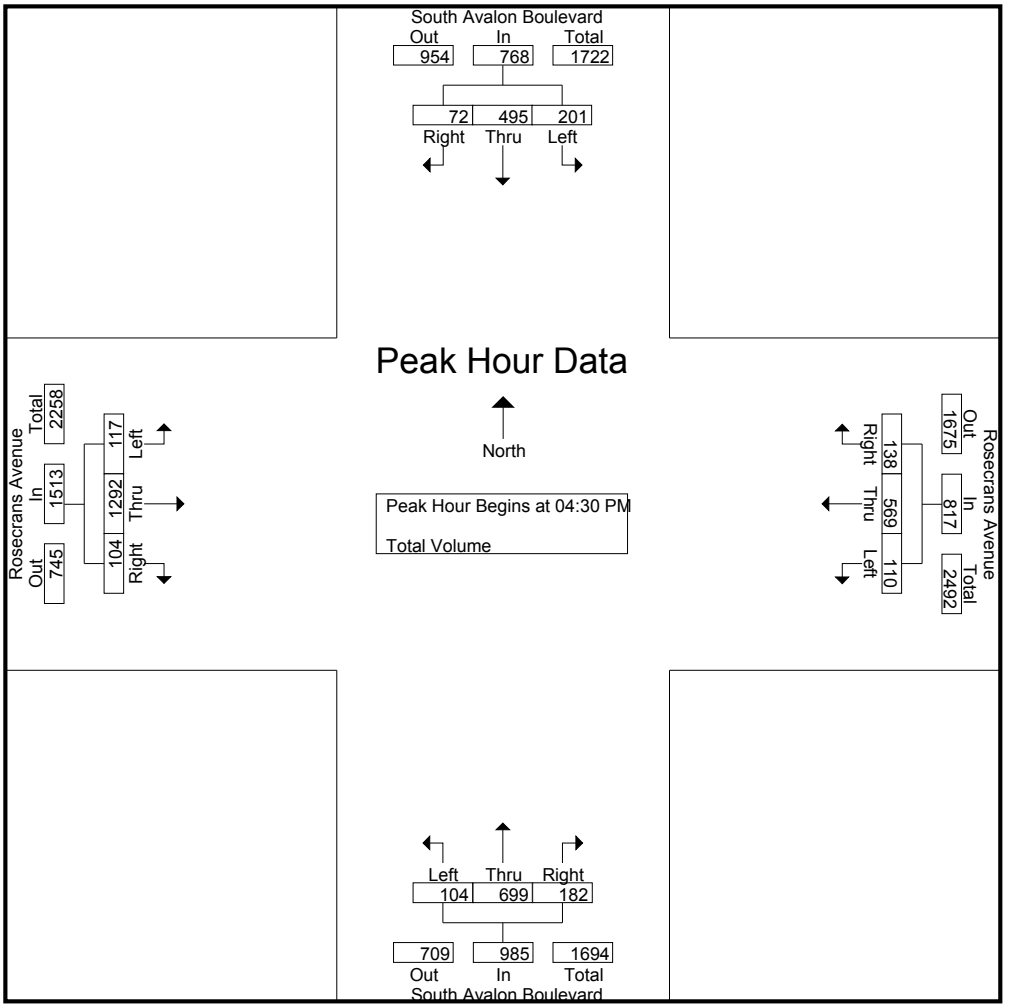
	South Avalon Boulevard Southbound				Rosecrans Avenue Westbound				South Avalon Boulevard Northbound				Rosecrans Avenue Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
04:00 PM	48	106	26	180	32	150	41	223	28	163	42	233	32	323	23	378	1014
04:15 PM	69	113	22	204	29	143	27	199	26	184	43	253	22	314	23	359	1015
04:30 PM	57	142	18	217	24	132	29	185	27	167	45	239	31	368	27	426	1067
04:45 PM	41	108	22	171	36	155	36	227	27	165	44	236	25	301	25	351	985
Total	215	469	88	772	121	580	133	834	108	679	174	961	110	1306	98	1514	4081
05:00 PM	48	130	14	192	26	141	33	200	24	187	47	258	34	297	27	358	1008
05:15 PM	55	115	18	188	24	141	40	205	26	180	46	252	27	326	25	378	1023
05:30 PM	61	105	19	185	18	125	34	177	24	211	52	287	29	307	27	363	1012
05:45 PM	39	105	16	160	18	121	34	173	41	189	44	274	36	289	20	345	952
Total	203	455	67	725	86	528	141	755	115	767	189	1071	126	1219	99	1444	3995
Grand Total	418	924	155	1497	207	1108	274	1589	223	1446	363	2032	236	2525	197	2958	8076
Apprch %	27.9	61.7	10.4		13	69.7	17.2		11	71.2	17.9		8	85.4	6.7		
Total %	5.2	11.4	1.9	18.5	2.6	13.7	3.4	19.7	2.8	17.9	4.5	25.2	2.9	31.3	2.4	36.6	

	South Avalon Boulevard Southbound				Rosecrans Avenue Westbound				South Avalon Boulevard Northbound				Rosecrans Avenue Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:30 PM																	
04:30 PM	**57**	**142**	18	**217**	24	132	29	185	**27**	167	45	239	31	**368**	**27**	**426**	**1067**
04:45 PM	41	108	**22**	171	**36**	**155**	36	**227**	27	165	44	236	25	301	25	351	985
05:00 PM	48	130	14	192	26	141	33	200	24	**187**	**47**	**258**	**34**	297	27	358	1008
05:15 PM	55	115	18	188	24	141	**40**	205	26	180	46	252	27	326	25	378	1023
Total Volume	201	495	72	768	110	569	138	817	104	699	182	985	117	1292	104	1513	4083
% App. Total	26.2	64.5	9.4		13.5	69.6	16.9		10.6	71	18.5		7.7	85.4	6.9		
PHF	.882	.871	.818	.885	.764	.918	.863	.900	.963	.934	.968	.954	.860	.878	.963	.888	.957

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File Name : 05_CLA_S Avalon_Rosecrans PM
Site Code : 10518875
Start Date : 11/15/2018
Page No : 2



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:15 PM				04:00 PM				05:00 PM				04:00 PM			
+0 mins.	**69**	113	**22**	204	32	150	**41**	223	24	187	47	258	**32**	323	23	378
+15 mins.	57	**142**	18	**217**	29	143	27	199	26	180	46	252	22	314	23	359
+30 mins.	41	108	22	171	24	132	29	185	24	**211**	**52**	**287**	31	**368**	**27**	**426**
+45 mins.	48	130	14	192	**36**	**155**	36	**227**	**41**	189	44	274	25	301	25	351
Total Volume	215	493	76	784	121	580	133	834	115	767	189	1071	110	1306	98	1514
% App. Total	27.4	62.9	9.7		14.5	69.5	15.9		10.7	71.6	17.6		7.3	86.3	6.5	
PHF	.779	.868	.864	.903	.840	.935	.811	.919	.701	.909	.909	.933	.859	.887	.907	.888

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County of Los Angeles
N/S: South Avalon Boulevard
E/W: East Compton Boulevard
Weather: Clear

File Name : 06_CLA_S Avalon_E Compton AM
Site Code : 10518875
Start Date : 11/15/2018
Page No : 1

Groups Printed- Total Volume

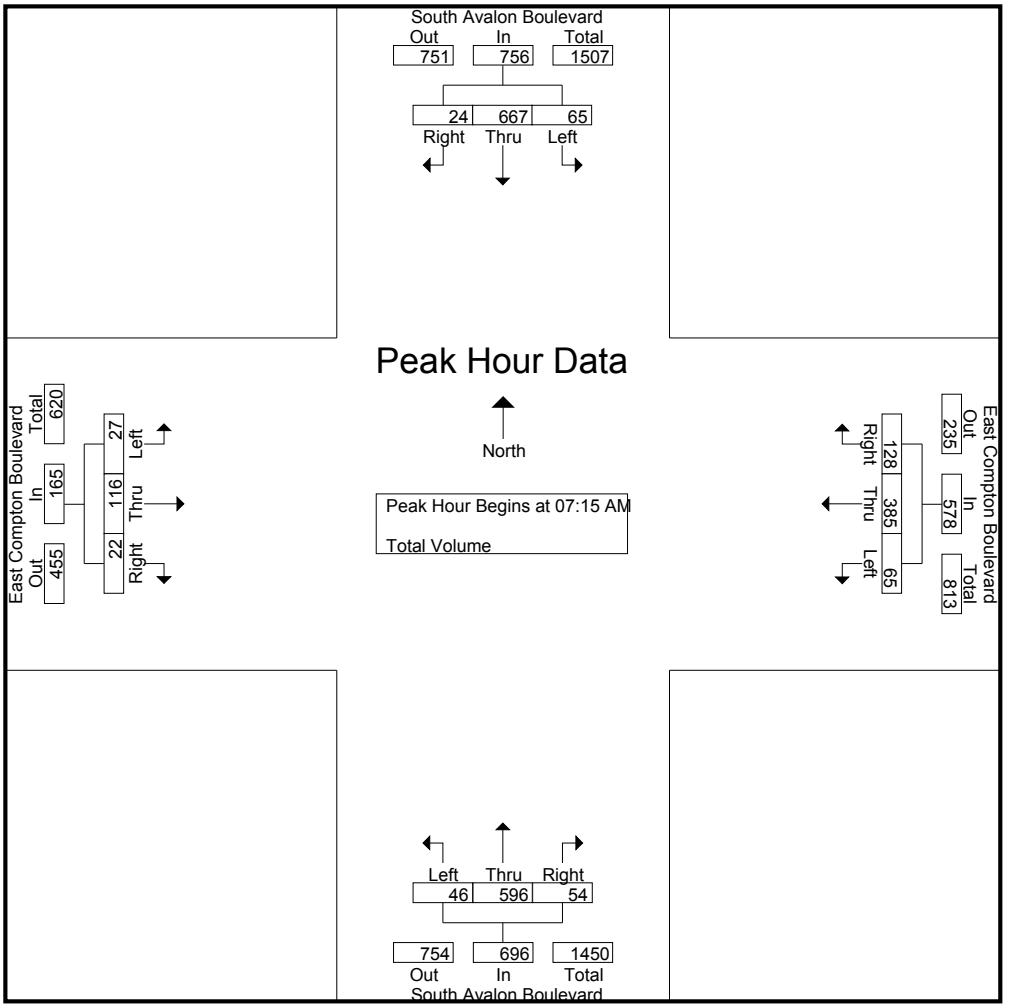
	South Avalon Boulevard Southbound				East Compton Boulevard Westbound				South Avalon Boulevard Northbound				East Compton Boulevard Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00 AM	17	103	11	131	8	86	23	117	7	93	8	108	7	22	1	30	386
07:15 AM	4	137	7	148	7	113	37	157	7	122	2	131	6	19	5	30	466
07:30 AM	15	228	7	250	18	82	29	129	16	170	15	201	4	30	7	41	621
07:45 AM	26	146	4	176	28	94	21	143	10	138	21	169	5	37	3	45	533
Total	62	614	29	705	61	375	110	546	40	523	46	609	22	108	16	146	2006
08:00 AM	20	156	6	182	12	96	41	149	13	166	16	195	12	30	7	49	575
08:15 AM	16	135	6	157	4	71	24	99	8	126	16	150	3	22	2	27	433
08:30 AM	19	120	10	149	14	63	17	94	7	144	8	159	9	17	2	28	430
08:45 AM	9	104	7	120	10	55	35	100	11	145	20	176	8	19	6	33	429
Total	64	515	29	608	40	285	117	442	39	581	60	680	32	88	17	137	1867
Grand Total	126	1129	58	1313	101	660	227	988	79	1104	106	1289	54	196	33	283	3873
Apprch %	9.6	86	4.4		10.2	66.8	23		6.1	85.6	8.2		19.1	69.3	11.7		
Total %	3.3	29.2	1.5	33.9	2.6	17	5.9	25.5	2	28.5	2.7	33.3	1.4	5.1	0.9	7.3	

	South Avalon Boulevard Southbound				East Compton Boulevard Westbound				South Avalon Boulevard Northbound				East Compton Boulevard Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	4	137	**7**	148	7	**113**	37	**157**	7	122	2	131	6	19	5	30	466
07:30 AM	15	**228**	7	**250**	18	82	29	129	**16**	**170**	15	**201**	4	30	**7**	41	**621**
07:45 AM	**26**	146	4	176	**28**	94	21	143	10	138	**21**	169	5	**37**	3	45	533
08:00 AM	20	156	6	182	12	96	**41**	149	13	166	16	195	**12**	30	7	**49**	575
Total Volume	65	667	24	756	65	385	128	578	46	596	54	696	27	116	22	165	2195
% App. Total	8.6	88.2	3.2		11.2	66.6	22.1		6.6	85.6	7.8		16.4	70.3	13.3		
PHF	.625	.731	.857	.756	.580	.852	.780	.920	.719	.876	.643	.866	.563	.784	.786	.842	.884

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County of Los Angeles
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E/W: East Compton Boulevard
Weather: Clear

File Name : 06_CLA_S Avalon_E Compton AM
Site Code : 10518875
Start Date : 11/15/2018
Page No : 2



Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:30 AM				07:15 AM				07:30 AM				07:15 AM			
+0 mins.	15	**228**	**7**	**250**	7	**113**	37	**157**	**16**	**170**	15	**201**	6	19	5	30
+15 mins.	**26**	146	4	176	18	82	29	129	10	138	**21**	169	4	30	**7**	41
+30 mins.	20	156	6	182	**28**	94	21	143	13	166	16	195	5	**37**	3	45
+45 mins.	16	135	6	157	12	96	**41**	149	8	126	16	150	**12**	30	7	**49**
Total Volume	77	665	23	765	65	385	128	578	47	600	68	715	27	116	22	165
% App. Total	10.1	86.9	3		11.2	66.6	22.1		6.6	83.9	9.5		16.4	70.3	13.3	
PHF	.740	.729	.821	.765	.580	.852	.780	.920	.734	.882	.810	.889	.563	.784	.786	.842

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Weather: Clear

File Name : 06_CLA_S Avalon_E Compton PM
Site Code : 10518875
Start Date : 11/15/2018
Page No : 1

Groups Printed- Total Volume

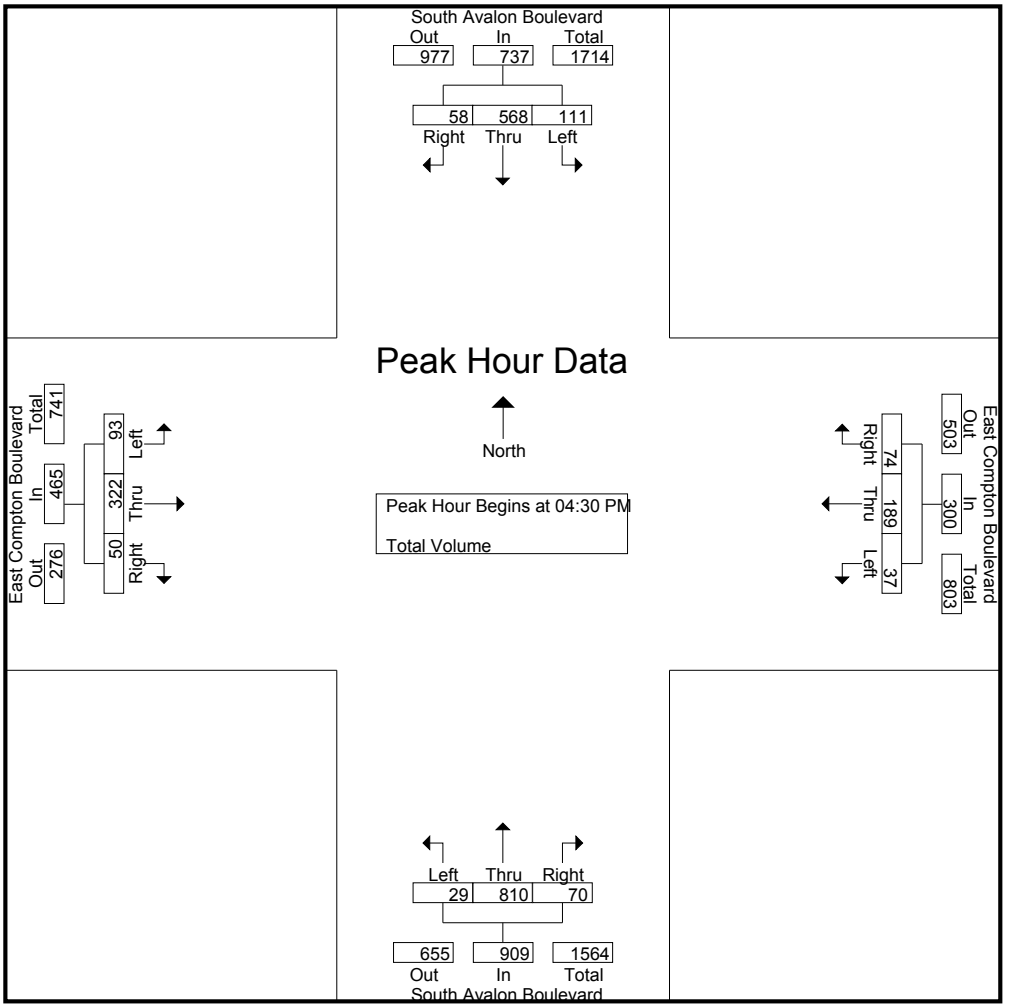
	South Avalon Boulevard Southbound				East Compton Boulevard Westbound				South Avalon Boulevard Northbound				East Compton Boulevard Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
04:00 PM	35	128	15	178	6	44	25	75	7	210	16	233	20	90	14	124	610
04:15 PM	28	122	16	166	5	44	25	74	7	199	18	224	16	75	9	100	564
04:30 PM	29	152	17	198	13	38	22	73	9	191	17	217	29	88	15	132	620
04:45 PM	24	128	13	165	10	53	23	86	9	175	13	197	14	81	10	105	553
Total	116	530	61	707	34	179	95	308	32	775	64	871	79	334	48	461	2347
05:00 PM	32	137	15	184	10	55	12	77	5	214	19	238	23	90	16	129	628
05:15 PM	26	151	13	190	4	43	17	64	6	230	21	257	27	63	9	99	610
05:30 PM	22	131	3	156	6	29	10	45	9	215	22	246	14	66	5	85	532
05:45 PM	15	119	7	141	6	49	20	75	6	227	17	250	12	80	9	101	567
Total	95	538	38	671	26	176	59	261	26	886	79	991	76	299	39	414	2337
Grand Total	211	1068	99	1378	60	355	154	569	58	1661	143	1862	155	633	87	875	4684
Apprch %	15.3	77.5	7.2		10.5	62.4	27.1		3.1	89.2	7.7		17.7	72.3	9.9		
Total %	4.5	22.8	2.1	29.4	1.3	7.6	3.3	12.1	1.2	35.5	3.1	39.8	3.3	13.5	1.9	18.7	

	South Avalon Boulevard Southbound				East Compton Boulevard Westbound				South Avalon Boulevard Northbound				East Compton Boulevard Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:30 PM																	
04:30 PM	29	**152**	**17**	**198**	**13**	38	22	73	**9**	191	17	217	**29**	88	15	**132**	620
04:45 PM	24	128	13	165	10	53	**23**	**86**	9	175	13	197	14	81	10	105	553
05:00 PM	**32**	137	15	184	10	**55**	12	77	5	214	19	238	23	**90**	**16**	129	**628**
05:15 PM	26	151	13	190	4	43	17	64	6	**230**	**21**	**257**	27	63	9	99	610
Total Volume	111	568	58	737	37	189	74	300	29	810	70	909	93	322	50	465	2411
% App. Total	15.1	77.1	7.9		12.3	63	24.7		3.2	89.1	7.7		20	69.2	10.8		
PHF	.867	.934	.853	.931	.712	.859	.804	.872	.806	.880	.833	.884	.802	.894	.781	.881	.960

Counts Unlimited
PO Box 1178
Corona, CA 92878
(951) 268-6268

County of Los Angeles
N/S: South Avalon Boulevard
E/W: East Compton Boulevard
Weather: Clear

File Name : 06_CLA_S Avalon_E Compton PM
Site Code : 10518875
Start Date : 11/15/2018



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:30 PM				04:15 PM				05:00 PM				04:15 PM			
+0 mins.	29	**152**	**17**	**198**	5	44	**25**	74	5	214	19	238	16	75	9	100
+15 mins.	24	128	13	165	**13**	38	22	73	6	**230**	21	**257**	**29**	88	15	**132**
+30 mins.	**32**	137	15	184	10	53	23	**86**	**9**	215	**22**	246	14	81	10	105
+45 mins.	26	151	13	190	10	**55**	12	77	6	227	17	250	23	**90**	**16**	129
Total Volume	111	568	58	737	38	190	82	310	26	886	79	991	82	334	50	466
% App. Total	15.1	77.1	7.9		12.3	61.3	26.5		2.6	89.4	8		17.6	71.7	10.7	
PHF	.867	.934	.853	.931	.731	.864	.820	.901	.722	.963	.898	.964	.707	.928	.781	.883

Counts Unlimited, Inc.

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County of Los Angeles
Avalon Boulevard
S/ Rosecrans Avenue
24 Hour Directional Volume Count

CLA001
Site Code: 105-18875

Start Time	11/15/2018 Thu	Northbound Morning	Northbound Afternoon	Hour Totals Morning	Hour Totals Afternoon	Southbound Morning	Southbound Afternoon	Hour Totals Morning	Hour Totals Afternoon	Combined Totals Morning	Combined Totals Afternoon
12:00		29	138			9	155				
12:15		23	146			23	109				
12:30		27	160			16	131				
12:45		18	160	97	604	16	106	64	501	161	1105
01:00		24	144			15	131				
01:15		20	179			11	142				
01:30		18	175			8	131				
01:45		18	162	80	660	11	148	45	552	125	1212
02:00		12	186			12	127				
02:15		25	222			17	152				
02:30		11	207			9	152				
02:45		10	220	58	835	26	158	64	589	122	1424
03:00		18	186			16	159				
03:15		13	211			26	175				
03:30		14	251			22	186				
03:45		17	249	62	897	24	167	88	687	150	1584
04:00		22	260			39	164				
04:15		29	242			65	**205**				
04:30		32	235			90	**168**				
04:45		36	**255**	119	992	60	**193**	254	730	373	1722
05:00		51	**259**			114	**179**				
05:15		83	**270**			109	135				
05:30		109	**271**			138	139				
05:45		134	208	377	1008	91	117	452	570	829	1578
06:00		123	190			119	107				
06:15		153	164			147	106				
06:30		155	130			128	92				
06:45		153	143	584	627	143	92	537	397	1121	1024
07:00		**165**	114			160	90				
07:15		**205**	92			**236**	87				
07:30		**166**	102			**197**	68				
07:45		**194**	104	730	412	**186**	75	779	320	1509	732
08:00		156	88			**168**	74				
08:15		180	71			144	48				
08:30		160	80			135	49				
08:45		154	55	650	294	117	49	564	220	1214	514
09:00		146	70			113	45				
09:15		131	66			117	47				
09:30		128	54			102	49				
09:45		120	77	525	267	104	32	436	173	961	440
10:00		122	69			91	37				
10:15		127	62			122	29				
10:30		136	55			109	23				
10:45		122	46	507	232	102	26	424	115	931	347
11:00		149	42			134	32				
11:15		133	40			115	23				
11:30		147	40			113	23				
11:45		154	47	583	169	105	25	467	103	1050	272
Total		4372	6997	4372	6997	4174	4957	4174	4957	8546	11954
Combined Total		11369		11369		9131		9131		20500	
AM Peak	-	07:00	-	-	-	07:15	-	-	-	-	-
Vol.	-	730	-	-	-	787	-	-	-	-	-
P.H.F.		0.890				0.834					
PM Peak	-	-	04:45	-	-	-	04:15	-	-	-	-
Vol.	-	-	1055	-	-	-	745	-	-	-	-
P.H.F.			0.973				0.909				
Percentage		38.5%	61.5%			45.7%	54.3%				
ADT/AADT		ADT 20,500		AADT 20,500							

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County of Los Angeles
Rosecrans Avenue
E/ Avalon Boulevard
24 Hour Directional Volume Count

CLA002
Site Code: 105-18875

Start Time	11/15/2018 Thu	Eastbound Morning	Eastbound Afternoon	Hour Totals Morning	Hour Totals Afternoon	Westbound Morning	Westbound Afternoon	Hour Totals Morning	Hour Totals Afternoon	Combined Totals Morning	Combined Totals Afternoon
12:00		43	190			22	156				
12:15		37	161			35	174				
12:30		25	171			27	160				
12:45		37	193	142	715	18	187	102	677	244	1392
01:00		20	217			22	160				
01:15		18	179			24	**233**				
01:30		20	191			26	**183**				
01:45		25	193	83	780	22	**199**	94	775	177	1555
02:00		19	205			18	**184**				
02:15		23	266			14	192				
02:30		12	290			29	171				
02:45		24	295	78	1056	21	182	82	729	160	1785
03:00		18	289			19	150				
03:15		17	311			39	191				
03:30		30	312			48	160				
03:45		35	**354**	100	1266	39	206	145	707	245	1973
04:00		44	**347**			51	192				
04:15		26	**378**			94	180				
04:30		50	**339**			102	207				
04:45		27	354	147	1418	80	178	327	757	474	2175
05:00		65	339			139	177				
05:15		51	363			196	169				
05:30		67	328			244	183				
05:45		70	296	253	1326	228	138	807	667	1060	1993
06:00		73	283			241	142				
06:15		78	259			308	120				
06:30		104	243			**306**	135				
06:45		113	246	368	1031	**306**	118	1161	515	1529	1546
07:00		118	177			**318**	123				
07:15		146	155			**339**	114				
07:30		156	137			280	100				
07:45		158	105	578	574	243	113	1180	450	1758	1024
08:00		132	133			230	109				
08:15		155	109			209	107				
08:30		143	114			197	78				
08:45		128	120	558	476	184	79	820	373	1378	849
09:00		134	91			186	64				
09:15		109	111			186	83				
09:30		149	103			157	75				
09:45		127	82	519	387	157	75	686	297	1205	684
10:00		130	86			167	77				
10:15		127	68			126	65				
10:30		137	59			153	54				
10:45		150	68	544	281	133	35	579	231	1123	512
11:00		**160**	51			164	51				
11:15		**147**	48			158	44				
11:30		**169**	48			163	52				
11:45		**182**	50	658	197	165	33	650	180	1308	377
Total		4028	9507	4028	9507	6633	6358	6633	6358	10661	15865
Combined Total		13535		13535		12991		12991		26526	
AM Peak	-	11:00	-	-	-	06:30	-	-	-	-	-
Vol.	-	658	-	-	-	1269	-	-	-	-	-
P.H.F.		0.904				0.936					
PM Peak	-	-	03:45	-	-	-	01:15	-	-	-	-
Vol.	-	-	1418	-	-	-	799	-	-	-	-
P.H.F.			0.938				0.857				
Percentage		29.8%	70.2%			51.1%	48.9%				
ADT/AADT		ADT 26,526		AADT 26,526							

Appendix C

Existing Level of Service Analysis Worksheets

Metro Bus Facility Rosecrans and Avalon TIS
Existing Conditions
AM Peak Hour

Scenario Report

Scenario:	EX_AM
Command:	EX_AM
Volume:	EX_AM
Geometry:	EX
Impact Fee:	Default Impact Fee
Trip Generation:	NONE
Trip Distribution:	DEFAULT
Paths:	Default Path
Routes:	Default Route
Configuration:	EX

Metro Bus Facility Rosecrans and Avalon TIS
Existing Conditions
AM Peak Hour

Turning Movement Report
NONE

Volume	Northbound			Southbound			Eastbound			Westbound			Total
Type	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Volume
#1 I-110 SB Ramps / East Rosecrans Ave													
Base	0	0	0	327	4	479	0	867	645	256	1267	0	3845
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	327	4	479	0	867	645	256	1267	0	3845
#2 I-110 NB Ramps / East Rosecrans Ave													
Base	480	6	176	2	0	12	1	798	357	0	1303	14	3149
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	480	6	176	2	0	12	1	798	357	0	1303	14	3149
#3 South Main St / East Rosecrans Ave													
Base	59	284	41	48	386	77	61	526	55	93	965	73	2668
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	59	284	41	48	386	77	61	526	55	93	965	73	2668
#4 South Avalon Blvd / East 135th St													
Base	105	539	30	42	608	110	87	156	81	48	322	69	2197
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	105	539	30	42	608	110	87	156	81	48	322	69	2197
#5 South Avalon Blvd / East Rosecrans Ave													
Base	107	524	82	123	561	92	53	430	76	148	1034	121	3351
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	107	524	82	123	561	92	53	430	76	148	1034	121	3351
#6 South Avalon Blvd / Project Dwy - Bus													
Base	0	751	0	0	785	0	0	0	0	0	0	0	1536
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	751	0	0	785	0	0	0	0	0	0	0	1536
#7 South Avalon Blvd / East Compton Blvd													
Base	46	596	54	65	667	24	27	116	22	65	385	128	2195
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	46	596	54	65	667	24	27	116	22	65	385	128	2195
#8 Project Dwy - Employees / East Rosecrans Ave													
Base	0	0	0	0	0	0	0	635	0	0	1303	0	1938
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	635	0	0	1303	0	1938

Metro Bus Facility Rosecrans and Avalon TIS
Existing Conditions
AM Peak Hour

Level Of Service Computation Report
ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)

Intersection #1 I-110 SB Ramps / East Rosecrans Ave

Cycle (sec):	100	Critical Vol./Cap.(X):	0.832
Loss Time (sec):	10	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	75	Level Of Service:	D

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Split Phase			Split Phase			Permitted			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lanes:	0	0	0	1	0	1! 0 1	0	0	2 1 0	1	0	3 0 0
Volume Module:												
Base Vol:	0	0	0	327	4	479	0	867	645	256	1267	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	0	0	327	4	479	0	867	645	256	1267	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	0	0	0	327	4	479	0	867	645	256	1267	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	0	0	327	4	479	0	867	645	256	1267	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	0	0	0	327	4	479	0	867	645	256	1267	0
Saturation Flow Module:												
Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	0.00	0.00	0.00	1.21	0.01	1.78	0.00	2.00	1.00	1.00	3.00	0.00
Final Sat.:	0	0	0	1938	24	2839	0	3200	1600	1600	4800	0
Capacity Analysis Module:												
Vol/Sat:	0.00	0.00	0.00	0.17	0.17	0.17	0.00	0.27	0.40	0.16	0.26	0.00
Crit Moves:					****				****	****		

Metro Bus Facility Rosecrans and Avalon TIS
Existing Conditions
AM Peak Hour

Level Of Service Computation Report
ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)

Intersection #2 I-110 NB Ramps / East Rosecrans Ave

Cycle (sec):	100	Critical Vol./Cap.(X):	0.591
Loss Time (sec):	10	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	39	Level Of Service:	A

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Split Phase			Split Phase			Permitted			Permitted		
Rights:	Include			Include			Ovl			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lanes:	1	0	1! 0 0	0	0	1! 0 0	0	1	2 0 1	0	0	2 1 0
Volume Module:												
Base Vol:	480	6	176	2	0	12	1	798	357	0	1303	14
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	480	6	176	2	0	12	1	798	357	0	1303	14
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	480	6	176	2	0	12	1	798	357	0	1303	14
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	480	6	176	2	0	12	1	798	357	0	1303	14
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	480	6	176	2	0	12	1	798	357	0	1303	14
OvlAdjVol:									26			
Saturation Flow Module:												
Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	1.45	0.02	0.53	0.14	0.00	0.86	0.01	2.99	1.00	0.00	2.97	0.03
Final Sat.:	2320	29	851	229	0	1371	6	4794	1600	0	4749	51
Capacity Analysis Module:												
Vol/Sat:	0.21	0.21	0.21	0.01	0.00	0.01	0.00	0.17	0.22	0.00	0.27	0.27
OvlAdjV/S:									0.02			
Crit Moves:		****					****	****			****	

Metro Bus Facility Rosecrans and Avalon TIS
Existing Conditions
AM Peak Hour

Level Of Service Computation Report
ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)

Intersection #3 South Main St / East Rosecrans Ave

Cycle (sec):	100	Critical Vol./Cap.(X):	0.512
Loss Time (sec):	10	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	34	Level Of Service:	A

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Permitted			Permitted			Permitted		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lanes:	1	0 2	0 1	1	0 2	0 1	1	0 2	1 0	1	0 2	1 0
Volume Module:												
Base Vol:	59	284	41	48	386	77	61	526	55	93	965	73
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	59	284	41	48	386	77	61	526	55	93	965	73
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	59	284	41	48	386	77	61	526	55	93	965	73
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	59	284	41	48	386	77	61	526	55	93	965	73
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	59	284	41	48	386	77	61	526	55	93	965	73
Saturation Flow Module:												
Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	1.00	2.00	1.00	1.00	2.00	1.00	1.00	2.72	0.28	1.00	2.79	0.21
Final Sat.:	1600	3200	1600	1600	3200	1600	1600	4346	454	1600	4462	338
Capacity Analysis Module:												
Vol/Sat:	0.04	0.09	0.03	0.03	0.12	0.05	0.04	0.12	0.12	0.06	0.22	0.22
Crit Moves:	****				****		****				****	

Metro Bus Facility Rosecrans and Avalon TIS
Existing Conditions
AM Peak Hour

Level Of Service Computation Report
ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)

Intersection #4 South Avalon Blvd / East 135th St

Cycle (sec):	100	Critical Vol./Cap.(X):	0.511
Loss Time (sec):	10	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	34	Level Of Service:	A

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Permitted			Permitted			Permitted		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lanes:	1	0 1	1 0	1	0 2	0 1	1	0 1	0 1	1	0 2	0 1
Volume Module:												
Base Vol:	105	539	30	42	608	110	87	156	81	48	322	69
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	105	539	30	42	608	110	87	156	81	48	322	69
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	105	539	30	42	608	110	87	156	81	48	322	69
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	105	539	30	42	608	110	87	156	81	48	322	69
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	105	539	30	42	608	110	87	156	81	48	322	69
Saturation Flow Module:												
Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	1.00	1.89	0.11	1.00	2.00	1.00	1.00	1.00	1.00	1.00	2.00	1.00
Final Sat.:	1600	3031	169	1600	3200	1600	1600	1600	1600	1600	3200	1600
Capacity Analysis Module:												
Vol/Sat:	0.07	0.18	0.18	0.03	0.19	0.07	0.05	0.10	0.05	0.03	0.10	0.04
Crit Moves:	****				****		****				****	

Metro Bus Facility Rosecrans and Avalon TIS
Existing Conditions
AM Peak Hour

Level Of Service Computation Report
ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)

Intersection #5 South Avalon Blvd / East Rosecrans Ave

Cycle (sec):	100	Critical Vol./Cap.(X):	0.616
Loss Time (sec):	10	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	41	Level Of Service:	B

Approach:	North Bound				South Bound				East Bound				West Bound			
Movement:	L	- T	- R		L	- T	- R		L	- T	- R		L	- T	- R	
Control:	Prot+Permit				Prot+Permit				Prot+Permit				Prot+Permit			
Rights:	Include				Include				Include				Include			
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lanes:	1	0 2	0	1	1	0 2	0	1	1	0 2	1	0	1	0 2	1	0
Volume Module:																
Base Vol:	107	524	82	123	561	92	53	430	76	148	1034	121				
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00				
Initial Bse:	107	524	82	123	561	92	53	430	76	148	1034	121				
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00				
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00				
PHF Volume:	107	524	82	123	561	92	53	430	76	148	1034	121				
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0				
Reduced Vol:	107	524	82	123	561	92	53	430	76	148	1034	121				
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00				
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00				
FinalVolume:	107	524	82	123	561	92	53	430	76	148	1034	121				
Saturation Flow Module:																
Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600				
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00				
Lanes:	1.00	2.00	1.00	1.00	2.00	1.00	1.00	2.55	0.45	1.00	2.69	0.31				
Final Sat.:	1600	3200	1600	1600	3200	1600	1600	4079	721	1600	4297	503				
Capacity Analysis Module:																
Vol/Sat:	0.07	0.16	0.05	0.08	0.18	0.06	0.03	0.11	0.11	0.09	0.24	0.24				
Crit Moves:	****				****		****				****					

Metro Bus Facility Rosecrans and Avalon TIS
Existing Conditions
AM Peak Hour

Level Of Service Computation Report
2000 HCM Unsignalized Method (Base Volume Alternative)

Intersection #6 South Avalon Blvd / Project Dwy - Bus

Average Delay (sec/veh): 0.0 Worst Case Level Of Service: A[0.0]

Approach:	North Bound					South Bound					East Bound					West Bound				
Movement:	L	- T	- R			L	- T	- R			L	- T	- R			L	- T	- R		
Control:	Uncontrolled					Uncontrolled					Stop Sign					Stop Sign				
Rights:	Include					Include					Include					Include				
Lanes:	0	0 2	0	1		1	0 2	0	0		0	0 0	0	0		0	0 0	0	0	1
Volume Module:																				
Base Vol:	0	751	0			0	785	0			0	0	0			0	0	0		
Growth Adj:	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00		
Initial Bse:	0	751	0			0	785	0			0	0	0			0	0	0		
User Adj:	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00		
PHF Adj:	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00		
PHF Volume:	0	751	0			0	785	0			0	0	0			0	0	0		
Reduct Vol:	0	0	0			0	0	0			0	0	0			0	0	0		
FinalVolume:	0	751	0			0	785	0			0	0	0			0	0	0		
Critical Gap Module:																				
Critical Gp:	xxxxx	xxxx	xxxxx			xxxxx	xxxx	xxxxx			xxxxx	xxxx	xxxxx			xxxxx	xxxx	6.9		
FollowUpTim:	xxxxx	xxxx	xxxxx			xxxxx	xxxx	xxxxx			xxxxx	xxxx	xxxxx			xxxxx	xxxx	3.3		
Capacity Module:																				
Cnflict Vol:	xxxx	xxxx	xxxxx			xxxx	xxxx	xxxxx			xxxx	xxxx	xxxxx			xxxx	xxxx	376		
Potent Cap.:	xxxx	xxxx	xxxxx			xxxx	xxxx	xxxxx			xxxx	xxxx	xxxxx			xxxx	xxxx	628		
Move Cap.:	xxxx	xxxx	xxxxx			xxxx	xxxx	xxxxx			xxxx	xxxx	xxxxx			xxxx	xxxx	628		
Volume/Cap:	xxxx	xxxx	xxxx			xxxx	xxxx	xxxx			xxxx	xxxx	xxxx			xxxx	xxxx	0.00		
Level Of Service Module:																				
2Way95thQ:	xxxx	xxxx	xxxxx			xxxx	xxxx	xxxxx			xxxx	xxxx	xxxxx			xxxx	xxxx	xxxxx		
Control Del:	xxxxx	xxxx	xxxxx			xxxxx	xxxx	xxxxx			xxxxx	xxxx	xxxxx			xxxxx	xxxx	xxxxx		
LOS by Move:	*	*	*			*	*	*			*	*	*			*	*	*		
Movement:	LT -	LTR -	RT			LT -	LTR -	RT			LT -	LTR -	RT			LT -	LTR -	RT		
Shared Cap.:	xxxx	xxxx	xxxxx			xxxx	xxxx	xxxxx			xxxx	xxxx	xxxxx			xxxx	xxxx	xxxxx		
SharedQueue:	xxxxx	xxxx	xxxxx			xxxxx	xxxx	xxxxx			xxxxx	xxxx	xxxxx			xxxxx	xxxx	xxxxx		
Shrd ConDel:	xxxxx	xxxx	xxxxx			xxxxx	xxxx	xxxxx			xxxxx	xxxx	xxxxx			xxxxx	xxxx	xxxxx		
Shared LOS:	*	*	*			*	*	*			*	*	*			*	*	*		
ApproachDel:	xxxxxx					xxxxxx					xxxxxx					xxxxxx				
ApproachLOS:	*					*					*					*				

Note: Queue reported is the number of cars per lane.

Metro Bus Facility Rosecrans and Avalon TIS
Existing Conditions
AM Peak Hour

Level Of Service Computation Report
ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)

Intersection #7 South Avalon Blvd / East Compton Blvd

Cycle (sec):	100	Critical Vol./Cap.(X):	0.514
Loss Time (sec):	10	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	34	Level Of Service:	A

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Permitted			Permitted			Permitted		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lanes:	1	0 2	0 1	1	0 2	0 1	1	0 1	1 0	1	0 1	1 0
Volume Module:												
Base Vol:	46	596	54	65	667	24	27	116	22	65	385	128
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	46	596	54	65	667	24	27	116	22	65	385	128
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	46	596	54	65	667	24	27	116	22	65	385	128
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	46	596	54	65	667	24	27	116	22	65	385	128
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	46	596	54	65	667	24	27	116	22	65	385	128
Saturation Flow Module:												
Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	1.00	2.00	1.00	1.00	2.00	1.00	1.00	1.68	0.32	1.00	1.50	0.50
Final Sat.:	1600	3200	1600	1600	3200	1600	1600	2690	510	1600	2402	798
Capacity Analysis Module:												
Vol/Sat:	0.03	0.19	0.03	0.04	0.21	0.02	0.02	0.04	0.04	0.04	0.16	0.16
Crit Moves:	****				****		****				****	

Metro Bus Facility Rosecrans and Avalon TIS
Existing Conditions
AM Peak Hour

Level Of Service Computation Report
2000 HCM Unsignalized Method (Base Volume Alternative)

Intersection #8 Project Dwy - Employees / East Rosecrans Ave

Average Delay (sec/veh): 0.0 Worst Case Level Of Service: A[0.0]

Approach:	North Bound				South Bound				East Bound				West Bound			
Movement:	L	-	T	- R	L	-	T	- R	L	-	T	- R	L	-	T	- R
Control:	Stop Sign				Stop Sign				Uncontrolled				Uncontrolled			
Rights:	Include				Include				Include				Include			
Lanes:	0	0	1!	0 0	0	0	0	0 0	0	0	2	1 0	1	0	3	0 0
Volume Module:																
Base Vol:	0	0	0	0	0	0	0	0	0	635	0	0	1303	0		
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		
Initial Bse:	0	0	0	0	0	0	0	0	0	635	0	0	1303	0		
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		
PHF Volume:	0	0	0	0	0	0	0	0	0	635	0	0	1303	0		
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
FinalVolume:	0	0	0	0	0	0	0	0	0	635	0	0	1303	0		
Critical Gap Module:																
Critical Gp:	6.8	6.5	6.9	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx				
FollowUpTim:	3.5	4.0	3.3	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx				
Capacity Module:																
Cnflict Vol:	1069	1938	212	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx				
Potent Cap.:	219	66	800	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx				
Move Cap.:	219	66	800	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx				
Volume/Cap:	0.00	0.00	0.00	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx				
Level Of Service Module:																
2Way95thQ:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx				
Control Del:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx				
LOS by Move:	*	*	*	*	*	*	*	*	*	*	*	*				
Movement:	LT -	LTR -	RT	LT -	LTR -	RT	LT -	LTR -	RT	LT -	LTR -	RT				
Shared Cap.:	xxxx	0	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx				
SharedQueue:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx				
Shrd ConDel:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx				
Shared LOS:	*	*	*	*	*	*	*	*	*	*	*	*				
ApproachDel:	xxxxxx			xxxxxx			xxxxxx			xxxxxx						
ApproachLOS:	*			*			*			*						

Note: Queue reported is the number of cars per lane.

Metro Bus Facility Rosecrans and Avalon TIS
Existing Conditions
PM Peak Hour

Scenario Report

Scenario:	EX_PM
Command:	EX_PM
Volume:	EX_PM
Geometry:	EX
Impact Fee:	Default Impact Fee
Trip Generation:	NONE
Trip Distribution:	DEFAULT
Paths:	Default Path
Routes:	Default Route
Configuration:	EX

Metro Bus Facility Rosecrans and Avalon TIS
Existing Conditions
PM Peak Hour

Turning Movement Report
NONE

Volume	Northbound			Southbound			Eastbound			Westbound			Total
Type	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Volume
#1 I-110 SB Ramps / East Rosecrans Ave													
Base	0	0	0	580	12	450	0	1396	444	201	1019	0	4102
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	580	12	450	0	1396	444	201	1019	0	4102
#2 I-110 NB Ramps / East Rosecrans Ave													
Base	292	3	186	2	0	29	1	1458	375	0	1450	19	3815
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	292	3	186	2	0	29	1	1458	375	0	1450	19	3815
#3 South Main St / East Rosecrans Ave													
Base	118	514	105	69	307	49	105	1372	88	67	668	54	3516
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	118	514	105	69	307	49	105	1372	88	67	668	54	3516
#4 South Avalon Blvd / East 135th St													
Base	88	816	69	79	568	73	261	550	135	27	151	71	2888
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	88	816	69	79	568	73	261	550	135	27	151	71	2888
#5 South Avalon Blvd / East Rosecrans Ave													
Base	104	699	182	201	495	72	117	1292	104	110	569	138	4083
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	104	699	182	201	495	72	117	1292	104	110	569	138	4083
#6 South Avalon Blvd / Project Dwy - Bus													
Base	0	977	0	0	709	0	0	0	0	0	0	0	1686
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	977	0	0	709	0	0	0	0	0	0	0	1686
#7 South Avalon Blvd / East Compton Blvd													
Base	29	810	70	111	568	58	93	322	50	37	189	74	2411
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	29	810	70	111	568	58	93	322	50	37	189	74	2411
#8 Project Dwy - Employees / East Rosecrans Ave													
Base	0	0	0	0	0	0	0	1675	0	0	817	0	2492
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	1675	0	0	817	0	2492

Metro Bus Facility Rosecrans and Avalon TIS
Existing Conditions
PM Peak Hour

Level Of Service Computation Report
ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)

Intersection #1 I-110 SB Ramps / East Rosecrans Ave

Cycle (sec):	100	Critical Vol./Cap.(X):	0.826
Loss Time (sec):	10	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	73	Level Of Service:	D

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Split Phase			Split Phase			Permitted			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lanes:	0	0	0	1	0	1! 0 1	0	0	2 1 0	1	0	3 0 0
Volume Module:												
Base Vol:	0	0	0	580	12	450	0	1396	444	201	1019	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	0	0	580	12	450	0	1396	444	201	1019	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	0	0	0	580	12	450	0	1396	444	201	1019	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	0	0	580	12	450	0	1396	444	201	1019	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	0	0	0	580	12	450	0	1396	444	201	1019	0
Saturation Flow Module:												
Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	0.00	0.00	0.00	1.67	0.03	1.30	0.00	2.28	0.72	1.00	3.00	0.00
Final Sat.:	0	0	0	2672	55	2073	0	3642	1158	1600	4800	0
Capacity Analysis Module:												
Vol/Sat:	0.00	0.00	0.00	0.22	0.22	0.22	0.00	0.38	0.38	0.13	0.21	0.00
Crit Moves:					****			****		****		

Metro Bus Facility Rosecrans and Avalon TIS
Existing Conditions
PM Peak Hour

Level Of Service Computation Report
ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)

Intersection #2 I-110 NB Ramps / East Rosecrans Ave

Cycle (sec):	100	Critical Vol./Cap.(X):	0.576
Loss Time (sec):	10	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	38	Level Of Service:	A

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Split Phase			Split Phase			Permitted			Permitted		
Rights:	Include			Include			Ovl			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lanes:	1	0	1! 0	0	0	1! 0	0	1	2 0 1	0	0	2 1 0
Volume Module:												
Base Vol:	292	3	186	2	0	29	1	1458	375	0	1450	19
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	292	3	186	2	0	29	1	1458	375	0	1450	19
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	292	3	186	2	0	29	1	1458	375	0	1450	19
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	292	3	186	2	0	29	1	1458	375	0	1450	19
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	292	3	186	2	0	29	1	1458	375	0	1450	19
OvlAdjVol:									134			
Saturation Flow Module:												
Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	1.22	0.01	0.77	0.06	0.00	0.94	0.01	2.99	1.00	0.00	2.96	0.04
Final Sat.:	1943	20	1237	103	0	1497	3	4797	1600	0	4738	62
Capacity Analysis Module:												
Vol/Sat:	0.15	0.15	0.15	0.02	0.00	0.02	0.00	0.30	0.23	0.00	0.31	0.31
OvlAdjV/S:									0.08			
Crit Moves:	****						****	****			****	

Metro Bus Facility Rosecrans and Avalon TIS
Existing Conditions
PM Peak Hour

Level Of Service Computation Report
ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)

Intersection #3 South Main St / East Rosecrans Ave

Cycle (sec):	100	Critical Vol./Cap.(X):	0.650
Loss Time (sec):	10	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	44	Level Of Service:	B

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Permitted			Permitted			Permitted		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lanes:	1	0 2	0 1	1	0 2	0 1	1	0 2	1 0	1	0 2	1 0
Volume Module:												
Base Vol:	118	514	105	69	307	49	105	1372	88	67	668	54
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	118	514	105	69	307	49	105	1372	88	67	668	54
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	118	514	105	69	307	49	105	1372	88	67	668	54
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	118	514	105	69	307	49	105	1372	88	67	668	54
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	118	514	105	69	307	49	105	1372	88	67	668	54
Saturation Flow Module:												
Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	1.00	2.00	1.00	1.00	2.00	1.00	1.00	2.82	0.18	1.00	2.78	0.22
Final Sat.:	1600	3200	1600	1600	3200	1600	1600	4511	289	1600	4441	359
Capacity Analysis Module:												
Vol/Sat:	0.07	0.16	0.07	0.04	0.10	0.03	0.07	0.30	0.30	0.04	0.15	0.15
Crit Moves:		****		****				****		****		

Metro Bus Facility Rosecrans and Avalon TIS
Existing Conditions
PM Peak Hour

Level Of Service Computation Report
ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)

Intersection #4 South Avalon Blvd / East 135th St

Cycle (sec):	100	Critical Vol./Cap.(X):	0.787
Loss Time (sec):	10	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	64	Level Of Service:	C

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Permitted			Permitted			Permitted		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lanes:	1	0 1	1 0	1	0 2	0 1	1	0 1	0 1	1	0 2	0 1
Volume Module:												
Base Vol:	88	816	69	79	568	73	261	550	135	27	151	71
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	88	816	69	79	568	73	261	550	135	27	151	71
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	88	816	69	79	568	73	261	550	135	27	151	71
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	88	816	69	79	568	73	261	550	135	27	151	71
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	88	816	69	79	568	73	261	550	135	27	151	71
Saturation Flow Module:												
Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	1.00	1.84	0.16	1.00	2.00	1.00	1.00	1.00	1.00	1.00	2.00	1.00
Final Sat.:	1600	2951	249	1600	3200	1600	1600	1600	1600	1600	3200	1600
Capacity Analysis Module:												
Vol/Sat:	0.06	0.28	0.28	0.05	0.18	0.05	0.16	0.34	0.08	0.02	0.05	0.04
Crit Moves:		****		****				****		****		

Metro Bus Facility Rosecrans and Avalon TIS
Existing Conditions
PM Peak Hour

Level Of Service Computation Report
ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)

Intersection #5 South Avalon Blvd / East Rosecrans Ave

Cycle (sec):	100	Critical Vol./Cap.(X):	0.804
Loss Time (sec):	10	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	67	Level Of Service:	D

Approach:	North Bound				South Bound				East Bound				West Bound			
Movement:	L	- T	- R		L	- T	- R		L	- T	- R		L	- T	- R	
Control:	Prot+Permit				Prot+Permit				Prot+Permit				Prot+Permit			
Rights:	Include				Include				Include				Include			
Min. Green:	0	0	0		0	0	0		0	0	0		0	0	0	
Y+R:	4.0	4.0	4.0		4.0	4.0	4.0		4.0	4.0	4.0		4.0	4.0	4.0	
Lanes:	1	0 2	0	1	1	0 2	0	1	1	0 2	1	0	1	0 2	1	0
Volume Module:																
Base Vol:	104	699	182		201	495	72		117	1292	104		110	569	138	
Growth Adj:	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00	
Initial Bse:	104	699	182		201	495	72		117	1292	104		110	569	138	
User Adj:	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00	
PHF Adj:	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00	
PHF Volume:	104	699	182		201	495	72		117	1292	104		110	569	138	
Reduct Vol:	0	0	0		0	0	0		0	0	0		0	0	0	
Reduced Vol:	104	699	182		201	495	72		117	1292	104		110	569	138	
PCE Adj:	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00	
MLF Adj:	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00	
FinalVolume:	104	699	182		201	495	72		117	1292	104		110	569	138	
Saturation Flow Module:																
Sat/Lane:	1600	1600	1600		1600	1600	1600		1600	1600	1600		1600	1600	1600	
Adjustment:	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00	
Lanes:	1.00	2.00	1.00		1.00	2.00	1.00		1.00	2.78	0.22		1.00	2.41	0.59	
Final Sat.:	1600	3200	1600		1600	3200	1600		1600	4442	358		1600	3863	937	
Capacity Analysis Module:																
Vol/Sat:	0.07	0.22	0.11		0.13	0.15	0.05		0.07	0.29	0.29		0.07	0.15	0.15	
Crit Moves:		****				****				****				****		

Metro Bus Facility Rosecrans and Avalon TIS
Existing Conditions
PM Peak Hour

Level Of Service Computation Report
2000 HCM Unsignalized Method (Base Volume Alternative)

Intersection #6 South Avalon Blvd / Project Dwy - Bus

Average Delay (sec/veh): 0.0 Worst Case Level Of Service: A[0.0]

Approach:	North Bound					South Bound					East Bound					West Bound				
Movement:	L	- T	- R			L	- T	- R			L	- T	- R			L	- T	- R		
Control:	Uncontrolled					Uncontrolled					Stop Sign					Stop Sign				
Rights:	Include					Include					Include					Include				
Lanes:	0	0 2	0	1		1	0 2	0	0		0	0 0	0	0		0	0 0	0	0	1
Volume Module:																				
Base Vol:	0	977	0			0	709	0			0	0	0			0	0	0		
Growth Adj:	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00		
Initial Bse:	0	977	0			0	709	0			0	0	0			0	0	0		
User Adj:	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00		
PHF Adj:	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00		
PHF Volume:	0	977	0			0	709	0			0	0	0			0	0	0		
Reduct Vol:	0	0	0			0	0	0			0	0	0			0	0	0		
FinalVolume:	0	977	0			0	709	0			0	0	0			0	0	0		
Critical Gap Module:																				
Critical Gp:	xxxxx	xxxx	xxxxx			xxxxx	xxxx	xxxxx			xxxxx	xxxx	xxxxx			xxxxx	xxxx		6.9	
FollowUpTim:	xxxxx	xxxx	xxxxx			xxxxx	xxxx	xxxxx			xxxxx	xxxx	xxxxx			xxxxx	xxxx		3.3	
Capacity Module:																				
Cnflict Vol:	xxxx	xxxx	xxxxx			xxxx	xxxx	xxxxx			xxxx	xxxx	xxxxx			xxxx	xxxx		489	
Potent Cap.:	xxxx	xxxx	xxxxx			xxxx	xxxx	xxxxx			xxxx	xxxx	xxxxx			xxxx	xxxx		531	
Move Cap.:	xxxx	xxxx	xxxxx			xxxx	xxxx	xxxxx			xxxx	xxxx	xxxxx			xxxx	xxxx		531	
Volume/Cap:	xxxx	xxxx	xxxx			xxxx	xxxx	xxxx			xxxx	xxxx	xxxx			xxxx	xxxx		0.00	
Level Of Service Module:																				
2Way95thQ:	xxxx	xxxx	xxxxx			xxxx	xxxx	xxxxx			xxxx	xxxx	xxxxx			xxxx	xxxx	xxxxx		
Control Del:	xxxxx	xxxx	xxxxx			xxxxx	xxxx	xxxxx			xxxxx	xxxx	xxxxx			xxxxx	xxxx	xxxxx		
LOS by Move:	*	*	*			*	*	*			*	*	*			*	*	*		
Movement:	LT -	LTR -	RT			LT -	LTR -	RT			LT -	LTR -	RT			LT -	LTR -	RT		
Shared Cap.:	xxxx	xxxx	xxxxx			xxxx	xxxx	xxxxx			xxxx	xxxx	xxxxx			xxxx	xxxx	xxxxx		
SharedQueue:	xxxxx	xxxx	xxxxx			xxxxx	xxxx	xxxxx			xxxxx	xxxx	xxxxx			xxxxx	xxxx	xxxxx		
Shrd ConDel:	xxxxx	xxxx	xxxxx			xxxxx	xxxx	xxxxx			xxxxx	xxxx	xxxxx			xxxxx	xxxx	xxxxx		
Shared LOS:	*	*	*			*	*	*			*	*	*			*	*	*		
ApproachDel:	xxxxxx					xxxxxx					xxxxxx					xxxxxx				
ApproachLOS:	*					*					*					*				

Note: Queue reported is the number of cars per lane.

Metro Bus Facility Rosecrans and Avalon TIS
Existing Conditions
PM Peak Hour

Level Of Service Computation Report
ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)

Intersection #7 South Avalon Blvd / East Compton Blvd

Cycle (sec):	100	Critical Vol./Cap.(X):	0.563
Loss Time (sec):	10	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	37	Level Of Service:	A

Approach:	North Bound				South Bound				East Bound				West Bound			
Movement:	L	-	T	- R	L	-	T	- R	L	-	T	- R	L	-	T	- R
Control:	Permitted				Permitted				Permitted				Permitted			
Rights:	Include				Include				Include				Include			
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lanes:	1	0	2	0 1	1	0	2	0 1	1	0	1	1 0	1	0	1	1 0
Volume Module:																
Base Vol:	29	810	70	111	568	58	93	322	50	37	189	74				
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00				
Initial Bse:	29	810	70	111	568	58	93	322	50	37	189	74				
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00				
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00				
PHF Volume:	29	810	70	111	568	58	93	322	50	37	189	74				
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0				
Reduced Vol:	29	810	70	111	568	58	93	322	50	37	189	74				
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00				
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00				
FinalVolume:	29	810	70	111	568	58	93	322	50	37	189	74				
Saturation Flow Module:																
Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600				
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00				
Lanes:	1.00	2.00	1.00	1.00	2.00	1.00	1.00	1.73	0.27	1.00	1.44	0.56				
Final Sat.:	1600	3200	1600	1600	3200	1600	1600	2770	430	1600	2300	900				
Capacity Analysis Module:																
Vol/Sat:	0.02	0.25	0.04	0.07	0.18	0.04	0.06	0.12	0.12	0.02	0.08	0.08				
Crit Moves:		****			****			****				****				

Metro Bus Facility Rosecrans and Avalon TIS
Existing Conditions
PM Peak Hour

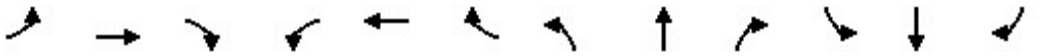
Level Of Service Computation Report
2000 HCM Unsignalized Method (Base Volume Alternative)

Intersection #8 Project Dwy - Employees / East Rosecrans Ave

Average Delay (sec/veh): 0.0 Worst Case Level Of Service: A[0.0]

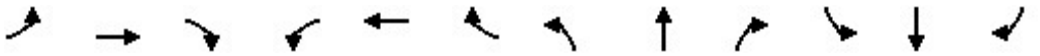
Approach:	North Bound				South Bound				East Bound				West Bound			
Movement:	L	-	T	- R	L	-	T	- R	L	-	T	- R	L	-	T	- R
Control:	Stop Sign				Stop Sign				Uncontrolled				Uncontrolled			
Rights:	Include				Include				Include				Include			
Lanes:	0	0	1! 0	0	0	0	0	0	0	0	2	1 0	1	0	3	0 0
Volume Module:																
Base Vol:	0	0	0	0	0	0	0	1675	0	0	817	0				
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00				
Initial Bse:	0	0	0	0	0	0	0	1675	0	0	817	0				
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00				
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00				
PHF Volume:	0	0	0	0	0	0	0	1675	0	0	817	0				
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0				
FinalVolume:	0	0	0	0	0	0	0	1675	0	0	817	0				
Critical Gap Module:																
Critical Gp:	6.8	6.5	6.9	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx				
FollowUpTim:	3.5	4.0	3.3	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx				
Capacity Module:																
Cnflict Vol:	1947	2492	558	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx				
Potent Cap.:	58	30	478	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx				
Move Cap.:	58	30	478	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx				
Volume/Cap:	0.00	0.00	0.00	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx				
Level Of Service Module:																
2Way95thQ:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx				
Control Del:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx				
LOS by Move:	*	*	*	*	*	*	*	*	*	*	*	*				
Movement:	LT -	LTR -	RT	LT -	LTR -	RT	LT -	LTR -	RT	LT -	LTR -	RT				
Shared Cap.:	xxxx	0	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx				
SharedQueue:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx				
Shrd ConDel:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx				
Shared LOS:	*	*	*	*	*	*	*	*	*	*	*	*				
ApproachDel:	xxxxxx			xxxxxx			xxxxxx			xxxxxx						
ApproachLOS:	*			*			*			*						

Note: Queue reported is the number of cars per lane.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	275		0	0		0	150		150
Storage Lanes	0		0	1		0	0		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.91	0.91	1.00	0.91	1.00	1.00	1.00	1.00	0.95	0.91	0.95
Ped Bike Factor												
Frt		0.936									0.878	0.850
Flt Protected				0.950						0.950	0.991	
Satd. Flow (prot)	0	4760	0	1770	5085	0	0	0	0	1681	1475	1504
Flt Permitted				0.950						0.950	0.991	
Satd. Flow (perm)	0	4760	0	1770	5085	0	0	0	0	1681	1475	1504
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		320									42	109
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		508			258			584			534	
Travel Time (s)		11.5			5.9			13.3			12.1	

Intersection Summary	
Area Type:	Other



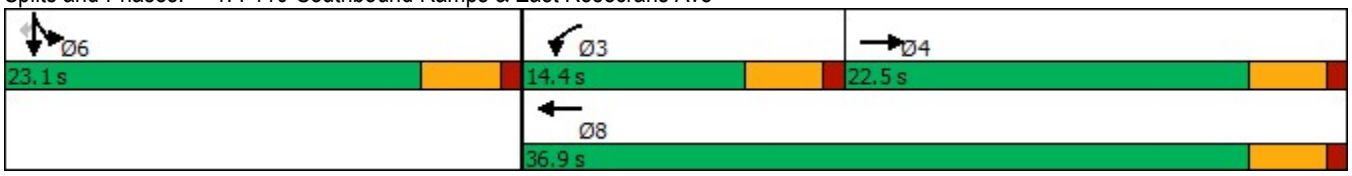
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	0	867	645	256	1267	0	0	0	0	327	4	479
Future Volume (vph)	0	867	645	256	1267	0	0	0	0	327	4	479
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	0	894	665	264	1306	0	0	0	0	337	4	494
Shared Lane Traffic (%)										14%		45%
Lane Group Flow (vph)	0	1559	0	264	1306	0	0	0	0	290	273	272

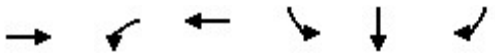
Intersection Summary

Lane Group	EBT	WBL	WBT	SBL	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	867	256	1267	327	4	479
Future Volume (vph)	867	256	1267	327	4	479
Turn Type	NA	Prot	NA	Split	NA	Perm
Protected Phases	4	3	8	6	6	
Permitted Phases						6
Detector Phase	4	3	8	6	6	6
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	9.5	22.5	22.5	22.5	22.5
Total Split (s)	22.5	14.4	36.9	23.1	23.1	23.1
Total Split (%)	37.5%	24.0%	61.5%	38.5%	38.5%	38.5%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lag	Lead				
Lead-Lag Optimize?	Yes	Yes				
Recall Mode	None	None	None	Max	Max	Max
Act Effct Green (s)	18.0	9.9	32.4	18.6	18.6	18.6
Actuated g/C Ratio	0.30	0.16	0.54	0.31	0.31	0.31
v/c Ratio	0.94	0.90	0.48	0.56	0.56	0.50
Control Delay	30.2	62.0	9.3	22.2	19.8	13.7
Queue Delay	0.0	0.0	0.9	0.0	0.0	0.0
Total Delay	30.2	62.0	10.2	22.2	19.8	13.7
LOS	C	E	B	C	B	B
Approach Delay	30.2		18.9		18.6	
Approach LOS	C		B		B	

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 60	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.94	
Intersection Signal Delay: 23.3	Intersection LOS: C
Intersection Capacity Utilization 70.7%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 1: I-110-Southbound Ramps & East Rosecrans Ave

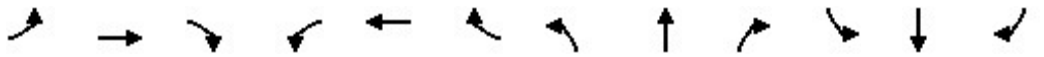




Lane Group	EBT	WBL	WBT	SBL	SBT	SBR
Lane Group Flow (vph)	1559	264	1306	290	273	272
v/c Ratio	0.94	0.90	0.48	0.56	0.56	0.50
Control Delay	30.2	62.0	9.3	22.2	19.8	13.7
Queue Delay	0.0	0.0	0.9	0.0	0.0	0.0
Total Delay	30.2	62.0	10.2	22.2	19.8	13.7
Queue Length 50th (ft)	161	95	96	90	74	47
Queue Length 95th (ft)	#261	#216	127	162	148	111
Internal Link Dist (ft)	428		178		454	
Turn Bay Length (ft)		275		150		150
Base Capacity (vph)	1652	292	2745	521	486	541
Starvation Cap Reductn	0	0	1068	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.94	0.90	0.78	0.56	0.56	0.50

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

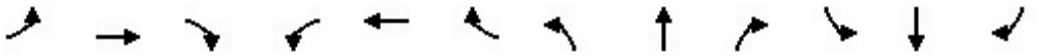


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	867	645	256	1267	0	0	0	0	327	4	479
Future Volume (veh/h)	0	867	645	256	1267	0	0	0	0	327	4	479
Number	7	4	14	3	8	18				1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1863	1900	1863	1863	0				1863	1863	1863
Adj Flow Rate, veh/h	0	894	665	264	1306	0				226	0	616
Adj No. of Lanes	0	3	0	1	3	0				1	0	2
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97				0.97	0.97	0.97
Percent Heavy Veh, %	0	2	2	2	2	0				2	2	2
Cap, veh/h	0	1017	475	293	2746	0				550	0	982
Arrive On Green	0.00	0.30	0.30	0.16	0.54	0.00				0.31	0.00	0.31
Sat Flow, veh/h	0	3558	1583	1774	5253	0				1774	0	3167
Grp Volume(v), veh/h	0	894	665	264	1306	0				226	0	616
Grp Sat Flow(s),veh/h/ln	0	1695	1583	1774	1695	0				1774	0	1583
Q Serve(g_s), s	0.0	15.0	18.0	8.8	9.5	0.0				6.0	0.0	10.0
Cycle Q Clear(g_c), s	0.0	15.0	18.0	8.8	9.5	0.0				6.0	0.0	10.0
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	1017	475	293	2746	0				550	0	982
V/C Ratio(X)	0.00	0.88	1.40	0.90	0.48	0.00				0.41	0.00	0.63
Avail Cap(c_a), veh/h	0	1017	475	293	2746	0				550	0	982
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	20.0	21.0	24.6	8.5	0.0				16.4	0.0	17.7
Incr Delay (d2), s/veh	0.0	8.9	192.4	28.9	0.1	0.0				2.3	0.0	3.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	8.2	33.2	6.6	4.4	0.0				3.3	0.0	4.8
LnGrp Delay(d),s/veh	0.0	28.9	213.4	53.5	8.7	0.0				18.6	0.0	20.8
LnGrp LOS		C	F	D	A					B		C
Approach Vol, veh/h		1559			1570						842	
Approach Delay, s/veh		107.6			16.2						20.2	
Approach LOS		F			B						C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs			3	4		6		8
Phs Duration (G+Y+Rc), s			14.4	22.5		23.1		36.9
Change Period (Y+Rc), s			4.5	4.5		4.5		4.5
Max Green Setting (Gmax), s			9.9	18.0		18.6		32.4
Max Q Clear Time (g_c+I1), s			10.8	20.0		12.0		11.5
Green Ext Time (p_c), s			0.0	0.0		2.0		9.9

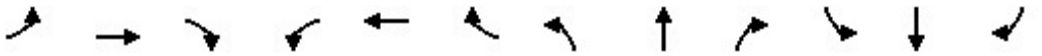
Intersection Summary	
HCM 2010 Ctrl Delay	52.9
HCM 2010 LOS	D

Notes



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		100	0		0	0		0	0		0
Storage Lanes	0		1	0		0	1		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.91	0.91	1.00	1.00	0.91	0.91	0.95	0.95	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt			0.850		0.998			0.918			0.884	
Flt Protected							0.950	0.979			0.993	
Satd. Flow (prot)	0	5085	1583	0	5075	0	1681	1590	0	0	1635	0
Flt Permitted		0.938					0.950	0.979			0.993	
Satd. Flow (perm)	0	4770	1583	0	5075	0	1681	1590	0	0	1635	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			364		2			86			94	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		148			3372			503			198	
Travel Time (s)		3.4			76.6			11.4			4.5	

Intersection Summary	
Area Type:	Other



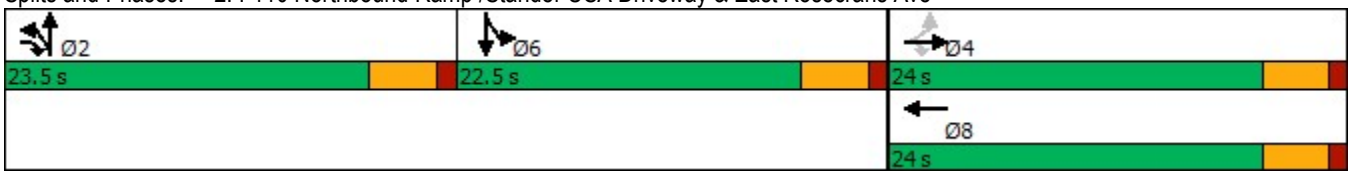
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	1	798	357	0	1303	14	480	6	176	2	0	12
Future Volume (vph)	1	798	357	0	1303	14	480	6	176	2	0	12
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	1	814	364	0	1330	14	490	6	180	2	0	12
Shared Lane Traffic (%)							29%					
Lane Group Flow (vph)	0	815	364	0	1344	0	348	328	0	0	14	0

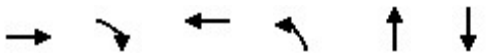
Intersection Summary

Lane Group	EBL	EBT	EBR	WBT	NBL	NBT	SBT
Lane Configurations							
Traffic Volume (vph)	1	798	357	1303	480	6	0
Future Volume (vph)	1	798	357	1303	480	6	0
Turn Type	Perm	NA	pm+ov	NA	Split	NA	NA
Protected Phases		4	2	8	2	2	6
Permitted Phases	4		4				
Detector Phase	4	4	2	8	2	2	6
Switch Phase							
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	24.0	24.0	23.5	24.0	23.5	23.5	22.5
Total Split (%)	34.3%	34.3%	33.6%	34.3%	33.6%	33.6%	32.1%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag							
Lead-Lag Optimize?							
Recall Mode	None	None	Max	None	Max	Max	Min
Act Effct Green (s)		19.5	43.0	19.5	19.0	19.0	5.5
Actuated g/C Ratio		0.34	0.75	0.34	0.33	0.33	0.10
v/c Ratio		0.50	0.29	0.78	0.63	0.56	0.06
Control Delay		16.5	0.9	20.9	22.3	16.0	0.4
Queue Delay		0.0	0.3	0.0	0.0	0.0	0.0
Total Delay		16.5	1.2	20.9	22.3	16.0	0.4
LOS		B	A	C	C	B	A
Approach Delay		11.7		20.9		19.2	0.4
Approach LOS		B		C		B	A

Intersection Summary	
Cycle Length: 70	
Actuated Cycle Length: 57.5	
Natural Cycle: 70	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.78	
Intersection Signal Delay: 17.1	Intersection LOS: B
Intersection Capacity Utilization 58.5%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 2: I-110 Northbound Ramp /Stander USA Driveway & East Rosecrans Ave





Lane Group	EBT	EBR	WBT	NBL	NBT	SBT
Lane Group Flow (vph)	815	364	1344	348	328	14
v/c Ratio	0.50	0.29	0.78	0.63	0.56	0.06
Control Delay	16.5	0.9	20.9	22.3	16.0	0.4
Queue Delay	0.0	0.3	0.0	0.0	0.0	0.0
Total Delay	16.5	1.2	20.9	22.3	16.0	0.4
Queue Length 50th (ft)	80	0	148	104	67	0
Queue Length 95th (ft)	112	13	197	185	142	0
Internal Link Dist (ft)	68		3292		423	118
Turn Bay Length (ft)		100				
Base Capacity (vph)	1617	1275	1722	555	582	576
Starvation Cap Reductn	0	407	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.50	0.42	0.78	0.63	0.56	0.02

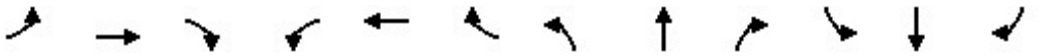
Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	798	357	0	1303	14	480	6	176	2	0	12
Future Volume (veh/h)	1	798	357	0	1303	14	480	6	176	2	0	12
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1863	1863	0	1863	1900	1863	1863	1900	1900	1863	1900
Adj Flow Rate, veh/h	1	814	364	0	1330	14	338	219	180	2	0	12
Adj No. of Lanes	0	3	1	0	3	0	1	1	0	0	1	0
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	2	2	2	0	2	2	2	2	2	2	2	2
Cap, veh/h	65	1611	1057	0	1690	18	606	323	266	21	0	124
Arrive On Green	0.33	0.33	0.33	0.00	0.33	0.33	0.34	0.34	0.34	0.09	0.00	0.09
Sat Flow, veh/h	1	4944	1583	0	5356	55	1774	947	778	230	0	1378
Grp Volume(v), veh/h	307	508	364	0	869	475	338	0	399	14	0	0
Grp Sat Flow(s),veh/h/ln	1859	1543	1583	0	1695	1853	1774	0	1725	1608	0	0
Q Serve(g_s), s	0.0	7.4	5.5	0.0	12.9	12.9	8.6	0.0	11.0	0.4	0.0	0.0
Cycle Q Clear(g_c), s	7.4	7.4	5.5	0.0	12.9	12.9	8.6	0.0	11.0	0.4	0.0	0.0
Prop In Lane	0.00		1.00	0.00		0.03	1.00		0.45	0.14		0.86
Lane Grp Cap(c), veh/h	671	1005	1057	0	1105	604	606	0	589	145	0	0
V/C Ratio(X)	0.46	0.51	0.34	0.00	0.79	0.79	0.56	0.00	0.68	0.10	0.00	0.00
Avail Cap(c_a), veh/h	716	1082	1096	0	1189	650	606	0	589	520	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	15.1	15.1	4.0	0.0	17.0	17.0	14.9	0.0	15.7	23.2	0.0	0.0
Incr Delay (d2), s/veh	0.5	0.4	0.2	0.0	3.4	6.0	3.7	0.0	6.1	0.3	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.8	3.2	4.9	0.0	6.6	7.6	4.8	0.0	6.2	0.2	0.0	0.0
LnGrp Delay(d),s/veh	15.6	15.5	4.2	0.0	20.4	23.0	18.6	0.0	21.8	23.5	0.0	0.0
LnGrp LOS	B	B	A		C	C	B		C	C		
Approach Vol, veh/h		1179			1344			737			14	
Approach Delay, s/veh		12.1			21.3			20.3			23.5	
Approach LOS		B			C			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		23.5		22.6		9.5		22.6
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5
Max Green Setting (Gmax), s		19.0		19.5		18.0		19.5
Max Q Clear Time (g_c+I1), s		13.0		9.4		2.4		14.9
Green Ext Time (p_c), s		2.0		4.7		0.0		3.2

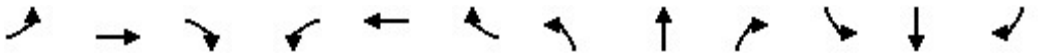
Intersection Summary	
HCM 2010 Ctrl Delay	17.8
HCM 2010 LOS	B

Notes



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	150		0	155		0	190		100	190		100
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.91	0.91	1.00	0.91	0.91	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor												
Frt		0.986			0.989				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	5014	0	1770	5029	0	1770	3539	1583	1770	3539	1583
Flt Permitted	0.204			0.415			0.517			0.573		
Satd. Flow (perm)	380	5014	0	773	5029	0	963	3539	1583	1067	3539	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		42			28				42			73
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		3372			2662			738			2100	
Travel Time (s)		76.6			60.5			16.8			47.7	

Intersection Summary	
Area Type:	Other



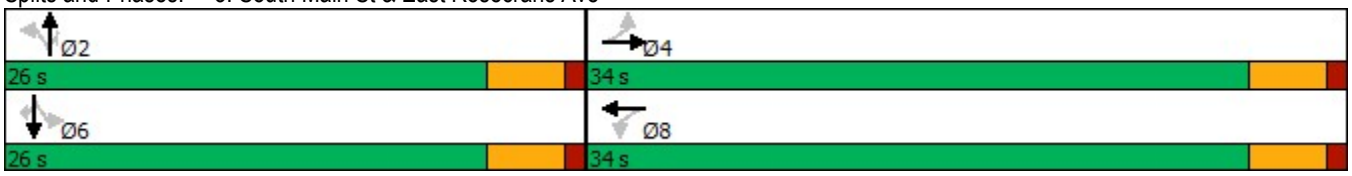
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	61	526	55	93	965	73	59	284	41	48	386	77
Future Volume (vph)	61	526	55	93	965	73	59	284	41	48	386	77
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	63	542	57	96	995	75	61	293	42	49	398	79
Shared Lane Traffic (%)												
Lane Group Flow (vph)	63	599	0	96	1070	0	61	293	42	49	398	79

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	61	526	93	965	59	284	41	48	386	77
Future Volume (vph)	61	526	93	965	59	284	41	48	386	77
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4		8		2			6	
Permitted Phases	4		8		2		2	6		6
Detector Phase	4	4	8	8	2	2	2	6	6	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	34.0	34.0	34.0	34.0	26.0	26.0	26.0	26.0	26.0	26.0
Total Split (%)	56.7%	56.7%	56.7%	56.7%	43.3%	43.3%	43.3%	43.3%	43.3%	43.3%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag										
Lead-Lag Optimize?										
Recall Mode	None	None	None	None	Max	Max	Max	Max	Max	Max
Act Effct Green (s)	20.4	20.4	20.4	20.4	21.8	21.8	21.8	21.8	21.8	21.8
Actuated g/C Ratio	0.40	0.40	0.40	0.40	0.42	0.42	0.42	0.42	0.42	0.42
v/c Ratio	0.42	0.30	0.31	0.53	0.15	0.20	0.06	0.11	0.26	0.11
Control Delay	20.0	9.7	13.0	12.1	12.7	11.2	5.0	12.1	11.5	4.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	20.0	9.7	13.0	12.1	12.7	11.2	5.0	12.1	11.5	4.7
LOS	B	A	B	B	B	B	A	B	B	A
Approach Delay		10.7		12.2		10.7			10.6	
Approach LOS		B		B		B			B	

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 51.3	
Natural Cycle: 45	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.53	
Intersection Signal Delay: 11.3	Intersection LOS: B
Intersection Capacity Utilization 54.3%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 3: South Main St & East Rosecrans Ave





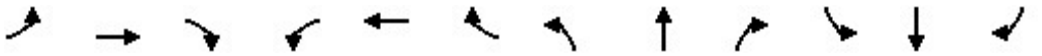
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	63	599	96	1070	61	293	42	49	398	79
v/c Ratio	0.42	0.30	0.31	0.53	0.15	0.20	0.06	0.11	0.26	0.11
Control Delay	20.0	9.7	13.0	12.1	12.7	11.2	5.0	12.1	11.5	4.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	20.0	9.7	13.0	12.1	12.7	11.2	5.0	12.1	11.5	4.7
Queue Length 50th (ft)	13	39	19	82	10	26	0	8	37	1
Queue Length 95th (ft)	41	57	46	110	39	62	17	32	83	24
Internal Link Dist (ft)		3292		2582		658			2020	
Turn Bay Length (ft)	150		155		190		100	190		100
Base Capacity (vph)	221	2937	450	2940	408	1502	696	453	1502	714
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.29	0.20	0.21	0.36	0.15	0.20	0.06	0.11	0.26	0.11

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	61	526	55	93	965	73	59	284	41	48	386	77
Future Volume (veh/h)	61	526	55	93	965	73	59	284	41	48	386	77
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	63	542	57	96	995	75	61	293	42	49	398	79
Adj No. of Lanes	1	3	0	1	3	0	1	2	1	1	2	1
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	264	1805	188	393	1861	140	475	1533	686	543	1533	686
Arrive On Green	0.39	0.39	0.39	0.39	0.39	0.39	0.43	0.43	0.43	0.43	0.43	0.43
Sat Flow, veh/h	525	4681	487	816	4826	363	914	3539	1583	1041	3539	1583
Grp Volume(v), veh/h	63	391	208	96	699	371	61	293	42	49	398	79
Grp Sat Flow(s),veh/h/ln	525	1695	1777	816	1695	1799	914	1770	1583	1041	1770	1583
Q Serve(g_s), s	5.2	4.0	4.0	4.6	7.9	7.9	2.3	2.5	0.8	1.5	3.6	1.5
Cycle Q Clear(g_c), s	13.2	4.0	4.0	8.7	7.9	7.9	5.8	2.5	0.8	4.1	3.6	1.5
Prop In Lane	1.00		0.27	1.00		0.20	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	264	1307	685	393	1307	694	475	1533	686	543	1533	686
V/C Ratio(X)	0.24	0.30	0.30	0.24	0.53	0.54	0.13	0.19	0.06	0.09	0.26	0.12
Avail Cap(c_a), veh/h	373	2015	1056	564	2015	1069	475	1533	686	543	1533	686
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	16.9	10.6	10.6	13.6	11.8	11.8	10.8	8.7	8.2	9.9	9.0	8.4
Incr Delay (d2), s/veh	0.5	0.1	0.2	0.3	0.3	0.6	0.6	0.3	0.2	0.3	0.4	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	1.9	2.0	1.1	3.7	4.0	0.6	1.3	0.4	0.5	1.8	0.7
LnGrp Delay(d),s/veh	17.4	10.7	10.9	13.9	12.1	12.5	11.4	9.0	8.4	10.3	9.4	8.7
LnGrp LOS	B	B	B	B	B	B	B	A	A	B	A	A
Approach Vol, veh/h		662			1166			396			526	
Approach Delay, s/veh		11.4			12.4			9.3			9.4	
Approach LOS		B			B			A			A	

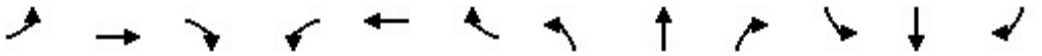
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		26.0		23.6		26.0		23.6
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5
Max Green Setting (Gmax), s		21.5		29.5		21.5		29.5
Max Q Clear Time (g_c+I1), s		7.8		15.2		6.1		10.7
Green Ext Time (p_c), s		1.9		4.0		2.7		7.8

Intersection Summary	
HCM 2010 Ctrl Delay	11.1
HCM 2010 LOS	B



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	105		105	80		100	100		0	100		100
Storage Lanes	1		1	1		1	1		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	0.95	1.00	0.95	1.00
Ped Bike Factor												
Frt			0.850			0.850		0.992				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1863	1583	1770	3539	1583	1770	3511	0	1770	3539	1583
Flt Permitted	0.536			0.649			0.392			0.414		
Satd. Flow (perm)	998	1863	1583	1209	3539	1583	730	3511	0	771	3539	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			89			76		14				121
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		774			575			2576			504	
Travel Time (s)		17.6			13.1			58.5			11.5	

Intersection Summary	
Area Type:	Other



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	87	156	81	48	322	69	105	539	30	42	608	110
Future Volume (vph)	87	156	81	48	322	69	105	539	30	42	608	110
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	96	171	89	53	354	76	115	592	33	46	668	121
Shared Lane Traffic (%)												
Lane Group Flow (vph)	96	171	89	53	354	76	115	625	0	46	668	121

Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	87	156	81	48	322	69	105	539	42	608	110
Future Volume (vph)	87	156	81	48	322	69	105	539	42	608	110
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm	NA	Perm
Protected Phases		4			8			2		6	
Permitted Phases	4		4	8		8	2		6		6
Detector Phase	4	4	4	8	8	8	2	2	6	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	25.0	25.0	25.0	25.0	25.0	25.0	35.0	35.0	35.0	35.0	35.0
Total Split (%)	41.7%	41.7%	41.7%	41.7%	41.7%	41.7%	58.3%	58.3%	58.3%	58.3%	58.3%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag											
Lead-Lag Optimize?											
Recall Mode	None	None	None	None	None	None	Max	Max	Max	Max	Max
Act Effct Green (s)	11.4	11.4	11.4	11.4	11.4	11.4	30.6	30.6	30.6	30.6	30.6
Actuated g/C Ratio	0.22	0.22	0.22	0.22	0.22	0.22	0.60	0.60	0.60	0.60	0.60
v/c Ratio	0.43	0.41	0.21	0.20	0.45	0.18	0.26	0.30	0.10	0.32	0.12
Control Delay	23.0	19.7	5.6	17.3	18.7	5.8	8.0	5.9	6.2	6.1	1.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.0	19.7	5.6	17.3	18.7	5.8	8.0	5.9	6.2	6.1	1.9
LOS	C	B	A	B	B	A	A	A	A	A	A
Approach Delay		17.1			16.5			6.2		5.5	
Approach LOS		B			B			A		A	

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 51.1	
Natural Cycle: 45	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.45	
Intersection Signal Delay: 9.6	Intersection LOS: A
Intersection Capacity Utilization 51.3%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 4: South Avalon Blvd & East 135th St





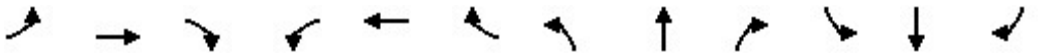
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	96	171	89	53	354	76	115	625	46	668	121
v/c Ratio	0.43	0.41	0.21	0.20	0.45	0.18	0.26	0.30	0.10	0.32	0.12
Control Delay	23.0	19.7	5.6	17.3	18.7	5.8	8.0	5.9	6.2	6.1	1.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.0	19.7	5.6	17.3	18.7	5.8	8.0	5.9	6.2	6.1	1.9
Queue Length 50th (ft)	25	44	0	13	47	0	13	37	5	42	0
Queue Length 95th (ft)	59	86	25	35	77	24	48	83	21	91	18
Internal Link Dist (ft)		694			495			2496		424	
Turn Bay Length (ft)	105		105	80		100	100		100		100
Base Capacity (vph)	401	750	690	487	1425	682	437	2109	461	2120	997
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.24	0.23	0.13	0.11	0.25	0.11	0.26	0.30	0.10	0.32	0.12

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	87	156	81	48	322	69	105	539	30	42	608	110
Future Volume (veh/h)	87	156	81	48	322	69	105	539	30	42	608	110
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	96	171	89	53	354	76	115	592	33	46	668	121
Adj No. of Lanes	1	1	1	1	2	1	1	2	0	1	2	1
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	287	447	380	320	849	380	474	2001	111	537	2077	929
Arrive On Green	0.24	0.24	0.24	0.24	0.24	0.24	0.59	0.59	0.59	0.59	0.59	0.59
Sat Flow, veh/h	954	1863	1583	1115	3539	1583	684	3409	190	797	3539	1583
Grp Volume(v), veh/h	96	171	89	53	354	76	115	307	318	46	668	121
Grp Sat Flow(s),veh/h/ln	954	1863	1583	1115	1770	1583	684	1770	1829	797	1770	1583
Q Serve(g_s), s	4.9	4.0	2.4	2.2	4.4	2.0	5.4	4.5	4.5	1.6	5.0	1.8
Cycle Q Clear(g_c), s	9.3	4.0	2.4	6.2	4.4	2.0	10.3	4.5	4.5	6.1	5.0	1.8
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.10	1.00		1.00
Lane Grp Cap(c), veh/h	287	447	380	320	849	380	474	1038	1073	537	2077	929
V/C Ratio(X)	0.33	0.38	0.23	0.17	0.42	0.20	0.24	0.30	0.30	0.09	0.32	0.13
Avail Cap(c_a), veh/h	434	735	625	493	1396	625	474	1038	1073	537	2077	929
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	20.6	16.5	15.9	19.1	16.7	15.8	8.1	5.4	5.4	6.9	5.5	4.8
Incr Delay (d2), s/veh	0.7	0.5	0.3	0.2	0.3	0.3	1.2	0.7	0.7	0.3	0.4	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.3	2.1	1.0	0.7	2.2	0.9	1.1	2.3	2.4	0.4	2.5	0.8
LnGrp Delay(d),s/veh	21.3	17.1	16.2	19.3	17.0	16.0	9.3	6.1	6.1	7.2	5.9	5.1
LnGrp LOS	C	B	B	B	B	B	A	A	A	A	A	A
Approach Vol, veh/h		356			483			740			835	
Approach Delay, s/veh		18.0			17.1			6.6			5.8	
Approach LOS		B			B			A			A	

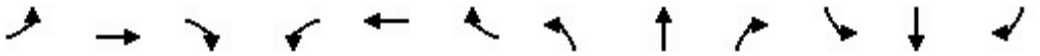
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		35.0		17.0		35.0		17.0
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5
Max Green Setting (Gmax), s		30.5		20.5		30.5		20.5
Max Q Clear Time (g_c+I1), s		12.3		11.3		8.1		8.2
Green Ext Time (p_c), s		4.6		1.2		5.5		2.2

Intersection Summary	
HCM 2010 Ctrl Delay	10.1
HCM 2010 LOS	B



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	220		0	200		0	110		110	120		100
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.91	0.91	1.00	0.91	0.91	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor												
Frt		0.978			0.984				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	4973	0	1770	5004	0	1770	3539	1583	1770	3539	1583
Flt Permitted	0.221			0.366			0.284			0.315		
Satd. Flow (perm)	412	4973	0	682	5004	0	529	3539	1583	587	3539	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		53			31				176			176
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		2662			498			439			2576	
Travel Time (s)		60.5			11.3			10.0			58.5	

Intersection Summary	
Area Type:	Other



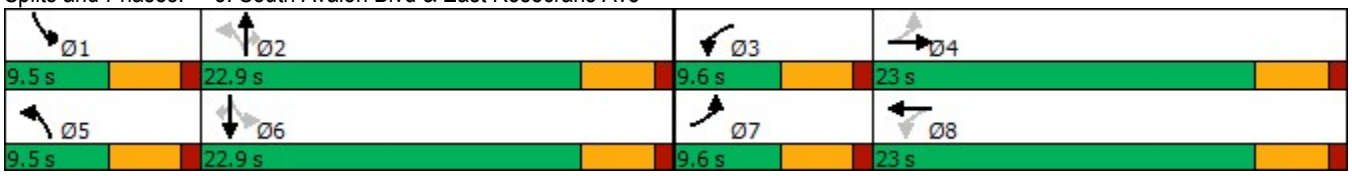
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	53	430	76	148	1034	121	107	524	82	123	561	92
Future Volume (vph)	53	430	76	148	1034	121	107	524	82	123	561	92
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	61	494	87	170	1189	139	123	602	94	141	645	106
Shared Lane Traffic (%)												
Lane Group Flow (vph)	61	581	0	170	1328	0	123	602	94	141	645	106

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	53	430	148	1034	107	524	82	123	561	92
Future Volume (vph)	53	430	148	1034	107	524	82	123	561	92
Turn Type	pm+pt	NA	pm+pt	NA	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4	3	8	5	2		1	6	
Permitted Phases	4		8		2		2	6		6
Detector Phase	7	4	3	8	5	2	2	1	6	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	9.5	22.5	9.5	22.5	22.5	9.5	22.5	22.5
Total Split (s)	9.6	23.0	9.6	23.0	9.5	22.9	22.9	9.5	22.9	22.9
Total Split (%)	14.8%	35.4%	14.8%	35.4%	14.6%	35.2%	35.2%	14.6%	35.2%	35.2%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	Max	Max	None	Max	Max
Act Effct Green (s)	21.1	17.2	22.0	19.2	22.5	18.8	18.8	22.5	18.8	18.8
Actuated g/C Ratio	0.35	0.29	0.37	0.32	0.38	0.32	0.32	0.38	0.32	0.32
v/c Ratio	0.23	0.39	0.49	0.81	0.40	0.54	0.15	0.44	0.58	0.17
Control Delay	13.5	17.4	17.9	25.4	15.7	20.6	0.9	16.3	21.2	1.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	13.5	17.4	17.9	25.4	15.7	20.6	0.9	16.3	21.2	1.5
LOS	B	B	B	C	B	C	A	B	C	A
Approach Delay		17.1		24.5		17.6			18.1	
Approach LOS		B		C		B			B	

Intersection Summary	
Cycle Length: 65	
Actuated Cycle Length: 59.6	
Natural Cycle: 65	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.81	
Intersection Signal Delay: 20.3	Intersection LOS: C
Intersection Capacity Utilization 63.3%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 5: South Avalon Blvd & East Rosecrans Ave

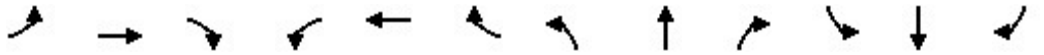




Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	61	581	170	1328	123	602	94	141	645	106
v/c Ratio	0.23	0.39	0.49	0.81	0.40	0.54	0.15	0.44	0.58	0.17
Control Delay	13.5	17.4	17.9	25.4	15.7	20.6	0.9	16.3	21.2	1.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	13.5	17.4	17.9	25.4	15.7	20.6	0.9	16.3	21.2	1.5
Queue Length 50th (ft)	14	60	40	181	29	107	0	33	116	0
Queue Length 95th (ft)	32	85	74	#252	56	149	3	63	161	7
Internal Link Dist (ft)		2582		418		359			2496	
Turn Bay Length (ft)	220		200		110		110	120		100
Base Capacity (vph)	264	1610	346	1644	306	1114	619	323	1114	619
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.23	0.36	0.49	0.81	0.40	0.54	0.15	0.44	0.58	0.17

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	53	430	76	148	1034	121	107	524	82	123	561	92
Future Volume (veh/h)	53	430	76	148	1034	121	107	524	82	123	561	92
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	61	494	87	170	1189	139	123	602	94	141	645	106
Adj No. of Lanes	1	3	0	1	3	0	1	2	1	1	2	1
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	225	1141	197	395	1341	157	342	1035	463	364	1066	477
Arrive On Green	0.05	0.26	0.26	0.08	0.29	0.29	0.07	0.29	0.29	0.08	0.30	0.30
Sat Flow, veh/h	1774	4366	754	1774	4618	540	1774	3539	1583	1774	3539	1583
Grp Volume(v), veh/h	61	381	200	170	873	455	123	602	94	141	645	106
Grp Sat Flow(s),veh/h/ln	1774	1695	1730	1774	1695	1768	1774	1770	1583	1774	1770	1583
Q Serve(g_s), s	1.5	5.9	6.1	4.4	15.5	15.5	3.0	9.1	2.8	3.4	9.8	3.2
Cycle Q Clear(g_c), s	1.5	5.9	6.1	4.4	15.5	15.5	3.0	9.1	2.8	3.4	9.8	3.2
Prop In Lane	1.00		0.44	1.00		0.31	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	225	886	452	395	985	513	342	1035	463	364	1066	477
V/C Ratio(X)	0.27	0.43	0.44	0.43	0.89	0.89	0.36	0.58	0.20	0.39	0.61	0.22
Avail Cap(c_a), veh/h	277	997	509	395	997	520	358	1035	463	366	1066	477
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	17.1	19.3	19.4	15.4	21.3	21.3	14.5	19.0	16.7	14.3	18.8	16.5
Incr Delay (d2), s/veh	0.6	0.3	0.7	0.7	9.7	16.7	0.6	2.4	1.0	0.7	2.6	1.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	2.8	3.0	2.2	8.5	9.8	1.5	4.8	1.4	1.7	5.1	1.5
LnGrp Delay(d),s/veh	17.7	19.7	20.1	16.1	31.0	38.0	15.2	21.3	17.7	15.0	21.3	17.5
LnGrp LOS	B	B	C	B	C	D	B	C	B	B	C	B
Approach Vol, veh/h		642			1498			819			892	
Approach Delay, s/veh		19.6			31.4			20.0			19.9	
Approach LOS		B			C			C			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.5	22.9	9.6	20.9	8.9	23.4	7.8	22.8
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	5.0	18.4	5.1	18.5	5.0	18.4	5.1	18.5
Max Q Clear Time (g_c+I1), s	5.4	11.1	6.4	8.1	5.0	11.8	3.5	17.5
Green Ext Time (p_c), s	0.0	2.5	0.0	2.7	0.0	2.6	0.0	0.8

Intersection Summary	
HCM 2010 Ctrl Delay	24.4
HCM 2010 LOS	C



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%		0%			0%
Storage Length (ft)	0	0		100	100	
Storage Lanes	0	1		1	1	
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	1.00	0.95	1.00	1.00	0.95
Ped Bike Factor						
Frt						
Flt Protected						
Satd. Flow (prot)	0	1863	3539	1863	1863	3539
Flt Permitted						
Satd. Flow (perm)	0	1863	3539	1863	1863	3539
Link Speed (mph)	30		30			30
Link Distance (ft)	196		2086			439
Travel Time (s)	4.5		47.4			10.0

Intersection Summary	
Area Type:	Other



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Volume (vph)	0	0	751	0	0	785
Future Volume (vph)	0	0	751	0	0	785
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%		0%			0%
Adj. Flow (vph)	0	0	816	0	0	853
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	816	0	0	853

Intersection Summary

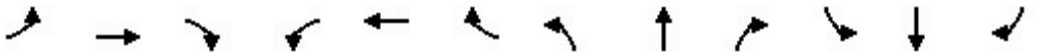
Intersection	
Int Delay, s/veh	0

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	0	751	0	0	785
Future Vol, veh/h	0	0	751	0	0	785
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	100	100	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	0	816	0	0	853

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	-	408	0	0	816	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.94	-	-	4.14	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.32	-	-	2.22	-
Pot Cap-1 Maneuver	0	593	-	-	807	-
Stage 1	0	-	-	-	-	-
Stage 2	0	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	-	593	-	-	807	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

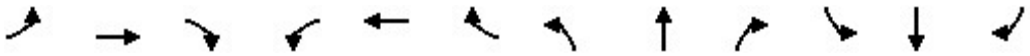
Approach	WB	NB	SB
HCM Control Delay, s	0	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	-	807	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s)	-	-	0	0	-
HCM Lane LOS	-	-	A	A	-
HCM 95th %tile Q(veh)	-	-	-	0	-



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	155		0	150		0	110		100	115		100
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor												
Frt		0.976			0.963				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3454	0	1770	3408	0	1770	3539	1583	1770	3539	1583
Flt Permitted	0.335			0.652			0.337			0.377		
Satd. Flow (perm)	624	3454	0	1215	3408	0	628	3539	1583	702	3539	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		25			86				61			27
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		972			474			575			2086	
Travel Time (s)		22.1			10.8			13.1			47.4	

Intersection Summary	
Area Type:	Other



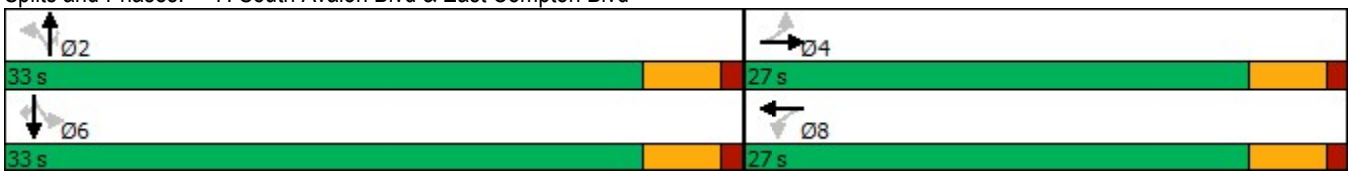
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	27	116	22	65	385	128	46	596	54	65	667	24
Future Volume (vph)	27	116	22	65	385	128	46	596	54	65	667	24
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	31	132	25	74	438	145	52	677	61	74	758	27
Shared Lane Traffic (%)												
Lane Group Flow (vph)	31	157	0	74	583	0	52	677	61	74	758	27

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	27	116	65	385	46	596	54	65	667	24
Future Volume (vph)	27	116	65	385	46	596	54	65	667	24
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4		8		2			6	
Permitted Phases	4		8		2		2	6		6
Detector Phase	4	4	8	8	2	2	2	6	6	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	27.0	27.0	27.0	27.0	33.0	33.0	33.0	33.0	33.0	33.0
Total Split (%)	45.0%	45.0%	45.0%	45.0%	55.0%	55.0%	55.0%	55.0%	55.0%	55.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag										
Lead-Lag Optimize?										
Recall Mode	None	None	None	None	Max	Max	Max	Max	Max	Max
Act Effct Green (s)	14.4	14.4	14.4	14.4	28.7	28.7	28.7	28.7	28.7	28.7
Actuated g/C Ratio	0.28	0.28	0.28	0.28	0.55	0.55	0.55	0.55	0.55	0.55
v/c Ratio	0.18	0.16	0.22	0.58	0.15	0.35	0.07	0.19	0.39	0.03
Control Delay	16.3	11.9	15.6	15.9	8.7	7.9	2.8	9.0	8.3	3.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	16.3	11.9	15.6	15.9	8.7	7.9	2.8	9.0	8.3	3.5
LOS	B	B	B	B	A	A	A	A	A	A
Approach Delay		12.6		15.8		7.6			8.2	
Approach LOS		B		B		A			A	

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 52.2	
Natural Cycle: 45	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.58	
Intersection Signal Delay: 10.3	Intersection LOS: B
Intersection Capacity Utilization 56.5%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 7: South Avalon Blvd & East Compton Blvd





Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	31	157	74	583	52	677	61	74	758	27
v/c Ratio	0.18	0.16	0.22	0.58	0.15	0.35	0.07	0.19	0.39	0.03
Control Delay	16.3	11.9	15.6	15.9	8.7	7.9	2.8	9.0	8.3	3.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	16.3	11.9	15.6	15.9	8.7	7.9	2.8	9.0	8.3	3.5
Queue Length 50th (ft)	7	15	17	66	7	53	0	10	62	0
Queue Length 95th (ft)	23	32	41	102	27	104	14	35	118	10
Internal Link Dist (ft)		892		394		495			2006	
Turn Bay Length (ft)	155		150		110		100	115		100
Base Capacity (vph)	271	1513	527	1528	345	1946	897	386	1946	882
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.11	0.10	0.14	0.38	0.15	0.35	0.07	0.19	0.39	0.03

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	27	116	22	65	385	128	46	596	54	65	667	24
Future Volume (veh/h)	27	116	22	65	385	128	46	596	54	65	667	24
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	31	132	25	74	438	145	52	677	61	74	758	27
Adj No. of Lanes	1	2	0	1	2	0	1	2	1	1	2	1
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	229	760	141	412	668	219	451	2005	897	476	2005	897
Arrive On Green	0.25	0.25	0.25	0.25	0.25	0.25	0.57	0.57	0.57	0.57	0.57	0.57
Sat Flow, veh/h	828	2982	553	1225	2621	860	686	3539	1583	717	3539	1583
Grp Volume(v), veh/h	31	77	80	74	294	289	52	677	61	74	758	27
Grp Sat Flow(s),veh/h/ln	828	1770	1765	1225	1770	1711	686	1770	1583	717	1770	1583
Q Serve(g_s), s	1.8	1.7	1.8	2.5	7.5	7.6	2.3	5.2	0.9	3.1	5.9	0.4
Cycle Q Clear(g_c), s	9.4	1.7	1.8	4.3	7.5	7.6	8.2	5.2	0.9	8.3	5.9	0.4
Prop In Lane	1.00		0.31	1.00		0.50	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	229	451	450	412	451	436	451	2005	897	476	2005	897
V/C Ratio(X)	0.14	0.17	0.18	0.18	0.65	0.66	0.12	0.34	0.07	0.16	0.38	0.03
Avail Cap(c_a), veh/h	388	791	789	647	791	765	451	2005	897	476	2005	897
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	21.0	14.6	14.6	16.3	16.8	16.8	8.3	5.8	4.9	8.1	6.0	4.8
Incr Delay (d2), s/veh	0.3	0.2	0.2	0.2	1.6	1.7	0.5	0.5	0.1	0.7	0.5	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.9	0.9	0.9	3.8	3.7	0.5	2.6	0.4	0.7	3.0	0.2
LnGrp Delay(d),s/veh	21.3	14.8	14.8	16.5	18.4	18.5	8.8	6.3	5.1	8.8	6.6	4.9
LnGrp LOS	C	B	B	B	B	B	A	A	A	A	A	A
Approach Vol, veh/h		188			657			790			859	
Approach Delay, s/veh		15.9			18.2			6.4			6.7	
Approach LOS		B			B			A			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		33.0		17.3		33.0		17.3
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5
Max Green Setting (Gmax), s		28.5		22.5		28.5		22.5
Max Q Clear Time (g_c+I1), s		10.2		11.4		10.3		9.6
Green Ext Time (p_c), s		5.1		0.7		5.8		3.2

Intersection Summary	
HCM 2010 Ctrl Delay	10.3
HCM 2010 LOS	B



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)		0	100		0	0
Storage Lanes		0	1		1	0
Taper Length (ft)			25		25	
Lane Util. Factor	0.91	0.91	1.00	0.91	1.00	1.00
Ped Bike Factor						
Frt						
Flt Protected						
Satd. Flow (prot)	5085	0	1863	5085	1863	0
Flt Permitted						
Satd. Flow (perm)	5085	0	1863	5085	1863	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	498			189	111	
Travel Time (s)	11.3			4.3	2.5	

Intersection Summary	
Area Type:	Other



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Traffic Volume (vph)	635	0	0	1303	0	0
Future Volume (vph)	635	0	0	1303	0	0
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Adj. Flow (vph)	690	0	0	1416	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	690	0	0	1416	0	0

Intersection Summary

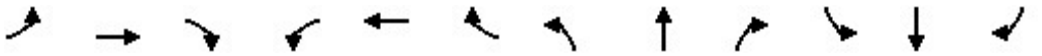
Intersection	
Int Delay, s/veh	0

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	635	0	0	1303	0	0
Future Vol, veh/h	635	0	0	1303	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	100	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	690	0	0	1416	0	0

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	690	0	1256	345
Stage 1	-	-	-	-	690	-
Stage 2	-	-	-	-	566	-
Critical Hdwy	-	-	5.34	-	5.74	7.14
Critical Hdwy Stg 1	-	-	-	-	6.64	-
Critical Hdwy Stg 2	-	-	-	-	6.04	-
Follow-up Hdwy	-	-	3.12	-	3.82	3.92
Pot Cap-1 Maneuver	-	-	551	-	230	556
Stage 1	-	-	-	-	372	-
Stage 2	-	-	-	-	485	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	551	-	230	556
Mov Cap-2 Maneuver	-	-	-	-	293	-
Stage 1	-	-	-	-	372	-
Stage 2	-	-	-	-	485	-

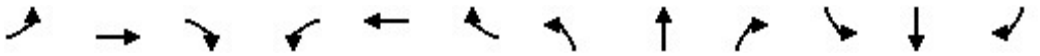
Approach	EB	WB	NB
HCM Control Delay, s	0	0	0
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	-	-	-	551	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s)	0	-	-	0	-
HCM Lane LOS	A	-	-	A	-
HCM 95th %tile Q(veh)	-	-	-	0	-



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	275		0	0		0	150		150
Storage Lanes	0		0	1		0	0		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.91	0.91	1.00	0.91	1.00	1.00	1.00	1.00	0.95	0.91	0.95
Ped Bike Factor												
Frt		0.964									0.948	0.850
Flt Protected				0.950						0.950	0.970	
Satd. Flow (prot)	0	4902	0	1770	5085	0	0	0	0	1681	1559	1504
Flt Permitted				0.950						0.950	0.970	
Satd. Flow (perm)	0	4902	0	1770	5085	0	0	0	0	1681	1559	1504
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		109									30	78
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		508			258			584			534	
Travel Time (s)		11.5			5.9			13.3			12.1	

Intersection Summary	
Area Type:	Other



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	0	1396	444	201	1019	0	0	0	0	580	12	450
Future Volume (vph)	0	1396	444	201	1019	0	0	0	0	580	12	450
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	0	1662	529	239	1213	0	0	0	0	690	14	536
Shared Lane Traffic (%)										38%		27%
Lane Group Flow (vph)	0	2191	0	239	1213	0	0	0	0	428	421	391

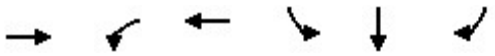
Intersection Summary

Lane Group	EBT	WBL	WBT	SBL	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	1396	201	1019	580	12	450
Future Volume (vph)	1396	201	1019	580	12	450
Turn Type	NA	Prot	NA	Split	NA	Perm
Protected Phases	4	3	8	6	6	
Permitted Phases						6
Detector Phase	4	3	8	6	6	6
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	9.5	22.5	22.5	22.5	22.5
Total Split (s)	42.0	17.5	59.5	30.5	30.5	30.5
Total Split (%)	46.7%	19.4%	66.1%	33.9%	33.9%	33.9%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lag	Lead				
Lead-Lag Optimize?	Yes	Yes				
Recall Mode	None	None	None	Max	Max	Max
Act Effct Green (s)	37.5	13.0	55.0	26.0	26.0	26.0
Actuated g/C Ratio	0.42	0.14	0.61	0.29	0.29	0.29
v/c Ratio	1.04	0.94	0.39	0.88	0.89	0.80
Control Delay	56.9	82.7	9.4	52.3	52.2	37.6
Queue Delay	0.0	0.0	2.0	0.0	0.0	0.0
Total Delay	56.9	82.7	11.4	52.3	52.2	37.6
LOS	E	F	B	D	D	D
Approach Delay	56.9		23.1		47.6	
Approach LOS	E		C		D	

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Natural Cycle: 90	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.04	
Intersection Signal Delay: 44.5	Intersection LOS: D
Intersection Capacity Utilization 103.3%	ICU Level of Service G
Analysis Period (min) 15	

Splits and Phases: 1: I-110-Southbound Ramps & East Rosecrans Ave



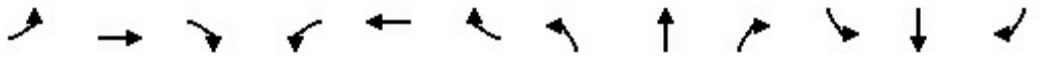


Lane Group	EBT	WBL	WBT	SBL	SBT	SBR
Lane Group Flow (vph)	2191	239	1213	428	421	391
v/c Ratio	1.04	0.94	0.39	0.88	0.89	0.80
Control Delay	56.9	82.7	9.4	52.3	52.2	37.6
Queue Delay	0.0	0.0	2.0	0.0	0.0	0.0
Total Delay	56.9	82.7	11.4	52.3	52.2	37.6
Queue Length 50th (ft)	~484	136	117	243	235	174
Queue Length 95th (ft)	#510	#249	132	#373	#378	#274
Internal Link Dist (ft)	428		178		454	
Turn Bay Length (ft)		275		150		150
Base Capacity (vph)	2106	255	3107	485	471	489
Starvation Cap Reductn	0	0	1683	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	1.04	0.94	0.85	0.88	0.89	0.80

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

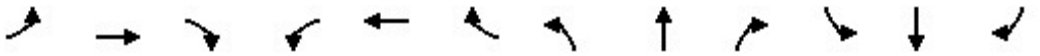


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	1396	444	201	1019	0	0	0	0	580	12	450
Future Volume (veh/h)	0	1396	444	201	1019	0	0	0	0	580	12	450
Number	7	4	14	3	8	18				1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1863	1900	1863	1863	0				1863	1863	1863
Adj Flow Rate, veh/h	0	1662	529	239	1213	0				862	0	362
Adj No. of Lanes	0	3	0	1	3	0				2	0	1
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84				0.84	0.84	0.84
Percent Heavy Veh, %	0	2	2	2	2	0				2	2	2
Cap, veh/h	0	1603	498	256	3108	0				1025	0	457
Arrive On Green	0.00	0.42	0.42	0.14	0.61	0.00				0.29	0.00	0.29
Sat Flow, veh/h	0	4016	1194	1774	5253	0				3548	0	1583
Grp Volume(v), veh/h	0	1459	732	239	1213	0				862	0	362
Grp Sat Flow(s),veh/h/ln	0	1695	1652	1774	1695	0				1774	0	1583
Q Serve(g_s), s	0.0	37.5	37.5	12.0	11.0	0.0				20.5	0.0	19.0
Cycle Q Clear(g_c), s	0.0	37.5	37.5	12.0	11.0	0.0				20.5	0.0	19.0
Prop In Lane	0.00		0.72	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	1413	688	256	3108	0				1025	0	457
V/C Ratio(X)	0.00	1.03	1.06	0.93	0.39	0.00				0.84	0.00	0.79
Avail Cap(c_a), veh/h	0	1413	688	256	3108	0				1025	0	457
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	26.3	26.3	38.1	8.9	0.0				30.1	0.0	29.5
Incr Delay (d2), s/veh	0.0	32.9	52.3	38.4	0.1	0.0				8.3	0.0	13.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	23.9	27.0	8.6	5.1	0.0				11.2	0.0	9.9
LnGrp Delay(d),s/veh	0.0	59.1	78.6	76.5	9.0	0.0				38.4	0.0	42.6
LnGrp LOS		F	F	E	A					D		D
Approach Vol, veh/h		2191			1452						1224	
Approach Delay, s/veh		65.6			20.1						39.6	
Approach LOS		E			C						D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs			3	4		6		8
Phs Duration (G+Y+Rc), s			17.5	42.0		30.5		59.5
Change Period (Y+Rc), s			4.5	4.5		4.5		4.5
Max Green Setting (Gmax), s			13.0	37.5		26.0		55.0
Max Q Clear Time (g_c+I1), s			14.0	39.5		22.5		13.0
Green Ext Time (p_c), s			0.0	0.0		1.7		11.7

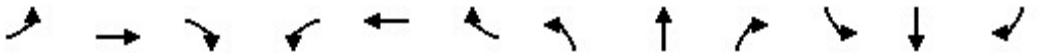
Intersection Summary	
HCM 2010 Ctrl Delay	45.5
HCM 2010 LOS	D

Notes



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		100	0		0	0		0	0		0
Storage Lanes	0		1	0		0	1		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.91	0.91	1.00	1.00	0.91	0.91	0.95	0.95	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt			0.850		0.998			0.879			0.873	
Flt Protected							0.950	0.991			0.997	
Satd. Flow (prot)	0	5085	1583	0	5075	0	1681	1541	0	0	1621	0
Flt Permitted		0.939					0.950	0.991			0.997	
Satd. Flow (perm)	0	4775	1583	0	5075	0	1681	1541	0	0	1621	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			399		3			198			87	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		148			3372			503			198	
Travel Time (s)		3.4			76.6			11.4			4.5	

Intersection Summary	
Area Type:	Other



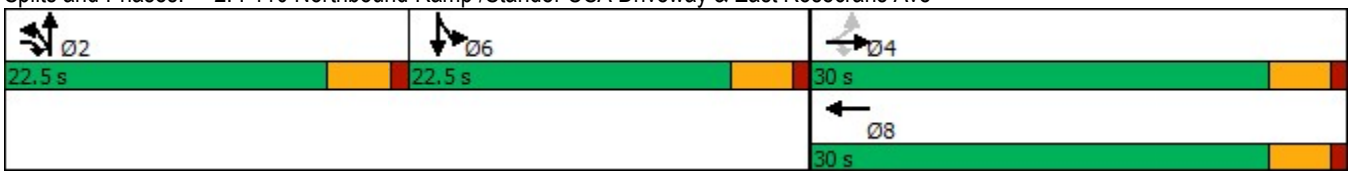
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	1	1458	375	0	1450	19	292	3	186	2	0	29
Future Volume (vph)	1	1458	375	0	1450	19	292	3	186	2	0	29
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	1	1551	399	0	1543	20	311	3	198	2	0	31
Shared Lane Traffic (%)							14%					
Lane Group Flow (vph)	0	1552	399	0	1563	0	267	245	0	0	33	0

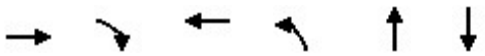
Intersection Summary

Lane Group	EBL	EBT	EBR	WBT	NBL	NBT	SBT
Lane Configurations							
Traffic Volume (vph)	1	1458	375	1450	292	3	0
Future Volume (vph)	1	1458	375	1450	292	3	0
Turn Type	Perm	NA	pm+ov	NA	Split	NA	NA
Protected Phases		4	2	8	2	2	6
Permitted Phases	4		4				
Detector Phase	4	4	2	8	2	2	6
Switch Phase							
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	30.0	30.0	22.5	30.0	22.5	22.5	22.5
Total Split (%)	40.0%	40.0%	30.0%	40.0%	30.0%	30.0%	30.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag							
Lead-Lag Optimize?							
Recall Mode	None	None	Max	None	Max	Max	Min
Act Effct Green (s)		25.5	48.0	25.5	18.0	18.0	5.5
Actuated g/C Ratio		0.41	0.77	0.41	0.29	0.29	0.09
v/c Ratio		0.80	0.31	0.75	0.55	0.42	0.15
Control Delay		20.0	0.9	18.7	24.0	7.4	1.7
Queue Delay		0.7	0.4	0.0	0.0	0.0	0.0
Total Delay		20.7	1.2	18.7	24.0	7.4	1.7
LOS		C	A	B	C	A	A
Approach Delay		16.8		18.7		16.1	1.7
Approach LOS		B		B		B	A

Intersection Summary	
Cycle Length: 75	
Actuated Cycle Length: 62.5	
Natural Cycle: 75	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.80	
Intersection Signal Delay: 17.3	Intersection LOS: B
Intersection Capacity Utilization 56.9%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 2: I-110 Northbound Ramp /Stander USA Driveway & East Rosecrans Ave





Lane Group	EBT	EBR	WBT	NBL	NBT	SBT
Lane Group Flow (vph)	1552	399	1563	267	245	33
v/c Ratio	0.80	0.31	0.75	0.55	0.42	0.15
Control Delay	20.0	0.9	18.7	24.0	7.4	1.7
Queue Delay	0.7	0.4	0.0	0.0	0.0	0.0
Total Delay	20.7	1.2	18.7	24.0	7.4	1.7
Queue Length 50th (ft)	181	0	178	89	13	0
Queue Length 95th (ft)	236	12	229	160	64	3
Internal Link Dist (ft)	68		3292		423	118
Turn Bay Length (ft)		100				
Base Capacity (vph)	1948	1308	2072	484	584	528
Starvation Cap Reductn	143	453	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.86	0.47	0.75	0.55	0.42	0.06

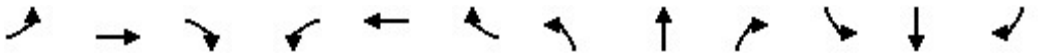
Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	1458	375	0	1450	19	292	3	186	2	0	29
Future Volume (veh/h)	1	1458	375	0	1450	19	292	3	186	2	0	29
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1863	1863	0	1863	1900	1863	1863	1900	1900	1863	1900
Adj Flow Rate, veh/h	1	1551	399	0	1543	20	256	80	198	2	0	31
Adj No. of Lanes	0	3	1	0	3	0	1	1	0	0	1	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	0	2	2	2	2	2	2	2	2
Cap, veh/h	60	1966	1100	0	2057	27	527	141	350	8	0	124
Arrive On Green	0.40	0.40	0.40	0.00	0.40	0.40	0.30	0.30	0.30	0.08	0.00	0.08
Sat Flow, veh/h	0	4946	1583	0	5342	67	1774	476	1179	97	0	1497
Grp Volume(v), veh/h	584	968	399	0	1011	552	256	0	278	33	0	0
Grp Sat Flow(s),veh/h/ln	1861	1543	1583	0	1695	1851	1774	0	1655	1594	0	0
Q Serve(g_s), s	0.0	16.7	6.2	0.0	15.5	15.5	7.2	0.0	8.6	1.2	0.0	0.0
Cycle Q Clear(g_c), s	16.7	16.7	6.2	0.0	15.5	15.5	7.2	0.0	8.6	1.2	0.0	0.0
Prop In Lane	0.00		1.00	0.00		0.04	1.00		0.71	0.06		0.94
Lane Grp Cap(c), veh/h	799	1227	1100	0	1348	736	527	0	492	132	0	0
V/C Ratio(X)	0.73	0.79	0.36	0.00	0.75	0.75	0.49	0.00	0.57	0.25	0.00	0.00
Avail Cap(c_a), veh/h	842	1298	1137	0	1427	779	527	0	492	473	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	16.0	16.0	3.8	0.0	15.7	15.7	17.5	0.0	18.0	26.0	0.0	0.0
Incr Delay (d2), s/veh	3.1	3.2	0.2	0.0	2.1	3.9	3.2	0.0	4.7	1.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	9.1	7.5	5.4	0.0	7.6	8.6	4.0	0.0	4.5	0.5	0.0	0.0
LnGrp Delay(d),s/veh	19.1	19.2	4.0	0.0	17.8	19.5	20.7	0.0	22.6	27.0	0.0	0.0
LnGrp LOS	B	B	A		B	B	C		C	C		
Approach Vol, veh/h		1951			1563			534			33	
Approach Delay, s/veh		16.1			18.4			21.7			27.0	
Approach LOS		B			B			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		22.5		28.6		9.5		28.6
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5
Max Green Setting (Gmax), s		18.0		25.5		18.0		25.5
Max Q Clear Time (g_c+I1), s		10.6		18.7		3.2		17.5
Green Ext Time (p_c), s		1.6		5.4		0.1		5.7

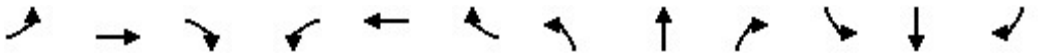
Intersection Summary	
HCM 2010 Ctrl Delay	17.8
HCM 2010 LOS	B

Notes



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	150		0	155		0	190		100	190		100
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.91	0.91	1.00	0.91	0.91	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor												
Frt		0.991			0.989				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	5040	0	1770	5029	0	1770	3539	1583	1770	3539	1583
Flt Permitted	0.341			0.137			0.554			0.381		
Satd. Flow (perm)	635	5040	0	255	5029	0	1032	3539	1583	710	3539	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		26			33				28			52
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		3372			2662			738			2100	
Travel Time (s)		76.6			60.5			16.8			47.7	

Intersection Summary	
Area Type:	Other



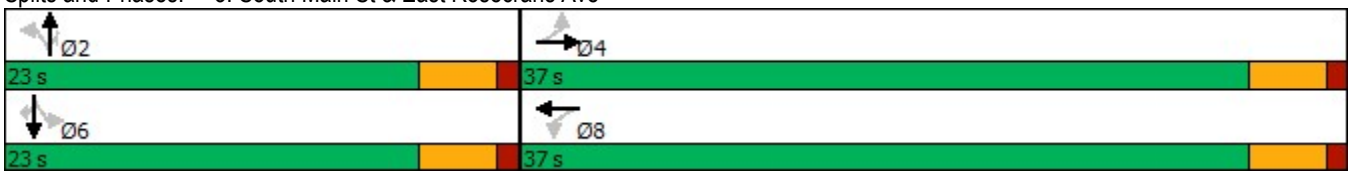
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	105	1372	88	67	668	54	118	514	105	69	307	49
Future Volume (vph)	105	1372	88	67	668	54	118	514	105	69	307	49
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	112	1460	94	71	711	57	126	547	112	73	327	52
Shared Lane Traffic (%)												
Lane Group Flow (vph)	112	1554	0	71	768	0	126	547	112	73	327	52

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	105	1372	67	668	118	514	105	69	307	49
Future Volume (vph)	105	1372	67	668	118	514	105	69	307	49
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4		8		2			6	
Permitted Phases	4		8		2		2	6		6
Detector Phase	4	4	8	8	2	2	2	6	6	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	37.0	37.0	37.0	37.0	23.0	23.0	23.0	23.0	23.0	23.0
Total Split (%)	61.7%	61.7%	61.7%	61.7%	38.3%	38.3%	38.3%	38.3%	38.3%	38.3%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag										
Lead-Lag Optimize?										
Recall Mode	None	None	None	None	Max	Max	Max	Max	Max	Max
Act Effct Green (s)	29.1	29.1	29.1	29.1	18.6	18.6	18.6	18.6	18.6	18.6
Actuated g/C Ratio	0.51	0.51	0.51	0.51	0.33	0.33	0.33	0.33	0.33	0.33
v/c Ratio	0.34	0.60	0.55	0.30	0.37	0.47	0.21	0.31	0.28	0.09
Control Delay	11.5	10.5	28.8	7.7	20.2	17.7	13.3	20.5	15.9	5.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	11.5	10.5	28.8	7.7	20.2	17.7	13.3	20.5	15.9	5.8
LOS	B	B	C	A	C	B	B	C	B	A
Approach Delay		10.6		9.5		17.4			15.5	
Approach LOS		B		A		B			B	

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 56.8	
Natural Cycle: 55	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.60	
Intersection Signal Delay: 12.4	Intersection LOS: B
Intersection Capacity Utilization 66.0%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 3: South Main St & East Rosecrans Ave





Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	112	1554	71	768	126	547	112	73	327	52
v/c Ratio	0.34	0.60	0.55	0.30	0.37	0.47	0.21	0.31	0.28	0.09
Control Delay	11.5	10.5	28.8	7.7	20.2	17.7	13.3	20.5	15.9	5.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	11.5	10.5	28.8	7.7	20.2	17.7	13.3	20.5	15.9	5.8
Queue Length 50th (ft)	20	120	15	47	35	83	22	20	46	0
Queue Length 95th (ft)	51	157	#71	66	78	125	55	53	75	20
Internal Link Dist (ft)		3292		2582		658			2020	
Turn Bay Length (ft)	150		155		190		100	190		100
Base Capacity (vph)	365	2915	147	2912	338	1161	538	232	1161	554
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.31	0.53	0.48	0.26	0.37	0.47	0.21	0.31	0.28	0.09

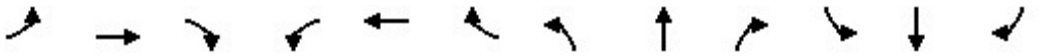
Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	105	1372	88	67	668	54	118	514	105	69	307	49
Future Volume (veh/h)	105	1372	88	67	668	54	118	514	105	69	307	49
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	112	1460	94	71	711	57	126	547	112	73	327	52
Adj No. of Lanes	1	3	0	1	3	0	1	2	1	1	2	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	422	2474	159	227	2433	194	393	1175	526	291	1175	526
Arrive On Green	0.51	0.51	0.51	0.51	0.51	0.51	0.33	0.33	0.33	0.33	0.33	0.33
Sat Flow, veh/h	697	4883	314	331	4803	383	1000	3539	1583	772	3539	1583
Grp Volume(v), veh/h	112	1014	540	71	501	267	126	547	112	73	327	52
Grp Sat Flow(s),veh/h/ln	697	1695	1807	331	1695	1795	1000	1770	1583	772	1770	1583
Q Serve(g_s), s	6.2	11.7	11.7	10.7	4.8	4.8	5.9	6.8	2.8	4.6	3.8	1.3
Cycle Q Clear(g_c), s	11.0	11.7	11.7	22.5	4.8	4.8	9.7	6.8	2.8	11.4	3.8	1.3
Prop In Lane	1.00		0.17	1.00		0.21	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	422	1718	916	227	1718	909	393	1175	526	291	1175	526
V/C Ratio(X)	0.27	0.59	0.59	0.31	0.29	0.29	0.32	0.47	0.21	0.25	0.28	0.10
Avail Cap(c_a), veh/h	476	1977	1054	252	1977	1047	393	1175	526	291	1175	526
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	11.2	9.7	9.7	17.6	8.0	8.0	17.3	14.7	13.4	19.2	13.7	12.9
Incr Delay (d2), s/veh	0.3	0.4	0.7	0.8	0.1	0.2	2.1	1.3	0.9	2.1	0.6	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	5.4	5.9	1.0	2.2	2.4	1.8	3.5	1.4	1.1	1.9	0.6
LnGrp Delay(d),s/veh	11.5	10.0	10.3	18.4	8.1	8.1	19.4	16.0	14.3	21.3	14.3	13.2
LnGrp LOS	B	B	B	B	A	A	B	B	B	C	B	B
Approach Vol, veh/h		1666			839			785			452	
Approach Delay, s/veh		10.2			9.0			16.3			15.3	
Approach LOS		B			A			B			B	

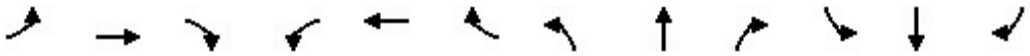
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		23.0		32.7		23.0		32.7
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5
Max Green Setting (Gmax), s		18.5		32.5		18.5		32.5
Max Q Clear Time (g_c+I1), s		11.7		13.7		13.4		24.5
Green Ext Time (p_c), s		2.6		11.5		1.2		3.8

Intersection Summary	
HCM 2010 Ctrl Delay	11.8
HCM 2010 LOS	B



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	105		105	80		100	100		0	100		100
Storage Lanes	1		1	1		1	1		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	0.95	1.00	0.95	1.00
Ped Bike Factor												
Frt			0.850			0.850		0.988				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1863	1583	1770	3539	1583	1770	3497	0	1770	3539	1583
Flt Permitted	0.652			0.211			0.395			0.226		
Satd. Flow (perm)	1215	1863	1583	393	3539	1583	736	3497	0	421	3539	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			134			74		18				76
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		774			575			2576			504	
Travel Time (s)		17.6			13.1			58.5			11.5	

Intersection Summary	
Area Type:	Other



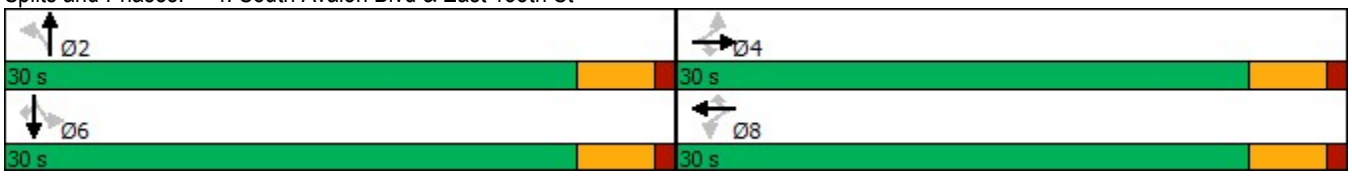
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	261	550	135	27	151	71	88	816	69	79	568	73
Future Volume (vph)	261	550	135	27	151	71	88	816	69	79	568	73
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	272	573	141	28	157	74	92	850	72	82	592	76
Shared Lane Traffic (%)												
Lane Group Flow (vph)	272	573	141	28	157	74	92	922	0	82	592	76

Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	261	550	135	27	151	71	88	816	79	568	73
Future Volume (vph)	261	550	135	27	151	71	88	816	79	568	73
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm	NA	Perm
Protected Phases		4			8			2		6	
Permitted Phases	4		4	8		8	2		6		6
Detector Phase	4	4	4	8	8	8	2	2	6	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0
Total Split (%)	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag											
Lead-Lag Optimize?											
Recall Mode	None	None	None	None	None	None	Max	Max	Max	Max	Max
Act Effct Green (s)	22.1	22.1	22.1	22.1	22.1	22.1	25.7	25.7	25.7	25.7	25.7
Actuated g/C Ratio	0.39	0.39	0.39	0.39	0.39	0.39	0.45	0.45	0.45	0.45	0.45
v/c Ratio	0.58	0.79	0.20	0.18	0.11	0.11	0.28	0.58	0.43	0.37	0.10
Control Delay	19.0	24.4	3.5	14.4	10.8	3.6	14.1	14.0	21.3	11.9	3.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	19.0	24.4	3.5	14.4	10.8	3.6	14.1	14.0	21.3	11.9	3.5
LOS	B	C	A	B	B	A	B	B	C	B	A
Approach Delay		19.9			9.2			14.0		12.1	
Approach LOS		B			A			B		B	

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 56.8	
Natural Cycle: 45	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.79	
Intersection Signal Delay: 15.0	Intersection LOS: B
Intersection Capacity Utilization 77.2%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 4: South Avalon Blvd & East 135th St





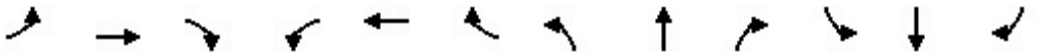
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	272	573	141	28	157	74	92	922	82	592	76
v/c Ratio	0.58	0.79	0.20	0.18	0.11	0.11	0.28	0.58	0.43	0.37	0.10
Control Delay	19.0	24.4	3.5	14.4	10.8	3.6	14.1	14.0	21.3	11.9	3.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	19.0	24.4	3.5	14.4	10.8	3.6	14.1	14.0	21.3	11.9	3.5
Queue Length 50th (ft)	69	164	1	6	17	0	21	127	20	74	0
Queue Length 95th (ft)	134	272	28	22	32	19	52	181	61	109	19
Internal Link Dist (ft)		694			495			2496		424	
Turn Bay Length (ft)	105		105	80		100	100		100		100
Base Capacity (vph)	549	841	788	177	1599	755	332	1589	190	1599	756
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.50	0.68	0.18	0.16	0.10	0.10	0.28	0.58	0.43	0.37	0.10

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	261	550	135	27	151	71	88	816	69	79	568	73
Future Volume (veh/h)	261	550	135	27	151	71	88	816	69	79	568	73
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	272	573	141	28	157	74	92	850	72	82	592	76
Adj No. of Lanes	1	1	1	1	2	1	1	2	0	1	2	1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	527	700	595	203	1330	595	401	1524	129	296	1633	730
Arrive On Green	0.38	0.38	0.38	0.38	0.38	0.38	0.46	0.46	0.46	0.46	0.46	0.46
Sat Flow, veh/h	1145	1863	1583	733	3539	1583	766	3303	280	604	3539	1583
Grp Volume(v), veh/h	272	573	141	28	157	74	92	455	467	82	592	76
Grp Sat Flow(s),veh/h/ln	1145	1863	1583	733	1770	1583	766	1770	1813	604	1770	1583
Q Serve(g_s), s	11.3	15.3	3.4	2.0	1.6	1.7	4.9	10.3	10.3	6.3	6.0	1.5
Cycle Q Clear(g_c), s	12.9	15.3	3.4	17.3	1.6	1.7	10.9	10.3	10.3	16.6	6.0	1.5
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.15	1.00		1.00
Lane Grp Cap(c), veh/h	527	700	595	203	1330	595	401	816	836	296	1633	730
V/C Ratio(X)	0.52	0.82	0.24	0.14	0.12	0.12	0.23	0.56	0.56	0.28	0.36	0.10
Avail Cap(c_a), veh/h	625	859	730	265	1633	730	401	816	836	296	1633	730
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	15.5	15.5	11.8	23.3	11.3	11.3	13.1	10.8	10.8	16.8	9.6	8.4
Incr Delay (d2), s/veh	0.8	5.2	0.2	0.3	0.0	0.1	1.3	2.7	2.7	2.3	0.6	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.7	8.8	1.5	0.4	0.8	0.8	1.2	5.6	5.7	1.2	3.0	0.7
LnGrp Delay(d),s/veh	16.2	20.7	12.0	23.7	11.3	11.4	14.5	13.5	13.5	19.1	10.3	8.7
LnGrp LOS	B	C	B	C	B	B	B	B	B	B	B	A
Approach Vol, veh/h		986			259			1014			750	
Approach Delay, s/veh		18.3			12.7			13.6			11.1	
Approach LOS		B			B			B			B	

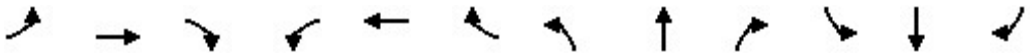
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		30.0		25.3		30.0		25.3
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5
Max Green Setting (Gmax), s		25.5		25.5		25.5		25.5
Max Q Clear Time (g_c+I1), s		12.9		17.3		18.6		19.3
Green Ext Time (p_c), s		5.4		3.5		2.8		0.7

Intersection Summary	
HCM 2010 Ctrl Delay	14.4
HCM 2010 LOS	B



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	220		0	200		0	110		110	120		100
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.91	0.91	1.00	0.91	0.91	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor												
Frt		0.989			0.971				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	5029	0	1770	4938	0	1770	3539	1583	1770	3539	1583
Flt Permitted	0.264			0.181			0.443			0.166		
Satd. Flow (perm)	492	5029	0	337	4938	0	825	3539	1583	309	3539	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		18			77				175			153
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		2662			498			439			2576	
Travel Time (s)		60.5			11.3			10.0			58.5	

Intersection Summary	
Area Type:	Other



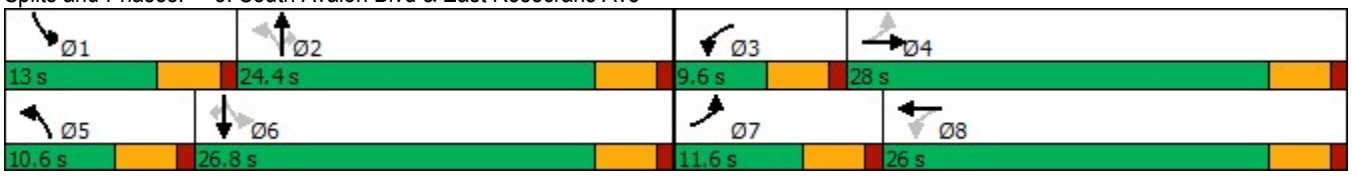
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	117	1292	104	110	569	138	104	699	182	201	495	72
Future Volume (vph)	117	1292	104	110	569	138	104	699	182	201	495	72
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	122	1346	108	115	593	144	108	728	190	209	516	75
Shared Lane Traffic (%)												
Lane Group Flow (vph)	122	1454	0	115	737	0	108	728	190	209	516	75

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	117	1292	110	569	104	699	182	201	495	72
Future Volume (vph)	117	1292	110	569	104	699	182	201	495	72
Turn Type	pm+pt	NA	pm+pt	NA	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4	3	8	5	2		1	6	
Permitted Phases	4		8		2		2	6		6
Detector Phase	7	4	3	8	5	2	2	1	6	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	9.5	22.5	9.5	22.5	22.5	9.5	22.5	22.5
Total Split (s)	11.6	28.0	9.6	26.0	10.6	24.4	24.4	13.0	26.8	26.8
Total Split (%)	15.5%	37.3%	12.8%	34.7%	14.1%	32.5%	32.5%	17.3%	35.7%	35.7%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	Max	Max	None	Max	Max
Act Effct Green (s)	29.1	23.6	26.0	22.0	26.0	20.0	20.0	31.2	24.6	24.6
Actuated g/C Ratio	0.40	0.32	0.36	0.30	0.36	0.27	0.27	0.43	0.34	0.34
v/c Ratio	0.38	0.89	0.52	0.48	0.29	0.75	0.34	0.70	0.43	0.12
Control Delay	16.5	32.0	22.4	20.3	15.2	30.6	6.7	28.7	21.8	0.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	16.5	32.0	22.4	20.3	15.2	30.6	6.7	28.7	21.8	0.4
LOS	B	C	C	C	B	C	A	C	C	A
Approach Delay		30.8		20.6		24.6			21.6	
Approach LOS		C		C		C			C	

Intersection Summary	
Cycle Length: 75	
Actuated Cycle Length: 72.9	
Natural Cycle: 75	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.89	
Intersection Signal Delay: 25.5	Intersection LOS: C
Intersection Capacity Utilization 78.8%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 5: South Avalon Blvd & East Rosecrans Ave

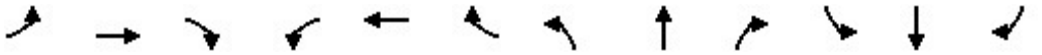




Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	122	1454	115	737	108	728	190	209	516	75
v/c Ratio	0.38	0.89	0.52	0.48	0.29	0.75	0.34	0.70	0.43	0.12
Control Delay	16.5	32.0	22.4	20.3	15.2	30.6	6.7	28.7	21.8	0.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	16.5	32.0	22.4	20.3	15.2	30.6	6.7	28.7	21.8	0.4
Queue Length 50th (ft)	33	233	31	92	29	164	5	59	103	0
Queue Length 95th (ft)	64	#326	60	127	57	226	51	#142	148	1
Internal Link Dist (ft)		2582		418		359			2496	
Turn Bay Length (ft)	220		200		110		110	120		100
Base Capacity (vph)	321	1640	220	1547	374	970	560	303	1192	634
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.38	0.89	0.52	0.48	0.29	0.75	0.34	0.69	0.43	0.12

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	117	1292	104	110	569	138	104	699	182	201	495	72
Future Volume (veh/h)	117	1292	104	110	569	138	104	699	182	201	495	72
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	122	1346	108	115	593	144	108	728	190	209	516	75
Adj No. of Lanes	1	3	0	1	3	0	1	2	1	1	2	1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	355	1507	121	228	1272	303	372	956	428	338	1115	499
Arrive On Green	0.07	0.31	0.31	0.06	0.31	0.31	0.06	0.27	0.27	0.11	0.31	0.31
Sat Flow, veh/h	1774	4800	385	1774	4103	978	1774	3539	1583	1774	3539	1583
Grp Volume(v), veh/h	122	951	503	115	488	249	108	728	190	209	516	75
Grp Sat Flow(s),veh/h/ln	1774	1695	1795	1774	1695	1690	1774	1770	1583	1774	1770	1583
Q Serve(g_s), s	3.4	19.7	19.7	3.2	8.5	8.8	3.2	13.9	7.3	6.0	8.6	2.5
Cycle Q Clear(g_c), s	3.4	19.7	19.7	3.2	8.5	8.8	3.2	13.9	7.3	6.0	8.6	2.5
Prop In Lane	1.00		0.21	1.00		0.58	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	355	1064	563	228	1051	524	372	956	428	338	1115	499
V/C Ratio(X)	0.34	0.89	0.89	0.50	0.46	0.47	0.29	0.76	0.44	0.62	0.46	0.15
Avail Cap(c_a), veh/h	406	1082	573	238	1051	524	408	956	428	352	1115	499
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	15.9	24.1	24.1	18.7	20.5	20.6	17.7	24.7	22.3	17.8	20.2	18.1
Incr Delay (d2), s/veh	0.6	9.6	16.2	1.7	0.3	0.7	0.4	5.7	3.3	3.1	1.4	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.7	10.5	12.2	1.7	4.0	4.2	1.6	7.5	3.6	3.2	4.4	1.2
LnGrp Delay(d),s/veh	16.5	33.7	40.3	20.4	20.8	21.2	18.1	30.4	25.6	20.9	21.6	18.8
LnGrp LOS	B	C	D	C	C	C	B	C	C	C	C	B
Approach Vol, veh/h		1576			852			1026			800	
Approach Delay, s/veh		34.4			20.9			28.2			21.2	
Approach LOS		C			C			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	12.4	24.4	9.2	27.6	9.1	27.7	9.5	27.3
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	8.5	19.9	5.1	23.5	6.1	22.3	7.1	21.5
Max Q Clear Time (g_c+I1), s	8.0	15.9	5.2	21.7	5.2	10.6	5.4	10.8
Green Ext Time (p_c), s	0.0	2.0	0.0	1.4	0.0	2.9	0.0	3.6

Intersection Summary	
HCM 2010 Ctrl Delay	27.7
HCM 2010 LOS	C



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%		0%			0%
Storage Length (ft)	0	0		100	100	
Storage Lanes	0	1		1	1	
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	1.00	0.95	1.00	1.00	0.95
Ped Bike Factor						
Frt						
Flt Protected						
Satd. Flow (prot)	0	1863	3539	1863	1863	3539
Flt Permitted						
Satd. Flow (perm)	0	1863	3539	1863	1863	3539
Link Speed (mph)	30		30			30
Link Distance (ft)	196		2086			439
Travel Time (s)	4.5		47.4			10.0

Intersection Summary	
Area Type:	Other



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Volume (vph)	0	0	977	0	0	709
Future Volume (vph)	0	0	977	0	0	709
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%		0%			0%
Adj. Flow (vph)	0	0	1062	0	0	771
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	1062	0	0	771

Intersection Summary

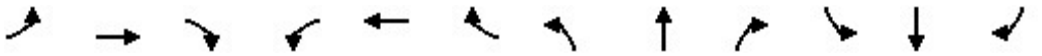
Intersection	
Int Delay, s/veh	0

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	0	977	0	0	709
Future Vol, veh/h	0	0	977	0	0	709
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	100	100	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	0	1062	0	0	771

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	-	531	0	0	1062	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.94	-	-	4.14	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.32	-	-	2.22	-
Pot Cap-1 Maneuver	0	493	-	-	652	-
Stage 1	0	-	-	-	-	-
Stage 2	0	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	-	493	-	-	652	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

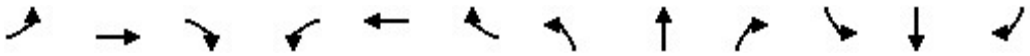
Approach	WB	NB	SB
HCM Control Delay, s	0	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	-	652	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s)	-	-	0	0	-
HCM Lane LOS	-	-	A	A	-
HCM 95th %tile Q(veh)	-	-	-	0	-



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	155		0	150		0	110		100	115		100
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor												
Frt		0.980			0.958				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3468	0	1770	3391	0	1770	3539	1583	1770	3539	1583
Flt Permitted	0.583			0.487			0.428			0.311		
Satd. Flow (perm)	1086	3468	0	907	3391	0	797	3539	1583	579	3539	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		30			77				73			60
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		972			474			575			2086	
Travel Time (s)		22.1			10.8			13.1			47.4	

Intersection Summary	
Area Type:	Other



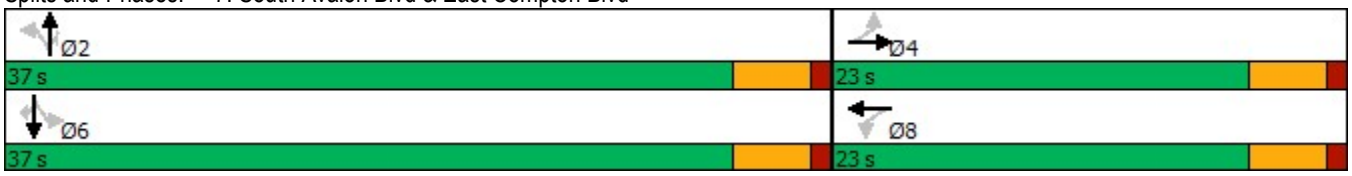
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	93	322	50	37	189	74	29	810	70	111	568	58
Future Volume (vph)	93	322	50	37	189	74	29	810	70	111	568	58
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	97	335	52	39	197	77	30	844	73	116	592	60
Shared Lane Traffic (%)												
Lane Group Flow (vph)	97	387	0	39	274	0	30	844	73	116	592	60

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	93	322	37	189	29	810	70	111	568	58
Future Volume (vph)	93	322	37	189	29	810	70	111	568	58
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4		8		2			6	
Permitted Phases	4		8		2		2	6		6
Detector Phase	4	4	8	8	2	2	2	6	6	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	23.0	23.0	23.0	23.0	37.0	37.0	37.0	37.0	37.0	37.0
Total Split (%)	38.3%	38.3%	38.3%	38.3%	61.7%	61.7%	61.7%	61.7%	61.7%	61.7%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag										
Lead-Lag Optimize?										
Recall Mode	None	None	None	None	Max	Max	Max	Max	Max	Max
Act Effct Green (s)	11.7	11.7	11.7	11.7	32.7	32.7	32.7	32.7	32.7	32.7
Actuated g/C Ratio	0.22	0.22	0.22	0.22	0.61	0.61	0.61	0.61	0.61	0.61
v/c Ratio	0.41	0.49	0.20	0.34	0.06	0.39	0.07	0.33	0.27	0.06
Control Delay	22.9	18.7	18.9	13.2	5.9	6.5	2.1	9.6	5.8	2.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	22.9	18.7	18.9	13.2	5.9	6.5	2.1	9.6	5.8	2.2
LOS	C	B	B	B	A	A	A	A	A	A
Approach Delay		19.6		13.9		6.2			6.1	
Approach LOS		B		B		A			A	

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 53.4	
Natural Cycle: 55	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.49	
Intersection Signal Delay: 9.7	Intersection LOS: A
Intersection Capacity Utilization 58.2%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 7: South Avalon Blvd & East Compton Blvd





Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	97	387	39	274	30	844	73	116	592	60
v/c Ratio	0.41	0.49	0.20	0.34	0.06	0.39	0.07	0.33	0.27	0.06
Control Delay	22.9	18.7	18.9	13.2	5.9	6.5	2.1	9.6	5.8	2.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	22.9	18.7	18.9	13.2	5.9	6.5	2.1	9.6	5.8	2.2
Queue Length 50th (ft)	26	51	10	27	3	58	0	15	37	0
Queue Length 95th (ft)	61	84	30	52	15	122	14	56	81	13
Internal Link Dist (ft)		892		394		495			2006	
Turn Bay Length (ft)	155		150		110		100	115		100
Base Capacity (vph)	378	1227	315	1230	487	2164	996	354	2164	991
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.26	0.32	0.12	0.22	0.06	0.39	0.07	0.33	0.27	0.06

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	93	322	50	37	189	74	29	810	70	111	568	58
Future Volume (veh/h)	93	322	50	37	189	74	29	810	70	111	568	58
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	97	335	52	39	197	77	30	844	73	116	592	60
Adj No. of Lanes	1	2	0	1	2	0	1	2	1	1	2	1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	303	680	104	259	555	210	548	2159	966	431	2159	966
Arrive On Green	0.22	0.22	0.22	0.22	0.22	0.22	0.61	0.61	0.61	0.61	0.61	0.61
Sat Flow, veh/h	1101	3076	473	992	2514	951	777	3539	1583	607	3539	1583
Grp Volume(v), veh/h	97	191	196	39	137	137	30	844	73	116	592	60
Grp Sat Flow(s),veh/h/ln	1101	1770	1779	992	1770	1695	777	1770	1583	607	1770	1583
Q Serve(g_s), s	4.4	5.0	5.1	1.9	3.5	3.7	1.0	6.5	1.0	6.4	4.2	0.8
Cycle Q Clear(g_c), s	8.0	5.0	5.1	7.0	3.5	3.7	5.2	6.5	1.0	13.0	4.2	0.8
Prop In Lane	1.00		0.27	1.00		0.56	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	303	391	393	259	391	374	548	2159	966	431	2159	966
V/C Ratio(X)	0.32	0.49	0.50	0.15	0.35	0.37	0.05	0.39	0.08	0.27	0.27	0.06
Avail Cap(c_a), veh/h	442	615	618	384	615	589	548	2159	966	431	2159	966
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	21.0	18.1	18.2	21.2	17.5	17.6	6.1	5.3	4.2	8.6	4.9	4.2
Incr Delay (d2), s/veh	0.6	1.0	1.0	0.3	0.5	0.6	0.2	0.5	0.2	1.5	0.3	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.4	2.5	2.6	0.5	1.7	1.8	0.2	3.3	0.5	1.2	2.1	0.4
LnGrp Delay(d),s/veh	21.6	19.1	19.1	21.5	18.1	18.2	6.3	5.9	4.4	10.2	5.2	4.3
LnGrp LOS	C	B	B	C	B	B	A	A	A	B	A	A
Approach Vol, veh/h		484			313			947			768	
Approach Delay, s/veh		19.6			18.5			5.8			5.9	
Approach LOS		B			B			A			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		37.0		16.3		37.0		16.3
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5
Max Green Setting (Gmax), s		32.5		18.5		32.5		18.5
Max Q Clear Time (g_c+I1), s		8.5		10.0		15.0		9.0
Green Ext Time (p_c), s		6.9		1.7		5.1		1.2

Intersection Summary	
HCM 2010 Ctrl Delay	10.0
HCM 2010 LOS	B



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)		0	100		0	0
Storage Lanes		0	1		1	0
Taper Length (ft)			25		25	
Lane Util. Factor	0.91	0.91	1.00	0.91	1.00	1.00
Ped Bike Factor						
Frt						
Flt Protected						
Satd. Flow (prot)	5085	0	1863	5085	1863	0
Flt Permitted						
Satd. Flow (perm)	5085	0	1863	5085	1863	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	498			189	111	
Travel Time (s)	11.3			4.3	2.5	

Intersection Summary	
Area Type:	Other



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Traffic Volume (vph)	1675	0	0	817	0	0
Future Volume (vph)	1675	0	0	817	0	0
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Adj. Flow (vph)	1821	0	0	888	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1821	0	0	888	0	0

Intersection Summary

Intersection	
Int Delay, s/veh	0

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	1675	0	0	817	0	0
Future Vol, veh/h	1675	0	0	817	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	100	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1821	0	0	888	0	0

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1821	0	2176	911
Stage 1	-	-	-	-	1821	-
Stage 2	-	-	-	-	355	-
Critical Hdwy	-	-	5.34	-	5.74	7.14
Critical Hdwy Stg 1	-	-	-	-	6.64	-
Critical Hdwy Stg 2	-	-	-	-	6.04	-
Follow-up Hdwy	-	-	3.12	-	3.82	3.92
Pot Cap-1 Maneuver	-	-	154	-	75	238
Stage 1	-	-	-	-	74	-
Stage 2	-	-	-	-	623	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	154	-	75	238
Mov Cap-2 Maneuver	-	-	-	-	67	-
Stage 1	-	-	-	-	74	-
Stage 2	-	-	-	-	623	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	0
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	-	-	-	154	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s)	0	-	-	0	-
HCM Lane LOS	A	-	-	A	-
HCM 95th %tile Q(veh)	-	-	-	0	-

Appendix D

Metro Bus Schedule and Naud Street Counts

Metro Bus Schedule - Legend
Naud Street Facility

- GAR – Garage = 1611 Naud st.
- GLEGAL – Glendale Galleria
- TER028 – Terminal 28
- VPLVEN – Ventura and Ventura Place
- RAYDEL – Raymond and Delmar
- NHSLV – North Hollywood Station
- VENGOO – Ventura and Goodland
- WILSAN – Wilson and San Pasqual
- CHAMTL – Chatsworth Metro Link
- JETPRO – Jet Propulsion Lab

Metro Bus Schedule - Weekday
Naud Street Facility

From	Start	End	To	Block
GAR	3:31	4:21	CHAMTL	16701
GAR	4:08	4:22	OLIVEN	9601
GAR	4:10	4:50	VENGOO	16702
GAR	4:11	4:41	BURMLS	9602
GAR	4:20	5:00	NHSTLV	50101
GAR	4:25	5:00	RAYDEL	50102
GAR	4:31	4:45	OLIVEN	9603
GAR	4:35	4:55	TER028	60301
GAR	4:37	5:10	WILSAN	17701
GAR	4:38	5:08	BURMLS	9606
GAR	4:39	5:29	CHAMTL	16706
GAR	4:41	5:05	GLEGAL	60310
GAR	4:42	5:22	NHSTLV	50105
GAR	4:44	5:24	VENGOO	16703
GAR	4:48	5:23	RAYDEL	50106
GAR	4:52	5:12	TER028	60311
GAR	4:53	5:17	GLEGAL	60312
GAR	4:57	5:11	OLIVEN	9604
GAR	4:59	5:39	NHSTLV	50107
GAR	5:01	5:41	VPLVEN	21801
GAR	5:08	5:28	TER028	60302
GAR	5:15	5:35	TER028	9605
GAR	5:17	5:50	WILSAN	17702
GAR	5:22	5:42	TER028	60314
GAR	5:24	5:48	GLEGAL	60313
GAR	5:26	6:06	VPLVEN	21802
GAR	5:34	6:04	TER028	60303
GAR	5:39	6:19	NHSTLV	50103
GAR	5:42	6:17	RAYDEL	50104
GAR	5:43	6:08	GLEGAL	60304
GAR	5:45	6:25	VPLVEN	21803
GAR	5:49	6:19	TER028	60305
GAR	5:53	6:33	VENGOO	16704
GAR	5:53	6:18	GLEGAL	60306
GAR	5:56	6:16	TER028	60315
GAR	6:01	6:26	GLEGAL	60317
GAR	6:03	6:43	NHSTLV	50108
GAR	6:06	6:46	VPLVEN	21804
GAR	6:07	6:27	TER028	60307
GAR	6:12	6:32	TER028	60316
GAR	6:18	6:53	RAYDEL	50109
GAR	6:26	6:56	TER028	60308
GAR	6:28	6:53	GLEGAL	60309
GAR	7:14	7:54	VENGOO	16705
GLEGAL	7:42	8:06	GAR	60315
TER028	7:43	8:03	GAR	60311
GLEGAL	7:47	8:11	GAR	60312
GLEGAL	8:17	8:41	GAR	60313
VPLVEN	8:19	8:59	GAR	21804
TER028	8:25	8:50	GAR	60314
RAYDEL	8:39	9:14	GAR	50106

Metro Bus Schedule - Weekday
Naud Street Facility

From	Start	End	To	Block
TER028	8:47	9:07	GAR	60310
NHSTLV	8:56	9:36	GAR	50107
RAYDEL	9:09	9:44	GAR	50108
CHAMTL	9:09	9:59	GAR	16706
TER028	9:10	9:35	GAR	60316
GLEGAL	9:13	9:37	GAR	60317
TER028	9:15	9:40	GAR	9606
JETPRO	9:17	10:02	GAR	17702
NHSTLV	9:18	9:58	GAR	50109
WILSAN	9:21	9:54	GAR	17701
RAYDEL	9:21	9:56	GAR	50105
GAR	12:49	13:13	GLEGAL	60310
GAR	13:25	14:15	CHAMTL	16706
GAR	13:25	13:50	GLEGAL	60311
GAR	13:38	14:03	TER028	60312
GAR	13:47	14:12	GLEGAL	60313
GAR	14:08	14:33	GLEGAL	60314
GAR	14:14	14:39	TER028	60315
GAR	14:16	14:43	GLEGAL	60316
GAR	14:25	15:10	JETPRO	17701
GAR	14:28	15:03	RAYDEL	50105
GAR	14:30	14:55	TER028	9606
GAR	14:31	15:11	VPLVEN	21804
GAR	14:33	15:13	NHSTLV	50106
GAR	14:45	15:25	NHSTLV	50107
GAR	14:48	15:15	GLEGAL	60317
GAR	14:49	15:22	WILSAN	17702
GAR	14:52	15:27	RAYDEL	50108
GAR	15:09	15:49	NHSTLV	50109
GAR	15:16	15:51	RAYDEL	50110
TER028	17:00	17:25	GAR	60306
TER028	17:46	18:11	GAR	60315
RAYDEL	17:51	18:26	GAR	50102
GLEGAL	18:07	18:31	GAR	60316
TER028	18:19	18:44	GAR	60305
VENGOO	18:25	19:05	GAR	16701
RAYDEL	18:27	19:02	GAR	50103
NHSTLV	18:27	19:07	GAR	50104
TER028	18:30	18:55	GAR	60311
GLEGAL	18:32	18:56	GAR	60317
BURMLS	18:41	19:11	GAR	9604
RAYDEL	18:51	19:26	GAR	50105
NHSTLV	18:55	19:35	GAR	50106
TER028	19:06	19:26	GAR	60308
VPLVEN	19:07	19:47	GAR	21804
WILSAN	19:13	19:46	GAR	17702
GLEGAL	19:15	19:39	GAR	60309
TER028	19:17	19:37	GAR	9601
GLEGAL	19:27	19:51	GAR	60310
TER028	19:31	19:51	GAR	60301
WILSAN	19:43	20:16	GAR	17701

Metro Bus Schedule - Weekday
Naud Street Facility

From	Start	End	To	Block
RAYDEL	20:06	20:41	GAR	50107
BURMLS	20:17	20:47	GAR	9602
GLEGAL	20:19	20:43	GAR	60313
VENGOO	20:21	21:01	GAR	16706
TER028	20:25	20:45	GAR	9606
VPLVEN	20:39	21:19	GAR	21802
CHAMTL	20:41	21:31	GAR	16704
GEOGRA	20:55	21:40	GAR	21801
GLEGAL	21:00	21:24	GAR	60304
TER028	21:01	21:21	GAR	60303
BURMLS	21:04	21:34	GAR	9603
VPLVEN	21:17	21:57	GAR	21803
TER028	21:20	21:40	GAR	9605
NHSTLV	21:39	22:19	GAR	50101
RAYDEL	21:40	22:15	GAR	50110
NHSTLV	22:06	22:46	GAR	50108
RAYDEL	22:08	22:43	GAR	50109
GLEGAL	22:32	22:56	GAR	60307
TER028	22:38	22:58	GAR	60312
VENGOO	23:06	23:46	GAR	16705
GLEGAL	23:11	23:35	GAR	60314
TER028	23:21	23:41	GAR	60302
CHAMTL	23:34	0:24	GAR	16703
VENGOO	0:06	0:46	GAR	16702

0.00 126

Metro Bus Schedule - Saturday
Naud Street Facility

From	Start	End	To	Block
GAR	3:46	4:36	CHAMTL	16701
GAR	4:46	5:36	CHAMTL	16702
GAR	5:01	5:41	VENGOO	16703
GAR	5:07	5:35	BURMLS	9601
GAR	5:10	5:30	TER028	60301
GAR	5:15	5:45	RAYDEL	50101
GAR	5:20	6:00	NHSTLV	50102
GAR	5:34	6:24	CHAMTL	16704
GAR	5:35	5:55	TER028	60302
GAR	5:36	6:00	GLEGAL	60303
GAR	5:40	6:20	VPLVEN	21801
GAR	5:40	6:00	TER028	9602
GAR	5:54	6:14	TER028	60304
GAR	5:57	6:25	BURMLS	9603
GAR	6:15	6:35	TER028	60305
GAR	6:17	6:57	VPLVEN	21802
GAR	6:32	6:52	TER028	60306
GAR	6:46	7:06	TER028	60307
GAR	7:19	7:39	TER028	60308
GAR	9:27	10:07	VPLVEN	21803
GAR	10:07	10:27	TER028	60309
GAR	11:26	11:46	TER028	60310
GAR	12:18	12:38	TER028	60311
GAR	13:00	13:20	TER028	60312
GLEGAL	16:54	17:18	GAR	60303
TER028	17:52	18:12	GAR	60306
VPLVEN	18:45	19:25	GAR	21803
TER028	18:52	19:12	GAR	60312
VPLVEN	19:19	19:59	GAR	21801
GLEGAL	19:22	19:46	GAR	60307
TER028	19:36	19:56	GAR	60302
VPLVEN	19:59	20:39	GAR	21802
TER028	20:30	20:50	GAR	9603
TER028	20:31	20:51	GAR	60310
CHAMTL	20:42	21:32	GAR	16703
BURMLS	20:59	21:27	GAR	9601
GLEGAL	21:06	21:30	GAR	60304
TER028	21:11	21:31	GAR	60308
TER028	21:24	21:44	GAR	9602
RAYDEL	21:35	22:05	GAR	50102
NHSTLV	21:35	22:15	GAR	50101
GLEGAL	22:36	23:00	GAR	60309
TER028	22:41	23:01	GAR	60305
VENGOO	23:00	23:40	GAR	16701
GLEGAL	23:12	23:36	GAR	60301
TER028	23:19	23:39	GAR	60311
CHAMTL	23:32	0:22	GAR	16704
VENGOO	0:09	0:49	GAR	16702

Metro Bus Schedule - Sunday
Naud Street Facility

From	Start	End	To	Block
GAR	3:46	4:36	CHAMTL	16701
GAR	4:46	5:36	CHAMTL	16702
GAR	5:01	5:41	VENGOO	16703
GAR	5:15	5:45	RAYDEL	50101
GAR	5:20	6:00	NHSTLV	50102
GAR	5:24	5:44	TER028	60301
GAR	5:30	5:54	GLEGAL	60302
GAR	5:34	6:24	CHAMTL	16704
GAR	5:40	6:20	VPLVEN	21801
GAR	5:48	6:16	BURMLS	9601
GAR	5:52	6:12	TER028	60303
GAR	6:07	6:27	GLEGAL	60304
GAR	6:26	7:06	VPLVEN	21802
GAR	6:28	6:48	TER028	9602
GAR	6:45	7:13	BURMLS	9603
GAR	7:31	7:51	GLEGAL	60305
GAR	8:33	8:53	TER028	60306
GAR	9:49	10:09	TER028	60307
GAR	10:21	10:41	TER028	60308
GAR	10:53	11:13	TER028	60309
GAR	11:57	12:17	TER028	60310
GAR	14:47	15:07	GLEGAL	60311
TER028	18:01	18:21	GAR	60307
TER028	18:31	18:51	GAR	60308
GLEGAL	18:42	19:02	GAR	60302
VPLVEN	18:51	19:31	GAR	21801
TER028	19:08	19:28	GAR	9601
TER028	19:16	19:36	GAR	60309
VPLVEN	19:41	20:21	GAR	21802
BURMLS	19:50	20:18	GAR	9602
TER028	20:08	20:28	GAR	9603
TER028	20:14	20:34	GAR	60310
TER028	20:31	20:51	GAR	60304
CHAMTL	20:42	21:32	GAR	16703
TER028	21:11	21:31	GAR	60303
RAYDEL	21:35	22:05	GAR	50102
NHSTLV	21:35	22:15	GAR	50101
GLEGAL	22:35	22:55	GAR	60311
TER028	22:41	23:01	GAR	60305
VENGOO	23:00	23:40	GAR	16701
GLEGAL	23:12	23:32	GAR	60306
TER028	23:19	23:39	GAR	60301
CHAMTL	23:32	0:22	GAR	16704
VENGOO	23:59	0:39	GAR	16702

DRIVEWAY 1

City: Los Angeles
Location: 1611 Naud Street
Driveway: 1
Date: 10/30/2018
Count Type: Classsification

	Entering				Exiting			
	Pass Veh, Lt Trk, PU, SUV	Buses	Maint. Veh, Tow Trk, Other Hvy	Total	Pass Veh, Lt Trk, PU, SUV	Buses	Maint. Veh, Tow Trk, Other Hvy	Total
0:00	0	0	0	0	0	0	0	0
0:15	0	1	0	1	1	0	0	1
0:30	1	0	0	1	0	0	0	0
0:45	0	0	0	0	0	0	0	0
1:00	0	0	0	0	0	0	0	0
1:15	0	0	0	0	0	0	0	0
1:30	0	0	0	0	1	0	0	1
1:45	0	0	0	0	0	0	0	0
2:00	1	0	0	1	1	0	0	1
2:15	0	1	0	1	0	1	0	1
2:30	0	0	0	0	0	1	0	1
2:45	1	0	0	1	1	0	0	1
3:00	0	0	0	0	0	1	0	1
3:15	0	0	0	0	0	1	0	1
3:30	0	0	0	0	0	0	0	0
3:45	1	0	0	1	0	1	0	1
4:00	0	1	0	1	0	3	0	3
4:15	0	0	0	0	0	1	0	1
4:30	0	0	0	0	0	6	0	6
4:45	0	0	0	0	0	5	0	5
5:00	1	0	0	1	1	3	0	4
5:15	0	0	0	0	0	3	0	3
5:30	1	0	0	1	0	5	0	5
5:45	3	0	0	3	0	5	0	5
6:00	2	0	0	2	0	4	0	4
6:15	3	0	0	3	1	2	0	3
6:30	1	0	0	1	1	0	0	1
6:45	5	0	0	5	2	0	0	2
7:00	1	0	0	1	1	1	0	2
7:15	1	1	0	2	0	1	0	1
7:30	0	0	0	0	0	0	0	0
7:45	1	0	0	1	2	0	0	2
8:00	1	1	0	2	1	1	0	2
8:15	0	2	0	2	0	1	0	1
8:30	0	3	0	3	0	0	0	0
8:45	2	0	0	2	0	0	0	0
9:00	1	1	0	2	3	0	0	3
9:15	1	2	0	3	1	0	0	1
9:30	4	2	1	7	1	0	0	1
9:45	1	5	0	6	4	1	1	6
10:00	0	2	0	2	2	1	0	3
10:15	2	1	0	3	2	0	0	2
10:30	1	0	0	1	3	0	0	3
10:45	5	1	0	6	1	0	0	1
11:00	1	0	0	1	5	0	0	5
11:15	0	0	0	0	1	0	0	1
11:30	3	0	0	3	1	0	0	1
11:45	2	0	0	2	0	0	0	0
12:00	4	1	0	5	6	0	0	6
12:15	4	0	0	4	2	3	0	5
12:30	2	1	0	3	3	1	0	4
12:45	4	1	0	5	3	2	0	5
13:00	2	2	0	4	4	0	0	4
13:15	2	1	0	3	2	1	0	3
13:30	3	0	0	3	2	2	0	4
13:45	1	0	0	1	0	1	0	1
14:00	3	2	0	5	2	3	0	5
14:15	3	0	0	3	0	4	0	4
14:30	1	1	0	2	2	5	0	7
14:45	0	0	0	0	1	0	0	1
15:00	0	0	0	0	1	1	0	2
15:15	1	1	0	2	2	1	0	3
15:30	2	0	0	2	3	1	0	4
15:45	2	0	0	2	2	1	0	3
16:00	1	0	0	1	4	0	0	4
16:15	0	0	0	0	2	0	0	2
16:30	1	0	0	1	0	0	0	0
16:45	0	0	0	0	0	0	0	0
17:00	0	0	0	0	0	0	0	0
17:15	1	0	0	1	0	0	0	0
17:30	1	1	0	2	2	0	0	2
17:45	1	0	0	1	0	0	0	0
18:00	1	0	0	1	2	0	0	2
18:15	2	0	0	2	1	0	0	1
18:30	0	4	0	4	0	1	0	1
18:45	0	2	0	2	1	0	0	1
19:00	4	2	0	6	0	1	0	1
19:15	1	4	0	5	0	1	0	1
19:30	0	2	0	2	3	0	0	3
19:45	0	4	0	4	1	0	0	1
20:00	0	1	0	1	2	0	0	2
20:15	0	1	0	1	0	0	0	0
20:30	0	2	0	2	2	0	0	2
20:45	1	5	0	6	0	0	0	0
21:00	0	2	0	2	0	0	0	0
21:15	0	2	0	2	2	0	0	2
21:30	0	3	0	3	2	0	0	2
21:45	0	2	0	2	1	0	0	1
22:00	1	1	0	2	0	0	0	0
22:15	0	2	0	2	0	0	0	0
22:30	4	0	0	4	7	0	0	7
22:45	6	2	0	8	3	0	0	3
23:00	0	1	0	1	0	0	0	0
23:15	0	0	0	0	0	0	0	0
23:30	2	3	0	5	3	0	0	3
23:45	0	0	0	0	0	0	0	0
TOTAL	**108**	**80**	**1**	**189**	**110**	**77**	**1**	**188**

Counts Unlimited, Inc.
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Corona, CA 92878
(951) 268-6268

DRIVEWAY 2

City: Los Angeles
Location: 1611 Naud Street
Driveway: 2
Date: 10/30/2018
Count Type: Classsification

	Entering				Exiting			
	Pass Veh, Lt Trk, PU, SUV	Buses	Maint. Veh, Tow Trk, Other Hvy	Total	Pass Veh, Lt Trk, PU, SUV	Buses	Maint. Veh, Tow Trk, Other Hvy	Total
0:00	0	0	0	0	0	0	0	0
0:15	0	0	0	0	0	0	0	0
0:30	0	0	0	0	0	0	0	0
0:45	0	0	0	0	0	0	0	0
1:00	0	0	0	0	3	0	0	3
1:15	1	0	0	1	0	0	0	0
1:30	0	0	0	0	0	0	0	0
1:45	0	0	0	0	0	0	0	0
2:00	1	0	0	1	0	0	0	0
2:15	0	0	0	0	0	0	0	0
2:30	0	0	0	0	0	0	0	0
2:45	2	0	0	2	0	0	0	0
3:00	2	0	0	2	0	0	0	0
3:15	0	0	0	0	0	0	0	0
3:30	0	0	0	0	0	0	0	0
3:45	0	0	0	0	1	0	0	1
4:00	0	0	0	0	0	0	0	0
4:15	0	0	0	0	1	0	0	1
4:30	0	0	0	0	0	0	0	0
4:45	0	0	0	0	0	0	0	0
5:00	1	0	0	1	0	0	0	0
5:15	0	0	0	0	0	0	0	0
5:30	1	0	0	1	0	0	0	0
5:45	0	0	0	0	0	0	0	0
6:00	0	0	0	0	0	0	0	0
6:15	0	0	0	0	0	0	0	0
6:30	0	0	0	0	0	0	0	0
6:45	0	0	0	0	0	0	0	0
7:00	1	0	0	1	0	0	0	0
7:15	1	0	0	1	0	0	0	0
7:30	0	0	0	0	1	0	0	1
7:45	0	0	0	0	0	0	0	0
8:00	1	0	0	1	0	0	0	0
8:15	0	0	0	0	0	0	0	0
8:30	0	0	0	0	1	0	0	1
8:45	0	0	0	0	0	0	0	0
9:00	1	0	0	1	1	0	0	1
9:15	1	0	0	1	0	0	0	0
9:30	1	0	0	1	0	0	0	0
9:45	1	0	0	1	0	0	0	0
10:00	0	0	0	0	1	0	0	1
10:15	0	0	0	0	0	0	0	0
10:30	0	0	0	0	1	0	0	1
10:45	0	0	0	0	0	0	0	0
11:00	2	0	0	2	0	0	0	0
11:15	0	0	0	0	0	0	0	0
11:30	0	0	0	0	0	0	0	0
11:45	2	0	0	2	0	0	0	0
12:00	1	0	0	1	0	0	0	0
12:15	0	0	0	0	1	0	0	1
12:30	1	0	0	1	2	0	0	2
12:45	1	0	0	1	0	0	0	0
13:00	0	0	0	0	0	0	0	0
13:15	1	0	0	1	0	0	0	0
13:30	1	0	0	1	0	0	0	0
13:45	1	0	0	1	0	0	0	0
14:00	0	0	0	0	1	0	0	1
14:15	0	0	0	0	0	0	0	0
14:30	0	0	0	0	2	0	0	2
14:45	3	0	0	3	0	0	0	0
15:00	0	0	0	0	0	0	0	0
15:15	0	0	0	0	2	0	0	2
15:30	0	0	0	0	2	0	0	2
15:45	0	0	0	0	0	0	0	0
16:00	0	0	0	0	0	0	0	0
16:15	0	0	0	0	0	0	0	0
16:30	0	0	0	0	1	0	0	1
16:45	0	0	0	0	0	0	0	0
17:00	0	0	0	0	2	0	0	2
17:15	0	0	0	0	0	0	0	0
17:30	0	0	0	0	0	0	0	0
17:45	0	0	0	0	1	0	0	1
18:00	0	0	0	0	1	0	0	1
18:15	0	0	0	0	0	0	0	0
18:30	1	0	0	1	1	0	0	1
18:45	0	0	0	0	0	0	0	0
19:00	1	0	0	1	0	0	0	0
19:15	0	0	0	0	1	0	0	1
19:30	0	0	0	0	0	0	0	0
19:45	0	0	0	0	0	0	0	0
20:00	0	0	0	0	0	0	0	0
20:15	0	0	0	0	0	0	0	0
20:30	0	0	0	0	0	0	0	0
20:45	0	0	0	0	0	0	0	0
21:00	0	0	0	0	1	0	0	1
21:15	0	0	0	0	0	0	0	0
21:30	0	0	0	0	0	0	0	0
21:45	0	0	0	0	0	0	0	0
22:00	1	0	0	1	1	0	0	1
22:15	0	0	0	0	0	0	0	0
22:30	0	0	0	0	0	0	0	0
22:45	0	0	0	0	0	0	0	0
23:00	2	0	0	2	1	0	0	1
23:15	0	0	0	0	0	0	0	0
23:30	1	0	0	1	2	0	0	2
23:45	0	0	0	0	0	0	0	0
TOTAL	**34**	**0**	**0**	**34**	**32**	**0**	**0**	**32**

Counts Unlimited, Inc.
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TOTAL BOTH DRIVEWAYS

City:	Los Angeles
Location:	1611 Naud Street
Driveway:	Total Both Driveways
Date:	10/30/2018
Count Type:	Classsification

	Entering				Exiting			
	Pass Veh, Lt Trk, PU, SUV	Buses	Maint. Veh, Tow Trk, Other Hvy	Total	Pass Veh, Lt Trk, PU, SUV	Buses	Maint. Veh, Tow Trk, Other Hvy	Total
0:00	0	0	0	0	0	0	0	0
0:15	0	1	0	1	1	0	0	1
0:30	1	0	0	1	0	0	0	0
0:45	0	0	0	0	0	0	0	0
1:00	0	0	0	0	3	0	0	3
1:15	1	0	0	1	0	0	0	0
1:30	0	0	0	0	1	0	0	1
1:45	0	0	0	0	0	0	0	0
2:00	2	0	0	2	1	0	0	1
2:15	0	1	0	1	0	1	0	1
2:30	0	0	0	0	0	1	0	1
2:45	3	0	0	3	1	0	0	1
3:00	2	0	0	2	0	1	0	1
3:15	0	0	0	0	0	1	0	1
3:30	0	0	0	0	0	0	0	0
3:45	1	0	0	1	1	1	0	2
4:00	0	1	0	1	0	3	0	3
4:15	0	0	0	0	1	1	0	2
4:30	0	0	0	0	0	6	0	6
4:45	0	0	0	0	0	5	0	5
5:00	2	0	0	2	1	3	0	4
5:15	0	0	0	0	0	3	0	3
5:30	2	0	0	2	0	5	0	5
5:45	3	0	0	3	0	5	0	5
6:00	2	0	0	2	0	4	0	4
6:15	3	0	0	3	1	2	0	3
6:30	1	0	0	1	1	0	0	1
6:45	5	0	0	5	2	0	0	2
7:00	2	0	0	2	1	1	0	2
7:15	2	1	0	3	0	1	0	1
7:30	0	0	0	0	1	0	0	1
7:45	1	0	0	1	2	0	0	2
8:00	2	1	0	3	1	1	0	2
8:15	0	2	0	2	0	1	0	1
8:30	0	3	0	3	1	0	0	1
8:45	2	0	0	2	0	0	0	0
9:00	2	1	0	3	4	0	0	4
9:15	2	2	0	4	1	0	0	1
9:30	5	2	1	8	1	0	0	1
9:45	2	5	0	7	4	1	1	6
10:00	0	2	0	2	3	1	0	4
10:15	2	1	0	3	2	0	0	2
10:30	1	0	0	1	4	0	0	4
10:45	5	1	0	6	1	0	0	1
11:00	3	0	0	3	5	0	0	5
11:15	0	0	0	0	1	0	0	1
11:30	3	0	0	3	1	0	0	1
11:45	4	0	0	4	0	0	0	0
12:00	5	1	0	6	6	0	0	6
12:15	4	0	0	4	3	3	0	6
12:30	3	1	0	4	5	1	0	6
12:45	5	1	0	6	3	2	0	5
13:00	2	2	0	4	4	0	0	4
13:15	3	1	0	4	2	1	0	3
13:30	4	0	0	4	2	2	0	4
13:45	2	0	0	2	0	1	0	1
14:00	3	2	0	5	3	3	0	6
14:15	3	0	0	3	0	4	0	4
14:30	1	1	0	2	4	5	0	9
14:45	3	0	0	3	1	0	0	1
15:00	0	0	0	0	1	1	0	2
15:15	1	1	0	2	4	1	0	5
15:30	2	0	0	2	5	1	0	6
15:45	2	0	0	2	2	1	0	3
16:00	1	0	0	1	4	0	0	4
16:15	0	0	0	0	2	0	0	2
16:30	1	0	0	1	1	0	0	1
16:45	0	0	0	0	0	0	0	0
17:00	0	0	0	0	2	0	0	2
17:15	1	0	0	1	0	0	0	0
17:30	1	1	0	2	2	0	0	2
17:45	1	0	0	1	1	0	0	1
18:00	1	0	0	1	3	0	0	3
18:15	2	0	0	2	1	0	0	1
18:30	1	4	0	5	1	1	0	2
18:45	0	2	0	2	1	0	0	1
19:00	5	2	0	7	0	1	0	1
19:15	1	4	0	5	1	1	0	2
19:30	0	2	0	2	3	0	0	3
19:45	0	4	0	4	1	0	0	1
20:00	0	1	0	1	2	0	0	2
20:15	0	1	0	1	0	0	0	0
20:30	0	2	0	2	2	0	0	2
20:45	1	5	0	6	0	0	0	0
21:00	0	2	0	2	1	0	0	1
21:15	0	2	0	2	2	0	0	2
21:30	0	3	0	3	2	0	0	2
21:45	0	2	0	2	1	0	0	1
22:00	2	1	0	3	1	0	0	1
22:15	0	2	0	2	0	0	0	0
22:30	4	0	0	4	7	0	0	7
22:45	6	2	0	8	3	0	0	3
23:00	2	1	0	3	1	0	0	1
23:15	0	0	0	0	0	0	0	0
23:30	3	3	0	6	5	0	0	5
23:45	0	0	0	0	0	0	0	0
TOTAL	**142**	**80**	**1**	**223**	**142**	**77**	**1**	**220**

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Appendix E

Existing Plus Project Conditions
Level of Service Analysis Worksheets

Metro Bus Facility Rosecrans and Avalon TIS
Existing Plus Project Conditions
AM Peak Hour

Scenario Report

Scenario:	EX+P_AM
Command:	EX+P_AM
Volume:	EX_AM
Geometry:	EX
Impact Fee:	Default Impact Fee
Trip Generation:	P_AM
Trip Distribution:	DEFAULT
Paths:	Default Path
Routes:	Default Route
Configuration:	EX

Metro Bus Facility Rosecrans and Avalon TIS
Existing Plus Project Conditions
AM Peak Hour

Trip Generation Report

Forecast for P_AM

Zone #	Subzone	Amount	Units	Rate In	Rate Out	Trips In	Trips Out	Total Trips	% Of Total
1	PROJECT - EM	1.00	PROJECT - EMPL	4.00	4.00	4	4	8	50.0
	Zone 1 Subtotal					4	4	8	50.0
2	PROJECT - BU	1.00	PROJECT - BUS	6.00	2.00	6	2	8	50.0
	Zone 2 Subtotal					6	2	8	50.0
100	TAZ 1	1.00	TAZ 1	0.00	0.00	0	0	0	0.0
TOTAL						10	6	16	100.0

Metro Bus Facility Rosecrans and Avalon TIS
Existing Plus Project Conditions
AM Peak Hour

Turning Movement Report
P_AM

Volume Type	Northbound Left	Thru	Right	Southbound Left	Thru	Right	Eastbound Left	Thru	Right	Westbound Left	Thru	Right	Total Volume
#1 I-110 SB Ramps / East Rosecrans Ave													
Base	0	0	0	327	4	479	0	867	645	256	1267	0	3845
Added	0	0	0	7	0	0	0	0	0	1	0	0	8
Total	0	0	0	334	4	479	0	867	645	257	1267	0	3853
#2 I-110 NB Ramps / East Rosecrans Ave													
Base	480	6	176	2	0	12	1	798	357	0	1303	14	3149
Added	0	0	1	0	0	0	0	8	0	0	5	0	14
Total	480	6	177	2	0	12	1	806	357	0	1308	14	3163
#3 South Main St / East Rosecrans Ave													
Base	59	284	41	48	386	77	61	526	55	93	965	73	2668
Added	0	0	0	0	0	0	0	9	0	0	5	0	14
Total	59	284	41	48	386	77	61	535	55	93	970	73	2682
#4 South Avalon Blvd / East 135th St													
Base	105	539	30	42	608	110	87	156	81	48	322	69	2197
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	105	539	30	42	608	110	87	156	81	48	322	69	2197
#5 South Avalon Blvd / East Rosecrans Ave													
Base	107	524	82	123	561	92	53	430	76	148	1034	121	3351
Added	2	0	0	0	0	0	0	3	6	0	3	0	14
Total	109	524	82	123	561	92	53	433	82	148	1037	121	3365
#6 South Avalon Blvd / Project Dwy - Bus													
Base	0	751	0	0	785	0	0	0	0	0	0	0	1536
Added	0	0	0	6	0	0	0	0	0	0	0	2	8
Total	0	751	0	6	785	0	0	0	0	0	0	2	1544
#7 South Avalon Blvd / East Compton Blvd													
Base	46	596	54	65	667	24	27	116	22	65	385	128	2195
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	46	596	54	65	667	24	27	116	22	65	385	128	2195
#8 Project Dwy - Employees / East Rosecrans Ave													
Base	0	0	0	0	0	0	0	635	0	0	1303	0	1938
Added	4	0	0	0	0	0	0	0	4	0	0	0	8
Total	4	0	0	0	0	0	0	635	4	0	1303	0	1946

Metro Bus Facility Rosecrans and Avalon TIS
Existing Plus Project Conditions
AM Peak Hour

Level Of Service Computation Report
ICU 1(Loss as Cycle Length %) Method (Future Volume Alternative)

Intersection #1 I-110 SB Ramps / East Rosecrans Ave

Cycle (sec): 100 Critical Vol./Cap.(X): 0.834
Loss Time (sec): 10 Average Delay (sec/veh): xxxxxx
Optimal Cycle: 75 Level Of Service: D

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Split Phase			Split Phase			Permitted			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lanes:	0	0	0	1	0	1! 0 1	0	0	2 1 0	1	0	3 0 0
Volume Module:												
Base Vol:	0	0	0	327	4	479	0	867	645	256	1267	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	0	0	327	4	479	0	867	645	256	1267	0
Added Vol:	0	0	0	7	0	0	0	0	0	1	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	0	0	334	4	479	0	867	645	257	1267	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	0	0	0	334	4	479	0	867	645	257	1267	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	0	0	334	4	479	0	867	645	257	1267	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	0	0	0	334	4	479	0	867	645	257	1267	0
Saturation Flow Module:												
Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	0.00	0.00	0.00	1.23	0.01	1.76	0.00	2.00	1.00	1.00	3.00	0.00
Final Sat.:	0	0	0	1962	24	2814	0	3200	1600	1600	4800	0
Capacity Analysis Module:												
Vol/Sat:	0.00	0.00	0.00	0.17	0.17	0.17	0.00	0.27	0.40	0.16	0.26	0.00
Crit Moves:					****				****	****		

Metro Bus Facility Rosecrans and Avalon TIS
Existing Plus Project Conditions
AM Peak Hour

Level Of Service Computation Report
ICU 1(Loss as Cycle Length %) Method (Future Volume Alternative)

Intersection #2 I-110 NB Ramps / East Rosecrans Ave

Cycle (sec):	100	Critical Vol./Cap.(X):	0.592
Loss Time (sec):	10	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	39	Level Of Service:	A

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Split Phase			Split Phase			Permitted			Permitted		
Rights:	Include			Include			Ovl			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lanes:	1	0	1! 0	0	0	1! 0	0	1	2 0	1	0	2 1 0
Volume Module:												
Base Vol:	480	6	176	2	0	12	1	798	357	0	1303	14
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	480	6	176	2	0	12	1	798	357	0	1303	14
Added Vol:	0	0	1	0	0	0	0	8	0	0	5	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	480	6	177	2	0	12	1	806	357	0	1308	14
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	480	6	177	2	0	12	1	806	357	0	1308	14
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	480	6	177	2	0	12	1	806	357	0	1308	14
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	480	6	177	2	0	12	1	806	357	0	1308	14
OvlAdjVol:									25			
Saturation Flow Module:												
Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	1.45	0.02	0.53	0.14	0.00	0.86	0.01	2.99	1.00	0.00	2.97	0.03
Final Sat.:	2317	29	854	229	0	1371	6	4794	1600	0	4749	51
Capacity Analysis Module:												
Vol/Sat:	0.21	0.21	0.21	0.01	0.00	0.01	0.00	0.17	0.22	0.00	0.28	0.28
OvlAdjV/S:									0.02			
Crit Moves:			****			****	****				****	

Metro Bus Facility Rosecrans and Avalon TIS
Existing Plus Project Conditions
AM Peak Hour

Level Of Service Computation Report
ICU 1(Loss as Cycle Length %) Method (Future Volume Alternative)

Intersection #3 South Main St / East Rosecrans Ave

Cycle (sec):	100	Critical Vol./Cap.(X):	0.513
Loss Time (sec):	10	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	34	Level Of Service:	A

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Permitted			Permitted			Permitted		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lanes:	1	0	2 0 1	1	0	2 0 1	1	0	2 1 0	1	0	2 1 0
Volume Module:												
Base Vol:	59	284	41	48	386	77	61	526	55	93	965	73
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	59	284	41	48	386	77	61	526	55	93	965	73
Added Vol:	0	0	0	0	0	0	0	9	0	0	5	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	59	284	41	48	386	77	61	535	55	93	970	73
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	59	284	41	48	386	77	61	535	55	93	970	73
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	59	284	41	48	386	77	61	535	55	93	970	73
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	59	284	41	48	386	77	61	535	55	93	970	73
Saturation Flow Module:												
Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	1.00	2.00	1.00	1.00	2.00	1.00	1.00	2.72	0.28	1.00	2.79	0.21
Final Sat.:	1600	3200	1600	1600	3200	1600	1600	4353	447	1600	4464	336
Capacity Analysis Module:												
Vol/Sat:	0.04	0.09	0.03	0.03	0.12	0.05	0.04	0.12	0.12	0.06	0.22	0.22
Crit Moves:	****				****		****				****	

Metro Bus Facility Rosecrans and Avalon TIS
Existing Plus Project Conditions
AM Peak Hour

Level Of Service Computation Report
ICU 1(Loss as Cycle Length %) Method (Future Volume Alternative)

Intersection #4 South Avalon Blvd / East 135th St

Cycle (sec):	100	Critical Vol./Cap.(X):	0.511
Loss Time (sec):	10	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	34	Level Of Service:	A

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Permitted			Permitted			Permitted		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lanes:	1	0 1	1 0	1	0 2	0 1	1	0 1	0 1	1	0 2	0 1
Volume Module:												
Base Vol:	105	539	30	42	608	110	87	156	81	48	322	69
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	105	539	30	42	608	110	87	156	81	48	322	69
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	105	539	30	42	608	110	87	156	81	48	322	69
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	105	539	30	42	608	110	87	156	81	48	322	69
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	105	539	30	42	608	110	87	156	81	48	322	69
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	105	539	30	42	608	110	87	156	81	48	322	69
Saturation Flow Module:												
Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	1.00	1.89	0.11	1.00	2.00	1.00	1.00	1.00	1.00	1.00	2.00	1.00
Final Sat.:	1600	3031	169	1600	3200	1600	1600	1600	1600	1600	3200	1600
Capacity Analysis Module:												
Vol/Sat:	0.07	0.18	0.18	0.03	0.19	0.07	0.05	0.10	0.05	0.03	0.10	0.04
Crit Moves:	****				****		****				****	

Metro Bus Facility Rosecrans and Avalon TIS
Existing Plus Project Conditions
AM Peak Hour

Level Of Service Computation Report
ICU 1(Loss as Cycle Length %) Method (Future Volume Alternative)

Intersection #5 South Avalon Blvd / East Rosecrans Ave

Cycle (sec):	100	Critical Vol./Cap.(X):	0.618
Loss Time (sec):	10	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	41	Level Of Service:	B

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Prot+Permit			Prot+Permit			Prot+Permit			Prot+Permit		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lanes:	1	0 2	0 1	1	0 2	0 1	1	0 2	1 0	1	0 2	1 0
Volume Module:												
Base Vol:	107	524	82	123	561	92	53	430	76	148	1034	121
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	107	524	82	123	561	92	53	430	76	148	1034	121
Added Vol:	2	0	0	0	0	0	0	3	6	0	3	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	109	524	82	123	561	92	53	433	82	148	1037	121
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	109	524	82	123	561	92	53	433	82	148	1037	121
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	109	524	82	123	561	92	53	433	82	148	1037	121
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	109	524	82	123	561	92	53	433	82	148	1037	121
Saturation Flow Module:												
Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	1.00	2.00	1.00	1.00	2.00	1.00	1.00	2.52	0.48	1.00	2.69	0.31
Final Sat.:	1600	3200	1600	1600	3200	1600	1600	4036	764	1600	4298	502
Capacity Analysis Module:												
Vol/Sat:	0.07	0.16	0.05	0.08	0.18	0.06	0.03	0.11	0.11	0.09	0.24	0.24
Crit Moves:	****				****		****				****	

Metro Bus Facility Rosecrans and Avalon TIS
Existing Plus Project Conditions
AM Peak Hour

Level Of Service Computation Report
2000 HCM Unsignalized Method (Future Volume Alternative)

Intersection #6 South Avalon Blvd / Project Dwy - Bus

Average Delay (sec/veh): 0.0 Worst Case Level Of Service: B[10.8]

Approach:	North Bound				South Bound				East Bound				West Bound			
Movement:	L	-	T	- R	L	-	T	- R	L	-	T	- R	L	-	T	- R
Control:	Uncontrolled				Uncontrolled				Stop Sign				Stop Sign			
Rights:	Include				Include				Include				Include			
Lanes:	0	0	2	0 1	1	0	2	0 0	0	0	0	0 0	0	0	0	0 1
Volume Module:																
Base Vol:	0	751		0	0	785		0	0		0	0	0		0	0
Growth Adj:	1.00	1.00		1.00 1.00	1.00			1.00 1.00	1.00			1.00 1.00	1.00			1.00
Initial Bse:	0	751		0	0	785		0	0		0	0	0		0	0
Added Vol:	0	0		0	6	0		0	0		0	0	0		0	2
PasserByVol:	0	0		0	0	0		0	0		0	0	0		0	0
Initial Fut:	0	751		0	6	785		0	0		0	0	0		0	2
User Adj:	1.00	1.00		1.00 1.00	1.00			1.00 1.00	1.00			1.00 1.00	1.00			1.00
PHF Adj:	1.00	1.00		1.00 1.00	1.00			1.00 1.00	1.00			1.00 1.00	1.00			1.00
PHF Volume:	0	751		0	6	785		0	0		0	0	0		0	2
Reduct Vol:	0	0		0	0	0		0	0		0	0	0		0	0
FinalVolume:	0	751		0	6	785		0	0		0	0	0		0	2
Critical Gap Module:																
Critical Gp:	xxxxx	xxxx	xxxxx	4.1	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	6.9				
FollowUpTim:	xxxxx	xxxx	xxxxx	2.2	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	3.3				
Capacity Module:																
Cnflict Vol:	xxxx	xxxx	xxxxx	751	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	376				
Potent Cap.:	xxxx	xxxx	xxxxx	868	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	628				
Move Cap.:	xxxx	xxxx	xxxxx	868	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	628				
Volume/Cap:	xxxx	xxxx	xxxx	0.01	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	0.00				
Level Of Service Module:																
2Way95thQ:	xxxx	xxxx	xxxxx	0.0	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	0.0				
Control Del:	xxxxx	xxxx	xxxxx	9.2	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	10.8				
LOS by Move:	*	*	*	A	*	*	*	*	*	*	*	B				
Movement:	LT - LTR - RT				LT - LTR - RT				LT - LTR - RT				LT - LTR - RT			
Shared Cap.:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx				
SharedQueue:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx				
Shrd ConDel:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx				
Shared LOS:	*	*	*	*	*	*	*	*	*	*	*	*				
ApproachDel:	xxxxxx			xxxxxx			xxxxxx			10.8						
ApproachLOS:	*			*			*			B						

Note: Queue reported is the number of cars per lane.

Metro Bus Facility Rosecrans and Avalon TIS
Existing Plus Project Conditions
AM Peak Hour

Level Of Service Computation Report
ICU 1(Loss as Cycle Length %) Method (Future Volume Alternative)

Intersection #7 South Avalon Blvd / East Compton Blvd

Cycle (sec):	100	Critical Vol./Cap.(X):	0.514
Loss Time (sec):	10	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	34	Level Of Service:	A

Approach:	North Bound				South Bound				East Bound				West Bound			
Movement:	L	-	T	- R	L	-	T	- R	L	-	T	- R	L	-	T	- R
Control:	Permitted				Permitted				Permitted				Permitted			
Rights:	Include				Include				Include				Include			
Min. Green:	0	0	0		0	0	0		0	0	0		0	0	0	
Y+R:	4.0	4.0	4.0		4.0	4.0	4.0		4.0	4.0	4.0		4.0	4.0	4.0	
Lanes:	1	0	2	0 1	1	0	2	0 1	1	0	1	1 0	1	0	1	1 0
Volume Module:																
Base Vol:	46	596		54	65	667		24	27	116		22	65	385		128
Growth Adj:	1.00	1.00		1.00 1.00	1.00			1.00 1.00	1.00	1.00		1.00 1.00	1.00	1.00		1.00
Initial Bse:	46	596		54	65	667		24	27	116		22	65	385		128
Added Vol:	0	0		0	0	0		0	0	0		0	0	0		0
PasserByVol:	0	0		0	0	0		0	0	0		0	0	0		0
Initial Fut:	46	596		54	65	667		24	27	116		22	65	385		128
User Adj:	1.00	1.00		1.00 1.00	1.00			1.00 1.00	1.00	1.00		1.00 1.00	1.00	1.00		1.00
PHF Adj:	1.00	1.00		1.00 1.00	1.00			1.00 1.00	1.00	1.00		1.00 1.00	1.00	1.00		1.00
PHF Volume:	46	596		54	65	667		24	27	116		22	65	385		128
Reduct Vol:	0	0		0	0	0		0	0	0		0	0	0		0
Reduced Vol:	46	596		54	65	667		24	27	116		22	65	385		128
PCE Adj:	1.00	1.00		1.00 1.00	1.00			1.00 1.00	1.00	1.00		1.00 1.00	1.00	1.00		1.00
MLF Adj:	1.00	1.00		1.00 1.00	1.00			1.00 1.00	1.00	1.00		1.00 1.00	1.00	1.00		1.00
FinalVolume:	46	596		54	65	667		24	27	116		22	65	385		128
Saturation Flow Module:																
Sat/Lane:	1600	1600		1600	1600	1600		1600	1600	1600		1600	1600	1600		1600
Adjustment:	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00		1.00
Lanes:	1.00	2.00		1.00	1.00	2.00		1.00	1.00	1.68		0.32	1.00	1.50		0.50
Final Sat.:	1600	3200		1600	1600	3200		1600	1600	2690		510	1600	2402		798
Capacity Analysis Module:																
Vol/Sat:	0.03	0.19		0.03	0.04	0.21		0.02	0.02	0.04		0.04	0.04	0.16		0.16
Crit Moves:	****					****			****					****		

Metro Bus Facility Rosecrans and Avalon TIS
Existing Plus Project Conditions
AM Peak Hour

Level Of Service Computation Report
2000 HCM Unsignalized Method (Future Volume Alternative)

Intersection #8 Project Dwy - Employees / East Rosecrans Ave

Average Delay (sec/veh): 0.0 Worst Case Level Of Service: C[21.8]

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Stop Sign			Stop Sign			Uncontrolled			Uncontrolled		
Rights:	Include			Include			Include			Include		
Lanes:	1 0	0	0 0	0	0 0	0 0	0	0 2	1 0	1	0 3	0 0
Volume Module:												
Base Vol:	0	0	0	0	0	0	0	635	0	0	1303	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	0	0	0	0	0	0	635	0	0	1303	0
Added Vol:	4	0	0	0	0	0	0	0	4	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	4	0	0	0	0	0	0	635	4	0	1303	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	4	0	0	0	0	0	0	635	4	0	1303	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
FinalVolume:	4	0	0	0	0	0	0	635	4	0	1303	0
Critical Gap Module:												
Critical Gp:	6.8	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
FollowUpTim:	3.5	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Capacity Module:												
Cnflict Vol:	1071	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx
Potent Cap.:	219	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx
Move Cap.:	219	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx
Volume/Cap:	0.02	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx
Level Of Service Module:												
2Way95thQ:	0.1	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx
Control Del:	21.8	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
LOS by Move:	C	*	*	*	*	*	*	*	*	*	*	*
Movement:	LT - LTR - RT			LT - LTR - RT			LT - LTR - RT			LT - LTR - RT		
Shared Cap.:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx
SharedQueue:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Shrd ConDel:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Shared LOS:	*	*	*	*	*	*	*	*	*	*	*	*
ApproachDel:	21.8			xxxxxx			xxxxxx			xxxxxx		
ApproachLOS:	C			*			*			*		

Note: Queue reported is the number of cars per lane.

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Metro Bus Facility Rosecrans and Avalon TIS
Existing Plus Project Conditions
PM Peak Hour

Scenario Report

Scenario:	EX+P_PM
Command:	EX+P_PM
Volume:	EX_PM
Geometry:	EX
Impact Fee:	Default Impact Fee
Trip Generation:	P_PM
Trip Distribution:	DEFAULT
Paths:	Default Path
Routes:	Default Route
Configuration:	EX

Metro Bus Facility Rosecrans and Avalon TIS
Existing Plus Project Conditions
PM Peak Hour

Trip Generation Report

Forecast for P_PM

Zone #	Subzone	Amount	Units	Rate In	Rate Out	Trips In	Trips Out	Total Trips	% Of Total
1	PROJECT - EM	1.00	PROJECT - EMPL	2.00	7.00	2	7	9	90.0
	Zone 1 Subtotal					2	7	9	90.0
2	PROJECT - BU	1.00	PROJECT - BUS	1.00	0.00	1	0	1	10.0
	Zone 2 Subtotal					1	0	1	10.0
TOTAL						3	7	10	100.0

Metro Bus Facility Rosecrans and Avalon TIS
Existing Plus Project Conditions
PM Peak Hour

Turning Movement Report
P_PM

Volume Type	Northbound Left	Thru	Right	Southbound Left	Thru	Right	Eastbound Left	Thru	Right	Westbound Left	Thru	Right	Total Volume
#1 I-110 SB Ramps / East Rosecrans Ave													
Base	0	0	0	580	12	450	0	1396	444	201	1019	0	4102
Added	0	0	0	2	0	0	0	0	0	2	1	0	5
Total	0	0	0	582	12	450	0	1396	444	203	1020	0	4107
#2 I-110 NB Ramps / East Rosecrans Ave													
Base	292	3	186	2	0	29	1	1458	375	0	1450	19	3815
Added	0	0	1	0	0	0	0	2	0	0	5	0	8
Total	292	3	187	2	0	29	1	1460	375	0	1455	19	3823
#3 South Main St / East Rosecrans Ave													
Base	118	514	105	69	307	49	105	1372	88	67	668	54	3516
Added	0	0	0	0	0	0	0	2	0	0	5	0	7
Total	118	514	105	69	307	49	105	1374	88	67	673	54	3523
#4 South Avalon Blvd / East 135th St													
Base	88	816	69	79	568	73	261	550	135	27	151	71	2888
Added	0	1	0	0	0	0	0	0	0	0	0	0	1
Total	88	817	69	79	568	73	261	550	135	27	151	71	2889
#5 South Avalon Blvd / East Rosecrans Ave													
Base	104	699	182	201	495	72	117	1292	104	110	569	138	4083
Added	0	0	0	0	0	0	0	1	1	1	5	1	9
Total	104	699	182	201	495	72	117	1293	105	111	574	139	4092
#6 South Avalon Blvd / Project Dwy - Bus													
Base	0	977	0	0	709	0	0	0	0	0	0	0	1686
Added	0	0	0	1	1	0	0	0	0	0	0	0	2
Total	0	977	0	1	710	0	0	0	0	0	0	0	1688
#7 South Avalon Blvd / East Compton Blvd													
Base	29	810	70	111	568	58	93	322	50	37	189	74	2411
Added	0	0	0	0	1	0	0	0	0	0	0	0	1
Total	29	810	70	111	569	58	93	322	50	37	189	74	2412
#8 Project Dwy - Employees / East Rosecrans Ave													
Base	0	0	0	0	0	0	0	1675	0	0	817	0	2492
Added	6	0	1	0	0	0	0	0	2	0	0	0	9
Total	6	0	1	0	0	0	0	1675	2	0	817	0	2501

Metro Bus Facility Rosecrans and Avalon TIS
Existing Plus Project Conditions
PM Peak Hour

Level Of Service Computation Report
ICU 1(Loss as Cycle Length %) Method (Future Volume Alternative)

Intersection #1 I-110 SB Ramps / East Rosecrans Ave

Cycle (sec): 100 Critical Vol./Cap.(X): 0.828
Loss Time (sec): 10 Average Delay (sec/veh): xxxxxx
Optimal Cycle: 73 Level Of Service: D

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Split Phase			Split Phase			Permitted			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lanes:	0	0	0	1	0	1! 0	1	0	2	1	0	1	0	3	0	0
Volume Module:												
Base Vol:	0	0	0	580	12	450	0	1396	444	201	1019	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	0	0	580	12	450	0	1396	444	201	1019	0
Added Vol:	0	0	0	2	0	0	0	0	0	2	1	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	0	0	582	12	450	0	1396	444	203	1020	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	0	0	0	582	12	450	0	1396	444	203	1020	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	0	0	582	12	450	0	1396	444	203	1020	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	0	0	0	582	12	450	0	1396	444	203	1020	0
Saturation Flow Module:												
Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	0.00	0.00	0.00	1.68	0.03	1.29	0.00	2.28	0.72	1.00	3.00	0.00
Final Sat.:	0	0	0	2676	55	2069	0	3642	1158	1600	4800	0
Capacity Analysis Module:												
Vol/Sat:	0.00	0.00	0.00	0.22	0.22	0.22	0.00	0.38	0.38	0.13	0.21	0.00
Crit Moves:					****			****		****		

Metro Bus Facility Rosecrans and Avalon TIS
Existing Plus Project Conditions
PM Peak Hour

Level Of Service Computation Report
ICU 1(Loss as Cycle Length %) Method (Future Volume Alternative)

Intersection #2 I-110 NB Ramps / East Rosecrans Ave

Cycle (sec):	100	Critical Vol./Cap.(X):	0.578
Loss Time (sec):	10	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	38	Level Of Service:	A

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Split Phase			Split Phase			Permitted			Permitted		
Rights:	Include			Include			Ovl			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lanes:	1	0	1! 0	0	0	1! 0	0	1	2 0	1	0	0 2 1 0
Volume Module:												
Base Vol:	292	3	186	2	0	29	1	1458	375	0	1450	19
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	292	3	186	2	0	29	1	1458	375	0	1450	19
Added Vol:	0	0	1	0	0	0	0	2	0	0	5	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	292	3	187	2	0	29	1	1460	375	0	1455	19
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	292	3	187	2	0	29	1	1460	375	0	1455	19
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	292	3	187	2	0	29	1	1460	375	0	1455	19
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	292	3	187	2	0	29	1	1460	375	0	1455	19
OvlAdjVol:									134			
Saturation Flow Module:												
Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	1.21	0.01	0.78	0.06	0.00	0.94	0.01	2.99	1.00	0.00	2.96	0.04
Final Sat.:	1939	20	1241	103	0	1497	3	4797	1600	0	4738	62
Capacity Analysis Module:												
Vol/Sat:	0.15	0.15	0.15	0.02	0.00	0.02	0.00	0.30	0.23	0.00	0.31	0.31
OvlAdjV/S:									0.08			
Crit Moves:		****				****	****				****	

Metro Bus Facility Rosecrans and Avalon TIS
Existing Plus Project Conditions
PM Peak Hour

Level Of Service Computation Report
ICU 1(Loss as Cycle Length %) Method (Future Volume Alternative)

Intersection #3 South Main St / East Rosecrans Ave

Cycle (sec):	100	Critical Vol./Cap.(X):	0.650
Loss Time (sec):	10	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	44	Level Of Service:	B

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Permitted			Permitted			Permitted		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lanes:	1	0	2 0 1	1	0	2 0 1	1	0	2 1 0	1	0	2 1 0
Volume Module:												
Base Vol:	118	514	105	69	307	49	105	1372	88	67	668	54
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	118	514	105	69	307	49	105	1372	88	67	668	54
Added Vol:	0	0	0	0	0	0	0	2	0	0	5	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	118	514	105	69	307	49	105	1374	88	67	673	54
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	118	514	105	69	307	49	105	1374	88	67	673	54
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	118	514	105	69	307	49	105	1374	88	67	673	54
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	118	514	105	69	307	49	105	1374	88	67	673	54
Saturation Flow Module:												
Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	1.00	2.00	1.00	1.00	2.00	1.00	1.00	2.82	0.18	1.00	2.78	0.22
Final Sat.:	1600	3200	1600	1600	3200	1600	1600	4511	289	1600	4443	357
Capacity Analysis Module:												
Vol/Sat:	0.07	0.16	0.07	0.04	0.10	0.03	0.07	0.30	0.30	0.04	0.15	0.15
Crit Moves:		****			****				****		****	

Metro Bus Facility Rosecrans and Avalon TIS
Existing Plus Project Conditions
PM Peak Hour

Level Of Service Computation Report
ICU 1(Loss as Cycle Length %) Method (Future Volume Alternative)

Intersection #4 South Avalon Blvd / East 135th St

Cycle (sec):	100	Critical Vol./Cap.(X):	0.787
Loss Time (sec):	10	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	64	Level Of Service:	C

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Permitted			Permitted			Permitted		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lanes:	1 0	1	1 0	1 0	2	0 1	1 0	1	0 1	1 0	2	0 1
Volume Module:												
Base Vol:	88	816	69	79	568	73	261	550	135	27	151	71
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	88	816	69	79	568	73	261	550	135	27	151	71
Added Vol:	0	1	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	88	817	69	79	568	73	261	550	135	27	151	71
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	88	817	69	79	568	73	261	550	135	27	151	71
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	88	817	69	79	568	73	261	550	135	27	151	71
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	88	817	69	79	568	73	261	550	135	27	151	71
Saturation Flow Module:												
Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	1.00	1.84	0.16	1.00	2.00	1.00	1.00	1.00	1.00	1.00	2.00	1.00
Final Sat.:	1600	2951	249	1600	3200	1600	1600	1600	1600	1600	3200	1600
Capacity Analysis Module:												
Vol/Sat:	0.06	0.28	0.28	0.05	0.18	0.05	0.16	0.34	0.08	0.02	0.05	0.04
Crit Moves:		****			****			****			****	

Metro Bus Facility Rosecrans and Avalon TIS
Existing Plus Project Conditions
PM Peak Hour

Level Of Service Computation Report
ICU 1(Loss as Cycle Length %) Method (Future Volume Alternative)

Intersection #5 South Avalon Blvd / East Rosecrans Ave

Cycle (sec):	100	Critical Vol./Cap.(X):	0.805
Loss Time (sec):	10	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	68	Level Of Service:	D

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Prot+Permit			Prot+Permit			Prot+Permit			Prot+Permit		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lanes:	1 0	2	0 1	1 0	2	0 1	1 0	2	1 0	1 0	2	1 0
Volume Module:												
Base Vol:	104	699	182	201	495	72	117	1292	104	110	569	138
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	104	699	182	201	495	72	117	1292	104	110	569	138
Added Vol:	0	0	0	0	0	0	0	1	1	1	5	1
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	104	699	182	201	495	72	117	1293	105	111	574	139
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	104	699	182	201	495	72	117	1293	105	111	574	139
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	104	699	182	201	495	72	117	1293	105	111	574	139
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	104	699	182	201	495	72	117	1293	105	111	574	139
Saturation Flow Module:												
Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	1.00	2.00	1.00	1.00	2.00	1.00	1.00	2.77	0.23	1.00	2.42	0.58
Final Sat.:	1600	3200	1600	1600	3200	1600	1600	4439	361	1600	3864	936
Capacity Analysis Module:												
Vol/Sat:	0.07	0.22	0.11	0.13	0.15	0.05	0.07	0.29	0.29	0.07	0.15	0.15
Crit Moves:		****			****				****		****	

Metro Bus Facility Rosecrans and Avalon TIS
Existing Plus Project Conditions
PM Peak Hour

Level Of Service Computation Report
2000 HCM Unsignalized Method (Future Volume Alternative)

Intersection #6 South Avalon Blvd / Project Dwy - Bus

Average Delay (sec/veh): 0.0 Worst Case Level Of Service: B[10.0]

Approach:	North Bound				South Bound				East Bound				West Bound			
Movement:	L	-	T	- R	L	-	T	- R	L	-	T	- R	L	-	T	- R
Control:	Uncontrolled				Uncontrolled				Stop Sign				Stop Sign			
Rights:	Include				Include				Include				Include			
Lanes:	0	0	2	0 1	1	0	2	0 0	0	0	0	0 0	0	0	0	0 1
Volume Module:																
Base Vol:	0	977		0 0	709			0 0	0			0 0	0			0 0
Growth Adj:	1.00	1.00		1.00 1.00	1.00			1.00 1.00	1.00			1.00 1.00	1.00			1.00 1.00
Initial Bse:	0	977		0 0	709			0 0	0			0 0	0			0 0
Added Vol:	0	0		0 1	1			0 0	0			0 0	0			0 0
PasserByVol:	0	0		0 0	0			0 0	0			0 0	0			0 0
Initial Fut:	0	977		0 1	710			0 0	0			0 0	0			0 0
User Adj:	1.00	1.00		1.00 1.00	1.00			1.00 1.00	1.00			1.00 1.00	1.00			1.00 1.00
PHF Adj:	1.00	1.00		1.00 1.00	1.00			1.00 1.00	1.00			1.00 1.00	1.00			1.00 1.00
PHF Volume:	0	977		0 1	710			0 0	0			0 0	0			0 0
Reduct Vol:	0	0		0 0	0			0 0	0			0 0	0			0 0
FinalVolume:	0	977		0 1	710			0 0	0			0 0	0			0 0
Critical Gap Module:																
Critical Gp:	xxxxx	xxxx	xxxxx	4.1	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	6.9				
FollowUpTim:	xxxxx	xxxx	xxxxx	2.2	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	3.3				
Capacity Module:																
Cnflict Vol:	xxxx	xxxx	xxxxx	977	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	489				
Potent Cap.:	xxxx	xxxx	xxxxx	714	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	531				
Move Cap.:	xxxx	xxxx	xxxxx	714	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	531				
Volume/Cap:	xxxx	xxxx	xxxx	0.00	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	0.00				
Level Of Service Module:																
2Way95thQ:	xxxx	xxxx	xxxxx	0.0	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx				
Control Del:	xxxxx	xxxx	xxxxx	10.0	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx				
LOS by Move:	*	*	*	B	*	*	*	*	*	*	*	*				
Movement:	LT - LTR - RT				LT - LTR - RT				LT - LTR - RT				LT - LTR - RT			
Shared Cap.:	xxxx	xxxx	xxxxx		xxxx	xxxx	xxxxx		xxxx	xxxx	xxxxx		xxxx	xxxx	xxxxx	
SharedQueue:	xxxxx	xxxx	xxxxx		xxxxx	xxxx	xxxxx		xxxxx	xxxx	xxxxx		xxxxx	xxxx	xxxxx	
Shrd ConDel:	xxxxx	xxxx	xxxxx		xxxxx	xxxx	xxxxx		xxxxx	xxxx	xxxxx		xxxxx	xxxx	xxxxx	
Shared LOS:	*	*	*		*	*	*		*	*	*		*	*	*	
ApproachDel:	xxxxxx				xxxxxx				xxxxxx				xxxxxx			
ApproachLOS:	*				*				*				*			

Note: Queue reported is the number of cars per lane.

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Metro Bus Facility Rosecrans and Avalon TIS
Existing Plus Project Conditions
PM Peak Hour

Level Of Service Computation Report
ICU 1(Loss as Cycle Length %) Method (Future Volume Alternative)

Intersection #7 South Avalon Blvd / East Compton Blvd

Cycle (sec):	100	Critical Vol./Cap.(X):	0.563
Loss Time (sec):	10	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	37	Level Of Service:	A

Approach:	North Bound				South Bound				East Bound				West Bound			
Movement:	L	-	T	- R	L	-	T	- R	L	-	T	- R	L	-	T	- R
Control:	Permitted				Permitted				Permitted				Permitted			
Rights:	Include				Include				Include				Include			
Min. Green:	0	0	0		0	0	0		0	0	0		0	0	0	
Y+R:	4.0	4.0	4.0		4.0	4.0	4.0		4.0	4.0	4.0		4.0	4.0	4.0	
Lanes:	1	0	2	0 1	1	0	2	0 1	1	0	1	1 0	1	0	1	1 0
Volume Module:																
Base Vol:	29	810		70	111	568		58	93	322		50	37	189		74
Growth Adj:	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00		1.00
Initial Bse:	29	810		70	111	568		58	93	322		50	37	189		74
Added Vol:	0	0		0	0	1		0	0	0		0	0	0		0
PasserByVol:	0	0		0	0	0		0	0	0		0	0	0		0
Initial Fut:	29	810		70	111	569		58	93	322		50	37	189		74
User Adj:	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00		1.00
PHF Adj:	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00		1.00
PHF Volume:	29	810		70	111	569		58	93	322		50	37	189		74
Reduct Vol:	0	0		0	0	0		0	0	0		0	0	0		0
Reduced Vol:	29	810		70	111	569		58	93	322		50	37	189		74
PCE Adj:	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00		1.00
MLF Adj:	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00		1.00
FinalVolume:	29	810		70	111	569		58	93	322		50	37	189		74
Saturation Flow Module:																
Sat/Lane:	1600	1600		1600	1600	1600		1600	1600	1600		1600	1600	1600		1600
Adjustment:	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00		1.00
Lanes:	1.00	2.00		1.00	1.00	2.00		1.00	1.00	1.73		0.27	1.00	1.44		0.56
Final Sat.:	1600	3200		1600	1600	3200		1600	1600	2770		430	1600	2300		900
Capacity Analysis Module:																
Vol/Sat:	0.02	0.25		0.04	0.07	0.18		0.04	0.06	0.12		0.12	0.02	0.08		0.08
Crit Moves:		****				****				****					****	

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Metro Bus Facility Rosecrans and Avalon TIS
Existing Plus Project Conditions
PM Peak Hour

Level Of Service Computation Report
2000 HCM Unsignalized Method (Future Volume Alternative)

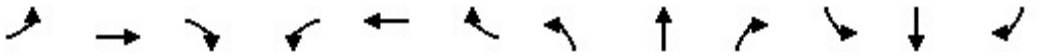
Intersection #8 Project Dwy - Employees / East Rosecrans Ave

Average Delay (sec/veh): 0.2 Worst Case Level Of Service: F[65.8]

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Stop Sign			Stop Sign			Uncontrolled			Uncontrolled		
Rights:	Include			Include			Include			Include		
Lanes:	0 0	1! 0	0	0 0	0 0	0	0 0	2 1	0	1 0	3 0	0
Volume Module:												
Base Vol:	0	0	0	0	0	0	0	1675	0	0	817	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	0	0	0	0	0	0	1675	0	0	817	0
Added Vol:	6	0	1	0	0	0	0	0	2	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	6	0	1	0	0	0	0	1675	2	0	817	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	6	0	1	0	0	0	0	1675	2	0	817	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
FinalVolume:	6	0	1	0	0	0	0	1675	2	0	817	0
Critical Gap Module:												
Critical Gp:	6.8	6.5	6.9	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
FollowUpTim:	3.5	4.0	3.3	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Capacity Module:												
Cnflict Vol:	1948	2493	559	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx
Potent Cap.:	58	30	477	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx
Move Cap.:	58	30	477	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx
Volume/Cap:	0.10	0.00	0.00	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx
Level Of Service Module:												
2Way95thQ:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx
Control Del:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
LOS by Move:	*	*	*	*	*	*	*	*	*	*	*	*
Movement:	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT
Shared Cap.:	xxxx	66	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx
SharedQueue:	xxxxx	0.3	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Shrd ConDel:	xxxxx	65.8	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Shared LOS:	*	F	*	*	*	*	*	*	*	*	*	*
ApproachDel:	65.8			xxxxxx			xxxxxx			xxxxxx		
ApproachLOS:	F			*			*			*		

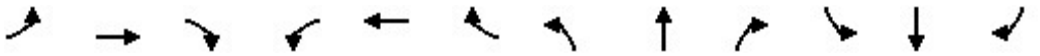
Note: Queue reported is the number of cars per lane.

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	275		0	0		0	150		150
Storage Lanes	0		0	1		0	0		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.91	0.91	1.00	0.91	1.00	1.00	1.00	1.00	0.95	0.91	0.95
Ped Bike Factor												
Frt		0.936									0.880	0.850
Flt Protected				0.950						0.950	0.991	
Satd. Flow (prot)	0	4760	0	1770	5085	0	0	0	0	1681	1478	1504
Flt Permitted				0.950						0.950	0.991	
Satd. Flow (perm)	0	4760	0	1770	5085	0	0	0	0	1681	1478	1504
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		320									43	109
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		508			258			584			534	
Travel Time (s)		11.5			5.9			13.3			12.1	

Intersection Summary	
Area Type:	Other



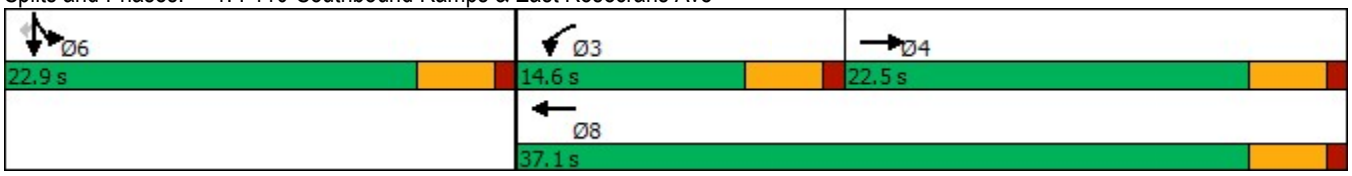
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	0	867	645	257	1267	0	0	0	0	334	4	479
Future Volume (vph)	0	867	645	257	1267	0	0	0	0	334	4	479
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	0	894	665	265	1306	0	0	0	0	344	4	494
Shared Lane Traffic (%)										15%		45%
Lane Group Flow (vph)	0	1559	0	265	1306	0	0	0	0	292	278	272

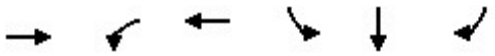
Intersection Summary

Lane Group	EBT	WBL	WBT	SBL	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	867	257	1267	334	4	479
Future Volume (vph)	867	257	1267	334	4	479
Turn Type	NA	Prot	NA	Split	NA	Perm
Protected Phases	4	3	8	6	6	
Permitted Phases						6
Detector Phase	4	3	8	6	6	6
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	9.5	22.5	22.5	22.5	22.5
Total Split (s)	22.5	14.6	37.1	22.9	22.9	22.9
Total Split (%)	37.5%	24.3%	61.8%	38.2%	38.2%	38.2%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lag	Lead				
Lead-Lag Optimize?	Yes	Yes				
Recall Mode	None	None	None	Max	Max	Max
Act Effct Green (s)	18.0	10.1	32.6	18.4	18.4	18.4
Actuated g/C Ratio	0.30	0.17	0.54	0.31	0.31	0.31
v/c Ratio	0.94	0.89	0.47	0.57	0.58	0.51
Control Delay	30.2	59.4	9.1	22.6	20.3	13.9
Queue Delay	0.0	0.0	0.9	0.0	0.0	0.0
Total Delay	30.2	59.4	10.1	22.6	20.3	13.9
LOS	C	E	B	C	C	B
Approach Delay	30.2		18.4		19.0	
Approach LOS	C		B		B	

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 60	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.94	
Intersection Signal Delay: 23.2	Intersection LOS: C
Intersection Capacity Utilization 70.9%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 1: I-110-Southbound Ramps & East Rosecrans Ave

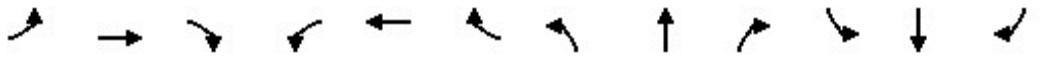




Lane Group	EBT	WBL	WBT	SBL	SBT	SBR
Lane Group Flow (vph)	1559	265	1306	292	278	272
v/c Ratio	0.94	0.89	0.47	0.57	0.58	0.51
Control Delay	30.2	59.4	9.1	22.6	20.3	13.9
Queue Delay	0.0	0.0	0.9	0.0	0.0	0.0
Total Delay	30.2	59.4	10.1	22.6	20.3	13.9
Queue Length 50th (ft)	161	95	95	92	75	47
Queue Length 95th (ft)	#261	#215	126	164	151	112
Internal Link Dist (ft)	428		178		454	
Turn Bay Length (ft)		275		150		150
Base Capacity (vph)	1652	297	2762	515	483	536
Starvation Cap Reductn	0	0	1079	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.94	0.89	0.78	0.57	0.58	0.51

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

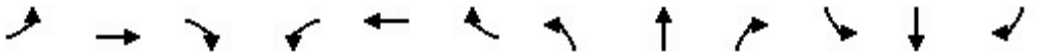


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	867	645	257	1267	0	0	0	0	334	4	479
Future Volume (veh/h)	0	867	645	257	1267	0	0	0	0	334	4	479
Number	7	4	14	3	8	18				1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1863	1900	1863	1863	0				1863	1863	1863
Adj Flow Rate, veh/h	0	894	665	265	1306	0				231	0	618
Adj No. of Lanes	0	3	0	1	3	0				1	0	2
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97				0.97	0.97	0.97
Percent Heavy Veh, %	0	2	2	2	2	0				2	2	2
Cap, veh/h	0	1017	475	299	2763	0				544	0	971
Arrive On Green	0.00	0.30	0.30	0.17	0.54	0.00				0.31	0.00	0.31
Sat Flow, veh/h	0	3558	1583	1774	5253	0				1774	0	3167
Grp Volume(v), veh/h	0	894	665	265	1306	0				231	0	618
Grp Sat Flow(s),veh/h/ln	0	1695	1583	1774	1695	0				1774	0	1583
Q Serve(g_s), s	0.0	15.0	18.0	8.8	9.5	0.0				6.2	0.0	10.1
Cycle Q Clear(g_c), s	0.0	15.0	18.0	8.8	9.5	0.0				6.2	0.0	10.1
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	1017	475	299	2763	0				544	0	971
V/C Ratio(X)	0.00	0.88	1.40	0.89	0.47	0.00				0.42	0.00	0.64
Avail Cap(c_a), veh/h	0	1017	475	299	2763	0				544	0	971
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	20.0	21.0	24.4	8.4	0.0				16.6	0.0	17.9
Incr Delay (d2), s/veh	0.0	8.9	192.4	25.9	0.1	0.0				2.4	0.0	3.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	8.2	33.2	6.4	4.4	0.0				3.4	0.0	4.8
LnGrp Delay(d),s/veh	0.0	28.9	213.4	50.3	8.5	0.0				19.0	0.0	21.1
LnGrp LOS		C	F	D	A					B		C
Approach Vol, veh/h		1559			1571						849	
Approach Delay, s/veh		107.6			15.6						20.5	
Approach LOS		F			B						C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs			3	4		6		8
Phs Duration (G+Y+Rc), s			14.6	22.5		22.9		37.1
Change Period (Y+Rc), s			4.5	4.5		4.5		4.5
Max Green Setting (Gmax), s			10.1	18.0		18.4		32.6
Max Q Clear Time (g_c+I1), s			10.8	20.0		12.1		11.5
Green Ext Time (p_c), s			0.0	0.0		2.0		9.9

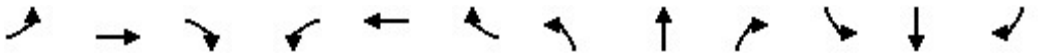
Intersection Summary	
HCM 2010 Ctrl Delay	52.7
HCM 2010 LOS	D

Notes



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		100	0		0	0		0	0		0
Storage Lanes	0		1	0		0	1		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.91	0.91	1.00	1.00	0.91	0.91	0.95	0.95	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt			0.850		0.998			0.917			0.884	
Flt Protected							0.950	0.979			0.993	
Satd. Flow (prot)	0	5085	1583	0	5075	0	1681	1589	0	0	1635	0
Flt Permitted		0.938					0.950	0.979			0.993	
Satd. Flow (perm)	0	4770	1583	0	5075	0	1681	1589	0	0	1635	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			364		2			86			94	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		148			3372			503			198	
Travel Time (s)		3.4			76.6			11.4			4.5	

Intersection Summary	
Area Type:	Other



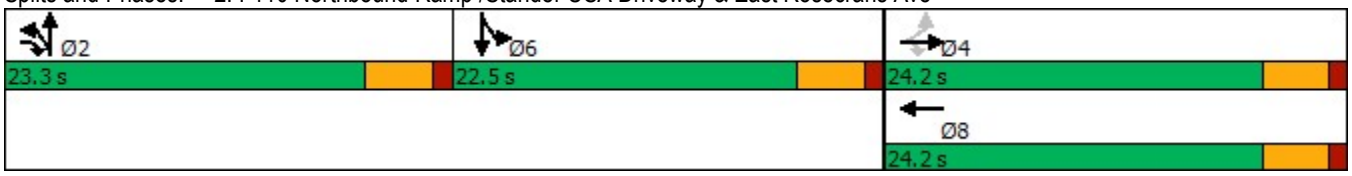
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	1	806	357	0	1308	14	480	6	177	2	0	12
Future Volume (vph)	1	806	357	0	1308	14	480	6	177	2	0	12
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	1	822	364	0	1335	14	490	6	181	2	0	12
Shared Lane Traffic (%)							29%					
Lane Group Flow (vph)	0	823	364	0	1349	0	348	329	0	0	14	0

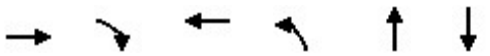
Intersection Summary

Lane Group	EBL	EBT	EBR	WBT	NBL	NBT	SBT
Lane Configurations							
Traffic Volume (vph)	1	806	357	1308	480	6	0
Future Volume (vph)	1	806	357	1308	480	6	0
Turn Type	Perm	NA	pm+ov	NA	Split	NA	NA
Protected Phases		4	2	8	2	2	6
Permitted Phases	4		4				
Detector Phase	4	4	2	8	2	2	6
Switch Phase							
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	24.2	24.2	23.3	24.2	23.3	23.3	22.5
Total Split (%)	34.6%	34.6%	33.3%	34.6%	33.3%	33.3%	32.1%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag							
Lead-Lag Optimize?							
Recall Mode	None	None	Max	None	Max	Max	Min
Act Effct Green (s)		19.7	43.0	19.7	18.8	18.8	5.5
Actuated g/C Ratio		0.34	0.75	0.34	0.33	0.33	0.10
v/c Ratio		0.50	0.29	0.78	0.63	0.57	0.06
Control Delay		16.3	0.9	20.6	22.7	16.2	0.4
Queue Delay		0.0	0.3	0.0	0.0	0.0	0.0
Total Delay		16.3	1.2	20.6	22.7	16.2	0.4
LOS		B	A	C	C	B	A
Approach Delay		11.7		20.6		19.5	0.4
Approach LOS		B		C		B	A

Intersection Summary	
Cycle Length: 70	
Actuated Cycle Length: 57.5	
Natural Cycle: 70	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.78	
Intersection Signal Delay: 17.0	Intersection LOS: B
Intersection Capacity Utilization 58.6%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 2: I-110 Northbound Ramp /Stander USA Driveway & East Rosecrans Ave





Lane Group	EBT	EBR	WBT	NBL	NBT	SBT
Lane Group Flow (vph)	823	364	1349	348	329	14
v/c Ratio	0.50	0.29	0.78	0.63	0.57	0.06
Control Delay	16.3	0.9	20.6	22.7	16.2	0.4
Queue Delay	0.0	0.3	0.0	0.0	0.0	0.0
Total Delay	16.3	1.2	20.6	22.7	16.2	0.4
Queue Length 50th (ft)	80	0	148	105	68	0
Queue Length 95th (ft)	112	13	196	186	143	0
Internal Link Dist (ft)	68		3292		423	118
Turn Bay Length (ft)		100				
Base Capacity (vph)	1634	1275	1740	549	577	576
Starvation Cap Reductn	0	407	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.50	0.42	0.78	0.63	0.57	0.02

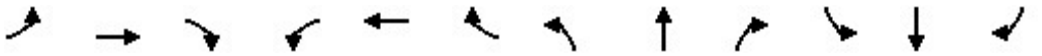
Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	806	357	0	1308	14	480	6	177	2	0	12
Future Volume (veh/h)	1	806	357	0	1308	14	480	6	177	2	0	12
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1863	1863	0	1863	1900	1863	1863	1900	1900	1863	1900
Adj Flow Rate, veh/h	1	822	364	0	1335	14	338	218	181	2	0	12
Adj No. of Lanes	0	3	1	0	3	0	1	1	0	0	1	0
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	2	2	2	0	2	2	2	2	2	2	2	2
Cap, veh/h	65	1624	1056	0	1705	18	600	319	265	21	0	124
Arrive On Green	0.33	0.33	0.33	0.00	0.33	0.33	0.34	0.34	0.34	0.09	0.00	0.09
Sat Flow, veh/h	1	4944	1583	0	5357	54	1774	942	782	230	0	1378
Grp Volume(v), veh/h	310	513	364	0	872	477	338	0	399	14	0	0
Grp Sat Flow(s),veh/h/ln	1859	1543	1583	0	1695	1853	1774	0	1725	1608	0	0
Q Serve(g_s), s	0.0	7.4	5.5	0.0	12.9	12.9	8.6	0.0	11.1	0.4	0.0	0.0
Cycle Q Clear(g_c), s	7.4	7.4	5.5	0.0	12.9	12.9	8.6	0.0	11.1	0.4	0.0	0.0
Prop In Lane	0.00		1.00	0.00		0.03	1.00		0.45	0.14		0.86
Lane Grp Cap(c), veh/h	676	1014	1056	0	1114	609	600	0	584	145	0	0
V/C Ratio(X)	0.46	0.51	0.34	0.00	0.78	0.78	0.56	0.00	0.68	0.10	0.00	0.00
Avail Cap(c_a), veh/h	724	1094	1097	0	1202	657	600	0	584	521	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	15.0	15.0	4.0	0.0	16.9	16.9	15.0	0.0	15.8	23.2	0.0	0.0
Incr Delay (d2), s/veh	0.5	0.4	0.2	0.0	3.2	5.7	3.8	0.0	6.4	0.3	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.9	3.2	4.9	0.0	6.6	7.6	4.9	0.0	6.2	0.2	0.0	0.0
LnGrp Delay(d),s/veh	15.5	15.4	4.2	0.0	20.1	22.6	18.8	0.0	22.2	23.5	0.0	0.0
LnGrp LOS	B	B	A		C	C	B		C	C		
Approach Vol, veh/h		1187			1349			737			14	
Approach Delay, s/veh		12.0			21.0			20.6			23.5	
Approach LOS		B			C			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		23.3		22.7		9.5		22.7
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5
Max Green Setting (Gmax), s		18.8		19.7		18.0		19.7
Max Q Clear Time (g_c+I1), s		13.1		9.4		2.4		14.9
Green Ext Time (p_c), s		1.9		4.8		0.0		3.3

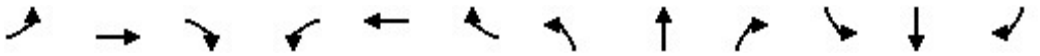
Intersection Summary	
HCM 2010 Ctrl Delay	17.7
HCM 2010 LOS	B

Notes



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	150		0	155		0	190		100	190		100
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.91	0.91	1.00	0.91	0.91	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor												
Frt		0.986			0.990				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	5014	0	1770	5034	0	1770	3539	1583	1770	3539	1583
Flt Permitted	0.203			0.411			0.517			0.573		
Satd. Flow (perm)	378	5014	0	766	5034	0	963	3539	1583	1067	3539	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		41			28				42			72
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		3372			2662			738			2100	
Travel Time (s)		76.6			60.5			16.8			47.7	

Intersection Summary	
Area Type:	Other



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	61	535	55	93	970	73	59	284	41	48	386	77
Future Volume (vph)	61	535	55	93	970	73	59	284	41	48	386	77
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	63	552	57	96	1000	75	61	293	42	49	398	79
Shared Lane Traffic (%)												
Lane Group Flow (vph)	63	609	0	96	1075	0	61	293	42	49	398	79

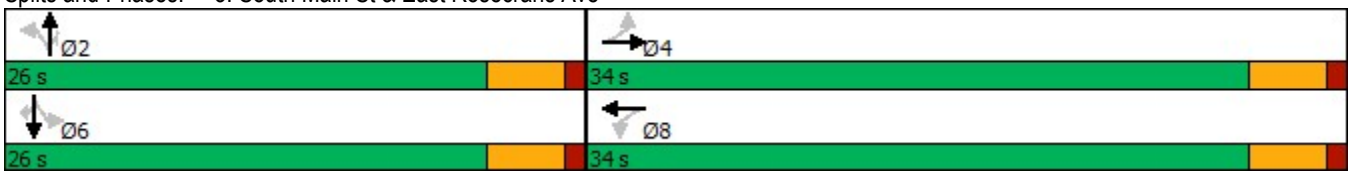
Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	61	535	93	970	59	284	41	48	386	77
Future Volume (vph)	61	535	93	970	59	284	41	48	386	77
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4		8		2			6	
Permitted Phases	4		8		2		2	6		6
Detector Phase	4	4	8	8	2	2	2	6	6	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	34.0	34.0	34.0	34.0	26.0	26.0	26.0	26.0	26.0	26.0
Total Split (%)	56.7%	56.7%	56.7%	56.7%	43.3%	43.3%	43.3%	43.3%	43.3%	43.3%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag										
Lead-Lag Optimize?										
Recall Mode	None	None	None	None	Max	Max	Max	Max	Max	Max
Act Effct Green (s)	20.8	20.8	20.8	20.8	21.8	21.8	21.8	21.8	21.8	21.8
Actuated g/C Ratio	0.40	0.40	0.40	0.40	0.42	0.42	0.42	0.42	0.42	0.42
v/c Ratio	0.41	0.30	0.31	0.53	0.15	0.20	0.06	0.11	0.27	0.11
Control Delay	19.8	9.7	12.9	12.0	12.8	11.3	5.0	12.2	11.7	4.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	19.8	9.7	12.9	12.0	12.8	11.3	5.0	12.2	11.7	4.8
LOS	B	A	B	B	B	B	A	B	B	A
Approach Delay		10.6		12.0		10.9			10.7	
Approach LOS		B		B		B			B	

Intersection Summary

Cycle Length: 60
Actuated Cycle Length: 51.7
Natural Cycle: 45
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.53
Intersection Signal Delay: 11.3 — Intersection LOS: B
Intersection Capacity Utilization 54.4% — ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 3: South Main St & East Rosecrans Ave





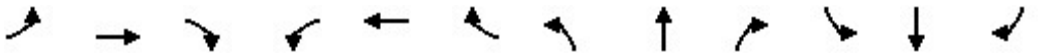
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	63	609	96	1075	61	293	42	49	398	79
v/c Ratio	0.41	0.30	0.31	0.53	0.15	0.20	0.06	0.11	0.27	0.11
Control Delay	19.8	9.7	12.9	12.0	12.8	11.3	5.0	12.2	11.7	4.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	19.8	9.7	12.9	12.0	12.8	11.3	5.0	12.2	11.7	4.8
Queue Length 50th (ft)	13	39	19	82	11	28	0	9	40	1
Queue Length 95th (ft)	41	58	46	111	39	62	17	32	83	24
Internal Link Dist (ft)		3292		2582		658			2020	
Turn Bay Length (ft)	150		155		190		100	190		100
Base Capacity (vph)	218	2912	442	2918	405	1489	690	448	1489	707
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.29	0.21	0.22	0.37	0.15	0.20	0.06	0.11	0.27	0.11

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	61	535	55	93	970	73	59	284	41	48	386	77
Future Volume (veh/h)	61	535	55	93	970	73	59	284	41	48	386	77
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	63	552	57	96	1000	75	61	293	42	49	398	79
Adj No. of Lanes	1	3	0	1	3	0	1	2	1	1	2	1
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	263	1816	185	391	1869	140	474	1529	684	541	1529	684
Arrive On Green	0.39	0.39	0.39	0.39	0.39	0.39	0.43	0.43	0.43	0.43	0.43	0.43
Sat Flow, veh/h	523	4690	479	809	4828	361	914	3539	1583	1041	3539	1583
Grp Volume(v), veh/h	63	397	212	96	702	373	61	293	42	49	398	79
Grp Sat Flow(s),veh/h/ln	523	1695	1778	809	1695	1799	914	1770	1583	1041	1770	1583
Q Serve(g_s), s	5.3	4.0	4.1	4.7	8.0	8.0	2.3	2.6	0.8	1.5	3.6	1.5
Cycle Q Clear(g_c), s	13.3	4.0	4.1	8.8	8.0	8.0	5.9	2.6	0.8	4.1	3.6	1.5
Prop In Lane	1.00		0.27	1.00		0.20	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	263	1313	689	391	1313	697	474	1529	684	541	1529	684
V/C Ratio(X)	0.24	0.30	0.31	0.25	0.53	0.54	0.13	0.19	0.06	0.09	0.26	0.12
Avail Cap(c_a), veh/h	371	2009	1054	557	2009	1066	474	1529	684	541	1529	684
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	16.9	10.6	10.6	13.7	11.8	11.8	10.9	8.8	8.2	10.0	9.0	8.5
Incr Delay (d2), s/veh	0.5	0.1	0.3	0.3	0.3	0.6	0.6	0.3	0.2	0.3	0.4	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	1.9	2.0	1.1	3.8	4.1	0.6	1.3	0.4	0.5	1.8	0.7
LnGrp Delay(d),s/veh	17.4	10.7	10.9	14.0	12.1	12.4	11.5	9.0	8.4	10.3	9.5	8.8
LnGrp LOS	B	B	B	B	B	B	B	A	A	B	A	A
Approach Vol, veh/h		672			1171			396			526	
Approach Delay, s/veh		11.4			12.4			9.3			9.4	
Approach LOS		B			B			A			A	

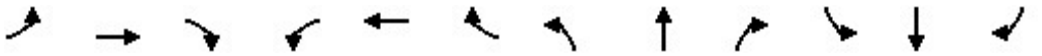
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		26.0		23.8		26.0		23.8
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5
Max Green Setting (Gmax), s		21.5		29.5		21.5		29.5
Max Q Clear Time (g_c+I1), s		7.9		15.3		6.1		10.8
Green Ext Time (p_c), s		1.9		4.0		2.7		7.8

Intersection Summary	
HCM 2010 Ctrl Delay	11.1
HCM 2010 LOS	B



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	105		105	80		100	100		0	100		100
Storage Lanes	1		1	1		1	1		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	0.95	1.00	0.95	1.00
Ped Bike Factor												
Frt			0.850			0.850		0.992				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1863	1583	1770	3539	1583	1770	3511	0	1770	3539	1583
Flt Permitted	0.536			0.649			0.392			0.414		
Satd. Flow (perm)	998	1863	1583	1209	3539	1583	730	3511	0	771	3539	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			89			76		14				121
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		774			575			2576			504	
Travel Time (s)		17.6			13.1			58.5			11.5	

Intersection Summary	
Area Type:	Other



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	87	156	81	48	322	69	105	539	30	42	608	110
Future Volume (vph)	87	156	81	48	322	69	105	539	30	42	608	110
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	96	171	89	53	354	76	115	592	33	46	668	121
Shared Lane Traffic (%)												
Lane Group Flow (vph)	96	171	89	53	354	76	115	625	0	46	668	121

Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	87	156	81	48	322	69	105	539	42	608	110
Future Volume (vph)	87	156	81	48	322	69	105	539	42	608	110
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm	NA	Perm
Protected Phases		4			8			2		6	
Permitted Phases	4		4	8		8	2		6		6
Detector Phase	4	4	4	8	8	8	2	2	6	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	25.0	25.0	25.0	25.0	25.0	25.0	35.0	35.0	35.0	35.0	35.0
Total Split (%)	41.7%	41.7%	41.7%	41.7%	41.7%	41.7%	58.3%	58.3%	58.3%	58.3%	58.3%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag											
Lead-Lag Optimize?											
Recall Mode	None	None	None	None	None	None	Max	Max	Max	Max	Max
Act Effct Green (s)	11.4	11.4	11.4	11.4	11.4	11.4	30.6	30.6	30.6	30.6	30.6
Actuated g/C Ratio	0.22	0.22	0.22	0.22	0.22	0.22	0.60	0.60	0.60	0.60	0.60
v/c Ratio	0.43	0.41	0.21	0.20	0.45	0.18	0.26	0.30	0.10	0.32	0.12
Control Delay	23.0	19.7	5.6	17.3	18.7	5.8	8.0	5.9	6.2	6.1	1.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.0	19.7	5.6	17.3	18.7	5.8	8.0	5.9	6.2	6.1	1.9
LOS	C	B	A	B	B	A	A	A	A	A	A
Approach Delay		17.1			16.5			6.2		5.5	
Approach LOS		B			B			A		A	

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 51.1	
Natural Cycle: 45	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.45	
Intersection Signal Delay: 9.6	Intersection LOS: A
Intersection Capacity Utilization 51.3%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 4: South Avalon Blvd & East 135th St





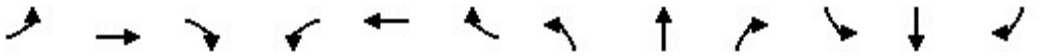
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	96	171	89	53	354	76	115	625	46	668	121
v/c Ratio	0.43	0.41	0.21	0.20	0.45	0.18	0.26	0.30	0.10	0.32	0.12
Control Delay	23.0	19.7	5.6	17.3	18.7	5.8	8.0	5.9	6.2	6.1	1.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.0	19.7	5.6	17.3	18.7	5.8	8.0	5.9	6.2	6.1	1.9
Queue Length 50th (ft)	25	44	0	13	47	0	13	37	5	42	0
Queue Length 95th (ft)	59	86	25	35	77	24	48	83	21	91	18
Internal Link Dist (ft)		694			495			2496		424	
Turn Bay Length (ft)	105		105	80		100	100		100		100
Base Capacity (vph)	401	750	690	487	1425	682	437	2109	461	2120	997
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.24	0.23	0.13	0.11	0.25	0.11	0.26	0.30	0.10	0.32	0.12

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	87	156	81	48	322	69	105	539	30	42	608	110
Future Volume (veh/h)	87	156	81	48	322	69	105	539	30	42	608	110
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	96	171	89	53	354	76	115	592	33	46	668	121
Adj No. of Lanes	1	1	1	1	2	1	1	2	0	1	2	1
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	287	447	380	320	849	380	474	2001	111	537	2077	929
Arrive On Green	0.24	0.24	0.24	0.24	0.24	0.24	0.59	0.59	0.59	0.59	0.59	0.59
Sat Flow, veh/h	954	1863	1583	1115	3539	1583	684	3409	190	797	3539	1583
Grp Volume(v), veh/h	96	171	89	53	354	76	115	307	318	46	668	121
Grp Sat Flow(s),veh/h/ln	954	1863	1583	1115	1770	1583	684	1770	1829	797	1770	1583
Q Serve(g_s), s	4.9	4.0	2.4	2.2	4.4	2.0	5.4	4.5	4.5	1.6	5.0	1.8
Cycle Q Clear(g_c), s	9.3	4.0	2.4	6.2	4.4	2.0	10.3	4.5	4.5	6.1	5.0	1.8
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.10	1.00		1.00
Lane Grp Cap(c), veh/h	287	447	380	320	849	380	474	1038	1073	537	2077	929
V/C Ratio(X)	0.33	0.38	0.23	0.17	0.42	0.20	0.24	0.30	0.30	0.09	0.32	0.13
Avail Cap(c_a), veh/h	434	735	625	493	1396	625	474	1038	1073	537	2077	929
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	20.6	16.5	15.9	19.1	16.7	15.8	8.1	5.4	5.4	6.9	5.5	4.8
Incr Delay (d2), s/veh	0.7	0.5	0.3	0.2	0.3	0.3	1.2	0.7	0.7	0.3	0.4	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.3	2.1	1.0	0.7	2.2	0.9	1.1	2.3	2.4	0.4	2.5	0.8
LnGrp Delay(d),s/veh	21.3	17.1	16.2	19.3	17.0	16.0	9.3	6.1	6.1	7.2	5.9	5.1
LnGrp LOS	C	B	B	B	B	B	A	A	A	A	A	A
Approach Vol, veh/h		356			483			740			835	
Approach Delay, s/veh		18.0			17.1			6.6			5.8	
Approach LOS		B			B			A			A	

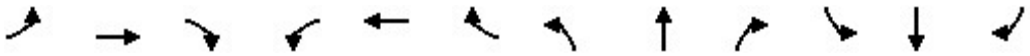
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		35.0		17.0		35.0		17.0
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5
Max Green Setting (Gmax), s		30.5		20.5		30.5		20.5
Max Q Clear Time (g_c+I1), s		12.3		11.3		8.1		8.2
Green Ext Time (p_c), s		4.6		1.2		5.5		2.2

Intersection Summary	
HCM 2010 Ctrl Delay	10.1
HCM 2010 LOS	B



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	220		0	200		0	110		110	120		100
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.91	0.91	1.00	0.91	0.91	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor												
Frt		0.976			0.984				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	4963	0	1770	5004	0	1770	3539	1583	1770	3539	1583
Flt Permitted	0.221			0.359			0.284			0.315		
Satd. Flow (perm)	412	4963	0	669	5004	0	529	3539	1583	587	3539	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		59			31				176			176
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		2662			498			439			2576	
Travel Time (s)		60.5			11.3			10.0			58.5	

Intersection Summary	
Area Type:	Other



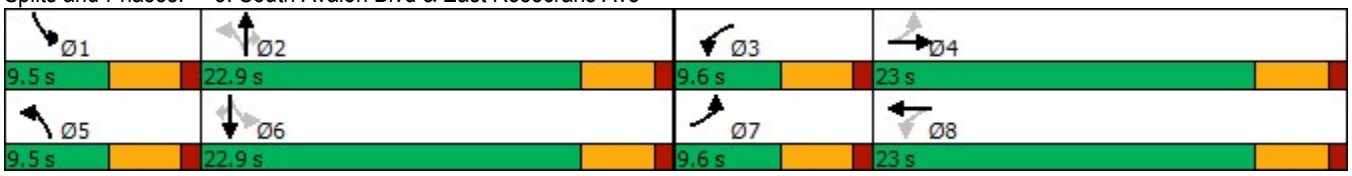
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	53	433	82	148	1037	121	109	524	82	123	561	92
Future Volume (vph)	53	433	82	148	1037	121	109	524	82	123	561	92
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	61	498	94	170	1192	139	125	602	94	141	645	106
Shared Lane Traffic (%)												
Lane Group Flow (vph)	61	592	0	170	1331	0	125	602	94	141	645	106

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	53	433	148	1037	109	524	82	123	561	92
Future Volume (vph)	53	433	148	1037	109	524	82	123	561	92
Turn Type	pm+pt	NA	pm+pt	NA	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4	3	8	5	2		1	6	
Permitted Phases	4		8		2		2	6		6
Detector Phase	7	4	3	8	5	2	2	1	6	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	9.5	22.5	9.5	22.5	22.5	9.5	22.5	22.5
Total Split (s)	9.6	23.0	9.6	23.0	9.5	22.9	22.9	9.5	22.9	22.9
Total Split (%)	14.8%	35.4%	14.8%	35.4%	14.6%	35.2%	35.2%	14.6%	35.2%	35.2%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	Max	Max	None	Max	Max
Act Effct Green (s)	21.1	17.2	22.0	19.2	22.5	18.8	18.8	22.5	18.8	18.8
Actuated g/C Ratio	0.35	0.29	0.37	0.32	0.38	0.32	0.32	0.38	0.32	0.32
v/c Ratio	0.23	0.40	0.50	0.82	0.41	0.54	0.15	0.44	0.58	0.17
Control Delay	13.5	17.3	18.1	25.4	15.8	20.7	0.9	16.3	21.2	1.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	13.5	17.3	18.1	25.4	15.8	20.7	0.9	16.3	21.2	1.5
LOS	B	B	B	C	B	C	A	B	C	A
Approach Delay		17.0		24.6		17.7			18.1	
Approach LOS		B		C		B			B	

Intersection Summary	
Cycle Length: 65	
Actuated Cycle Length: 59.6	
Natural Cycle: 65	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.82	
Intersection Signal Delay: 20.3	Intersection LOS: C
Intersection Capacity Utilization 63.4%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 5: South Avalon Blvd & East Rosecrans Ave

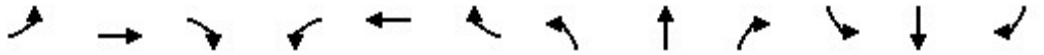




Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	61	592	170	1331	125	602	94	141	645	106
v/c Ratio	0.23	0.40	0.50	0.82	0.41	0.54	0.15	0.44	0.58	0.17
Control Delay	13.5	17.3	18.1	25.4	15.8	20.7	0.9	16.3	21.2	1.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	13.5	17.3	18.1	25.4	15.8	20.7	0.9	16.3	21.2	1.5
Queue Length 50th (ft)	14	61	40	181	29	107	0	33	116	0
Queue Length 95th (ft)	32	86	74	#253	57	149	3	63	161	7
Internal Link Dist (ft)		2582		418		359			2496	
Turn Bay Length (ft)	220		200		110		110	120		100
Base Capacity (vph)	264	1610	343	1646	305	1113	618	323	1113	618
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.23	0.37	0.50	0.81	0.41	0.54	0.15	0.44	0.58	0.17

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	53	433	82	148	1037	121	109	524	82	123	561	92
Future Volume (veh/h)	53	433	82	148	1037	121	109	524	82	123	561	92
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	61	498	94	170	1192	139	125	602	94	141	645	106
Adj No. of Lanes	1	3	0	1	3	0	1	2	1	1	2	1
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	225	1129	209	392	1342	156	343	1035	463	364	1062	475
Arrive On Green	0.05	0.26	0.26	0.08	0.29	0.29	0.07	0.29	0.29	0.08	0.30	0.30
Sat Flow, veh/h	1774	4315	797	1774	4619	539	1774	3539	1583	1774	3539	1583
Grp Volume(v), veh/h	61	389	203	170	875	456	125	602	94	141	645	106
Grp Sat Flow(s),veh/h/ln	1774	1695	1722	1774	1695	1768	1774	1770	1583	1774	1770	1583
Q Serve(g_s), s	1.5	6.0	6.2	4.4	15.5	15.5	3.0	9.1	2.8	3.4	9.8	3.2
Cycle Q Clear(g_c), s	1.5	6.0	6.2	4.4	15.5	15.5	3.0	9.1	2.8	3.4	9.8	3.2
Prop In Lane	1.00		0.46	1.00		0.30	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	225	887	450	392	985	514	343	1035	463	364	1062	475
V/C Ratio(X)	0.27	0.44	0.45	0.43	0.89	0.89	0.36	0.58	0.20	0.39	0.61	0.22
Avail Cap(c_a), veh/h	276	997	506	392	997	520	358	1035	463	365	1062	475
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	17.1	19.4	19.4	15.4	21.3	21.3	14.5	19.0	16.7	14.3	18.8	16.5
Incr Delay (d2), s/veh	0.6	0.3	0.7	0.8	9.8	16.9	0.7	2.4	1.0	0.7	2.6	1.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	2.9	3.0	2.2	8.5	9.9	1.5	4.8	1.4	1.7	5.1	1.5
LnGrp Delay(d),s/veh	17.7	19.7	20.2	16.2	31.1	38.2	15.2	21.4	17.7	15.0	21.4	17.6
LnGrp LOS	B	B	C	B	C	D	B	C	B	B	C	B
Approach Vol, veh/h		653			1501			821			892	
Approach Delay, s/veh		19.7			31.6			20.0			19.9	
Approach LOS		B			C			C			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.5	22.9	9.6	21.0	9.0	23.4	7.8	22.8
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	5.0	18.4	5.1	18.5	5.0	18.4	5.1	18.5
Max Q Clear Time (g_c+I1), s	5.4	11.1	6.4	8.2	5.0	11.8	3.5	17.5
Green Ext Time (p_c), s	0.0	2.5	0.0	2.8	0.0	2.6	0.0	0.7

Intersection Summary	
HCM 2010 Ctrl Delay	24.4
HCM 2010 LOS	C



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%		0%			0%
Storage Length (ft)	0	0		100	100	
Storage Lanes	0	1		1	1	
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	1.00	0.95	1.00	1.00	0.95
Ped Bike Factor						
Frt		0.865				
Flt Protected					0.950	
Satd. Flow (prot)	0	1611	3539	1863	1770	3539
Flt Permitted					0.950	
Satd. Flow (perm)	0	1611	3539	1863	1770	3539
Link Speed (mph)	30		30			30
Link Distance (ft)	196		2086			439
Travel Time (s)	4.5		47.4			10.0

Intersection Summary	
Area Type:	Other



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Volume (vph)	0	2	751	0	6	785
Future Volume (vph)	0	2	751	0	6	785
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%		0%			0%
Adj. Flow (vph)	0	2	816	0	7	853
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	2	816	0	7	853

Intersection Summary

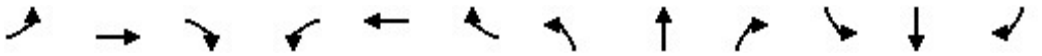
Intersection	
Int Delay, s/veh	0.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	2	751	0	6	785
Future Vol, veh/h	0	2	751	0	6	785
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	100	100	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	2	816	0	7	853

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	-	408	0	0	816	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.94	-	-	4.14	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.32	-	-	2.22	-
Pot Cap-1 Maneuver	0	593	-	-	807	-
Stage 1	0	-	-	-	-	-
Stage 2	0	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	-	593	-	-	807	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

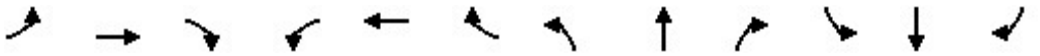
Approach	WB	NB	SB
HCM Control Delay, s	11.1	0	0.1
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	593	807	-
HCM Lane V/C Ratio	-	-	0.004	0.008	-
HCM Control Delay (s)	-	-	11.1	9.5	-
HCM Lane LOS	-	-	B	A	-
HCM 95th %tile Q(veh)	-	-	0	0	-



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	155		0	150		0	110		100	115		100
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor												
Frt		0.976			0.963				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3454	0	1770	3408	0	1770	3539	1583	1770	3539	1583
Flt Permitted	0.335			0.652			0.337			0.377		
Satd. Flow (perm)	624	3454	0	1215	3408	0	628	3539	1583	702	3539	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		25			86				61			27
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		972			474			575			2086	
Travel Time (s)		22.1			10.8			13.1			47.4	

Intersection Summary	
Area Type:	Other



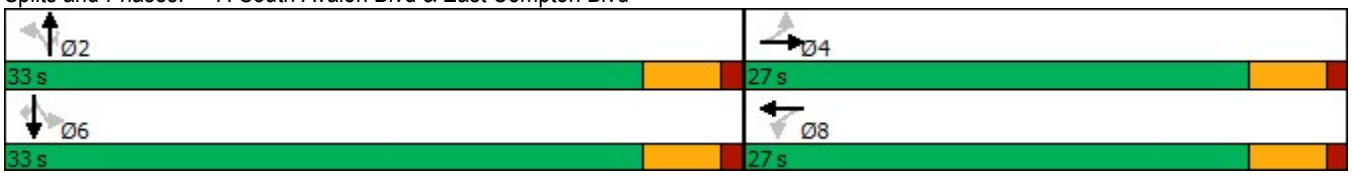
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	27	116	22	65	385	128	46	596	54	65	667	24
Future Volume (vph)	27	116	22	65	385	128	46	596	54	65	667	24
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	31	132	25	74	438	145	52	677	61	74	758	27
Shared Lane Traffic (%)												
Lane Group Flow (vph)	31	157	0	74	583	0	52	677	61	74	758	27

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	27	116	65	385	46	596	54	65	667	24
Future Volume (vph)	27	116	65	385	46	596	54	65	667	24
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4		8		2			6	
Permitted Phases	4		8		2		2	6		6
Detector Phase	4	4	8	8	2	2	2	6	6	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	27.0	27.0	27.0	27.0	33.0	33.0	33.0	33.0	33.0	33.0
Total Split (%)	45.0%	45.0%	45.0%	45.0%	55.0%	55.0%	55.0%	55.0%	55.0%	55.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag										
Lead-Lag Optimize?										
Recall Mode	None	None	None	None	Max	Max	Max	Max	Max	Max
Act Effct Green (s)	14.4	14.4	14.4	14.4	28.7	28.7	28.7	28.7	28.7	28.7
Actuated g/C Ratio	0.28	0.28	0.28	0.28	0.55	0.55	0.55	0.55	0.55	0.55
v/c Ratio	0.18	0.16	0.22	0.58	0.15	0.35	0.07	0.19	0.39	0.03
Control Delay	16.3	11.9	15.6	15.9	8.7	7.9	2.8	9.0	8.3	3.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	16.3	11.9	15.6	15.9	8.7	7.9	2.8	9.0	8.3	3.5
LOS	B	B	B	B	A	A	A	A	A	A
Approach Delay		12.6		15.8		7.6			8.2	
Approach LOS		B		B		A			A	

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 52.2	
Natural Cycle: 45	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.58	
Intersection Signal Delay: 10.3	Intersection LOS: B
Intersection Capacity Utilization 56.5%	ICU Level of Service B
Analysis Period (min) 15	

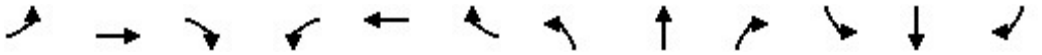
Splits and Phases: 7: South Avalon Blvd & East Compton Blvd





Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	31	157	74	583	52	677	61	74	758	27
v/c Ratio	0.18	0.16	0.22	0.58	0.15	0.35	0.07	0.19	0.39	0.03
Control Delay	16.3	11.9	15.6	15.9	8.7	7.9	2.8	9.0	8.3	3.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	16.3	11.9	15.6	15.9	8.7	7.9	2.8	9.0	8.3	3.5
Queue Length 50th (ft)	7	15	17	66	7	53	0	10	62	0
Queue Length 95th (ft)	23	32	41	102	27	104	14	35	118	10
Internal Link Dist (ft)		892		394		495			2006	
Turn Bay Length (ft)	155		150		110		100	115		100
Base Capacity (vph)	271	1513	527	1528	345	1946	897	386	1946	882
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.11	0.10	0.14	0.38	0.15	0.35	0.07	0.19	0.39	0.03

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	27	116	22	65	385	128	46	596	54	65	667	24
Future Volume (veh/h)	27	116	22	65	385	128	46	596	54	65	667	24
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	31	132	25	74	438	145	52	677	61	74	758	27
Adj No. of Lanes	1	2	0	1	2	0	1	2	1	1	2	1
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	229	760	141	412	668	219	451	2005	897	476	2005	897
Arrive On Green	0.25	0.25	0.25	0.25	0.25	0.25	0.57	0.57	0.57	0.57	0.57	0.57
Sat Flow, veh/h	828	2982	553	1225	2621	860	686	3539	1583	717	3539	1583
Grp Volume(v), veh/h	31	77	80	74	294	289	52	677	61	74	758	27
Grp Sat Flow(s),veh/h/ln	828	1770	1765	1225	1770	1711	686	1770	1583	717	1770	1583
Q Serve(g_s), s	1.8	1.7	1.8	2.5	7.5	7.6	2.3	5.2	0.9	3.1	5.9	0.4
Cycle Q Clear(g_c), s	9.4	1.7	1.8	4.3	7.5	7.6	8.2	5.2	0.9	8.3	5.9	0.4
Prop In Lane	1.00		0.31	1.00		0.50	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	229	451	450	412	451	436	451	2005	897	476	2005	897
V/C Ratio(X)	0.14	0.17	0.18	0.18	0.65	0.66	0.12	0.34	0.07	0.16	0.38	0.03
Avail Cap(c_a), veh/h	388	791	789	647	791	765	451	2005	897	476	2005	897
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	21.0	14.6	14.6	16.3	16.8	16.8	8.3	5.8	4.9	8.1	6.0	4.8
Incr Delay (d2), s/veh	0.3	0.2	0.2	0.2	1.6	1.7	0.5	0.5	0.1	0.7	0.5	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.9	0.9	0.9	3.8	3.7	0.5	2.6	0.4	0.7	3.0	0.2
LnGrp Delay(d),s/veh	21.3	14.8	14.8	16.5	18.4	18.5	8.8	6.3	5.1	8.8	6.6	4.9
LnGrp LOS	C	B	B	B	B	B	A	A	A	A	A	A
Approach Vol, veh/h		188			657			790			859	
Approach Delay, s/veh		15.9			18.2			6.4			6.7	
Approach LOS		B			B			A			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		33.0		17.3		33.0		17.3
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5
Max Green Setting (Gmax), s		28.5		22.5		28.5		22.5
Max Q Clear Time (g_c+I1), s		10.2		11.4		10.3		9.6
Green Ext Time (p_c), s		5.1		0.7		5.8		3.2

Intersection Summary	
HCM 2010 Ctrl Delay	10.3
HCM 2010 LOS	B



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)		0	100		0	0
Storage Lanes		0	1		1	0
Taper Length (ft)			25		25	
Lane Util. Factor	0.91	0.91	1.00	0.91	1.00	1.00
Ped Bike Factor						
Frt	0.999					
Flt Protected					0.950	
Satd. Flow (prot)	5080	0	1863	5085	1770	0
Flt Permitted					0.950	
Satd. Flow (perm)	5080	0	1863	5085	1770	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	498			189	111	
Travel Time (s)	11.3			4.3	2.5	

Intersection Summary	
Area Type:	Other



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Traffic Volume (vph)	635	4	0	1303	4	0
Future Volume (vph)	635	4	0	1303	4	0
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Adj. Flow (vph)	690	4	0	1416	4	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	694	0	0	1416	4	0

Intersection Summary

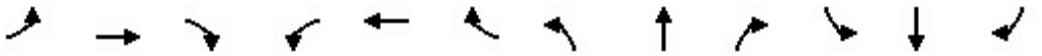
Intersection	
Int Delay, s/veh	0

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	635	4	0	1303	4	0
Future Vol, veh/h	635	4	0	1303	4	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	100	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	690	4	0	1416	4	0

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	694	0	1258	347
Stage 1	-	-	-	-	692	-
Stage 2	-	-	-	-	566	-
Critical Hdwy	-	-	5.34	-	5.74	7.14
Critical Hdwy Stg 1	-	-	-	-	6.64	-
Critical Hdwy Stg 2	-	-	-	-	6.04	-
Follow-up Hdwy	-	-	3.12	-	3.82	3.92
Pot Cap-1 Maneuver	-	-	548	-	230	554
Stage 1	-	-	-	-	371	-
Stage 2	-	-	-	-	485	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	548	-	230	554
Mov Cap-2 Maneuver	-	-	-	-	293	-
Stage 1	-	-	-	-	371	-
Stage 2	-	-	-	-	485	-

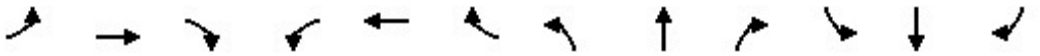
Approach	EB	WB	NB
HCM Control Delay, s	0	0	17.5
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	293	-	-	548	-
HCM Lane V/C Ratio	0.015	-	-	-	-
HCM Control Delay (s)	17.5	-	-	0	-
HCM Lane LOS	C	-	-	A	-
HCM 95th %tile Q(veh)	0	-	-	0	-



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	275		0	0		0	150		150
Storage Lanes	0		0	1		0	0		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.91	0.91	1.00	0.91	1.00	1.00	1.00	1.00	0.95	0.91	0.95
Ped Bike Factor												
Frt		0.964									0.948	0.850
Flt Protected				0.950						0.950	0.970	
Satd. Flow (prot)	0	4902	0	1770	5085	0	0	0	0	1681	1559	1504
Flt Permitted				0.950						0.950	0.970	
Satd. Flow (perm)	0	4902	0	1770	5085	0	0	0	0	1681	1559	1504
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		109									29	78
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		508			258			584			534	
Travel Time (s)		11.5			5.9			13.3			12.1	

Intersection Summary	
Area Type:	Other



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	0	1396	444	203	1020	0	0	0	0	582	12	450
Future Volume (vph)	0	1396	444	203	1020	0	0	0	0	582	12	450
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	0	1662	529	242	1214	0	0	0	0	693	14	536
Shared Lane Traffic (%)										38%		27%
Lane Group Flow (vph)	0	2191	0	242	1214	0	0	0	0	430	422	391

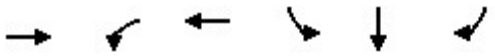
Intersection Summary

Lane Group	EBT	WBL	WBT	SBL	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	1396	203	1020	582	12	450
Future Volume (vph)	1396	203	1020	582	12	450
Turn Type	NA	Prot	NA	Split	NA	Perm
Protected Phases	4	3	8	6	6	
Permitted Phases						6
Detector Phase	4	3	8	6	6	6
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	9.5	22.5	22.5	22.5	22.5
Total Split (s)	42.0	17.6	59.6	30.4	30.4	30.4
Total Split (%)	46.7%	19.6%	66.2%	33.8%	33.8%	33.8%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lag	Lead				
Lead-Lag Optimize?	Yes	Yes				
Recall Mode	None	None	None	Max	Max	Max
Act Effct Green (s)	37.5	13.1	55.1	25.9	25.9	25.9
Actuated g/C Ratio	0.42	0.15	0.61	0.29	0.29	0.29
v/c Ratio	1.04	0.94	0.39	0.89	0.90	0.80
Control Delay	56.9	83.3	9.3	53.5	53.3	37.8
Queue Delay	0.0	0.0	2.0	0.0	0.0	0.0
Total Delay	56.9	83.3	11.3	53.5	53.3	37.8
LOS	E	F	B	D	D	D
Approach Delay	56.9		23.3		48.5	
Approach LOS	E		C		D	

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Natural Cycle: 90	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.04	
Intersection Signal Delay: 44.7	Intersection LOS: D
Intersection Capacity Utilization 103.4%	ICU Level of Service G
Analysis Period (min) 15	

Splits and Phases: 1: I-110-Southbound Ramps & East Rosecrans Ave



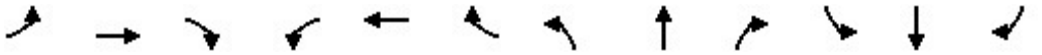


Lane Group	EBT	WBL	WBT	SBL	SBT	SBR
Lane Group Flow (vph)	2191	242	1214	430	422	391
v/c Ratio	1.04	0.94	0.39	0.89	0.90	0.80
Control Delay	56.9	83.3	9.3	53.5	53.3	37.8
Queue Delay	0.0	0.0	2.0	0.0	0.0	0.0
Total Delay	56.9	83.3	11.3	53.5	53.3	37.8
Queue Length 50th (ft)	~484	138	117	245	237	174
Queue Length 95th (ft)	#510	#251	131	#378	#381	#287
Internal Link Dist (ft)	428		178		454	
Turn Bay Length (ft)		275		150		150
Base Capacity (vph)	2106	257	3113	483	469	488
Starvation Cap Reductn	0	0	1687	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	1.04	0.94	0.85	0.89	0.90	0.80

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

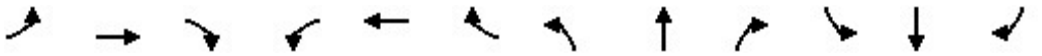


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	1396	444	203	1020	0	0	0	0	582	12	450
Future Volume (veh/h)	0	1396	444	203	1020	0	0	0	0	582	12	450
Number	7	4	14	3	8	18				1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1863	1900	1863	1863	0				1863	1863	1863
Adj Flow Rate, veh/h	0	1662	529	242	1214	0				865	0	362
Adj No. of Lanes	0	3	0	1	3	0				2	0	1
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84				0.84	0.84	0.84
Percent Heavy Veh, %	0	2	2	2	2	0				2	2	2
Cap, veh/h	0	1603	498	258	3113	0				1021	0	456
Arrive On Green	0.00	0.42	0.42	0.15	0.61	0.00				0.29	0.00	0.29
Sat Flow, veh/h	0	4016	1194	1774	5253	0				3548	0	1583
Grp Volume(v), veh/h	0	1459	732	242	1214	0				865	0	362
Grp Sat Flow(s),veh/h/ln	0	1695	1652	1774	1695	0				1774	0	1583
Q Serve(g_s), s	0.0	37.5	37.5	12.1	10.9	0.0				20.7	0.0	19.0
Cycle Q Clear(g_c), s	0.0	37.5	37.5	12.1	10.9	0.0				20.7	0.0	19.0
Prop In Lane	0.00		0.72	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	1413	688	258	3113	0				1021	0	456
V/C Ratio(X)	0.00	1.03	1.06	0.94	0.39	0.00				0.85	0.00	0.79
Avail Cap(c_a), veh/h	0	1413	688	258	3113	0				1021	0	456
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	26.3	26.3	38.0	8.9	0.0				30.2	0.0	29.6
Incr Delay (d2), s/veh	0.0	32.9	52.3	39.3	0.1	0.0				8.7	0.0	13.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	23.9	27.0	8.7	5.1	0.0				11.3	0.0	9.9
LnGrp Delay(d),s/veh	0.0	59.1	78.6	77.3	9.0	0.0				38.9	0.0	42.9
LnGrp LOS		F	F	E	A					D		D
Approach Vol, veh/h		2191			1456						1227	
Approach Delay, s/veh		65.6			20.3						40.1	
Approach LOS		E			C						D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs			3	4		6		8
Phs Duration (G+Y+Rc), s			17.6	42.0		30.4		59.6
Change Period (Y+Rc), s			4.5	4.5		4.5		4.5
Max Green Setting (Gmax), s			13.1	37.5		25.9		55.1
Max Q Clear Time (g_c+I1), s			14.1	39.5		22.7		12.9
Green Ext Time (p_c), s			0.0	0.0		1.7		11.7

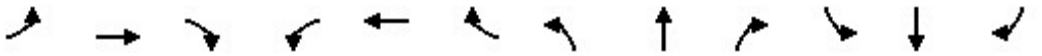
Intersection Summary	
HCM 2010 Ctrl Delay	45.7
HCM 2010 LOS	D

Notes



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		100	0		0	0		0	0		0
Storage Lanes	0		1	0		0	1		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.91	0.91	1.00	1.00	0.91	0.91	0.95	0.95	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt			0.850		0.998			0.879			0.873	
Flt Protected							0.950	0.991			0.997	
Satd. Flow (prot)	0	5085	1583	0	5075	0	1681	1541	0	0	1621	0
Flt Permitted		0.939					0.950	0.991			0.997	
Satd. Flow (perm)	0	4775	1583	0	5075	0	1681	1541	0	0	1621	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			399		3			199			87	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		148			3372			503			198	
Travel Time (s)		3.4			76.6			11.4			4.5	

Intersection Summary	
Area Type:	Other



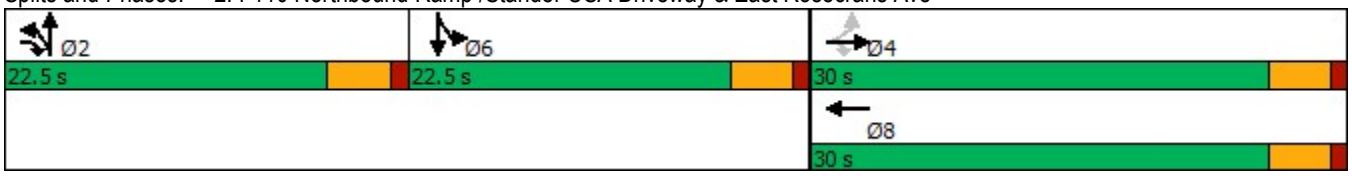
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	1	1460	375	0	1455	19	292	3	187	2	0	29
Future Volume (vph)	1	1460	375	0	1455	19	292	3	187	2	0	29
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	1	1553	399	0	1548	20	311	3	199	2	0	31
Shared Lane Traffic (%)							14%					
Lane Group Flow (vph)	0	1554	399	0	1568	0	267	246	0	0	33	0

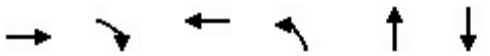
Intersection Summary

Lane Group	EBL	EBT	EBR	WBT	NBL	NBT	SBT
Lane Configurations							
Traffic Volume (vph)	1	1460	375	1455	292	3	0
Future Volume (vph)	1	1460	375	1455	292	3	0
Turn Type	Perm	NA	pm+ov	NA	Split	NA	NA
Protected Phases		4	2	8	2	2	6
Permitted Phases	4		4				
Detector Phase	4	4	2	8	2	2	6
Switch Phase							
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	30.0	30.0	22.5	30.0	22.5	22.5	22.5
Total Split (%)	40.0%	40.0%	30.0%	40.0%	30.0%	30.0%	30.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag							
Lead-Lag Optimize?							
Recall Mode	None	None	Max	None	Max	Max	Min
Act Effct Green (s)		25.5	48.0	25.5	18.0	18.0	5.5
Actuated g/C Ratio		0.41	0.77	0.41	0.29	0.29	0.09
v/c Ratio		0.80	0.31	0.76	0.55	0.42	0.15
Control Delay		20.1	0.9	18.7	24.0	7.4	1.7
Queue Delay		0.7	0.4	0.0	0.0	0.0	0.0
Total Delay		20.8	1.2	18.7	24.0	7.4	1.7
LOS		C	A	B	C	A	A
Approach Delay		16.8		18.7		16.0	1.7
Approach LOS		B		B		B	A

Intersection Summary	
Cycle Length: 75	
Actuated Cycle Length: 62.5	
Natural Cycle: 75	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.80	
Intersection Signal Delay: 17.3	Intersection LOS: B
Intersection Capacity Utilization 56.9%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 2: I-110 Northbound Ramp /Stander USA Driveway & East Rosecrans Ave





Lane Group	EBT	EBR	WBT	NBL	NBT	SBT
Lane Group Flow (vph)	1554	399	1568	267	246	33
v/c Ratio	0.80	0.31	0.76	0.55	0.42	0.15
Control Delay	20.1	0.9	18.7	24.0	7.4	1.7
Queue Delay	0.7	0.4	0.0	0.0	0.0	0.0
Total Delay	20.8	1.2	18.7	24.0	7.4	1.7
Queue Length 50th (ft)	182	0	179	89	13	0
Queue Length 95th (ft)	236	12	230	160	64	3
Internal Link Dist (ft)	68		3292		423	118
Turn Bay Length (ft)		100				
Base Capacity (vph)	1948	1308	2072	484	585	528
Starvation Cap Reductn	143	453	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.86	0.47	0.76	0.55	0.42	0.06

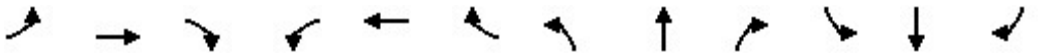
Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	1460	375	0	1455	19	292	3	187	2	0	29
Future Volume (veh/h)	1	1460	375	0	1455	19	292	3	187	2	0	29
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1863	1863	0	1863	1900	1863	1863	1900	1900	1863	1900
Adj Flow Rate, veh/h	1	1553	399	0	1548	20	256	79	199	2	0	31
Adj No. of Lanes	0	3	1	0	3	0	1	1	0	0	1	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	0	2	2	2	2	2	2	2	2
Cap, veh/h	60	1967	1100	0	2058	27	527	140	352	8	0	124
Arrive On Green	0.40	0.40	0.40	0.00	0.40	0.40	0.30	0.30	0.30	0.08	0.00	0.08
Sat Flow, veh/h	0	4945	1583	0	5342	67	1774	470	1184	97	0	1497
Grp Volume(v), veh/h	585	969	399	0	1014	554	256	0	278	33	0	0
Grp Sat Flow(s),veh/h/ln	1861	1543	1583	0	1695	1851	1774	0	1654	1594	0	0
Q Serve(g_s), s	0.0	16.7	6.2	0.0	15.6	15.6	7.2	0.0	8.6	1.2	0.0	0.0
Cycle Q Clear(g_c), s	16.7	16.7	6.2	0.0	15.6	15.6	7.2	0.0	8.6	1.2	0.0	0.0
Prop In Lane	0.00		1.00	0.00		0.04	1.00		0.72	0.06		0.94
Lane Grp Cap(c), veh/h	800	1227	1100	0	1348	736	527	0	491	131	0	0
V/C Ratio(X)	0.73	0.79	0.36	0.00	0.75	0.75	0.49	0.00	0.57	0.25	0.00	0.00
Avail Cap(c_a), veh/h	842	1298	1137	0	1427	779	527	0	491	473	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	16.0	16.0	3.8	0.0	15.7	15.7	17.5	0.0	18.0	26.0	0.0	0.0
Incr Delay (d2), s/veh	3.1	3.2	0.2	0.0	2.2	3.9	3.2	0.0	4.7	1.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	9.1	7.5	5.4	0.0	7.6	8.6	4.0	0.0	4.6	0.5	0.0	0.0
LnGrp Delay(d),s/veh	19.1	19.2	4.0	0.0	17.9	19.6	20.7	0.0	22.7	27.0	0.0	0.0
LnGrp LOS	B	B	A		B	B	C		C	C		
Approach Vol, veh/h		1953			1568			534			33	
Approach Delay, s/veh		16.1			18.5			21.7			27.0	
Approach LOS		B			B			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		22.5		28.6		9.5		28.6
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5
Max Green Setting (Gmax), s		18.0		25.5		18.0		25.5
Max Q Clear Time (g_c+I1), s		10.6		18.7		3.2		17.6
Green Ext Time (p_c), s		1.6		5.4		0.1		5.7

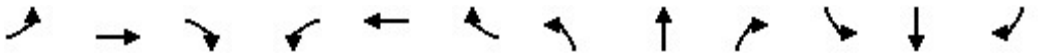
Intersection Summary	
HCM 2010 Ctrl Delay	17.8
HCM 2010 LOS	B

Notes



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	150		0	155		0	190		100	190		100
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.91	0.91	1.00	0.91	0.91	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor												
Frt		0.991			0.989				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	5040	0	1770	5029	0	1770	3539	1583	1770	3539	1583
Flt Permitted	0.339			0.137			0.554			0.381		
Satd. Flow (perm)	631	5040	0	255	5029	0	1032	3539	1583	710	3539	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		26			33				28			52
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		3372			2662			738			2100	
Travel Time (s)		76.6			60.5			16.8			47.7	

Intersection Summary	
Area Type:	Other



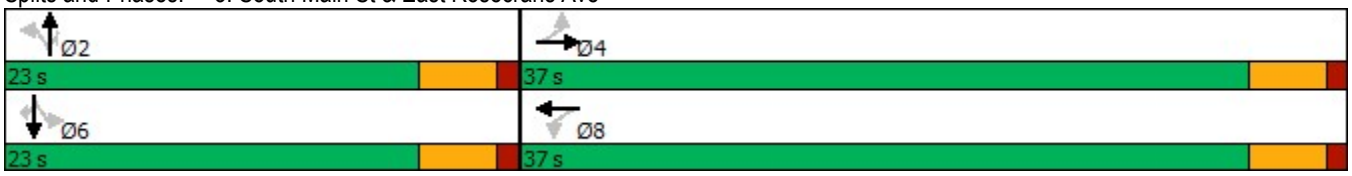
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	105	1374	88	67	673	54	118	514	105	69	307	49
Future Volume (vph)	105	1374	88	67	673	54	118	514	105	69	307	49
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	112	1462	94	71	716	57	126	547	112	73	327	52
Shared Lane Traffic (%)												
Lane Group Flow (vph)	112	1556	0	71	773	0	126	547	112	73	327	52

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	105	1374	67	673	118	514	105	69	307	49
Future Volume (vph)	105	1374	67	673	118	514	105	69	307	49
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4		8		2			6	
Permitted Phases	4		8		2		2	6		6
Detector Phase	4	4	8	8	2	2	2	6	6	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	37.0	37.0	37.0	37.0	23.0	23.0	23.0	23.0	23.0	23.0
Total Split (%)	61.7%	61.7%	61.7%	61.7%	38.3%	38.3%	38.3%	38.3%	38.3%	38.3%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag										
Lead-Lag Optimize?										
Recall Mode	None	None	None	None	Max	Max	Max	Max	Max	Max
Act Effct Green (s)	29.1	29.1	29.1	29.1	18.6	18.6	18.6	18.6	18.6	18.6
Actuated g/C Ratio	0.51	0.51	0.51	0.51	0.33	0.33	0.33	0.33	0.33	0.33
v/c Ratio	0.35	0.60	0.55	0.30	0.37	0.47	0.21	0.31	0.28	0.09
Control Delay	11.5	10.5	28.8	7.7	20.2	17.7	13.3	20.5	15.9	5.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	11.5	10.5	28.8	7.7	20.2	17.7	13.3	20.5	15.9	5.8
LOS	B	B	C	A	C	B	B	C	B	A
Approach Delay		10.6		9.5		17.4			15.5	
Approach LOS		B		A		B			B	

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 56.8	
Natural Cycle: 55	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.60	
Intersection Signal Delay: 12.4	Intersection LOS: B
Intersection Capacity Utilization 66.0%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 3: South Main St & East Rosecrans Ave





Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	112	1556	71	773	126	547	112	73	327	52
v/c Ratio	0.35	0.60	0.55	0.30	0.37	0.47	0.21	0.31	0.28	0.09
Control Delay	11.5	10.5	28.8	7.7	20.2	17.7	13.3	20.5	15.9	5.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	11.5	10.5	28.8	7.7	20.2	17.7	13.3	20.5	15.9	5.8
Queue Length 50th (ft)	20	120	15	47	35	83	22	20	46	0
Queue Length 95th (ft)	51	157	#71	66	78	125	55	53	75	20
Internal Link Dist (ft)		3292		2582		658			2020	
Turn Bay Length (ft)	150		155		190		100	190		100
Base Capacity (vph)	363	2913	147	2910	338	1160	537	232	1160	554
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.31	0.53	0.48	0.27	0.37	0.47	0.21	0.31	0.28	0.09

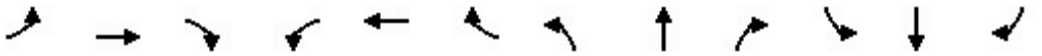
Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	105	1374	88	67	673	54	118	514	105	69	307	49
Future Volume (veh/h)	105	1374	88	67	673	54	118	514	105	69	307	49
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	112	1462	94	71	716	57	126	547	112	73	327	52
Adj No. of Lanes	1	3	0	1	3	0	1	2	1	1	2	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	421	2477	159	227	2437	193	393	1174	525	291	1174	525
Arrive On Green	0.51	0.51	0.51	0.51	0.51	0.51	0.33	0.33	0.33	0.33	0.33	0.33
Sat Flow, veh/h	694	4884	314	330	4805	380	1000	3539	1583	772	3539	1583
Grp Volume(v), veh/h	112	1015	541	71	504	269	126	547	112	73	327	52
Grp Sat Flow(s),veh/h/ln	694	1695	1807	330	1695	1796	1000	1770	1583	772	1770	1583
Q Serve(g_s), s	6.2	11.7	11.8	10.8	4.8	4.8	5.9	6.8	2.8	4.6	3.8	1.3
Cycle Q Clear(g_c), s	11.1	11.7	11.8	22.5	4.8	4.8	9.7	6.8	2.8	11.4	3.8	1.3
Prop In Lane	1.00		0.17	1.00		0.21	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	421	1719	917	227	1719	911	393	1174	525	291	1174	525
V/C Ratio(X)	0.27	0.59	0.59	0.31	0.29	0.30	0.32	0.47	0.21	0.25	0.28	0.10
Avail Cap(c_a), veh/h	473	1975	1053	252	1975	1046	393	1174	525	291	1174	525
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	11.2	9.7	9.7	17.6	8.0	8.0	17.3	14.7	13.4	19.3	13.7	12.9
Incr Delay (d2), s/veh	0.3	0.4	0.7	0.8	0.1	0.2	2.2	1.3	0.9	2.1	0.6	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	5.4	5.9	1.0	2.3	2.4	1.8	3.5	1.4	1.1	1.9	0.6
LnGrp Delay(d),s/veh	11.5	10.0	10.3	18.4	8.1	8.2	19.5	16.1	14.3	21.3	14.3	13.3
LnGrp LOS	B	B	B	B	A	A	B	B	B	C	B	B
Approach Vol, veh/h		1668			844			785			452	
Approach Delay, s/veh		10.2			9.0			16.4			15.3	
Approach LOS		B			A			B			B	

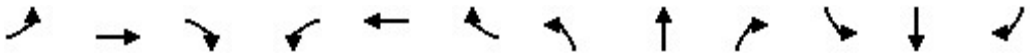
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		23.0		32.8		23.0		32.8
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5
Max Green Setting (Gmax), s		18.5		32.5		18.5		32.5
Max Q Clear Time (g_c+I1), s		11.7		13.8		13.4		24.5
Green Ext Time (p_c), s		2.6		11.5		1.2		3.8

Intersection Summary	
HCM 2010 Ctrl Delay	11.8
HCM 2010 LOS	B



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	105		105	80		100	100		0	100		100
Storage Lanes	1		1	1		1	1		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	0.95	1.00	0.95	1.00
Ped Bike Factor												
Frt			0.850			0.850		0.988				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1863	1583	1770	3539	1583	1770	3497	0	1770	3539	1583
Flt Permitted	0.652			0.211			0.395			0.225		
Satd. Flow (perm)	1215	1863	1583	393	3539	1583	736	3497	0	419	3539	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			134			74		18				76
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		774			575			2576			504	
Travel Time (s)		17.6			13.1			58.5			11.5	

Intersection Summary	
Area Type:	Other



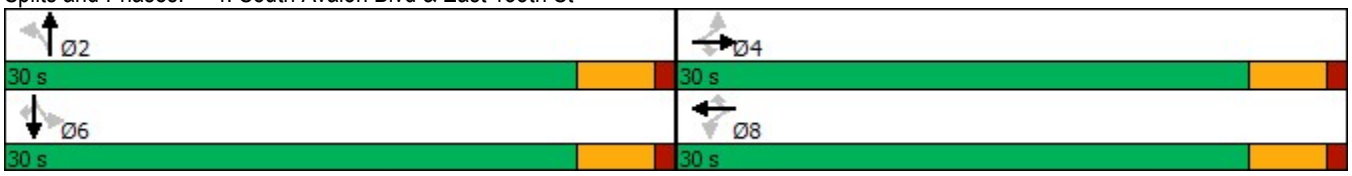
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	261	550	135	27	151	71	88	817	69	79	568	73
Future Volume (vph)	261	550	135	27	151	71	88	817	69	79	568	73
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	272	573	141	28	157	74	92	851	72	82	592	76
Shared Lane Traffic (%)												
Lane Group Flow (vph)	272	573	141	28	157	74	92	923	0	82	592	76

Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	261	550	135	27	151	71	88	817	79	568	73
Future Volume (vph)	261	550	135	27	151	71	88	817	79	568	73
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm	NA	Perm
Protected Phases		4			8			2		6	
Permitted Phases	4		4	8		8	2		6		6
Detector Phase	4	4	4	8	8	8	2	2	6	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0
Total Split (%)	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag											
Lead-Lag Optimize?											
Recall Mode	None	None	None	None	None	None	Max	Max	Max	Max	Max
Act Effct Green (s)	22.1	22.1	22.1	22.1	22.1	22.1	25.7	25.7	25.7	25.7	25.7
Actuated g/C Ratio	0.39	0.39	0.39	0.39	0.39	0.39	0.45	0.45	0.45	0.45	0.45
v/c Ratio	0.58	0.79	0.20	0.18	0.11	0.11	0.28	0.58	0.43	0.37	0.10
Control Delay	19.0	24.4	3.5	14.4	10.8	3.6	14.1	14.0	21.4	11.9	3.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	19.0	24.4	3.5	14.4	10.8	3.6	14.1	14.0	21.4	11.9	3.5
LOS	B	C	A	B	B	A	B	B	C	B	A
Approach Delay		19.9			9.2			14.0		12.1	
Approach LOS		B			A			B		B	

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 56.8	
Natural Cycle: 45	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.79	
Intersection Signal Delay: 15.0	Intersection LOS: B
Intersection Capacity Utilization 77.3%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 4: South Avalon Blvd & East 135th St





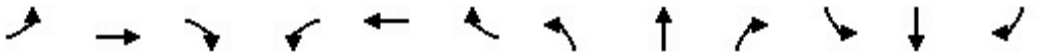
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	272	573	141	28	157	74	92	923	82	592	76
v/c Ratio	0.58	0.79	0.20	0.18	0.11	0.11	0.28	0.58	0.43	0.37	0.10
Control Delay	19.0	24.4	3.5	14.4	10.8	3.6	14.1	14.0	21.4	11.9	3.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	19.0	24.4	3.5	14.4	10.8	3.6	14.1	14.0	21.4	11.9	3.5
Queue Length 50th (ft)	69	164	1	6	17	0	21	127	20	74	0
Queue Length 95th (ft)	134	272	28	22	32	19	52	182	61	109	19
Internal Link Dist (ft)		694			495			2496		424	
Turn Bay Length (ft)	105		105	80		100	100		100		100
Base Capacity (vph)	549	841	788	177	1599	755	332	1589	189	1599	756
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.50	0.68	0.18	0.16	0.10	0.10	0.28	0.58	0.43	0.37	0.10

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	261	550	135	27	151	71	88	817	69	79	568	73
Future Volume (veh/h)	261	550	135	27	151	71	88	817	69	79	568	73
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	272	573	141	28	157	74	92	851	72	82	592	76
Adj No. of Lanes	1	1	1	1	2	1	1	2	0	1	2	1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	527	700	595	203	1330	595	401	1524	129	296	1633	730
Arrive On Green	0.38	0.38	0.38	0.38	0.38	0.38	0.46	0.46	0.46	0.46	0.46	0.46
Sat Flow, veh/h	1145	1863	1583	733	3539	1583	766	3304	279	603	3539	1583
Grp Volume(v), veh/h	272	573	141	28	157	74	92	456	467	82	592	76
Grp Sat Flow(s),veh/h/ln	1145	1863	1583	733	1770	1583	766	1770	1813	603	1770	1583
Q Serve(g_s), s	11.3	15.3	3.4	2.0	1.6	1.7	4.9	10.3	10.3	6.3	6.0	1.5
Cycle Q Clear(g_c), s	12.9	15.3	3.4	17.3	1.6	1.7	10.9	10.3	10.3	16.6	6.0	1.5
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.15	1.00		1.00
Lane Grp Cap(c), veh/h	527	700	595	203	1330	595	401	816	836	296	1633	730
V/C Ratio(X)	0.52	0.82	0.24	0.14	0.12	0.12	0.23	0.56	0.56	0.28	0.36	0.10
Avail Cap(c_a), veh/h	625	859	730	265	1633	730	401	816	836	296	1633	730
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	15.5	15.5	11.8	23.3	11.3	11.3	13.1	10.8	10.8	16.8	9.6	8.4
Incr Delay (d2), s/veh	0.8	5.2	0.2	0.3	0.0	0.1	1.3	2.8	2.7	2.3	0.6	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.7	8.8	1.5	0.4	0.8	0.8	1.2	5.6	5.7	1.2	3.0	0.7
LnGrp Delay(d),s/veh	16.2	20.7	12.0	23.7	11.3	11.4	14.5	13.6	13.5	19.2	10.3	8.7
LnGrp LOS	B	C	B	C	B	B	B	B	B	B	B	A
Approach Vol, veh/h		986			259			1015			750	
Approach Delay, s/veh		18.3			12.7			13.6			11.1	
Approach LOS		B			B			B			B	

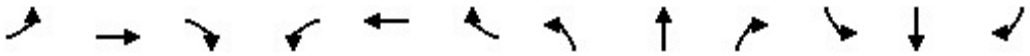
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		30.0		25.3		30.0		25.3
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5
Max Green Setting (Gmax), s		25.5		25.5		25.5		25.5
Max Q Clear Time (g_c+I1), s		12.9		17.3		18.6		19.3
Green Ext Time (p_c), s		5.4		3.5		2.8		0.7

Intersection Summary	
HCM 2010 Ctrl Delay	14.4
HCM 2010 LOS	B



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	220		0	200		0	110		110	120		100
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.91	0.91	1.00	0.91	0.91	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor												
Frt		0.989			0.971				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	5029	0	1770	4938	0	1770	3539	1583	1770	3539	1583
Flt Permitted	0.261			0.181			0.443			0.166		
Satd. Flow (perm)	486	5029	0	337	4938	0	825	3539	1583	309	3539	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		18			77				175			153
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		2662			498			439			2576	
Travel Time (s)		60.5			11.3			10.0			58.5	

Intersection Summary	
Area Type:	Other



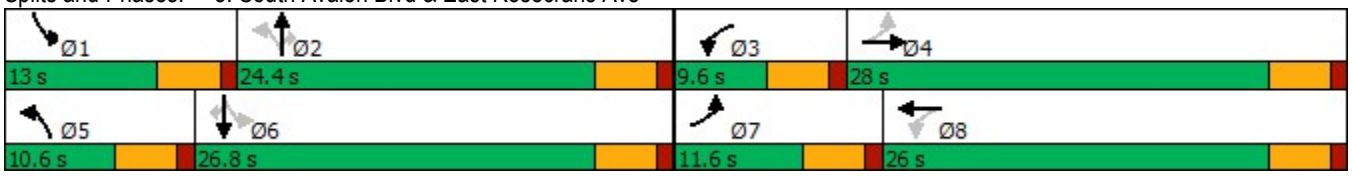
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	117	1293	105	111	574	139	104	699	182	201	495	72
Future Volume (vph)	117	1293	105	111	574	139	104	699	182	201	495	72
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	122	1347	109	116	598	145	108	728	190	209	516	75
Shared Lane Traffic (%)												
Lane Group Flow (vph)	122	1456	0	116	743	0	108	728	190	209	516	75

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	117	1293	111	574	104	699	182	201	495	72
Future Volume (vph)	117	1293	111	574	104	699	182	201	495	72
Turn Type	pm+pt	NA	pm+pt	NA	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4	3	8	5	2		1	6	
Permitted Phases	4		8		2		2	6		6
Detector Phase	7	4	3	8	5	2	2	1	6	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	9.5	22.5	9.5	22.5	22.5	9.5	22.5	22.5
Total Split (s)	11.6	28.0	9.6	26.0	10.6	24.4	24.4	13.0	26.8	26.8
Total Split (%)	15.5%	37.3%	12.8%	34.7%	14.1%	32.5%	32.5%	17.3%	35.7%	35.7%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	Max	Max	None	Max	Max
Act Effct Green (s)	29.1	23.6	26.0	22.0	26.0	20.0	20.0	31.2	24.6	24.6
Actuated g/C Ratio	0.40	0.32	0.36	0.30	0.36	0.27	0.27	0.43	0.34	0.34
v/c Ratio	0.39	0.89	0.53	0.48	0.29	0.75	0.34	0.70	0.43	0.12
Control Delay	16.5	32.1	22.6	20.3	15.2	30.6	6.7	28.7	21.8	0.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	16.5	32.1	22.6	20.3	15.2	30.6	6.7	28.7	21.8	0.4
LOS	B	C	C	C	B	C	A	C	C	A
Approach Delay		30.9		20.7		24.6			21.6	
Approach LOS		C		C		C			C	

Intersection Summary	
Cycle Length: 75	
Actuated Cycle Length: 72.9	
Natural Cycle: 75	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.89	
Intersection Signal Delay: 25.6	Intersection LOS: C
Intersection Capacity Utilization 78.9%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 5: South Avalon Blvd & East Rosecrans Ave

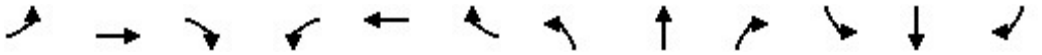




Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	122	1456	116	743	108	728	190	209	516	75
v/c Ratio	0.39	0.89	0.53	0.48	0.29	0.75	0.34	0.70	0.43	0.12
Control Delay	16.5	32.1	22.6	20.3	15.2	30.6	6.7	28.7	21.8	0.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	16.5	32.1	22.6	20.3	15.2	30.6	6.7	28.7	21.8	0.4
Queue Length 50th (ft)	33	234	31	93	29	164	5	59	103	0
Queue Length 95th (ft)	64	#327	61	128	57	226	51	#142	148	1
Internal Link Dist (ft)		2582		418		359			2496	
Turn Bay Length (ft)	220		200		110		110	120		100
Base Capacity (vph)	319	1640	220	1547	374	970	560	303	1192	634
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.38	0.89	0.53	0.48	0.29	0.75	0.34	0.69	0.43	0.12

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	117	1293	105	111	574	139	104	699	182	201	495	72
Future Volume (veh/h)	117	1293	105	111	574	139	104	699	182	201	495	72
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	122	1347	109	116	598	145	108	728	190	209	516	75
Adj No. of Lanes	1	3	0	1	3	0	1	2	1	1	2	1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	354	1505	122	228	1274	303	372	955	427	338	1114	498
Arrive On Green	0.07	0.31	0.31	0.06	0.31	0.31	0.06	0.27	0.27	0.11	0.31	0.31
Sat Flow, veh/h	1774	4796	388	1774	4104	977	1774	3539	1583	1774	3539	1583
Grp Volume(v), veh/h	122	952	504	116	492	251	108	728	190	209	516	75
Grp Sat Flow(s),veh/h/ln	1774	1695	1794	1774	1695	1690	1774	1770	1583	1774	1770	1583
Q Serve(g_s), s	3.4	19.8	19.8	3.2	8.6	8.9	3.2	13.9	7.3	6.0	8.6	2.5
Cycle Q Clear(g_c), s	3.4	19.8	19.8	3.2	8.6	8.9	3.2	13.9	7.3	6.0	8.6	2.5
Prop In Lane	1.00		0.22	1.00		0.58	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	354	1064	563	228	1053	525	372	955	427	338	1114	498
V/C Ratio(X)	0.35	0.89	0.89	0.51	0.47	0.48	0.29	0.76	0.44	0.62	0.46	0.15
Avail Cap(c_a), veh/h	404	1081	572	237	1053	525	407	955	427	351	1114	498
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	15.9	24.1	24.1	18.7	20.5	20.6	17.7	24.7	22.3	17.8	20.3	18.2
Incr Delay (d2), s/veh	0.6	9.7	16.4	1.7	0.3	0.7	0.4	5.7	3.3	3.1	1.4	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.7	10.6	12.2	1.7	4.1	4.2	1.6	7.5	3.6	3.2	4.4	1.2
LnGrp Delay(d),s/veh	16.5	33.8	40.5	20.5	20.8	21.2	18.1	30.5	25.6	20.9	21.6	18.8
LnGrp LOS	B	C	D	C	C	C	B	C	C	C	C	B
Approach Vol, veh/h		1578			859			1026			800	
Approach Delay, s/veh		34.6			20.9			28.3			21.2	
Approach LOS		C			C			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	12.4	24.4	9.2	27.6	9.1	27.7	9.5	27.4
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	8.5	19.9	5.1	23.5	6.1	22.3	7.1	21.5
Max Q Clear Time (g_c+I1), s	8.0	15.9	5.2	21.8	5.2	10.6	5.4	10.9
Green Ext Time (p_c), s	0.0	2.0	0.0	1.4	0.0	2.9	0.0	3.6

Intersection Summary	
HCM 2010 Ctrl Delay	27.8
HCM 2010 LOS	C



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%		0%			0%
Storage Length (ft)	0	0		100	100	
Storage Lanes	0	1		1	1	
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	1.00	0.95	1.00	1.00	0.95
Ped Bike Factor						
Frt						
Flt Protected					0.950	
Satd. Flow (prot)	0	1863	3539	1863	1770	3539
Flt Permitted					0.950	
Satd. Flow (perm)	0	1863	3539	1863	1770	3539
Link Speed (mph)	30		30			30
Link Distance (ft)	196		2086			439
Travel Time (s)	4.5		47.4			10.0

Intersection Summary	
Area Type:	Other



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Volume (vph)	0	0	977	0	1	710
Future Volume (vph)	0	0	977	0	1	710
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%		0%			0%
Adj. Flow (vph)	0	0	1062	0	1	772
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	1062	0	1	772

Intersection Summary

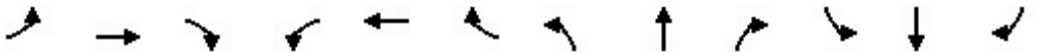
Intersection	
Int Delay, s/veh	0

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	0	977	0	1	710
Future Vol, veh/h	0	0	977	0	1	710
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	100	100	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	0	1062	0	1	772

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	-	531	0	0	1062	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.94	-	-	4.14	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.32	-	-	2.22	-
Pot Cap-1 Maneuver	0	493	-	-	652	-
Stage 1	0	-	-	-	-	-
Stage 2	0	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	-	493	-	-	652	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

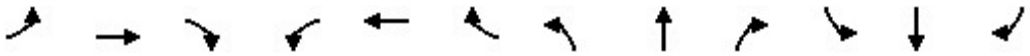
Approach	WB	NB	SB
HCM Control Delay, s	0	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	-	652	-
HCM Lane V/C Ratio	-	-	-	0.002	-
HCM Control Delay (s)	-	-	0	10.5	-
HCM Lane LOS	-	-	A	B	-
HCM 95th %tile Q(veh)	-	-	-	0	-



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	155		0	150		0	110		100	115		100
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor												
Frt		0.980			0.958				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3468	0	1770	3391	0	1770	3539	1583	1770	3539	1583
Flt Permitted	0.583			0.487			0.428			0.311		
Satd. Flow (perm)	1086	3468	0	907	3391	0	797	3539	1583	579	3539	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		30			77				73			60
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		972			474			575			2086	
Travel Time (s)		22.1			10.8			13.1			47.4	

Intersection Summary	
Area Type:	Other



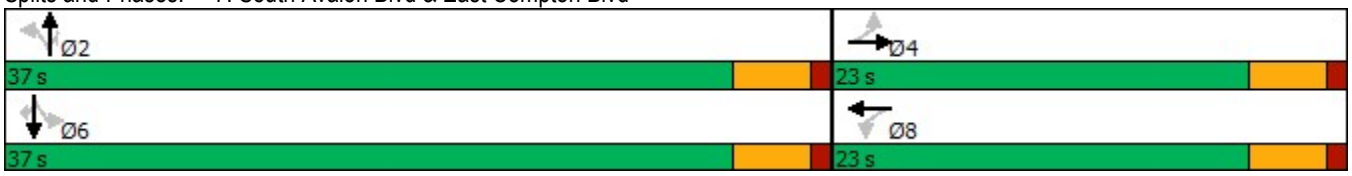
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	93	322	50	37	189	74	29	810	70	111	569	58
Future Volume (vph)	93	322	50	37	189	74	29	810	70	111	569	58
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	97	335	52	39	197	77	30	844	73	116	593	60
Shared Lane Traffic (%)												
Lane Group Flow (vph)	97	387	0	39	274	0	30	844	73	116	593	60

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	93	322	37	189	29	810	70	111	569	58
Future Volume (vph)	93	322	37	189	29	810	70	111	569	58
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4		8		2			6	
Permitted Phases	4		8		2		2	6		6
Detector Phase	4	4	8	8	2	2	2	6	6	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	23.0	23.0	23.0	23.0	37.0	37.0	37.0	37.0	37.0	37.0
Total Split (%)	38.3%	38.3%	38.3%	38.3%	61.7%	61.7%	61.7%	61.7%	61.7%	61.7%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag										
Lead-Lag Optimize?										
Recall Mode	None	None	None	None	Max	Max	Max	Max	Max	Max
Act Effct Green (s)	11.7	11.7	11.7	11.7	32.7	32.7	32.7	32.7	32.7	32.7
Actuated g/C Ratio	0.22	0.22	0.22	0.22	0.61	0.61	0.61	0.61	0.61	0.61
v/c Ratio	0.41	0.49	0.20	0.34	0.06	0.39	0.07	0.33	0.27	0.06
Control Delay	22.9	18.7	18.9	13.2	5.9	6.5	2.1	9.6	5.8	2.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	22.9	18.7	18.9	13.2	5.9	6.5	2.1	9.6	5.8	2.2
LOS	C	B	B	B	A	A	A	A	A	A
Approach Delay		19.6		13.9		6.2			6.1	
Approach LOS		B		B		A			A	

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 53.4	
Natural Cycle: 55	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.49	
Intersection Signal Delay: 9.7	Intersection LOS: A
Intersection Capacity Utilization 58.2%	ICU Level of Service B
Analysis Period (min) 15	

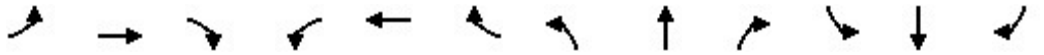
Splits and Phases: 7: South Avalon Blvd & East Compton Blvd





Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	97	387	39	274	30	844	73	116	593	60
v/c Ratio	0.41	0.49	0.20	0.34	0.06	0.39	0.07	0.33	0.27	0.06
Control Delay	22.9	18.7	18.9	13.2	5.9	6.5	2.1	9.6	5.8	2.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	22.9	18.7	18.9	13.2	5.9	6.5	2.1	9.6	5.8	2.2
Queue Length 50th (ft)	26	51	10	27	3	58	0	15	37	0
Queue Length 95th (ft)	61	84	30	52	15	122	14	56	81	13
Internal Link Dist (ft)		892		394		495			2006	
Turn Bay Length (ft)	155		150		110		100	115		100
Base Capacity (vph)	378	1227	315	1230	487	2164	996	354	2164	991
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.26	0.32	0.12	0.22	0.06	0.39	0.07	0.33	0.27	0.06

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	93	322	50	37	189	74	29	810	70	111	569	58
Future Volume (veh/h)	93	322	50	37	189	74	29	810	70	111	569	58
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	97	335	52	39	197	77	30	844	73	116	593	60
Adj No. of Lanes	1	2	0	1	2	0	1	2	1	1	2	1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	303	680	104	259	555	210	548	2159	966	431	2159	966
Arrive On Green	0.22	0.22	0.22	0.22	0.22	0.22	0.61	0.61	0.61	0.61	0.61	0.61
Sat Flow, veh/h	1101	3076	473	992	2514	951	776	3539	1583	607	3539	1583
Grp Volume(v), veh/h	97	191	196	39	137	137	30	844	73	116	593	60
Grp Sat Flow(s),veh/h/ln	1101	1770	1779	992	1770	1695	776	1770	1583	607	1770	1583
Q Serve(g_s), s	4.4	5.0	5.1	1.9	3.5	3.7	1.0	6.5	1.0	6.4	4.2	0.8
Cycle Q Clear(g_c), s	8.0	5.0	5.1	7.0	3.5	3.7	5.2	6.5	1.0	13.0	4.2	0.8
Prop In Lane	1.00		0.27	1.00		0.56	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	303	391	393	259	391	374	548	2159	966	431	2159	966
V/C Ratio(X)	0.32	0.49	0.50	0.15	0.35	0.37	0.05	0.39	0.08	0.27	0.27	0.06
Avail Cap(c_a), veh/h	442	615	618	384	615	589	548	2159	966	431	2159	966
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	21.0	18.1	18.2	21.2	17.5	17.6	6.1	5.3	4.2	8.6	4.9	4.2
Incr Delay (d2), s/veh	0.6	1.0	1.0	0.3	0.5	0.6	0.2	0.5	0.2	1.5	0.3	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.4	2.5	2.6	0.5	1.7	1.8	0.2	3.3	0.5	1.2	2.1	0.4
LnGrp Delay(d),s/veh	21.6	19.1	19.1	21.5	18.1	18.2	6.3	5.9	4.4	10.2	5.2	4.3
LnGrp LOS	C	B	B	C	B	B	A	A	A	B	A	A
Approach Vol, veh/h		484			313			947			769	
Approach Delay, s/veh		19.6			18.5			5.8			5.9	
Approach LOS		B			B			A			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		37.0		16.3		37.0		16.3
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5
Max Green Setting (Gmax), s		32.5		18.5		32.5		18.5
Max Q Clear Time (g_c+I1), s		8.5		10.0		15.0		9.0
Green Ext Time (p_c), s		6.9		1.7		5.1		1.2

Intersection Summary	
HCM 2010 Ctrl Delay	10.0
HCM 2010 LOS	B



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)		0	100		0	0
Storage Lanes		0	1		1	0
Taper Length (ft)			25		25	
Lane Util. Factor	0.91	0.91	1.00	0.91	1.00	1.00
Ped Bike Factor						
Frt					0.983	
Flt Protected					0.958	
Satd. Flow (prot)	5085	0	1863	5085	1754	0
Flt Permitted					0.958	
Satd. Flow (perm)	5085	0	1863	5085	1754	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	498			189	111	
Travel Time (s)	11.3			4.3	2.5	

Intersection Summary	
Area Type:	Other



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Traffic Volume (vph)	1675	2	0	817	6	1
Future Volume (vph)	1675	2	0	817	6	1
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Adj. Flow (vph)	1821	2	0	888	7	1
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1823	0	0	888	8	0

Intersection Summary

Intersection	
Int Delay, s/veh	0.2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	1675	2	0	817	6	1
Future Vol, veh/h	1675	2	0	817	6	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	100	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1821	2	0	888	7	1

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1823	0	2177	912
Stage 1	-	-	-	-	1822	-
Stage 2	-	-	-	-	355	-
Critical Hdwy	-	-	5.34	-	5.74	7.14
Critical Hdwy Stg 1	-	-	-	-	6.64	-
Critical Hdwy Stg 2	-	-	-	-	6.04	-
Follow-up Hdwy	-	-	3.12	-	3.82	3.92
Pot Cap-1 Maneuver	-	-	154	-	75	237
Stage 1	-	-	-	-	74	-
Stage 2	-	-	-	-	623	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	154	-	75	237
Mov Cap-2 Maneuver	-	-	-	-	67	-
Stage 1	-	-	-	-	74	-
Stage 2	-	-	-	-	623	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	58.3
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	75	-	-	154	-
HCM Lane V/C Ratio	0.101	-	-	-	-
HCM Control Delay (s)	58.3	-	-	0	-
HCM Lane LOS	F	-	-	A	-
HCM 95th %tile Q(veh)	0.3	-	-	0	-

Appendix F

Cumulative Conditions Without Project
Level of Service Analysis Worksheets

Metro Bus Facility Rosecrans and Avalon TIS
Existing Plus Cumulative Conditions
AM Peak Hour

Scenario Report

Scenario:	EX+C_AM
Command:	EX+C_AM
Volume:	EX_AM
Geometry:	EX
Impact Fee:	Default Impact Fee
Trip Generation:	C_AM
Trip Distribution:	DEFAULT
Paths:	Default Path
Routes:	Default Route
Configuration:	EX

Metro Bus Facility Rosecrans and Avalon TIS
Existing Plus Cumulative Conditions
AM Peak Hour

Trip Generation Report

Forecast for C_AM

Zone #	Subzone	Amount	Units	Rate In	Rate Out	Trips In	Trips Out	Total Trips	% Of Total
100	TAZ 1	1.00	TAZ 1	1.00	1.00	1	1	2	0.2
	Zone 100 Subtotal					1	1	2	0.2
200	TAZ 2	1.00	TAZ 2	23.00	12.00	23	12	35	2.9
	Zone 200 Subtotal					23	12	35	2.9
300	TAZ 3	1.00	TAZ 3	4.00	2.00	4	2	6	0.5
	Zone 300 Subtotal					4	2	6	0.5
400	TAZ 4	1.00	TAZ 4	15.00	10.00	15	10	25	2.1
	Zone 400 Subtotal					15	10	25	2.1
500	TAZ 5	1.00	TAZ 5	114.00	40.00	114	40	154	12.9
	Zone 500 Subtotal					114	40	154	12.9
600	TAZ 6	1.00	TAZ 6	249.00	279.00	249	279	528	44.2
	Zone 600 Subtotal					249	279	528	44.2
700	TAZ 7	1.00	TAZ 7	16.00	46.00	16	46	62	5.2
	Zone 700 Subtotal					16	46	62	5.2
800	TAZ 8	1.00	TAZ 8	148.00	102.00	148	102	250	20.9
	Zone 800 Subtotal					148	102	250	20.9
900	TAZ 9	1.00	TAZ 9	86.00	12.00	86	12	98	8.2
	Zone 900 Subtotal					86	12	98	8.2
1000	TAZ 10	1.00	TAZ 10	21.00	13.00	21	13	34	2.8
	Zone 1000 Subtotal					21	13	34	2.8
TOTAL						677	517	1194	100.0

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Metro Bus Facility Rosecrans and Avalon TIS
Existing Plus Cumulative Conditions
AM Peak Hour

Turning Movement Report
C_AM

Volume Type	Northbound Left	Thru	Right	Southbound Left	Thru	Right	Eastbound Left	Thru	Right	Westbound Left	Thru	Right	Total Volume
#1 I-110 SB Ramps / East Rosecrans Ave													
Base	0	0	0	327	4	479	0	867	645	256	1267	0	3845
Added	0	0	0	33	0	2	0	45	7	10	16	0	113
Total	0	0	0	360	4	481	0	912	652	266	1283	0	3958
#2 I-110 NB Ramps / East Rosecrans Ave													
Base	480	6	176	2	0	12	1	798	357	0	1303	14	3149
Added	2	0	31	0	0	0	0	71	7	0	35	0	146
Total	482	6	207	2	0	12	1	869	364	0	1338	14	3295
#3 South Main St / East Rosecrans Ave													
Base	59	284	41	48	386	77	61	526	55	93	965	73	2668
Added	0	0	0	0	0	0	0	102	0	0	35	0	137
Total	59	284	41	48	386	77	61	628	55	93	1000	73	2805
#4 South Avalon Blvd / East 135th St													
Base	105	539	30	42	608	110	87	156	81	48	322	69	2197
Added	0	16	0	0	24	0	0	0	0	0	0	0	40
Total	105	555	30	42	632	110	87	156	81	48	322	69	2237
#5 South Avalon Blvd / East Rosecrans Ave													
Base	107	524	82	123	561	92	53	430	76	148	1034	121	3351
Added	4	6	47	18	5	1	1	98	5	23	33	10	251
Total	111	530	129	141	566	93	54	528	81	171	1067	131	3602
#6 South Avalon Blvd / Project Dwy - Bus													
Base	0	751	0	0	785	0	0	0	0	0	0	0	1536
Added	0	56	0	0	33	0	0	0	0	0	0	0	89
Total	0	807	0	0	818	0	0	0	0	0	0	0	1625
#7 South Avalon Blvd / East Compton Blvd													
Base	46	596	54	65	667	24	27	116	22	65	385	128	2195
Added	1	56	8	0	33	0	0	0	2	8	0	0	108
Total	47	652	62	65	700	24	27	116	24	73	385	128	2303
#8 Project Dwy - Employees / East Rosecrans Ave													
Base	0	0	0	0	0	0	0	635	0	0	1303	0	1938
Added	0	0	0	0	0	0	0	162	0	0	66	0	228
Total	0	0	0	0	0	0	0	797	0	0	1369	0	2166

Metro Bus Facility Rosecrans and Avalon TIS
Existing Plus Cumulative Conditions
AM Peak Hour

Level Of Service Computation Report
ICU 1(Loss as Cycle Length %) Method (Future Volume Alternative)

Intersection #1 I-110 SB Ramps / East Rosecrans Ave

Cycle (sec):	100	Critical Vol./Cap.(X):	0.850
Loss Time (sec):	10	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	80	Level Of Service:	D

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Split Phase			Split Phase			Permitted			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lanes:	0	0	0	1	0	1! 0	1	0	2	1	0	1	0	3	0	0
Volume Module:												
Base Vol:	0	0	0	327	4	479	0	867	645	256	1267	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	0	0	327	4	479	0	867	645	256	1267	0
Added Vol:	0	0	0	33	0	2	0	45	7	10	16	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	0	0	360	4	481	0	912	652	266	1283	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	0	0	0	360	4	481	0	912	652	266	1283	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	0	0	360	4	481	0	912	652	266	1283	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	0	0	0	360	4	481	0	912	652	266	1283	0
Saturation Flow Module:												
Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	0.00	0.00	0.00	1.28	0.01	1.71	0.00	2.00	1.00	1.00	3.00	0.00
Final Sat.:	0	0	0	2045	23	2732	0	3200	1600	1600	4800	0
Capacity Analysis Module:												
Vol/Sat:	0.00	0.00	0.00	0.18	0.18	0.18	0.00	0.28	0.41	0.17	0.27	0.00
Crit Moves:					****				****	****		

Metro Bus Facility Rosecrans and Avalon TIS
Existing Plus Cumulative Conditions
AM Peak Hour

Level Of Service Computation Report
ICU 1(Loss as Cycle Length %) Method (Future Volume Alternative)

Intersection #2 I-110 NB Ramps / East Rosecrans Ave

Cycle (sec):	100	Critical Vol./Cap.(X):	0.608
Loss Time (sec):	10	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	41	Level Of Service:	B

Approach:	North Bound				South Bound				East Bound				West Bound			
Movement:	L	-	T	- R	L	-	T	- R	L	-	T	- R	L	-	T	- R
Control:	Split Phase				Split Phase				Permitted				Permitted			
Rights:	Include				Include				Ovl				Include			
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lanes:	1	0	1!	0 0	0	0	1!	0 0	0	1	2	0 1	0	0	2	1 0
Volume Module:																
Base Vol:	480	6	176	2	0	12	1	798	357	0	1303	14				
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00				
Initial Bse:	480	6	176	2	0	12	1	798	357	0	1303	14				
Added Vol:	2	0	31	0	0	0	0	71	7	0	35	0				
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0				
Initial Fut:	482	6	207	2	0	12	1	869	364	0	1338	14				
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00				
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00				
PHF Volume:	482	6	207	2	0	12	1	869	364	0	1338	14				
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0				
Reduced Vol:	482	6	207	2	0	12	1	869	364	0	1338	14				
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00				
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00				
FinalVolume:	482	6	207	2	0	12	1	869	364	0	1338	14				
OvlAdjVol:									17							
Saturation Flow Module:																
Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600				
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00				
Lanes:	1.39	0.02	0.59	0.14	0.00	0.86	0.01	2.99	1.00	0.00	2.97	0.03				
Final Sat.:	2219	28	953	229	0	1371	6	4794	1600	0	4750	50				
Capacity Analysis Module:																
Vol/Sat:	0.22	0.22	0.22	0.01	0.00	0.01	0.00	0.18	0.23	0.00	0.28	0.28				
OvlAdjV/S:									0.01							
Crit Moves:	****					****	****				****					

Metro Bus Facility Rosecrans and Avalon TIS
Existing Plus Cumulative Conditions
AM Peak Hour

Level Of Service Computation Report
ICU 1(Loss as Cycle Length %) Method (Future Volume Alternative)

Intersection #3 South Main St / East Rosecrans Ave

Cycle (sec):	100	Critical Vol./Cap.(X):	0.519
Loss Time (sec):	10	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	34	Level Of Service:	A

Approach:	North Bound				South Bound				East Bound				West Bound			
Movement:	L	-	T	- R	L	-	T	- R	L	-	T	- R	L	-	T	- R
Control:	Permitted				Permitted				Permitted				Permitted			
Rights:	Include				Include				Include				Include			
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lanes:	1	0	2	0 1	1	0	2	0 1	1	0	2	1 0	1	0	2	1 0
Volume Module:																
Base Vol:	59	284	41	48	386	77	61	526	55	93	965	73				
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00				
Initial Bse:	59	284	41	48	386	77	61	526	55	93	965	73				
Added Vol:	0	0	0	0	0	0	0	102	0	0	35	0				
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0				
Initial Fut:	59	284	41	48	386	77	61	628	55	93	1000	73				
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00				
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00				
PHF Volume:	59	284	41	48	386	77	61	628	55	93	1000	73				
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0				
Reduced Vol:	59	284	41	48	386	77	61	628	55	93	1000	73				
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00				
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00				
FinalVolume:	59	284	41	48	386	77	61	628	55	93	1000	73				
Saturation Flow Module:																
Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600				
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00				
Lanes:	1.00	2.00	1.00	1.00	2.00	1.00	1.00	2.76	0.24	1.00	2.80	0.20				
Final Sat.:	1600	3200	1600	1600	3200	1600	1600	4413	387	1600	4473	327				
Capacity Analysis Module:																
Vol/Sat:	0.04	0.09	0.03	0.03	0.12	0.05	0.04	0.14	0.14	0.06	0.22	0.22				
Crit Moves:	****				****		****				****					

Metro Bus Facility Rosecrans and Avalon TIS
Existing Plus Cumulative Conditions
AM Peak Hour

Level Of Service Computation Report
ICU 1(Loss as Cycle Length %) Method (Future Volume Alternative)

Intersection #4 South Avalon Blvd / East 135th St

Cycle (sec):	100	Critical Vol./Cap.(X):	0.518
Loss Time (sec):	10	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	34	Level Of Service:	A

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Permitted			Permitted			Permitted		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lanes:	1	0 1	1 0	1	0 2	0 1	1	0 1	0 1	1	0 2	0 1
Volume Module:												
Base Vol:	105	539	30	42	608	110	87	156	81	48	322	69
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	105	539	30	42	608	110	87	156	81	48	322	69
Added Vol:	0	16	0	0	24	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	105	555	30	42	632	110	87	156	81	48	322	69
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	105	555	30	42	632	110	87	156	81	48	322	69
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	105	555	30	42	632	110	87	156	81	48	322	69
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	105	555	30	42	632	110	87	156	81	48	322	69
Saturation Flow Module:												
Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	1.00	1.90	0.10	1.00	2.00	1.00	1.00	1.00	1.00	1.00	2.00	1.00
Final Sat.:	1600	3036	164	1600	3200	1600	1600	1600	1600	1600	3200	1600
Capacity Analysis Module:												
Vol/Sat:	0.07	0.18	0.18	0.03	0.20	0.07	0.05	0.10	0.05	0.03	0.10	0.04
Crit Moves:	****				****		****				****	

Metro Bus Facility Rosecrans and Avalon TIS
Existing Plus Cumulative Conditions
AM Peak Hour

Level Of Service Computation Report
ICU 1(Loss as Cycle Length %) Method (Future Volume Alternative)

Intersection #5 South Avalon Blvd / East Rosecrans Ave

Cycle (sec):	100	Critical Vol./Cap.(X):	0.637
Loss Time (sec):	10	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	43	Level Of Service:	B

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Prot+Permit			Prot+Permit			Prot+Permit			Prot+Permit		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lanes:	1	0 2	0 1	1	0 2	0 1	1	0 2	1 0	1	0 2	1 0
Volume Module:												
Base Vol:	107	524	82	123	561	92	53	430	76	148	1034	121
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	107	524	82	123	561	92	53	430	76	148	1034	121
Added Vol:	4	6	47	18	5	1	1	98	5	23	33	10
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	111	530	129	141	566	93	54	528	81	171	1067	131
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	111	530	129	141	566	93	54	528	81	171	1067	131
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	111	530	129	141	566	93	54	528	81	171	1067	131
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	111	530	129	141	566	93	54	528	81	171	1067	131
Saturation Flow Module:												
Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	1.00	2.00	1.00	1.00	2.00	1.00	1.00	2.60	0.40	1.00	2.67	0.33
Final Sat.:	1600	3200	1600	1600	3200	1600	1600	4162	638	1600	4275	525
Capacity Analysis Module:												
Vol/Sat:	0.07	0.17	0.08	0.09	0.18	0.06	0.03	0.13	0.13	0.11	0.25	0.25
Crit Moves:		****			****			****				****

Metro Bus Facility Rosecrans and Avalon TIS
Existing Plus Cumulative Conditions
AM Peak Hour

Level Of Service Computation Report
2000 HCM Unsignalized Method (Future Volume Alternative)

Intersection #6 South Avalon Blvd / Project Dwy - Bus

Average Delay (sec/veh): 0.0 Worst Case Level Of Service: A[0.0]

Approach:	North Bound				South Bound				East Bound				West Bound			
Movement:	L	-	T	- R	L	-	T	- R	L	-	T	- R	L	-	T	- R
Control:	Uncontrolled				Uncontrolled				Stop Sign				Stop Sign			
Rights:	Include				Include				Include				Include			
Lanes:	0	0	2	0 1	1	0	2	0 0	0	0	0	0 0	0	0	0	0 1
Volume Module:																
Base Vol:	0	751		0	0	785		0	0		0	0	0		0	0
Growth Adj:	1.00	1.00		1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00		1.00	1.00
Initial Bse:	0	751		0	0	785		0	0		0	0	0		0	0
Added Vol:	0	56		0	0	33		0	0		0	0	0		0	0
PasserByVol:	0	0		0	0	0		0	0		0	0	0		0	0
Initial Fut:	0	807		0	0	818		0	0		0	0	0		0	0
User Adj:	1.00	1.00		1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00		1.00	1.00
PHF Adj:	1.00	1.00		1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00		1.00	1.00
PHF Volume:	0	807		0	0	818		0	0		0	0	0		0	0
Reduct Vol:	0	0		0	0	0		0	0		0	0	0		0	0
FinalVolume:	0	807		0	0	818		0	0		0	0	0		0	0
Critical Gap Module:																
Critical Gp:	xxxxx	xxxx		xxxxx	xxxxx	xxxx		xxxxx	xxxxx	xxxx		xxxxx	xxxxx	xxxx		6.9
FollowUpTim:	xxxxx	xxxx		xxxxx	xxxxx	xxxx		xxxxx	xxxxx	xxxx		xxxxx	xxxxx	xxxx		3.3
Capacity Module:																
Cnflict Vol:	xxxx	xxxx		xxxxx	xxxx	xxxx		xxxxx	xxxx	xxxx		xxxxx	xxxx	xxxx		404
Potent Cap.:	xxxx	xxxx		xxxxx	xxxx	xxxx		xxxxx	xxxx	xxxx		xxxxx	xxxx	xxxx		602
Move Cap.:	xxxx	xxxx		xxxxx	xxxx	xxxx		xxxxx	xxxx	xxxx		xxxxx	xxxx	xxxx		602
Volume/Cap:	xxxx	xxxx		xxxx	xxxx	xxxx		xxxx	xxxx	xxxx		xxxx	xxxx	xxxx		0.00
Level Of Service Module:																
2Way95thQ:	xxxx	xxxx		xxxxx	xxxx	xxxx		xxxxx	xxxx	xxxx		xxxxx	xxxx	xxxx		xxxxx
Control Del:	xxxxx	xxxx		xxxxx	xxxxx	xxxx		xxxxx	xxxxx	xxxx		xxxxx	xxxxx	xxxx		xxxxx
LOS by Move:	*	*		*	*	*		*	*	*		*	*	*		*
Movement:	LT - LTR - RT				LT - LTR - RT				LT - LTR - RT				LT - LTR - RT			
Shared Cap.:	xxxx	xxxx		xxxxx	xxxx	xxxx		xxxxx	xxxx	xxxx		xxxxx	xxxx	xxxx		xxxxx
SharedQueue:	xxxxx	xxxx		xxxxx	xxxxx	xxxx		xxxxx	xxxxx	xxxx		xxxxx	xxxxx	xxxx		xxxxx
Shrd ConDel:	xxxxx	xxxx		xxxxx	xxxxx	xxxx		xxxxx	xxxxx	xxxx		xxxxx	xxxxx	xxxx		xxxxx
Shared LOS:	*	*		*	*	*		*	*	*		*	*	*		*
ApproachDel:	xxxxxx				xxxxxx				xxxxxx				xxxxxx			
ApproachLOS:	*				*				*				*			

Note: Queue reported is the number of cars per lane.

Metro Bus Facility Rosecrans and Avalon TIS
Existing Plus Cumulative Conditions
AM Peak Hour

Level Of Service Computation Report
ICU 1(Loss as Cycle Length %) Method (Future Volume Alternative)

Intersection #7 South Avalon Blvd / East Compton Blvd

Cycle (sec):	100	Critical Vol./Cap.(X):	0.525
Loss Time (sec):	10	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	35	Level Of Service:	A

Approach:	North Bound				South Bound				East Bound				West Bound			
Movement:	L	-	T	- R	L	-	T	- R	L	-	T	- R	L	-	T	- R
Control:	Permitted				Permitted				Permitted				Permitted			
Rights:	Include				Include				Include				Include			
Min. Green:	0	0	0		0	0	0		0	0	0		0	0	0	
Y+R:	4.0	4.0	4.0		4.0	4.0	4.0		4.0	4.0	4.0		4.0	4.0	4.0	
Lanes:	1	0	2	0 1	1	0	2	0 1	1	0	1	1 0	1	0	1	1 0
Volume Module:																
Base Vol:	46	596		54	65	667		24	27	116		22	65	385		128
Growth Adj:	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00		1.00
Initial Bse:	46	596		54	65	667		24	27	116		22	65	385		128
Added Vol:	1	56		8	0	33		0	0	0		2	8	0		0
PasserByVol:	0	0		0	0	0		0	0	0		0	0	0		0
Initial Fut:	47	652		62	65	700		24	27	116		24	73	385		128
User Adj:	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00		1.00
PHF Adj:	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00		1.00
PHF Volume:	47	652		62	65	700		24	27	116		24	73	385		128
Reduct Vol:	0	0		0	0	0		0	0	0		0	0	0		0
Reduced Vol:	47	652		62	65	700		24	27	116		24	73	385		128
PCE Adj:	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00		1.00
MLF Adj:	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00		1.00
FinalVolume:	47	652		62	65	700		24	27	116		24	73	385		128
Saturation Flow Module:																
Sat/Lane:	1600	1600		1600	1600	1600		1600	1600	1600		1600	1600	1600		1600
Adjustment:	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00		1.00
Lanes:	1.00	2.00		1.00	1.00	2.00		1.00	1.00	1.66		0.34	1.00	1.50		0.50
Final Sat.:	1600	3200		1600	1600	3200		1600	1600	2651		549	1600	2402		798
Capacity Analysis Module:																
Vol/Sat:	0.03	0.20		0.04	0.04	0.22		0.02	0.02	0.04		0.04	0.05	0.16		0.16
Crit Moves:	****					****			****					****		

Metro Bus Facility Rosecrans and Avalon TIS
Existing Plus Cumulative Conditions
AM Peak Hour

Level Of Service Computation Report
2000 HCM Unsignalized Method (Future Volume Alternative)

Intersection #8 Project Dwy - Employees / East Rosecrans Ave

Average Delay (sec/veh): 0.0 Worst Case Level Of Service: A[0.0]

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Stop Sign			Stop Sign			Uncontrolled			Uncontrolled		
Rights:	Include			Include			Include			Include		
Lanes:	0 0	1! 0	0	0 0	0 0	0	0 0	2 1	0	1 0	3 0	0
Volume Module:												
Base Vol:	0	0	0	0	0	0	0	635	0	0	1303	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	0	0	0	0	0	0	635	0	0	1303	0
Added Vol:	0	0	0	0	0	0	0	162	0	0	66	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	0	0	0	0	0	0	797	0	0	1369	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	0	0	0	0	0	0	0	797	0	0	1369	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
FinalVolume:	0	0	0	0	0	0	0	797	0	0	1369	0
Critical Gap Module:												
Critical Gp:	6.8	6.5	6.9	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
FollowUpTim:	3.5	4.0	3.3	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Capacity Module:												
Cnflict Vol:	1253	2166	266	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx
Potent Cap.:	167	48	739	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx
Move Cap.:	167	48	739	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx
Volume/Cap:	0.00	0.00	0.00	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx
Level Of Service Module:												
2Way95thQ:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx
Control Del:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
LOS by Move:	*	*	*	*	*	*	*	*	*	*	*	*
Movement:	LT -	LTR -	RT	LT -	LTR -	RT	LT -	LTR -	RT	LT -	LTR -	RT
Shared Cap.:	xxxx	0	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx
SharedQueue:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Shrd ConDel:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Shared LOS:	*	*	*	*	*	*	*	*	*	*	*	*
ApproachDel:	xxxxxx			xxxxxx			xxxxxx			xxxxxx		
ApproachLOS:	*			*			*			*		

Note: Queue reported is the number of cars per lane.

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Metro Bus Facility Rosecrans and Avalon TIS
Existing Plus Cumulative Conditions
PM Peak Hour

Scenario Report

Scenario:	EX+C_PM
Command:	EX+C_PM
Volume:	EX_PM
Geometry:	EX
Impact Fee:	Default Impact Fee
Trip Generation:	C_PM
Trip Distribution:	DEFAULT
Paths:	Default Path
Routes:	Default Route
Configuration:	EX

Metro Bus Facility Rosecrans and Avalon TIS
Existing Plus Cumulative Conditions
PM Peak Hour

Trip Generation Report

Forecast for C_PM

Zone #	Subzone	Amount	Units	Rate In	Rate Out	Trips In	Trips Out	Total Trips	% Of Total
100	TAZ 1	1.00	TAZ 1	1.00	1.00	1	1	2	0.1
	Zone 100 Subtotal					1	1	2	0.1
200	TAZ 2	1.00	TAZ 2	21.00	24.00	21	24	45	2.8
	Zone 200 Subtotal					21	24	45	2.8
300	TAZ 3	1.00	TAZ 3	11.00	12.00	11	12	23	1.4
	Zone 300 Subtotal					11	12	23	1.4
400	TAZ 4	1.00	TAZ 4	14.00	14.00	14	14	28	1.7
	Zone 400 Subtotal					14	14	28	1.7
500	TAZ 5	1.00	TAZ 5	58.00	133.00	58	133	191	11.8
	Zone 500 Subtotal					58	133	191	11.8
600	TAZ 6	1.00	TAZ 6	328.00	313.00	328	313	641	39.7
	Zone 600 Subtotal					328	313	641	39.7
700	TAZ 7	1.00	TAZ 7	57.00	36.00	57	36	93	5.8
	Zone 700 Subtotal					57	36	93	5.8
800	TAZ 8	1.00	TAZ 8	139.00	184.00	139	184	323	20.0
	Zone 800 Subtotal					139	184	323	20.0
900	TAZ 9	1.00	TAZ 9	11.00	77.00	11	77	88	5.4
	Zone 900 Subtotal					11	77	88	5.4
1000	TAZ 10	1.00	TAZ 10	88.00	93.00	88	93	181	11.2
	Zone 1000 Subtotal					88	93	181	11.2
TOTAL						728	887	1615	100.0

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Metro Bus Facility Rosecrans and Avalon TIS
Existing Plus Cumulative Conditions
PM Peak Hour

Turning Movement Report
C_PM

Volume Type	Northbound Left	Thru	Right	Southbound Left	Thru	Right	Eastbound Left	Thru	Right	Westbound Left	Thru	Right	Total Volume
#1 I-110 SB Ramps / East Rosecrans Ave													
Base	0	0	0	580	12	450	0	1396	444	201	1019	0	4102
Added	0	0	0	18	0	9	0	25	5	33	50	0	140
Total	0	0	0	598	12	459	0	1421	449	234	1069	0	4242
#2 I-110 NB Ramps / East Rosecrans Ave													
Base	292	3	186	2	0	29	1	1458	375	0	1450	19	3815
Added	9	0	14	0	0	0	0	38	5	0	113	0	179
Total	301	3	200	2	0	29	1	1496	380	0	1563	19	3994
#3 South Main St / East Rosecrans Ave													
Base	118	514	105	69	307	49	105	1372	88	67	668	54	3516
Added	0	0	0	0	0	0	0	52	0	0	113	0	165
Total	118	514	105	69	307	49	105	1424	88	67	781	54	3681
#4 South Avalon Blvd / East 135th St													
Base	88	816	69	79	568	73	261	550	135	27	151	71	2888
Added	0	34	0	0	25	0	0	0	0	0	0	0	59
Total	88	850	69	79	593	73	261	550	135	27	151	71	2947
#5 South Avalon Blvd / East Rosecrans Ave													
Base	104	699	182	201	495	72	117	1292	104	110	569	138	4083
Added	10	11	31	12	11	3	3	45	10	53	105	20	314
Total	114	710	213	213	506	75	120	1337	114	163	674	158	4397
#6 South Avalon Blvd / Project Dwy - Bus													
Base	0	977	0	0	709	0	0	0	0	0	0	0	1686
Added	0	51	0	0	74	0	0	0	0	0	0	0	125
Total	0	1028	0	0	783	0	0	0	0	0	0	0	1811
#7 South Avalon Blvd / East Compton Blvd													
Base	29	810	70	111	568	58	93	322	50	37	189	74	2411
Added	1	51	9	0	74	0	0	0	1	9	0	0	145
Total	30	861	79	111	642	58	93	322	51	46	189	74	2556
#8 Project Dwy - Employees / East Rosecrans Ave													
Base	0	0	0	0	0	0	0	1675	0	0	817	0	2492
Added	0	0	0	0	0	0	0	88	0	0	179	0	267
Total	0	0	0	0	0	0	0	1763	0	0	996	0	2759

Metro Bus Facility Rosecrans and Avalon TIS
Existing Plus Cumulative Conditions
PM Peak Hour

Level Of Service Computation Report
ICU 1(Loss as Cycle Length %) Method (Future Volume Alternative)

Intersection #1 I-110 SB Ramps / East Rosecrans Ave

Cycle (sec): 100 Critical Vol./Cap.(X): 0.859
Loss Time (sec): 10 Average Delay (sec/veh): xxxxxx
Optimal Cycle: 83 Level Of Service: D

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Split Phase			Split Phase			Permitted			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lanes:	0	0	0	1	0	1!	0	1	0	1	0	0
Volume Module:												
Base Vol:	0	0	0	580	12	450	0	1396	444	201	1019	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	0	0	580	12	450	0	1396	444	201	1019	0
Added Vol:	0	0	0	18	0	9	0	25	5	33	50	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	0	0	598	12	459	0	1421	449	234	1069	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	0	0	0	598	12	459	0	1421	449	234	1069	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	0	0	598	12	459	0	1421	449	234	1069	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	0	0	0	598	12	459	0	1421	449	234	1069	0
Saturation Flow Module:												
Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	0.00	0.00	0.00	1.68	0.03	1.29	0.00	2.28	0.72	1.00	3.00	0.00
Final Sat.:	0	0	0	2685	54	2061	0	3647	1153	1600	4800	0
Capacity Analysis Module:												
Vol/Sat:	0.00	0.00	0.00	0.22	0.22	0.22	0.00	0.39	0.39	0.15	0.22	0.00
Crit Moves:					****			****		****		

Metro Bus Facility Rosecrans and Avalon TIS
Existing Plus Cumulative Conditions
PM Peak Hour

Level Of Service Computation Report
ICU 1(Loss as Cycle Length %) Method (Future Volume Alternative)

Intersection #2 I-110 NB Ramps / East Rosecrans Ave

Cycle (sec):	100	Critical Vol./Cap.(X):	0.607
Loss Time (sec):	10	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	41	Level Of Service:	B

Approach:	North Bound				South Bound				East Bound				West Bound			
Movement:	L	- T	- R		L	- T	- R		L	- T	- R		L	- T	- R	
Control:	Split Phase				Split Phase				Permitted				Permitted			
Rights:	Include				Include				Ovl				Include			
Min. Green:	0	0	0		0	0	0		0	0	0		0	0	0	
Y+R:	4.0	4.0	4.0		4.0	4.0	4.0		4.0	4.0	4.0		4.0	4.0	4.0	
Lanes:	1	0 1!	0		0	0 1!	0		0	1 2	0 1		0	0 2	1	0
Volume Module:																
Base Vol:	292	3	186		2	0	29		1	1458	375		0	1450		19
Growth Adj:	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00		1.00
Initial Bse:	292	3	186		2	0	29		1	1458	375		0	1450		19
Added Vol:	9	0	14		0	0	0		0	38	5		0	113		0
PasserByVol:	0	0	0		0	0	0		0	0	0		0	0		0
Initial Fut:	301	3	200		2	0	29		1	1496	380		0	1563		19
User Adj:	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00		1.00
PHF Adj:	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00		1.00
PHF Volume:	301	3	200		2	0	29		1	1496	380		0	1563		19
Reduct Vol:	0	0	0		0	0	0		0	0	0		0	0		0
Reduced Vol:	301	3	200		2	0	29		1	1496	380		0	1563		19
PCE Adj:	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00		1.00
MLF Adj:	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00		1.00
FinalVolume:	301	3	200		2	0	29		1	1496	380		0	1563		19
OvlAdjVol:											128					
Saturation Flow Module:																
Sat/Lane:	1600	1600	1600		1600	1600	1600		1600	1600	1600		1600	1600		1600
Adjustment:	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00		1.00
Lanes:	1.20	0.01	0.79		0.06	0.00	0.94		0.01	2.99	1.00		0.00	2.96		0.04
Final Sat.:	1911	19	1270		103	0	1497		3	4797	1600		0	4742		58
Capacity Analysis Module:																
Vol/Sat:	0.16	0.16	0.16		0.02	0.00	0.02		0.00	0.31	0.24		0.00	0.33		0.33
OvlAdjV/S:											0.08					
Crit Moves:	****						****		****					****		

Metro Bus Facility Rosecrans and Avalon TIS
Existing Plus Cumulative Conditions
PM Peak Hour

Level Of Service Computation Report
ICU 1(Loss as Cycle Length %) Method (Future Volume Alternative)

Intersection #3 South Main St / East Rosecrans Ave

Cycle (sec):	100	Critical Vol./Cap.(X):	0.661
Loss Time (sec):	10	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	46	Level Of Service:	B

Approach:	North Bound				South Bound				East Bound				West Bound			
Movement:	L	- T	- R		L	- T	- R		L	- T	- R		L	- T	- R	
Control:	Permitted				Permitted				Permitted				Permitted			
Rights:	Include				Include				Include				Include			
Min. Green:	0	0	0		0	0	0		0	0	0		0	0	0	
Y+R:	4.0	4.0	4.0		4.0	4.0	4.0		4.0	4.0	4.0		4.0	4.0	4.0	
Lanes:	1	0 2	0 1		1	0 2	0 1		1	0 2	1 0		1	0 2	1	0
Volume Module:																
Base Vol:	118	514	105		69	307	49		105	1372	88		67	668		54
Growth Adj:	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00		1.00
Initial Bse:	118	514	105		69	307	49		105	1372	88		67	668		54
Added Vol:	0	0	0		0	0	0		0	52	0		0	113		0
PasserByVol:	0	0	0		0	0	0		0	0	0		0	0		0
Initial Fut:	118	514	105		69	307	49		105	1424	88		67	781		54
User Adj:	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00		1.00
PHF Adj:	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00		1.00
PHF Volume:	118	514	105		69	307	49		105	1424	88		67	781		54
Reduct Vol:	0	0	0		0	0	0		0	0	0		0	0		0
Reduced Vol:	118	514	105		69	307	49		105	1424	88		67	781		54
PCE Adj:	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00		1.00
MLF Adj:	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00		1.00
FinalVolume:	118	514	105		69	307	49		105	1424	88		67	781		54
Saturation Flow Module:																
Sat/Lane:	1600	1600	1600		1600	1600	1600		1600	1600	1600		1600	1600		1600
Adjustment:	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00		1.00
Lanes:	1.00	2.00	1.00		1.00	2.00	1.00		1.00	2.83	0.17		1.00	2.81		0.19
Final Sat.:	1600	3200	1600		1600	3200	1600		1600	4521	279		1600	4490		310
Capacity Analysis Module:																
Vol/Sat:	0.07	0.16	0.07		0.04	0.10	0.03		0.07	0.32	0.31		0.04	0.17		0.17
Crit Moves:		****				****					****			****		

Metro Bus Facility Rosecrans and Avalon TIS
Existing Plus Cumulative Conditions
PM Peak Hour

Level Of Service Computation Report
ICU 1(Loss as Cycle Length %) Method (Future Volume Alternative)

Intersection #4 South Avalon Blvd / East 135th St

Cycle (sec):	100	Critical Vol./Cap.(X):	0.797
Loss Time (sec):	10	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	66	Level Of Service:	C

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Permitted			Permitted			Permitted		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lanes:	1	0 1	1 0	1	0 2	0 1	1	0 1	0 1	1	0 2	0 1
Volume Module:												
Base Vol:	88	816	69	79	568	73	261	550	135	27	151	71
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	88	816	69	79	568	73	261	550	135	27	151	71
Added Vol:	0	34	0	0	25	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	88	850	69	79	593	73	261	550	135	27	151	71
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	88	850	69	79	593	73	261	550	135	27	151	71
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	88	850	69	79	593	73	261	550	135	27	151	71
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	88	850	69	79	593	73	261	550	135	27	151	71
Saturation Flow Module:												
Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	1.00	1.85	0.15	1.00	2.00	1.00	1.00	1.00	1.00	1.00	2.00	1.00
Final Sat.:	1600	2960	240	1600	3200	1600	1600	1600	1600	1600	3200	1600
Capacity Analysis Module:												
Vol/Sat:	0.06	0.29	0.29	0.05	0.19	0.05	0.16	0.34	0.08	0.02	0.05	0.04
Crit Moves:		****		****				****		****		

Metro Bus Facility Rosecrans and Avalon TIS
Existing Plus Cumulative Conditions
PM Peak Hour

Level Of Service Computation Report
ICU 1(Loss as Cycle Length %) Method (Future Volume Alternative)

Intersection #5 South Avalon Blvd / East Rosecrans Ave

Cycle (sec):	100	Critical Vol./Cap.(X):	0.859
Loss Time (sec):	10	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	83	Level Of Service:	D

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Prot+Permit			Prot+Permit			Prot+Permit			Prot+Permit		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lanes:	1	0 2	0 1	1	0 2	0 1	1	0 2	1 0	1	0 2	1 0
Volume Module:												
Base Vol:	104	699	182	201	495	72	117	1292	104	110	569	138
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	104	699	182	201	495	72	117	1292	104	110	569	138
Added Vol:	10	11	31	12	11	3	3	45	10	53	105	20
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	114	710	213	213	506	75	120	1337	114	163	674	158
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	114	710	213	213	506	75	120	1337	114	163	674	158
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	114	710	213	213	506	75	120	1337	114	163	674	158
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	114	710	213	213	506	75	120	1337	114	163	674	158
Saturation Flow Module:												
Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	1.00	2.00	1.00	1.00	2.00	1.00	1.00	2.76	0.24	1.00	2.43	0.57
Final Sat.:	1600	3200	1600	1600	3200	1600	1600	4423	377	1600	3888	912
Capacity Analysis Module:												
Vol/Sat:	0.07	0.22	0.13	0.13	0.16	0.05	0.08	0.30	0.30	0.10	0.17	0.17
Crit Moves:		****		****				****		****		

Metro Bus Facility Rosecrans and Avalon TIS
Existing Plus Cumulative Conditions
PM Peak Hour

Level Of Service Computation Report
2000 HCM Unsignalized Method (Future Volume Alternative)

Intersection #6 South Avalon Blvd / Project Dwy - Bus

Average Delay (sec/veh): 0.0 Worst Case Level Of Service: A[0.0]

Approach:	North Bound				South Bound				East Bound				West Bound			
Movement:	L	-	T	- R	L	-	T	- R	L	-	T	- R	L	-	T	- R
Control:	Uncontrolled				Uncontrolled				Stop Sign				Stop Sign			
Rights:	Include				Include				Include				Include			
Lanes:	0	0	2	0 1	1	0	2	0 0	0	0	0	0 0	0	0	0	0 1
Volume Module:																
Base Vol:	0	977		0	0	709		0	0		0	0	0		0	0
Growth Adj:	1.00	1.00		1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00		1.00	1.00
Initial Bse:	0	977		0	0	709		0	0		0	0	0		0	0
Added Vol:	0	51		0	0	74		0	0		0	0	0		0	0
PasserByVol:	0	0		0	0	0		0	0		0	0	0		0	0
Initial Fut:	0	1028		0	0	783		0	0		0	0	0		0	0
User Adj:	1.00	1.00		1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00		1.00	1.00
PHF Adj:	1.00	1.00		1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00		1.00	1.00
PHF Volume:	0	1028		0	0	783		0	0		0	0	0		0	0
Reduct Vol:	0	0		0	0	0		0	0		0	0	0		0	0
FinalVolume:	0	1028		0	0	783		0	0		0	0	0		0	0
Critical Gap Module:																
Critical Gp:	xxxxx	xxxx		xxxxx	xxxxx	xxxx		xxxxx	xxxxx	xxxx		xxxxx	xxxxx	xxxx		6.9
FollowUpTim:	xxxxx	xxxx		xxxxx	xxxxx	xxxx		xxxxx	xxxxx	xxxx		xxxxx	xxxxx	xxxx		3.3
Capacity Module:																
Cnflict Vol:	xxxx	xxxx		xxxxx	xxxx	xxxx		xxxxx	xxxx	xxxx		xxxxx	xxxx	xxxx		514
Potent Cap.:	xxxx	xxxx		xxxxx	xxxx	xxxx		xxxxx	xxxx	xxxx		xxxxx	xxxx	xxxx		511
Move Cap.:	xxxx	xxxx		xxxxx	xxxx	xxxx		xxxxx	xxxx	xxxx		xxxxx	xxxx	xxxx		511
Volume/Cap:	xxxx	xxxx		xxxx	xxxx	xxxx		xxxx	xxxx	xxxx		xxxx	xxxx	xxxx		0.00
Level Of Service Module:																
2Way95thQ:	xxxx	xxxx		xxxxx	xxxx	xxxx		xxxxx	xxxx	xxxx		xxxxx	xxxx	xxxx		xxxxx
Control Del:	xxxxx	xxxx		xxxxx	xxxxx	xxxx		xxxxx	xxxxx	xxxx		xxxxx	xxxxx	xxxx		xxxxx
LOS by Move:	*	*		*	*	*		*	*	*		*	*	*		*
Movement:	LT - LTR - RT				LT - LTR - RT				LT - LTR - RT				LT - LTR - RT			
Shared Cap.:	xxxx	xxxx		xxxxx	xxxx	xxxx		xxxxx	xxxx	xxxx		xxxxx	xxxx	xxxx		xxxxx
SharedQueue:	xxxxx	xxxx		xxxxx	xxxxx	xxxx		xxxxx	xxxxx	xxxx		xxxxx	xxxxx	xxxx		xxxxx
Shrd ConDel:	xxxxx	xxxx		xxxxx	xxxxx	xxxx		xxxxx	xxxxx	xxxx		xxxxx	xxxxx	xxxx		xxxxx
Shared LOS:	*	*		*	*	*		*	*	*		*	*	*		*
ApproachDel:	xxxxxx				xxxxxx				xxxxxx				xxxxxx			
ApproachLOS:	*				*				*				*			

Note: Queue reported is the number of cars per lane.

Metro Bus Facility Rosecrans and Avalon TIS
Existing Plus Cumulative Conditions
PM Peak Hour

Level Of Service Computation Report
ICU 1(Loss as Cycle Length %) Method (Future Volume Alternative)

Intersection #7 South Avalon Blvd / East Compton Blvd

Cycle (sec):	100	Critical Vol./Cap.(X):	0.584
Loss Time (sec):	10	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	39	Level Of Service:	A

Approach:	North Bound				South Bound				East Bound				West Bound			
Movement:	L	-	T	- R	L	-	T	- R	L	-	T	- R	L	-	T	- R
Control:	Permitted				Permitted				Permitted				Permitted			
Rights:	Include				Include				Include				Include			
Min. Green:	0	0		0	0	0		0	0	0		0	0	0		0
Y+R:	4.0	4.0		4.0	4.0	4.0		4.0	4.0	4.0		4.0	4.0	4.0		4.0
Lanes:	1	0	2	0 1	1	0	2	0 1	1	0	1	1 0	1	0	1	1 0
Volume Module:																
Base Vol:	29	810		70	111	568		58	93	322		50	37	189		74
Growth Adj:	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00		1.00
Initial Bse:	29	810		70	111	568		58	93	322		50	37	189		74
Added Vol:	1	51		9	0	74		0	0	0		1	9	0		0
PasserByVol:	0	0		0	0	0		0	0	0		0	0	0		0
Initial Fut:	30	861		79	111	642		58	93	322		51	46	189		74
User Adj:	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00		1.00
PHF Adj:	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00		1.00
PHF Volume:	30	861		79	111	642		58	93	322		51	46	189		74
Reduct Vol:	0	0		0	0	0		0	0	0		0	0	0		0
Reduced Vol:	30	861		79	111	642		58	93	322		51	46	189		74
PCE Adj:	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00		1.00
MLF Adj:	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00		1.00
FinalVolume:	30	861		79	111	642		58	93	322		51	46	189		74
Saturation Flow Module:																
Sat/Lane:	1600	1600		1600	1600	1600		1600	1600	1600		1600	1600	1600		1600
Adjustment:	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00		1.00
Lanes:	1.00	2.00		1.00	1.00	2.00		1.00	1.00	1.73		0.27	1.00	1.44		0.56
Final Sat.:	1600	3200		1600	1600	3200		1600	1600	2762		438	1600	2300		900
Capacity Analysis Module:																
Vol/Sat:	0.02	0.27		0.05	0.07	0.20		0.04	0.06	0.12		0.12	0.03	0.08		0.08
Crit Moves:		****				****					****			****		

Metro Bus Facility Rosecrans and Avalon TIS
Existing Plus Cumulative Conditions
PM Peak Hour

Level Of Service Computation Report
2000 HCM Unsignalized Method (Future Volume Alternative)

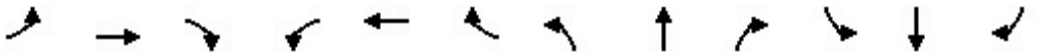
Intersection #8 Project Dwy - Employees / East Rosecrans Ave

Average Delay (sec/veh): 0.0 Worst Case Level Of Service: A[0.0]

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Stop Sign			Stop Sign			Uncontrolled			Uncontrolled		
Rights:	Include			Include			Include			Include		
Lanes:	0 0	1! 0	0	0 0	0 0	0	0 0	2 1	0	1 0	3 0	0
Volume Module:												
Base Vol:	0	0	0	0	0	0	0	1675	0	0	817	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	0	0	0	0	0	0	1675	0	0	817	0
Added Vol:	0	0	0	0	0	0	0	88	0	0	179	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	0	0	0	0	0	0	1763	0	0	996	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	0	0	0	0	0	0	0	1763	0	0	996	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
FinalVolume:	0	0	0	0	0	0	0	1763	0	0	996	0
Critical Gap Module:												
Critical Gp:	6.8	6.5	6.9	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
FollowUpTim:	3.5	4.0	3.3	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Capacity Module:												
Cnflict Vol:	2095	2759	588	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx
Potent Cap.:	46	20	457	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx
Move Cap.:	46	20	457	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx
Volume/Cap:	0.00	0.00	0.00	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx
Level Of Service Module:												
2Way95thQ:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx
Control Del:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
LOS by Move:	*	*	*	*	*	*	*	*	*	*	*	*
Movement:	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT
Shared Cap.:	xxxx	0	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx
SharedQueue:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Shrd ConDel:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Shared LOS:	*	*	*	*	*	*	*	*	*	*	*	*
ApproachDel:	xxxxxx			xxxxxx			xxxxxx			xxxxxx		
ApproachLOS:	*			*			*			*		

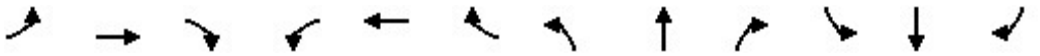
Note: Queue reported is the number of cars per lane.

Traffix 8.0.0715 (c) 2008 Dowling Assoc. Licensed to RK ENGINEERING GROUP



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	275		0	0		0	150		150
Storage Lanes	0		0	1		0	0		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.91	0.91	1.00	0.91	1.00	1.00	1.00	1.00	0.95	0.91	0.95
Ped Bike Factor												
Frt		0.937									0.889	0.850
Flt Protected				0.950						0.950	0.988	
Satd. Flow (prot)	0	4765	0	1770	5085	0	0	0	0	1681	1489	1504
Flt Permitted				0.950						0.950	0.988	
Satd. Flow (perm)	0	4765	0	1770	5085	0	0	0	0	1681	1489	1504
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		271									51	94
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		508			258			584			534	
Travel Time (s)		11.5			5.9			13.3			12.1	

Intersection Summary	
Area Type:	Other



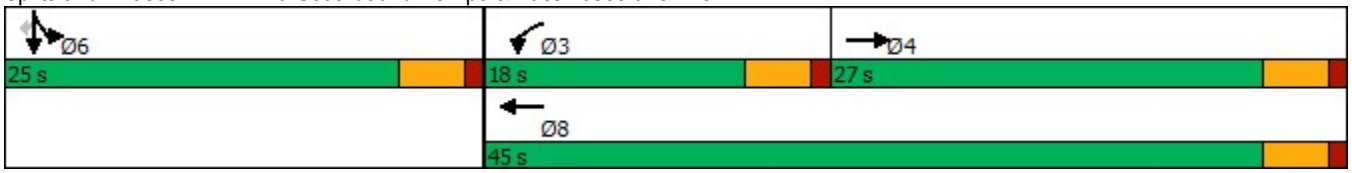
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	0	912	652	266	1283	0	0	0	0	360	4	481
Future Volume (vph)	0	912	652	266	1283	0	0	0	0	360	4	481
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	0	940	672	274	1323	0	0	0	0	371	4	496
Shared Lane Traffic (%)										19%		43%
Lane Group Flow (vph)	0	1612	0	274	1323	0	0	0	0	301	287	283

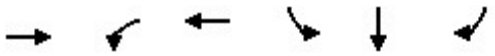
Intersection Summary

Lane Group	EBT	WBL	WBT	SBL	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	912	266	1283	360	4	481
Future Volume (vph)	912	266	1283	360	4	481
Turn Type	NA	Prot	NA	Split	NA	Perm
Protected Phases	4	3	8	6	6	
Permitted Phases						6
Detector Phase	4	3	8	6	6	6
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	9.5	22.5	22.5	22.5	22.5
Total Split (s)	27.0	18.0	45.0	25.0	25.0	25.0
Total Split (%)	38.6%	25.7%	64.3%	35.7%	35.7%	35.7%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lag	Lead				
Lead-Lag Optimize?	Yes	Yes				
Recall Mode	None	None	None	Max	Max	Max
Act Effct Green (s)	22.5	13.0	40.0	20.5	20.5	20.5
Actuated g/C Ratio	0.32	0.19	0.58	0.29	0.29	0.29
v/c Ratio	0.95dr	0.83	0.45	0.61	0.60	0.56
Control Delay	31.0	50.1	9.1	27.4	23.6	18.5
Queue Delay	0.0	0.0	1.3	0.0	0.0	0.0
Total Delay	31.0	50.1	10.3	27.4	23.6	18.5
LOS	C	D	B	C	C	B
Approach Delay	31.0		17.1		23.3	
Approach LOS	C		B		C	

Intersection Summary	
Cycle Length: 70	
Actuated Cycle Length: 69.5	
Natural Cycle: 70	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.93	
Intersection Signal Delay: 23.9	Intersection LOS: C
Intersection Capacity Utilization 73.2%	ICU Level of Service D
Analysis Period (min) 15	
dr Defacto Right Lane. Recode with 1 though lane as a right lane.	

Splits and Phases: 1: I-110-Southbound Ramps & East Rosecrans Ave

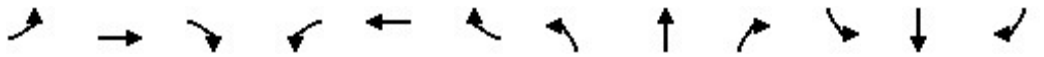




Lane Group	EBT	WBL	WBT	SBL	SBT	SBR
Lane Group Flow (vph)	1612	274	1323	301	287	283
v/c Ratio	0.95dr	0.83	0.45	0.61	0.60	0.56
Control Delay	31.0	50.1	9.1	27.4	23.6	18.5
Queue Delay	0.0	0.0	1.3	0.0	0.0	0.0
Total Delay	31.0	50.1	10.3	27.4	23.6	18.5
Queue Length 50th (ft)	208	114	106	116	94	69
Queue Length 95th (ft)	#311	#231	136	198	179	145
Internal Link Dist (ft)	428		178		454	
Turn Bay Length (ft)		275		150		150
Base Capacity (vph)	1726	344	2964	496	475	509
Starvation Cap Reductn	0	0	1335	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.93	0.80	0.81	0.61	0.60	0.56

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
dr Defacto Right Lane. Recode with 1 though lane as a right lane.

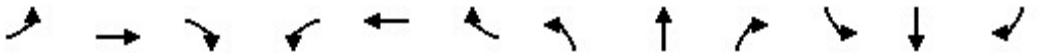


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	912	652	266	1283	0	0	0	0	360	4	481
Future Volume (veh/h)	0	912	652	266	1283	0	0	0	0	360	4	481
Number	7	4	14	3	8	18				1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1863	1900	1863	1863	0				1863	1863	1863
Adj Flow Rate, veh/h	0	940	672	274	1323	0				546	0	311
Adj No. of Lanes	0	3	0	1	3	0				2	0	1
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97				0.97	0.97	0.97
Percent Heavy Veh, %	0	2	2	2	2	0				2	2	2
Cap, veh/h	0	1108	517	318	2907	0				1056	0	471
Arrive On Green	0.00	0.33	0.33	0.18	0.57	0.00				0.30	0.00	0.30
Sat Flow, veh/h	0	3558	1583	1774	5253	0				3548	0	1583
Grp Volume(v), veh/h	0	940	672	274	1323	0				546	0	311
Grp Sat Flow(s),veh/h/ln	0	1695	1583	1774	1695	0				1774	0	1583
Q Serve(g_s), s	0.0	17.8	22.5	10.3	10.4	0.0				8.8	0.0	11.8
Cycle Q Clear(g_c), s	0.0	17.8	22.5	10.3	10.4	0.0				8.8	0.0	11.8
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	1108	517	318	2907	0				1056	0	471
V/C Ratio(X)	0.00	0.85	1.30	0.86	0.46	0.00				0.52	0.00	0.66
Avail Cap(c_a), veh/h	0	1108	517	348	2991	0				1056	0	471
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	21.6	23.2	27.4	8.5	0.0				20.1	0.0	21.1
Incr Delay (d2), s/veh	0.0	6.4	148.2	18.1	0.1	0.0				1.8	0.0	7.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	9.2	30.9	6.6	4.8	0.0				4.6	0.0	6.0
LnGrp Delay(d),s/veh	0.0	27.9	171.4	45.5	8.7	0.0				21.9	0.0	28.2
LnGrp LOS		C	F	D	A					C		C
Approach Vol, veh/h		1612			1597						857	
Approach Delay, s/veh		87.8			15.0						24.2	
Approach LOS		F			B						C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs			3	4		6		8
Phs Duration (G+Y+Rc), s			16.9	27.0		25.0		43.9
Change Period (Y+Rc), s			4.5	4.5		4.5		4.5
Max Green Setting (Gmax), s			13.5	22.5		20.5		40.5
Max Q Clear Time (g_c+I1), s			12.3	24.5		13.8		12.4
Green Ext Time (p_c), s			0.1	0.0		2.0		11.6

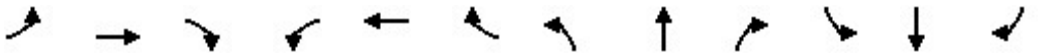
Intersection Summary	
HCM 2010 Ctrl Delay	45.8
HCM 2010 LOS	D

Notes



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		100	0		0	0		0	0		0
Storage Lanes	0		1	0		0	1		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.91	0.91	1.00	1.00	0.91	0.91	0.95	0.95	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt			0.850		0.998			0.907			0.884	
Flt Protected							0.950	0.982			0.993	
Satd. Flow (prot)	0	5085	1583	0	5075	0	1681	1576	0	0	1635	0
Flt Permitted		0.939					0.950	0.982			0.993	
Satd. Flow (perm)	0	4775	1583	0	5075	0	1681	1576	0	0	1635	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			371		2			109			87	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		148			3372			503			198	
Travel Time (s)		3.4			76.6			11.4			4.5	

Intersection Summary	
Area Type:	Other



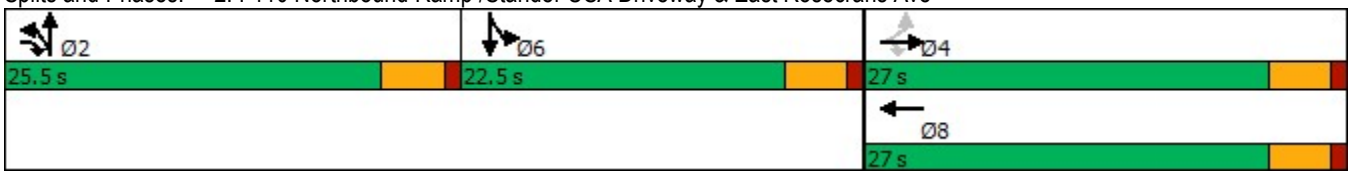
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	1	869	364	0	1338	14	482	6	207	2	0	12
Future Volume (vph)	1	869	364	0	1338	14	482	6	207	2	0	12
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	1	887	371	0	1365	14	492	6	211	2	0	12
Shared Lane Traffic (%)							25%					
Lane Group Flow (vph)	0	888	371	0	1379	0	369	340	0	0	14	0

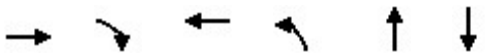
Intersection Summary

Lane Group	EBL	EBT	EBR	WBT	NBL	NBT	SBT
Lane Configurations							
Traffic Volume (vph)	1	869	364	1338	482	6	0
Future Volume (vph)	1	869	364	1338	482	6	0
Turn Type	Perm	NA	pm+ov	NA	Split	NA	NA
Protected Phases		4	2	8	2	2	6
Permitted Phases	4		4				
Detector Phase	4	4	2	8	2	2	6
Switch Phase							
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	27.0	27.0	25.5	27.0	25.5	25.5	22.5
Total Split (%)	36.0%	36.0%	34.0%	36.0%	34.0%	34.0%	30.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag							
Lead-Lag Optimize?							
Recall Mode	None	None	Max	None	Max	Max	Min
Act Effct Green (s)		22.5	48.0	22.5	21.0	21.0	5.5
Actuated g/C Ratio		0.36	0.77	0.36	0.34	0.34	0.09
v/c Ratio		0.52	0.29	0.75	0.65	0.57	0.06
Control Delay		17.0	0.8	20.8	24.2	15.6	0.6
Queue Delay		0.0	0.3	0.0	0.0	0.0	0.0
Total Delay		17.0	1.2	20.8	24.2	15.6	0.6
LOS		B	A	C	C	B	A
Approach Delay		12.4		20.8		20.1	0.6
Approach LOS		B		C		C	A

Intersection Summary	
Cycle Length: 75	
Actuated Cycle Length: 62.5	
Natural Cycle: 75	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.75	
Intersection Signal Delay: 17.4	Intersection LOS: B
Intersection Capacity Utilization 60.2%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 2: I-110 Northbound Ramp /Stander USA Driveway & East Rosecrans Ave





Lane Group	EBT	EBR	WBT	NBL	NBT	SBT
Lane Group Flow (vph)	888	371	1379	369	340	14
v/c Ratio	0.52	0.29	0.75	0.65	0.57	0.06
Control Delay	17.0	0.8	20.8	24.2	15.6	0.6
Queue Delay	0.0	0.3	0.0	0.0	0.0	0.0
Total Delay	17.0	1.2	20.8	24.2	15.6	0.6
Queue Length 50th (ft)	94	0	163	122	70	0
Queue Length 95th (ft)	128	12	213	211	148	0
Internal Link Dist (ft)	68		3292		423	118
Turn Bay Length (ft)		100				
Base Capacity (vph)	1719	1301	1828	564	601	532
Starvation Cap Reductn	0	465	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.52	0.44	0.75	0.65	0.57	0.03

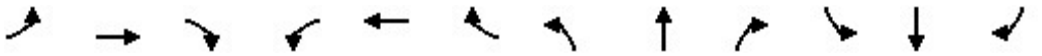
Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	869	364	0	1338	14	482	6	207	2	0	12
Future Volume (veh/h)	1	869	364	0	1338	14	482	6	207	2	0	12
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1863	1863	0	1863	1900	1863	1863	1900	1900	1863	1900
Adj Flow Rate, veh/h	1	887	371	0	1365	14	354	198	211	2	0	12
Adj No. of Lanes	0	3	1	0	3	0	1	1	0	0	1	0
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	2	2	2	0	2	2	2	2	2	2	2	2
Cap, veh/h	61	1686	1095	0	1770	18	622	290	309	19	0	115
Arrive On Green	0.34	0.34	0.34	0.00	0.34	0.34	0.35	0.35	0.35	0.08	0.00	0.08
Sat Flow, veh/h	1	4944	1583	0	5358	53	1774	827	881	230	0	1378
Grp Volume(v), veh/h	334	554	371	0	892	487	354	0	409	14	0	0
Grp Sat Flow(s),veh/h/ln	1860	1543	1583	0	1695	1853	1774	0	1707	1608	0	0
Q Serve(g_s), s	0.0	8.6	5.7	0.0	14.1	14.1	9.7	0.0	12.3	0.5	0.0	0.0
Cycle Q Clear(g_c), s	8.6	8.6	5.7	0.0	14.1	14.1	9.7	0.0	12.3	0.5	0.0	0.0
Prop In Lane	0.00		1.00	0.00		0.03	1.00		0.52	0.14		0.86
Lane Grp Cap(c), veh/h	694	1052	1095	0	1156	632	622	0	598	134	0	0
V/C Ratio(X)	0.48	0.53	0.34	0.00	0.77	0.77	0.57	0.00	0.68	0.10	0.00	0.00
Avail Cap(c_a), veh/h	758	1158	1149	0	1273	696	622	0	598	483	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	15.9	15.9	3.7	0.0	17.7	17.7	15.8	0.0	16.6	25.4	0.0	0.0
Incr Delay (d2), s/veh	0.5	0.4	0.2	0.0	2.7	4.9	3.8	0.0	6.2	0.3	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.5	3.7	5.3	0.0	7.0	8.0	5.4	0.0	6.7	0.2	0.0	0.0
LnGrp Delay(d),s/veh	16.4	16.3	3.9	0.0	20.4	22.5	19.6	0.0	22.9	25.7	0.0	0.0
LnGrp LOS	B	B	A		C	C	B		C	C		
Approach Vol, veh/h		1259			1379			763			14	
Approach Delay, s/veh		12.7			21.1			21.3			25.7	
Approach LOS		B			C			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		25.5		24.9		9.5		24.9
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5
Max Green Setting (Gmax), s		21.0		22.5		18.0		22.5
Max Q Clear Time (g_c+I1), s		14.3		10.6		2.5		16.1
Green Ext Time (p_c), s		2.2		5.6		0.0		4.3

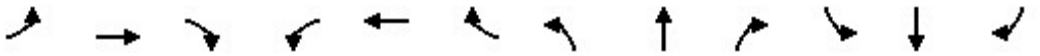
Intersection Summary	
HCM 2010 Ctrl Delay	18.1
HCM 2010 LOS	B

Notes



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	150		0	155		0	190		100	190		100
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.91	0.91	1.00	0.91	0.91	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor												
Frt		0.988			0.990				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	5024	0	1770	5034	0	1770	3539	1583	1770	3539	1583
Flt Permitted	0.195			0.361			0.517			0.573		
Satd. Flow (perm)	363	5024	0	672	5034	0	963	3539	1583	1067	3539	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		33			27				42			66
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		3372			2662			738			2100	
Travel Time (s)		76.6			60.5			16.8			47.7	

Intersection Summary	
Area Type:	Other



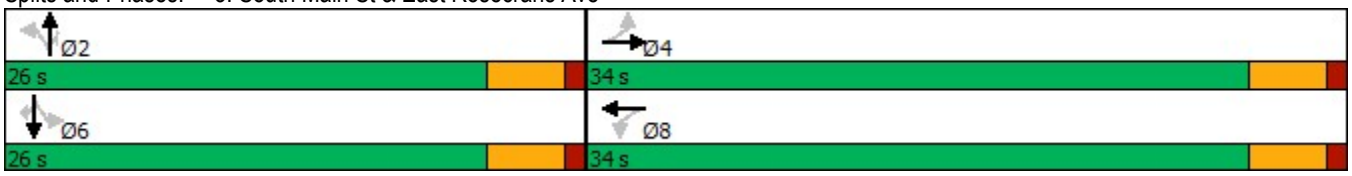
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	61	628	55	93	1000	73	59	284	41	48	386	77
Future Volume (vph)	61	628	55	93	1000	73	59	284	41	48	386	77
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	63	647	57	96	1031	75	61	293	42	49	398	79
Shared Lane Traffic (%)												
Lane Group Flow (vph)	63	704	0	96	1106	0	61	293	42	49	398	79

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	61	628	93	1000	59	284	41	48	386	77
Future Volume (vph)	61	628	93	1000	59	284	41	48	386	77
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4		8		2			6	
Permitted Phases	4		8		2		2	6		6
Detector Phase	4	4	8	8	2	2	2	6	6	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	34.0	34.0	34.0	34.0	26.0	26.0	26.0	26.0	26.0	26.0
Total Split (%)	56.7%	56.7%	56.7%	56.7%	43.3%	43.3%	43.3%	43.3%	43.3%	43.3%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag										
Lead-Lag Optimize?										
Recall Mode	None	None	None	None	Max	Max	Max	Max	Max	Max
Act Effct Green (s)	21.6	21.6	21.6	21.6	21.7	21.7	21.7	21.7	21.7	21.7
Actuated g/C Ratio	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41
v/c Ratio	0.42	0.34	0.35	0.53	0.15	0.20	0.06	0.11	0.27	0.11
Control Delay	20.3	10.1	14.0	11.9	13.0	11.6	5.0	12.5	12.0	5.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	20.3	10.1	14.0	11.9	13.0	11.6	5.0	12.5	12.0	5.4
LOS	C	B	B	B	B	B	A	B	B	A
Approach Delay		10.9		12.1		11.1			11.0	
Approach LOS		B		B		B			B	

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 52.4	
Natural Cycle: 50	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.53	
Intersection Signal Delay: 11.5	Intersection LOS: B
Intersection Capacity Utilization 54.9%	ICU Level of Service A
Analysis Period (min) 15	

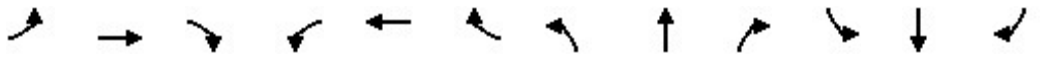
Splits and Phases: 3: South Main St & East Rosecrans Ave





Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	63	704	96	1106	61	293	42	49	398	79
v/c Ratio	0.42	0.34	0.35	0.53	0.15	0.20	0.06	0.11	0.27	0.11
Control Delay	20.3	10.1	14.0	11.9	13.0	11.6	5.0	12.5	12.0	5.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	20.3	10.1	14.0	11.9	13.0	11.6	5.0	12.5	12.0	5.4
Queue Length 50th (ft)	13	48	19	85	11	28	0	9	40	2
Queue Length 95th (ft)	43	68	48	115	39	62	17	32	83	26
Internal Link Dist (ft)		3292		2582		658			2020	
Turn Bay Length (ft)	150		155		190		100	190		100
Base Capacity (vph)	206	2874	382	2877	399	1468	681	443	1468	695
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.31	0.24	0.25	0.38	0.15	0.20	0.06	0.11	0.27	0.11

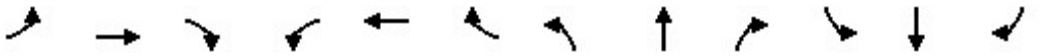
Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	61	628	55	93	1000	73	59	284	41	48	386	77
Future Volume (veh/h)	61	628	55	93	1000	73	59	284	41	48	386	77
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	63	647	57	96	1031	75	61	293	42	49	398	79
Adj No. of Lanes	1	3	0	1	3	0	1	2	1	1	2	1
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	262	1902	166	367	1933	140	462	1499	670	528	1499	670
Arrive On Green	0.40	0.40	0.40	0.40	0.40	0.40	0.42	0.42	0.42	0.42	0.42	0.42
Sat Flow, veh/h	508	4763	416	740	4839	352	914	3539	1583	1041	3539	1583
Grp Volume(v), veh/h	63	459	245	96	722	384	61	293	42	49	398	79
Grp Sat Flow(s),veh/h/ln	508	1695	1789	740	1695	1801	914	1770	1583	1041	1770	1583
Q Serve(g_s), s	5.5	4.8	4.8	5.3	8.3	8.3	2.4	2.6	0.8	1.6	3.7	1.5
Cycle Q Clear(g_c), s	13.8	4.8	4.8	10.1	8.3	8.3	6.1	2.6	0.8	4.2	3.7	1.5
Prop In Lane	1.00		0.23	1.00		0.20	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	262	1354	715	367	1354	719	462	1499	670	528	1499	670
V/C Ratio(X)	0.24	0.34	0.34	0.26	0.53	0.53	0.13	0.20	0.06	0.09	0.27	0.12
Avail Cap(c_a), veh/h	354	1970	1039	501	1970	1046	462	1499	670	528	1499	670
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	16.9	10.6	10.6	14.1	11.6	11.6	11.5	9.2	8.7	10.5	9.5	8.9
Incr Delay (d2), s/veh	0.5	0.1	0.3	0.4	0.3	0.6	0.6	0.3	0.2	0.3	0.4	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	2.3	2.4	1.1	3.9	4.2	0.7	1.3	0.4	0.5	1.9	0.7
LnGrp Delay(d),s/veh	17.4	10.7	10.9	14.5	12.0	12.3	12.1	9.5	8.9	10.9	9.9	9.2
LnGrp LOS	B	B	B	B	B	B	B	A	A	B	A	A
Approach Vol, veh/h		767			1202			396			526	
Approach Delay, s/veh		11.3			12.3			9.8			9.9	
Approach LOS		B			B			A			A	

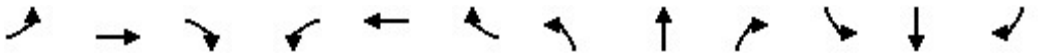
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		26.0		24.8		26.0		24.8
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5
Max Green Setting (Gmax), s		21.5		29.5		21.5		29.5
Max Q Clear Time (g_c+I1), s		8.1		15.8		6.2		12.1
Green Ext Time (p_c), s		1.9		4.5		2.7		7.8

Intersection Summary	
HCM 2010 Ctrl Delay	11.3
HCM 2010 LOS	B



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	105		105	80		100	100		0	100		100
Storage Lanes	1		1	1		1	1		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	0.95	1.00	0.95	1.00
Ped Bike Factor												
Frt			0.850			0.850		0.992				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1863	1583	1770	3539	1583	1770	3511	0	1770	3539	1583
Flt Permitted	0.536			0.649			0.378			0.405		
Satd. Flow (perm)	998	1863	1583	1209	3539	1583	704	3511	0	754	3539	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			89			76		13				121
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		774			575			2576			504	
Travel Time (s)		17.6			13.1			58.5			11.5	

Intersection Summary	
Area Type:	Other



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	87	156	81	48	322	69	105	555	30	42	632	110
Future Volume (vph)	87	156	81	48	322	69	105	555	30	42	632	110
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	96	171	89	53	354	76	115	610	33	46	695	121
Shared Lane Traffic (%)												
Lane Group Flow (vph)	96	171	89	53	354	76	115	643	0	46	695	121

Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	87	156	81	48	322	69	105	555	42	632	110
Future Volume (vph)	87	156	81	48	322	69	105	555	42	632	110
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm	NA	Perm
Protected Phases		4			8			2		6	
Permitted Phases	4		4	8		8	2		6		6
Detector Phase	4	4	4	8	8	8	2	2	6	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	25.0	25.0	25.0	25.0	25.0	25.0	35.0	35.0	35.0	35.0	35.0
Total Split (%)	41.7%	41.7%	41.7%	41.7%	41.7%	41.7%	58.3%	58.3%	58.3%	58.3%	58.3%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag											
Lead-Lag Optimize?											
Recall Mode	None	None	None	None	None	None	Max	Max	Max	Max	Max
Act Effct Green (s)	11.4	11.4	11.4	11.4	11.4	11.4	30.6	30.6	30.6	30.6	30.6
Actuated g/C Ratio	0.22	0.22	0.22	0.22	0.22	0.22	0.60	0.60	0.60	0.60	0.60
v/c Ratio	0.43	0.41	0.21	0.20	0.45	0.18	0.27	0.30	0.10	0.33	0.12
Control Delay	23.0	19.7	5.6	17.3	18.7	5.8	8.3	6.0	6.3	6.2	1.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.0	19.7	5.6	17.3	18.7	5.8	8.3	6.0	6.3	6.2	1.9
LOS	C	B	A	B	B	A	A	A	A	A	A
Approach Delay		17.1			16.5			6.3		5.6	
Approach LOS		B			B			A		A	

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 51.1	
Natural Cycle: 45	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.45	
Intersection Signal Delay: 9.6	Intersection LOS: A
Intersection Capacity Utilization 52.0%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 4: South Avalon Blvd & East 135th St





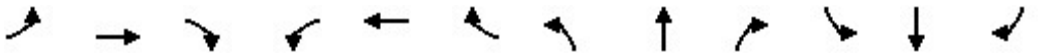
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	96	171	89	53	354	76	115	643	46	695	121
v/c Ratio	0.43	0.41	0.21	0.20	0.45	0.18	0.27	0.30	0.10	0.33	0.12
Control Delay	23.0	19.7	5.6	17.3	18.7	5.8	8.3	6.0	6.3	6.2	1.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.0	19.7	5.6	17.3	18.7	5.8	8.3	6.0	6.3	6.2	1.9
Queue Length 50th (ft)	25	44	0	13	47	0	13	40	5	44	0
Queue Length 95th (ft)	59	86	25	35	77	24	49	86	21	95	18
Internal Link Dist (ft)		694			495			2496		424	
Turn Bay Length (ft)	105		105	80		100	100		100		100
Base Capacity (vph)	401	750	690	487	1425	682	421	2109	452	2120	997
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.24	0.23	0.13	0.11	0.25	0.11	0.27	0.30	0.10	0.33	0.12

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	87	156	81	48	322	69	105	555	30	42	632	110
Future Volume (veh/h)	87	156	81	48	322	69	105	555	30	42	632	110
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	96	171	89	53	354	76	115	610	33	46	695	121
Adj No. of Lanes	1	1	1	1	2	1	1	2	0	1	2	1
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	287	447	380	320	849	380	463	2004	108	528	2077	929
Arrive On Green	0.24	0.24	0.24	0.24	0.24	0.24	0.59	0.59	0.59	0.59	0.59	0.59
Sat Flow, veh/h	954	1863	1583	1115	3539	1583	667	3415	185	784	3539	1583
Grp Volume(v), veh/h	96	171	89	53	354	76	115	316	327	46	695	121
Grp Sat Flow(s),veh/h/ln	954	1863	1583	1115	1770	1583	667	1770	1830	784	1770	1583
Q Serve(g_s), s	4.9	4.0	2.4	2.2	4.4	2.0	5.6	4.7	4.7	1.6	5.2	1.8
Cycle Q Clear(g_c), s	9.3	4.0	2.4	6.2	4.4	2.0	10.8	4.7	4.7	6.3	5.2	1.8
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.10	1.00		1.00
Lane Grp Cap(c), veh/h	287	447	380	320	849	380	463	1038	1074	528	2077	929
V/C Ratio(X)	0.33	0.38	0.23	0.17	0.42	0.20	0.25	0.30	0.30	0.09	0.33	0.13
Avail Cap(c_a), veh/h	434	735	625	493	1396	625	463	1038	1074	528	2077	929
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	20.6	16.5	15.9	19.1	16.7	15.8	8.3	5.4	5.4	7.0	5.5	4.8
Incr Delay (d2), s/veh	0.7	0.5	0.3	0.2	0.3	0.3	1.3	0.8	0.7	0.3	0.4	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.3	2.1	1.0	0.7	2.2	0.9	1.2	2.4	2.5	0.4	2.6	0.8
LnGrp Delay(d),s/veh	21.3	17.1	16.2	19.3	17.0	16.0	9.6	6.2	6.1	7.3	6.0	5.1
LnGrp LOS	C	B	B	B	B	B	A	A	A	A	A	A
Approach Vol, veh/h		356			483			758			862	
Approach Delay, s/veh		18.0			17.1			6.7			5.9	
Approach LOS		B			B			A			A	

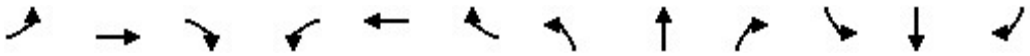
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		35.0		17.0		35.0		17.0
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5
Max Green Setting (Gmax), s		30.5		20.5		30.5		20.5
Max Q Clear Time (g_c+I1), s		12.8		11.3		8.3		8.2
Green Ext Time (p_c), s		4.7		1.2		5.7		2.2

Intersection Summary	
HCM 2010 Ctrl Delay	10.1
HCM 2010 LOS	B



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	220		0	200		0	110		110	120		100
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.91	0.91	1.00	0.91	0.91	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor												
Frt		0.980			0.984				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	4984	0	1770	5004	0	1770	3539	1583	1770	3539	1583
Flt Permitted	0.233			0.269			0.277			0.307		
Satd. Flow (perm)	434	4984	0	501	5004	0	516	3539	1583	572	3539	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		44			33				176			176
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		2662			498			439			2576	
Travel Time (s)		60.5			11.3			10.0			58.5	

Intersection Summary	
Area Type:	Other



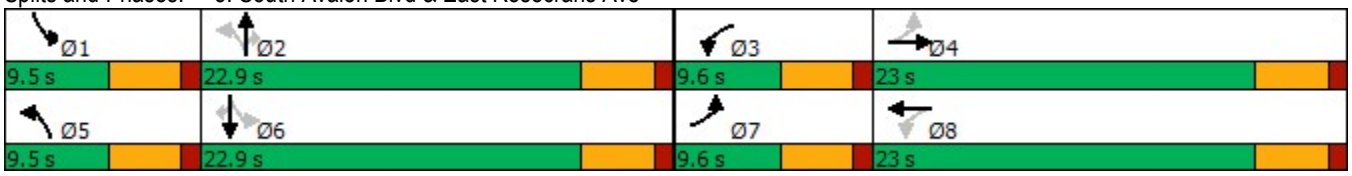
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	54	528	81	171	1067	131	111	530	129	141	566	93
Future Volume (vph)	54	528	81	171	1067	131	111	530	129	141	566	93
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	62	607	93	197	1226	151	128	609	148	162	651	107
Shared Lane Traffic (%)												
Lane Group Flow (vph)	62	700	0	197	1377	0	128	609	148	162	651	107

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	54	528	171	1067	111	530	129	141	566	93
Future Volume (vph)	54	528	171	1067	111	530	129	141	566	93
Turn Type	pm+pt	NA	pm+pt	NA	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4	3	8	5	2		1	6	
Permitted Phases	4		8		2		2	6		6
Detector Phase	7	4	3	8	5	2	2	1	6	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	9.5	22.5	9.5	22.5	22.5	9.5	22.5	22.5
Total Split (s)	9.6	23.0	9.6	23.0	9.5	22.9	22.9	9.5	22.9	22.9
Total Split (%)	14.8%	35.4%	14.8%	35.4%	14.6%	35.2%	35.2%	14.6%	35.2%	35.2%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	Max	Max	None	Max	Max
Act Effct Green (s)	20.3	15.2	22.4	19.6	22.5	18.7	18.7	22.5	18.7	18.7
Actuated g/C Ratio	0.34	0.25	0.37	0.33	0.38	0.31	0.31	0.38	0.31	0.31
v/c Ratio	0.24	0.54	0.66	0.83	0.43	0.55	0.24	0.51	0.59	0.17
Control Delay	13.5	19.9	27.0	26.3	16.3	20.9	3.6	18.5	21.5	1.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	13.5	19.9	27.0	26.3	16.3	20.9	3.6	18.5	21.5	1.6
LOS	B	B	C	C	B	C	A	B	C	A
Approach Delay		19.4		26.4		17.4			18.7	
Approach LOS		B		C		B			B	

Intersection Summary	
Cycle Length: 65	
Actuated Cycle Length: 60	
Natural Cycle: 65	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.83	
Intersection Signal Delay: 21.5	Intersection LOS: C
Intersection Capacity Utilization 65.2%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 5: South Avalon Blvd & East Rosecrans Ave

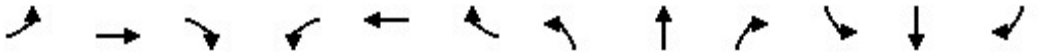




Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	62	700	197	1377	128	609	148	162	651	107
v/c Ratio	0.24	0.54	0.66	0.83	0.43	0.55	0.24	0.51	0.59	0.17
Control Delay	13.5	19.9	27.0	26.3	16.3	20.9	3.6	18.5	21.5	1.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	13.5	19.9	27.0	26.3	16.3	20.9	3.6	18.5	21.5	1.6
Queue Length 50th (ft)	14	78	48	190	30	108	0	39	118	0
Queue Length 95th (ft)	32	105	#103	#267	58	151	24	71	163	8
Internal Link Dist (ft)		2582		418		359			2496	
Turn Bay Length (ft)	220		200		110		110	120		100
Base Capacity (vph)	262	1594	297	1657	300	1104	615	316	1104	615
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.24	0.44	0.66	0.83	0.43	0.55	0.24	0.51	0.59	0.17

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	54	528	81	171	1067	131	111	530	129	141	566	93
Future Volume (veh/h)	54	528	81	171	1067	131	111	530	129	141	566	93
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	62	607	93	197	1226	151	128	609	148	162	651	107
Adj No. of Lanes	1	3	0	1	3	0	1	2	1	1	2	1
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	220	1177	178	366	1341	165	341	1031	461	356	1054	472
Arrive On Green	0.05	0.26	0.26	0.08	0.29	0.29	0.07	0.29	0.29	0.08	0.30	0.30
Sat Flow, veh/h	1774	4460	674	1774	4588	565	1774	3539	1583	1774	3539	1583
Grp Volume(v), veh/h	62	459	241	197	906	471	128	609	148	162	651	107
Grp Sat Flow(s),veh/h/ln	1774	1695	1744	1774	1695	1763	1774	1770	1583	1774	1770	1583
Q Serve(g_s), s	1.6	7.3	7.4	5.1	16.3	16.3	3.1	9.3	4.6	4.0	10.0	3.2
Cycle Q Clear(g_c), s	1.6	7.3	7.4	5.1	16.3	16.3	3.1	9.3	4.6	4.0	10.0	3.2
Prop In Lane	1.00		0.39	1.00		0.32	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	220	895	460	366	991	515	341	1031	461	356	1054	472
V/C Ratio(X)	0.28	0.51	0.52	0.54	0.91	0.91	0.38	0.59	0.32	0.46	0.62	0.23
Avail Cap(c_a), veh/h	271	993	511	366	993	516	353	1031	461	356	1054	472
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	17.3	19.8	19.9	15.9	21.6	21.6	14.7	19.2	17.5	14.7	19.1	16.7
Incr Delay (d2), s/veh	0.7	0.5	0.9	1.6	12.6	20.9	0.7	2.5	1.8	0.9	2.7	1.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	3.4	3.7	2.6	9.3	10.8	1.6	4.8	2.2	2.0	5.3	1.5
LnGrp Delay(d),s/veh	18.0	20.3	20.8	17.5	34.2	42.5	15.4	21.7	19.3	15.6	21.8	17.8
LnGrp LOS	B	C	C	B	C	D	B	C	B	B	C	B
Approach Vol, veh/h		762			1574			885			920	
Approach Delay, s/veh		20.2			34.6			20.4			20.2	
Approach LOS		C			C			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.5	22.9	9.6	21.2	9.1	23.3	7.8	23.0
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	5.0	18.4	5.1	18.5	5.0	18.4	5.1	18.5
Max Q Clear Time (g_c+I1), s	6.0	11.3	7.1	9.4	5.1	12.0	3.6	18.3
Green Ext Time (p_c), s	0.0	2.6	0.0	3.0	0.0	2.5	0.0	0.2

Intersection Summary	
HCM 2010 Ctrl Delay	25.7
HCM 2010 LOS	C



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%		0%			0%
Storage Length (ft)	0	0		100	100	
Storage Lanes	0	1		1	1	
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	1.00	0.95	1.00	1.00	0.95
Ped Bike Factor						
Frt						
Flt Protected						
Satd. Flow (prot)	0	1863	3539	1863	1863	3539
Flt Permitted						
Satd. Flow (perm)	0	1863	3539	1863	1863	3539
Link Speed (mph)	30		30			30
Link Distance (ft)	196		2086			439
Travel Time (s)	4.5		47.4			10.0

Intersection Summary	
Area Type:	Other



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Volume (vph)	0	0	807	0	0	818
Future Volume (vph)	0	0	807	0	0	818
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%		0%			0%
Adj. Flow (vph)	0	0	877	0	0	889
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	877	0	0	889

Intersection Summary

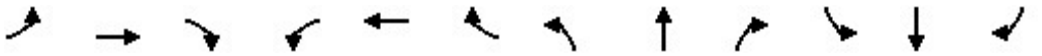
Intersection	
Int Delay, s/veh	0

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	0	807	0	0	818
Future Vol, veh/h	0	0	807	0	0	818
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	100	100	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	0	877	0	0	889

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	-	439	0	0	877	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.94	-	-	4.14	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.32	-	-	2.22	-
Pot Cap-1 Maneuver	0	566	-	-	766	-
Stage 1	0	-	-	-	-	-
Stage 2	0	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	-	566	-	-	766	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

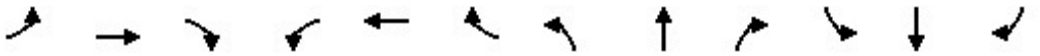
Approach	WB	NB	SB
HCM Control Delay, s	0	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	-	766	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s)	-	-	0	0	-
HCM Lane LOS	-	-	A	A	-
HCM 95th %tile Q(veh)	-	-	-	0	-



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	155		0	150		0	110		100	115		100
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor												
Frt		0.975			0.963				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3451	0	1770	3408	0	1770	3539	1583	1770	3539	1583
Flt Permitted	0.335			0.651			0.319			0.345		
Satd. Flow (perm)	624	3451	0	1213	3408	0	594	3539	1583	643	3539	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		27			86				70			27
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		972			474			575			2086	
Travel Time (s)		22.1			10.8			13.1			47.4	

Intersection Summary	
Area Type:	Other



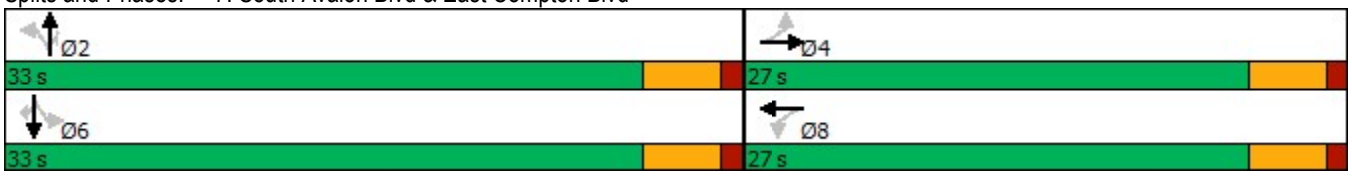
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	27	116	24	73	385	128	47	652	62	65	700	24
Future Volume (vph)	27	116	24	73	385	128	47	652	62	65	700	24
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	31	132	27	83	438	145	53	741	70	74	795	27
Shared Lane Traffic (%)												
Lane Group Flow (vph)	31	159	0	83	583	0	53	741	70	74	795	27

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	27	116	73	385	47	652	62	65	700	24
Future Volume (vph)	27	116	73	385	47	652	62	65	700	24
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4		8		2			6	
Permitted Phases	4		8		2		2	6		6
Detector Phase	4	4	8	8	2	2	2	6	6	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	27.0	27.0	27.0	27.0	33.0	33.0	33.0	33.0	33.0	33.0
Total Split (%)	45.0%	45.0%	45.0%	45.0%	55.0%	55.0%	55.0%	55.0%	55.0%	55.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag										
Lead-Lag Optimize?										
Recall Mode	None	None	None	None	Max	Max	Max	Max	Max	Max
Act Effct Green (s)	14.4	14.4	14.4	14.4	28.7	28.7	28.7	28.7	28.7	28.7
Actuated g/C Ratio	0.28	0.28	0.28	0.28	0.55	0.55	0.55	0.55	0.55	0.55
v/c Ratio	0.18	0.16	0.25	0.58	0.16	0.38	0.08	0.21	0.41	0.03
Control Delay	16.3	11.8	16.0	15.9	9.0	8.2	2.7	9.4	8.4	3.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	16.3	11.8	16.0	15.9	9.0	8.2	2.7	9.4	8.4	3.5
LOS	B	B	B	B	A	A	A	A	A	A
Approach Delay		12.5		15.9		7.8			8.3	
Approach LOS		B		B		A			A	

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 52.2	
Natural Cycle: 45	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.58	
Intersection Signal Delay: 10.4	Intersection LOS: B
Intersection Capacity Utilization 57.4%	ICU Level of Service B
Analysis Period (min) 15	

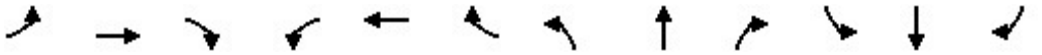
Splits and Phases: 7: South Avalon Blvd & East Compton Blvd





Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	31	159	83	583	53	741	70	74	795	27
v/c Ratio	0.18	0.16	0.25	0.58	0.16	0.38	0.08	0.21	0.41	0.03
Control Delay	16.3	11.8	16.0	15.9	9.0	8.2	2.7	9.4	8.4	3.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	16.3	11.8	16.0	15.9	9.0	8.2	2.7	9.4	8.4	3.5
Queue Length 50th (ft)	7	15	20	66	7	60	0	10	65	0
Queue Length 95th (ft)	23	32	45	102	27	115	15	36	125	10
Internal Link Dist (ft)		892		394		495			2006	
Turn Bay Length (ft)	155		150		110		100	115		100
Base Capacity (vph)	271	1513	526	1528	326	1946	902	353	1946	882
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.11	0.11	0.16	0.38	0.16	0.38	0.08	0.21	0.41	0.03

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	27	116	24	73	385	128	47	652	62	65	700	24
Future Volume (veh/h)	27	116	24	73	385	128	47	652	62	65	700	24
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	31	132	27	83	438	145	53	741	70	74	795	27
Adj No. of Lanes	1	2	0	1	2	0	1	2	1	1	2	1
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	229	751	150	411	669	219	435	2003	896	445	2003	896
Arrive On Green	0.26	0.26	0.26	0.26	0.26	0.26	0.57	0.57	0.57	0.57	0.57	0.57
Sat Flow, veh/h	828	2941	588	1222	2621	860	663	3539	1583	670	3539	1583
Grp Volume(v), veh/h	31	78	81	83	294	289	53	741	70	74	795	27
Grp Sat Flow(s),veh/h/ln	828	1770	1759	1222	1770	1711	663	1770	1583	670	1770	1583
Q Serve(g_s), s	1.8	1.7	1.8	2.9	7.5	7.6	2.4	5.8	1.0	3.4	6.3	0.4
Cycle Q Clear(g_c), s	9.4	1.7	1.8	4.7	7.5	7.6	8.8	5.8	1.0	9.2	6.3	0.4
Prop In Lane	1.00		0.33	1.00		0.50	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	229	452	449	411	452	437	435	2003	896	445	2003	896
V/C Ratio(X)	0.14	0.17	0.18	0.20	0.65	0.66	0.12	0.37	0.08	0.17	0.40	0.03
Avail Cap(c_a), veh/h	388	791	786	645	791	765	435	2003	896	445	2003	896
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	21.0	14.6	14.6	16.5	16.8	16.8	8.6	6.0	5.0	8.5	6.1	4.8
Incr Delay (d2), s/veh	0.3	0.2	0.2	0.2	1.6	1.7	0.6	0.5	0.2	0.8	0.6	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.9	0.9	1.0	3.8	3.7	0.5	2.9	0.5	0.7	3.1	0.2
LnGrp Delay(d),s/veh	21.3	14.8	14.8	16.7	18.4	18.5	9.1	6.5	5.1	9.3	6.7	4.9
LnGrp LOS	C	B	B	B	B	B	A	A	A	A	A	A
Approach Vol, veh/h		190			666			864			896	
Approach Delay, s/veh		15.9			18.2			6.6			6.9	
Approach LOS		B			B			A			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		33.0		17.3		33.0		17.3
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5
Max Green Setting (Gmax), s		28.5		22.5		28.5		22.5
Max Q Clear Time (g_c+I1), s		10.8		11.4		11.2		9.6
Green Ext Time (p_c), s		5.6		0.7		6.0		3.2

Intersection Summary	
HCM 2010 Ctrl Delay	10.3
HCM 2010 LOS	B



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)		0	100		0	0
Storage Lanes		0	1		1	0
Taper Length (ft)			25		25	
Lane Util. Factor	0.91	0.91	1.00	0.91	1.00	1.00
Ped Bike Factor						
Frt						
Flt Protected						
Satd. Flow (prot)	5085	0	1863	5085	1863	0
Flt Permitted						
Satd. Flow (perm)	5085	0	1863	5085	1863	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	498			189	111	
Travel Time (s)	11.3			4.3	2.5	

Intersection Summary	
Area Type:	Other



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Traffic Volume (vph)	797	0	0	1369	0	0
Future Volume (vph)	797	0	0	1369	0	0
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Adj. Flow (vph)	866	0	0	1488	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	866	0	0	1488	0	0

Intersection Summary

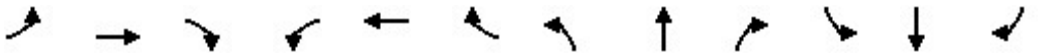
Intersection	
Int Delay, s/veh	0

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	797	0	0	1369	0	0
Future Vol, veh/h	797	0	0	1369	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	100	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	866	0	0	1488	0	0

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	866	0	1461	433
Stage 1	-	-	-	-	866	-
Stage 2	-	-	-	-	595	-
Critical Hdwy	-	-	5.34	-	5.74	7.14
Critical Hdwy Stg 1	-	-	-	-	6.64	-
Critical Hdwy Stg 2	-	-	-	-	6.04	-
Follow-up Hdwy	-	-	3.12	-	3.82	3.92
Pot Cap-1 Maneuver	-	-	454	-	181	488
Stage 1	-	-	-	-	292	-
Stage 2	-	-	-	-	468	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	454	-	181	488
Mov Cap-2 Maneuver	-	-	-	-	238	-
Stage 1	-	-	-	-	292	-
Stage 2	-	-	-	-	468	-

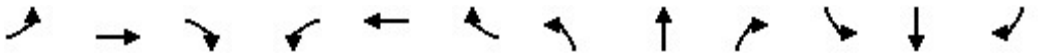
Approach	EB	WB	NB
HCM Control Delay, s	0	0	0
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	-	-	-	454	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s)	0	-	-	0	-
HCM Lane LOS	A	-	-	A	-
HCM 95th %tile Q(veh)	-	-	-	0	-



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	275		0	0		0	150		150
Storage Lanes	0		0	1		0	0		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.91	0.91	1.00	0.91	1.00	1.00	1.00	1.00	0.95	0.91	0.95
Ped Bike Factor												
Frt		0.964									0.949	0.850
Flt Protected				0.950						0.950	0.970	
Satd. Flow (prot)	0	4902	0	1770	5085	0	0	0	0	1681	1560	1504
Flt Permitted				0.950						0.950	0.970	
Satd. Flow (perm)	0	4902	0	1770	5085	0	0	0	0	1681	1560	1504
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		109									28	73
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		508			258			584			534	
Travel Time (s)		11.5			5.9			13.3			12.1	

Intersection Summary	
Area Type:	Other



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	0	1421	449	234	1069	0	0	0	0	598	12	459
Future Volume (vph)	0	1421	449	234	1069	0	0	0	0	598	12	459
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	0	1692	535	279	1273	0	0	0	0	712	14	546
Shared Lane Traffic (%)										38%		27%
Lane Group Flow (vph)	0	2227	0	279	1273	0	0	0	0	441	432	399

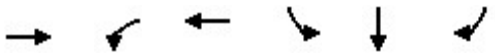
Intersection Summary

Lane Group	EBT	WBL	WBT	SBL	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	1421	234	1069	598	12	459
Future Volume (vph)	1421	234	1069	598	12	459
Turn Type	NA	Prot	NA	Split	NA	Perm
Protected Phases	4	3	8	6	6	
Permitted Phases						6
Detector Phase	4	3	8	6	6	6
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	9.5	22.5	22.5	22.5	22.5
Total Split (s)	42.0	19.0	61.0	29.0	29.0	29.0
Total Split (%)	46.7%	21.1%	67.8%	32.2%	32.2%	32.2%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lag	Lead				
Lead-Lag Optimize?	Yes	Yes				
Recall Mode	None	None	None	Max	Max	Max
Act Effct Green (s)	37.5	14.5	56.5	24.5	24.5	24.5
Actuated g/C Ratio	0.42	0.16	0.63	0.27	0.27	0.27
v/c Ratio	1.06	0.98	0.40	0.96	0.97	0.86
Control Delay	62.7	88.2	8.8	68.5	68.3	45.7
Queue Delay	0.0	3.2	2.1	0.0	0.0	0.0
Total Delay	62.7	91.4	10.9	68.5	68.3	45.7
LOS	E	F	B	E	E	D
Approach Delay	62.7		25.4		61.3	
Approach LOS	E		C		E	

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Natural Cycle: 90	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.06	
Intersection Signal Delay: 50.9	Intersection LOS: D
Intersection Capacity Utilization 104.5%	ICU Level of Service G
Analysis Period (min) 15	

Splits and Phases: 1: I-110-Southbound Ramps & East Rosecrans Ave



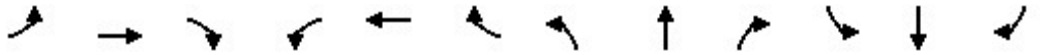


Lane Group	EBT	WBL	WBT	SBL	SBT	SBR
Lane Group Flow (vph)	2227	279	1273	441	432	399
v/c Ratio	1.06	0.98	0.40	0.96	0.97	0.86
Control Delay	62.7	88.2	8.8	68.5	68.3	45.7
Queue Delay	0.0	3.2	2.1	0.0	0.0	0.0
Total Delay	62.7	91.4	10.9	68.5	68.3	45.7
Queue Length 50th (ft)	~500	160	118	260	251	188
Queue Length 95th (ft)	#525	#285	132	#409	#410	#316
Internal Link Dist (ft)	428		178		454	
Turn Bay Length (ft)		275		150		150
Base Capacity (vph)	2106	285	3192	457	445	462
Starvation Cap Reductn	0	4	1717	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	1.06	0.99	0.86	0.96	0.97	0.86

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

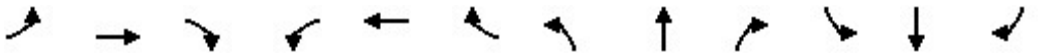


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	1421	449	234	1069	0	0	0	0	598	12	459
Future Volume (veh/h)	0	1421	449	234	1069	0	0	0	0	598	12	459
Number	7	4	14	3	8	18				1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1863	1900	1863	1863	0				1863	1863	1863
Adj Flow Rate, veh/h	0	1692	535	279	1273	0				888	0	369
Adj No. of Lanes	0	3	0	1	3	0				2	0	1
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84				0.84	0.84	0.84
Percent Heavy Veh, %	0	2	2	2	2	0				2	2	2
Cap, veh/h	0	1607	494	286	3192	0				966	0	431
Arrive On Green	0.00	0.42	0.42	0.16	0.63	0.00				0.27	0.00	0.27
Sat Flow, veh/h	0	4025	1186	1774	5253	0				3548	0	1583
Grp Volume(v), veh/h	0	1481	746	279	1273	0				888	0	369
Grp Sat Flow(s),veh/h/ln	0	1695	1653	1774	1695	0				1774	0	1583
Q Serve(g_s), s	0.0	37.5	37.5	14.1	11.2	0.0				21.9	0.0	19.9
Cycle Q Clear(g_c), s	0.0	37.5	37.5	14.1	11.2	0.0				21.9	0.0	19.9
Prop In Lane	0.00		0.72	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	1413	689	286	3192	0				966	0	431
V/C Ratio(X)	0.00	1.05	1.08	0.98	0.40	0.00				0.92	0.00	0.86
Avail Cap(c_a), veh/h	0	1413	689	286	3192	0				966	0	431
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	26.3	26.3	37.6	8.3	0.0				31.8	0.0	31.1
Incr Delay (d2), s/veh	0.0	37.8	58.7	46.5	0.1	0.0				15.0	0.0	19.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	24.9	28.3	10.6	5.2	0.0				12.7	0.0	11.0
LnGrp Delay(d),s/veh	0.0	64.1	85.0	84.1	8.4	0.0				46.8	0.0	50.2
LnGrp LOS		F	F	F	A					D		D
Approach Vol, veh/h		2227			1552						1257	
Approach Delay, s/veh		71.1			22.0						47.8	
Approach LOS		E			C						D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs			3	4		6		8
Phs Duration (G+Y+Rc), s			19.0	42.0		29.0		61.0
Change Period (Y+Rc), s			4.5	4.5		4.5		4.5
Max Green Setting (Gmax), s			14.5	37.5		24.5		56.5
Max Q Clear Time (g_c+I1), s			16.1	39.5		23.9		13.2
Green Ext Time (p_c), s			0.0	0.0		0.4		12.7

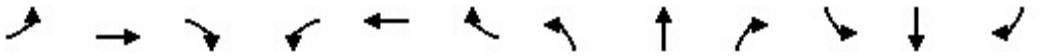
Intersection Summary	
HCM 2010 Ctrl Delay	50.1
HCM 2010 LOS	D

Notes



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		100	0		0	0		0	0		0
Storage Lanes	0		1	0		0	1		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.91	0.91	1.00	1.00	0.91	0.91	0.95	0.95	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt			0.850		0.998			0.874			0.873	
Flt Protected							0.950	0.993			0.997	
Satd. Flow (prot)	0	5085	1583	0	5075	0	1681	1536	0	0	1621	0
Flt Permitted		0.939					0.950	0.993			0.997	
Satd. Flow (perm)	0	4775	1583	0	5075	0	1681	1536	0	0	1621	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			404		2			213			87	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		148			3372			503			198	
Travel Time (s)		3.4			76.6			11.4			4.5	

Intersection Summary	
Area Type:	Other



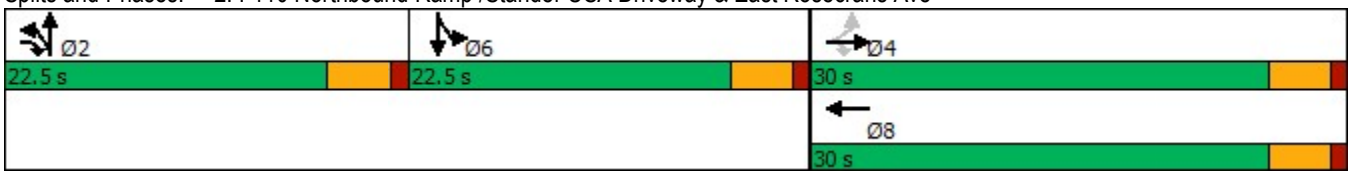
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	1	1496	380	0	1563	19	301	3	200	2	0	29
Future Volume (vph)	1	1496	380	0	1563	19	301	3	200	2	0	29
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	1	1591	404	0	1663	20	320	3	213	2	0	31
Shared Lane Traffic (%)							12%					
Lane Group Flow (vph)	0	1592	404	0	1683	0	282	254	0	0	33	0

Intersection Summary

Lane Group	EBL	EBT	EBR	WBT	NBL	NBT	SBT
Lane Configurations							
Traffic Volume (vph)	1	1496	380	1563	301	3	0
Future Volume (vph)	1	1496	380	1563	301	3	0
Turn Type	Perm	NA	pm+ov	NA	Split	NA	NA
Protected Phases		4	2	8	2	2	6
Permitted Phases	4		4				
Detector Phase	4	4	2	8	2	2	6
Switch Phase							
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	30.0	30.0	22.5	30.0	22.5	22.5	22.5
Total Split (%)	40.0%	40.0%	30.0%	40.0%	30.0%	30.0%	30.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag							
Lead-Lag Optimize?							
Recall Mode	None	None	Max	None	Max	Max	Min
Act Effct Green (s)		25.5	48.0	25.5	18.0	18.0	5.5
Actuated g/C Ratio		0.41	0.77	0.41	0.29	0.29	0.09
v/c Ratio		0.82	0.31	0.81	0.58	0.43	0.15
Control Delay		20.8	0.9	20.3	24.8	7.1	1.7
Queue Delay		0.9	0.4	0.0	0.0	0.0	0.0
Total Delay		21.7	1.3	20.3	24.8	7.1	1.7
LOS		C	A	C	C	A	A
Approach Delay		17.6		20.3		16.4	1.7
Approach LOS		B		C		B	A

Intersection Summary	
Cycle Length: 75	
Actuated Cycle Length: 62.5	
Natural Cycle: 75	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.82	
Intersection Signal Delay: 18.4	Intersection LOS: B
Intersection Capacity Utilization 59.3%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 2: I-110 Northbound Ramp /Stander USA Driveway & East Rosecrans Ave



Lane Group	EBT	EBR	WBT	NBL	NBT	SBT
Lane Group Flow (vph)	1592	404	1683	282	254	33
v/c Ratio	0.82	0.31	0.81	0.58	0.43	0.15
Control Delay	20.8	0.9	20.3	24.8	7.1	1.7
Queue Delay	0.9	0.4	0.0	0.0	0.0	0.0
Total Delay	21.7	1.3	20.3	24.8	7.1	1.7
Queue Length 50th (ft)	188	0	198	95	11	0
Queue Length 95th (ft)	245	12	254	169	63	3
Internal Link Dist (ft)	68		3292		423	118
Turn Bay Length (ft)		100				
Base Capacity (vph)	1948	1309	2071	484	594	528
Starvation Cap Reductn	142	450	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.88	0.47	0.81	0.58	0.43	0.06

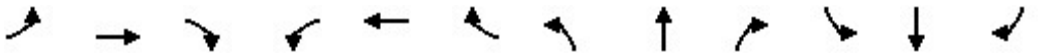
Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	1496	380	0	1563	19	301	3	200	2	0	29
Future Volume (veh/h)	1	1496	380	0	1563	19	301	3	200	2	0	29
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1863	1863	0	1863	1900	1863	1863	1900	1900	1863	1900
Adj Flow Rate, veh/h	1	1591	404	0	1663	20	268	76	213	2	0	31
Adj No. of Lanes	0	3	1	0	3	0	1	1	0	0	1	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	0	2	2	2	2	2	2	2	2
Cap, veh/h	59	1979	1102	0	2072	25	525	128	359	8	0	123
Arrive On Green	0.40	0.40	0.40	0.00	0.40	0.40	0.30	0.30	0.30	0.08	0.00	0.08
Sat Flow, veh/h	0	4945	1583	0	5347	62	1774	433	1215	97	0	1497
Grp Volume(v), veh/h	599	993	404	0	1088	595	268	0	289	33	0	0
Grp Sat Flow(s),veh/h/ln	1861	1543	1583	0	1695	1852	1774	0	1648	1594	0	0
Q Serve(g_s), s	0.0	17.3	6.3	0.0	17.3	17.3	7.6	0.0	9.1	1.2	0.0	0.0
Cycle Q Clear(g_c), s	17.3	17.3	6.3	0.0	17.3	17.3	7.6	0.0	9.1	1.2	0.0	0.0
Prop In Lane	0.00		1.00	0.00		0.03	1.00		0.74	0.06		0.94
Lane Grp Cap(c), veh/h	804	1234	1102	0	1356	741	525	0	488	131	0	0
V/C Ratio(X)	0.75	0.80	0.37	0.00	0.80	0.80	0.51	0.00	0.59	0.25	0.00	0.00
Avail Cap(c_a), veh/h	839	1293	1132	0	1421	776	525	0	488	471	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	16.1	16.1	3.8	0.0	16.1	16.1	17.8	0.0	18.3	26.2	0.0	0.0
Incr Delay (d2), s/veh	3.5	3.7	0.2	0.0	3.3	5.9	3.5	0.0	5.2	1.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	9.6	7.9	5.4	0.0	8.6	10.0	4.2	0.0	4.8	0.6	0.0	0.0
LnGrp Delay(d),s/veh	19.6	19.8	4.0	0.0	19.4	22.0	21.3	0.0	23.5	27.2	0.0	0.0
LnGrp LOS	B	B	A		B	C	C		C	C		
Approach Vol, veh/h		1996			1683			557			33	
Approach Delay, s/veh		16.6			20.3			22.4			27.2	
Approach LOS		B			C			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		22.5		28.8		9.5		28.8
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5
Max Green Setting (Gmax), s		18.0		25.5		18.0		25.5
Max Q Clear Time (g_c+I1), s		11.1		19.3		3.2		19.3
Green Ext Time (p_c), s		1.6		5.0		0.1		4.9

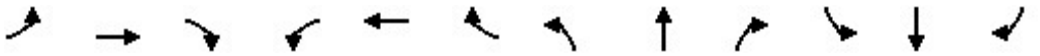
Intersection Summary	
HCM 2010 Ctrl Delay	18.9
HCM 2010 LOS	B

Notes



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	150		0	155		0	190		100	190		100
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.91	0.91	1.00	0.91	0.91	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor												
Frt		0.991			0.990				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	5040	0	1770	5034	0	1770	3539	1583	1770	3539	1583
Flt Permitted	0.292			0.136			0.554			0.380		
Satd. Flow (perm)	544	5040	0	253	5034	0	1032	3539	1583	708	3539	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		25			28				27			52
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		3372			2662			738			2100	
Travel Time (s)		76.6			60.5			16.8			47.7	

Intersection Summary	
Area Type:	Other



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	105	1424	88	67	781	54	118	514	105	69	307	49
Future Volume (vph)	105	1424	88	67	781	54	118	514	105	69	307	49
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	112	1515	94	71	831	57	126	547	112	73	327	52
Shared Lane Traffic (%)												
Lane Group Flow (vph)	112	1609	0	71	888	0	126	547	112	73	327	52

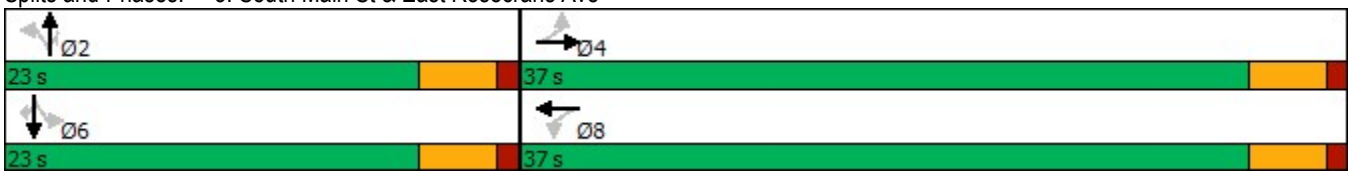
Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	105	1424	67	781	118	514	105	69	307	49
Future Volume (vph)	105	1424	67	781	118	514	105	69	307	49
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4		8		2			6	
Permitted Phases	4		8		2		2	6		6
Detector Phase	4	4	8	8	2	2	2	6	6	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	37.0	37.0	37.0	37.0	23.0	23.0	23.0	23.0	23.0	23.0
Total Split (%)	61.7%	61.7%	61.7%	61.7%	38.3%	38.3%	38.3%	38.3%	38.3%	38.3%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag										
Lead-Lag Optimize?										
Recall Mode	None	None	None	None	Max	Max	Max	Max	Max	Max
Act Effct Green (s)	29.5	29.5	29.5	29.5	18.6	18.6	18.6	18.6	18.6	18.6
Actuated g/C Ratio	0.52	0.52	0.52	0.52	0.33	0.33	0.33	0.33	0.33	0.33
v/c Ratio	0.40	0.62	0.55	0.34	0.38	0.48	0.21	0.32	0.28	0.09
Control Delay	13.3	10.7	29.0	8.1	20.3	17.8	13.5	20.7	16.0	5.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	13.3	10.7	29.0	8.1	20.3	17.8	13.5	20.7	16.0	5.7
LOS	B	B	C	A	C	B	B	C	B	A
Approach Delay		10.8		9.6		17.6			15.6	
Approach LOS		B		A		B			B	

Intersection Summary

Cycle Length: 60
Actuated Cycle Length: 57.2
Natural Cycle: 60
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.62
Intersection Signal Delay: 12.4 — Intersection LOS: B
Intersection Capacity Utilization 67.0% — ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 3: South Main St & East Rosecrans Ave





Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	112	1609	71	888	126	547	112	73	327	52
v/c Ratio	0.40	0.62	0.55	0.34	0.38	0.48	0.21	0.32	0.28	0.09
Control Delay	13.3	10.7	29.0	8.1	20.3	17.8	13.5	20.7	16.0	5.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	13.3	10.7	29.0	8.1	20.3	17.8	13.5	20.7	16.0	5.7
Queue Length 50th (ft)	21	126	15	56	35	83	22	20	46	0
Queue Length 95th (ft)	56	165	#71	78	78	125	55	53	75	20
Internal Link Dist (ft)		3292		2582		658			2020	
Turn Bay Length (ft)	150		155		190		100	190		100
Base Capacity (vph)	310	2891	144	2889	336	1151	533	230	1151	550
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.36	0.56	0.49	0.31	0.38	0.48	0.21	0.32	0.28	0.09

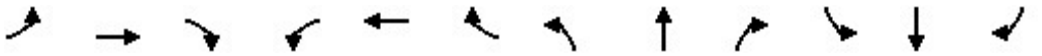
Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	105	1424	88	67	781	54	118	514	105	69	307	49
Future Volume (veh/h)	105	1424	88	67	781	54	118	514	105	69	307	49
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	112	1515	94	71	831	57	126	547	112	73	327	52
Adj No. of Lanes	1	3	0	1	3	0	1	2	1	1	2	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	387	2537	157	221	2520	172	381	1147	513	281	1147	513
Arrive On Green	0.52	0.52	0.52	0.52	0.52	0.52	0.32	0.32	0.32	0.32	0.32	0.32
Sat Flow, veh/h	623	4896	304	314	4862	332	1000	3539	1583	772	3539	1583
Grp Volume(v), veh/h	112	1049	560	71	579	309	126	547	112	73	327	52
Grp Sat Flow(s),veh/h/ln	623	1695	1809	314	1695	1804	1000	1770	1583	772	1770	1583
Q Serve(g_s), s	7.3	12.3	12.3	11.6	5.7	5.7	6.1	7.1	2.9	4.8	3.9	1.3
Cycle Q Clear(g_c), s	13.0	12.3	12.3	24.0	5.7	5.7	10.1	7.1	2.9	11.8	3.9	1.3
Prop In Lane	1.00		0.17	1.00		0.18	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	387	1757	938	221	1757	935	381	1147	513	281	1147	513
V/C Ratio(X)	0.29	0.60	0.60	0.32	0.33	0.33	0.33	0.48	0.22	0.26	0.29	0.10
Avail Cap(c_a), veh/h	419	1930	1030	237	1930	1027	381	1147	513	281	1147	513
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	11.8	9.6	9.6	18.0	8.0	8.0	18.1	15.4	14.0	20.2	14.4	13.5
Incr Delay (d2), s/veh	0.4	0.4	0.8	0.8	0.1	0.2	2.3	1.4	1.0	2.2	0.6	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.3	5.8	6.3	1.1	2.6	2.8	1.9	3.6	1.4	1.2	2.0	0.6
LnGrp Delay(d),s/veh	12.2	10.0	10.4	18.8	8.1	8.2	20.4	16.8	15.0	22.4	15.0	13.9
LnGrp LOS	B	B	B	B	A	A	C	B	B	C	B	B
Approach Vol, veh/h		1721			959			785			452	
Approach Delay, s/veh		10.3			8.9			17.2			16.1	
Approach LOS		B			A			B			B	

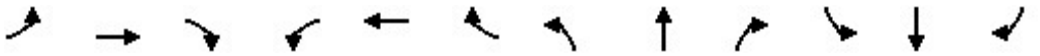
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		23.0		34.1		23.0		34.1
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5
Max Green Setting (Gmax), s		18.5		32.5		18.5		32.5
Max Q Clear Time (g_c+I1), s		12.1		15.0		13.8		26.0
Green Ext Time (p_c), s		2.5		11.4		1.2		3.6

Intersection Summary	
HCM 2010 Ctrl Delay	12.0
HCM 2010 LOS	B



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	105		105	80		100	100		0	100		100
Storage Lanes	1		1	1		1	1		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	0.95	1.00	0.95	1.00
Ped Bike Factor												
Frt			0.850			0.850		0.989				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1863	1583	1770	3539	1583	1770	3500	0	1770	3539	1583
Flt Permitted	0.652			0.199			0.382			0.215		
Satd. Flow (perm)	1215	1863	1583	371	3539	1583	712	3500	0	400	3539	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			130			74		18				76
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		774			575			2576			504	
Travel Time (s)		17.6			13.1			58.5			11.5	

Intersection Summary	
Area Type:	Other



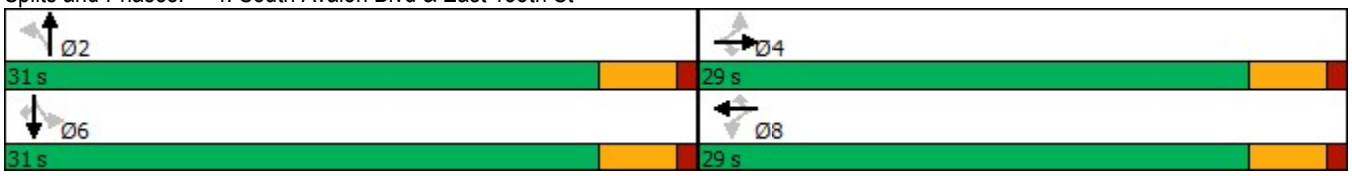
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	261	550	135	27	151	71	88	850	69	79	593	73
Future Volume (vph)	261	550	135	27	151	71	88	850	69	79	593	73
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	272	573	141	28	157	74	92	885	72	82	618	76
Shared Lane Traffic (%)												
Lane Group Flow (vph)	272	573	141	28	157	74	92	957	0	82	618	76

Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	261	550	135	27	151	71	88	850	79	593	73
Future Volume (vph)	261	550	135	27	151	71	88	850	79	593	73
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm	NA	Perm
Protected Phases		4			8			2		6	
Permitted Phases	4		4	8		8	2		6		6
Detector Phase	4	4	4	8	8	8	2	2	6	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	29.0	29.0	29.0	29.0	29.0	29.0	31.0	31.0	31.0	31.0	31.0
Total Split (%)	48.3%	48.3%	48.3%	48.3%	48.3%	48.3%	51.7%	51.7%	51.7%	51.7%	51.7%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag											
Lead-Lag Optimize?											
Recall Mode	None	None	None	None	None	None	Max	Max	Max	Max	Max
Act Effct Green (s)	21.8	21.8	21.8	21.8	21.8	21.8	26.7	26.7	26.7	26.7	26.7
Actuated g/C Ratio	0.38	0.38	0.38	0.38	0.38	0.38	0.46	0.46	0.46	0.46	0.46
v/c Ratio	0.59	0.81	0.21	0.20	0.12	0.11	0.28	0.59	0.44	0.38	0.10
Control Delay	20.2	26.8	3.9	15.8	11.4	3.8	13.6	13.6	21.4	11.5	3.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	20.2	26.8	3.9	15.8	11.4	3.8	13.6	13.6	21.4	11.5	3.3
LOS	C	C	A	B	B	A	B	B	C	B	A
Approach Delay		21.7			9.7			13.6		11.7	
Approach LOS		C			A			B		B	

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 57.5	
Natural Cycle: 45	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.81	
Intersection Signal Delay: 15.4	Intersection LOS: B
Intersection Capacity Utilization 78.2%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 4: South Avalon Blvd & East 135th St





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	272	573	141	28	157	74	92	957	82	618	76
v/c Ratio	0.59	0.81	0.21	0.20	0.12	0.11	0.28	0.59	0.44	0.38	0.10
Control Delay	20.2	26.8	3.9	15.8	11.4	3.8	13.6	13.6	21.4	11.5	3.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	20.2	26.8	3.9	15.8	11.4	3.8	13.6	13.6	21.4	11.5	3.3
Queue Length 50th (ft)	72	170	2	6	17	0	20	129	20	75	0
Queue Length 95th (ft)	139	#319	30	23	33	20	51	184	#61	111	19
Internal Link Dist (ft)		694			495			2496		424	
Turn Bay Length (ft)	105		105	80		100	100		100		100
Base Capacity (vph)	520	798	752	159	1517	720	330	1631	185	1641	774
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.52	0.72	0.19	0.18	0.10	0.10	0.28	0.59	0.44	0.38	0.10

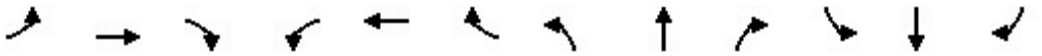
Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	261	550	135	27	151	71	88	850	69	79	593	73
Future Volume (veh/h)	261	550	135	27	151	71	88	850	69	79	593	73
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	272	573	141	28	157	74	92	885	72	82	618	76
Adj No. of Lanes	1	1	1	1	2	1	1	2	0	1	2	1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	517	688	585	193	1307	585	396	1561	127	290	1666	745
Arrive On Green	0.37	0.37	0.37	0.37	0.37	0.37	0.47	0.47	0.47	0.47	0.47	0.47
Sat Flow, veh/h	1145	1863	1583	733	3539	1583	747	3315	270	584	3539	1583
Grp Volume(v), veh/h	272	573	141	28	157	74	92	472	485	82	618	76
Grp Sat Flow(s),veh/h/ln	1145	1863	1583	733	1770	1583	747	1770	1815	584	1770	1583
Q Serve(g_s), s	11.6	15.8	3.5	2.0	1.6	1.7	5.1	10.8	10.8	6.6	6.3	1.5
Cycle Q Clear(g_c), s	13.2	15.8	3.5	17.8	1.6	1.7	11.4	10.8	10.8	17.5	6.3	1.5
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.15	1.00		1.00
Lane Grp Cap(c), veh/h	517	688	585	193	1307	585	396	833	855	290	1666	745
V/C Ratio(X)	0.53	0.83	0.24	0.14	0.12	0.13	0.23	0.57	0.57	0.28	0.37	0.10
Avail Cap(c_a), veh/h	593	811	689	242	1540	689	396	833	855	290	1666	745
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	16.1	16.2	12.3	24.3	11.7	11.7	13.2	10.8	10.8	17.1	9.5	8.3
Incr Delay (d2), s/veh	0.8	6.5	0.2	0.3	0.0	0.1	1.4	2.8	2.7	2.4	0.6	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.7	9.2	1.5	0.4	0.8	0.8	1.2	5.9	6.0	1.3	3.2	0.7
LnGrp Delay(d),s/veh	16.9	22.7	12.5	24.6	11.8	11.8	14.6	13.5	13.5	19.5	10.2	8.6
LnGrp LOS	B	C	B	C	B	B	B	B	B	B	B	A
Approach Vol, veh/h		986			259			1049			776	
Approach Delay, s/veh		19.6			13.2			13.6			11.0	
Approach LOS		B			B			B			B	

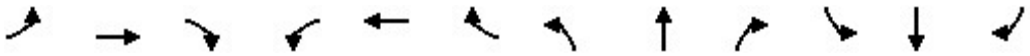
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		31.0		25.3		31.0		25.3
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5
Max Green Setting (Gmax), s		26.5		24.5		26.5		24.5
Max Q Clear Time (g_c+I1), s		13.4		17.8		19.5		19.8
Green Ext Time (p_c), s		5.7		3.0		2.9		0.5

Intersection Summary	
HCM 2010 Ctrl Delay	14.8
HCM 2010 LOS	B



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	220		0	200		0	110		110	120		100
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.91	0.91	1.00	0.91	0.91	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor												
Frt		0.988			0.971				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	5024	0	1770	4938	0	1770	3539	1583	1770	3539	1583
Flt Permitted	0.221			0.182			0.392			0.186		
Satd. Flow (perm)	412	5024	0	339	4938	0	730	3539	1583	346	3539	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		20			77				212			164
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		2662			498			439			2576	
Travel Time (s)		60.5			11.3			10.0			58.5	

Intersection Summary	
Area Type:	Other



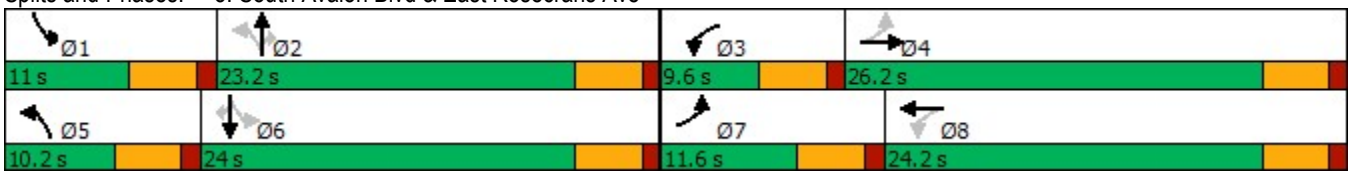
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	120	1337	114	163	674	158	114	710	213	213	506	75
Future Volume (vph)	120	1337	114	163	674	158	114	710	213	213	506	75
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	125	1393	119	170	702	165	119	740	222	222	527	78
Shared Lane Traffic (%)												
Lane Group Flow (vph)	125	1512	0	170	867	0	119	740	222	222	527	78

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	120	1337	163	674	114	710	213	213	506	75
Future Volume (vph)	120	1337	163	674	114	710	213	213	506	75
Turn Type	pm+pt	NA	pm+pt	NA	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4	3	8	5	2		1	6	
Permitted Phases	4		8		2		2	6		6
Detector Phase	7	4	3	8	5	2	2	1	6	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	9.5	22.5	9.5	22.5	22.5	9.5	22.5	22.5
Total Split (s)	11.6	26.2	9.6	24.2	10.2	23.2	23.2	11.0	24.0	24.0
Total Split (%)	16.6%	37.4%	13.7%	34.6%	14.6%	33.1%	33.1%	15.7%	34.3%	34.3%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	Max	Max	None	Max	Max
Act Effct Green (s)	28.6	21.7	26.1	22.0	24.4	18.7	18.7	26.7	21.5	21.5
Actuated g/C Ratio	0.41	0.31	0.37	0.31	0.35	0.27	0.27	0.38	0.31	0.31
v/c Ratio	0.42	0.96	0.74	0.54	0.35	0.78	0.38	0.84	0.48	0.13
Control Delay	16.1	40.3	35.8	20.2	15.8	30.9	6.1	45.2	22.4	0.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	16.1	40.3	35.8	20.2	15.8	30.9	6.1	45.2	22.4	0.5
LOS	B	D	D	C	B	C	A	D	C	A
Approach Delay		38.4		22.8		24.2			26.4	
Approach LOS		D		C		C			C	

Intersection Summary	
Cycle Length: 70	
Actuated Cycle Length: 70	
Natural Cycle: 70	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.96	
Intersection Signal Delay: 29.4	Intersection LOS: C
Intersection Capacity Utilization 83.8%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 5: South Avalon Blvd & East Rosecrans Ave

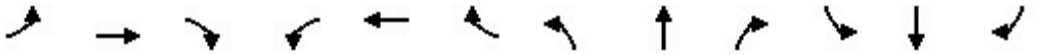




Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	125	1512	170	867	119	740	222	222	527	78
v/c Ratio	0.42	0.96	0.74	0.54	0.35	0.78	0.38	0.84	0.48	0.13
Control Delay	16.1	40.3	35.8	20.2	15.8	30.9	6.1	45.2	22.4	0.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	16.1	40.3	35.8	20.2	15.8	30.9	6.1	45.2	22.4	0.5
Queue Length 50th (ft)	31	229	43	106	30	154	3	61	101	0
Queue Length 95th (ft)	60	#331	#117	145	61	#220	51	#165	146	0
Internal Link Dist (ft)		2582		418		359			2496	
Turn Bay Length (ft)	220		200		110		110	120		100
Base Capacity (vph)	307	1571	230	1606	339	945	578	264	1088	600
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.41	0.96	0.74	0.54	0.35	0.78	0.38	0.84	0.48	0.13

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	120	1337	114	163	674	158	114	710	213	213	506	75
Future Volume (veh/h)	120	1337	114	163	674	158	114	710	213	213	506	75
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	125	1393	119	170	702	165	119	740	222	222	527	78
Adj No. of Lanes	1	3	0	1	3	0	1	2	1	1	2	1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	335	1480	126	241	1293	300	361	945	423	310	1030	461
Arrive On Green	0.07	0.31	0.31	0.07	0.31	0.31	0.07	0.27	0.27	0.09	0.29	0.29
Sat Flow, veh/h	1774	4773	408	1774	4126	958	1774	3539	1583	1774	3539	1583
Grp Volume(v), veh/h	125	989	523	170	575	292	119	740	222	222	527	78
Grp Sat Flow(s),veh/h/ln	1774	1695	1791	1774	1695	1694	1774	1770	1583	1774	1770	1583
Q Serve(g_s), s	3.3	19.9	19.9	4.6	9.8	10.0	3.3	13.6	8.4	6.4	8.7	2.6
Cycle Q Clear(g_c), s	3.3	19.9	19.9	4.6	9.8	10.0	3.3	13.6	8.4	6.4	8.7	2.6
Prop In Lane	1.00		0.23	1.00		0.57	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	335	1051	555	241	1062	531	361	945	423	310	1030	461
V/C Ratio(X)	0.37	0.94	0.94	0.71	0.54	0.55	0.33	0.78	0.52	0.72	0.51	0.17
Avail Cap(c_a), veh/h	391	1051	555	241	1062	531	383	945	423	310	1030	461
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	15.3	23.5	23.5	18.1	19.9	19.9	16.9	23.8	21.9	18.4	20.7	18.5
Incr Delay (d2), s/veh	0.7	15.7	24.5	9.0	0.6	1.2	0.5	6.4	4.6	7.6	1.8	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.7	11.5	13.5	2.8	4.6	4.8	1.7	7.4	4.2	3.7	4.5	1.2
LnGrp Delay(d),s/veh	16.0	39.2	48.1	27.1	20.4	21.2	17.5	30.2	26.5	26.0	22.5	19.3
LnGrp LOS	B	D	D	C	C	C	B	C	C	C	C	B
Approach Vol, veh/h		1637			1037			1081			827	
Approach Delay, s/veh		40.3			21.7			28.0			23.1	
Approach LOS		D			C			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.0	23.2	9.6	26.2	9.3	24.9	9.4	26.4
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	6.5	18.7	5.1	21.7	5.7	19.5	7.1	19.7
Max Q Clear Time (g_c+I1), s	8.4	15.6	6.6	21.9	5.3	10.7	5.3	12.0
Green Ext Time (p_c), s	0.0	1.7	0.0	0.0	0.0	2.5	0.0	3.4

Intersection Summary	
HCM 2010 Ctrl Delay	30.1
HCM 2010 LOS	C



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%		0%			0%
Storage Length (ft)	0	0		100	100	
Storage Lanes	0	1		1	1	
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	1.00	0.95	1.00	1.00	0.95
Ped Bike Factor						
Frt						
Flt Protected						
Satd. Flow (prot)	0	1863	3539	1863	1863	3539
Flt Permitted						
Satd. Flow (perm)	0	1863	3539	1863	1863	3539
Link Speed (mph)	30		30			30
Link Distance (ft)	196		2086			439
Travel Time (s)	4.5		47.4			10.0

Intersection Summary	
Area Type:	Other



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Volume (vph)	0	0	1028	0	0	783
Future Volume (vph)	0	0	1028	0	0	783
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%		0%			0%
Adj. Flow (vph)	0	0	1117	0	0	851
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	1117	0	0	851

Intersection Summary

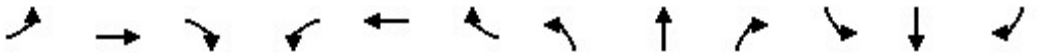
Intersection	
Int Delay, s/veh	0

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	0	1028	0	0	783
Future Vol, veh/h	0	0	1028	0	0	783
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	100	100	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	0	1117	0	0	851

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	-	559	0	0	1117	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.94	-	-	4.14	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.32	-	-	2.22	-
Pot Cap-1 Maneuver	0	472	-	-	621	-
Stage 1	0	-	-	-	-	-
Stage 2	0	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	-	472	-	-	621	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

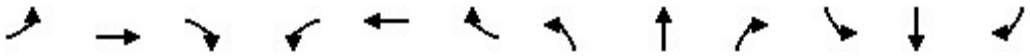
Approach	WB	NB	SB
HCM Control Delay, s	0	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	-	621	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s)	-	-	0	0	-
HCM Lane LOS	-	-	A	A	-
HCM 95th %tile Q(veh)	-	-	-	0	-



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	155		0	150		0	110		100	115		100
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor												
Frt		0.980			0.958				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3468	0	1770	3391	0	1770	3539	1583	1770	3539	1583
Flt Permitted	0.583			0.483			0.391			0.290		
Satd. Flow (perm)	1086	3468	0	900	3391	0	728	3539	1583	540	3539	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		30			77				82			60
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		972			474			575			2086	
Travel Time (s)		22.1			10.8			13.1			47.4	

Intersection Summary	
Area Type:	Other



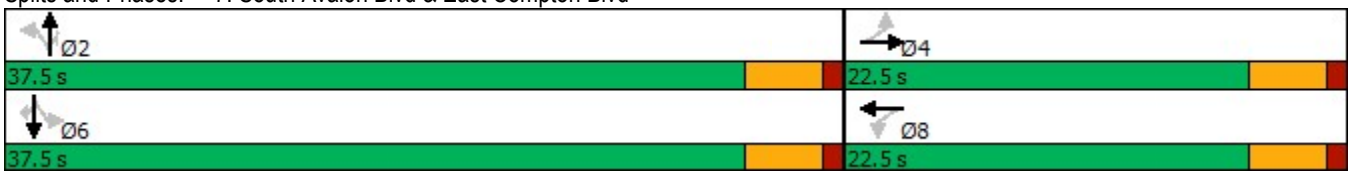
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	93	322	51	46	189	74	30	861	79	111	642	58
Future Volume (vph)	93	322	51	46	189	74	30	861	79	111	642	58
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	97	335	53	48	197	77	31	897	82	116	669	60
Shared Lane Traffic (%)												
Lane Group Flow (vph)	97	388	0	48	274	0	31	897	82	116	669	60

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	93	322	46	189	30	861	79	111	642	58
Future Volume (vph)	93	322	46	189	30	861	79	111	642	58
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4		8		2			6	
Permitted Phases	4		8		2		2	6		6
Detector Phase	4	4	8	8	2	2	2	6	6	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	22.5	22.5	22.5	22.5	37.5	37.5	37.5	37.5	37.5	37.5
Total Split (%)	37.5%	37.5%	37.5%	37.5%	62.5%	62.5%	62.5%	62.5%	62.5%	62.5%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag										
Lead-Lag Optimize?										
Recall Mode	None	None	None	None	Max	Max	Max	Max	Max	Max
Act Effct Green (s)	11.7	11.7	11.7	11.7	33.1	33.1	33.1	33.1	33.1	33.1
Actuated g/C Ratio	0.22	0.22	0.22	0.22	0.61	0.61	0.61	0.61	0.61	0.61
v/c Ratio	0.41	0.50	0.24	0.34	0.07	0.41	0.08	0.35	0.31	0.06
Control Delay	23.3	19.0	20.2	13.4	5.9	6.7	2.0	10.2	6.0	2.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.3	19.0	20.2	13.4	5.9	6.7	2.0	10.2	6.0	2.1
LOS	C	B	C	B	A	A	A	B	A	A
Approach Delay		19.9		14.4		6.3			6.3	
Approach LOS		B		B		A			A	

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 53.9	
Natural Cycle: 55	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.50	
Intersection Signal Delay: 9.7	Intersection LOS: A
Intersection Capacity Utilization 59.6%	ICU Level of Service B
Analysis Period (min) 15	

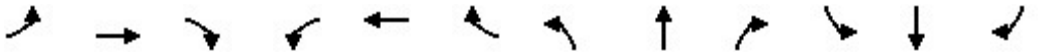
Splits and Phases: 7: South Avalon Blvd & East Compton Blvd





Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	97	388	48	274	31	897	82	116	669	60
v/c Ratio	0.41	0.50	0.24	0.34	0.07	0.41	0.08	0.35	0.31	0.06
Control Delay	23.3	19.0	20.2	13.4	5.9	6.7	2.0	10.2	6.0	2.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.3	19.0	20.2	13.4	5.9	6.7	2.0	10.2	6.0	2.1
Queue Length 50th (ft)	27	52	13	27	3	64	0	15	44	0
Queue Length 95th (ft)	61	85	35	53	15	131	15	58	92	13
Internal Link Dist (ft)		892		394		495			2006	
Turn Bay Length (ft)	155		150		110		100	115		100
Base Capacity (vph)	364	1182	301	1187	447	2174	1004	331	2174	995
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.27	0.33	0.16	0.23	0.07	0.41	0.08	0.35	0.31	0.06

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	93	322	51	46	189	74	30	861	79	111	642	58
Future Volume (veh/h)	93	322	51	46	189	74	30	861	79	111	642	58
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	97	335	53	48	197	77	31	897	82	116	669	60
Adj No. of Lanes	1	2	0	1	2	0	1	2	1	1	2	1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	299	672	105	255	551	208	512	2171	971	410	2171	971
Arrive On Green	0.22	0.22	0.22	0.22	0.22	0.22	0.61	0.61	0.61	0.61	0.61	0.61
Sat Flow, veh/h	1101	3067	481	992	2514	951	723	3539	1583	572	3539	1583
Grp Volume(v), veh/h	97	192	196	48	137	137	31	897	82	116	669	60
Grp Sat Flow(s),veh/h/ln	1101	1770	1778	992	1770	1695	723	1770	1583	572	1770	1583
Q Serve(g_s), s	4.4	5.1	5.2	2.4	3.5	3.7	1.1	7.1	1.1	7.1	4.8	0.8
Cycle Q Clear(g_c), s	8.1	5.1	5.2	7.6	3.5	3.7	6.0	7.1	1.1	14.1	4.8	0.8
Prop In Lane	1.00		0.27	1.00		0.56	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	299	388	390	255	388	372	512	2171	971	410	2171	971
V/C Ratio(X)	0.32	0.49	0.50	0.19	0.35	0.37	0.06	0.41	0.08	0.28	0.31	0.06
Avail Cap(c_a), veh/h	426	592	595	370	592	567	512	2171	971	410	2171	971
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	21.3	18.4	18.4	21.8	17.8	17.8	6.4	5.4	4.2	9.0	5.0	4.2
Incr Delay (d2), s/veh	0.6	1.0	1.0	0.4	0.5	0.6	0.2	0.6	0.2	1.7	0.4	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.4	2.6	2.7	0.7	1.8	1.8	0.3	3.5	0.5	1.3	2.4	0.4
LnGrp Delay(d),s/veh	21.9	19.4	19.4	22.1	18.3	18.5	6.6	6.0	4.4	10.8	5.3	4.3
LnGrp LOS	C	B	B	C	B	B	A	A	A	B	A	A
Approach Vol, veh/h		485			322			1010			845	
Approach Delay, s/veh		19.9			18.9			5.9			6.0	
Approach LOS		B			B			A			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		37.5		16.3		37.5		16.3
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5
Max Green Setting (Gmax), s		33.0		18.0		33.0		18.0
Max Q Clear Time (g_c+I1), s		9.1		10.1		16.1		9.6
Green Ext Time (p_c), s		7.5		1.7		5.6		1.1

Intersection Summary	
HCM 2010 Ctrl Delay	10.0
HCM 2010 LOS	B



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)		0	100		0	0
Storage Lanes		0	1		1	0
Taper Length (ft)			25		25	
Lane Util. Factor	0.91	0.91	1.00	0.91	1.00	1.00
Ped Bike Factor						
Frt						
Flt Protected						
Satd. Flow (prot)	5085	0	1863	5085	1863	0
Flt Permitted						
Satd. Flow (perm)	5085	0	1863	5085	1863	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	498			189	111	
Travel Time (s)	11.3			4.3	2.5	

Intersection Summary	
Area Type:	Other



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Traffic Volume (vph)	1763	0	0	996	0	0
Future Volume (vph)	1763	0	0	996	0	0
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Adj. Flow (vph)	1916	0	0	1083	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1916	0	0	1083	0	0

Intersection Summary

Intersection	
Int Delay, s/veh	0

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	1763	0	0	996	0	0
Future Vol, veh/h	1763	0	0	996	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	100	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1916	0	0	1083	0	0

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1916	0	2349	958
Stage 1	-	-	-	-	1916	-
Stage 2	-	-	-	-	433	-
Critical Hdwy	-	-	5.34	-	5.74	7.14
Critical Hdwy Stg 1	-	-	-	-	6.64	-
Critical Hdwy Stg 2	-	-	-	-	6.04	-
Follow-up Hdwy	-	-	3.12	-	3.82	3.92
Pot Cap-1 Maneuver	-	-	138	-	61	221
Stage 1	-	-	-	-	64	-
Stage 2	-	-	-	-	568	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	138	-	61	221
Mov Cap-2 Maneuver	-	-	-	-	58	-
Stage 1	-	-	-	-	64	-
Stage 2	-	-	-	-	568	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	0
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	-	-	-	138	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s)	0	-	-	0	-
HCM Lane LOS	A	-	-	A	-
HCM 95th %tile Q(veh)	-	-	-	0	-

Appendix G

Cumulative Conditions With Project
Level of Service Analysis Worksheets

Metro Bus Facility Rosecrans and Avalon TIS
Existing Plus Project Plus Cumulative Conditions
AM Peak Hour

Scenario Report

Scenario:	EX+P+C_AM
Command:	EX+P+C_AM
Volume:	EX_AM
Geometry:	EX
Impact Fee:	Default Impact Fee
Trip Generation:	P+C_AM
Trip Distribution:	DEFAULT
Paths:	Default Path
Routes:	Default Route
Configuration:	EX

Metro Bus Facility Rosecrans and Avalon TIS
Existing Plus Project Plus Cumulative Conditions
AM Peak Hour

Trip Generation Report

Forecast for P_AM

Zone #	Subzone	Amount	Units	Rate In	Rate Out	Trips In	Trips Out	Total Trips	% Of Total
1	PROJECT - EM	1.00	PROJECT - EMPL	4.00	4.00	4	4	8	0.7
	Zone 1 Subtotal					4	4	8	0.7
2	PROJECT - BU	1.00	PROJECT - BUS	6.00	2.00	6	2	8	0.7
	Zone 2 Subtotal					6	2	8	0.7
100	TAZ 1	1.00	TAZ 1	0.00	0.00	0	0	0	0.0
TOTAL						10	6	16	1.3

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Metro Bus Facility Rosecrans and Avalon TIS
Existing Plus Project Plus Cumulative Conditions
AM Peak Hour

Trip Generation Report

Forecast for C_AM

Zone #	Subzone	Amount	Units	Rate In	Rate Out	Trips In	Trips Out	Total Trips	% Of Total
100	TAZ 1	1.00	TAZ 1	1.00	1.00	1	1	2	0.2
	Zone 100 Subtotal					1	1	2	0.2
200	TAZ 2	1.00	TAZ 2	23.00	12.00	23	12	35	2.9
	Zone 200 Subtotal					23	12	35	2.9
300	TAZ 3	1.00	TAZ 3	4.00	2.00	4	2	6	0.5
	Zone 300 Subtotal					4	2	6	0.5
400	TAZ 4	1.00	TAZ 4	15.00	10.00	15	10	25	2.1
	Zone 400 Subtotal					15	10	25	2.1
500	TAZ 5	1.00	TAZ 5	114.00	40.00	114	40	154	12.7
	Zone 500 Subtotal					114	40	154	12.7
600	TAZ 6	1.00	TAZ 6	249.00	279.00	249	279	528	43.6
	Zone 600 Subtotal					249	279	528	43.6
700	TAZ 7	1.00	TAZ 7	16.00	46.00	16	46	62	5.1
	Zone 700 Subtotal					16	46	62	5.1
800	TAZ 8	1.00	TAZ 8	148.00	102.00	148	102	250	20.7
	Zone 800 Subtotal					148	102	250	20.7
900	TAZ 9	1.00	TAZ 9	86.00	12.00	86	12	98	8.1
	Zone 900 Subtotal					86	12	98	8.1
1000	TAZ 10	1.00	TAZ 10	21.00	13.00	21	13	34	2.8
	Zone 1000 Subtotal					21	13	34	2.8
TOTAL						677	517	1194	98.7

Metro Bus Facility Rosecrans and Avalon TIS
Existing Plus Project Plus Cumulative Conditions
AM Peak Hour

Turning Movement Report

P_AM + C_AM

Volume	Northbound			Southbound			Eastbound			Westbound			Total
Type	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Volume
#1 I-110 SB Ramps / East Rosecrans Ave													
Base	0	0	0	327	4	479	0	867	645	256	1267	0	3845
Added	0	0	0	40	0	2	0	45	7	11	16	0	121
Total	0	0	0	367	4	481	0	912	652	267	1283	0	3966
#2 I-110 NB Ramps / East Rosecrans Ave													
Base	480	6	176	2	0	12	1	798	357	0	1303	14	3149
Added	2	0	33	0	0	0	0	78	7	0	39	0	159
Total	482	6	209	2	0	12	1	876	364	0	1342	14	3308
#3 South Main St / East Rosecrans Ave													
Base	59	284	41	48	386	77	61	526	55	93	965	73	2668
Added	0	0	0	0	0	0	0	111	0	0	39	0	150
Total	59	284	41	48	386	77	61	637	55	93	1004	73	2818
#4 South Avalon Blvd / East 135th St													
Base	105	539	30	42	608	110	87	156	81	48	322	69	2197
Added	0	17	0	0	25	0	0	0	0	0	0	0	42
Total	105	556	30	42	633	110	87	156	81	48	322	69	2239
#5 South Avalon Blvd / East Rosecrans Ave													
Base	107	524	82	123	561	92	53	430	76	148	1034	121	3351
Added	6	6	47	18	5	1	1	100	11	24	35	10	264
Total	113	530	129	141	566	93	54	530	87	172	1069	131	3615
#6 South Avalon Blvd / Project Dwy - Bus													
Base	0	751	0	0	785	0	0	0	0	0	0	0	1536
Added	0	57	0	6	34	0	0	0	0	0	0	2	99
Total	0	808	0	6	819	0	0	0	0	0	0	2	1635
#7 South Avalon Blvd / East Compton Blvd													
Base	46	596	54	65	667	24	27	116	22	65	385	128	2195
Added	1	57	8	0	34	0	0	0	2	8	0	0	110
Total	47	653	62	65	701	24	27	116	24	73	385	128	2305
#8 Project Dwy - Employees / East Rosecrans Ave													
Base	0	0	0	0	0	0	0	635	0	0	1303	0	1938
Added	4	0	0	0	0	0	0	162	4	0	66	0	236
Total	4	0	0	0	0	0	0	797	4	0	1369	0	2174

Metro Bus Facility Rosecrans and Avalon TIS
Existing Plus Project Plus Cumulative Conditions
AM Peak Hour

Level Of Service Computation Report
ICU 1(Loss as Cycle Length %) Method (Future Volume Alternative)

Intersection #1 I-110 SB Ramps / East Rosecrans Ave

Cycle (sec):	100	Critical Vol./Cap.(X):	0.852
Loss Time (sec):	10	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	81	Level Of Service:	D

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Split Phase			Split Phase			Permitted			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lanes:	0	0	0	1	0	1! 0 1	0	0	2 1 0	1	0	3 0 0
Volume Module:												
Base Vol:	0	0	0	327	4	479	0	867	645	256	1267	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	0	0	327	4	479	0	867	645	256	1267	0
Added Vol:	0	0	0	40	0	2	0	45	7	11	16	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	0	0	367	4	481	0	912	652	267	1283	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	0	0	0	367	4	481	0	912	652	267	1283	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	0	0	367	4	481	0	912	652	267	1283	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	0	0	0	367	4	481	0	912	652	267	1283	0
Saturation Flow Module:												
Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	0.00	0.00	0.00	1.29	0.01	1.70	0.00	2.00	1.00	1.00	3.00	0.00
Final Sat.:	0	0	0	2068	23	2710	0	3200	1600	1600	4800	0
Capacity Analysis Module:												
Vol/Sat:	0.00	0.00	0.00	0.18	0.18	0.18	0.00	0.28	0.41	0.17	0.27	0.00
Crit Moves:					****				****	****		

Metro Bus Facility Rosecrans and Avalon TIS
Existing Plus Project Plus Cumulative Conditions
AM Peak Hour

Level Of Service Computation Report
ICU 1(Loss as Cycle Length %) Method (Future Volume Alternative)

Intersection #2 I-110 NB Ramps / East Rosecrans Ave

Cycle (sec):	100	Critical Vol./Cap.(X):	0.610
Loss Time (sec):	10	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	41	Level Of Service:	B

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Split Phase			Split Phase			Permitted			Permitted		
Rights:	Include			Include			Ovl			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lanes:	1	0	1! 0 0	0	0	1! 0 0	0	1	2 0 1	0	0	2 1 0
Volume Module:												
Base Vol:	480	6	176	2	0	12	1	798	357	0	1303	14
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	480	6	176	2	0	12	1	798	357	0	1303	14
Added Vol:	2	0	33	0	0	0	0	78	7	0	39	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	482	6	209	2	0	12	1	876	364	0	1342	14
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	482	6	209	2	0	12	1	876	364	0	1342	14
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	482	6	209	2	0	12	1	876	364	0	1342	14
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	482	6	209	2	0	12	1	876	364	0	1342	14
OvlAdjVol:									15			
Saturation Flow Module:												
Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	1.38	0.02	0.60	0.14	0.00	0.86	0.01	2.99	1.00	0.00	2.97	0.03
Final Sat.:	2213	28	960	229	0	1371	5	4795	1600	0	4750	50
Capacity Analysis Module:												
Vol/Sat:	0.22	0.22	0.22	0.01	0.00	0.01	0.00	0.18	0.23	0.00	0.28	0.28
OvlAdjV/S:									0.01			
Crit Moves:	****						****	****			****	

Metro Bus Facility Rosecrans and Avalon TIS
Existing Plus Project Plus Cumulative Conditions
AM Peak Hour

Level Of Service Computation Report
ICU 1(Loss as Cycle Length %) Method (Future Volume Alternative)

Intersection #3 South Main St / East Rosecrans Ave

Cycle (sec):	100	Critical Vol./Cap.(X):	0.520
Loss Time (sec):	10	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	34	Level Of Service:	A

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Permitted			Permitted			Permitted		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lanes:	1	0 2	0 1	1	0 2	0 1	1	0 2	1 0	1	0 2	1 0
Volume Module:												
Base Vol:	59	284	41	48	386	77	61	526	55	93	965	73
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	59	284	41	48	386	77	61	526	55	93	965	73
Added Vol:	0	0	0	0	0	0	0	111	0	0	39	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	59	284	41	48	386	77	61	637	55	93	1004	73
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	59	284	41	48	386	77	61	637	55	93	1004	73
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	59	284	41	48	386	77	61	637	55	93	1004	73
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	59	284	41	48	386	77	61	637	55	93	1004	73
Saturation Flow Module:												
Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	1.00	2.00	1.00	1.00	2.00	1.00	1.00	2.76	0.24	1.00	2.80	0.20
Final Sat.:	1600	3200	1600	1600	3200	1600	1600	4418	382	1600	4475	325
Capacity Analysis Module:												
Vol/Sat:	0.04	0.09	0.03	0.03	0.12	0.05	0.04	0.14	0.14	0.06	0.22	0.22
Crit Moves:	****				****		****				****	

Metro Bus Facility Rosecrans and Avalon TIS
Existing Plus Project Plus Cumulative Conditions
AM Peak Hour

Level Of Service Computation Report
ICU 1(Loss as Cycle Length %) Method (Future Volume Alternative)

Intersection #4 South Avalon Blvd / East 135th St

Cycle (sec):	100	Critical Vol./Cap.(X):	0.518
Loss Time (sec):	10	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	34	Level Of Service:	A

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Permitted			Permitted			Permitted		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lanes:	1	0 1	1 0	1	0 2	0 1	1	0 1	0 1	1	0 2	0 1
Volume Module:												
Base Vol:	105	539	30	42	608	110	87	156	81	48	322	69
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	105	539	30	42	608	110	87	156	81	48	322	69
Added Vol:	0	17	0	0	25	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	105	556	30	42	633	110	87	156	81	48	322	69
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	105	556	30	42	633	110	87	156	81	48	322	69
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	105	556	30	42	633	110	87	156	81	48	322	69
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	105	556	30	42	633	110	87	156	81	48	322	69
Saturation Flow Module:												
Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	1.00	1.90	0.10	1.00	2.00	1.00	1.00	1.00	1.00	1.00	2.00	1.00
Final Sat.:	1600	3036	164	1600	3200	1600	1600	1600	1600	1600	3200	1600
Capacity Analysis Module:												
Vol/Sat:	0.07	0.18	0.18	0.03	0.20	0.07	0.05	0.10	0.05	0.03	0.10	0.04
Crit Moves:	****				****		****				****	

Metro Bus Facility Rosecrans and Avalon TIS
Existing Plus Project Plus Cumulative Conditions
AM Peak Hour

Level Of Service Computation Report
ICU 1(Loss as Cycle Length %) Method (Future Volume Alternative)

Intersection #5 South Avalon Blvd / East Rosecrans Ave

Cycle (sec):	100	Critical Vol./Cap.(X):	0.637
Loss Time (sec):	10	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	43	Level Of Service:	B

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Prot+Permit			Prot+Permit			Prot+Permit			Prot+Permit		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lanes:	1 0	2	0 1	1 0	2	0 1	1 0	2	1 0	1 0	2	1 0
Volume Module:												
Base Vol:	107	524	82	123	561	92	53	430	76	148	1034	121
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	107	524	82	123	561	92	53	430	76	148	1034	121
Added Vol:	6	6	47	18	5	1	1	100	11	24	35	10
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	113	530	129	141	566	93	54	530	87	172	1069	131
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	113	530	129	141	566	93	54	530	87	172	1069	131
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	113	530	129	141	566	93	54	530	87	172	1069	131
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	113	530	129	141	566	93	54	530	87	172	1069	131
Saturation Flow Module:												
Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	1.00	2.00	1.00	1.00	2.00	1.00	1.00	2.58	0.42	1.00	2.67	0.33
Final Sat.:	1600	3200	1600	1600	3200	1600	1600	4123	677	1600	4276	524
Capacity Analysis Module:												
Vol/Sat:	0.07	0.17	0.08	0.09	0.18	0.06	0.03	0.13	0.13	0.11	0.25	0.25
Crit Moves:		****			****			****			****	

Metro Bus Facility Rosecrans and Avalon TIS
Existing Plus Project Plus Cumulative Conditions
AM Peak Hour

Level Of Service Computation Report
2000 HCM Unsignalized Method (Future Volume Alternative)

Intersection #6 South Avalon Blvd / Project Dwy - Bus

Average Delay (sec/veh): 0.0 Worst Case Level Of Service: B[11.0]

Approach:	North Bound				South Bound				East Bound				West Bound			
Movement:	L	-	T	- R	L	-	T	- R	L	-	T	- R	L	-	T	- R
Control:	Uncontrolled				Uncontrolled				Stop Sign				Stop Sign			
Rights:	Include				Include				Include				Include			
Lanes:	0 0	2	0	1	1 0	2	0	0	0 0	0	0	0	0 0	0	0	1
Volume Module:																
Base Vol:	0	751	0		0	785	0		0	0	0		0	0	0	
Growth Adj:	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00	
Initial Bse:	0	751	0		0	785	0		0	0	0		0	0	0	
Added Vol:	0	57	0		6	34	0		0	0	0		0	0	0	
PasserByVol:	0	0	0		0	0	0		0	0	0		0	0	0	
Initial Fut:	0	808	0		6	819	0		0	0	0		0	0	0	
User Adj:	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00	
PHF Adj:	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00	
PHF Volume:	0	808	0		6	819	0		0	0	0		0	0	0	
Reduct Vol:	0	0	0		0	0	0		0	0	0		0	0	0	
FinalVolume:	0	808	0		6	819	0		0	0	0		0	0	0	
Critical Gap Module:																
Critical Gp:	xxxxx	xxxx	xxxxx		4.1	xxxx	xxxxx		xxxxx	xxxx	xxxxx		xxxx	xxxx	6.9	
FollowUpTim:	xxxxx	xxxx	xxxxx		2.2	xxxx	xxxxx		xxxxx	xxxx	xxxxx		xxxx	xxxx	3.3	
Capacity Module:																
Cnflict Vol:	xxxx	xxxx	xxxxx		808	xxxx	xxxxx		xxxx	xxxx	xxxxx		xxxx	xxxx	404	
Potent Cap.:	xxxx	xxxx	xxxxx		826	xxxx	xxxxx		xxxx	xxxx	xxxxx		xxxx	xxxx	602	
Move Cap.:	xxxx	xxxx	xxxxx		826	xxxx	xxxxx		xxxx	xxxx	xxxxx		xxxx	xxxx	602	
Volume/Cap:	xxxx	xxxx	xxxx		0.01	xxxx	xxxx		xxxx	xxxx	xxxx		xxxx	xxxx	0.00	
Level Of Service Module:																
2Way95thQ:	xxxx	xxxx	xxxxx		0.0	xxxx	xxxxx		xxxx	xxxx	xxxxx		xxxx	xxxx	0.0	
Control Del:	xxxxx	xxxx	xxxxx		9.4	xxxx	xxxxx		xxxxx	xxxx	xxxxx		xxxxx	xxxx	11.0	
LOS by Move:	*	*	*		A	*	*		*	*	*		*	*	B	
Movement:	LT -	LTR -	RT		LT -	LTR -	RT		LT -	LTR -	RT		LT -	LTR -	RT	
Shared Cap.:	xxxx	xxxx	xxxxx		xxxx	xxxx	xxxxx		xxxx	xxxx	xxxxx		xxxx	xxxx	xxxxx	
SharedQueue:	xxxxx	xxxx	xxxxx		xxxxx	xxxx	xxxxx		xxxxx	xxxx	xxxxx		xxxxx	xxxx	xxxxx	
Shrd ConDel:	xxxxx	xxxx	xxxxx		xxxxx	xxxx	xxxxx		xxxxx	xxxx	xxxxx		xxxxx	xxxx	xxxxx	
Shared LOS:	*	*	*		*	*	*		*	*	*		*	*	*	
ApproachDel:	xxxxxx				xxxxxx				xxxxxx				11.0			
ApproachLOS:	*				*				*				B			

Note: Queue reported is the number of cars per lane.

Metro Bus Facility Rosecrans and Avalon TIS
Existing Plus Project Plus Cumulative Conditions
AM Peak Hour

Level Of Service Computation Report
ICU 1(Loss as Cycle Length %) Method (Future Volume Alternative)

Intersection #7 South Avalon Blvd / East Compton Blvd

Cycle (sec): 100 Critical Vol./Cap.(X): 0.526
Loss Time (sec): 10 Average Delay (sec/veh): xxxxxx
Optimal Cycle: 35 Level Of Service: A

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Permitted			Permitted			Permitted		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lanes:	1	0 2	0 1	1	0 2	0 1	1	0 1	1 0	1	0 1	1 0
Volume Module:												
Base Vol:	46	596	54	65	667	24	27	116	22	65	385	128
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	46	596	54	65	667	24	27	116	22	65	385	128
Added Vol:	1	57	8	0	34	0	0	0	2	8	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	47	653	62	65	701	24	27	116	24	73	385	128
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	47	653	62	65	701	24	27	116	24	73	385	128
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	47	653	62	65	701	24	27	116	24	73	385	128
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	47	653	62	65	701	24	27	116	24	73	385	128
Saturation Flow Module:												
Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	1.00	2.00	1.00	1.00	2.00	1.00	1.00	1.66	0.34	1.00	1.50	0.50
Final Sat.:	1600	3200	1600	1600	3200	1600	1600	2651	549	1600	2402	798
Capacity Analysis Module:												
Vol/Sat:	0.03	0.20	0.04	0.04	0.22	0.02	0.02	0.04	0.04	0.05	0.16	0.16
Crit Moves:	****				****		****				****	

Metro Bus Facility Rosecrans and Avalon TIS
Existing Plus Project Plus Cumulative Conditions
AM Peak Hour

Level Of Service Computation Report
2000 HCM Unsignalized Method (Future Volume Alternative)

Intersection #8 Project Dwy - Employees / East Rosecrans Ave

Average Delay (sec/veh): 0.1 Worst Case Level Of Service: D[27.2]

Approach:	North Bound				South Bound				East Bound				West Bound			
Movement:	L	-	T	- R	L	-	T	- R	L	-	T	- R	L	-	T	- R
Control:	Stop Sign				Stop Sign				Uncontrolled				Uncontrolled			
Rights:	Include				Include				Include				Include			
Lanes:	1	0 0	0	0	0	0 0	0	0	0	0 2	1	0	1	0 3	0	0
Volume Module:																
Base Vol:	0	0	0	0	0	0	0	0	0	635	0	0	0	1303	0	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	0	0	0	0	0	0	0	0	635	0	0	0	1303	0	0
Added Vol:	4	0	0	0	0	0	0	0	0	162	4	0	0	66	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	4	0	0	0	0	0	0	0	0	797	4	0	0	1369	0	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	4	0	0	0	0	0	0	0	0	797	4	0	0	1369	0	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
FinalVolume:	4	0	0	0	0	0	0	0	0	797	4	0	0	1369	0	0
Critical Gap Module:																
Critical Gp:	6.8	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx				
FollowUpTim:	3.5	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx				
Capacity Module:																
Cnflict Vol:	1255	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx				
Potent Cap.:	166	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx				
Move Cap.:	166	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx				
Volume/Cap:	0.02	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx				
Level Of Service Module:																
2Way95thQ:	0.1	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx				
Control Del:	27.2	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx				
LOS by Move:	D	*	*	*	*	*	*	*	*	*	*	*				
Movement:	LT - LTR - RT				LT - LTR - RT				LT - LTR - RT				LT - LTR - RT			
Shared Cap.:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx				
SharedQueue:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx				
Shrd ConDel:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx				
Shared LOS:	*	*	*	*	*	*	*	*	*	*	*	*				
ApproachDel:	27.2			xxxxxx			xxxxxx			xxxxxx						
ApproachLOS:	D			*			*			*						

Note: Queue reported is the number of cars per lane.

Metro Bus Facility Rosecrans and Avalon TIS
Existing Plus Project Plus Cumulative Conditions
PM Peak Hour

Scenario Report

Scenario:	EX+P+C_PM
Command:	EX+P+C_PM
Volume:	EX_PM
Geometry:	EX
Impact Fee:	Default Impact Fee
Trip Generation:	P+C_PM
Trip Distribution:	DEFAULT
Paths:	Default Path
Routes:	Default Route
Configuration:	EX

Metro Bus Facility Rosecrans and Avalon TIS
Existing Plus Project Plus Cumulative Conditions
PM Peak Hour

Trip Generation Report

Forecast for P_PM

Zone #	Subzone	Amount	Units	Rate In	Rate Out	Trips In	Trips Out	Total Trips	% Of Total
1	PROJECT - EM	1.00	PROJECT - EMPL	2.00	7.00	2	7	9	0.6
	Zone 1 Subtotal					2	7	9	0.6
2	PROJECT - BU	1.00	PROJECT - BUS	1.00	0.00	1	0	1	0.1
	Zone 2 Subtotal					1	0	1	0.1
TOTAL						3	7	10	0.6

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Metro Bus Facility Rosecrans and Avalon TIS
Existing Plus Project Plus Cumulative Conditions
PM Peak Hour

Trip Generation Report

Forecast for C_PM

Zone #	Subzone	Amount	Units	Rate In	Rate Out	Trips In	Trips Out	Total Trips	% Of Total
100	TAZ 1	1.00	TAZ 1	1.00	1.00	1	1	2	0.1
	Zone 100 Subtotal					1	1	2	0.1
200	TAZ 2	1.00	TAZ 2	21.00	24.00	21	24	45	2.8
	Zone 200 Subtotal					21	24	45	2.8
300	TAZ 3	1.00	TAZ 3	11.00	12.00	11	12	23	1.4
	Zone 300 Subtotal					11	12	23	1.4
400	TAZ 4	1.00	TAZ 4	14.00	14.00	14	14	28	1.7
	Zone 400 Subtotal					14	14	28	1.7
500	TAZ 5	1.00	TAZ 5	58.00	133.00	58	133	191	11.8
	Zone 500 Subtotal					58	133	191	11.8
600	TAZ 6	1.00	TAZ 6	328.00	313.00	328	313	641	39.4
	Zone 600 Subtotal					328	313	641	39.4
700	TAZ 7	1.00	TAZ 7	57.00	36.00	57	36	93	5.7
	Zone 700 Subtotal					57	36	93	5.7
800	TAZ 8	1.00	TAZ 8	139.00	184.00	139	184	323	19.9
	Zone 800 Subtotal					139	184	323	19.9
900	TAZ 9	1.00	TAZ 9	11.00	77.00	11	77	88	5.4
	Zone 900 Subtotal					11	77	88	5.4
1000	TAZ 10	1.00	TAZ 10	88.00	93.00	88	93	181	11.1
	Zone 1000 Subtotal					88	93	181	11.1
TOTAL						728	887	1615	99.4

Metro Bus Facility Rosecrans and Avalon TIS
Existing Plus Project Plus Cumulative Conditions
PM Peak Hour

Turning Movement Report

P_PM + C_PM

Volume Type	Northbound Left	Thru	Right	Southbound Left	Thru	Right	Eastbound Left	Thru	Right	Westbound Left	Thru	Right	Total Volume
#1 I-110 SB Ramps / East Rosecrans Ave													
Base	0	0	0	580	12	450	0	1396	444	201	1019	0	4102
Added	0	0	0	20	0	9	0	26	5	35	51	0	146
Total	0	0	0	600	12	459	0	1422	449	236	1070	0	4248
#2 I-110 NB Ramps / East Rosecrans Ave													
Base	292	3	186	2	0	29	1	1458	375	0	1450	19	3815
Added	9	0	14	0	0	0	0	40	5	0	118	0	186
Total	301	3	200	2	0	29	1	1498	380	0	1568	19	4001
#3 South Main St / East Rosecrans Ave													
Base	118	514	105	69	307	49	105	1372	88	67	668	54	3516
Added	0	0	0	0	0	0	0	54	0	0	118	0	172
Total	118	514	105	69	307	49	105	1426	88	67	786	54	3688
#4 South Avalon Blvd / East 135th St													
Base	88	816	69	79	568	73	261	550	135	27	151	71	2888
Added	0	34	0	0	25	0	0	0	0	0	0	0	59
Total	88	850	69	79	593	73	261	550	135	27	151	71	2947
#5 South Avalon Blvd / East Rosecrans Ave													
Base	104	699	182	201	495	72	117	1292	104	110	569	138	4083
Added	10	11	31	12	11	3	3	47	11	54	110	21	324
Total	114	710	213	213	506	75	120	1339	115	164	679	159	4407
#6 South Avalon Blvd / Project Dwy - Bus													
Base	0	977	0	0	709	0	0	0	0	0	0	0	1686
Added	0	52	0	1	75	0	0	0	0	0	0	0	128
Total	0	1029	0	1	784	0	0	0	0	0	0	0	1814
#7 South Avalon Blvd / East Compton Blvd													
Base	29	810	70	111	568	58	93	322	50	37	189	74	2411
Added	1	52	9	0	75	0	0	0	1	9	0	0	147
Total	30	862	79	111	643	58	93	322	51	46	189	74	2558
#8 Project Dwy - Employees / East Rosecrans Ave													
Base	0	0	0	0	0	0	0	1675	0	0	817	0	2492
Added	6	0	1	0	0	0	0	88	2	0	179	0	276
Total	6	0	1	0	0	0	0	1763	2	0	996	0	2768

Metro Bus Facility Rosecrans and Avalon TIS
Existing Plus Project Plus Cumulative Conditions
PM Peak Hour

Level Of Service Computation Report
ICU 1(Loss as Cycle Length %) Method (Future Volume Alternative)

Intersection #1 I-110 SB Ramps / East Rosecrans Ave

Cycle (sec):	100	Critical Vol./Cap.(X):	0.860
Loss Time (sec):	10	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	83	Level Of Service:	D

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Split Phase			Split Phase			Permitted			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lanes:	0	0	0	1	0	1! 0 1	0	0	2 1 0	1	0	3 0 0
Volume Module:												
Base Vol:	0	0	0	580	12	450	0	1396	444	201	1019	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	0	0	580	12	450	0	1396	444	201	1019	0
Added Vol:	0	0	0	20	0	9	0	26	5	35	51	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	0	0	600	12	459	0	1422	449	236	1070	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	0	0	0	600	12	459	0	1422	449	236	1070	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	0	0	600	12	459	0	1422	449	236	1070	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	0	0	0	600	12	459	0	1422	449	236	1070	0
Saturation Flow Module:												
Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	0.00	0.00	0.00	1.68	0.03	1.29	0.00	2.28	0.72	1.00	3.00	0.00
Final Sat.:	0	0	0	2689	54	2057	0	3648	1152	1600	4800	0
Capacity Analysis Module:												
Vol/Sat:	0.00	0.00	0.00	0.22	0.22	0.22	0.00	0.39	0.39	0.15	0.22	0.00
Crit Moves:					****			****		****		

Metro Bus Facility Rosecrans and Avalon TIS
Existing Plus Project Plus Cumulative Conditions
PM Peak Hour

Level Of Service Computation Report
ICU 1(Loss as Cycle Length %) Method (Future Volume Alternative)

Intersection #2 I-110 NB Ramps / East Rosecrans Ave

Cycle (sec):	100	Critical Vol./Cap.(X):	0.608
Loss Time (sec):	10	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	41	Level Of Service:	B

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Split Phase			Split Phase			Permitted			Permitted		
Rights:	Include			Include			Ovl			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lanes:	1	0	1! 0	0	0	1! 0 0	0	1	2 0 1	0	0	2 1 0
Volume Module:												
Base Vol:	292	3	186	2	0	29	1	1458	375	0	1450	19
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	292	3	186	2	0	29	1	1458	375	0	1450	19
Added Vol:	9	0	14	0	0	0	0	40	5	0	118	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	301	3	200	2	0	29	1	1498	380	0	1568	19
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	301	3	200	2	0	29	1	1498	380	0	1568	19
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	301	3	200	2	0	29	1	1498	380	0	1568	19
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	301	3	200	2	0	29	1	1498	380	0	1568	19
OvlAdjVol:									128			
Saturation Flow Module:												
Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	1.20	0.01	0.79	0.06	0.00	0.94	0.01	2.99	1.00	0.00	2.96	0.04
Final Sat.:	1911	19	1270	103	0	1497	3	4797	1600	0	4743	57
Capacity Analysis Module:												
Vol/Sat:	0.16	0.16	0.16	0.02	0.00	0.02	0.00	0.31	0.24	0.00	0.33	0.33
OvlAdjV/S:									0.08			
Crit Moves:	****						****	****			****	

Metro Bus Facility Rosecrans and Avalon TIS
Existing Plus Project Plus Cumulative Conditions
PM Peak Hour

Level Of Service Computation Report
ICU 1(Loss as Cycle Length %) Method (Future Volume Alternative)

Intersection #3 South Main St / East Rosecrans Ave

Cycle (sec):	100	Critical Vol./Cap.(X):	0.661
Loss Time (sec):	10	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	46	Level Of Service:	B

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Permitted			Permitted			Permitted		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lanes:	1 0	2 0	1	1 0	2 0	1	1 0	2 1	0	1 0	2 1	0
Volume Module:												
Base Vol:	118	514	105	69	307	49	105	1372	88	67	668	54
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	118	514	105	69	307	49	105	1372	88	67	668	54
Added Vol:	0	0	0	0	0	0	0	54	0	0	118	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	118	514	105	69	307	49	105	1426	88	67	786	54
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	118	514	105	69	307	49	105	1426	88	67	786	54
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	118	514	105	69	307	49	105	1426	88	67	786	54
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	118	514	105	69	307	49	105	1426	88	67	786	54
Saturation Flow Module:												
Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	1.00	2.00	1.00	1.00	2.00	1.00	1.00	2.83	0.17	1.00	2.81	0.19
Final Sat.:	1600	3200	1600	1600	3200	1600	1600	4521	279	1600	4491	309
Capacity Analysis Module:												
Vol/Sat:	0.07	0.16	0.07	0.04	0.10	0.03	0.07	0.32	0.32	0.04	0.18	0.17
Crit Moves:		****		****				****		****		

Metro Bus Facility Rosecrans and Avalon TIS
Existing Plus Project Plus Cumulative Conditions
PM Peak Hour

Level Of Service Computation Report
ICU 1(Loss as Cycle Length %) Method (Future Volume Alternative)

Intersection #4 South Avalon Blvd / East 135th St

Cycle (sec):	100	Critical Vol./Cap.(X):	0.797
Loss Time (sec):	10	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	66	Level Of Service:	C

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Permitted			Permitted			Permitted		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lanes:	1 0	1 1	0	1 0	2 0	1	1 0	1 0	1	1 0	2 0	1
Volume Module:												
Base Vol:	88	816	69	79	568	73	261	550	135	27	151	71
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	88	816	69	79	568	73	261	550	135	27	151	71
Added Vol:	0	34	0	0	25	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	88	850	69	79	593	73	261	550	135	27	151	71
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	88	850	69	79	593	73	261	550	135	27	151	71
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	88	850	69	79	593	73	261	550	135	27	151	71
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	88	850	69	79	593	73	261	550	135	27	151	71
Saturation Flow Module:												
Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	1.00	1.85	0.15	1.00	2.00	1.00	1.00	1.00	1.00	1.00	2.00	1.00
Final Sat.:	1600	2960	240	1600	3200	1600	1600	1600	1600	1600	3200	1600
Capacity Analysis Module:												
Vol/Sat:	0.06	0.29	0.29	0.05	0.19	0.05	0.16	0.34	0.08	0.02	0.05	0.04
Crit Moves:		****		****				****		****		

Metro Bus Facility Rosecrans and Avalon TIS
Existing Plus Project Plus Cumulative Conditions
PM Peak Hour

Level Of Service Computation Report
ICU 1(Loss as Cycle Length %) Method (Future Volume Alternative)

Intersection #5 South Avalon Blvd / East Rosecrans Ave

Cycle (sec):	100	Critical Vol./Cap.(X):	0.860
Loss Time (sec):	10	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	83	Level Of Service:	D

Approach:	North Bound				South Bound				East Bound				West Bound			
Movement:	L	-	T	- R	L	-	T	- R	L	-	T	- R	L	-	T	- R
Control:	Prot+Permit				Prot+Permit				Prot+Permit				Prot+Permit			
Rights:	Include				Include				Include				Include			
Min. Green:	0	0	0		0	0	0		0	0	0		0	0	0	
Y+R:	4.0	4.0	4.0		4.0	4.0	4.0		4.0	4.0	4.0		4.0	4.0	4.0	
Lanes:	1	0	2	0 1	1	0	2	0 1	1	0	2	1 0	1	0	2	1 0
Volume Module:																
Base Vol:	104	699	182		201	495	72		117	1292	104		110	569	138	
Growth Adj:	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00	
Initial Bse:	104	699	182		201	495	72		117	1292	104		110	569	138	
Added Vol:	10	11	31		12	11	3		3	47	11		54	110	21	
PasserByVol:	0	0	0		0	0	0		0	0	0		0	0	0	
Initial Fut:	114	710	213		213	506	75		120	1339	115		164	679	159	
User Adj:	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00	
PHF Adj:	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00	
PHF Volume:	114	710	213		213	506	75		120	1339	115		164	679	159	
Reduct Vol:	0	0	0		0	0	0		0	0	0		0	0	0	
Reduced Vol:	114	710	213		213	506	75		120	1339	115		164	679	159	
PCE Adj:	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00	
MLF Adj:	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00	
FinalVolume:	114	710	213		213	506	75		120	1339	115		164	679	159	
Saturation Flow Module:																
Sat/Lane:	1600	1600	1600		1600	1600	1600		1600	1600	1600		1600	1600	1600	
Adjustment:	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00	
Lanes:	1.00	2.00	1.00		1.00	2.00	1.00		1.00	2.76	0.24		1.00	2.43	0.57	
Final Sat.:	1600	3200	1600		1600	3200	1600		1600	4420	380		1600	3889	911	
Capacity Analysis Module:																
Vol/Sat:	0.07	0.22	0.13		0.13	0.16	0.05		0.08	0.30	0.30		0.10	0.17	0.17	
Crit Moves:		****				****					****			****		

Metro Bus Facility Rosecrans and Avalon TIS
Existing Plus Project Plus Cumulative Conditions
PM Peak Hour

Level Of Service Computation Report
2000 HCM Unsignalized Method (Future Volume Alternative)

Intersection #6 South Avalon Blvd / Project Dwy - Bus

Average Delay (sec/veh): 0.0 Worst Case Level Of Service: B[10.3]

Approach:	North Bound					South Bound					East Bound					West Bound				
Movement:	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R
Control:	Uncontrolled					Uncontrolled					Stop Sign					Stop Sign				
Rights:	Include					Include					Include					Include				
Lanes:	0	0	2	0	1	1	0	2	0	0	0	0	0	0	0	0	0	0	0	1
Volume Module:																				
Base Vol:	0	977	0			0	709	0			0	0	0			0	0	0		
Growth Adj:	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00		
Initial Bse:	0	977	0			0	709	0			0	0	0			0	0	0		
Added Vol:	0	52	0			1	75	0			0	0	0			0	0	0		
PasserByVol:	0	0	0			0	0	0			0	0	0			0	0	0		
Initial Fut:	0	1029	0			1	784	0			0	0	0			0	0	0		
User Adj:	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00		
PHF Adj:	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00		
PHF Volume:	0	1029	0			1	784	0			0	0	0			0	0	0		
Reduct Vol:	0	0	0			0	0	0			0	0	0			0	0	0		
FinalVolume:	0	1029	0			1	784	0			0	0	0			0	0	0		
Critical Gap Module:																				
Critical Gp:	xxxxx	xxxx	xxxxx			4.1	xxxx	xxxxx			xxxxx	xxxx	xxxxx			xxxxx	xxxx	6.9		
FollowUpTim:	xxxxx	xxxx	xxxxx			2.2	xxxx	xxxxx			xxxxx	xxxx	xxxxx			xxxxx	xxxx	3.3		
Capacity Module:																				
Cnflict Vol:	xxxx	xxxx	xxxxx			1029	xxxx	xxxxx			xxxx	xxxx	xxxxx			xxxx	xxxx	515		
Potent Cap.:	xxxx	xxxx	xxxxx			683	xxxx	xxxxx			xxxx	xxxx	xxxxx			xxxx	xxxx	510		
Move Cap.:	xxxx	xxxx	xxxxx			683	xxxx	xxxxx			xxxx	xxxx	xxxxx			xxxx	xxxx	510		
Volume/Cap:	xxxx	xxxx	xxxx			0.00	xxxx	xxxx			xxxx	xxxx	xxxx			xxxx	xxxx	0.00		
Level Of Service Module:																				
2Way95thQ:	xxxx	xxxx	xxxxx			0.0	xxxx	xxxxx			xxxx	xxxx	xxxxx			xxxx	xxxx	xxxxx		
Control Del:	xxxxx	xxxx	xxxxx			10.3	xxxx	xxxxx			xxxxx	xxxx	xxxxx			xxxxx	xxxx	xxxxx		
LOS by Move:	*	*	*			B	*	*			*	*	*			*	*	*		
Movement:	LT -	LTR -	RT			LT -	LTR -	RT			LT -	LTR -	RT			LT -	LTR -	RT		
Shared Cap.:	xxxx	xxxx	xxxxx			xxxx	xxxx	xxxxx			xxxx	xxxx	xxxxx			xxxx	xxxx	xxxxx		
SharedQueue:	xxxxx	xxxx	xxxxx			xxxxx	xxxx	xxxxx			xxxxx	xxxx	xxxxx			xxxxx	xxxx	xxxxx		
Shrd ConDel:	xxxxx	xxxx	xxxxx			xxxxx	xxxx	xxxxx			xxxxx	xxxx	xxxxx			xxxxx	xxxx	xxxxx		
Shared LOS:	*	*	*			*	*	*			*	*	*			*	*	*		
ApproachDel:	xxxxxx					xxxxxx					xxxxxx					xxxxxx				
ApproachLOS:	*					*					*					*				

Note: Queue reported is the number of cars per lane.

Metro Bus Facility Rosecrans and Avalon TIS
Existing Plus Project Plus Cumulative Conditions
PM Peak Hour

Level Of Service Computation Report
ICU 1(Loss as Cycle Length %) Method (Future Volume Alternative)

Intersection #7 South Avalon Blvd / East Compton Blvd

Cycle (sec):	100	Critical Vol./Cap.(X):	0.584
Loss Time (sec):	10	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	39	Level Of Service:	A

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Permitted			Permitted			Permitted		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lanes:	1	0 2	0 1	1	0 2	0 1	1	0 1	1 0	1	0 1	1 0
Volume Module:												
Base Vol:	29	810	70	111	568	58	93	322	50	37	189	74
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	29	810	70	111	568	58	93	322	50	37	189	74
Added Vol:	1	52	9	0	75	0	0	0	1	9	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	30	862	79	111	643	58	93	322	51	46	189	74
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	30	862	79	111	643	58	93	322	51	46	189	74
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	30	862	79	111	643	58	93	322	51	46	189	74
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	30	862	79	111	643	58	93	322	51	46	189	74
Saturation Flow Module:												
Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	1.00	2.00	1.00	1.00	2.00	1.00	1.00	1.73	0.27	1.00	1.44	0.56
Final Sat.:	1600	3200	1600	1600	3200	1600	1600	2762	438	1600	2300	900
Capacity Analysis Module:												
Vol/Sat:	0.02	0.27	0.05	0.07	0.20	0.04	0.06	0.12	0.12	0.03	0.08	0.08
Crit Moves:		****		****				****		****		

Metro Bus Facility Rosecrans and Avalon TIS
Existing Plus Project Plus Cumulative Conditions
PM Peak Hour

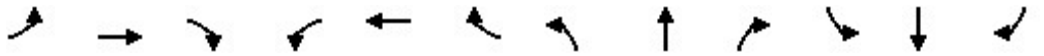
Level Of Service Computation Report
2000 HCM Unsignalized Method (Future Volume Alternative)

Intersection #8 Project Dwy - Employees / East Rosecrans Ave

Average Delay (sec/veh): 0.2 Worst Case Level Of Service: F[83.4]

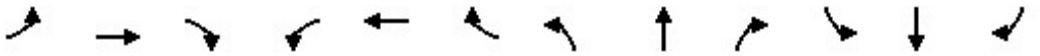
Approach:	North Bound						South Bound						East Bound						West Bound					
Movement:	L	-	T	-	R		L	-	T	-	R		L	-	T	-	R		L	-	T	-	R	
Control:	Stop Sign						Stop Sign						Uncontrolled						Uncontrolled					
Rights:	Include						Include						Include						Include					
Lanes:	0	0	1!	0	0		0	0	0	0	0		0	0	2	1	0		1	0	3	0	0	
Volume Module:																								
Base Vol:	0		0		0		0		0		0		0		1675		0		0		817		0	
Growth Adj:	1.00		1.00		1.00		1.00		1.00		1.00		1.00		1.00		1.00		1.00		1.00		1.00	
Initial Bse:	0		0		0		0		0		0		0		1675		0		0		817		0	
Added Vol:	6		0		1		0		0		0		0		88		2		0		179		0	
PasserByVol:	0		0		0		0		0		0		0		0		0		0		0		0	
Initial Fut:	6		0		1		0		0		0		0		1763		2		0		996		0	
User Adj:	1.00		1.00		1.00		1.00		1.00		1.00		1.00		1.00		1.00		1.00		1.00		1.00	
PHF Adj:	1.00		1.00		1.00		1.00		1.00		1.00		1.00		1.00		1.00		1.00		1.00		1.00	
PHF Volume:	6		0		1		0		0		0		0		1763		2		0		996		0	
Reduct Vol:	0		0		0		0		0		0		0		0		0		0		0		0	
FinalVolume:	6		0		1		0		0		0		0		1763		2		0		996		0	
Critical Gap Module:																								
Critical Gp:	6.8		6.5		6.9		xxxxx		xxxx		xxxxx		xxxxx		xxxx		xxxxx		xxxxx		xxxx		xxxxx	
FollowUpTim:	3.5		4.0		3.3		xxxxx		xxxx		xxxxx		xxxxx		xxxx		xxxxx		xxxxx		xxxx		xxxxx	
Capacity Module:																								
Cnflict Vol:	2096		2760		589		xxxx		xxxx		xxxxx		xxxx		xxxx		xxxxx		xxxx		xxxx		xxxxx	
Potent Cap.:	46		20		457		xxxx		xxxx		xxxxx		xxxx		xxxx		xxxxx		xxxx		xxxx		xxxxx	
Move Cap.:	46		20		457		xxxx		xxxx		xxxxx		xxxx		xxxx		xxxxx		xxxx		xxxx		xxxxx	
Volume/Cap:	0.13		0.00		0.00		xxxx		xxxx		xxxx		xxxx		xxxx		xxxx		xxxx		xxxx		xxxx	
Level Of Service Module:																								
2Way95thQ:	xxxx		xxxx		xxxxx		xxxx		xxxx		xxxxx		xxxx		xxxx		xxxxx		xxxx		xxxx		xxxxx	
Control Del:	xxxxx		xxxx		xxxxx		xxxxx		xxxx		xxxxx		xxxxx		xxxx		xxxxx		xxxxx		xxxx		xxxxx	
LOS by Move:	*		*		*		*		*		*		*		*		*		*		*		*	
Movement:	LT	-	LTR	-	RT		LT	-	LTR	-	RT		LT	-	LTR	-	RT		LT	-	LTR	-	RT	
Shared Cap.:	xxxx		53		xxxxx		xxxx		xxxx		xxxxx		xxxx		xxxx		xxxxx		xxxx		xxxx		xxxxx	
SharedQueue:	xxxxx		0.4		xxxxx		xxxxx		xxxx		xxxxx		xxxxx		xxxx		xxxxx		xxxxx		xxxx		xxxxx	
Shrd ConDel:	xxxxx		83.4		xxxxx		xxxxx		xxxx		xxxxx		xxxxx		xxxx		xxxxx		xxxxx		xxxx		xxxxx	
Shared LOS:	*		F		*		*		*		*		*		*		*		*		*		*	
ApproachDel:	83.4						xxxxxx						xxxxxx						xxxxxx					
ApproachLOS:	F						*						*						*					

Note: Queue reported is the number of cars per lane.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	275		0	0		0	150		150
Storage Lanes	0		0	1		0	0		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.91	0.91	1.00	0.91	1.00	1.00	1.00	1.00	0.95	0.91	0.95
Ped Bike Factor												
Frt		0.937									0.889	0.850
Flt Protected				0.950						0.950	0.988	
Satd. Flow (prot)	0	4765	0	1770	5085	0	0	0	0	1681	1489	1504
Flt Permitted				0.950						0.950	0.988	
Satd. Flow (perm)	0	4765	0	1770	5085	0	0	0	0	1681	1489	1504
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		271									51	94
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		508			258			584			534	
Travel Time (s)		11.5			5.9			13.3			12.1	

Intersection Summary	
Area Type:	Other



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	0	912	652	267	1283	0	0	0	0	367	4	481
Future Volume (vph)	0	912	652	267	1283	0	0	0	0	367	4	481
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	0	940	672	275	1323	0	0	0	0	378	4	496
Shared Lane Traffic (%)										19%		43%
Lane Group Flow (vph)	0	1612	0	275	1323	0	0	0	0	306	289	283

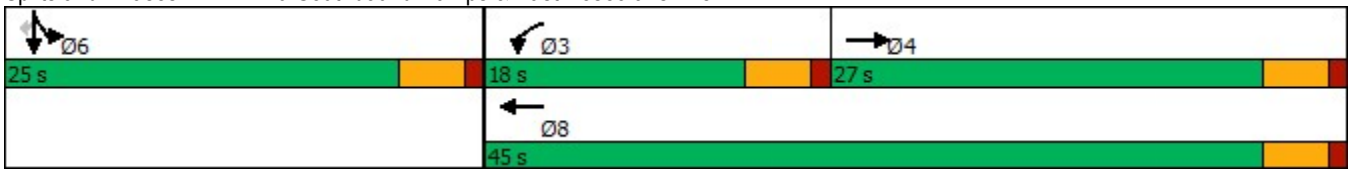
Intersection Summary

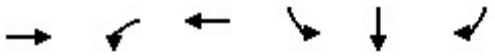
Lane Group	EBT	WBL	WBT	SBL	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	912	267	1283	367	4	481
Future Volume (vph)	912	267	1283	367	4	481
Turn Type	NA	Prot	NA	Split	NA	Perm
Protected Phases	4	3	8	6	6	
Permitted Phases						6
Detector Phase	4	3	8	6	6	6
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	9.5	22.5	22.5	22.5	22.5
Total Split (s)	27.0	18.0	45.0	25.0	25.0	25.0
Total Split (%)	38.6%	25.7%	64.3%	35.7%	35.7%	35.7%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lag	Lead				
Lead-Lag Optimize?	Yes	Yes				
Recall Mode	None	None	None	Max	Max	Max
Act Effct Green (s)	22.5	13.0	40.0	20.5	20.5	20.5
Actuated g/C Ratio	0.32	0.19	0.58	0.29	0.29	0.29
v/c Ratio	0.95dr	0.83	0.45	0.62	0.61	0.56
Control Delay	31.0	50.5	9.1	27.7	23.7	18.5
Queue Delay	0.0	0.0	1.3	0.0	0.0	0.0
Total Delay	31.0	50.5	10.3	27.7	23.7	18.5
LOS	C	D	B	C	C	B
Approach Delay	31.0		17.2		23.4	
Approach LOS	C		B		C	

Intersection Summary	
Cycle Length: 70	
Actuated Cycle Length: 69.5	
Natural Cycle: 70	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.93	
Intersection Signal Delay: 24.0	Intersection LOS: C
Intersection Capacity Utilization 73.4%	ICU Level of Service D
Analysis Period (min) 15	

dr Defacto Right Lane. Recode with 1 though lane as a right lane.

Splits and Phases: 1: I-110-Southbound Ramps & East Rosecrans Ave





Lane Group	EBT	WBL	WBT	SBL	SBT	SBR
Lane Group Flow (vph)	1612	275	1323	306	289	283
v/c Ratio	0.95dr	0.83	0.45	0.62	0.61	0.56
Control Delay	31.0	50.5	9.1	27.7	23.7	18.5
Queue Delay	0.0	0.0	1.3	0.0	0.0	0.0
Total Delay	31.0	50.5	10.3	27.7	23.7	18.5
Queue Length 50th (ft)	208	114	106	118	95	69
Queue Length 95th (ft)	#311	#232	136	202	181	145
Internal Link Dist (ft)	428		178		454	
Turn Bay Length (ft)		275		150		150
Base Capacity (vph)	1726	344	2964	496	475	509
Starvation Cap Reductn	0	0	1335	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.93	0.80	0.81	0.62	0.61	0.56

Intersection Summary

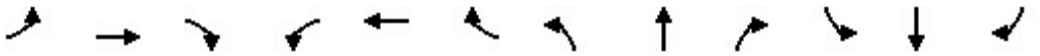
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
dr Defacto Right Lane. Recode with 1 though lane as a right lane.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	912	652	267	1283	0	0	0	0	367	4	481
Future Volume (veh/h)	0	912	652	267	1283	0	0	0	0	367	4	481
Number	7	4	14	3	8	18				1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1863	1900	1863	1863	0				1863	1863	1863
Adj Flow Rate, veh/h	0	940	672	275	1323	0				552	0	312
Adj No. of Lanes	0	3	0	1	3	0				2	0	1
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97				0.97	0.97	0.97
Percent Heavy Veh, %	0	2	2	2	2	0				2	2	2
Cap, veh/h	0	1107	517	319	2908	0				1056	0	471
Arrive On Green	0.00	0.33	0.33	0.18	0.57	0.00				0.30	0.00	0.30
Sat Flow, veh/h	0	3558	1583	1774	5253	0				3548	0	1583
Grp Volume(v), veh/h	0	940	672	275	1323	0				552	0	312
Grp Sat Flow(s),veh/h/ln	0	1695	1583	1774	1695	0				1774	0	1583
Q Serve(g_s), s	0.0	17.8	22.5	10.4	10.4	0.0				8.9	0.0	11.9
Cycle Q Clear(g_c), s	0.0	17.8	22.5	10.4	10.4	0.0				8.9	0.0	11.9
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	1107	517	319	2908	0				1056	0	471
V/C Ratio(X)	0.00	0.85	1.30	0.86	0.45	0.00				0.52	0.00	0.66
Avail Cap(c_a), veh/h	0	1107	517	348	2989	0				1056	0	471
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	21.6	23.2	27.4	8.5	0.0				20.1	0.0	21.2
Incr Delay (d2), s/veh	0.0	6.4	148.6	18.2	0.1	0.0				1.9	0.0	7.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	9.2	31.0	6.7	4.8	0.0				4.6	0.0	6.1
LnGrp Delay(d),s/veh	0.0	28.0	171.8	45.6	8.6	0.0				22.0	0.0	28.3
LnGrp LOS		C	F	D	A					C		C
Approach Vol, veh/h		1612			1598						864	
Approach Delay, s/veh		87.9			15.0						24.3	
Approach LOS		F			B						C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs			3	4		6		8
Phs Duration (G+Y+Rc), s			16.9	27.0		25.0		43.9
Change Period (Y+Rc), s			4.5	4.5		4.5		4.5
Max Green Setting (Gmax), s			13.5	22.5		20.5		40.5
Max Q Clear Time (g_c+I1), s			12.4	24.5		13.9		12.4
Green Ext Time (p_c), s			0.1	0.0		2.0		11.6

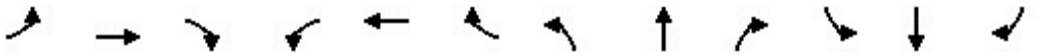
Intersection Summary	
HCM 2010 Ctrl Delay	45.8
HCM 2010 LOS	D

Notes



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		100	0		0	0		0	0		0
Storage Lanes	0		1	0		0	1		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.91	0.91	1.00	1.00	0.91	0.91	0.95	0.95	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt			0.850		0.998			0.907			0.884	
Flt Protected							0.950	0.982			0.993	
Satd. Flow (prot)	0	5085	1583	0	5075	0	1681	1576	0	0	1635	0
Flt Permitted		0.939					0.950	0.982			0.993	
Satd. Flow (perm)	0	4775	1583	0	5075	0	1681	1576	0	0	1635	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			371		2			110			87	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		148			3372			503			198	
Travel Time (s)		3.4			76.6			11.4			4.5	

Intersection Summary	
Area Type:	Other



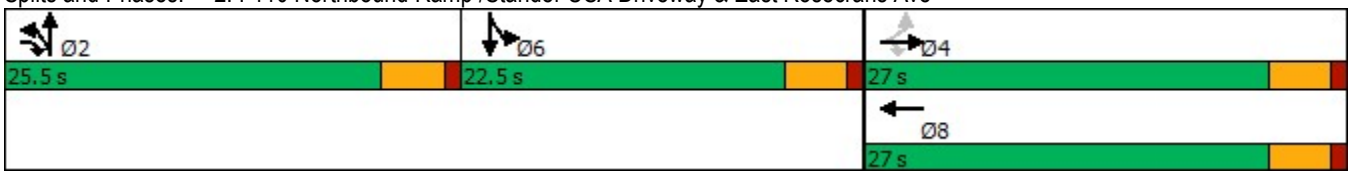
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	1	876	364	0	1342	14	482	6	209	2	0	12
Future Volume (vph)	1	876	364	0	1342	14	482	6	209	2	0	12
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	1	894	371	0	1369	14	492	6	213	2	0	12
Shared Lane Traffic (%)							25%					
Lane Group Flow (vph)	0	895	371	0	1383	0	369	342	0	0	14	0

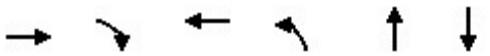
Intersection Summary

Lane Group	EBL	EBT	EBR	WBT	NBL	NBT	SBT
Lane Configurations							
Traffic Volume (vph)	1	876	364	1342	482	6	0
Future Volume (vph)	1	876	364	1342	482	6	0
Turn Type	Perm	NA	pm+ov	NA	Split	NA	NA
Protected Phases		4	2	8	2	2	6
Permitted Phases	4		4				
Detector Phase	4	4	2	8	2	2	6
Switch Phase							
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	27.0	27.0	25.5	27.0	25.5	25.5	22.5
Total Split (%)	36.0%	36.0%	34.0%	36.0%	34.0%	34.0%	30.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag							
Lead-Lag Optimize?							
Recall Mode	None	None	Max	None	Max	Max	Min
Act Effct Green (s)		22.5	48.0	22.5	21.0	21.0	5.5
Actuated g/C Ratio		0.36	0.77	0.36	0.34	0.34	0.09
v/c Ratio		0.52	0.29	0.76	0.65	0.57	0.06
Control Delay		17.1	0.8	20.8	24.2	15.7	0.6
Queue Delay		0.0	0.3	0.0	0.0	0.0	0.0
Total Delay		17.1	1.2	20.8	24.2	15.7	0.6
LOS		B	A	C	C	B	A
Approach Delay		12.4		20.8		20.1	0.6
Approach LOS		B		C		C	A

Intersection Summary	
Cycle Length: 75	
Actuated Cycle Length: 62.5	
Natural Cycle: 75	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.76	
Intersection Signal Delay: 17.4	Intersection LOS: B
Intersection Capacity Utilization 60.3%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 2: I-110 Northbound Ramp /Stander USA Driveway & East Rosecrans Ave





Lane Group	EBT	EBR	WBT	NBL	NBT	SBT
Lane Group Flow (vph)	895	371	1383	369	342	14
v/c Ratio	0.52	0.29	0.76	0.65	0.57	0.06
Control Delay	17.1	0.8	20.8	24.2	15.7	0.6
Queue Delay	0.0	0.3	0.0	0.0	0.0	0.0
Total Delay	17.1	1.2	20.8	24.2	15.7	0.6
Queue Length 50th (ft)	95	0	164	122	70	0
Queue Length 95th (ft)	130	12	213	211	149	0
Internal Link Dist (ft)	68		3292		423	118
Turn Bay Length (ft)		100				
Base Capacity (vph)	1719	1301	1828	564	602	532
Starvation Cap Reductn	0	465	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.52	0.44	0.76	0.65	0.57	0.03

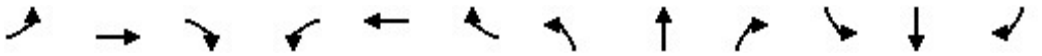
Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	876	364	0	1342	14	482	6	209	2	0	12
Future Volume (veh/h)	1	876	364	0	1342	14	482	6	209	2	0	12
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1863	1863	0	1863	1900	1863	1863	1900	1900	1863	1900
Adj Flow Rate, veh/h	1	894	371	0	1369	14	356	197	213	2	0	12
Adj No. of Lanes	0	3	1	0	3	0	1	1	0	0	1	0
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	2	2	2	0	2	2	2	2	2	2	2	2
Cap, veh/h	60	1688	1095	0	1772	18	621	287	310	19	0	115
Arrive On Green	0.34	0.34	0.34	0.00	0.34	0.34	0.35	0.35	0.35	0.08	0.00	0.08
Sat Flow, veh/h	1	4944	1583	0	5358	53	1774	820	886	230	0	1378
Grp Volume(v), veh/h	337	558	371	0	894	489	356	0	410	14	0	0
Grp Sat Flow(s),veh/h/ln	1860	1543	1583	0	1695	1853	1774	0	1706	1608	0	0
Q Serve(g_s), s	0.0	8.7	5.7	0.0	14.2	14.2	9.8	0.0	12.3	0.5	0.0	0.0
Cycle Q Clear(g_c), s	8.7	8.7	5.7	0.0	14.2	14.2	9.8	0.0	12.3	0.5	0.0	0.0
Prop In Lane	0.00		1.00	0.00		0.03	1.00		0.52	0.14		0.86
Lane Grp Cap(c), veh/h	695	1053	1095	0	1157	633	621	0	598	134	0	0
V/C Ratio(X)	0.48	0.53	0.34	0.00	0.77	0.77	0.57	0.00	0.69	0.10	0.00	0.00
Avail Cap(c_a), veh/h	757	1158	1149	0	1272	695	621	0	598	483	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	15.9	15.9	3.7	0.0	17.7	17.7	15.8	0.0	16.7	25.4	0.0	0.0
Incr Delay (d2), s/veh	0.5	0.4	0.2	0.0	2.8	4.9	3.8	0.0	6.3	0.3	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.5	3.8	5.3	0.0	7.0	8.1	5.4	0.0	6.9	0.2	0.0	0.0
LnGrp Delay(d),s/veh	16.4	16.3	3.9	0.0	20.4	22.6	19.7	0.0	23.0	25.8	0.0	0.0
LnGrp LOS	B	B	A		C	C	B		C	C		
Approach Vol, veh/h		1266			1383			766			14	
Approach Delay, s/veh		12.7			21.2			21.4			25.8	
Approach LOS		B			C			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		25.5		25.0		9.5		25.0
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5
Max Green Setting (Gmax), s		21.0		22.5		18.0		22.5
Max Q Clear Time (g_c+I1), s		14.3		10.7		2.5		16.2
Green Ext Time (p_c), s		2.2		5.6		0.0		4.3

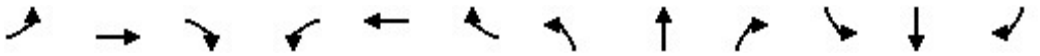
Intersection Summary	
HCM 2010 Ctrl Delay	18.1
HCM 2010 LOS	B

Notes



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	150		0	155		0	190		100	190		100
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.91	0.91	1.00	0.91	0.91	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor												
Frt		0.988			0.990				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	5024	0	1770	5034	0	1770	3539	1583	1770	3539	1583
Flt Permitted	0.194			0.356			0.517			0.573		
Satd. Flow (perm)	361	5024	0	663	5034	0	963	3539	1583	1067	3539	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		33			27				42			66
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		3372			2662			738			2100	
Travel Time (s)		76.6			60.5			16.8			47.7	

Intersection Summary	
Area Type:	Other



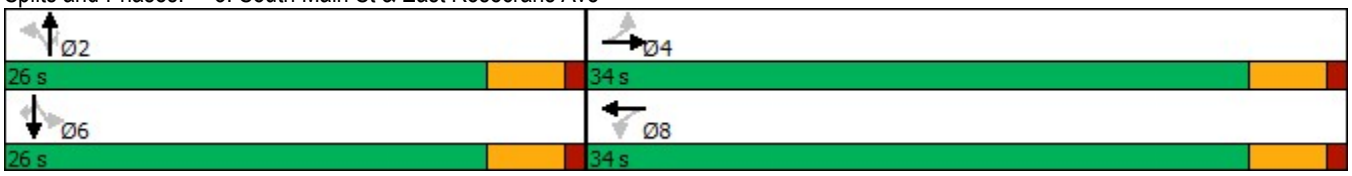
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	61	637	55	93	1004	73	59	284	41	48	386	77
Future Volume (vph)	61	637	55	93	1004	73	59	284	41	48	386	77
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	63	657	57	96	1035	75	61	293	42	49	398	79
Shared Lane Traffic (%)												
Lane Group Flow (vph)	63	714	0	96	1110	0	61	293	42	49	398	79

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	61	637	93	1004	59	284	41	48	386	77
Future Volume (vph)	61	637	93	1004	59	284	41	48	386	77
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4		8		2			6	
Permitted Phases	4		8		2		2	6		6
Detector Phase	4	4	8	8	2	2	2	6	6	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	34.0	34.0	34.0	34.0	26.0	26.0	26.0	26.0	26.0	26.0
Total Split (%)	56.7%	56.7%	56.7%	56.7%	43.3%	43.3%	43.3%	43.3%	43.3%	43.3%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag										
Lead-Lag Optimize?										
Recall Mode	None	None	None	None	Max	Max	Max	Max	Max	Max
Act Effct Green (s)	21.6	21.6	21.6	21.6	21.7	21.7	21.7	21.7	21.7	21.7
Actuated g/C Ratio	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41
v/c Ratio	0.43	0.34	0.35	0.53	0.15	0.20	0.06	0.11	0.27	0.11
Control Delay	20.4	10.1	14.1	11.9	13.1	11.6	5.0	12.5	12.0	5.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	20.4	10.1	14.1	11.9	13.1	11.6	5.0	12.5	12.0	5.4
LOS	C	B	B	B	B	B	A	B	B	A
Approach Delay		10.9		12.1		11.1			11.1	
Approach LOS		B		B		B			B	

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 52.4	
Natural Cycle: 50	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.53	
Intersection Signal Delay: 11.5	Intersection LOS: B
Intersection Capacity Utilization 55.0%	ICU Level of Service B
Analysis Period (min) 15	

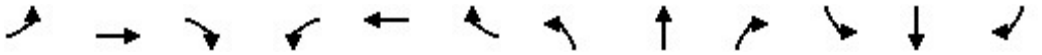
Splits and Phases: 3: South Main St & East Rosecrans Ave





Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	63	714	96	1110	61	293	42	49	398	79
v/c Ratio	0.43	0.34	0.35	0.53	0.15	0.20	0.06	0.11	0.27	0.11
Control Delay	20.4	10.1	14.1	11.9	13.1	11.6	5.0	12.5	12.0	5.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	20.4	10.1	14.1	11.9	13.1	11.6	5.0	12.5	12.0	5.4
Queue Length 50th (ft)	13	49	19	86	11	28	0	9	40	2
Queue Length 95th (ft)	43	69	48	115	39	62	17	32	83	26
Internal Link Dist (ft)		3292		2582		658			2020	
Turn Bay Length (ft)	150		155		190		100	190		100
Base Capacity (vph)	205	2871	376	2874	399	1466	680	442	1466	694
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.31	0.25	0.26	0.39	0.15	0.20	0.06	0.11	0.27	0.11

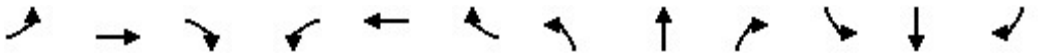
Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	61	637	55	93	1004	73	59	284	41	48	386	77
Future Volume (veh/h)	61	637	55	93	1004	73	59	284	41	48	386	77
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	63	657	57	96	1035	75	61	293	42	49	398	79
Adj No. of Lanes	1	3	0	1	3	0	1	2	1	1	2	1
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	262	1911	165	365	1940	140	461	1495	669	527	1495	669
Arrive On Green	0.40	0.40	0.40	0.40	0.40	0.40	0.42	0.42	0.42	0.42	0.42	0.42
Sat Flow, veh/h	506	4770	411	733	4841	350	914	3539	1583	1041	3539	1583
Grp Volume(v), veh/h	63	466	248	96	724	386	61	293	42	49	398	79
Grp Sat Flow(s),veh/h/ln	506	1695	1790	733	1695	1801	914	1770	1583	1041	1770	1583
Q Serve(g_s), s	5.5	4.9	4.9	5.3	8.3	8.3	2.4	2.7	0.8	1.6	3.7	1.5
Cycle Q Clear(g_c), s	13.8	4.9	4.9	10.2	8.3	8.3	6.1	2.7	0.8	4.2	3.7	1.5
Prop In Lane	1.00		0.23	1.00		0.19	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	262	1359	717	365	1359	722	461	1495	669	527	1495	669
V/C Ratio(X)	0.24	0.34	0.35	0.26	0.53	0.53	0.13	0.20	0.06	0.09	0.27	0.12
Avail Cap(c_a), veh/h	352	1965	1038	496	1965	1044	461	1495	669	527	1495	669
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	16.9	10.6	10.6	14.2	11.6	11.6	11.5	9.3	8.7	10.6	9.6	8.9
Incr Delay (d2), s/veh	0.5	0.1	0.3	0.4	0.3	0.6	0.6	0.3	0.2	0.3	0.4	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	2.3	2.5	1.1	3.9	4.2	0.7	1.3	0.4	0.5	1.9	0.7
LnGrp Delay(d),s/veh	17.4	10.7	10.9	14.6	11.9	12.2	12.1	9.5	8.9	10.9	10.0	9.3
LnGrp LOS	B	B	B	B	B	B	B	A	A	B	B	A
Approach Vol, veh/h		777			1206			396			526	
Approach Delay, s/veh		11.3			12.3			9.9			10.0	
Approach LOS		B			B			A			A	

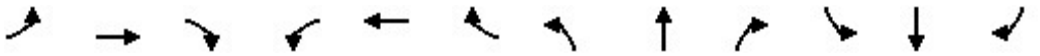
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		26.0		24.9		26.0		24.9
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5
Max Green Setting (Gmax), s		21.5		29.5		21.5		29.5
Max Q Clear Time (g_c+I1), s		8.1		15.8		6.2		12.2
Green Ext Time (p_c), s		1.9		4.6		2.7		7.8

Intersection Summary	
HCM 2010 Ctrl Delay	11.3
HCM 2010 LOS	B



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	105		105	80		100	100		0	100		100
Storage Lanes	1		1	1		1	1		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	0.95	1.00	0.95	1.00
Ped Bike Factor												
Frt			0.850			0.850		0.992				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1863	1583	1770	3539	1583	1770	3511	0	1770	3539	1583
Flt Permitted	0.536			0.649			0.378			0.404		
Satd. Flow (perm)	998	1863	1583	1209	3539	1583	704	3511	0	753	3539	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			89			76		13				121
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		774			575			2576			504	
Travel Time (s)		17.6			13.1			58.5			11.5	

Intersection Summary	
Area Type:	Other



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	87	156	81	48	322	69	105	556	30	42	633	110
Future Volume (vph)	87	156	81	48	322	69	105	556	30	42	633	110
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	96	171	89	53	354	76	115	611	33	46	696	121
Shared Lane Traffic (%)												
Lane Group Flow (vph)	96	171	89	53	354	76	115	644	0	46	696	121

Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	87	156	81	48	322	69	105	556	42	633	110
Future Volume (vph)	87	156	81	48	322	69	105	556	42	633	110
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm	NA	Perm
Protected Phases		4			8			2		6	
Permitted Phases	4		4	8		8	2		6		6
Detector Phase	4	4	4	8	8	8	2	2	6	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	25.0	25.0	25.0	25.0	25.0	25.0	35.0	35.0	35.0	35.0	35.0
Total Split (%)	41.7%	41.7%	41.7%	41.7%	41.7%	41.7%	58.3%	58.3%	58.3%	58.3%	58.3%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag											
Lead-Lag Optimize?											
Recall Mode	None	None	None	None	None	None	Max	Max	Max	Max	Max
Act Effct Green (s)	11.4	11.4	11.4	11.4	11.4	11.4	30.6	30.6	30.6	30.6	30.6
Actuated g/C Ratio	0.22	0.22	0.22	0.22	0.22	0.22	0.60	0.60	0.60	0.60	0.60
v/c Ratio	0.43	0.41	0.21	0.20	0.45	0.18	0.27	0.31	0.10	0.33	0.12
Control Delay	23.0	19.7	5.6	17.3	18.7	5.8	8.3	6.0	6.3	6.2	1.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.0	19.7	5.6	17.3	18.7	5.8	8.3	6.0	6.3	6.2	1.9
LOS	C	B	A	B	B	A	A	A	A	A	A
Approach Delay		17.1			16.5			6.3		5.6	
Approach LOS		B			B			A		A	

Intersection Summary		
Cycle Length: 60		
Actuated Cycle Length: 51.1		
Natural Cycle: 45		
Control Type: Actuated-Uncoordinated		
Maximum v/c Ratio: 0.45		
Intersection Signal Delay: 9.6	Intersection LOS: A	
Intersection Capacity Utilization 52.0%	ICU Level of Service A	
Analysis Period (min) 15		

Splits and Phases: 4: South Avalon Blvd & East 135th St





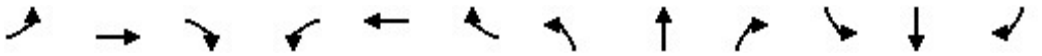
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	96	171	89	53	354	76	115	644	46	696	121
v/c Ratio	0.43	0.41	0.21	0.20	0.45	0.18	0.27	0.31	0.10	0.33	0.12
Control Delay	23.0	19.7	5.6	17.3	18.7	5.8	8.3	6.0	6.3	6.2	1.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.0	19.7	5.6	17.3	18.7	5.8	8.3	6.0	6.3	6.2	1.9
Queue Length 50th (ft)	25	44	0	13	47	0	13	40	5	44	0
Queue Length 95th (ft)	59	86	25	35	77	24	49	86	21	95	18
Internal Link Dist (ft)		694			495			2496		424	
Turn Bay Length (ft)	105		105	80		100	100		100		100
Base Capacity (vph)	401	750	690	487	1425	682	421	2109	451	2120	997
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.24	0.23	0.13	0.11	0.25	0.11	0.27	0.31	0.10	0.33	0.12

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	87	156	81	48	322	69	105	556	30	42	633	110
Future Volume (veh/h)	87	156	81	48	322	69	105	556	30	42	633	110
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	96	171	89	53	354	76	115	611	33	46	696	121
Adj No. of Lanes	1	1	1	1	2	1	1	2	0	1	2	1
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	287	447	380	320	849	380	462	2004	108	527	2077	929
Arrive On Green	0.24	0.24	0.24	0.24	0.24	0.24	0.59	0.59	0.59	0.59	0.59	0.59
Sat Flow, veh/h	954	1863	1583	1115	3539	1583	666	3416	184	783	3539	1583
Grp Volume(v), veh/h	96	171	89	53	354	76	115	316	328	46	696	121
Grp Sat Flow(s),veh/h/ln	954	1863	1583	1115	1770	1583	666	1770	1830	783	1770	1583
Q Serve(g_s), s	4.9	4.0	2.4	2.2	4.4	2.0	5.6	4.7	4.7	1.6	5.3	1.8
Cycle Q Clear(g_c), s	9.3	4.0	2.4	6.2	4.4	2.0	10.8	4.7	4.7	6.3	5.3	1.8
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.10	1.00		1.00
Lane Grp Cap(c), veh/h	287	447	380	320	849	380	462	1038	1074	527	2077	929
V/C Ratio(X)	0.33	0.38	0.23	0.17	0.42	0.20	0.25	0.30	0.31	0.09	0.34	0.13
Avail Cap(c_a), veh/h	434	735	625	493	1396	625	462	1038	1074	527	2077	929
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	20.6	16.5	15.9	19.1	16.7	15.8	8.3	5.4	5.4	7.0	5.5	4.8
Incr Delay (d2), s/veh	0.7	0.5	0.3	0.2	0.3	0.3	1.3	0.8	0.7	0.3	0.4	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.3	2.1	1.0	0.7	2.2	0.9	1.2	2.4	2.5	0.4	2.6	0.8
LnGrp Delay(d),s/veh	21.3	17.1	16.2	19.3	17.0	16.0	9.6	6.2	6.1	7.3	6.0	5.1
LnGrp LOS	C	B	B	B	B	B	A	A	A	A	A	A
Approach Vol, veh/h		356			483			759			863	
Approach Delay, s/veh		18.0			17.1			6.7			5.9	
Approach LOS		B			B			A			A	

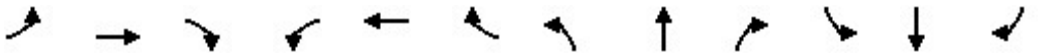
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		35.0		17.0		35.0		17.0
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5
Max Green Setting (Gmax), s		30.5		20.5		30.5		20.5
Max Q Clear Time (g_c+I1), s		12.8		11.3		8.3		8.2
Green Ext Time (p_c), s		4.7		1.2		5.8		2.2

Intersection Summary	
HCM 2010 Ctrl Delay	10.1
HCM 2010 LOS	B



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	220		0	200		0	110		110	120		100
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.91	0.91	1.00	0.91	0.91	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor												
Frt		0.979			0.984				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	4979	0	1770	5004	0	1770	3539	1583	1770	3539	1583
Flt Permitted	0.233			0.265			0.277			0.307		
Satd. Flow (perm)	434	4979	0	494	5004	0	516	3539	1583	572	3539	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		48			33				176			176
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		2662			498			439			2576	
Travel Time (s)		60.5			11.3			10.0			58.5	

Intersection Summary	
Area Type:	Other



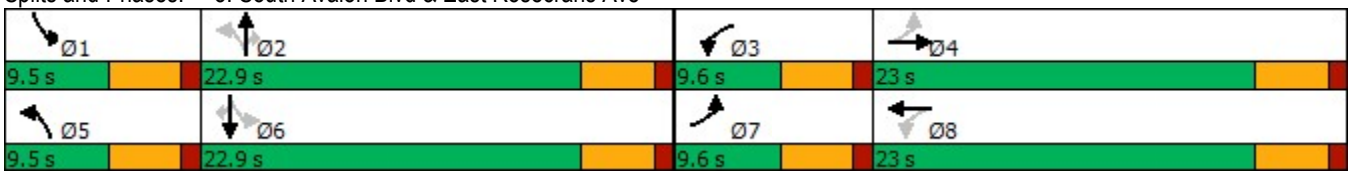
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	54	530	87	172	1069	131	113	530	129	141	566	93
Future Volume (vph)	54	530	87	172	1069	131	113	530	129	141	566	93
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	62	609	100	198	1229	151	130	609	148	162	651	107
Shared Lane Traffic (%)												
Lane Group Flow (vph)	62	709	0	198	1380	0	130	609	148	162	651	107

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	54	530	172	1069	113	530	129	141	566	93
Future Volume (vph)	54	530	172	1069	113	530	129	141	566	93
Turn Type	pm+pt	NA	pm+pt	NA	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4	3	8	5	2		1	6	
Permitted Phases	4		8		2		2	6		6
Detector Phase	7	4	3	8	5	2	2	1	6	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	9.5	22.5	9.5	22.5	22.5	9.5	22.5	22.5
Total Split (s)	9.6	23.0	9.6	23.0	9.5	22.9	22.9	9.5	22.9	22.9
Total Split (%)	14.8%	35.4%	14.8%	35.4%	14.6%	35.2%	35.2%	14.6%	35.2%	35.2%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	Max	Max	None	Max	Max
Act Effct Green (s)	20.4	15.2	22.4	19.6	22.5	18.7	18.7	22.5	18.7	18.7
Actuated g/C Ratio	0.34	0.25	0.37	0.33	0.38	0.31	0.31	0.38	0.31	0.31
v/c Ratio	0.24	0.55	0.67	0.83	0.43	0.55	0.24	0.51	0.59	0.17
Control Delay	13.5	19.8	27.5	26.4	16.5	20.9	3.6	18.5	21.5	1.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	13.5	19.8	27.5	26.4	16.5	20.9	3.6	18.5	21.5	1.6
LOS	B	B	C	C	B	C	A	B	C	A
Approach Delay		19.3		26.5		17.4			18.7	
Approach LOS		B		C		B			B	

Intersection Summary	
Cycle Length: 65	
Actuated Cycle Length: 60	
Natural Cycle: 65	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.83	
Intersection Signal Delay: 21.5	Intersection LOS: C
Intersection Capacity Utilization 65.2%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 5: South Avalon Blvd & East Rosecrans Ave

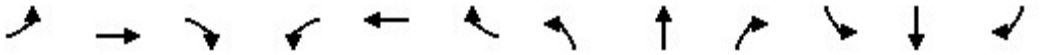




Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	62	709	198	1380	130	609	148	162	651	107
v/c Ratio	0.24	0.55	0.67	0.83	0.43	0.55	0.24	0.51	0.59	0.17
Control Delay	13.5	19.8	27.5	26.4	16.5	20.9	3.6	18.5	21.5	1.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	13.5	19.8	27.5	26.4	16.5	20.9	3.6	18.5	21.5	1.6
Queue Length 50th (ft)	14	78	48	191	30	108	0	39	118	0
Queue Length 95th (ft)	32	106	#104	#268	59	151	24	71	163	8
Internal Link Dist (ft)		2582		418		359			2496	
Turn Bay Length (ft)	220		200		110		110	120		100
Base Capacity (vph)	262	1594	295	1658	299	1103	615	316	1103	615
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.24	0.44	0.67	0.83	0.43	0.55	0.24	0.51	0.59	0.17

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	54	530	87	172	1069	131	113	530	129	141	566	93
Future Volume (veh/h)	54	530	87	172	1069	131	113	530	129	141	566	93
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	62	609	100	198	1229	151	130	609	148	162	651	107
Adj No. of Lanes	1	3	0	1	3	0	1	2	1	1	2	1
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	220	1165	189	364	1342	165	342	1031	461	356	1050	470
Arrive On Green	0.05	0.26	0.26	0.08	0.29	0.29	0.07	0.29	0.29	0.08	0.30	0.30
Sat Flow, veh/h	1774	4412	715	1774	4590	564	1774	3539	1583	1774	3539	1583
Grp Volume(v), veh/h	62	466	243	198	908	472	130	609	148	162	651	107
Grp Sat Flow(s),veh/h/ln	1774	1695	1737	1774	1695	1763	1774	1770	1583	1774	1770	1583
Q Serve(g_s), s	1.6	7.4	7.6	5.1	16.4	16.4	3.2	9.3	4.6	4.0	10.0	3.2
Cycle Q Clear(g_c), s	1.6	7.4	7.6	5.1	16.4	16.4	3.2	9.3	4.6	4.0	10.0	3.2
Prop In Lane	1.00		0.41	1.00		0.32	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	220	895	459	364	991	515	342	1031	461	356	1050	470
V/C Ratio(X)	0.28	0.52	0.53	0.54	0.92	0.92	0.38	0.59	0.32	0.46	0.62	0.23
Avail Cap(c_a), veh/h	270	993	508	364	993	516	352	1031	461	356	1050	470
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	17.3	19.8	19.9	16.0	21.6	21.6	14.7	19.2	17.5	14.7	19.1	16.8
Incr Delay (d2), s/veh	0.7	0.5	1.0	1.7	12.8	21.2	0.7	2.5	1.8	0.9	2.7	1.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	3.5	3.8	2.6	9.3	10.9	1.6	4.8	2.2	2.0	5.3	1.5
LnGrp Delay(d),s/veh	18.0	20.3	20.8	17.7	34.4	42.8	15.4	21.7	19.3	15.6	21.9	17.9
LnGrp LOS	B	C	C	B	C	D	B	C	B	B	C	B
Approach Vol, veh/h		771			1578			887			920	
Approach Delay, s/veh		20.3			34.8			20.4			20.3	
Approach LOS		C			C			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.5	22.9	9.6	21.2	9.1	23.3	7.8	23.0
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	5.0	18.4	5.1	18.5	5.0	18.4	5.1	18.5
Max Q Clear Time (g_c+I1), s	6.0	11.3	7.1	9.6	5.2	12.0	3.6	18.4
Green Ext Time (p_c), s	0.0	2.6	0.0	3.1	0.0	2.5	0.0	0.1

Intersection Summary	
HCM 2010 Ctrl Delay	25.8
HCM 2010 LOS	C



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%		0%			0%
Storage Length (ft)	0	0		100	100	
Storage Lanes	0	1		1	1	
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	1.00	0.95	1.00	1.00	0.95
Ped Bike Factor						
Frt		0.865				
Flt Protected					0.950	
Satd. Flow (prot)	0	1611	3539	1863	1770	3539
Flt Permitted					0.950	
Satd. Flow (perm)	0	1611	3539	1863	1770	3539
Link Speed (mph)	30		30			30
Link Distance (ft)	196		2086			439
Travel Time (s)	4.5		47.4			10.0

Intersection Summary	
Area Type:	Other



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Volume (vph)	0	2	808	0	6	819
Future Volume (vph)	0	2	808	0	6	819
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%		0%			0%
Adj. Flow (vph)	0	2	878	0	7	890
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	2	878	0	7	890

Intersection Summary

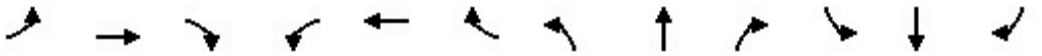
Intersection	
Int Delay, s/veh	0.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	2	808	0	6	819
Future Vol, veh/h	0	2	808	0	6	819
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	100	100	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	2	878	0	7	890

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	-	439	0	0	878	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.94	-	-	4.14	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.32	-	-	2.22	-
Pot Cap-1 Maneuver	0	566	-	-	765	-
Stage 1	0	-	-	-	-	-
Stage 2	0	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	-	566	-	-	765	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

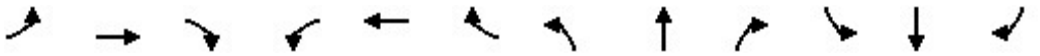
Approach	WB	NB	SB
HCM Control Delay, s	11.4	0	0.1
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	566	765	-
HCM Lane V/C Ratio	-	-	0.004	0.009	-
HCM Control Delay (s)	-	-	11.4	9.7	-
HCM Lane LOS	-	-	B	A	-
HCM 95th %tile Q(veh)	-	-	0	0	-



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	155		0	150		0	110		100	115		100
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor												
Frt		0.975			0.963				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3451	0	1770	3408	0	1770	3539	1583	1770	3539	1583
Flt Permitted	0.335			0.651			0.319			0.344		
Satd. Flow (perm)	624	3451	0	1213	3408	0	594	3539	1583	641	3539	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		27			86				70			27
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		972			474			575			2086	
Travel Time (s)		22.1			10.8			13.1			47.4	

Intersection Summary	
Area Type:	Other



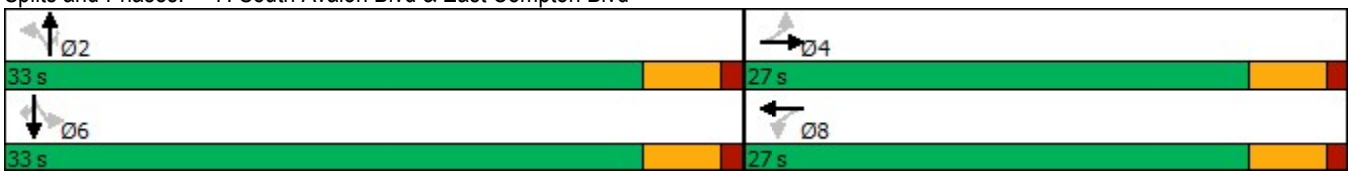
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	27	116	24	73	385	128	47	653	62	65	701	24
Future Volume (vph)	27	116	24	73	385	128	47	653	62	65	701	24
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	31	132	27	83	438	145	53	742	70	74	797	27
Shared Lane Traffic (%)												
Lane Group Flow (vph)	31	159	0	83	583	0	53	742	70	74	797	27

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	27	116	73	385	47	653	62	65	701	24
Future Volume (vph)	27	116	73	385	47	653	62	65	701	24
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4		8		2			6	
Permitted Phases	4		8		2		2	6		6
Detector Phase	4	4	8	8	2	2	2	6	6	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	27.0	27.0	27.0	27.0	33.0	33.0	33.0	33.0	33.0	33.0
Total Split (%)	45.0%	45.0%	45.0%	45.0%	55.0%	55.0%	55.0%	55.0%	55.0%	55.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag										
Lead-Lag Optimize?										
Recall Mode	None	None	None	None	Max	Max	Max	Max	Max	Max
Act Effct Green (s)	14.4	14.4	14.4	14.4	28.7	28.7	28.7	28.7	28.7	28.7
Actuated g/C Ratio	0.28	0.28	0.28	0.28	0.55	0.55	0.55	0.55	0.55	0.55
v/c Ratio	0.18	0.16	0.25	0.58	0.16	0.38	0.08	0.21	0.41	0.03
Control Delay	16.3	11.8	16.0	15.9	9.0	8.2	2.7	9.5	8.4	3.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	16.3	11.8	16.0	15.9	9.0	8.2	2.7	9.5	8.4	3.5
LOS	B	B	B	B	A	A	A	A	A	A
Approach Delay		12.5		15.9		7.8			8.4	
Approach LOS		B		B		A			A	

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 52.2	
Natural Cycle: 45	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.58	
Intersection Signal Delay: 10.4	Intersection LOS: B
Intersection Capacity Utilization 57.4%	ICU Level of Service B
Analysis Period (min) 15	

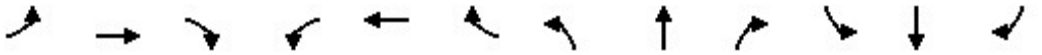
Splits and Phases: 7: South Avalon Blvd & East Compton Blvd





Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	31	159	83	583	53	742	70	74	797	27
v/c Ratio	0.18	0.16	0.25	0.58	0.16	0.38	0.08	0.21	0.41	0.03
Control Delay	16.3	11.8	16.0	15.9	9.0	8.2	2.7	9.5	8.4	3.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	16.3	11.8	16.0	15.9	9.0	8.2	2.7	9.5	8.4	3.5
Queue Length 50th (ft)	7	15	20	66	7	60	0	10	65	0
Queue Length 95th (ft)	23	32	45	102	27	115	15	36	125	10
Internal Link Dist (ft)		892		394		495			2006	
Turn Bay Length (ft)	155		150		110		100	115		100
Base Capacity (vph)	271	1513	526	1528	326	1946	902	352	1946	882
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.11	0.11	0.16	0.38	0.16	0.38	0.08	0.21	0.41	0.03

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	27	116	24	73	385	128	47	653	62	65	701	24
Future Volume (veh/h)	27	116	24	73	385	128	47	653	62	65	701	24
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	31	132	27	83	438	145	53	742	70	74	797	27
Adj No. of Lanes	1	2	0	1	2	0	1	2	1	1	2	1
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	229	751	150	411	669	219	434	2003	896	445	2003	896
Arrive On Green	0.26	0.26	0.26	0.26	0.26	0.26	0.57	0.57	0.57	0.57	0.57	0.57
Sat Flow, veh/h	828	2941	588	1222	2621	860	662	3539	1583	669	3539	1583
Grp Volume(v), veh/h	31	78	81	83	294	289	53	742	70	74	797	27
Grp Sat Flow(s),veh/h/ln	828	1770	1759	1222	1770	1711	662	1770	1583	669	1770	1583
Q Serve(g_s), s	1.8	1.7	1.8	2.9	7.5	7.6	2.5	5.8	1.0	3.4	6.3	0.4
Cycle Q Clear(g_c), s	9.4	1.7	1.8	4.7	7.5	7.6	8.8	5.8	1.0	9.2	6.3	0.4
Prop In Lane	1.00		0.33	1.00		0.50	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	229	452	449	411	452	437	434	2003	896	445	2003	896
V/C Ratio(X)	0.14	0.17	0.18	0.20	0.65	0.66	0.12	0.37	0.08	0.17	0.40	0.03
Avail Cap(c_a), veh/h	388	791	786	645	791	765	434	2003	896	445	2003	896
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	21.0	14.6	14.6	16.5	16.8	16.8	8.6	6.0	5.0	8.5	6.1	4.8
Incr Delay (d2), s/veh	0.3	0.2	0.2	0.2	1.6	1.7	0.6	0.5	0.2	0.8	0.6	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.9	0.9	1.0	3.8	3.7	0.5	2.9	0.5	0.7	3.2	0.2
LnGrp Delay(d),s/veh	21.3	14.8	14.8	16.7	18.4	18.5	9.2	6.5	5.1	9.3	6.7	4.9
LnGrp LOS	C	B	B	B	B	B	A	A	A	A	A	A
Approach Vol, veh/h		190			666			865			898	
Approach Delay, s/veh		15.9			18.2			6.6			6.9	
Approach LOS		B			B			A			A	

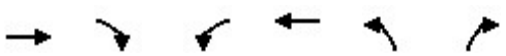
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		33.0		17.3		33.0		17.3
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5
Max Green Setting (Gmax), s		28.5		22.5		28.5		22.5
Max Q Clear Time (g_c+I1), s		10.8		11.4		11.2		9.6
Green Ext Time (p_c), s		5.6		0.7		6.0		3.2

Intersection Summary	
HCM 2010 Ctrl Delay	10.3
HCM 2010 LOS	B



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)		0	100		0	0
Storage Lanes		0	1		1	0
Taper Length (ft)			25		25	
Lane Util. Factor	0.91	0.91	1.00	0.91	1.00	1.00
Ped Bike Factor						
Frt	0.999					
Flt Protected					0.950	
Satd. Flow (prot)	5080	0	1863	5085	1770	0
Flt Permitted					0.950	
Satd. Flow (perm)	5080	0	1863	5085	1770	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	498			189	111	
Travel Time (s)	11.3			4.3	2.5	

Intersection Summary	
Area Type:	Other



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Traffic Volume (vph)	797	4	0	1369	4	0
Future Volume (vph)	797	4	0	1369	4	0
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Adj. Flow (vph)	866	4	0	1488	4	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	870	0	0	1488	4	0

Intersection Summary

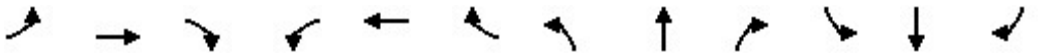
Intersection	
Int Delay, s/veh	0

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	797	4	0	1369	4	0
Future Vol, veh/h	797	4	0	1369	4	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	100	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	866	4	0	1488	4	0

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	870	0	1463	435
Stage 1	-	-	-	-	868	-
Stage 2	-	-	-	-	595	-
Critical Hdwy	-	-	5.34	-	5.74	7.14
Critical Hdwy Stg 1	-	-	-	-	6.64	-
Critical Hdwy Stg 2	-	-	-	-	6.04	-
Follow-up Hdwy	-	-	3.12	-	3.82	3.92
Pot Cap-1 Maneuver	-	-	452	-	180	487
Stage 1	-	-	-	-	291	-
Stage 2	-	-	-	-	468	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	452	-	180	487
Mov Cap-2 Maneuver	-	-	-	-	237	-
Stage 1	-	-	-	-	291	-
Stage 2	-	-	-	-	468	-

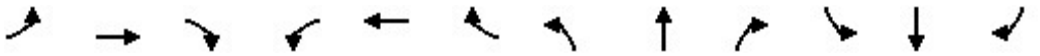
Approach	EB	WB	NB
HCM Control Delay, s	0	0	20.5
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	237	-	-	452	-
HCM Lane V/C Ratio	0.018	-	-	-	-
HCM Control Delay (s)	20.5	-	-	0	-
HCM Lane LOS	C	-	-	A	-
HCM 95th %tile Q(veh)	0.1	-	-	0	-



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	275		0	0		0	150		150
Storage Lanes	0		0	1		0	0		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.91	0.91	1.00	0.91	1.00	1.00	1.00	1.00	0.95	0.91	0.95
Ped Bike Factor												
Frt		0.964									0.949	0.850
Flt Protected				0.950						0.950	0.970	
Satd. Flow (prot)	0	4902	0	1770	5085	0	0	0	0	1681	1560	1504
Flt Permitted				0.950						0.950	0.970	
Satd. Flow (perm)	0	4902	0	1770	5085	0	0	0	0	1681	1560	1504
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		83									22	74
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		508			258			584			534	
Travel Time (s)		11.5			5.9			13.3			12.1	

Intersection Summary	
Area Type:	Other



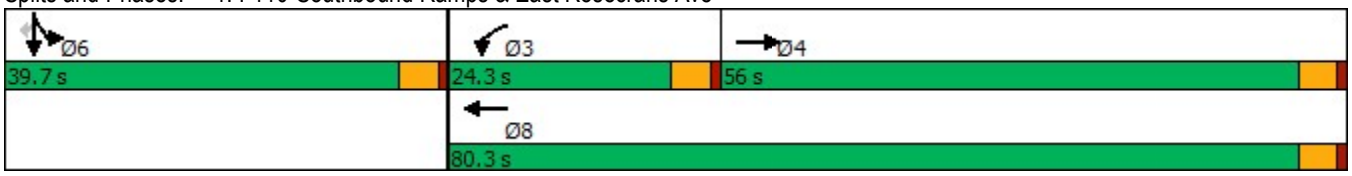
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	0	1422	449	236	1070	0	0	0	0	600	12	459
Future Volume (vph)	0	1422	449	236	1070	0	0	0	0	600	12	459
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	0	1693	535	281	1274	0	0	0	0	714	14	546
Shared Lane Traffic (%)										38%		27%
Lane Group Flow (vph)	0	2228	0	281	1274	0	0	0	0	443	432	399

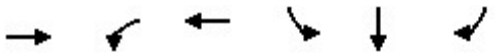
Intersection Summary

Lane Group	EBT	WBL	WBT	SBL	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	1422	236	1070	600	12	459
Future Volume (vph)	1422	236	1070	600	12	459
Turn Type	NA	Prot	NA	Split	NA	Perm
Protected Phases	4	3	8	6	6	
Permitted Phases						6
Detector Phase	4	3	8	6	6	6
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	9.5	22.5	22.5	22.5	22.5
Total Split (s)	56.0	24.3	80.3	39.7	39.7	39.7
Total Split (%)	46.7%	20.3%	66.9%	33.1%	33.1%	33.1%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lag	Lead				
Lead-Lag Optimize?	Yes	Yes				
Recall Mode	None	None	None	Max	Max	Max
Act Effct Green (s)	51.5	19.8	75.8	35.2	35.2	35.2
Actuated g/C Ratio	0.43	0.16	0.63	0.29	0.29	0.29
v/c Ratio	1.04	0.96	0.40	0.90	0.91	0.81
Control Delay	62.2	94.1	11.3	63.3	64.2	46.0
Queue Delay	0.0	42.6	7.4	0.0	0.0	0.0
Total Delay	62.2	136.7	18.7	63.3	64.2	46.0
LOS	E	F	B	E	E	D
Approach Delay	62.2		40.1		58.2	
Approach LOS	E		D		E	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Natural Cycle: 120	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.04	
Intersection Signal Delay: 54.4	Intersection LOS: D
Intersection Capacity Utilization 104.6%	ICU Level of Service G
Analysis Period (min) 15	

Splits and Phases: 1: I-110-Southbound Ramps & East Rosecrans Ave





Lane Group	EBT	WBL	WBT	SBL	SBT	SBR
Lane Group Flow (vph)	2228	281	1274	443	432	399
v/c Ratio	1.04	0.96	0.40	0.90	0.91	0.81
Control Delay	62.2	94.1	11.3	63.3	64.2	46.0
Queue Delay	0.0	42.6	7.4	0.0	0.0	0.0
Total Delay	62.2	136.7	18.7	63.3	64.2	46.0
Queue Length 50th (ft)	~666	219	165	346	339	250
Queue Length 95th (ft)	#667	#350	177	#484	#489	346
Internal Link Dist (ft)	428		178		454	
Turn Bay Length (ft)		275		150		150
Base Capacity (vph)	2151	292	3212	493	473	493
Starvation Cap Reductn	0	67	1891	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	1.04	1.25	0.96	0.90	0.91	0.81

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

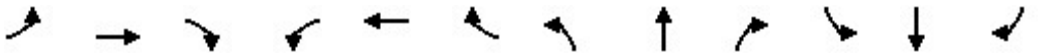
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	1422	449	236	1070	0	0	0	0	600	12	459
Future Volume (veh/h)	0	1422	449	236	1070	0	0	0	0	600	12	459
Number	7	4	14	3	8	18				1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1863	1900	1863	1863	0				1863	1863	1863
Adj Flow Rate, veh/h	0	1693	535	281	1274	0				890	0	369
Adj No. of Lanes	0	3	0	1	3	0				2	0	1
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84				0.84	0.84	0.84
Percent Heavy Veh, %	0	2	2	2	2	0				2	2	2
Cap, veh/h	0	1656	509	293	3212	0				1041	0	464
Arrive On Green	0.00	0.43	0.43	0.16	0.63	0.00				0.29	0.00	0.29
Sat Flow, veh/h	0	4026	1186	1774	5253	0				3548	0	1583
Grp Volume(v), veh/h	0	1482	746	281	1274	0				890	0	369
Grp Sat Flow(s),veh/h/ln	0	1695	1653	1774	1695	0				1774	0	1583
Q Serve(g_s), s	0.0	51.5	51.5	18.9	14.8	0.0				28.4	0.0	25.8
Cycle Q Clear(g_c), s	0.0	51.5	51.5	18.9	14.8	0.0				28.4	0.0	25.8
Prop In Lane	0.00		0.72	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	1455	710	293	3212	0				1041	0	464
V/C Ratio(X)	0.00	1.02	1.05	0.96	0.40	0.00				0.86	0.00	0.79
Avail Cap(c_a), veh/h	0	1455	710	293	3212	0				1041	0	464
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	34.2	34.3	49.7	10.9	0.0				40.0	0.0	39.1
Incr Delay (d2), s/veh	0.0	28.4	48.1	41.7	0.1	0.0				9.0	0.0	13.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	29.8	32.9	12.6	6.9	0.0				15.1	0.0	13.0
LnGrp Delay(d),s/veh	0.0	62.6	82.3	91.4	10.9	0.0				49.0	0.0	52.2
LnGrp LOS		F	F	F	B					D		D
Approach Vol, veh/h		2228			1555						1259	
Approach Delay, s/veh		69.2			25.5						49.9	
Approach LOS		E			C						D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs			3	4		6		8
Phs Duration (G+Y+Rc), s			24.3	56.0		39.7		80.3
Change Period (Y+Rc), s			4.5	4.5		4.5		4.5
Max Green Setting (Gmax), s			19.8	51.5		35.2		75.8
Max Q Clear Time (g_c+I1), s			20.9	53.5		30.4		16.8
Green Ext Time (p_c), s			0.0	0.0		2.3		13.4

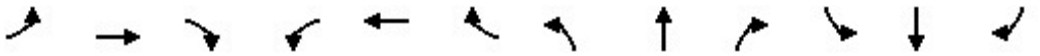
Intersection Summary	
HCM 2010 Ctrl Delay	50.9
HCM 2010 LOS	D

Notes



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		100	0		0	0		0	0		0
Storage Lanes	0		1	0		0	1		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.91	0.91	1.00	1.00	0.91	0.91	0.95	0.95	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt			0.850		0.998			0.874			0.873	
Flt Protected							0.950	0.993			0.997	
Satd. Flow (prot)	0	5085	1583	0	5075	0	1681	1536	0	0	1621	0
Flt Permitted		0.939					0.950	0.993			0.997	
Satd. Flow (perm)	0	4775	1583	0	5075	0	1681	1536	0	0	1621	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			404		2			213			87	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		148			3372			503			198	
Travel Time (s)		3.4			76.6			11.4			4.5	

Intersection Summary	
Area Type:	Other



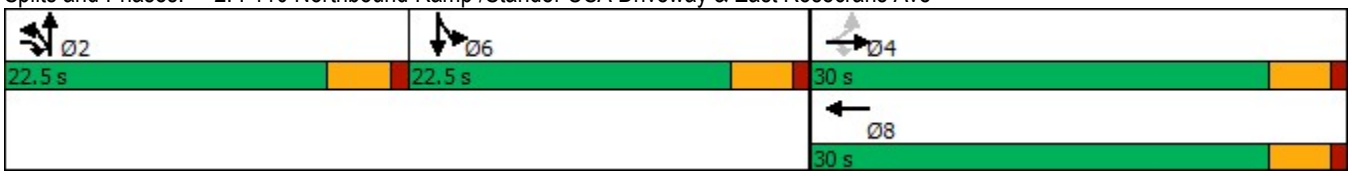
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	1	1498	380	0	1568	19	301	3	200	2	0	29
Future Volume (vph)	1	1498	380	0	1568	19	301	3	200	2	0	29
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	1	1594	404	0	1668	20	320	3	213	2	0	31
Shared Lane Traffic (%)							12%					
Lane Group Flow (vph)	0	1595	404	0	1688	0	282	254	0	0	33	0

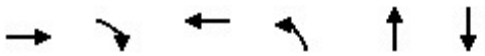
Intersection Summary

Lane Group	EBL	EBT	EBR	WBT	NBL	NBT	SBT
Lane Configurations							
Traffic Volume (vph)	1	1498	380	1568	301	3	0
Future Volume (vph)	1	1498	380	1568	301	3	0
Turn Type	Perm	NA	pm+ov	NA	Split	NA	NA
Protected Phases		4	2	8	2	2	6
Permitted Phases	4		4				
Detector Phase	4	4	2	8	2	2	6
Switch Phase							
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	30.0	30.0	22.5	30.0	22.5	22.5	22.5
Total Split (%)	40.0%	40.0%	30.0%	40.0%	30.0%	30.0%	30.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag							
Lead-Lag Optimize?							
Recall Mode	None	None	Max	None	Max	Max	Min
Act Effct Green (s)		25.5	48.0	25.5	18.0	18.0	5.5
Actuated g/C Ratio		0.41	0.77	0.41	0.29	0.29	0.09
v/c Ratio		0.82	0.31	0.82	0.58	0.43	0.15
Control Delay		20.9	0.9	20.4	24.8	7.1	1.7
Queue Delay		0.9	0.4	0.0	0.0	0.0	0.0
Total Delay		21.8	1.3	20.4	24.8	7.1	1.7
LOS		C	A	C	C	A	A
Approach Delay		17.7		20.4		16.4	1.7
Approach LOS		B		C		B	A

Intersection Summary	
Cycle Length: 75	
Actuated Cycle Length: 62.5	
Natural Cycle: 75	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.82	
Intersection Signal Delay: 18.5	Intersection LOS: B
Intersection Capacity Utilization 59.4%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 2: I-110 Northbound Ramp /Stander USA Driveway & East Rosecrans Ave





Lane Group	EBT	EBR	WBT	NBL	NBT	SBT
Lane Group Flow (vph)	1595	404	1688	282	254	33
v/c Ratio	0.82	0.31	0.82	0.58	0.43	0.15
Control Delay	20.9	0.9	20.4	24.8	7.1	1.7
Queue Delay	0.9	0.4	0.0	0.0	0.0	0.0
Total Delay	21.8	1.3	20.4	24.8	7.1	1.7
Queue Length 50th (ft)	189	0	199	95	11	0
Queue Length 95th (ft)	245	12	256	169	63	3
Internal Link Dist (ft)	68		3292		423	118
Turn Bay Length (ft)		100				
Base Capacity (vph)	1948	1309	2071	484	594	528
Starvation Cap Reductn	141	450	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.88	0.47	0.82	0.58	0.43	0.06

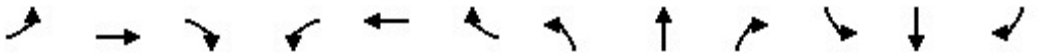
Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	1498	380	0	1568	19	301	3	200	2	0	29
Future Volume (veh/h)	1	1498	380	0	1568	19	301	3	200	2	0	29
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1863	1863	0	1863	1900	1863	1863	1900	1900	1863	1900
Adj Flow Rate, veh/h	1	1594	404	0	1668	20	268	76	213	2	0	31
Adj No. of Lanes	0	3	1	0	3	0	1	1	0	0	1	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	0	2	2	2	2	2	2	2	2
Cap, veh/h	59	1979	1102	0	2073	25	525	128	359	8	0	123
Arrive On Green	0.40	0.40	0.40	0.00	0.40	0.40	0.30	0.30	0.30	0.08	0.00	0.08
Sat Flow, veh/h	0	4945	1583	0	5348	62	1774	433	1215	97	0	1497
Grp Volume(v), veh/h	600	995	404	0	1092	596	268	0	289	33	0	0
Grp Sat Flow(s),veh/h/ln	1861	1543	1583	0	1695	1852	1774	0	1648	1594	0	0
Q Serve(g_s), s	0.0	17.4	6.3	0.0	17.3	17.3	7.6	0.0	9.1	1.2	0.0	0.0
Cycle Q Clear(g_c), s	17.4	17.4	6.3	0.0	17.3	17.3	7.6	0.0	9.1	1.2	0.0	0.0
Prop In Lane	0.00		1.00	0.00		0.03	1.00		0.74	0.06		0.94
Lane Grp Cap(c), veh/h	804	1235	1102	0	1357	741	525	0	488	131	0	0
V/C Ratio(X)	0.75	0.81	0.37	0.00	0.80	0.80	0.51	0.00	0.59	0.25	0.00	0.00
Avail Cap(c_a), veh/h	839	1293	1132	0	1420	776	525	0	488	471	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	16.1	16.2	3.8	0.0	16.1	16.1	17.8	0.0	18.3	26.2	0.0	0.0
Incr Delay (d2), s/veh	3.5	3.7	0.2	0.0	3.3	6.0	3.5	0.0	5.2	1.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	9.6	8.0	5.4	0.0	8.7	10.0	4.2	0.0	4.8	0.6	0.0	0.0
LnGrp Delay(d),s/veh	19.7	19.9	4.0	0.0	19.5	22.1	21.3	0.0	23.5	27.2	0.0	0.0
LnGrp LOS	B	B	A		B	C	C		C	C		
Approach Vol, veh/h		1999			1688			557			33	
Approach Delay, s/veh		16.6			20.4			22.5			27.2	
Approach LOS		B			C			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		22.5		28.9		9.5		28.9
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5
Max Green Setting (Gmax), s		18.0		25.5		18.0		25.5
Max Q Clear Time (g_c+I1), s		11.1		19.4		3.2		19.3
Green Ext Time (p_c), s		1.6		5.0		0.1		4.8

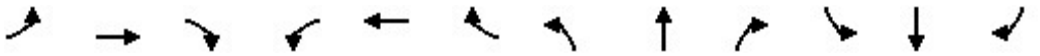
Intersection Summary	
HCM 2010 Ctrl Delay	19.0
HCM 2010 LOS	B

Notes



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	150		0	155		0	190		100	190		100
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.91	0.91	1.00	0.91	0.91	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor												
Frt		0.991			0.990				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	5040	0	1770	5034	0	1770	3539	1583	1770	3539	1583
Flt Permitted	0.290			0.135			0.554			0.379		
Satd. Flow (perm)	540	5040	0	251	5034	0	1032	3539	1583	706	3539	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		25			28				27			52
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		3372			2662			738			2100	
Travel Time (s)		76.6			60.5			16.8			47.7	

Intersection Summary	
Area Type:	Other



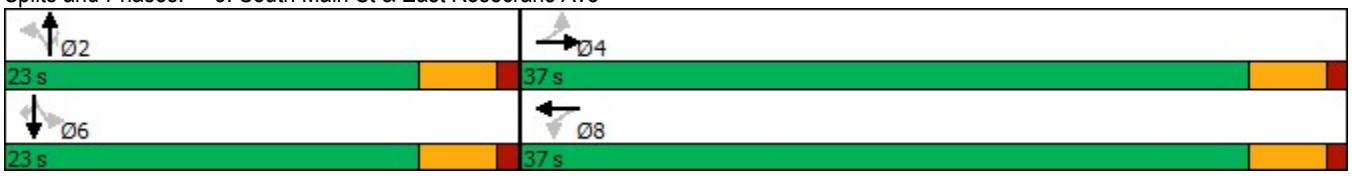
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	105	1426	88	67	786	54	118	514	105	69	307	49
Future Volume (vph)	105	1426	88	67	786	54	118	514	105	69	307	49
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	112	1517	94	71	836	57	126	547	112	73	327	52
Shared Lane Traffic (%)												
Lane Group Flow (vph)	112	1611	0	71	893	0	126	547	112	73	327	52

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	105	1426	67	786	118	514	105	69	307	49
Future Volume (vph)	105	1426	67	786	118	514	105	69	307	49
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4		8		2			6	
Permitted Phases	4		8		2		2	6		6
Detector Phase	4	4	8	8	2	2	2	6	6	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	37.0	37.0	37.0	37.0	23.0	23.0	23.0	23.0	23.0	23.0
Total Split (%)	61.7%	61.7%	61.7%	61.7%	38.3%	38.3%	38.3%	38.3%	38.3%	38.3%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag										
Lead-Lag Optimize?										
Recall Mode	None	None	None	None	Max	Max	Max	Max	Max	Max
Act Effct Green (s)	29.5	29.5	29.5	29.5	18.6	18.6	18.6	18.6	18.6	18.6
Actuated g/C Ratio	0.52	0.52	0.52	0.52	0.33	0.33	0.33	0.33	0.33	0.33
v/c Ratio	0.40	0.62	0.55	0.34	0.38	0.48	0.21	0.32	0.28	0.09
Control Delay	13.4	10.7	29.8	8.1	20.3	17.8	13.5	20.7	16.0	5.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	13.4	10.7	29.8	8.1	20.3	17.8	13.5	20.7	16.0	5.7
LOS	B	B	C	A	C	B	B	C	B	A
Approach Delay		10.9		9.7		17.6			15.6	
Approach LOS		B		A		B			B	

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 57.2	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.62	
Intersection Signal Delay: 12.5	Intersection LOS: B
Intersection Capacity Utilization 67.1%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 3: South Main St & East Rosecrans Ave





Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	112	1611	71	893	126	547	112	73	327	52
v/c Ratio	0.40	0.62	0.55	0.34	0.38	0.48	0.21	0.32	0.28	0.09
Control Delay	13.4	10.7	29.8	8.1	20.3	17.8	13.5	20.7	16.0	5.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	13.4	10.7	29.8	8.1	20.3	17.8	13.5	20.7	16.0	5.7
Queue Length 50th (ft)	21	127	15	57	35	83	22	20	46	0
Queue Length 95th (ft)	56	165	#72	79	78	125	55	53	75	20
Internal Link Dist (ft)		3292		2582		658			2020	
Turn Bay Length (ft)	150		155		190		100	190		100
Base Capacity (vph)	308	2890	143	2887	335	1151	532	229	1151	550
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.36	0.56	0.50	0.31	0.38	0.48	0.21	0.32	0.28	0.09

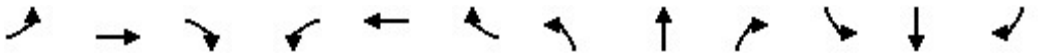
Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	105	1426	88	67	786	54	118	514	105	69	307	49
Future Volume (veh/h)	105	1426	88	67	786	54	118	514	105	69	307	49
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	112	1517	94	71	836	57	126	547	112	73	327	52
Adj No. of Lanes	1	3	0	1	3	0	1	2	1	1	2	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	386	2539	157	221	2523	171	381	1146	513	281	1146	513
Arrive On Green	0.52	0.52	0.52	0.52	0.52	0.52	0.32	0.32	0.32	0.32	0.32	0.32
Sat Flow, veh/h	620	4896	303	313	4864	331	1000	3539	1583	772	3539	1583
Grp Volume(v), veh/h	112	1050	561	71	582	311	126	547	112	73	327	52
Grp Sat Flow(s),veh/h/ln	620	1695	1809	313	1695	1804	1000	1770	1583	772	1770	1583
Q Serve(g_s), s	7.3	12.3	12.3	11.7	5.7	5.7	6.1	7.1	2.9	4.8	3.9	1.3
Cycle Q Clear(g_c), s	13.1	12.3	12.3	24.0	5.7	5.7	10.1	7.1	2.9	11.8	3.9	1.3
Prop In Lane	1.00		0.17	1.00		0.18	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	386	1758	938	221	1758	936	381	1146	513	281	1146	513
V/C Ratio(X)	0.29	0.60	0.60	0.32	0.33	0.33	0.33	0.48	0.22	0.26	0.29	0.10
Avail Cap(c_a), veh/h	417	1928	1029	236	1928	1026	381	1146	513	281	1146	513
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	11.8	9.6	9.6	18.0	8.0	8.0	18.1	15.5	14.1	20.2	14.4	13.5
Incr Delay (d2), s/veh	0.4	0.4	0.8	0.8	0.1	0.2	2.3	1.4	1.0	2.2	0.6	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.3	5.8	6.3	1.1	2.6	2.9	1.9	3.6	1.4	1.2	2.0	0.6
LnGrp Delay(d),s/veh	12.2	10.0	10.4	18.8	8.1	8.2	20.5	16.9	15.0	22.4	15.0	13.9
LnGrp LOS	B	B	B	B	A	A	C	B	B	C	B	B
Approach Vol, veh/h		1723			964			785			452	
Approach Delay, s/veh		10.3			8.9			17.2			16.1	
Approach LOS		B			A			B			B	

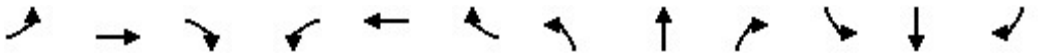
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		23.0		34.1		23.0		34.1
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5
Max Green Setting (Gmax), s		18.5		32.5		18.5		32.5
Max Q Clear Time (g_c+I1), s		12.1		15.1		13.8		26.0
Green Ext Time (p_c), s		2.5		11.4		1.2		3.6

Intersection Summary	
HCM 2010 Ctrl Delay	12.0
HCM 2010 LOS	B



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	105		105	80		100	100		0	100		100
Storage Lanes	1		1	1		1	1		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	0.95	1.00	0.95	1.00
Ped Bike Factor												
Frt			0.850			0.850		0.989				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1863	1583	1770	3539	1583	1770	3500	0	1770	3539	1583
Flt Permitted	0.652			0.199			0.382			0.215		
Satd. Flow (perm)	1215	1863	1583	371	3539	1583	712	3500	0	400	3539	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			130			74		18				76
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		774			575			2576			504	
Travel Time (s)		17.6			13.1			58.5			11.5	

Intersection Summary	
Area Type:	Other



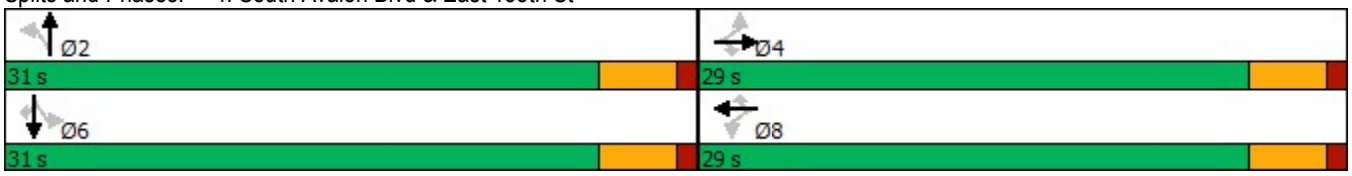
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	261	550	135	27	151	71	88	850	69	79	593	73
Future Volume (vph)	261	550	135	27	151	71	88	850	69	79	593	73
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	272	573	141	28	157	74	92	885	72	82	618	76
Shared Lane Traffic (%)												
Lane Group Flow (vph)	272	573	141	28	157	74	92	957	0	82	618	76

Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	261	550	135	27	151	71	88	850	79	593	73
Future Volume (vph)	261	550	135	27	151	71	88	850	79	593	73
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm	NA	Perm
Protected Phases		4			8			2		6	
Permitted Phases	4		4	8		8	2		6		6
Detector Phase	4	4	4	8	8	8	2	2	6	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	29.0	29.0	29.0	29.0	29.0	29.0	31.0	31.0	31.0	31.0	31.0
Total Split (%)	48.3%	48.3%	48.3%	48.3%	48.3%	48.3%	51.7%	51.7%	51.7%	51.7%	51.7%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag											
Lead-Lag Optimize?											
Recall Mode	None	None	None	None	None	None	Max	Max	Max	Max	Max
Act Effct Green (s)	21.8	21.8	21.8	21.8	21.8	21.8	26.7	26.7	26.7	26.7	26.7
Actuated g/C Ratio	0.38	0.38	0.38	0.38	0.38	0.38	0.46	0.46	0.46	0.46	0.46
v/c Ratio	0.59	0.81	0.21	0.20	0.12	0.11	0.28	0.59	0.44	0.38	0.10
Control Delay	20.2	26.8	3.9	15.8	11.4	3.8	13.6	13.6	21.4	11.5	3.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	20.2	26.8	3.9	15.8	11.4	3.8	13.6	13.6	21.4	11.5	3.3
LOS	C	C	A	B	B	A	B	B	C	B	A
Approach Delay		21.7			9.7			13.6		11.7	
Approach LOS		C			A			B		B	

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 57.5	
Natural Cycle: 45	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.81	
Intersection Signal Delay: 15.4	Intersection LOS: B
Intersection Capacity Utilization 78.2%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 4: South Avalon Blvd & East 135th St





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	272	573	141	28	157	74	92	957	82	618	76
v/c Ratio	0.59	0.81	0.21	0.20	0.12	0.11	0.28	0.59	0.44	0.38	0.10
Control Delay	20.2	26.8	3.9	15.8	11.4	3.8	13.6	13.6	21.4	11.5	3.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	20.2	26.8	3.9	15.8	11.4	3.8	13.6	13.6	21.4	11.5	3.3
Queue Length 50th (ft)	72	170	2	6	17	0	20	129	20	75	0
Queue Length 95th (ft)	139	#319	30	23	33	20	51	184	#61	111	19
Internal Link Dist (ft)		694			495			2496		424	
Turn Bay Length (ft)	105		105	80		100	100		100		100
Base Capacity (vph)	520	798	752	159	1517	720	330	1631	185	1641	774
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.52	0.72	0.19	0.18	0.10	0.10	0.28	0.59	0.44	0.38	0.10

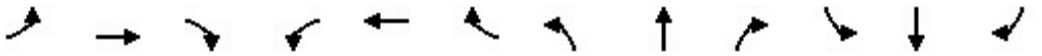
Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	261	550	135	27	151	71	88	850	69	79	593	73
Future Volume (veh/h)	261	550	135	27	151	71	88	850	69	79	593	73
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	272	573	141	28	157	74	92	885	72	82	618	76
Adj No. of Lanes	1	1	1	1	2	1	1	2	0	1	2	1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	517	688	585	193	1307	585	396	1561	127	290	1666	745
Arrive On Green	0.37	0.37	0.37	0.37	0.37	0.37	0.47	0.47	0.47	0.47	0.47	0.47
Sat Flow, veh/h	1145	1863	1583	733	3539	1583	747	3315	270	584	3539	1583
Grp Volume(v), veh/h	272	573	141	28	157	74	92	472	485	82	618	76
Grp Sat Flow(s),veh/h/ln	1145	1863	1583	733	1770	1583	747	1770	1815	584	1770	1583
Q Serve(g_s), s	11.6	15.8	3.5	2.0	1.6	1.7	5.1	10.8	10.8	6.6	6.3	1.5
Cycle Q Clear(g_c), s	13.2	15.8	3.5	17.8	1.6	1.7	11.4	10.8	10.8	17.5	6.3	1.5
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.15	1.00		1.00
Lane Grp Cap(c), veh/h	517	688	585	193	1307	585	396	833	855	290	1666	745
V/C Ratio(X)	0.53	0.83	0.24	0.14	0.12	0.13	0.23	0.57	0.57	0.28	0.37	0.10
Avail Cap(c_a), veh/h	593	811	689	242	1540	689	396	833	855	290	1666	745
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	16.1	16.2	12.3	24.3	11.7	11.7	13.2	10.8	10.8	17.1	9.5	8.3
Incr Delay (d2), s/veh	0.8	6.5	0.2	0.3	0.0	0.1	1.4	2.8	2.7	2.4	0.6	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.7	9.2	1.5	0.4	0.8	0.8	1.2	5.9	6.0	1.3	3.2	0.7
LnGrp Delay(d),s/veh	16.9	22.7	12.5	24.6	11.8	11.8	14.6	13.5	13.5	19.5	10.2	8.6
LnGrp LOS	B	C	B	C	B	B	B	B	B	B	B	A
Approach Vol, veh/h		986			259			1049			776	
Approach Delay, s/veh		19.6			13.2			13.6			11.0	
Approach LOS		B			B			B			B	

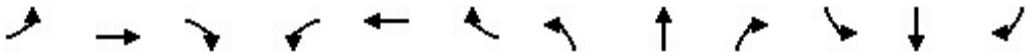
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		31.0		25.3		31.0		25.3
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5
Max Green Setting (Gmax), s		26.5		24.5		26.5		24.5
Max Q Clear Time (g_c+I1), s		13.4		17.8		19.5		19.8
Green Ext Time (p_c), s		5.7		3.0		2.9		0.5

Intersection Summary	
HCM 2010 Ctrl Delay	14.8
HCM 2010 LOS	B



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	220		0	200		0	110		110	120		100
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.91	0.91	1.00	0.91	0.91	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor												
Frt		0.988			0.971				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	5024	0	1770	4938	0	1770	3539	1583	1770	3539	1583
Flt Permitted	0.218			0.182			0.392			0.186		
Satd. Flow (perm)	406	5024	0	339	4938	0	730	3539	1583	346	3539	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		21			77				212			164
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		2662			498			439			2576	
Travel Time (s)		60.5			11.3			10.0			58.5	

Intersection Summary	
Area Type:	Other



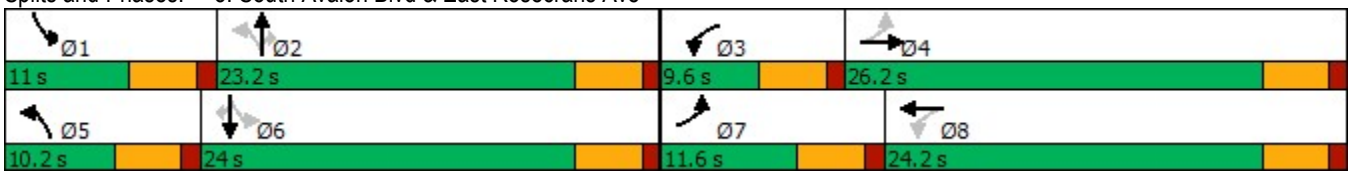
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	120	1339	115	164	679	159	114	710	213	213	506	75
Future Volume (vph)	120	1339	115	164	679	159	114	710	213	213	506	75
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	125	1395	120	171	707	166	119	740	222	222	527	78
Shared Lane Traffic (%)												
Lane Group Flow (vph)	125	1515	0	171	873	0	119	740	222	222	527	78

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	120	1339	164	679	114	710	213	213	506	75
Future Volume (vph)	120	1339	164	679	114	710	213	213	506	75
Turn Type	pm+pt	NA	pm+pt	NA	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4	3	8	5	2		1	6	
Permitted Phases	4		8		2		2	6		6
Detector Phase	7	4	3	8	5	2	2	1	6	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	9.5	22.5	9.5	22.5	22.5	9.5	22.5	22.5
Total Split (s)	11.6	26.2	9.6	24.2	10.2	23.2	23.2	11.0	24.0	24.0
Total Split (%)	16.6%	37.4%	13.7%	34.6%	14.6%	33.1%	33.1%	15.7%	34.3%	34.3%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	Max	Max	None	Max	Max
Act Effct Green (s)	28.6	21.7	26.1	22.0	24.4	18.7	18.7	26.7	21.5	21.5
Actuated g/C Ratio	0.41	0.31	0.37	0.31	0.35	0.27	0.27	0.38	0.31	0.31
v/c Ratio	0.42	0.96	0.74	0.54	0.35	0.78	0.38	0.84	0.48	0.13
Control Delay	16.1	40.6	36.2	20.3	15.8	30.9	6.1	45.2	22.4	0.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	16.1	40.6	36.2	20.3	15.8	30.9	6.1	45.2	22.4	0.5
LOS	B	D	D	C	B	C	A	D	C	A
Approach Delay		38.8		22.9		24.2			26.4	
Approach LOS		D		C		C			C	

Intersection Summary	
Cycle Length: 70	
Actuated Cycle Length: 70	
Natural Cycle: 70	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.96	
Intersection Signal Delay: 29.5	Intersection LOS: C
Intersection Capacity Utilization 83.9%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 5: South Avalon Blvd & East Rosecrans Ave

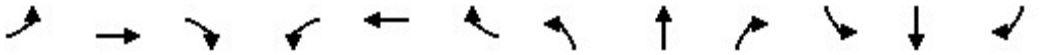




Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	125	1515	171	873	119	740	222	222	527	78
v/c Ratio	0.42	0.96	0.74	0.54	0.35	0.78	0.38	0.84	0.48	0.13
Control Delay	16.1	40.6	36.2	20.3	15.8	30.9	6.1	45.2	22.4	0.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	16.1	40.6	36.2	20.3	15.8	30.9	6.1	45.2	22.4	0.5
Queue Length 50th (ft)	31	229	43	107	30	154	3	61	101	0
Queue Length 95th (ft)	60	#332	#118	146	61	#220	51	#165	146	0
Internal Link Dist (ft)		2582		418		359			2496	
Turn Bay Length (ft)	220		200		110		110	120		100
Base Capacity (vph)	305	1571	230	1606	339	945	578	264	1088	600
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.41	0.96	0.74	0.54	0.35	0.78	0.38	0.84	0.48	0.13

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	120	1339	115	164	679	159	114	710	213	213	506	75
Future Volume (veh/h)	120	1339	115	164	679	159	114	710	213	213	506	75
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	125	1395	120	171	707	166	119	740	222	222	527	78
Adj No. of Lanes	1	3	0	1	3	0	1	2	1	1	2	1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	333	1479	127	241	1293	300	361	945	423	310	1030	461
Arrive On Green	0.07	0.31	0.31	0.07	0.31	0.31	0.07	0.27	0.27	0.09	0.29	0.29
Sat Flow, veh/h	1774	4770	410	1774	4127	957	1774	3539	1583	1774	3539	1583
Grp Volume(v), veh/h	125	991	524	171	579	294	119	740	222	222	527	78
Grp Sat Flow(s),veh/h/ln	1774	1695	1790	1774	1695	1694	1774	1770	1583	1774	1770	1583
Q Serve(g_s), s	3.3	20.0	20.0	4.6	9.9	10.1	3.3	13.6	8.4	6.4	8.7	2.6
Cycle Q Clear(g_c), s	3.3	20.0	20.0	4.6	9.9	10.1	3.3	13.6	8.4	6.4	8.7	2.6
Prop In Lane	1.00		0.23	1.00		0.57	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	333	1051	555	241	1062	531	361	945	423	310	1030	461
V/C Ratio(X)	0.38	0.94	0.94	0.71	0.55	0.55	0.33	0.78	0.52	0.72	0.51	0.17
Avail Cap(c_a), veh/h	390	1051	555	241	1062	531	383	945	423	310	1030	461
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	15.4	23.6	23.6	18.1	19.9	20.0	16.9	23.8	21.9	18.4	20.7	18.5
Incr Delay (d2), s/veh	0.7	16.0	24.9	9.4	0.6	1.3	0.5	6.4	4.6	7.6	1.8	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.7	11.6	13.6	2.9	4.7	4.8	1.7	7.4	4.2	3.7	4.5	1.2
LnGrp Delay(d),s/veh	16.1	39.5	48.5	27.4	20.5	21.2	17.5	30.2	26.5	26.0	22.5	19.3
LnGrp LOS	B	D	D	C	C	C	B	C	C	C	C	B
Approach Vol, veh/h		1640			1044			1081			827	
Approach Delay, s/veh		40.6			21.8			28.0			23.1	
Approach LOS		D			C			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.0	23.2	9.6	26.2	9.3	24.9	9.4	26.4
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	6.5	18.7	5.1	21.7	5.7	19.5	7.1	19.7
Max Q Clear Time (g_c+I1), s	8.4	15.6	6.6	22.0	5.3	10.7	5.3	12.1
Green Ext Time (p_c), s	0.0	1.7	0.0	0.0	0.0	2.5	0.0	3.4

Intersection Summary	
HCM 2010 Ctrl Delay	30.2
HCM 2010 LOS	C



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%		0%			0%
Storage Length (ft)	0	0		100	100	
Storage Lanes	0	1		1	1	
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	1.00	0.95	1.00	1.00	0.95
Ped Bike Factor						
Frt						
Flt Protected					0.950	
Satd. Flow (prot)	0	1863	3539	1863	1770	3539
Flt Permitted					0.950	
Satd. Flow (perm)	0	1863	3539	1863	1770	3539
Link Speed (mph)	30		30			30
Link Distance (ft)	196		2086			439
Travel Time (s)	4.5		47.4			10.0

Intersection Summary	
Area Type:	Other



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Volume (vph)	0	0	1029	0	1	784
Future Volume (vph)	0	0	1029	0	1	784
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%		0%			0%
Adj. Flow (vph)	0	0	1118	0	1	852
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	1118	0	1	852

Intersection Summary

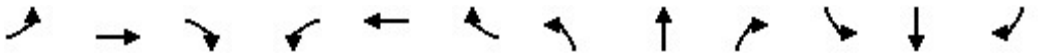
Intersection	
Int Delay, s/veh	0

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	0	1029	0	1	784
Future Vol, veh/h	0	0	1029	0	1	784
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	100	100	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	0	1118	0	1	852

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	-	559	0	0	1118	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.94	-	-	4.14	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.32	-	-	2.22	-
Pot Cap-1 Maneuver	0	472	-	-	620	-
Stage 1	0	-	-	-	-	-
Stage 2	0	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	-	472	-	-	620	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

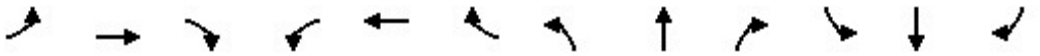
Approach	WB	NB	SB
HCM Control Delay, s	0	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	-	620	-
HCM Lane V/C Ratio	-	-	-	0.002	-
HCM Control Delay (s)	-	-	0	10.8	-
HCM Lane LOS	-	-	A	B	-
HCM 95th %tile Q(veh)	-	-	-	0	-



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	155		0	150		0	110		100	115		100
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor												
Frt		0.980			0.958				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3468	0	1770	3391	0	1770	3539	1583	1770	3539	1583
Flt Permitted	0.583			0.483			0.390			0.290		
Satd. Flow (perm)	1086	3468	0	900	3391	0	726	3539	1583	540	3539	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		30			77				82			60
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		972			474			575			2086	
Travel Time (s)		22.1			10.8			13.1			47.4	

Intersection Summary	
Area Type:	Other



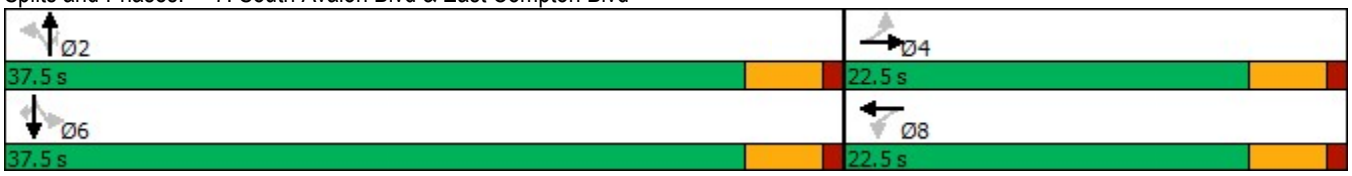
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	93	322	51	46	189	74	30	862	79	111	643	58
Future Volume (vph)	93	322	51	46	189	74	30	862	79	111	643	58
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	97	335	53	48	197	77	31	898	82	116	670	60
Shared Lane Traffic (%)												
Lane Group Flow (vph)	97	388	0	48	274	0	31	898	82	116	670	60

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	93	322	46	189	30	862	79	111	643	58
Future Volume (vph)	93	322	46	189	30	862	79	111	643	58
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4		8		2			6	
Permitted Phases	4		8		2		2	6		6
Detector Phase	4	4	8	8	2	2	2	6	6	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	22.5	22.5	22.5	22.5	37.5	37.5	37.5	37.5	37.5	37.5
Total Split (%)	37.5%	37.5%	37.5%	37.5%	62.5%	62.5%	62.5%	62.5%	62.5%	62.5%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag										
Lead-Lag Optimize?										
Recall Mode	None	None	None	None	Max	Max	Max	Max	Max	Max
Act Effct Green (s)	11.7	11.7	11.7	11.7	33.1	33.1	33.1	33.1	33.1	33.1
Actuated g/C Ratio	0.22	0.22	0.22	0.22	0.61	0.61	0.61	0.61	0.61	0.61
v/c Ratio	0.41	0.50	0.24	0.34	0.07	0.41	0.08	0.35	0.31	0.06
Control Delay	23.3	19.0	20.2	13.4	5.9	6.7	2.0	10.2	6.0	2.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.3	19.0	20.2	13.4	5.9	6.7	2.0	10.2	6.0	2.1
LOS	C	B	C	B	A	A	A	B	A	A
Approach Delay		19.9		14.4		6.3			6.3	
Approach LOS		B		B		A			A	

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 53.9	
Natural Cycle: 55	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.50	
Intersection Signal Delay: 9.7	Intersection LOS: A
Intersection Capacity Utilization 59.7%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 7: South Avalon Blvd & East Compton Blvd





Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	97	388	48	274	31	898	82	116	670	60
v/c Ratio	0.41	0.50	0.24	0.34	0.07	0.41	0.08	0.35	0.31	0.06
Control Delay	23.3	19.0	20.2	13.4	5.9	6.7	2.0	10.2	6.0	2.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.3	19.0	20.2	13.4	5.9	6.7	2.0	10.2	6.0	2.1
Queue Length 50th (ft)	27	52	13	27	3	64	0	15	44	0
Queue Length 95th (ft)	61	85	35	53	15	131	15	58	93	13
Internal Link Dist (ft)		892		394		495			2006	
Turn Bay Length (ft)	155		150		110		100	115		100
Base Capacity (vph)	364	1182	301	1187	446	2174	1004	331	2174	995
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.27	0.33	0.16	0.23	0.07	0.41	0.08	0.35	0.31	0.06

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	93	322	51	46	189	74	30	862	79	111	643	58
Future Volume (veh/h)	93	322	51	46	189	74	30	862	79	111	643	58
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	97	335	53	48	197	77	31	898	82	116	670	60
Adj No. of Lanes	1	2	0	1	2	0	1	2	1	1	2	1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	299	672	105	255	551	208	512	2171	971	409	2171	971
Arrive On Green	0.22	0.22	0.22	0.22	0.22	0.22	0.61	0.61	0.61	0.61	0.61	0.61
Sat Flow, veh/h	1101	3067	481	992	2514	951	723	3539	1583	572	3539	1583
Grp Volume(v), veh/h	97	192	196	48	137	137	31	898	82	116	670	60
Grp Sat Flow(s),veh/h/ln	1101	1770	1778	992	1770	1695	723	1770	1583	572	1770	1583
Q Serve(g_s), s	4.4	5.1	5.2	2.4	3.5	3.7	1.1	7.1	1.1	7.1	4.9	0.8
Cycle Q Clear(g_c), s	8.1	5.1	5.2	7.6	3.5	3.7	6.0	7.1	1.1	14.2	4.9	0.8
Prop In Lane	1.00		0.27	1.00		0.56	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	299	388	390	255	388	372	512	2171	971	409	2171	971
V/C Ratio(X)	0.32	0.49	0.50	0.19	0.35	0.37	0.06	0.41	0.08	0.28	0.31	0.06
Avail Cap(c_a), veh/h	426	592	595	370	592	567	512	2171	971	409	2171	971
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	21.3	18.4	18.4	21.8	17.8	17.8	6.4	5.4	4.2	9.1	5.0	4.2
Incr Delay (d2), s/veh	0.6	1.0	1.0	0.4	0.5	0.6	0.2	0.6	0.2	1.7	0.4	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.4	2.6	2.7	0.7	1.8	1.8	0.3	3.5	0.5	1.3	2.4	0.4
LnGrp Delay(d),s/veh	21.9	19.4	19.4	22.1	18.3	18.5	6.6	6.0	4.4	10.8	5.3	4.3
LnGrp LOS	C	B	B	C	B	B	A	A	A	B	A	A
Approach Vol, veh/h		485			322			1011			846	
Approach Delay, s/veh		19.9			18.9			5.9			6.0	
Approach LOS		B			B			A			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		37.5		16.3		37.5		16.3
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5
Max Green Setting (Gmax), s		33.0		18.0		33.0		18.0
Max Q Clear Time (g_c+I1), s		9.1		10.1		16.2		9.6
Green Ext Time (p_c), s		7.5		1.7		5.6		1.1

Intersection Summary	
HCM 2010 Ctrl Delay	10.0
HCM 2010 LOS	B



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)		0	100		0	0
Storage Lanes		0	1		1	0
Taper Length (ft)			25		25	
Lane Util. Factor	0.91	0.91	1.00	0.91	1.00	1.00
Ped Bike Factor						
Frt					0.983	
Flt Protected					0.958	
Satd. Flow (prot)	5085	0	1863	5085	1754	0
Flt Permitted					0.958	
Satd. Flow (perm)	5085	0	1863	5085	1754	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	498			189	111	
Travel Time (s)	11.3			4.3	2.5	

Intersection Summary	
Area Type:	Other



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Traffic Volume (vph)	1763	2	0	996	6	1
Future Volume (vph)	1763	2	0	996	6	1
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Adj. Flow (vph)	1916	2	0	1083	7	1
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1918	0	0	1083	8	0

Intersection Summary

Intersection	
Int Delay, s/veh	0.2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	1763	2	0	996	6	1
Future Vol, veh/h	1763	2	0	996	6	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	100	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1916	2	0	1083	7	1

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1918	0	2350	959
Stage 1	-	-	-	-	1917	-
Stage 2	-	-	-	-	433	-
Critical Hdwy	-	-	5.34	-	5.74	7.14
Critical Hdwy Stg 1	-	-	-	-	6.64	-
Critical Hdwy Stg 2	-	-	-	-	6.04	-
Follow-up Hdwy	-	-	3.12	-	3.82	3.92
Pot Cap-1 Maneuver	-	-	138	-	60	221
Stage 1	-	-	-	-	64	-
Stage 2	-	-	-	-	568	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	138	-	60	221
Mov Cap-2 Maneuver	-	-	-	-	58	-
Stage 1	-	-	-	-	64	-
Stage 2	-	-	-	-	568	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	67.6
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	65	-	-	138	-
HCM Lane V/C Ratio	0.117	-	-	-	-
HCM Control Delay (s)	67.6	-	-	0	-
HCM Lane LOS	F	-	-	A	-
HCM 95th %tile Q(veh)	0.4	-	-	0	-

August 8, 2019

Ibrahima Toure
TRANSDEV NORTH AMERICA
720 Butterfield Road, Suite 300
Lombard, IL 60148

Subject: Metro Bus Facility (Rosecrans Avenue & Avalon Boulevard) Construction Traffic Evaluation, County of Los Angeles, CA

4Dear Ibrahima:

Dear Ibrahima:

A. Introduction

TRNASDEV North AMERICA is in the process of obtaining approvals for the proposed Metro Bus Facility project in the County of Los Angeles.

The proposed project is located at 636 East Rosecrans Avenue and 14110-14438 South Avalon Boulevard, in the unincorporated County of Los Angeles. The project site is bounded by Rosecrans Avenue to the north, existing industrial uses to the south and west, institutional uses to the south and east, existing residential land uses to the east, and Avalon Avenue to the west.

The project site is currently vacant and is zoned for Light Manufacturing (M-1-IP) uses in the County of Los Angeles Zoning Map and located in West Rancho Dominguez-Victoria Community Service District.

The project consists of constructing and operating a bus operations and maintenance facility for the Los Angeles County Metropolitan Transportation Authority (Metro). The project will include parking for buses, support vehicles, bus drivers, and Metro employees, bus maintenance and service facilities, an automated bus washing bay, Compressed Natural Gas (CNG) fueling pumps for the bus fleet, and approximately 12,137 square feet of building area for office/administrative use.

RK ENGINEERING GROUP, INC. (RK) has previously prepared the *Metro Bus Facility Rosecrans and Avalon Traffic Impact Analysis (February 4, 2019)*. The February 4th traffic study evaluated the potential traffic impacts associated with the operations of the proposed Metro Bus Facility project.

Based on the traffic study, the project operations is not expected to result in significant adverse environmental impacts related to traffic and no mitigation is required.

The County of Los Angeles has now requested evaluation of potential traffic impacts related to the construction of the proposed project.

This traffic evaluation letter is prepared to assess the potential traffic impacts for the proposed project during construction phase.

B. Project Operations Trip Generation

Table A shows the daily and peak-hour trip generation for the project during operations as documented in the *Metro Bus Facility Rosecrans and Avalon Traffic Impact Analysis (RK Engineering Group, Inc., February 4, 2019)*.

Table A
Proposed Project Operations Trip Generation

Project Trips	AM Peak Hour			PM Peak Hour			Daily Trips
	In	Out	Total	In	Out	Total	
Buses	6	2	8	1	0	1	157
Employees	4	4	8	2	7	9	284
Maintenance Vehicles	0	0	0	0	0	0	2
Total	**10**	**6**	**16**	**3**	**7**	**10**	**443**

Source: *Metro Bus Facility Rosecrans and Avalon Traffic Impact Analysis (RK Engineering Group, Inc., February 4, 2019)*.

Trip generation is classified by vehicle type; buses, employees (passenger cars/light duty trucks/SUVs), and maintenance vehicles/other trucks.

As shown in Table A, during operations, the proposed project is projected to generate a total of approximately 443 trip-ends per day, with 16 total trips per hour during the AM peak hour and 10 total trips per hour during the PM peak hour.

As previously noted, based on the traffic study, the project operations is not expected to result in significant adverse environmental impacts related to traffic and no mitigation is required.

C. Project Construction Trip Generation

Based on information provided by the project team, construction would occur over between six and nine months over five phases: (1) demolition; (2) grading; (3) building construction; (4) paving; and (5) architectural coating.

Each phase of construction would result in varying levels of intensity and a number of construction personnel. The construction workforce would consist of the following:

- **Demolition Phase:** approximately 10 worker trips per day during demolition;

- **Grading Phase:** approximately 10 worker trips per day and 40 total hauling trips during grading. Approximately 800 cubic yards of soil would be exported off the site during the grading phase, with a maximum of 5 truck trips per day. The export is expected to be taken to United Landfill, 1245 Arrow Highway, Irwindale, with a round trip of approximately 54 miles.

- **Building Construction Phase:** approximately 4 worker trips per day and 2 vendor trips per day during building construction;

- **Paving Phase:** approximately 18 worker trips per day during paving; and

- **Architectural Coating Phase:** approximately 1 worker trip per day during architectural coating.

It is important to note that no square footage would be removed during the demolition phases, as this phase would involve current tenant improvements in the building.

In addition,

Table B shows the number of trips per day for each construction phase based on the construction information above:

Table B
Proposed Project Number of Vehicles Per Day
During Construction Phases

Construction Phase	Trip Type Per Day				
	Worker Vehicles	Trucks	Vendor Vehicles	Total Vehicles	Total Two-Way Trips (Inbound & Outbound)
Demolition	10	0	0	10	20
Grading	10	5	0	15	30
Building	4	0	2	6	12
Paving	18	0	0	18	36
Coating	1	0	0	1	2

As shown in Table B, the most trip-intensive phase of construction is the paving phase with 18 vehicles per day (resulting in 36 two-way trips per day, 18 inbound and 18 outbound trips).

As previously shown in Table A, the proposed project is forecast to generate approximately 443 trips per day. Hence, during any of the construction phases, the project is forecast to generate substantially less number of daily trips when compared to the project operations.

Consistent with the analysis performed in the *Metro Bus Facility Rosecrans and Avalon Traffic Impact Analysis (RK Engineering Group, Inc., February 4, 2019)*, traffic impacts are generally evaluated during the AM peak period (7:00 AM to 9:00 AM) and PM peak period (4:00 PM to 6:00 PM).

As previously evaluated in the *Metro Bus Facility Rosecrans and Avalon Traffic Impact Analysis (RK Engineering Group, Inc., February 4, 2019)*, the project operations with 16 total trips per hour during the AM peak hour and 10 total trips per hour during the PM peak hour is forecast to not result in any significant impacts.

To ensure the construction phase of the proposed project does not result in any significant traffic impacts, each construction phase needs to be scheduled and planned such that the construction peak hour trips do not exceed the peak hour trip generation during project operations:

- The total trips per hour (trucks, workers, and vendors combined) does not exceed 16 total trips (inbound plus outbound) in a single hour between 7:00 AM to 9:00 AM;

- The total trips per hour (trucks, workers, and vendors combined) does not exceed 10 total trips (inbound plus outbound) in a single hour between 4:00 PM to 6:00 PM; and

- The remaining daily trips for each phase of construction need to be accommodated outside the peak periods of 7:00 to 9:00 AM and 4:00 to 6:00 PM. Typically, construction activities commence very early in the day even before 7:00 AM.

As previously noted, based on the project operations traffic study, the project operations is not expected to result in significant adverse environmental impacts related to traffic and no mitigation is required. By implementing the above trip schedules, the project trips during construction phase does not exceed the number of trips for the project's operations. Hence, the traffic impacts associated with the project construction phase can be considered less than significant.

D. Construction Phase Traffic Assessment

Each phase of construction would result in varying levels of intensity and a number of construction personnel. The construction workforce would consist of the following:

- **Demolition Phase:** approximately 10 worker trips per day during demolition;

- **Grading Phase:** approximately 10 worker trips per day and 40 total hauling trips during grading. Approximately 800 cubic yards of soil would be exported off the site during the grading phase, with a maximum of 5 truck trips per day. The export is expected to be taken to United Landfill, 1245 Arrow Highway, Irwindale, with a round trip of approximately 54 miles.

- **Building Construction Phase:** approximately 4 worker trips per day and 2 vendor trips per day during building construction;

- **Paving Phase:** approximately 18 worker trips per day during paving; and

- **Architectural Coating Phase:** approximately 1 worker trip per day during architectural coating.

The most trip-intensive phase of construction is the paving phase with 18 vehicles per day (resulting in 36 two-way trips per day, 18 inbound and 18 outbound trips).

As previously shown in Table A, the proposed project is forecast to generate approximately 443 trips per day. Hence, during any of the construction phases, the project is forecast to generate substantially less number of daily trips when compared to the project operations.

As previously evaluated in the *Metro Bus Facility Rosecrans and Avalon Traffic Impact Analysis (RK Engineering Group, Inc., February 4, 2019)*, the project operations with 16 total trips per hour during the AM peak hour and 10 total trips per hour during the PM peak hour is forecast to not result in any significant impacts.

To ensure the construction phase of the proposed project does not result in any significant traffic impacts, each construction phase needs to be scheduled and planned such that the construction peak hour trips do not exceed the peak hour trip generation during project operations:

- The total trips per hour (trucks, workers, and vendors combined) does not exceed 16 total trips (inbound plus outbound) in a single hour between 7:00 AM to 9:00 AM;

- The total trips per hour (trucks, workers, and vendors combined) does not exceed 10 total trips (inbound plus outbound) in a single hour between 4:00 PM to 6:00 PM; and

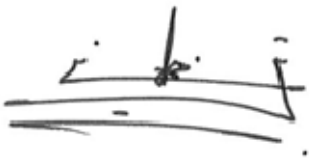
- The remaining daily trips for each phase of construction need to be accommodated outside the peak periods of 7:00 to 9:00 AM and 4:00 to 6:00 PM. Typically, construction activities commence very early in the day even before 7:00 AM.

As previously noted, based on the project operations traffic study, the project operations is not expected to result in significant adverse environmental impacts related to traffic and no mitigation is required. By implementing the above trip schedules, the project trips during construction phase does not exceed the number of trips for the project's operations. Hence, the traffic impacts associated with the project construction phase can be considered less than significant.

RK Engineering Group, Inc. appreciates this opportunity to work with TRANSDEV NORTH AMERICA on this project. If you have any questions regarding this study, please do not hesitate to contact us at (949) 474-0809.

Sincerely,

RK ENGINEERING GROUP, INC.





Alex Tabrizi, PE, TE
Associate Principal

Attachment

APPENDIX F.2

Metro Bus Facility (Rosecrans & Avalon) Vehicle Miles Traveled Analysis

March 17, 2020

Mr. Ibrahima Toure
TRANSDEV NORTH AMERICA
720 Butterfield Road, Suite 300
Lombard, IL 60148

Subject: Metro Bus Facility (Rosecrans & Avalon) Vehicle Miles Traveled Analysis, County of Los Angeles, CA

Dear Mr. Toure:

Introduction

RK ENGINEERING GROUP, INC. (RK) is pleased to provide this Vehicle Miles Traveled (VMT) analysis for the proposed Metro Bus Facility project located at the southeast corner of Rosecrans Avenue and Avalon Boulevard, in unincorporated Los Angeles County.

The purpose of this analysis is to assess the project's transportation impact pursuant to the requirements of California Senate Bill SB 743, the 2020 California Environmental Quality Act (CEQA) Statute Section 21099 and CEQA Guidelines Section 15064.3. The CEQA guidelines state that generally vehicle miles traveled is the most appropriate measure of transportation impacts. Effective July 1, 2020, all CEQA lead agencies should analyze a project's transportation impacts using VMT.

Project Description

The project consists of constructing and operating a bus operations and maintenance facility for the Los Angeles County Metropolitan Transportation Authority (Metro). The project will include parking for buses, support vehicles, bus drivers, and Metro employees, bus maintenance and service facilities, an automated bus washing bay, Compressed Natural Gas (CNG) fueling pumps for the bus fleet, and approximately 12,137 square feet of building area for office/administrative use. The total combined site area is approximately 5.35 acres in size. The existing site includes approximately 17,137 square feet of existing building structures that will be preserved for use within the proposed project.

The project is expected to replace an existing Metro Bus Facility located at 1611 Naud Street, in the City of Los Angeles. The project will continue to operate the same bus schedule at the proposed Rosecrans and Avalon site, with the potential in the future to increase bus service capacity for storage and maintenance.

The project serves Metro's fleet of buses and provides a facility to support and maintain safe and efficient operation of bus transit service throughout Los Angeles County. The project is a transit system serving use that provides maintenance, safety and repair of Metro's existing and future bus fleet.

Vehicle Miles Traveled (VMT) Analysis Criteria

The County of Los Angeles is still in the process of adopting criteria for the uniform evaluation of VMT impacts under CEQA, including the preferred analysis methodology, modeling requirements, and thresholds of significance. In the absence of adopted guidelines by the County, the State of California Governor's Office of Planning and Research (OPR) *Technical Advisory on Evaluating Transportation Impacts in CEQA,* December 2018 (OPR Advisory), is used as a general guidance document for the analysis of VMT impacts for this project.

The OPR Advisory recommends that transit projects would generally reduce VMT and therefore are presumed to cause a less-than-significant impact on transportation. Streamlining transit projects aligns with each of the three statutory goals contained in SB 743 by reducing GHG emissions, increasing multimodal transportation networks, and facilitating mixed use development.

Additionally, the OPR Advisory states that rehabilitation, maintenance, replacement, safety, and repair projects designed to improve the condition of existing transportation assets and transit systems would not likely lead to a substantial or measurable increase in vehicle travel and therefore should generally not require an induced travel analysis.

Hence, this project, which is considered a transit serving use and maintenance, safety and repair project would be considered to have a less than significant transportation impact per the latest requirements under CEQA.

To further expand upon CEQA's VMT analysis recommendations, discussion is provided regarding the project's proximity to existing transit services and data from the California Statewide Travel Demand Model (CSTDM) is provided for informational purposes.

Proximity to Transit

CEQA Guidelines Section 15064.3, subdivision (b)(1), states that generally, projects within one-half mile of either an existing major transit stop or a stop along an existing high quality transit corridor should be presumed to cause a less than significant transportation impact.

CEQA Statute Section 21155 (b) defines a high-quality transit corridor as a corridor with fixed route bus service with service intervals no longer than 15 minutes during peak commute hours.

According to the latest bus schedules published on Metro's website (metro.net), the project site is located adjacent to two transit corridors with fixed route bus service with service intervals of 15 minutes or less during peak commute hours. Table 1 provides information on the bus lines located near the project site.

Table 1
Proximity to Transit

Metro Bus Line	Roadway	Nearest Bus Stop to Project Site[1]	Peak Hour Service Intervals
Route 125	Rosecrans Avenue	300 feet	15 minutes or less
Route 51/52/351	Avalon Boulevard	60 feet	15 minutes or less

[1] Walking distance measured from closest point on the project site.

California Statewide Travel Demand Model (CSTDM) VMT projections

The County of Los Angeles has not yet identified the preferred travel demand model to be used for VMT analyses. Therefore, for purposes of this analysis, home-based-work VMT estimates from the California Statewide Travel Demand Model (CSTDM) have been reported for informational purposes.

Table 2 shows the 2010 base year and 2040 horizon year home-based-work VMT per employee for traffic analysis zone (TAZ) 4212, in which the project is located.

As shown in Table 2, home-based-work VMT per employee for traffic analysis zone (TAZ) 4212 is approximately 0.69 VMT higher than the Los Angeles County-wide average. To help further reduce VMT from the project, transportation demand management (TDM) strategies can be implemented, as recommended in subsequent sections of this report.

Table 2
Home-Based-Work VMT[1]

TAZ	Year	Home-Based-Work VMT	Employment	Home-Based-Work VMT per Employee
4212	2010	42,519	2,603	16.33
	2040	55,046	3,148	17.49
LA County-Wide Average Home-Based-Work VMT per Employee (Base Year 2010)				15.64

[1] Source: Caltrans, California Statewide Travel Demand Model (CSTDM), Version 2.0.

Transportation Demand Management Strategies

The following transportation demand management (TDM) strategies are provided to help further reduce project VMT.

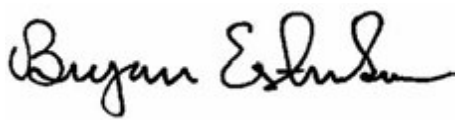
- Provide all employees of the facility with information regarding the availability of transit options in the vicinity of the site.

Conclusion

Based on this review, the proposed project is not expected to cause a significant transportation impact per the latest CEQA requirements. The project meets several of the new CEQA requirements for reducing VMT, including being a transit serving use and being located within one-half mile of a quality transit corridor. Therefore, **the project's transportation impact is considered less than significant.**

RK Engineering Group, Inc. appreciates this opportunity to work with TRANSDEV NORTH AMERICA on this project. If you have any questions regarding this study, please do not hesitate to contact us at (949) 474-0809.

Sincerely,
RK ENGINEERING GROUP, INC.



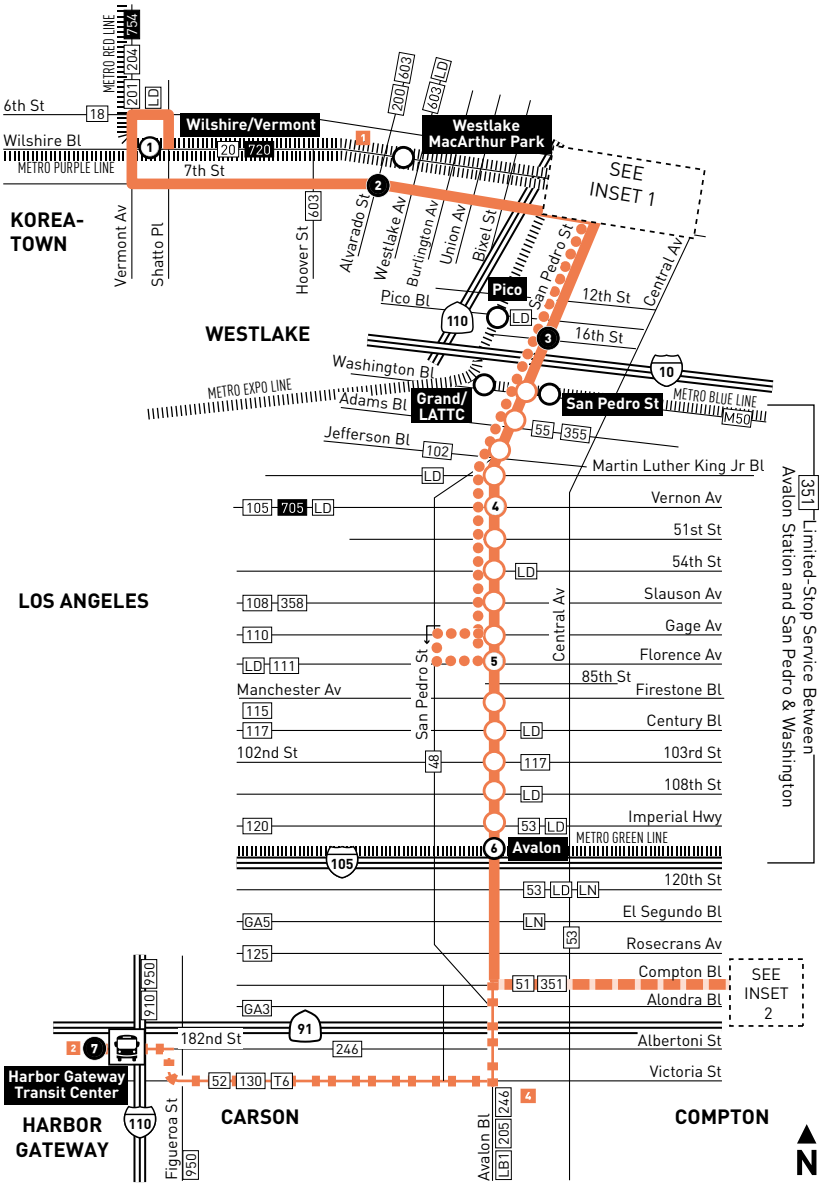
Bryan Estrada, AICP
Senior Associate

Attachments

Attachment A

Transit Service Information

ROUTE MAP



LEGEND

- Line 51/52/351 Route
- Line 51/351 Route Only
- Line 52 Route
- Line 51 Owl Route
- Metro Rail
- Local Stop Timepoint
- Local Stop Timepoint - Single Direction Only
- Local Stop
- Local Stop - Single Direction Only
- Limited Stop Timepoint
- Limited Stop Timepoint - Single Direction Only
- Limited Stop (Line 351)
- Owl Timepoint
- Metro Rail Station & Timepoint
- Metro Rail Station
- Transit Center
- Map Notes
- Connecting Line
- Rapid Connecting Line
- CS — Carson North/South Shuttle
- COM — Compton Renaissance Transit System
- GA — GTrans
- LB — Long Beach Transit
- LD — LADOT DASH
- LN — County of Los Angeles - The Link
- M — Montebello Bus Lines
- T — Torrance Transit

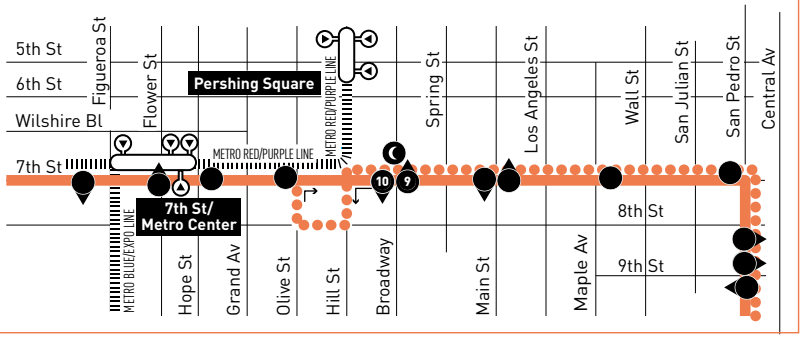
INSET 1 - DOWNTOWN LOS ANGELES

- Metro Rail Station
- Metro Rail Station Entrance

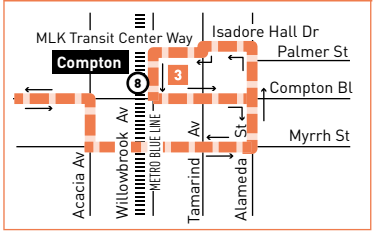
MAP NOTES

1. **MacArthur Park**
   Metro 51, 52, 200, 351, 603
2. **Harbor Gateway Transit Center**
   Metro 52, 130, 205, 246, 344, 550, Metro Silver Line 910/950; T1, T4X, T6; CS; GA2, GA4
3. **Martin Luther King Jr. Transit Center/ Compton Station**
   Metro 51, 60 Owl, 125, 127, 128, 202, 351; COM 1, 2, 3, 4, 5; GA3; Greyhound; Metro Blue Line
4. **StubHub Center/CSU Dominguez Hills**
   Metro 52, 130, 205, 246; T6; LB1

INSET 1 – DOWNTOWN LOS ANGELES ▲N



INSET 2 – M.L. KING JR. TRANSIT CENTER/ COMPTON STATION ▲N



Monday through Friday

Effective Jun 23 2019

51/52/351

Northbound (Approximate Times)

Route	M.L. King Jr. Transit Center/Compton Station	Harbor Gateway Transit Center	Avalon Station	Avalon & Florence	Avalon & Vernon	San Pedro & 16th	7th & Alvarado	Wilshire/Vermont Station
	COMPTON (8)	HARBOR GATEWAY (7)	LOS ANGELES (6)	LOS ANGELES (5)	LOS ANGELES (4)	DOWNTOWN LOS ANGELES (3)	WESTLAKE (2)	WILSHIRE CENTER (1)
51	—	—	4:25A	4:38A	4:44A	4:51A	5:06A	5:13A
51	—	—	4:47	5:00	5:09	5:17	5:37	5:44
51	4:42A	—	5:02	5:15	5:24	5:32	5:52	5:59
52	—	4:54A	5:16	5:29	5:39	5:47	6:08	6:15
51	—	—	5:29	5:43	5:53	6:02	6:23	6:30
51	5:16	—	5:36	5:51	6:01	6:12	6:33	6:41
52	—	5:22	5:45	6:00	6:10	6:21	6:42	6:50
51	—	—	5:53	6:08	6:18	6:29	6:51	6:59
51	5:41	—	6:01	6:16	6:26	6:37	6:59	7:07
52	—	5:45	6:08	6:23	6:33	6:44	7:07	7:15
51	—	—	6:14	6:29	6:39	6:50	7:13	7:21
51	—	—	6:20	6:35	6:45	6:56	7:19	7:27
351	6:11	—	6:33	6:44	6:53	7:02	7:25	7:33
52	—	6:06	6:30	6:45	6:55	7:07	7:30	7:38
51	—	—	6:34	6:49	6:59	7:12	7:36	7:44
51	—	—	6:38	6:53	7:04	7:17	7:41	7:49
51	—	—	6:43	6:58	7:09	7:22	7:46	7:54
52	—	6:22	6:46	7:01	7:13	7:26	7:50	7:58
351	6:33	—	6:56	7:08	7:19	7:30	7:54	8:02
51	—	—	6:54	7:09	7:21	7:34	7:58	8:06
51	—	—	6:56	7:12	7:24	7:38	8:02	8:10
51	—	—	7:00	7:16	7:28	7:42	8:06	8:14
52	—	6:41	7:05	7:21	7:33	7:47	8:11	8:19
51	—	—	7:10	7:26	7:38	7:52	8:16	8:24
351	6:57	—	7:21	7:34	7:45	7:57	8:22	8:30
51	—	—	7:20	7:36	7:48	8:02	8:27	8:35
51	—	—	7:25	7:41	7:53	8:07	8:32	8:40
52	—	7:05	7:30	7:46	7:58	8:12	8:38	8:46
51	—	—	7:35	7:51	8:03	8:17	8:43	8:51
351	7:22	—	7:48	8:01	8:11	8:22	8:48	8:56
51	—	—	7:46	8:02	8:14	8:28	8:54	9:02
52	—	7:26	7:52	8:08	8:20	8:34	9:00	9:09
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351	7:49	—	8:15	8:28	8:38	8:48	9:14	9:23
52	—	7:49	8:15	8:31	8:43	8:57	9:23	9:32
351	8:08	—	8:35	8:48	8:58	9:08	9:34	9:43
52	—	8:12	8:38	8:54	9:06	9:19	9:46	9:55
351	8:30	—	8:57	9:10	9:20	9:30	9:57	10:06
52	—	8:34	9:00	9:16	9:28	9:41	10:08	10:17
351	8:52	—	9:19	9:32	9:42	9:52	10:19	10:28
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52	—	10:02	10:28	10:45	10:57	11:10	11:38	11:47
51	10:14	—	10:40	10:57	11:09	11:22	11:50	11:59
52	—	10:26	10:52	11:09	11:21	11:34	12:02P	12:11P
51	10:38	—	11:04	11:21	11:33	11:46	12:14	12:23
52	—	10:50	11:16	11:33	11:45	11:58	12:26	12:35
51	11:02	—	11:28	11:45	11:57	12:10P	12:38	12:47
52	—	11:14	11:40	11:57	12:09P	12:22	12:50	12:59
51	11:26	—	11:52	12:09P	12:21	12:34	1:02	1:11
52	—	11:37	12:04P	12:21	12:33	12:46	1:14	1:23
51	11:50	—	12:16	12:33	12:45	12:58	1:26	1:35
52	—	12:01P	12:28	12:45	12:57	1:10	1:38	1:47
51	12:14P	—	12:40	12:57	1:09	1:22	1:50	1:59
52	—	12:25	12:52	1:09	1:21	1:34	2:02	2:11
51	12:38	—	1:04	1:21	1:33	1:46	2:14	2:23
52	—	12:49	1:16	1:33	1:45	1:58	2:26	2:35
51	1:02	—	1:28	1:45	1:57	2:10	2:38	2:47
52	—	1:13	1:40	1:57	2:09	2:22	2:50	2:59
51	1:26	—	1:52	2:09	2:21	2:34	3:02	3:11
52	—	1:37	2:04	2:21	2:33	2:46	3:14	3:23
51	1:49	—	2:16	2:33	2:45	2:58	3:26	3:35
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51	—	—	3:12	3:29	3:41	3:54	4:22	4:31
351	3:01	—	3:29	3:42	3:51	4:01	4:29	4:38
52	—	2:59	3:26	3:43	3:55	4:08	4:36	4:45
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51	—	—	3:54	4:11	4:23	4:36	5:04	5:13
351	3:41	—	4:09	4:22	4:32	4:43	5:11	5:20
52	—	3:41	4:08	4:25	4:37	4:50	5:18	5:27
51	—	—	4:14	4:31	4:43	4:56	5:24	5:33
351	4:00	—	4:28	4:41	4:51	5:02	5:30	5:39
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51	—	—	4:47	5:03	5:14	5:27	5:55	6:04
52	—	4:25	4:52	5:08	5:19	5:32	6:00	6:09
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51	7:03	—	7:27	7:43	7:53	8:03	8:26	8:34
52	—	7:33	7:56	8:11	8:20	8:29	8:50	8:58
51	8:05	—	8:28	8:42	8:51	B8:59	9:22	9:30
52	—	8:38	9:01	9:15	9:23	9:30	C9:47	—
51	9:11	—	9:32	9:45	9:53	B10:00	10:22	10:29
52	—	9:43	10:05	10:18	10:25	10:32	C10:48	—
51	10:12	—	10:33	10:46	10:53	B11:00	11:21	11:28

See Late Night/Owl Schedule for Additional Service

Southbound (Approximate Times)

Route	Wilshire/Vermont Station	7th & Alvarado	San Pedro & 16th	Avalon & Vernon	Avalon & Florence	Avalon Station	Harbor Gateway Transit Center	M.L. King Jr. Transit Center/Compton Station
	WILSHIRE CENTER (1)	WESTLAKE (2)	DOWNTOWN LOS ANGELES (3)	LOS ANGELES (4)	LOS ANGELES (5)	LOS ANGELES (6)	HARBOR GATEWAY (7)	COMPTON (8)
51	—	—	I4:20A	4:28A	4:35A	4:47A	—	5:07A
52	—	—	4:50	4:58	5:06	5:18	5:39A	—
52	—	D4:53A	5:11	5:20	5:28	5:41	6:02	—
51	—	D5:10	5:28	5:37	5:46	5:59	—	6:20
52	—	D5:23	5:41	5:50	5:59	6:13	6:35	—
51	5:27A	5:35	5:53	6:02	6:12	6:26	—	6:47
52	—	D5:46	6:04	6:14	6:24	6:38	7:01	—
351	—	D5:55	6:14	6:22	6:30	6:43	—	7:04
52	5:55	6:04	6:23	6:33	6:43	6:57	7:21	—
351	—	D6:12	6:31	6:40	6:49	7:02	—	7:25
51	6:08	6:18	6:38	6:48	6:58	7:15	—	—
52	—	D6:23	6:43	6:53	7:03	7:18	7:42	—
51	6:17	6:27	6:48	6:58	7:09	7:26	—	—
51	—	D6:32	6:53	7:03	7:14	7:29	—	7:52
51	6:27	6:37	6:58	7:08	7:19	7:36	—	—
52	—	D6:42	7:03	7:13	7:24	7:39	8:03	—
51	6:37	6:47	7:08	7:18	7:29	7:46	—	—
351	—	D6:52	7:13	7:23	7:33	7:46	—	8:09
51	6:47	6:57	7:18	7:28	7:39	7:56	—	—
51	—	D7:01	7:22	7:32	7:43	8:00	—	—
52	6:54	7:05	7:26	7:37	7:48	8:03	8:27	—
51	—	D7:09	7:30	7:41	7:52	8:09	—	—
351	7:02	7:13	7:34	7:44	7:54	8:07	—	8:30
51	—	D7:16	7:38	7:49	8:00	8:17	—	—
51	7:09	7:20	7:42	7:53	8:04	8:21	—	—
51	—	D7:24	7:46	7:57	8:08	8:25	—	—
52	7:16	7:27	7:50	8:01	8:12	8:27	8:51	—
351	—	D7:32	7:55	8:05	8:14	8:27	—	8:50
51	7:26	7:37	8:00	8:11	8:22	8:38	—	—
51	7:32	7:43	8:06	8:17	8:28	8:43	—	—
52	7:38	7:49	8:12	8:23	8:34	8:49	9:13	—
351	7:44	7:55	8:18	8:28	8:37	8:50	—	9:13
51	7:50	8:01	8:24	8:35	8:46	9:01	—	—
52	7:56	8:07	8:30	8:41	8:52	9:07	9:31	—
51	8:02	8:13	8:37	8:48	8:59	9:15	—	—
351	8:09	8:20	8:44	8:54	9:03	9:16	—	9:39
52	8:16	8:27	8:51	9:02	9:13	9:28	9:52	—
51	8:24	8:35	8:59	9:10	9:21	9:37	—	—
351	8:33	8:44	9:08	9:18	9:27	9:40	—	10:03
52	8:43	8:54	9:19	9:30	9:41	9:56	10:21	—
51	8:55	9:06	9:31	9:42	9:53	10:08	—	10:32
52	9:08	9:19	9:44	9:55	10:06	10:22	10:47	—
51	9:23	9:34	9:59	10:10	10:21	10:37	—	11:01
52	9:37	9:48	10:14	10:25	10:36	10:52	11:17	—
51	9:52	10:03	10:29	10:40	10:51	11:07	—	11:31
52	10:06	10:18	10:44	10:55	11:06	11:23	11:48	—
51	10:20	10:32	10:58	11:10	11:21	11:38	—	12:02P
52	10:31	10:43	11:10	11:22	11:33	11:50	12:15P	—
51	10:42	10:54	11:22	11:34	11:45	12:02P	—	12:26
52	10:54	11:06	11:34	11:46	11:57	12:14	12:39	—
51	11:05	11:18	11:46	11:58	12:10P	12:27	—	12:51
52	11:17	11:30	11:58	12:10P	12:22	12:39	1:04	—
51	11:28	11:41	12:10P	12:22	12:34	12:51	—	1:15
52	11:41	11:54	12:23	12:35	12:47	1:04	1:29	—
51	—	—	—	F12:39	12:51	1:08	—	1:32
51	—	—	—	F12:43	12:55	1:12	—	—
51	11:53	12:06P	12:35	12:47	12:59	1:16	—	1:40
52	12:05P	12:18	12:47	12:59	1:11	1:28	1:53	—
51	12:17	12:30	12:59	1:11	1:23	1:40	—	2:04
52	12:29	12:42	1:11	1:23	1:35	1:52	2:17	—
51	12:41	12:54	1:23	1:35	1:47	2:04	—	2:28
52	12:53	1:06	1:35	1:47	1:59	2:16	2:41	—
51	1:04	1:17	1:46	1:58	2:10	2:27	—	2:52
51	—	—	—	F1:59	2:11	2:28	—	—
51	—	—	—	F2:03	2:15	2:32	—	—
52	1:15	1:28	1:57	2:10	2:22	2:39	3:04	—
51	1:27	1:40	2:09	2:22	2:34	2:51	—	3:16
52	1:39	1:52	2:21	2:34	2:47	3:04	3:29	—
51	1:51	2:04	2:33	2:46	2:59	3:17	—	3:42
52	2:01	2:14	2:43	2:56	3:09	3:27	3:52	—
51	2:10	2:23	2:52	3:05	3:18	3:36	—	4:01
51	—	—	—	E3:13	3:26	3:44	—	—
52	2:19	2:32	3:01	3:14	3:27	3:45	4:10	—
51	—	—	—	E3:21	3:34	3:55	—	—
51	2:27	2:40	3:09	3:22	3:35	3:53	—	4:18
51	2:35	2:48	3:17	3:30	3:43	4:04	—	—
52	2:43	2:56	3:25	3:39	3:52	4:10	4:35	—
51	2:50	3:03	3:32	3:46	3:59	4:17	—	4:42
51	2:57	3:10	3:39	3:53	4:06	4:27	—	—
52	3:04	3:17	3:46	4:00	4:13	4:31	4:56	—
351	3:11	3:24	3:53	4:03	4:13	4:27	—	4:52
51	3:18	3:31	4:00	4:14	4:27	4:48	—	—
52	3:25	3:38	4:07	4:21	4:34	4:52	5:17	—
351	3:32	3:45	4:14	4:24	4:34	4:48	—	5:13
51	3:39	3:52	4:21	4:35	4:48	5:08	—	—
52	3:46	3:59	4:28	4:42	4:55	5:13	5:37	—
351	3:52	4:06	4:35	4:46	4:56	5:10	—	5:34
51	3:59	4:13	4:42	4:56	5:09	5:29	—	—
52	4:05	4:19	4:48	5:02	5:15	5:33	5:57	—
351	4:11	4:25	4:54	5:05	5:15	5:29	—	5:53
51	4:17	4:31	5:00	5:15	5:28	5:48	—	—
52	4:23	4:37	5:06	5:21	5:34	5:52	6:16	—
51	4:28	4:42	5:11	5:26	5:39	5:59	—	—
351	4:33	4:47	5:16	5:28	5:38	5:52	—	6:16
51	4:38	4:52	5:21	5:36	5:49	6:09	—	—
52	4:43	4:57	5:26	5:41	5:54	6:12	6:36	—
51	4:48	5:02	5:31	5:46	5:59	6:18	—	—
351	4:53	5:07	5:36	5:48	5:58	6:11	—	6:35
51	4:58	5:12	5:41	5:56	6:09	6:28	—	—
51	5:03	5:17	5:46	6:01	6:14	6:33	—	—
52	5:08	5:22	5:51	6:06	6:19	6:36	6:59	—
51	5:13	5:27	5:56	6:11	6:24	6:42	—	—
351	5:18	5:32	6:01	6:13	6:23	6:35	—	6:59
51	5:25	5:39	6:07	6:22	6:35	6:53	—	—
52	5:32	5:46	6:14	6:29	6:41	6:58	7:19	—
51	5:41	5:55	6:22	6:37	6:49	7:07	—	—
351	5:49	6:03	6:30	6:42	6:52	7:04	—	7:26
52	5:58	6:12	6:38	6:52	7:04	7:20	7:41	—
51	6:06	6:20	6:46	7:00	7:11	7:28	—	—
51	6:15	6:29	6:55	7:08	7:19	7:35	—	7:57
52	6:26	6:39	7:05	7:18	7:29	7:45	8:06	—
51	6:41	6:54	7:18	7:31	7:41	7:57	—	8:19
52	6:56	7:08	7:32	7:44	7:54	8:10	8:31	—
51	7:12	7:23	7:46	7:58	8:07	8:22	—	8:44
52	7:27	7:38	8:01	8:12	8:21	8:35	8:55	—
51	7:45	7:56	8:17	8:28	8:37	8:51	—	9:12
52	8:04	8:14	8:35	8:45	8:54	9:08	9:28	—
51	8:24	8:34	8:55	9:05	9:13	9:27	—	9:48
51	8:47	B8:57	9:20	9:30	9:38	9:52	—	10:12
51	9:23	9:31	9:50	9:59	10:06	10:18	—	—
51	9:49	B9:57	10:20	10:28	10:35	10:47	—	11:07
51	10:49	B10:57	11:20	11:28	11:35	—	—	—
51	11:49	B11:57	12:20A	12:28A	12:35A	—	—	—

See Late Night/Owl Schedule for Additional Service

Daily, Saturday, and Sunday Late Night/Owl Service

51

Northbound (Approximate Times)

Avalon & Florence	Avalon & Vernon	San Pedro & 16th	7th & Broadway
LOS ANGELES (5)	LOS ANGELES (4)	DOWNTOWN LOS ANGELES (3)	DOWNTOWN LOS ANGELES (9)
11:47P	11:53P	11:59P	12:06A
12:47A	12:53A	1:00A	1:12
1:47	1:53	2:00	2:12
2:47	2:53	3:00	3:12
3:47	3:53	4:00	4:12

Southbound (Approximate Times)

7th & Broadway	San Pedro & 16th	Avalon & Vernon	Avalon & Florence
DOWNTOWN LOS ANGELES (10)	DOWNTOWN LOS ANGELES (3)	LOS ANGELES (4)	LOS ANGELES (5)
1:12A	1:20A	1:28A	1:35A
2:12	2:20	2:28	2:35
3:12	3:20	3:28	3:35

Saturday

Effective Jun 23 2019

51/52

Northbound (Approximate Times)

Route	M.L. King Jr. Transit Center/Compton Station (8) – Compton	Harbor Gateway Transit Center (7) – Harbor Gateway	Avalon Station (6) – Los Angeles	Avalon & Florence (5)	Avalon & Vernon (4)	San Pedro & 16th (3) – Downtown Los Angeles	7th & Alvarado (2) – Westlake	Wilshire/Vermont Station (1) – Wilshire Center
51	—	—	4:25A	4:38A	4:44A	4:51A	5:05A	5:12A
51	—	—	5:00	5:13	5:21	5:29	5:45	5:52
51	4:57A	—	5:18	5:31	5:40	5:48	6:06	6:13
52	—	5:13A	5:33	5:46	5:55	6:04	6:22	6:29
51	5:25	—	5:46	5:59	6:08	6:17	6:36	6:43
51	—	—	5:55	6:09	6:18	6:28	6:47	6:54
51	—	—	6:03	6:17	6:27	6:37	6:56	7:03
52	—	5:51	6:11	6:25	6:35	6:45	7:04	7:11
51	5:57	—	6:19	6:33	6:43	6:53	7:12	7:19
51	—	—	6:27	6:41	6:51	7:01	7:20	7:27
51	—	—	6:34	6:48	6:58	7:08	7:28	7:36
52	—	6:21	6:41	6:55	7:05	7:15	7:35	7:43
51	6:26	—	6:48	7:02	7:12	7:22	7:42	7:50
51	—	—	6:54	7:09	7:19	7:29	7:49	7:57
51	—	—	7:00	7:15	7:25	7:36	7:56	—
51	—	—	7:07	7:22	7:32	7:43	8:03	8:11
52	—	6:52	7:13	7:28	7:39	7:50	8:11	8:19
51	6:58	—	7:20	7:35	7:46	7:57	8:19	—
51	—	—	7:27	7:42	7:53	8:04	8:26	8:34
52	—	7:10	7:34	7:49	8:00	8:11	8:33	—
51	—	—	7:40	7:55	8:07	8:18	8:40	8:48
51	7:24	—	7:47	8:02	8:14	8:25	8:47	8:55
52	—	7:31	7:55	8:10	8:22	8:33	8:55	—
51	—	—	8:03	8:18	8:30	8:41	9:03	9:11
51	7:49	—	8:12	8:27	8:39	8:50	9:13	9:21
52	—	7:57	8:21	8:36	8:48	8:59	9:22	—
51	—	—	8:30	8:45	8:57	9:08	9:31	9:39
51	8:17	—	8:40	8:55	9:07	9:18	9:41	9:49
52	—	8:26	8:50	9:05	9:17	9:28	9:52	10:00
51	—	—	8:59	9:15	9:27	9:38	10:02	—
51	8:46	—	9:09	9:25	9:37	9:48	10:12	10:20
52	—	8:55	9:19	9:35	9:47	9:58	10:22	10:30
51	—	—	9:29	9:45	9:57	10:08	10:32	10:40
51	9:14	—	9:39	9:55	10:07	10:18	10:43	10:51
51	—	—	9:49	10:05	10:17	10:28	10:54	11:02
52	—	9:33	9:58	10:14	10:26	10:38	11:04	11:13
51	9:43	—	10:08	10:24	10:36	10:48	11:14	11:23
51	—	—	10:18	10:34	10:46	10:58	11:25	11:34
52	—	10:03	10:28	10:44	10:56	11:08	11:35	11:44
51	—	—	10:38	10:54	11:06	11:18	11:45	11:54
51	10:23	—	10:48	11:04	11:16	11:28	11:55	12:04P
52	—	10:33	10:58	11:14	11:26	11:38	12:05P	12:14
51	—	—	11:08	11:24	11:36	11:48	12:15	12:24
51	10:51	—	11:16	11:32	11:44	11:56	12:23	12:32
51	—	—	11:23	11:39	11:51	12:03P	12:30	12:39
52	—	11:05	11:30	11:46	11:58	12:10	12:37	12:46
51	—	—	11:37	11:53	12:05P	12:17	12:44	—
51	—	—	11:43	11:59	12:11	12:23	12:50	12:59
51	11:23	—	11:48	12:04P	12:16	12:28	12:55	1:04
51	—	—	11:53	12:09	12:21	12:33	1:00	—
51	—	—	11:58	12:14	12:26	12:38	1:05	1:14
52	—	11:38	12:03P	12:19	12:31	12:43	1:10	—
51	—	—	12:08	12:24	12:36	12:48	1:15	1:24
51	—	—	12:13	12:29	12:41	12:53	1:20	—
51	—	—	12:18	12:34	12:46	12:58	1:25	1:34
51	11:59	—	12:24	12:40	12:52	1:04	1:31	1:40
51	—	—	12:31	12:47	12:59	1:11	1:38	1:47
52	—	12:13P	12:38	12:54	1:06	1:18	1:45	—
51	—	—	12:45	1:01	1:13	1:25	1:52	2:01
51	12:29P	—	12:54	1:09	1:21	1:33	2:00	2:09
51	—	—	1:02	1:17	1:29	1:41	2:08	2:17
52	—	12:45	1:10	1:25	1:37	1:49	2:16	2:25
51	—	—	1:18	1:33	1:45	1:57	2:24	2:33
51	1:02	—	1:27	1:42	1:54	2:06	2:33	2:42
52	—	1:11	1:36	1:51	2:03	2:15	2:42	2:51
51	—	—	1:45	2:00	2:12	2:24	2:51	3:00
51	1:29	—	1:54	2:09	2:21	2:33	3:00	3:09
52	—	1:38	2:03	2:18	2:30	2:42	3:09	3:18
51	—	—	2:12	2:27	2:39	2:51	3:18	3:27
51	1:56	—	2:21	2:36	2:48	3:00	3:27	3:36
52	—	2:05	2:30	2:45	2:57	3:09	3:35	3:44
51	—	—	2:39	2:54	3:06	3:18	3:44	3:53
51	2:23	—	2:48	3:03	3:15	3:27	3:53	4:02
52	—	2:32	2:57	3:12	3:24	3:36	4:02	4:11
51	2:41	—	3:06	3:21	3:33	3:45	4:11	4:20
51	—	—	3:15	3:30	3:42	3:54	4:19	4:28
51	2:59	—	3:24	3:39	3:51	4:03	4:27	4:36
52	—	3:09	3:34	3:49	4:01	4:12	4:36	4:45
51	—	—	3:44	3:59	4:10	4:21	4:45	4:54
51	—	—	3:52	4:07	4:18	4:29	4:53	5:02
51	3:35	—	4:00	4:15	4:26	4:37	5:01	5:10
52	—	3:43	4:08	4:23	4:34	4:45	5:09	5:18
51	—	—	4:16	4:31	4:42	4:53	5:17	5:26
51	—	—	4:25	4:40	4:51	5:01	5:24	5:33
51	4:08	—	4:33	4:48	4:59	5:09	5:32	5:41
52	—	4:16	4:41	4:56	5:07	5:17	5:40	5:49
51	—	—	4:49	5:04	5:15	5:25	5:48	5:57
51	4:32	—	4:57	5:12	5:23	5:33	5:56	6:05
52	—	4:42	5:06	5:21	5:32	5:42	6:05	6:14
51	—	—	5:15	5:30	5:41	5:51	6:14	6:23
51	5:03	—	5:26	5:41	5:51	6:01	6:24	6:33
52	—	5:12	5:36	5:51	6:01	6:11	6:34	—
51	—	—	5:46	6:01	6:11	6:21	6:44	6:53
51	5:33	—	5:56	6:11	6:21	6:31	6:54	7:03
52	—	5:45	6:09	6:24	6:34	6:44	7:07	7:16
51	6:03	—	6:26	6:41	6:50	7:00	7:23	7:32
52	—	6:21	6:45	7:00	7:09	7:19	7:41	7:50
51	6:44	—	7:07	7:22	7:31	7:39	8:01	8:09
52	—	7:05	7:27	7:42	7:51	7:59	8:21	8:29
51	7:28	—	7:50	8:04	8:12	8:20	8:39	—
52	—	7:48	8:10	8:24	8:32	8:40	8:59	9:07
51	8:08	—	8:30	8:44	8:52	B9:00	9:22	9:30
52	—	8:40	9:02	9:15	9:23	9:30	9:46	—
51	9:11	—	9:32	9:45	9:53	B10:00	10:22	10:29
52	—	9:42	10:03	10:16	10:23	10:30	10:46	—
51	10:12	—	10:33	10:46	10:53	B11:00	11:21	11:28

See Late Night/Owl Schedule for Additional Service

Southbound (Approximate Times)

Route	Wilshire/Vermont Station (1) – Wilshire Center	7th & Alvarado (2) – Westlake	San Pedro & 16th (3) – Downtown Los Angeles	Avalon & Vernon (4) – Los Angeles	Avalon & Florence (5)	Avalon Station (6)	Harbor Gateway Transit Center (7) – Harbor Gateway	M.L. King Jr. Transit Center/Compton Station (8) – Compton
51	—	—	I4:20A	4:28A	4:35A	4:47A	—	5:07A
51	—	—	4:50	4:58	5:05	5:17	—	5:36
52	—	D4:53A	5:11	5:19	5:26	5:39	5:58A	—
51	—	D5:13	5:31	5:39	5:46	5:59	—	6:18
52	5:23A	5:31	5:49	5:57	6:05	6:18	6:37	—
51	—	D5:45	6:03	6:12	6:21	6:34	—	6:53
51	—	D5:55	6:14	6:23	6:32	6:46	—	—
52	—	D6:05	6:24	6:33	6:42	6:55	7:14	—
51	6:05	6:13	6:33	6:42	6:51	7:05	—	—
51	—	D6:21	6:41	6:50	6:59	7:12	—	7:32
51	—	D6:27	6:47	6:56	7:05	7:19	—	—
52	6:24	6:33	6:53	7:02	7:11	7:24	7:43	—
51	—	D6:38	6:58	7:07	7:16	7:29	—	7:49
51	—	D6:42	7:03	7:12	7:22	7:35	—	—
51	6:38	6:47	7:08	7:17	7:27	7:41	—	—
51	—	D6:52	7:14	7:24	7:34	7:47	—	8:07
52	6:49	6:58	7:20	7:30	7:40	7:53	8:12	—
51	—	D7:04	7:26	7:36	7:46	7:59	—	—
51	7:00	7:10	7:32	7:42	7:52	8:06	—	—
51	—	D7:16	7:38	7:48	7:58	8:12	—	8:32
51	7:12	7:22	7:44	7:54	8:04	8:18	—	—
52	7:18	7:28	7:50	8:00	8:10	8:24	8:43	—
51	7:24	7:34	7:56	8:06	8:16	8:31	—	—
51	7:32	7:42	8:04	8:14	8:24	8:38	—	8:59
51	7:39	7:49	8:12	8:22	8:32	8:46	—	—
52	7:46	7:56	8:20	8:30	8:40	8:54	9:14	—
51	7:55	8:05	8:29	8:39	8:49	9:04	—	—
51	8:04	8:14	8:38	8:48	8:58	9:12	—	9:33
52	8:14	8:24	8:48	8:59	9:09	9:24	9:44	—
51	8:24	8:35	8:59	9:10	9:20	9:35	—	—
51	8:36	8:47	9:12	9:23	9:33	9:48	—	10:09
52	8:48	8:59	9:25	9:36	9:46	10:01	10:21	—
51	9:01	9:12	9:38	9:49	9:59	10:14	—	10:35
52	9:14	9:25	9:51	10:02	10:12	10:27	10:48	—
51	9:27	9:38	10:04	10:15	10:25	10:40	—	11:02
52	9:40	9:51	10:17	10:28	10:39	10:54	11:16	—
51	9:53	10:04	10:30	10:42	10:53	11:08	—	11:30
52	10:06	10:17	10:43	10:55	11:06	11:21	11:43	—
51	10:19	10:30	10:56	11:08	11:19	11:34	—	11:56
52	10:32	10:43	11:09	11:21	11:32	11:47	12:09P	—
51	10:45	10:56	11:22	11:34	11:45	11:59	—	12:22P
52	10:57	11:08	11:34	11:46	11:57	12:12P	12:34	—
51	11:09	11:20	11:46	11:58	12:09P	12:25	—	—
51	11:18	11:29	11:56	12:08P	12:19	12:34	—	12:56
52	11:28	11:39	12:06P	12:18	12:29	12:45	1:07	—
51	11:38	11:49	12:16	12:28	12:39	12:56	—	—
51	11:48	11:59	12:26	12:38	12:49	1:05	—	1:27
52	11:58	12:09P	12:36	12:48	12:59	1:15	1:37	—
51	12:08P	12:19	12:46	12:58	1:09	1:26	—	—
51	12:17	12:28	12:55	1:07	1:18	1:34	—	1:56
52	12:27	12:38	1:05	1:17	1:28	1:44	2:06	—
51	12:36	12:47	1:14	1:26	1:37	1:54	—	—
51	12:45	12:56	1:23	1:35	1:46	2:02	—	2:24
52	12:53	1:04	1:31	1:43	1:54	2:10	2:32	—
51	1:01	1:12	1:39	1:51	2:02	2:19	—	—
51	1:09	1:20	1:47	1:59	2:10	2:26	—	2:48
52	1:17	1:28	1:55	2:07	2:18	2:34	2:56	—
51	1:26	1:37	2:04	2:16	2:27	2:44	—	—
51	1:35	1:46	2:13	2:25	2:36	2:52	—	3:14
52	1:44	1:55	2:22	2:34	2:45	3:01	3:23	—
51	1:53	2:04	2:31	2:43	2:54	3:11	—	—
51	2:02	2:13	2:40	2:52	3:03	3:19	—	3:41
52	2:11	2:22	2:49	3:01	3:12	3:28	3:50	—
51	2:20	2:31	2:58	3:09	3:20	3:37	—	—
51	2:29	2:40	3:07	3:18	3:29	3:45	—	4:07
52	2:38	2:49	3:16	3:27	3:38	3:54	4:16	—
51	2:46	2:57	3:24	3:35	3:46	4:03	—	—
51	2:54	3:05	3:32	3:43	3:54	4:09	—	4:31
51	3:03	3:14	3:40	3:51	4:02	4:17	—	—
52	3:10	3:21	3:47	3:58	4:09	4:24	4:46	—
51	3:18	3:29	3:54	4:05	4:16	4:33	—	—
51	3:25	3:36	4:01	4:12	4:23	4:38	—	5:00
51	3:32	3:43	4:08	4:19	4:30	4:45	—	—
52	3:39	3:50	4:15	4:26	4:37	4:52	5:14	—
51	3:47	3:58	4:22	4:33	4:44	5:01	—	—
51	3:54	4:05	4:29	4:40	4:51	5:06	—	5:28
51	4:02	4:13	4:37	4:48	4:59	5:16	—	—
52	4:10	4:21	4:45	4:56	5:07	5:22	5:44	—
51	4:18	4:29	4:53	5:04	5:15	5:30	—	—
51	4:26	4:37	5:01	5:12	5:22	5:37	—	5:59
51	4:34	4:45	5:09	5:20	5:30	5:45	—	—
52	4:42	4:53	5:17	5:28	5:38	5:53	6:14	—
51	4:50	5:01	5:25	5:36	5:46	6:01	—	—
51	4:58	5:09	5:33	5:44	5:54	6:09	—	6:31
51	5:06	5:17	5:41	5:52	6:02	6:16	—	—
52	5:14	5:25	5:49	6:00	6:10	6:24	6:45	—
51	5:22	5:33	5:57	6:08	6:18	6:32	—	—
51	5:31	5:42	6:05	6:16	6:26	6:40	—	7:02
51	5:39	5:50	6:13	6:24	6:34	6:48	—	—
52	5:48	5:59	6:21	6:32	6:42	6:56	7:16	—
51	5:56	6:07	6:29	6:40	6:50	7:04	—	—
51	6:04	6:15	6:37	6:48	6:58	7:12	—	7:33
51	6:12	6:23	6:45	6:56	7:05	7:19	—	—
52	6:20	6:31	6:53	7:04	7:13	7:27	7:47	—
51	6:28	6:39	7:01	7:12	7:21	7:35	—	—
51	6:38	6:49	7:11	7:22	7:31	7:45	—	8:06
51	6:49	7:00	7:22	7:33	7:42	7:56	—	—
52	7:01	7:12	7:34	7:45	7:54	8:08	8:28	—
51	7:17	7:28	7:48	7:59	8:07	8:21	—	8:42
51	7:33	7:43	8:03	8:13	8:21	8:35	—	—
51	7:48	7:58	8:18	8:28	8:36	8:50	—	9:11
52	8:04	8:13	8:33	8:42	8:50	9:04	9:24	—
51	8:20	8:29	8:48	8:57	9:04	9:18	—	9:39
51	8:35	8:44	9:03	9:11	9:18	9:32	—	—
51	8:48	B8:57	9:20	9:28	9:35	9:49	—	10:09
51	9:24	9:32	9:50	9:58	10:05	10:17	—	10:37
51	9:49	B9:57	10:20	10:28	10:35	10:47	—	11:07
51	10:49	B10:57	11:20	11:28	11:35	—	—	—
51	11:49	B11:57	12:20A	12:28A	12:35A	—	—	—

See Late Night/Owl Schedule for Additional Service

Sunday & Holiday

51/52

Northbound (Approximate Times)

Route	M.L. King Jr. Transit Center/Compton Station (8) – Compton	Harbor Gateway Transit Center (7) – Harbor Gateway	Avalon Station (6) – Los Angeles	Avalon & Florence (5)	Avalon & Vernon (4)	San Pedro & 16th (3) – Downtown Los Angeles	7th & Alvarado (2) – Westlake	Wilshire/Vermont Station (1) – Wilshire Center
51	—	—	4:25A	4:38A	4:44A	4:51A	5:05A	5:12A
51	—	—	5:04	5:17	5:23	5:30	5:46	5:53
51	5:08A	—	5:27	5:40	5:47	5:55	6:12	6:19
52	—	5:30A	5:49	6:02	6:11	6:19	6:36	6:43
51	5:50	—	6:11	6:25	6:34	6:42	7:00	7:07
52	—	6:08	6:30	6:45	6:54	7:02	7:21	7:28
51	6:23	—	6:45	7:00	7:09	7:17	7:36	7:43
52	—	6:37	6:59	7:14	7:23	7:31	7:50	7:57
51	6:50	—	7:12	7:27	7:36	7:44	8:04	8:12
52	—	7:03	7:25	7:40	7:49	7:57	8:18	8:26
51	7:14	—	7:36	7:51	8:00	8:10	8:31	8:39
52	—	7:26	7:48	8:03	8:13	8:23	8:44	8:52
51	7:38	—	8:00	8:16	8:26	8:36	8:57	9:05
52	—	7:50	8:12	8:28	8:38	8:48	9:09	9:17
51	8:02	—	8:24	8:40	8:50	9:00	9:21	9:29
52	—	8:14	8:36	8:52	9:02	9:12	9:34	9:42
51	8:24	—	8:46	9:02	9:14	9:24	9:46	9:54
52	—	8:35	8:57	9:14	9:26	9:36	9:58	10:06
51	8:47	—	9:09	9:26	9:38	9:48	10:11	10:19
52	—	8:59	9:21	9:38	9:50	10:00	10:23	10:31
51	9:11	—	9:33	9:50	10:02	10:12	10:35	10:43
52	—	9:23	9:45	10:02	10:14	10:24	10:47	10:55
51	9:35	—	9:57	10:14	10:26	10:36	11:00	11:08
52	—	9:47	10:09	10:26	10:38	10:48	11:12	11:20
51	9:58	—	10:20	10:37	10:49	10:59	11:23	11:31
52	—	10:09	10:31	10:48	11:00	11:10	11:34	11:42
51	10:20	—	10:42	10:59	11:11	11:21	11:45	11:53
52	—	10:31	10:53	11:10	11:22	11:32	11:56	12:04P
51	10:41	—	11:04	11:21	11:33	11:43	12:07P	12:15
52	—	10:51	11:14	11:31	11:43	11:54	12:18	12:26
51	11:02	—	11:25	11:42	11:54	12:05P	12:29	12:37
52	—	11:13	11:36	11:53	12:05P	12:16	12:40	12:48
51	11:24	—	11:47	12:04P	12:16	12:27	12:51	1:00
52	—	11:35	11:58	12:15	12:27	12:38	1:02	1:11
51	11:46	—	12:09P	12:26	12:38	12:49	1:13	1:22
52	—	11:56	12:19	12:36	12:48	12:59	1:23	1:32
51	—	—	—	G12:46	12:58	1:09	1:33	1:42
51	12:16P	—	12:39	12:56	1:08	1:19	1:43	1:52
52	—	12:26P	12:49	1:06	1:18	1:29	1:53	2:02
51	—	—	—	G1:16	1:28	1:39	2:03	2:12
51	12:46	—	1:09	1:26	1:38	1:49	2:13	2:22
52	—	12:56	1:19	1:36	1:48	1:59	2:23	2:32
51	—	—	—	G1:46	1:58	2:09	2:33	2:42
51	1:16	—	1:39	1:56	2:08	2:19	2:43	2:52
52	—	1:26	1:49	2:06	2:18	2:29	2:53	3:02
51	—	—	—	2:16	2:28	2:39	3:03	3:12
51	1:46	—	2:09	2:26	2:38	2:49	3:13	3:22
52	—	1:56	2:19	2:36	2:48	2:59	3:23	3:32
51	—	—	—	G2:46	2:58	3:09	3:33	3:42
51	2:16	—	2:39	2:56	3:08	3:19	3:43	3:52
52	—	2:26	2:49	3:06	3:18	3:29	3:53	—
51	—	—	—	G3:17	3:29	3:39	4:02	4:11
51	2:49	—	3:12	3:29	3:39	3:49	4:12	4:21
52	—	3:00	3:23	3:39	3:49	3:59	4:22	4:31
51	—	—	—	G3:49	3:59	4:09	4:32	4:41
51	3:20	—	3:43	3:59	4:09	4:19	4:42	4:51
52	—	3:30	3:53	4:09	4:19	4:29	4:52	5:01
51	—	—	—	G4:19	4:29	4:39	5:02	5:11
51	3:50	—	4:13	4:29	4:39	4:49	5:12	5:21
52	—	4:00	4:23	4:39	4:49	4:59	5:22	5:31
51	—	—	—	G4:49	4:59	5:09	5:32	5:41
51	4:20	—	4:43	4:59	5:09	5:19	5:42	—
52	—	4:30	4:53	5:09	5:19	5:29	5:51	6:00
51	—	—	—	G5:22	5:32	5:41	6:03	6:12
51	4:57	—	5:20	5:36	5:46	5:55	6:17	6:26
52	—	5:13	5:36	5:52	6:02	6:11	6:33	6:42
52	—	5:29	5:52	6:08	6:18	6:27	6:49	6:58
51	5:47	—	6:10	6:26	6:36	6:45	7:07	7:16
52	—	6:06	6:29	6:44	6:54	7:03	7:24	7:32
51	6:25	—	6:48	7:03	7:12	7:21	7:41	—
52	—	6:47	7:10	7:25	7:34	7:43	8:03	—
51	7:11	—	7:34	7:49	7:58	8:07	8:26	8:34
52	—	7:38	7:59	8:14	8:23	8:32	8:51	8:59
51	8:04	—	8:27	8:42	8:51	B8:59	9:22	9:30
52	—	8:42	9:02	9:15	9:23	9:30	9:46	—
51	9:11	—	9:32	9:45	9:53	B10:00	10:22	10:29
52	—	9:43	10:03	10:16	10:23	10:30	10:46	—
51	10:12	—	10:33	10:46	10:53	B11:00	11:21	11:28

See Late Night/Owl Schedule for Additional Service

Southbound (Approximate Times)

Route	Wilshire/Vermont Station (1) – Wilshire Center	7th & Alvarado (2) – Westlake	San Pedro & 16th (3) – Downtown Los Angeles	Avalon & Vernon (4) – Los Angeles	Avalon & Florence (5)	Avalon Station (6)	Harbor Gateway Transit Center (7) – Harbor Gateway	M.L. King Jr. Transit Center/Compton Station (8) – Compton
51	—	—	I4:20A	4:28A	4:35A	4:47A	—	5:07A
52	—	—	4:55	5:03	5:10	5:22	5:40A	—
52	—	D5:09A	5:27	5:35	5:42	5:55	6:13	—
51	5:33A	5:41	5:59	6:08	6:16	6:29	—	6:48
52	6:01	6:09	6:27	6:36	6:44	6:57	7:16	—
51	—	D6:29	6:47	6:57	7:06	7:19	—	7:40
52	6:38	6:46	7:05	7:15	7:24	7:37	7:56	—
51	—	D6:59	7:19	7:29	7:39	7:52	—	8:13
52	7:03	7:12	7:32	7:42	7:52	8:05	8:25	—
51	—	D7:25	7:45	7:55	8:05	8:19	—	8:40
52	7:29	7:38	7:58	8:08	8:18	8:32	8:52	—
51	7:41	7:50	8:11	8:21	8:31	8:45	—	9:06
52	7:54	8:03	8:25	8:35	8:46	9:01	9:21	—
51	8:08	8:17	8:39	8:49	9:00	9:15	—	9:36
52	8:22	8:31	8:53	9:04	9:15	9:31	9:52	—
51	8:35	8:45	9:07	9:18	9:29	9:45	—	10:07
52	8:49	8:59	9:21	9:32	9:43	9:59	10:20	—
51	9:03	9:13	9:35	9:46	9:57	10:13	—	10:35
52	9:17	9:27	9:49	10:00	10:11	10:27	10:48	—
51	9:31	9:41	10:03	10:14	10:25	10:41	—	11:03
52	9:45	9:55	10:17	10:28	10:39	10:55	11:16	—
51	9:58	10:08	10:31	10:42	10:53	11:09	—	11:31
52	10:11	10:22	10:45	10:56	11:07	11:23	11:44	—
51	10:25	10:36	10:59	11:10	11:21	11:37	—	11:59
52	10:38	10:49	11:12	11:23	11:34	11:50	12:11P	—
51	10:50	11:01	11:24	11:35	11:46	12:02P	—	12:24P
52	11:01	11:12	11:36	11:47	11:58	12:14	12:35	—
51	11:12	11:23	11:47	11:58	J12:09P	—	—	—
51	11:23	11:34	11:58	12:09P	12:20	12:36	—	12:58
52	11:34	11:45	12:09P	12:20	12:31	12:47	1:08	—
51	11:45	11:56	12:20	12:31	J12:42	—	—	—
51	11:56	12:07P	12:31	12:42	12:53	1:09	—	1:31
52	12:07P	12:18	12:42	12:53	1:04	1:20	1:41	—
51	12:18	12:29	12:53	1:04	J1:15	—	—	—
51	12:28	12:39	1:03	1:14	1:25	1:41	—	2:03
52	12:38	12:49	1:13	1:24	1:35	1:51	2:12	—
51	12:48	12:59	1:23	1:34	J1:45	—	—	—
51	12:58	1:09	1:33	1:44	1:55	2:11	—	2:33
52	—	D1:19	1:43	1:54	2:05	2:21	2:42	—
51	1:17	1:29	1:53	2:04	J2:15	—	—	—
51	1:27	1:39	2:03	2:14	2:25	2:41	—	3:03
52	1:37	1:49	2:13	2:24	2:35	2:51	3:12	—
51	1:47	1:59	2:23	2:34	J2:45	—	—	—
51	1:57	2:09	2:33	2:44	2:55	3:11	—	3:33
52	2:07	2:19	2:43	2:54	3:05	3:21	3:42	—
51	2:17	2:29	2:53	3:04	J3:15	—	—	—
51	2:27	2:39	3:03	3:14	3:25	3:41	—	4:03
52	2:37	2:49	3:13	3:24	3:35	3:51	4:12	—
51	2:47	2:59	3:23	3:34	J3:45	—	—	—
51	2:57	3:09	3:33	3:44	3:55	4:11	—	4:33
52	3:07	3:19	3:43	3:54	4:05	4:21	4:42	—
51	3:18	3:30	3:54	4:05	J4:16	—	—	—
51	3:29	3:41	4:05	4:16	4:26	4:42	—	5:03
52	3:40	3:52	4:16	4:27	4:37	4:53	5:13	—
51	3:50	4:02	4:26	4:37	J4:47	—	—	—
51	4:00	4:12	4:36	4:47	4:57	5:13	—	5:34
52	4:11	4:22	4:46	4:57	5:07	5:23	5:43	—
51	4:22	4:33	4:56	5:07	J5:17	—	—	—
51	4:32	4:43	5:06	5:17	5:27	5:43	—	6:04
52	4:42	4:53	5:16	5:27	5:37	5:53	6:13	—
51	4:52	5:03	5:26	5:37	5:47	6:03	—	—
52	5:02	5:13	5:36	5:47	5:57	6:13	6:33	—
52	5:12	5:23	5:46	5:57	6:07	6:23	6:43	—
51	5:22	5:33	5:56	6:07	6:17	6:33	—	—
51	5:32	5:43	6:06	6:17	6:27	6:41	—	7:02
52	5:43	5:54	6:16	6:27	6:36	6:50	7:10	—
51	5:55	6:06	6:28	6:38	6:47	7:01	—	—
51	6:10	6:21	6:42	6:52	7:01	7:15	—	7:36
52	6:25	6:36	6:57	7:07	7:16	7:30	7:50	—
51	6:41	6:52	7:13	7:23	7:32	7:46	—	8:07
52	6:57	7:08	7:29	7:39	7:48	8:02	8:21	—
51	7:14	7:24	7:45	7:55	8:04	8:18	—	8:39
52	7:34	7:44	8:05	8:15	8:24	8:38	8:57	—
52	7:54	8:04	8:25	8:35	8:43	8:57	9:16	—
51	8:20	8:30	8:50	8:59	9:06	9:20	—	9:41
52	8:47	B8:57	9:20	9:28	9:35	9:49	10:08	—
51	9:24	9:32	9:50	9:58	10:05	10:17	—	10:37
51	9:49	B9:57	10:20	10:28	10:35	10:47	—	11:07
51	10:49	B10:57	11:20	11:28	11:35	—	—	—
51	11:49	B11:57	12:20A	12:28A	12:35A	—	—	—

See Late Night/Owl Schedule for Additional Service

Sunday and Holiday Schedules

Sunday and Holiday Schedule in effect on New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day and Christmas Day.

Nextrip

Text "metro" and your intersection or stop number to 41411 (example: metro vignes&cesarechavez or metro 1563). You can also visit metro.net or call 511 and say "Nextrip".

Special Notes

- **B** Trip waits at 7th & Broadway for transfer connections.
- **C** Trip ends at 7th & Hoover 3 minutes after time shown.
- **D** Trip begins at 7th & Hoover 3 minutes before time shown.
- **E** Operates school days only. Trip begins at San Pedro & Washington 10 minutes before time shown.
- **F** Operates on early dismissal school days. Trip begins at San Pedro & Washington 10 minutes before time shown.
- **G** Trip begins at Avalon & 103rd approximately 12-14 minutes before time shown.
- **I** Trip begins at 7th & Broadway approximately 8 minutes before time shown.
- **J** Trip ends at Avalon & 103rd 9-11 minutes after time shown.

Horarios de domingo y días feriados

Horarios de domingo y días feriados en vigor para New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day y Christmas Day

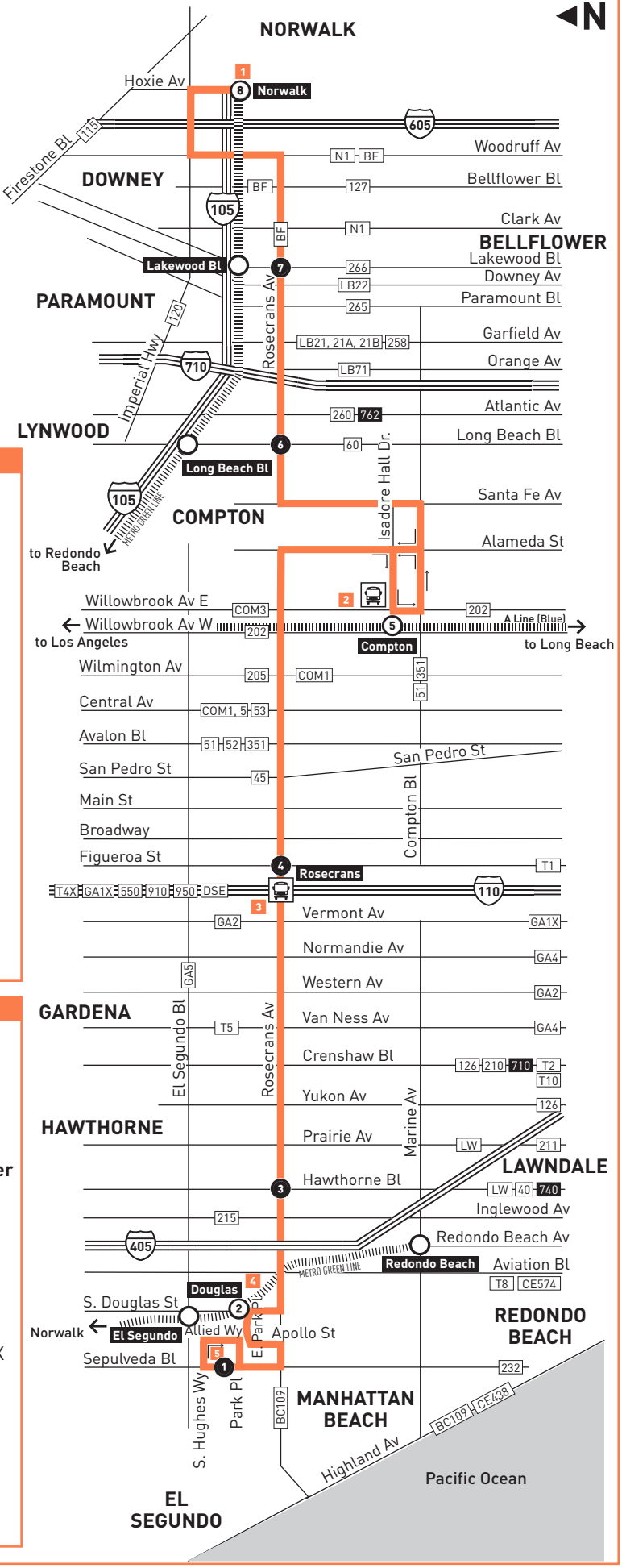
Nextrip

Envíe un mensaje de texto con "Metro" y la interseccíon de la calle o el número de su parada al 41411. Nextrip le enviará un mensaje de texto con la próxima llegada de cada autobús en esa parada. También puede visitar metro.net o llamar al 511 y decir "Nextrip".

Avisos especiales

- **B** *Viaje espera en la 7th y Broadway por las conexiones de transferencia.*
- **C** *Viaje termina en 7th y Hoover 3 minutos despues de la hora mostrada.*
- **D** *Viaje comienza en 7th y Hoover 3 minutos antes de la hora mostrada.*
- **E** *Opera dias de escuela solamente. Viaje comienza en San Pedro y Washington 10 minutos antes de la hora mostrada.*
- **F** *Opera los días de escuela con salida temprano. El viaje empieza en San Pedro y Washington 10 minutos antes de la hora mostrada.*
- **G** *Viaje empieza en Avalon y 103rd aproximadamente 12-14 minutos antes de la hora mostrada.*
- **I** *Viaje empieza en 7th y Broadway aproximadamente 8 minutos antes de la hora mostrada.*
- **J** *Viaje termina en Avalon y 103rd 9-11 minutos después de la hora mostrada.*

ROUTE MAP



LEGEND

- Line 125 Route
- (#) Local Stop Timepoint
- (#) Metro Rail Station & Timepoint
- Metro Rail Station
- Metro Rail
- Transit Center
- BC Beach Cities Transit
- BF Bellflower Bus
- CE LADOT Commuter Express
- COM Compton Renaissance
- DSE Dodger Stadium Express
- GA GTrans (Gardena)
- LB Long Beach Transit
- N Norwalk Transit
- T Torrance Transit

MAP NOTES

1. **Norwalk Station**
   Metro Green Line
   Metro 111, 115, 120, 125, 460, 577; LB172, 173; N2, N4, N5, N7
2. **Compton Station / Martin Luther King, Jr Transit Center**
   Metro Rail A Line (Blue); Metro 51, 55 Owl, 60 Owl, 125, 127, 128, 202, 351; COM1, COM2, COM3, COM4, COM5; GA3
3. **Rosecrans Station**
   Freeway Level: Metro 550; DSE; Metro Silver Line 910/950; T4X; GA1X
   Street Level: Metro 125
4. **Douglas Station**
   Metro Green Line;
   Metro 125; BC109; Amtrak Thruway;
5. **Plaza El Segundo**
   Metro 125, 232 (N/B only); BC109

Monday through Friday

Effective Dec 15 2019

125

Eastbound *Al Este* (Approximate Times/*Tiempos Aproximados*)

EL SEGUNDO		LAWNDALE	LOS ANGELES	COMPTON		DOWNEY	NORWALK
1	2	3	4	5	6	7	8
Plaza El Segundo	Douglas Station	Rosecrans & Hawthorne	Rosecrans & Figueroa	Compton Station	Rosecrans & Long Beach	Rosecrans & Lakewood	Norwalk Station
4:35A	4:45A	4:52A	5:10A	5:27A	5:36A	5:51A	6:02A
4:58	5:09	5:18	5:36	5:53	6:02	6:18	6:29
—	—	5:31	5:50	6:08	6:18	6:34	6:47
5:26	5:37	5:46	6:05	6:23	6:33	6:50	7:03
—	—	6:01	6:21	6:39	6:49	7:07	7:20
5:56	6:07	6:16	6:36	6:54	7:04	7:23	7:36
—	—	6:31	6:52	7:11	7:22	7:42	7:56
6:26	6:36	6:46	7:06	7:25	7:37	7:57	8:11
—	—	6:59	7:20	7:40	7:52	8:11	8:25
6:54	7:04	7:15	7:36	7:56	8:07	8:25	8:39
—	—	7:29	7:51	8:11	8:22	8:40	8:53
7:29	7:39	7:50	8:11	8:31	8:42	9:00	9:12
8:02	8:13	8:24	8:45	9:04	9:15	9:33	9:45
8:35	8:46	8:57	9:18	9:37	9:48	10:06	10:18
9:06	9:17	9:29	9:50	10:10	10:22	10:40	10:52
9:39	9:50	10:02	10:24	10:44	10:56	11:14	11:26
10:12	10:24	10:37	10:59	11:19	11:31	11:49	12:01P
10:45	10:57	11:11	11:34	11:54	12:06P	12:25P	12:38
11:20	11:32	11:46	12:09P	12:29P	12:41	1:00	1:13
11:54	12:06P	12:21P	12:44	1:04	1:16	1:35	1:48
12:27P	12:39	12:54	1:17	1:39	1:51	2:11	2:24
12:53	1:05	1:20	1:43	2:05	2:18	2:38	2:52
1:18	1:30	1:45	2:08	2:30	2:44	3:04	3:18
1:41	1:53	2:09	2:32	2:54	3:08	3:28	3:42
1:59	2:11	2:27	2:51	3:14	3:28	3:48	4:02
2:20	2:32	2:48	3:12	3:35	3:49	4:09	4:23
2:37	2:49	3:05	3:30	3:54	4:09	4:28	4:42
2:54	3:06	3:23	3:49	4:13	4:28	4:47	5:01
3:11	3:24	3:42	4:09	4:33	4:48	5:07	5:20
3:31	3:44	4:02	4:29	4:53	5:08	5:27	5:40
3:51	4:04	4:22	4:49	5:13	5:28	5:47	6:00
4:13	4:26	4:44	5:11	5:35	5:50	6:09	6:22
4:46	4:59	5:18	5:44	6:07	6:20	6:38	6:50
5:26	5:39	5:58	6:22	6:41	6:53	7:10	7:21
6:21	6:34	6:48	7:10	7:29	7:39	7:55	8:06
7:15	7:27	7:39	7:59	8:15	8:25	8:39	8:50
8:05	8:17	8:29	8:47	9:02	9:11	9:25	9:36

Monday through Friday

125

Westbound *Al Oeste* (Approximate Times/*Tiempos Aproximados*)

NORWALK	DOWNEY	COMPTON		LOS ANGELES	LAWNDALE	EL SEGUNDO	
8	7	6	5	4	3	2	1
Norwalk Station	Rosecrans & Lakewood	Rosecrans & Long Beach	Compton Station	Rosecrans & Figueroa	Rosecrans & Hawthorne	Douglas Station	Plaza El Segundo
4:25A	4:36A	4:51A	4:59A	5:18A	5:34A	5:41A	5:46A
4:50	5:01	5:16	5:24	5:44	6:02	6:09	6:14
5:13	5:25	5:41	5:50	6:10	6:28	6:36	6:41
5:33	5:45	6:01	6:10	6:31	6:52	7:00	7:05
5:52	6:04	6:20	6:29	6:51	7:10	—	—
6:05	6:18	6:35	6:45	7:07	7:32	7:43	7:48
6:19	6:32	6:51	7:01	7:25	7:50	—	—
6:35	6:48	7:07	7:18	7:42	8:07	8:18	8:23
6:50	7:03	7:23	7:34	7:58	8:22	8:34	8:39
7:05	7:18	7:39	7:50	8:14	8:36	8:48	8:53
7:19	7:32	7:54	8:05	8:28	8:49	—	—
7:33	7:47	8:09	8:20	8:42	9:03	9:13	9:18
7:49	8:03	8:24	8:35	8:57	9:18	—	—
8:06	8:20	8:39	8:49	9:11	9:32	9:42	9:47
8:27	8:41	8:59	9:09	9:31	9:52	—	—
8:53	9:06	9:24	9:34	9:56	10:18	10:27	10:32
9:26	9:39	9:56	10:07	10:30	10:52	11:01	11:07
9:57	10:11	10:28	10:39	11:02	11:24	11:33	11:39
10:30	10:44	11:03	11:14	11:37	11:59	12:08P	12:14P
11:06	11:20	11:39	11:50	12:14P	12:36P	12:45	12:51
11:41	11:55	12:15P	12:27P	12:52	1:14	1:23	1:29
12:17P	12:31P	12:51	1:03	1:28	1:51	2:00	2:06
12:52	1:06	1:26	1:38	2:03	2:26	2:35	2:40
1:27	1:41	2:01	2:13	2:39	3:02	3:11	3:16
2:01	2:15	2:37	2:49	3:15	3:38	3:47	3:52
2:20	2:34	2:57	3:09	3:35	3:58	4:07	4:12
2:41	2:55	3:19	3:31	3:57	4:19	4:28	4:33
3:07	3:21	3:44	3:56	4:22	4:44	4:53	4:58
3:32	3:46	4:08	4:19	4:45	5:07	5:16	5:22
3:55	4:09	4:30	4:41	5:07	5:29	5:38	5:44
4:17	4:31	4:52	5:03	5:28	5:50	5:59	6:04
4:40	4:54	5:14	5:25	5:49	6:10	6:19	6:24
5:02	5:16	5:36	5:46	6:10	6:30	6:38	6:43
5:25	5:39	5:59	6:09	6:32	6:51	6:59	7:04
6:15	6:29	6:47	6:57	7:18	7:37	7:44	7:49
7:17	7:29	7:45	7:54	8:14	8:31	8:38	8:42
8:18	8:30	8:45	8:54	9:12	9:28	9:35	9:39

Saturday 125

Eastbound *Al Este* (Approximate Times/*Tiempos Aproximados*)

EL SEGUNDO		LAWNDALE	LOS ANGELES	COMPTON		DOWNEY	NORWALK
1	2	3	4	5	6	7	8
Plaza El Segundo	Douglas Station	Rosecrans & Hawthorne	Rosecrans & Figueroa	Compton Station	Rosecrans & Long Beach	Rosecrans & Lakewood	Norwalk Station
5:05A	5:15A	5:22A	5:38A	5:54A	6:02A	6:15A	6:26A
5:50	6:00	6:07	6:24	6:40	6:49	7:04	7:15
6:28	6:38	6:46	7:03	7:20	7:29	7:44	7:55
7:03	7:13	7:21	7:38	7:56	8:05	8:20	8:31
7:30	7:40	7:49	8:08	8:27	8:37	8:53	9:04
8:02	8:12	8:21	8:40	8:59	9:09	9:26	9:37
8:31	8:41	8:51	9:11	9:30	9:41	9:58	10:09
9:01	9:11	9:22	9:43	10:02	10:13	10:30	10:41
9:31	9:41	9:53	10:14	10:34	10:45	11:02	11:14
10:02	10:12	10:24	10:45	11:05	11:17	11:35	11:47
10:33	10:43	10:55	11:17	11:37	11:49	12:07P	12:19P
11:03	11:14	11:27	11:49	12:09P	12:21P	12:40	12:52
11:36	11:47	12:00P	12:22P	12:42	12:53	1:12	1:24
12:07P	12:18P	12:31	12:53	1:13	1:25	1:43	1:55
12:40	12:51	1:04	1:26	1:45	1:57	2:15	2:27
1:12	1:23	1:36	1:58	2:17	2:29	2:47	2:59
1:44	1:55	2:08	2:30	2:49	3:00	3:18	3:30
2:10	2:22	2:35	2:57	3:16	3:27	3:45	3:57
2:37	2:49	3:02	3:24	3:43	3:54	4:12	4:24
3:04	3:16	3:29	3:51	4:10	4:21	4:39	4:51
3:31	3:43	3:56	4:18	4:37	4:48	5:05	5:17
3:57	4:09	4:23	4:45	5:04	5:15	5:32	5:43
4:30	4:42	4:56	5:18	5:36	5:47	6:04	6:15
5:09	5:21	5:35	5:57	6:15	6:26	6:43	6:53
6:00	6:12	6:25	6:46	7:04	7:14	7:30	7:40
6:56	7:07	7:18	7:39	7:56	8:06	8:21	8:31
8:00	8:11	8:21	8:38	8:53	9:02	9:15	9:25

Saturday 125

Westbound *Al Oeste* (Approximate Times/*Tiempos Aproximados*)

NORWALK	DOWNEY	COMPTON		LOS ANGELES	LAWNDALE	EL SEGUNDO	
8	7	6	5	4	3	2	1
Norwalk Station	Rosecrans & Lakewood	Rosecrans & Long Beach	Compton Station	Rosecrans & Figueroa	Rosecrans & Hawthorne	Douglas Station	Plaza El Segundo
5:03A	5:15A	5:28A	5:35A	5:53A	6:07A	6:14A	6:18A
5:51	6:04	6:19	6:27	6:45	7:02	7:10	7:14
6:38	6:51	7:07	7:16	7:36	7:55	8:03	8:07
7:26	7:39	7:55	8:04	8:24	8:44	8:52	8:56
8:09	8:22	8:38	8:48	9:09	9:29	9:37	9:42
8:44	8:57	9:14	9:24	9:45	10:06	10:14	10:19
9:16	9:29	9:46	9:56	10:17	10:38	10:46	10:51
9:44	9:57	10:15	10:25	10:46	11:06	11:14	11:19
10:12	10:25	10:44	10:54	11:16	11:36	11:44	11:49
10:41	10:54	11:13	11:23	11:46	12:06P	12:14P	12:19P
11:10	11:23	11:42	11:53	12:16P	12:36	12:44	12:49
11:37	11:52	12:11P	12:22P	12:45	1:05	1:13	1:18
12:06P	12:21P	12:40	12:51	1:14	1:34	1:42	1:47
12:35	12:50	1:09	1:20	1:43	2:03	2:11	2:16
1:05	1:20	1:39	1:50	2:13	2:33	2:41	2:46
1:31	1:46	2:05	2:16	2:39	2:59	3:07	3:12
2:00	2:14	2:33	2:44	3:07	3:27	3:35	3:40
2:26	2:40	2:59	3:10	3:32	3:52	4:00	4:05
2:51	3:05	3:24	3:35	3:57	4:17	—	—
3:17	3:30	3:49	4:00	4:22	4:42	4:50	4:55
3:44	3:57	4:15	4:26	4:48	5:08	—	—
4:10	4:23	4:41	4:51	5:13	5:32	5:40	5:45
4:37	4:50	5:08	5:17	5:38	5:56	—	—
5:13	5:26	5:44	5:54	6:14	6:33	6:41	6:46
6:07	6:20	6:38	6:48	7:08	7:25	7:33	7:37
7:04	7:17	7:33	7:41	8:00	8:15	8:22	8:26
8:02	8:14	8:29	8:37	8:55	9:09	9:15	9:19

Sunday & Holiday Schedules

Sunday & holiday schedule in effect on New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day and Christmas Day.

Horarios de domingo y días feriados

Horarios de domingo y días feriados en vigor para New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day y Christmas Day.

Nextrip

Text "metro" and your intersection or stop number to 41411 (example: metro vignes&cesarechavez or metro 1563). You can also visit metro.net or call 511 and say "Nextrip"

Nextrip

Envíe un mensaje de texto con "Metro" y la intersección de la calle o el número de su parada al 41411. Nextrip le enviará un mensaje de texto con la próxima llegada de cada autobús en esa parada. También puede visitar metro.net o llamar al 511 y decir "Nextrip"

Sunday and Holiday Schedule

Effective Dec 15 2019

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Eastbound *Al Este* (Approximate Times/*Tiempos Aproximados*)

EL SEGUNDO		LAWNDALE	LOS ANGELES	COMPTON		DOWNEY	NORWALK
1	2	3	4	5	6	7	8
Plaza El Segundo	Douglas Station	Rosecrans & Hawthorne	Rosecrans & Figueroa	Compton Station	Rosecrans & Long Beach	Rosecrans & Lakewood	Norwalk Station
6:00A	6:08A	6:15A	6:30A	6:44A	6:52A	7:05A	7:14A
6:52	7:02	7:11	7:27	7:43	7:53	8:07	8:16
7:49	7:59	8:07	8:24	8:40	8:50	9:05	9:16
8:39	8:49	8:57	9:14	9:31	9:41	9:57	10:08
9:28	9:38	9:48	10:06	10:24	10:34	10:51	11:02
10:09	10:20	10:31	10:49	11:07	11:17	11:34	11:45
10:41	10:52	11:03	11:21	11:40	11:50	12:07P	12:18P
11:11	11:22	11:33	11:51	12:10P	12:20P	12:37	12:48
11:40	11:51	12:03P	12:21P	12:40	12:51	1:08	1:19
12:10P	12:21P	12:33	12:51	1:10	1:21	1:38	1:49
12:43	12:54	1:06	1:25	1:44	1:55	2:12	2:23
1:18	1:29	1:41	2:00	2:19	2:30	2:47	2:58
1:54	2:05	2:17	2:36	2:55	3:06	3:23	3:34
2:29	2:40	2:52	3:11	3:29	3:40	3:57	4:08
3:04	3:15	3:27	3:46	4:04	4:15	4:31	4:42
3:46	3:57	4:09	4:27	4:45	4:55	5:11	5:22
4:34	4:45	4:57	5:15	5:33	5:43	5:59	6:10
5:32	5:42	5:54	6:12	6:28	6:38	6:54	7:05
6:29	6:39	6:50	7:08	7:24	7:33	7:48	7:58
7:28	7:38	7:48	8:05	8:21	8:29	8:42	8:52

Sunday and Holiday Schedule

125

Westbound *Al Oeste* (Approximate Times/*Tiempos Aproximados*)

NORWALK	DOWNEY	COMPTON		LOS ANGELES	LAWNDALE	EL SEGUNDO	
8	7	6	5	4	3	2	1
Norwalk Station	Rosecrans & Lakewood	Rosecrans & Long Beach	Compton Station	Rosecrans & Figueroa	Rosecrans & Hawthorne	Douglas Station	Plaza El Segundo
6:30A	6:40A	6:55A	7:02A	7:20A	7:35A	7:43A	7:47A
7:27	7:38	7:53	8:02	8:21	8:38	8:46	8:51
8:25	8:38	8:53	9:02	9:22	9:40	9:48	9:53
9:16	9:29	9:46	9:55	10:15	10:33	10:41	10:46
9:59	10:12	10:29	10:38	10:59	11:18	11:26	11:31
10:41	10:54	11:11	11:21	11:42	12:01P	12:09P	12:14P
11:23	11:36	11:54	12:04P	12:25P	12:44	12:52	12:57
12:05P	12:18P	12:36P	12:46	1:07	1:26	1:34	1:39
12:35	12:48	1:06	1:16	1:38	1:57	2:05	2:10
1:05	1:18	1:36	1:46	2:08	2:27	2:35	2:40
1:35	1:48	2:06	2:16	2:38	2:57	3:05	3:10
2:04	2:17	2:34	2:44	3:04	3:23	3:31	3:36
2:38	2:51	3:08	3:18	3:38	3:56	4:04	4:09
3:14	3:27	3:44	3:53	4:13	4:31	4:39	4:44
3:52	4:05	4:22	4:31	4:51	5:09	5:16	5:20
4:42	4:55	5:11	5:20	5:40	5:58	6:05	6:09
5:36	5:49	6:05	6:14	6:33	6:49	6:56	7:00
6:27	6:39	6:55	7:04	7:23	7:39	7:46	7:50
7:24	7:35	7:51	7:59	8:17	8:32	8:39	8:43

APPENDIX G

Mitigation Monitoring and Reporting Program

MITIGATION MONITORING AND REPORTING PROGRAM (MMRP)
PROJECT NO. 2018-004292/ PERMIT NO. RPPL2018006758 / ENV NO. RPPL2019000742

#	Environmental Factor	Mitigation	Action Required	When Monitoring to Occur	Responsible Agency or Party	Monitoring Agency or Party
1	Aesthetics	No mitigation required.				
2	Agriculture / Forest	No mitigation required.				
3	Air Quality	No mitigation required.				
4	Biological Resources	No mitigation required.				
5	Cultural Resources	MM CUL-1: If any cultural resources are inadvertently discovered during construction, all construction work occurring within 100 feet of the resources shall immediately stop until a qualified archaeologist, meeting the Secretary of the Interior's Professional Qualification Standards, can evaluate the significance of the resources and determine whether additional actions, such as preparation of an archaeological treatment plan, testing, or data recovery, are warranted.	Stop construction and evaluate findings	During construction	Contractor	DRP
6	Energy	No mitigation required.				
7	Geology / Soils	No mitigation required.				
8	Greenhouse Gas	No mitigation required.				
9	Hazards / Hazardous	No mitigation required.				
10	Hydrology / Water Quality	No mitigation required.				
11	Land Use / Planning	No mitigation required.				
12	Mineral Resources	No mitigation required.				
13	Noise	MM NOISE-1: All construction-related noise activities shall comply with the requirements set forth in the County of Los Angeles Municipal Code Section 12.08.430. a. Operating or causing the operation of any tools or equipment used in construction, drilling, repair, alteration or demolition work between weekday hours of 7:00 p.m. and 7:00 a.m., or at any time on Sundays or holidays, such that the sound therefrom creates a noise disturbance across a residential or commercial real-property line, except for emergency work of public service utilities or by variance issued by the health officer is prohibited. A noise monitoring program shall be implemented during construction. The monitoring program will alert construction management personnel when noise levels approach the upper limits of the residential noise threshold (65 dBA) near the northwest property line. Construction activity will cease prior to noise levels exceeding the residential threshold. noise reducing measures and actions be identified and implemented as needed if the standard is exceeded to meet this standard. No impact pile driving shall be allowed on the Project Site. During construction, the contractor shall ensure all construction equipment is equipped with appropriate noise attenuating devices and equipment shall be maintained so that vehicles and their loads are secured from rattling and banging. Idling equipment should be turned off when not in use. Locate staging area, generators and stationary construction equipment as far from the northwest property line, as reasonably feasible.	Prepare and implement noise monitoring program	During construction	Contractor	LA County BSD

		MM NOISE-2: Provide an eight (8) foot high CMU block or tilt-up concrete wall along the south and east property line, adjacent to the residential and school uses during the first phase of construction.	Construct block wall	Prior to start of construction	Contractor	LA County BSD
		MM NOISE-3: CNG compressor equipment should be enclosed and shielded by 5-foot CMU block wall.	Enclose CNG equipment	Prior to issuance of Occupancy Permit	Contractor	LA County BSD
		MM NOISE-4: Bus wash bay and equipment should be enclosed within a bus wash tunnel.	Enclose wash equipment	Prior to issuance of Occupancy Permit	Contractor	LA County BSD
		MM NOISE-5: All rooftop mounted HVAC equipment should be fully shielded or enclosed from the line of sight of adjacent residential uses. Shielding/parapet wall should be at least as high as the equipment.	Shield HVAC equipment from residential uses	Prior to issuance of Occupancy Permit	Contractor	LA County BSD
		MM NOISE-6: Limit engine idling time for all buses/trucks to 5 minutes or less.	Limit Idling	During operation	Facility Operator	DRP
		MM NOISE-7: Any delivery and unloading of bus maintenance supplies shall be limited to the hours of 7 am to 10 pm.	Limit loading and unloading activities	During operation	Facility Operator	DRP
		MM NOISE-8 Bus maintenance operations between the hours of 10pm and 7 am shall only occur within the facility's enclosed maintenance bays with the doors to those bays closed.	Limit use of industrial equipment	During operation	Facility Operator	DRP
14	Population / Housing	No mitigation required.				
15	Public Services	No mitigation required.				
16	Recreation	No mitigation required.				
17	Transportation / Traffic	MM TRANS-1: All employees of the facility shall be provided information regarding the availability of transit options in the vicinity of the site to reduce VMT for employees.	Provide information on available transit services to employees	During operation	Facility Operator	DRP
18	Tribal Cultural Resources	MM TCUL-1: If any cultural resources are inadvertently discovered during construction, all construction work occurring within 100 feet of the resources shall immediately stop until a qualified archaeologist, meeting the Secretary of the Interior's Professional Qualification Standards, can evaluate the significance of the resources and determine whether additional actions, such as preparation of an archaeological treatment plan, testing, or data recovery, are warranted. The Gabrieleño Band of Mission Indians–Kizh Nation shall also be contacted and notified of the discovery of any cultural resources.				
19	Utilities / Services	No mitigation required.				
20	Wildfire	No mitigation required.				
21	Mitigation Compliance	As a means of ensuring compliance of above mitigation measures, the applicant and subsequent owner(s) are responsible for submitting compliance report to the Department of Regional Planning for review, and for replenishing the mitigation monitoring account if necessary until such as all mitigation measures have been implemented and completed.	Submittal and approval of compliance report and replenishing mitigation monitoring account	Yearly and as required until all measures are completed.	Applicant and subsequent owner(s)	DRP

* In the "#" column, the number before the decimal should always correspond with the chapter number in the initial study.