3.7 Site Preparation - 2021

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	0.0628	2.1895	0.4635	6.6300e-003	0.1512	6.7900e-003	0.1580	0.0414	6.4900e-003	0.0479		717.9288	717.9288	0.0479		719.1262
Vendor	5.4700e-003	0.2437	0.0510	2.6000e-004	1.0300e-003	1.0000e-004	1.1300e-003	3.1000e-004	1.0000e-004	4.0000e-004		28.3217	28.3217	3.9500e-003		28.4203
Worker	0.0929	0.0602	0.8288	2.4500e-003	0.2459	1.8100e-003	0.2477	0.0652	1.6700e-003	0.0669		243.6287	243.6287	6.5500e-003		243.7925
Total	**0.1611**	**2.4934**	**1.3433**	**9.3400e-003**	**0.3982**	**8.7000e-003**	**0.4069**	**0.1070**	**8.2600e-003**	**0.1152**		**989.8792**	**989.8792**	**0.0584**		**991.3390**

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					4.3600e-003	0.0000	4.3600e-003	6.6000e-004	0.0000	6.6000e-004			0.0000			0.0000
Off-Road	0.3746	3.7916	4.5205	6.2100e-003		0.2236	0.2236		0.2057	0.2057	0.0000	601.8002	601.8002	0.1946		606.6660
Total	**0.3746**	**3.7916**	**4.5205**	**6.2100e-003**	**4.3600e-003**	**0.2236**	**0.2279**	**6.6000e-004**	**0.2057**	**0.2063**	**0.0000**	**601.8002**	**601.8002**	**0.1946**		**606.6660**

3.7 Site Preparation - 2021

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	0.0628	2.1895	0.4635	6.6300e-003	0.1512	6.7900e-003	0.1580	0.0414	6.4900e-003	0.0479		717.9288	717.9288	0.0479		719.1262
Vendor	5.4700e-003	0.2437	0.0510	2.6000e-004	1.0300e-003	1.0000e-004	1.1300e-003	3.1000e-004	1.0000e-004	4.0000e-004		28.3217	28.3217	3.9500e-003		28.4203
Worker	0.0929	0.0602	0.8288	2.4500e-003	0.2459	1.8100e-003	0.2477	0.0652	1.6700e-003	0.0669		243.6287	243.6287	6.5500e-003		243.7925
Total	**0.1611**	**2.4934**	**1.3433**	**9.3400e-003**	**0.3982**	**8.7000e-003**	**0.4069**	**0.1070**	**8.2600e-003**	**0.1152**		**989.8792**	**989.8792**	**0.0584**		**991.3390**

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	0.0000	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
Unmitigated	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

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
City Park	0.00	0.00	0.00		
City Park	0.00	0.00	0.00		
Other Asphalt Surfaces	0.00	0.00	0.00		
Other Non-Asphalt Surfaces	0.00	0.00	0.00		
Other Non-Asphalt Surfaces	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

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
City Park	16.60	8.40	6.90	33.00	48.00	19.00	66	28	6
City Park	16.60	8.40	6.90	33.00	48.00	19.00	66	28	6
Other Asphalt Surfaces	16.60	8.40	6.90	0.00	0.00	0.00	0	0	0
Other Non-Asphalt Surfaces	16.60	8.40	6.90	0.00	0.00	0.00	0	0	0
Other Non-Asphalt Surfaces	16.60	8.40	6.90	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
City Park	0.550151	0.042593	0.202457	0.116946	0.015037	0.005825	0.021699	0.034933	0.002123	0.001780	0.004876	0.000710	0.000868
Other Asphalt Surfaces	0.550151	0.042593	0.202457	0.116946	0.015037	0.005825	0.021699	0.034933	0.002123	0.001780	0.004876	0.000710	0.000868
Other Non-Asphalt Surfaces	0.550151	0.042593	0.202457	0.116946	0.015037	0.005825	0.021699	0.034933	0.002123	0.001780	0.004876	0.000710	0.000868

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	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
NaturalGas Unmitigated	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

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					
City Park	0	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
Other Asphalt Surfaces	0	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
Other Non-Asphalt Surfaces	0	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
Total		**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**

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					
City Park	0	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
Other Asphalt Surfaces	0	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
Other Non-Asphalt Surfaces	0	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
Total		**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**

6.0 Area Detail

6.1 Mitigation Measures Area

	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	0.9688	7.2000e-004	0.0795	1.0000e-005		2.8000e-004	2.8000e-004		2.8000e-004	2.8000e-004		0.1704	0.1704	4.5000e-004		0.1816
Unmitigated	0.9688	7.2000e-004	0.0795	1.0000e-005		2.8000e-004	2.8000e-004		2.8000e-004	2.8000e-004		0.1704	0.1704	4.5000e-004		0.1816

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	0.6810					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.2805					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	7.3600e-003	7.2000e-004	0.0795	1.0000e-005		2.8000e-004	2.8000e-004		2.8000e-004	2.8000e-004		0.1704	0.1704	4.5000e-004		0.1816
Total	**0.9688**	**7.2000e-004**	**0.0795**	**1.0000e-005**		**2.8000e-004**	**2.8000e-004**		**2.8000e-004**	**2.8000e-004**		**0.1704**	**0.1704**	**4.5000e-004**		**0.1816**

6.2 Area by SubCategory

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	0.6810					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.2805					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	7.3600e-003	7.2000e-004	0.0795	1.0000e-005		2.8000e-004	2.8000e-004		2.8000e-004	2.8000e-004		0.1704	0.1704	4.5000e-004		0.1816
Total	**0.9688**	**7.2000e-004**	**0.0795**	**1.0000e-005**		**2.8000e-004**	**2.8000e-004**		**2.8000e-004**	**2.8000e-004**		**0.1704**	**0.1704**	**4.5000e-004**		**0.1816**

7.0 Water Detail

7.1 Mitigation Measures Water

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 E:
NOISE IMPACT ASSESSMENT
LANDRUM AND BROWN

Noise Assessment for:
LAKEWOOD BOULEVARD CAPACITY ENHANCEMENT PROJECT CITY OF LAKEWOOD

Project #0110.x586.001.001
February 17, 2018

Prepared for:
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1. Introduction

This report analyzes the potential noise impacts associated with the proposed widening of Lakewood Boulevard in the City of Lakewood. Potential noise impacts arising from the construction and operation of the proposed project are assessed for activities occurring within the project site along with off-site traffic noise impacts. Future noise impacting the proposed project is also assessed relative to the City's land use/noise compatibility criteria. Section 1.1 presents a detailed description of the project.

Existing conditions related to noise are presented in Section 2. Existing sensitive receptors potentially impacted by the project are discussed in Section 2.1. Section 2.2 presents background information on noise discussing criteria for determining noise impacts as well as metrics used for measuring noise impacts. Section 0 presents the State and local noise impact criteria applicable to the project. Existing measured noise levels in the project area as well as modeled existing traffic noise levels are presented Section 2.4.

The noise impacts from the project are analyzed in Section 3. The thresholds of significance used to assess the project's impacts are presented in 3.1. Short-term impacts (i.e., construction) are discussed in Section 3.2. Long-Term impacts from the implementation of the project are discussed in Section 3.3. Mitigation is discussed in Section 4.

1.1 Project Description

The project proposes widening of Lakewood Boulevard between Ashworth Street and Del Amo Boulevard from its existing configuration of six through-lanes to the proposed installation of a Class I bike path along the east and west sides of Lakewood Blvd along the entire project length, and the addition of a second northbound left turn lane on Lakewood Boulevard at Hardwick Street. Figure 1 presents a vicinity map showing the project location, Figures 2A through 2C show project plans overlaid on aerial photographs. These figures show the proposed re-striping as well as the location of the proposed raised medians and other project components discussed further below.

1.2 Proposed Improvements

The proposed project improvements consist of street widening and median improvements on Lakewood Boulevard to accommodate a Class I bike path in the street parkway. Due to the street widening, the project will include utility undergrounding of overhead distribution and transmission power poles. The utility undergrounding design will be performed by Southern California Edison (SCE).

There will be construction of new sidewalks in areas where it does not exist, including along the east side of Lakewood Boulevard from Mall Entrance/Silva Street to Candlewood Street; along the parkway areas on both sides of the boulevard from Camerino Street to the Alley south of South Street; and along the alley north of South Street to Ashworth Street. A new sidewalk will be provided in the median parkway on the west side of the boulevard. Also, a meandering sidewalk will be provided in the parkway on the east side of Lakewood Boulevard.

Other proposed improvements would include construction of new catch basins due to proposed street widening, installation of new low flow dripline irrigation system for median landscape improvements, construction of two sets of bike lockers within the City of Lakewood's right-of-way, near the Lakewood Mall and transit stops, and relocation of existing bus shelters in street widened areas.

Improvements will also include the installation of traffic signal modifications including traffic signal poles, vehicle heads, pedestrian heads, detection, IISNS, conduit, controllers and service cabinets. The following is a list of the locations for the traffic signal modifications along Lakewood Boulevard: Hardwick Street, Candlewood Street, South Street, and Ashworth Street.

There will be an addition of second left-turn north-bound at the intersection of Lakewood Boulevard and Hardwick Street, the relocation of LED street lights along Lakewood Boulevard and the installation of signing and striping.

1.3 Streetscape Landscaping Improvements

Streetscape elements include installation of parkway planting and aesthetics where sidewalks are being added and modification of median to accommodate planting as needed for storm water quality improvements and drought adaptation. Improvements will include the installation of two (2) City entry monument signs at north and south City limits of Lakewood Boulevard. The entry signs will be lighted for nighttime illumination.

1.4 Sidewalk/Gutter Rehabilitation

The project will include the reconstruction of existing concrete sidewalk, curb and gutter, and drive approaches, as well at the replacement of the stamped concrete pavement and sidewalk at Hardwick Street and Candlewood Street. It will also include installation of new access curb ramps in compliance with the Americans with Disabilities Act (ADA) requirements. All newly installed access curb ramps will include truncated domes.

1.5 Overlay Repaving and Roadway Re-Striping

After completion of all roadway, utility and parkway improvements, the project will repave Lakewood Boulevard with an asphalt-rubber hot mix in order to accommodate traffic growth in the future. The final component of the project will include re-striping Lakewood Boulevard with the proposed striping of three travel lanes in each direction as shown in Figures 2A through 2C.

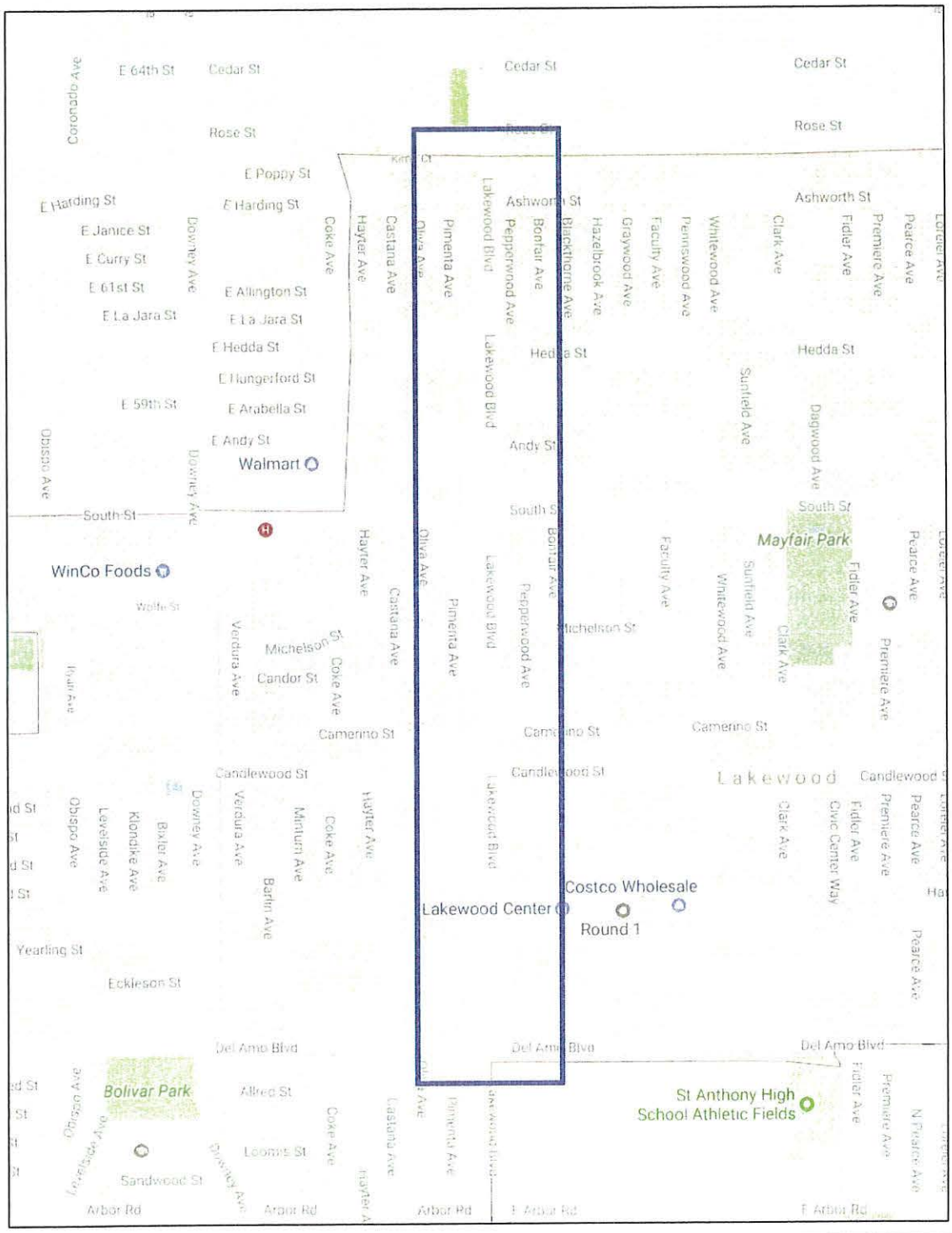


Figure 1
Location of Project Site

Landrum & Brown

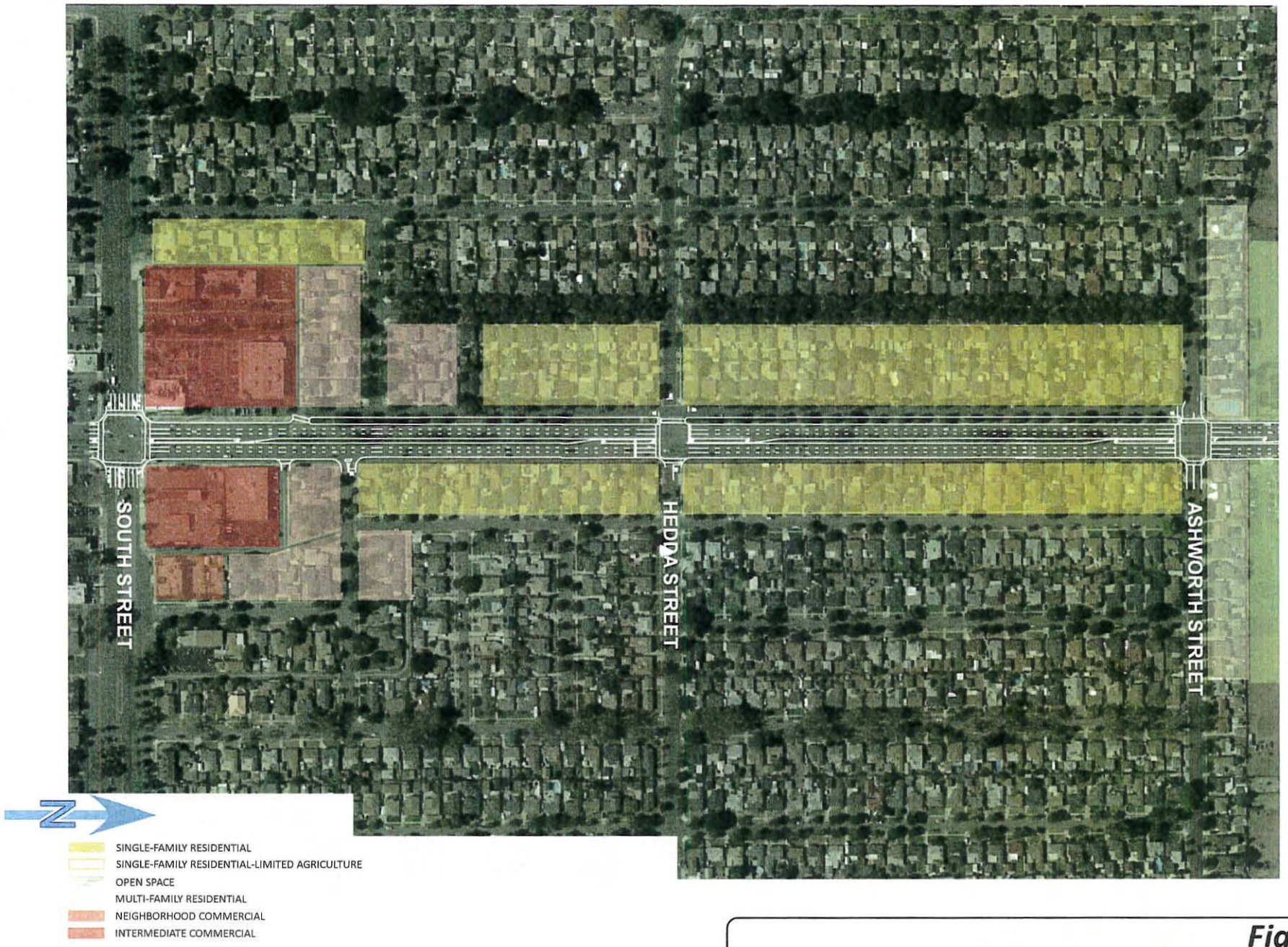


Figure 2A
Proposed Striping Plan

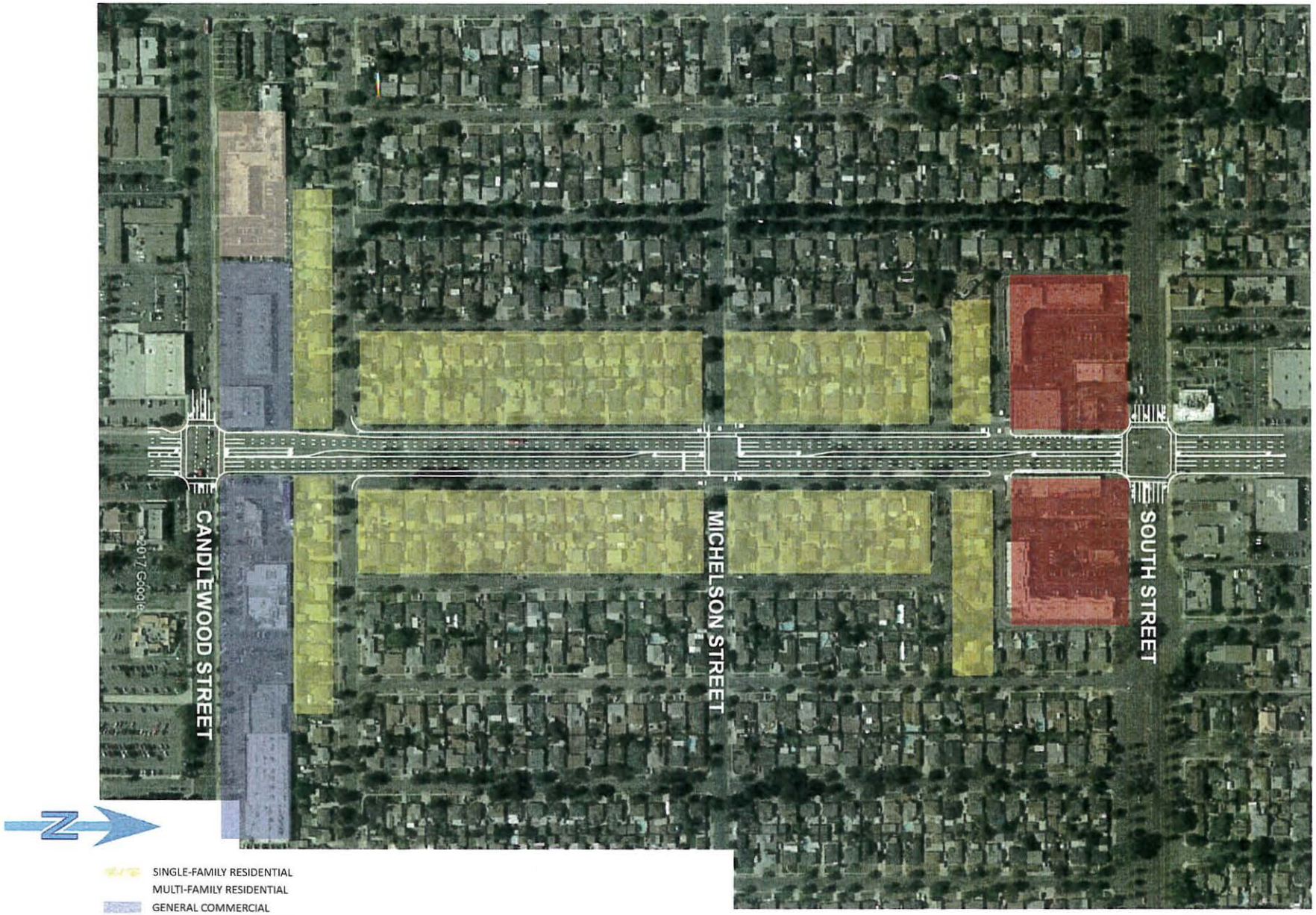


Figure 2B
Proposed Striping Plan

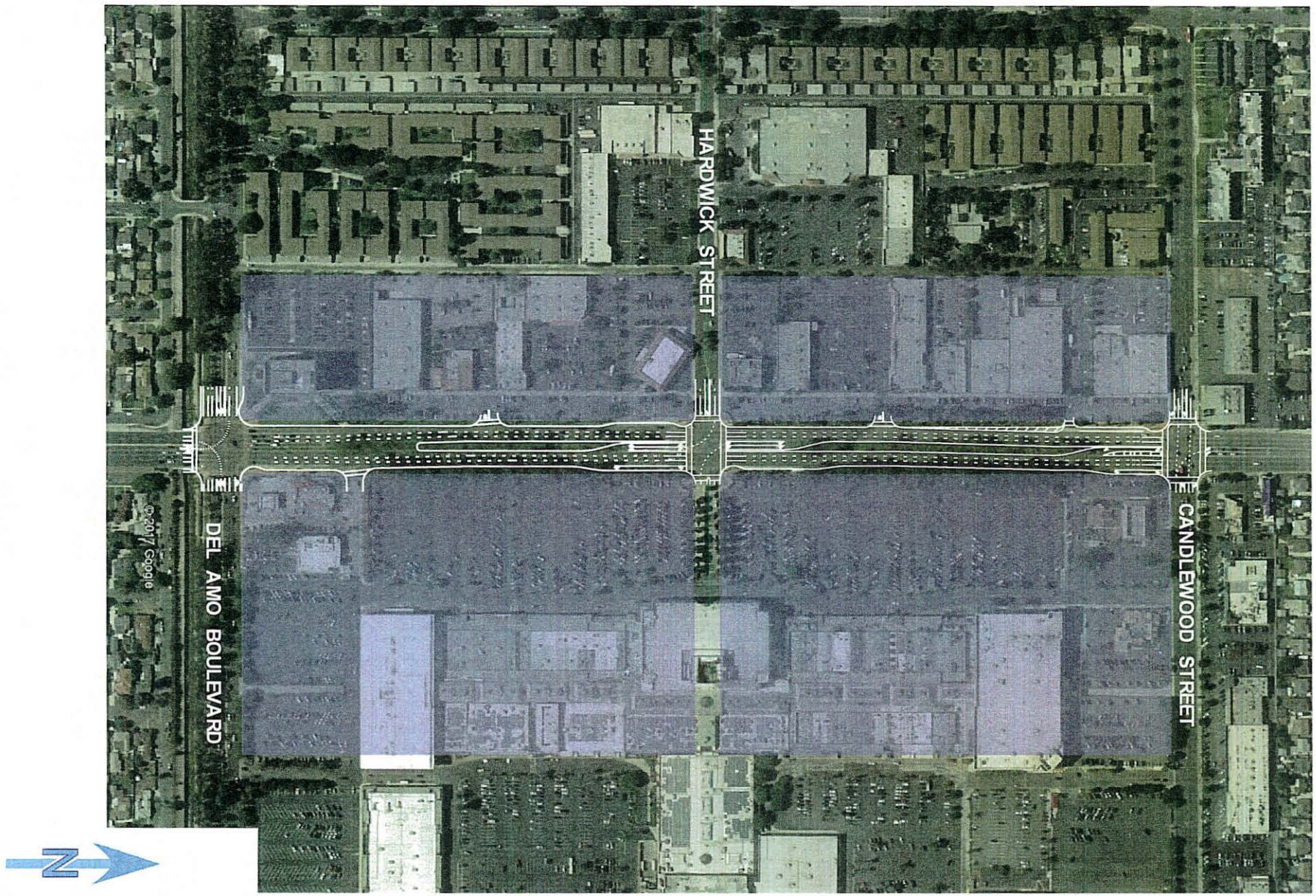


Figure 2C
Proposed Striping Plan

2. Existing Setting

2.1 Sensitive Receptors

The noise sensitive land uses in the immediate vicinity of the project are identified on Figures 2A through 2C. Generally, there are primarily residential land uses located adjacent to, and on both sides of, Lakewood Boulevard from north of Ashworth Street to south of Andy Street. There are then commercial uses located along both sides of Lakewood Boulevard on the north and south sides of South Street. These commercial land uses are not considered to be noise sensitive.

Residential land uses continue on both sides of the boulevard starting at Pimenta Avenue and Pepperwood Avenue and continue down to Camerino Street. There are commercial land uses lining both sides of Lakewood Boulevard from just north of Candlewood Street down to Del Amo Boulevard. South of Candlewood Street and north of Del Amo Boulevard, there are some apartments buildings located a block from Lakewood Boulevard on the west side of the street. The east side of the boulevard in this area is the Lakewood Center shopping mall.

2.2 Background Information on Noise

2.2.1 Noise Impact Criteria

Sound is technically described in terms of the loudness (amplitude) of the sound and frequency (pitch) of the sound. The standard unit of measurement of the loudness of sound is the decibel (dB). Decibels are based on the logarithmic scale. The logarithmic scale compresses the wide range in sound pressure levels to a more usable range of numbers in a manner similar to the Richter scale used to measure earthquakes. In terms of human response to noise, a sound 10 dB higher than another is judged to be twice as loud; a sound 20 dB higher is perceived to be four times as loud; and so forth. Everyday sounds normally range from 30 dB (very quiet) to 100 dB (very loud).

Since the human ear is not equally sensitive to sound at all frequencies, a special frequency-dependent rating scale has been devised to relate noise to human sensitivity. The A-weighted decibel scale (dBA) performs this compensation by discriminating against frequencies in a manner approximating the sensitivity of the human ear. Community noise levels are measured in terms of the "A-weighted decibel," abbreviated dBA.

Sound levels decrease as a function of distance from the source as a result of wave divergence, atmospheric absorption and ground attenuation. As the sound wave form travels away from the source, the sound energy is dispersed over a greater area, thereby dispersing the sound power of the wave. Atmospheric absorption also influences the levels that are received by the observer. The greater the distance traveled, the greater the influence and the resultant fluctuations. The degree of absorption is a function of the frequency of the sound as well as the humidity and temperature of the air. Turbulence and gradients of wind, and temperature also play a significant role in determining the degree of attenuation. Intervening topography can also have a substantial effect on the effective perceived noise levels. Figure 3 provides examples of various noises and their typical A-weighted noise level.

SOUND LEVELS AND LOUDNESS OF ILLUSTRATIVE NOISES
IN INDOOR AND OUTDOOR ENVIRONMENTS

Numbers in Parentheses are the A-Scale Weighted Sound Levels for that Noise Event

dB(A)	OVER-ALL LEVEL	COMMUNITY (Outdoor)	HOME OR INDUSTRY	LOUDNESS Human Judgement of Different Sound Levels
120		Military Jet Aircraft Take-Off With After-Burner From Aircraft Carrier @ 50 Ft. (130)	Oxygen Torch (121)	120 dB(A) 32 Times as Loud
110	UNCOMFORTABLY LOUD	Concord Takeoff (113)*	Riveting Machine (110) Rock-N-Roll Band (108-114)	110 dB(A) 16 Times as Loud
100		Boeing 747-200 Takeoff (101)*		100 dB(A) 8 Times as Loud
90	VERY LOUD	Power Mower (96) DC-10-30 Takeoff (96)* Motorcycle @25 Ft. (90)	Newspaper Press (97)	90 dB(A) 4 Times as Loud
80		Car Wash @ 20 Ft. (89) Boeing 727 w/ Hushkit Takeoff (96)* Diesel Truck, 40 MPH @ 50 Ft. (84) Diesel Train, 45 MPH @ 100 Ft. (83)	Food Blender (88) Milling Machine (85) Garbage Disposal (80)	80 dB(A) 2 Times as Loud
70	MODERATELY LOUD	High Urban Ambient Sound (80) Passenger Car, 65 MPH @ 25 Ft. (77) Freeway @ 50 Ft. From Pavement Edge, 10:00 AM (76 ± 6) Boeing 757 Takeoff (76)*	Living Room Music (76) TV-Audio, Vacuum Cleaner	70 dB(A)
60		Propeller Airplane Takeoff (67)* Air Conditioning Unit @ 100 Ft. (60)	Cash Register @ 10 Ft. (65-70) Electric Typewriter @ 10 Ft. (64) Dishwasher (Rinse) @ 10 Ft. (60) Conversation (60)	60 dB(A) 1/2 as Loud
50	QUIET	Large Transformers @ 100 Ft. (50)		50 dB(A) 1/4 as Loud
40		Bird Calls (44) Lower Limit Urban Ambient Sound (40)		40 dB(A) 1/8 as Loud
20	JUST AUDIBLE	(dB[A] Scale Interrupted) Desert at Night		
10	THRESHOLD OF HEARING			

*Aircraft takeoff noise measured 6,500 meters from beginning of takeoff roll

SOURCE: Leo L. Beranek "Noise And Vibration Control," 1971
*Aircraft Levels From FAA Advisory Circular AC-36-3G

Figure 3
Typical A-Weighted Noise Levels

Noise has been defined as unwanted sound and it is known to have several adverse effects on people. From these known effects of noise, criteria have been established to help protect the public health and safety and prevent disruption of certain human activities. This criterion is based on known impacts of noise on people, such as hearing loss, speech interference, sleep interference, physiological responses and annoyance. Each of these potential noise impacts on people are briefly discussed in the following narratives:

Hearing Loss is not a concern in community noise situations of this type. The potential for noise induced hearing loss is more commonly associated with occupational noise exposures in heavy industry or very noisy work environments. Noise levels in neighborhoods, even in very noisy airport environs, are not sufficiently loud as to cause hearing loss.

Speech Interference is one of the primary concerns in environmental noise problems. Normal conversational speech is in the range of 60 to 65 dBA and any noise in this range or louder may interfere with speech. There are specific methods of describing speech interference as a function of distance between speaker and listener and voice level.

Sleep Interference is a major noise concern for noise from transportation. Sleep disturbance studies have identified interior noise levels that have the potential to cause sleep disturbance. Note that sleep disturbance does not necessarily mean awakening from sleep, but can refer to altering the pattern and stages of sleep.

Physiological Responses are those measurable effects of noise on people that are realized as changes in pulse rate, blood pressure, etc. While such effects can be induced and observed, the extent is to which these physiological responses cause harm or are signs of harm is presently unknown.

Annoyance is the most difficult of all noise responses to describe. Annoyance is a very individual characteristic and can vary widely from person to person. What one person considers tolerable can be quite unbearable to another of equal hearing capability.

2.2.2 Noise Assessment Metrics

The description, analysis and reporting of community noise levels around communities is made difficult by the complexity of human response to noise and the myriad of noise metrics that have been developed for describing noise impacts. Each of these metrics attempts to quantify noise levels with respect to community response. Most of the metrics use the A-Weighted noise level to quantify noise impacts on humans. A-weighting is a frequency weighting that accounts for human sensitivity to different frequencies.

Noise metrics can be divided into two categories: single event and cumulative. Single-event metrics describe the noise levels from an individual event such as an aircraft fly-over or perhaps a heavy equipment pass-by. Cumulative metrics average the total noise over a specific time period, which is typically 1 or 24-hours

for community noise problems. For this type of analysis, cumulative noise metrics is typically used.

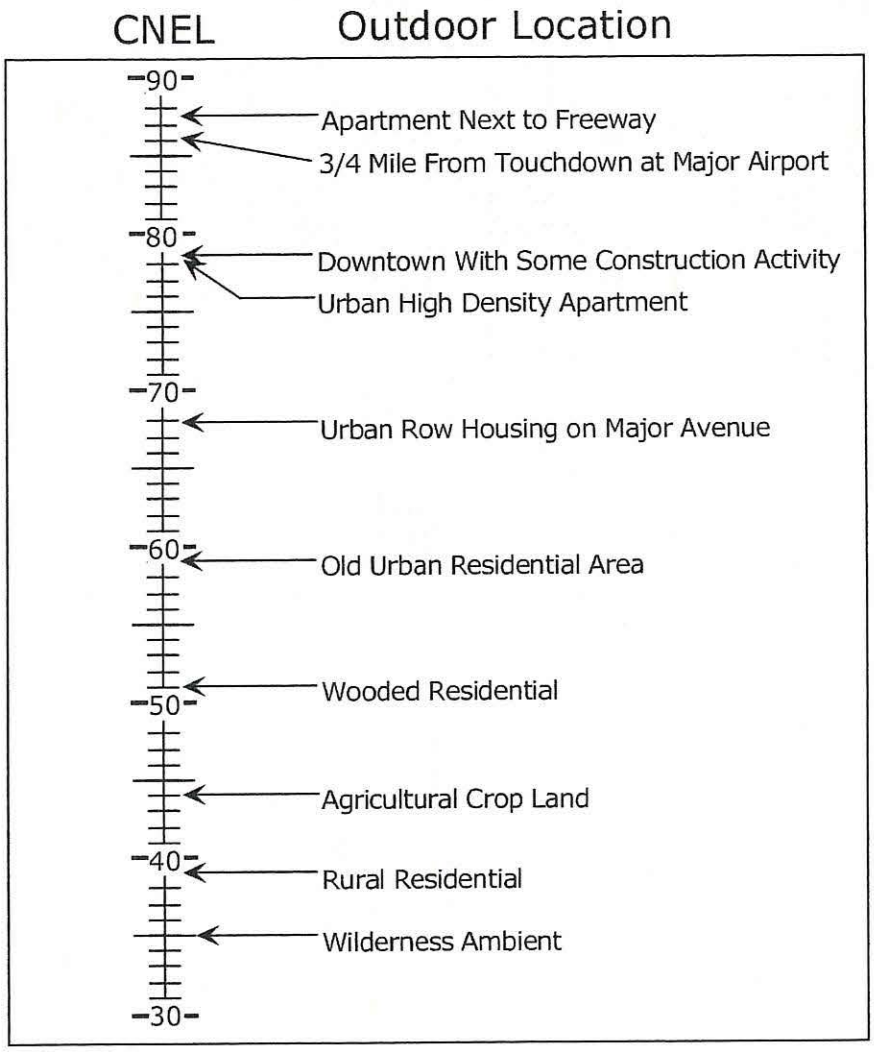
Several rating scales have been developed for measurement of community noise. These account for: (1) the parameters of noise that have been shown to contribute to the effects of noise on man, (2) the variety of noises found in the environment, (3) the variations in noise levels that occur as a person moves through the environment, and (4) the variations associated with the time of day. They are designed to account for the known health effects of noise on people described previously. Based on these effects, the observation has been made that the potential for a noise to impact people is dependent on the total acoustical energy content of the noise. A number of noise scales have been developed to account for this observation. The two most predominate noise scales are the: Equivalent Noise Level (LEQ) and the Community Noise Equivalent Level (CNEL). These scales are described in the following paragraphs along with the Ldn and L(%) scales that are also used for community noise assessment.

Leq is the sound level corresponding to a steady-state sound level containing the same total energy as a time-varying signal over a given sample period. Leq is the "energy" average noise level during the time period of the sample. Leq can be measured for any time period, but is typically measured for 1 hour. This 1-hour noise level can also be referred to as the Hourly Noise Level (HNL), the energy average of all the events and background noise levels that occur during that time period.

CNEL, Community Noise Equivalent Level, is the predominant rating scale now in use in California for land use compatibility assessment. The CNEL scale represents a time weighted 24-hour average noise level based on the A-weighted decibel. Time weighted refers to the fact that noise that occurs during certain sensitive time periods is penalized. The evening time period (7 p.m. to 10 p.m.) penalizes noises by 5 dBA, while nighttime (10 p.m. to 7 a.m.) noises are penalized by 10 dBA. These time periods and penalties were selected to reflect people's increased sensitivity to noise during these time periods. A CNEL noise level may be reported as a "CNEL of 60 dBA," "60 dBA CNEL," or simply "60 CNEL." Typical noise levels in terms of the CNEL scale for different types of communities are presented in Figure 4.

Ldn, the day-night scale is similar to the CNEL scale except that evening noises are not penalized. It is a measure of the overall noise experienced during an entire day. The time-weighted refers to the fact that noise that occurs during certain sensitive time periods is penalized. In the Ldn scale, those noise levels that occur during the night (10 pm to 7 am) are penalized by 10 dB. This penalty was selected to attempt to account for increased human sensitivity to noise during the quieter period of a day, where resting at home and sleep are the most probable activities.

L(%) is a statistical method of describing noise which accounts for variance in noise levels throughout a given measurement period. L(%) is a way of expressing the noise level exceeded for a percentage of time in a given measurement period.



Source: U.S. Environmental Protection Agency, "Impact Characterization of Noise Including Implications of Identifying and Achieving Levels of Cumulative Noise Exposure," EPA Report NTID 73.4, 1973.

Figure 4
Typical Outdoor Noise Levels

For example, since 15 minutes is 25% of 60 minutes, the L(25) value is the noise level that is equal to or exceeded for fifteen minutes in a sixty-minute measurement period. It is L(%) that is used for many Noise Ordinance standards. For example, most daytime City, State and City Noise Ordinances use an ordinance standard of 55 dBA for 30 minutes per hour or an L(50) level of 55 dBA. In other words, the Noise Ordinance states that no noise level should exceed 55 dBA for more than fifty percent of a given period. While The L(%) levels are typically used within the Noise Ordinances of most cities, they are not used within the City of Paramount Noise Ordinance.

2.3 Applicable Noise Impact Criteria

2.3.1 State of California

The State of California's 2013 Green Building Code (California Code of Regulations, Title 24, Part 11) specifies an interior noise standard for non-residential uses exposed to exterior noise levels from transportation noise sources (aircraft, roadway or rail) exceeding 65 dB CNEL or a one-hour Leq of 65 dBA or greater. The standard specifies minimum outdoor-indoor-transmission-class (OITC) ratings for exterior walls or a performance standard of a one-hour interior noise level of 50 dBA Leq(h).

The interior noise standards for residential buildings is found within 2016 California Building Code, Section 1207, "Sound Transmission". This standard state the following:

> *"1207.4 Allowable interior noise levels. Interior noise levels attributable to exterior sources shall not exceed 45 dB in any habitable room. The noise metric shall be either the day-night average sound level (Ldn) or the community noise equivalent level (CNEL), consistent with the noise element of the local general plan."*

2.3.2 City of Lakewood

The City of Lakewood noise criteria are presented in the Noise Element of the City's General Plan, and City's Municipal Code. Each of these documents is discussed below. The Noise Element presents the City's goals and policies for minimizing impacts and establishes noise standards for various land uses. The Noise Ordinance regulates noise generated on private property from impacting adjacent properties. State and federal laws prohibit the City from regulating transportation noise sources and the noise ordinance is not applicable to motor vehicles traveling on public rights of way.

2.3.2.1 Noise Element

The City of Lakewood last updated their General Plan in 1996. In this document, the Noise Element was incorporated as part of their document. The Noise Element does not contain any table describing the compatibility between land uses and outdoor noise, nor does it contain any specific noise level standards which would apply to any noise sensitive land uses. The Noise Element does contain policies and programs used to help control noise impacts within the City. The following policies and programs underscore the City's continued efforts to control noise impacts through project planning.

- Noise Element Policy 1.1. Ensure that new and expanded commercial projects do not generate adverse noise impacts on adjacent residential areas.

- Noise Element Policy 1.2. Support the enforcement of existing speed limits. Ensure motor vehicle codes are enforced that require adequate mufflers on all vehicles.

- Noise Element Policy 1.3. Integrate noise reduction techniques in the building plan review process.

- Noise Element Policy 1.5. Reduce the number of noise complaints in the City.

The City of Lakewood has also adopted Implementation Programs within the Noise Element of the General Plan. These Implementation Programs are the tools directly used to carry out the General Plan. The number shown in italics following each implementation program indicates the policy (or policies) that is supported by that program.

- Program 2. Monitor and enforce existing speed limits. Enforce motor vehicle codes requiring adequate mufflers on all types of vehicles traveling through the City.
  1.1, 1.2, 1.5

- Program 3. Require that new commercial or industrial projects or proposed expansions of existing commercial and industrial uses which abut residential uses provide noise barriers to protect residents. Require that new multifamily projects abutting single-family homes have noise barriers for adjacent areas.
  1.1, 1.3, 1.5

- Program 6. Continue to require noise attenuation measures as adopted in the Los Angeles County Building Code.
  1.3

Noise Element Policies 1.1, 1.2 and 1.3 are directly applicable to the proposed project, while Policy 1.5 is not applicable or related to the proposed project. Noise Element Implementation Programs 2, 3, and 6 are applicable to the proposed project.

Program 6 shows that the City of Lakewood has adopted the noise attenuation measures as adopted in the Los Angeles County Building Code. Those standards are not applicable to this project, and it does not appear that the City of Lakewood has adopted any other noise related standards or criteria from the County of Los Angeles.

There are several noise sensitive uses along Lakewood Boulevard in the Project Area. Noise generated by construction activities associated with the project is one of the primary potential impacts to the project. The analyses contained in this report assess the potential noise impacts from construction of the project as well as the impacts due to changes in traffic noise levels affected by the project. Standards relating to noise levels generated by construction activities are presented in the Noise Ordinance. These ordinances a presented in the section below.

2.3.2.2 Noise Ordinance

The City of Lakewood Municipal Code does not contain three specific sections dealing with allowable noise level limits relative to residential land uses. Two of these standards refer to noise generated on non-noise sensitive land uses impacting residentially zoned properties. One regulation deals with the noise level generated on a C-3 (Intermediate Commercial) zone. Section 9347.D.2.b.9 states the following:

> *Each facility shall not exceed noise levels of 60dBA, as measured at the property line of residentially zoned or occupied property.*

Another regulation deals with the noise level generated on a M-2 (Heavy Manufacturing) zone. Section 9368.B.3.d states the following:

> *Noise levels shall not exceed 60 dBA as measured at the property line of residentially zoned property, or otherwise shall not exceed 70 dBA.*

Section 9376 of the Noise Ordinance, which addresses noise levels generated by mechanical equipment and machinery onto residential zoned land uses, states the following:

> *9376. AIR CONDITIONERS, MECHANICAL EQUIPMENT AND MACHINERY NOISE IN RESIDENTIAL AREAS. No person within any area of the City zoned for residential use or any area adjacent thereto shall own, possess, control or maintain any machinery, equipment, pumps, fans, air conditioning or air-handling apparatus, or similar mechanical devices which cause the noise level at the property line of any property zoned for residential uses to exceed the sound pressure level permitted herein by more than* ***five decibels****. The production or maintenance of any sound in excess of said levels is hereby declared to be an unnecessary interference with the enjoyment of residential property and contrary to the public health and general welfare. The ownership, maintenance, operation, or control of any such machinery or equipment producing said excess sound pressure levels is hereby declared to be a public nuisance.*
>
> *9376.1. SAME: DECIBEL MEASUREMENT CRITERIA. The sound pressure level permitted herein shall be measured at any point on the property line of the residential property affected and is* ***sixty decibels****, reference 0.002 microbar, read on the A scale of a sound level meter. Reading shall be taken in accordance with the instrument manufacturer's instructions, using the slowest meter response, and as follows:*

A. PLACEMENT OF MEASURING MICROPHONE. Placement of the microphone can be at any point on the property line, but shall not be closer than three (3) feet from any wall and not less than three (3) feet above the ground where the above-listed maximum sound pressure level shall apply. At any point the measured level shall be the average of not less than three (3) readings, taken at two-minute intervals. To have valid readings, the levels must be five (5) decibels or more above the levels prevailing at the same point, excluding noise caused by the objectionable machinery.

B. SOUND LEVEL METER. Sound pressure levels shall be measured with a sound level meter manufactured according to U. S.A. Standard S 1.4-1961, published by the United States of America Standards Institute, New York City, New York.

Sections 9376 and 9376.1 establish the noise level standard for mechanical equipment at 65 dBA (60 dBA + 5 dBA) for residential land uses. Most noise ordinances provide a time duration along with the established noise level limits, however the City of Lakewood did not. Since no time duration was assigned to this noise level, it will be assumed as a worst case assumption to be an Lmax noise standard.

Section 8019 of the Noise Ordinance addresses the permitted hours of construction activities, and it states the following:

No person shall engage in any act o[grading, construction, reconstruction, or demolition, including but not limited to the use of any air compressors; jackhammers; power-driven drill; riveting machine; excavator; diesel-powered truck, tractor or other earth moving equipment; or any machine, tool, device or equipment which makes loud noises to the disturbance of persons occupying sleeping quarters in a dwelling, apartment, hotel, mobile home, or other place of residence, except during the hours of seven o'clock A.M. to seven o'clock P.M., Monday through Saturday; and nine o'clock A.M. to seven o'clock P.M., Sunday.

Construction activities are allow between 7:00 a.m. and 7:00 p.m. Monday through Saturday, and 9:00 a.m. and 7:00 p.m. on Sunday. However noise from construction activities is not exempted from the Noise Ordinance.

2.4 Existing Noise Levels

2.4.1 Ambient Noise Measurements

Noise measurements were performed in order to document the existing aural environment and noise levels currently experienced on and around the project site. Short-term, 15-minute, noise measurements were performed at the eight locations shown in Figures 5A through 5C and described in Table 1. The noise measurements were taken along Lakewood Boulevard from Del Amo Boulevard to just north of Ashworth Street on Thursday, November 9, and Wednesday, November 22, 2017.

Table 1
Ambient Noise Measurement Sites

Site	Location
1	West mid-section of Chase Bank parking lot, Del Amo & Lakewood Boulevard
2	Southwest entrance to Big Lots rear parking lot, Candlewood St & Lakewood Boulevard
3	Lakewood Boulevard, north of Candlewood near intersection of frontage road & Camerino Street
4	5442 Lakewood Boulevard, frontage road, between Camerino & Michelson St
5	5637 Lakewood Boulevard, frontage road, between Michelson & Pimenta Street
6	Lakewood Boulevard, north of Andy Street, adjacent to backyard at 5193 Pepperwood Avenue
7	6103 Lakewood Boulevard, north of Hedda Street, between Hedda & Ashworth Street
8	Lakewood Boulevard, at the Metro Bus Stop, north of Ashworth Street, and adjacent to the residential backyard located at 4303 Ashworth

The primary source of noise in the project area is traffic noise from vehicles on Lakewood Boulevard. Traffic on the major cross streets (Ashworth Ave., South St., Candlewood St., Del Amo Blvd.) and on local streets also contributes to the noise environment and the general din of traffic noise throughout the area defines the background noise levels. Noise is also generated by businesses in and around the Lakewood Center and other business activities in the area. The noise measurement locations were selected to document the existing noise levels and environment at the sensitive land uses located along the project.

The noise measurements at all sites were performed using a Larson Davis 824 sound level meter mounted on a tripod. During measurements, a large windscreen covered the sound meter's microphone to dampen-out the effect of unwanted wind-generated noise. For each measurement site, 20 minutes of data was collected and stored internally within the sound meter for subsequent downloading and post-processing on a computer. Both before and after each set of measurements were taken, a Brüel & Kjær calibrator with calibrations traceable to the National Institute of Standards and Technology was used to calibrate the sound meter to ensure that the measured sound levels readings were accurate.

Sound level data samples were recorded at 1-second intervals. At the conclusion of each set of measurements, the noise data for the full 20-minute time period was stored to a specific file within the noise meter. Prevailing weather conditions were noted along with any other factors that might adversely affect the noise measurements. This measurement system satisfies the American National Standards Institute (ANSI) Standards 1.4 for Type I precision noise measurement instrumentation.

Figure 5A
Measurement Sites - South

Landrum & Brown

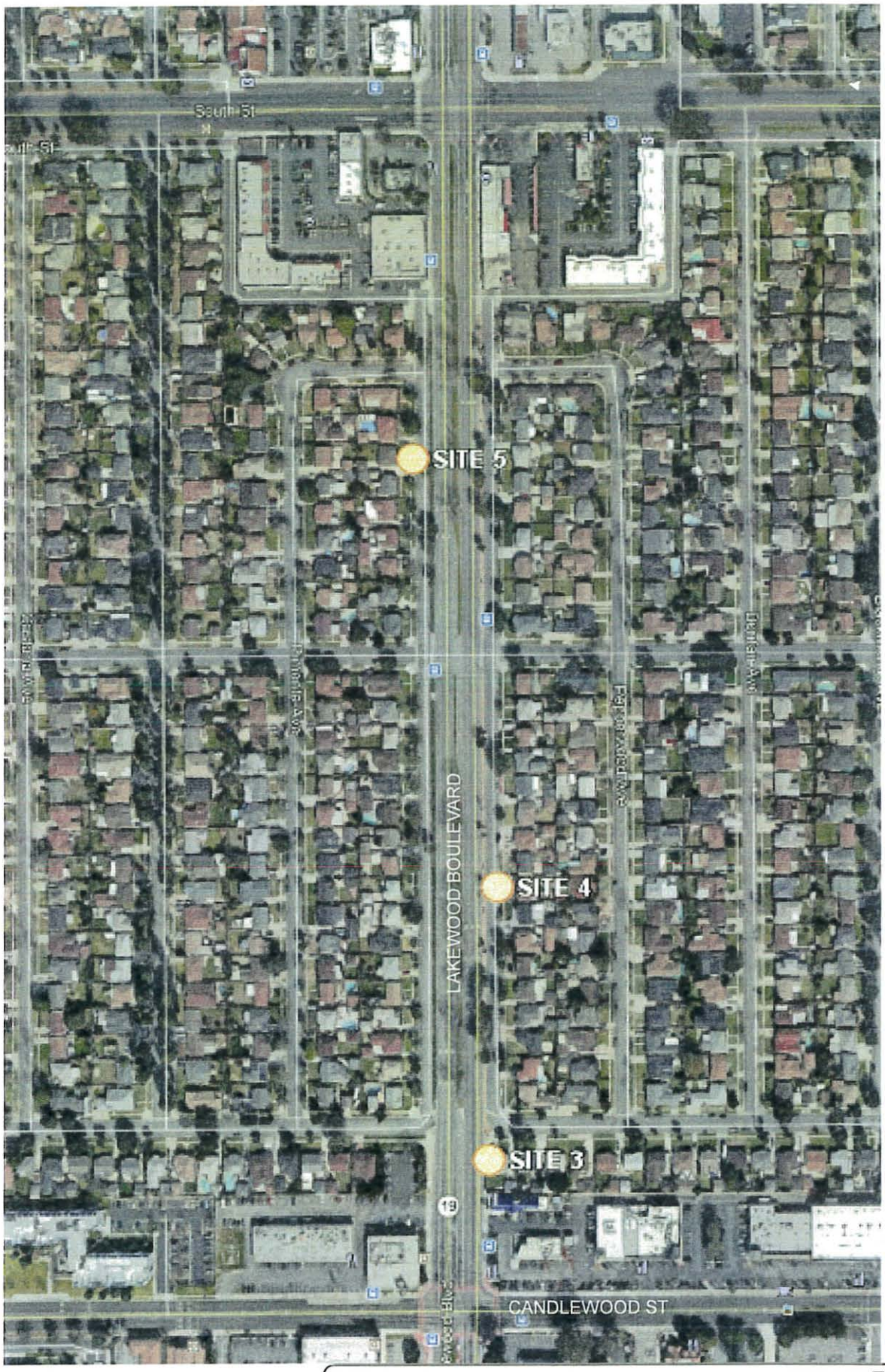


Figure 5B
Measurement Sites - Central

Landrum & Brown

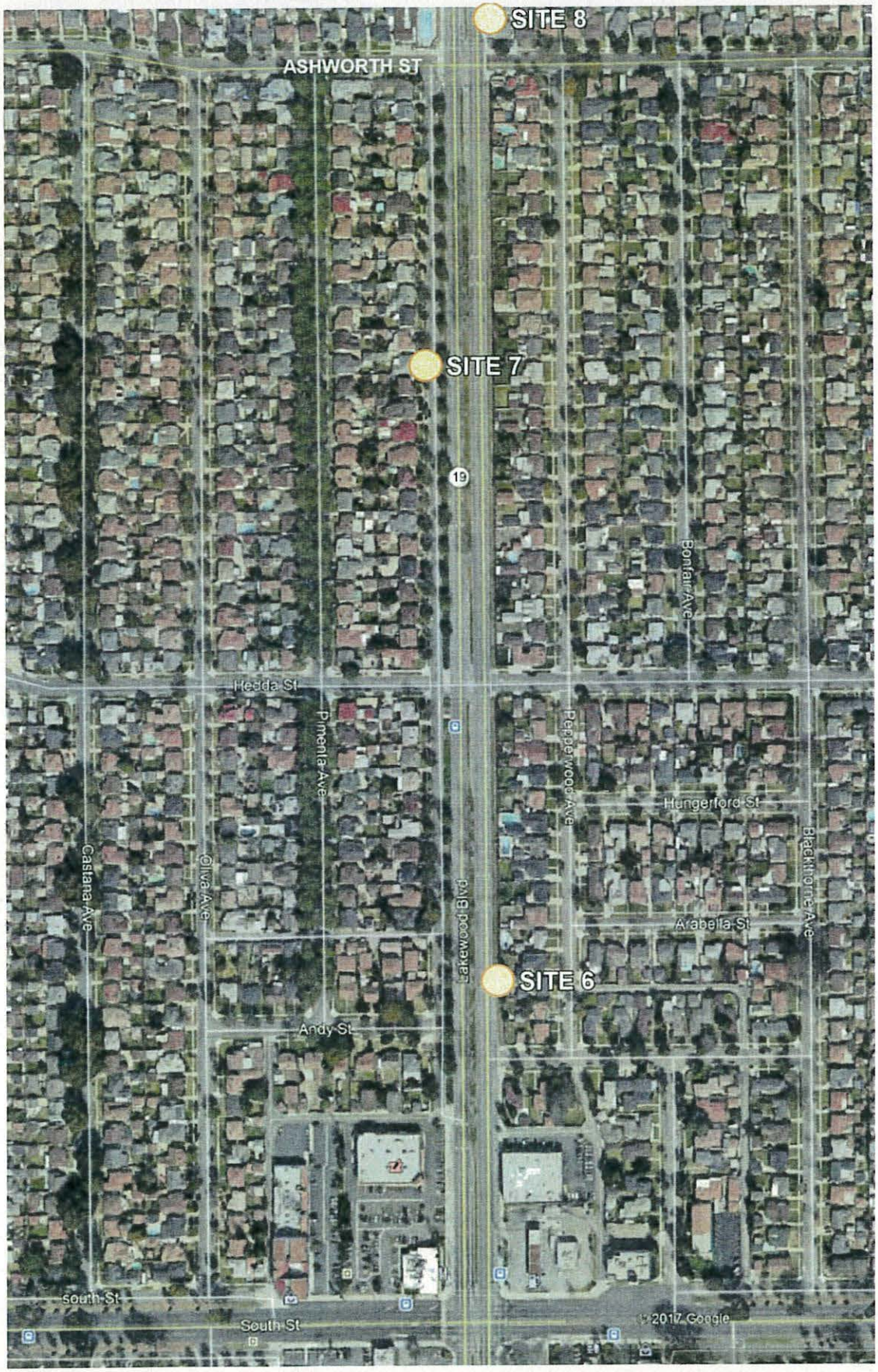


Figure 5C
Measurement Sites - North

Landrum & Brown

The monitor was set up to record the Leq, Lmax, Lmin noise levels for the measurement period as well as the Leq noise level during each second of the measurement period. The one-second Leq data was used to determine the percentile noise levels presented below. At the conclusion of each set of measurements, the average noise level, the minimum and maximum levels, and various statistical metrics for the entire measurement period were recorded on a data sheet and then the meter was reset to prepare it for the measurement at the next site.

Table 2 presents the measured noise levels. The start time of each measurement is presented along with the energy average noise level (Leq), the maximum noise level (Lmax), and the minimum noise level (Lmin) recorded during the measurement. The L50 and L90 noise levels are also presented. These correspond to the median noise level and the background noise level, respectively. The measured percentile noise levels (L%) that typically correspond with Noise Ordinance values. Given that the City of Lakewood Noise Ordinance does not include measured percentile noise levels (L%) within its Noise Ordinance, these values are presented for informational purposes only.

Table 2
Ambient Noise Measurement Results (dBA)

Site	Date	Start Time	Leq	Lmax	L50	L90	Lmin
1	11/22/2017	9:02	58.5	71.5	58.5	58.0	50.3
2	11/22/2017	9:32	58.7	71.7	58.7	58.0	50.2
3	11/9/2017	10:14	73.4	88.6	73.4	72.6	55.0
4	11/9/2017	10:50	68.2	75.9	68.2	67.8	49.2
5	11/9/2017	11:22	69.1	81.8	69.1	68.7	53.6
6	11/9/2017	12:14	74.4	89.2	74.4	73.6	48.9
7	11/9/2017	12:46	72.4	88.4	72.4	71.7	48.5
8	11/22/2017	10:09	74.9	91.7	74.9	61.1	55.8

Leq – Equivalent (Energy Average) Noise Level
Lmax – Maximum Noise Level during Measurement Period
L50 – Noise Level Exceed 50% of Measurement Period (equivalent to 30 minutes in an hour)
L90 – Noise Level Exceed 90% of Measurement Period (equivalent to 54 minutes in an hour)
Lmin – Minimum Noise Level during Measurement Period

Table 2 shows that the Lmax noise level at all eight measurements exceeded the City of Lakewood Noise Ordinance standard of 65 dBA for residential land uses. In fact, the background L90 noise level exceeded the Noise Ordinance standard for residential land uses level at measurement Sites 3 through 7. The sources of noise during each measurement period are noted in the paragraphs below. As noted. the primary source of noise at all sites were traffic and aircraft. Control of these sources by municipal noise ordinances is precluded by state and federal law.

Site 1 is located on a dirt median that separates the Chase Bank parking lot from the alley located west of the lot, and at a midpoint location between Del Amo Boulevard and the north border of the lot. The noise meter was positioned in line with the east exit of the alley (located between 4918 and 4928 Castana Avenue)

that leads from the alley into the parking area for the Park Del Amo Apartments. The meter was located approximately 450 feet from the centerline of Lakewood Boulevard, and 280 feet from the centerline of Del Amo Boulevard. Traffic on Del Amo, and local traffic from the alleyway were the dominant noise sources at Site 1. The Lmax was 71.5 dBA, which was due to the sounding of a car horn in the alleyway. The Leq at this site measured 58.5 dBA. The Lmin was 50.3 dBA.

Site 2 is located at the curb of the southwest rear entrance to the Big Lots parking, near a yellow pole. The noise meter was located approximately 445 feet from the centerline of Lakewood Boulevard, and about 275 feet from the centerline of Candlewood Street. Local traffic from the alleyway was the major noise source at this location. Some traffic could also be heard from Candlewood Street, while traffic noise from Lakewood Boulevard was insignificant. The Lmax was 71.7 dBA, and was due to a driver signaling to another driver with their car horn in the alley at the exit to Candlewood. The Leq at this site measured 58.7 dBA. The Lmin was 50.2 dBA at Site 2.

Site 3 is located on the sidewalk, near a streetlight pole and a United States Postal mailbox, at the intersection of Camerino Street and the frontage road adjacent to Lakewood Boulevard. The noise measurement was taken approximately 48 feet from the centerline of Lakewood Boulevard. Moderate traffic flow was observed at this location. The Lmax at Site 3 was 88.6 dBA, and was due to a passing bus on Lakewood Boulevard. The Leq was measured at 73.4 dBA. The Lmin was 55 dBA.

Site 4 is located in front of the residence at 5442 Lakewood Boulevard, within the right-of-way of the frontage road adjacent to Lakewood Boulevard. The noise meter was approximately 80 feet from the centerline of Lakewood Boulevard. A passing sports utility vehicle accounted for the Lmax, which was 75.9 dBA. The Leq at Site 4 measured 68.2 dBA. The Lmin was 49.2 dBA.

Site 5 located in front of the residence at 5637 Lakewood Boulevard, within the right-of-way of the frontage road adjacent to Lakewood Boulevard. The noise meter was approximately 80 feet from the centerline of Lakewood Boulevard. Local traffic on Lakewood Boulevard accounted for the Lmax, which was 81.8 dBA. The Leq at this site measured 69.1 dBA. The Lmin was 53.6 dBA.

Site 6 is located adjacent to the backyard of the residential home located at 5193 Pepperwood Avenue. Pepperwood Avenue runs parallel to Lakewood Boulevard. The noise meter was situated northeast of a light pole at a distance of about 6 feet from the pole, and about 50 feet from the centerline of Lakewood Boulevard. A passing motorcycle accounted for the Lmax, which was 89.2 dBA. The measured Leq at Site 6 was 74.4 dBA. The Lmin was 48.9 dBA.

Site 7 is located east of 6103 Lakewood Boulevard, on the west side of the median that separates the frontage road from Lakewood Boulevard, The noise meter was placed approximately 58 feet from the centerline of Lakewood Boulevard. A medium truck with trailer accounted for the Lmax, which was 88.4 dBA. The Leq at this site measured 72.4 dBA. The Lmin was 48.5 dBA.

Site 8 is located at the Metro bus stop on Lakewood Boulevard, north of Ashworth Street, and adjacent to the residential backyard of the home located at 4303

Ashworth. The dominate noise source was from traffic on Lakewood Boulevard. The Lmax was 91.7 dBA, and was due to traffic on Lakewood. The Leq was 74.9 dBA. The Lmin was 55.8 dBA.

2.4.2 Traffic Noise Levels

The highway noise levels presented in this report were computed using the Highway Noise Model published by the Federal Highway Administration ("FHWA Highway Traffic Noise Prediction Model," FHWA-RD-77-108, December, 1978). The FHWA Model uses traffic volume, vehicle mix, vehicle speed, and roadway geometry to compute the "equivalent noise level." A computer code has been written which computes equivalent noise levels for each of the periods used in the calculation of CNEL. Weighting these noise levels and summing them results in the CNEL for the traffic projections used. CNEL contours are found by iterating over many distances until the distances to the 60, 65, and 70 CNEL contours are found.

The distances to the existing CNEL contours for the roadways along the Project and projected to carry considerable Project traffic are given in Table 3. These represent the distance from the centerline of the roadway to the contour value shown. The noise level at a distance of 100 feet from the centerline is presented as well for each roadway segment.

Table 3
Existing Roadway Traffic Noise Levels

Road Segment	CNEL @ 100'†	Distance To CNEL Contour (ft.)† 70 CNEL	65 CNEL	60 CNEL
Lakewood Blvd.				
n/o Ashworth Street	67.1	64	138	297
Ashworth St. to South St.	67.1	64	138	297
South St. to Candlewood St.	67.1	64	138	297
Candlewood St. to Del Amo Blvd.	67.2	65	141	303
s/o Del Amo Blvd.	67.2	65	141	303
Ashworth St.				
w/o Lakewood Blvd.	52.5	RW	RW	32
e/o Lakewood Blvd.	53.1	RW	RW	35
South St.				
w/o Lakewood Blvd.	66.4	58	125	269
e/o Lakewood Blvd.	66.4	58	125	269
Candlewood St.				
w/o Lakewood Blvd.	63.9	39	84	181
e/o Lakewood Blvd.	64.5	43	93	200

† From Centerline of Road
RW – Contour does not extend beyond the Right-of-Way

Note that the values given in Table 3 do not take into account the effect of any noise barriers, buildings or topography that may affect ambient noise levels. The traffic data used to calculate the noise levels presented in Table 3 were taken from the traffic study prepared for the Project by the traffic engineer for the proposed

project (Willdan Engineering). The traffic volumes, speeds, and distribution used in the calculations are presented in the Appendix of this report.

3. Potential Noise Impacts

Noise impacts are commonly assessed into two parts: short-term (temporary) and long-term. Short-Term impacts are those associated with noise generated by construction activities required to implement the project. Long-Term impacts are the impacts caused by the long-term operation of the proposed project. Impacts are also divided between those from on-site activities and those from off-site activities. Impacts from off-site activities are those arising from additional road noise generated by traffic increases resulting from the project.

Section 3.1 presents the impact criteria used to determine the significance of the noise impacts. Short-term impacts are discussed in Section 3.2 and long-term impacts are analyzed in Section 3.3.

3.1 Project Noise Impact Criteria

Impacts from on-site activities, short-term and long-term are measured against the City of Lakewood Noise Ordinance criteria presented in Section 2.3.2.2. Construction, or on-site, operational activities that violate the provisions of the Noise Ordinance will result in a significant noise impact.

An off-site traffic noise impact occurs when there is a discernable increase in traffic noise AND the resulting noise level exceeds an established noise standard. In community noise assessment, changes in noise levels greater than 3 dB are often identified as substantial, while changes less than 1 dB will not be discernible to local residents. In the range of 1 to 3 dB, residents who are very sensitive to noise may perceive a slight change. In laboratory testing situations, humans are able to detect noise level changes of slightly less than 1 dB. This is based on a direct immediate comparison of two sound levels. In a community noise situation, however, noise exposures are over a long period, and changes in noise levels occur over years, rather than the immediate comparison made in a laboratory situation. Therefore, the level at which changes in community noise levels become discernible is likely to be some value greater than 1 dB, and 3 dB is the most commonly accepted discernable difference. A 5 dB change is generally recognized as a clearly discernable difference.

Because traffic noise levels at sensitive uses likely approach or exceed the 65 dB CNEL standard, a 1.0 dB increase due to the project will be used as the increase threshold for this project. The project will result in a significant noise impact when it causes a permanent increase in ambient noise levels of 1.0 dB and the resulting noise level exceeds the applicable exterior standard at a noise sensitive use.

A cumulative significant noise impact will occur if there is a 3.0 dB increase over existing conditions and the resulting noise level exceeds the applicable exterior standard at a sensitive use. The project will have considerably contributed to a significant cumulative impact if it contributes 1 dB or more to the cumulative noise level increase.

3.2 Short-Term Impacts

The project has four major construction components; (1) utility undergrounding, (2) streetscape median and parkway improvements, (3) overlay repaving and (4)

roadway re-striping. The first component of the project will be utility under-grounding. The second component of the project is the construction of the new raised medians shown in Figures 2A through 2C. This would also include the repair, replacement, and modifying of curbs, driveways and portions of the sidewalks. This work will improve ADA accessibility adjust grades as needed and improve drainage conditions. The third component of the project will be to repave Lakewood Boulevard with an asphalt overlay between Del Amo Boulevard and Ashworth Street. This resurfacing will first involve the grinding of the top two inches of AC and PCC and overlay with two inches of asphalt-concrete (AC) pavement on the roadway surface. The final component of the project will re-stripe Lakewood Boulevard with three travel lanes in each direction as shown in Figures 2A through 2C.

Worst-case examples of construction noise at 50 feet are presented in Figure 6. Note that rock drills or pile drivers are not anticipated to be required during construction of the project. Noise from a point source drops off at a rate of 6 dB per doubling of distance. Therefore, at 100 feet the construction equipment noise levels are 6 dB lower than shown in Figure 6. At 200 feet, the noise levels are 12 dB lower, and at 400 feet the noise levels are 18 dB lower. Note that these noise levels are based upon worst-case conditions. Typically, noise levels near the site will be less. Noise measurements made by Landrum & Brown for other projects show that the noise levels generated by commonly used grading equipment (i.e. loaders, graders and trucks) generate noise levels that typically do not exceed the middle of the range shown in Figure 6.

Backup warning systems, which are required by California labor law for heavy equipment, typically employ audible alarms in the form of backup beepers. These beepers typically produce sound levels between 63 to 67 dBA measured at 50 feet. Backup beepers tend to be audible over large distances, even when the sound may not be readily measurable. In general, the sound level generated by backup beepers is low enough that it would not increase the overall sound level produced by heavy equipment operating concurrently with the beepers. Accordingly, no attempt is made to project over distance the sound level produced by backup beepers. However, given the nature of the sound produced by backup beepers, they could be audible over several thousand feet when background noise levels are low.

The following paragraphs discuss the noise generating activities of each component of the project discussed above. The primary noise generation activities for each component are identified and the major noise generating activities that will generate noise level substantially higher than traffic levels are identified.

Undergrounding: The undergrounding work will consist of digging six feet deep and two feet wide trenches on both sides of the street, mostly within future parkway areas. Conduit will be placed in the trench and encased in concrete per Edison Undergrounding Structures Standards. The trench will then be backfilled with appropriately-compacted soil/fill materials. The existing overhead utility poles will be removed when the project is complete.

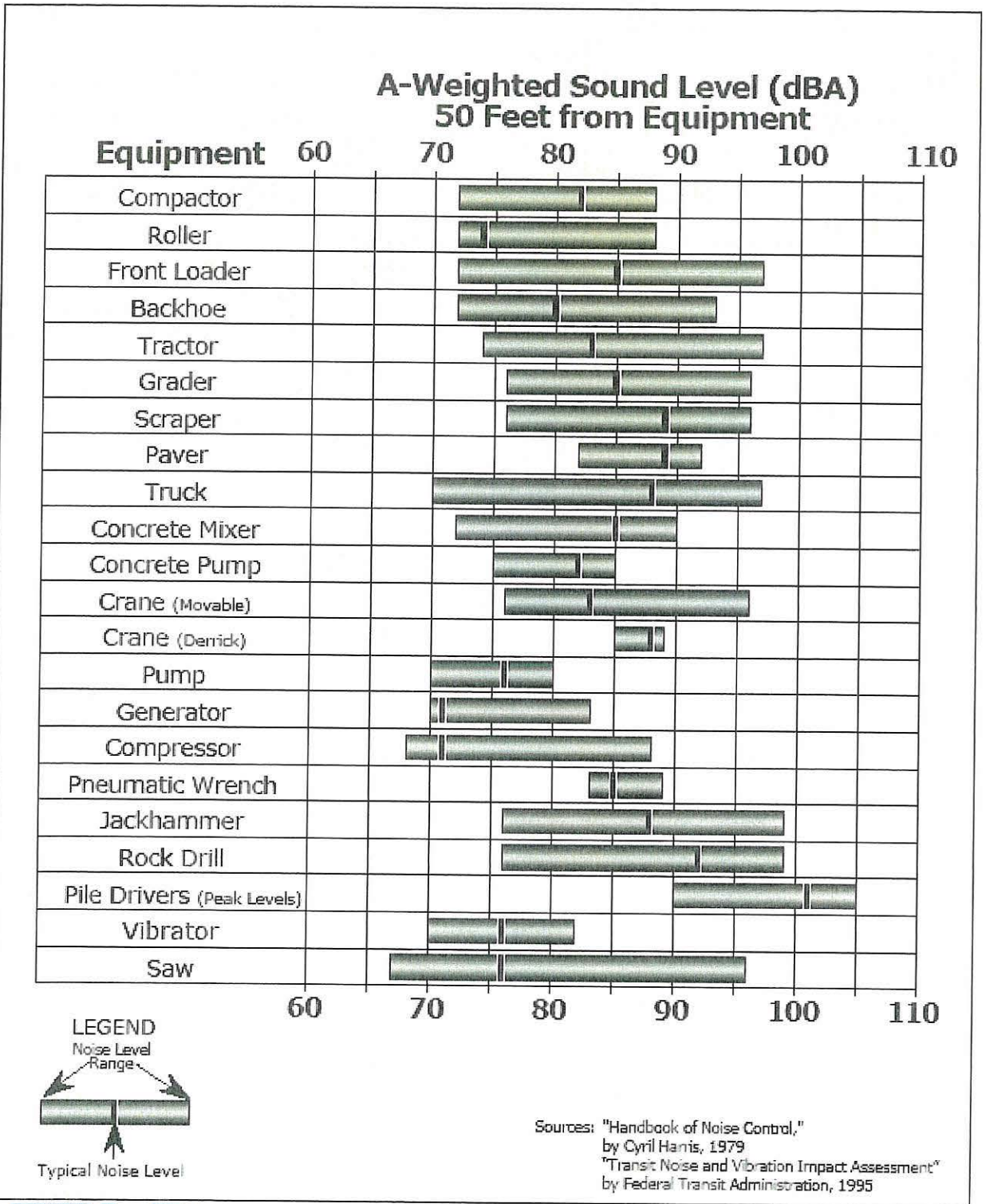


Figure 6
Construction Equipment Noise Levels

Median Construction: The proposed project will construct raised landscaped medians along Lakewood Boulevard extending from Del Amo Blvd. to Ashworth Street. The three primary construction activities associated with the medians include: (1) excavating the existing roadway; (2) constructing raised concrete curbs; and (3) landscaping of the medians.

Excavation of the existing roadway will involve concrete/asphalt sawing, the use of jack-hammers or hoe-rams (a tractor mounted impact hammer), and the use of a loader/backhoe and to excavate materials and load them into a dump truck. The use of concrete/asphalt saws and jack-hammers/hoe-rams will be the loudest activities during median construction. These activities will temporarily generate noise levels that exceed existing traffic noise levels. The use of loader/backhoes and dump trucks will generate noise levels similar to existing traffic noise levels.

The construction of the concrete curbs and median hardscape may be performed by hand work through the construction of forms and pouring of concrete from concrete trucks. Alternately, equipment is available that will form and lay the concrete curbs with a supply of concrete from a concrete truck. In either case, the noise generated by these activities will be similar to the noise generated by traffic on Lakewood Boulevard.

The final median construction activity, landscaping, will primarily be completed with hand work but a bobcat and/or loader/backhoe may be needed for larger tasks. The noise generated by these activities will be similar to the noise generated by traffic on Lakewood Boulevard.

Sidewalk/Gutter Rehabilitation: The project will repair, replace, and modify curbs, driveways and sidewalks. This work will increase accessibility, and improve drainage conditions. The total project length is approximately 7,500 feet. Generally, this will remove the gutter and approximately a five-foot width of sidewalk but in some areas as much as ten feet of sidewalk will need to be removed. On average approximately six feet of sidewalk will be removed for the project.

There will be two primary construction activities; (1) excavation of the existing gutter/sidewalk, (2) construction of concrete gutter/sidewalks. As with the project components discussed above, excavation of existing gutter and sidewalk will involve the use of concrete/asphalt saws and jackhammers/hoe-rams and generate the highest levels of noise. Because this work will occur on the edges of the roadway it will occur closest to the existing land uses located along the roadway. However, other than the concrete sawing and jackhammering, any other heavy equipment used would operate within the roadway. Construction of the gutters and sidewalks would either be performed through hand work constructing forms and the pouring of concrete from concrete trucks. Gutters/curbs may be constructed using equipment that forms and lays the gutter/curbs. In either case, the noise generated by these activities will be similar to the noise generated by traffic on Lakewood Boulevard.

Overlay Repaving and Roadway Re-Striping: After completion of all roadway, utility and parkway improvements, the project will repave Lakewood Boulevard with an asphalt overlay between Del Amo Boulevard to Ashworth Street. This

resurfacing will first grind the top two inches of AC and PCC and overlay with two inches of asphalt-concrete (AC) pavement on the roadway surface. The final component of the project will include re-striping Lakewood Boulevard with three travel lanes in each direction as shown in Figures 2A through 2C.

Prior to the repaving, a machine known as an asphaltic mill will "shave" the top of an asphalt surface down to enable the new asphalt to match existing asphalt, curb and gutter, sidewalks, or concrete pads. As the asphaltic mill grinds the top of the asphalt surface, it generates relatively high levels of noise, substantially greater than typical traffic noise levels. Paving equipment will be used to lay the asphalt overlay with dump trucks delivering the asphalt and rollers will be used to flatten and compact the overlay. The noise generated during these activities is similar to existing traffic noise levels.

Roadway Re-Striping: The final construction activity will be the restriping of the road as shown in Figures 2A through 2C. The restriping will be performed using a road striping truck. The noise generated by the road striping truck is not substantially louder than existing traffic on Lakewood Boulevard.

Figure 6 shows that jackhammers generate noise levels between 76 and 99 dBA at 50 feet and most typically generate a noise level of approximately 88 dBA. Hoe-rams generate similar noise levels. Saws are shown to generate noise levels between 67 dBA and 96 dBA at 50 feet and most generally generate a noise level of approximately 76 dBA. However, this is representative of all saws used in construction. The saws used to cut asphalt and concrete are large and quite noisy, generating noise levels similar to jackhammer/hoe rams noise levels.

The noise levels generated by a loader/backhoe is representative of the loudest noise that would be generated by all other construction activities associated with the project except for the asphaltic milling machine. The asphaltic milling machines generates a pass-by noise level of approximately 100 dBA at a distance of 50 feet, about 12 dB louder than a typical jackhammer/hoe-ram.

Table 4 presents a listing of the sensitive uses located along the project along with the range of noise levels expected from the use of a loader and from the use of a jack-hammer. The use of concrete saws and hoe-rams would generate similar noise levels to the jack-hammer. The asphaltic milling machine would generate noise levels approximately 12 dB louder than the jack-hammer noise levels presented in the table. The noise levels presented in the table represent the range of noise levels that would be expected when equipment is operating.

The first three columns of Table 4 present the roadway segment within which the sensitive land use is located, the side of Lakewood Boulevard on which the sensitive use is located, and the type of sensitive use. The fourth column shows the distance between the near curb and the property line of the land use. The fifth column shows whether or not there is a structure, building or wall that serves as a noise barrier. Noise barriers reduce noise when they break the line-of-sight between a noise source and a receptor. A structure that just breaks the line-of-sight provides approximately 5 dB of noise reduction. A structure or wall that breaks the line-of-sight by several feet will provide approximately 7 to 12 dB of noise reduction. The maximum amount of noise reduction provided by noise barriers is about 20 dB.

For many of the uses along the project there are noise barriers between the roadway and the sensitive receptors but the barriers are discontinuous (Noted as broken on the table). In these cases, some receptor/source location combinations will have reduced noise levels from building or barriers breaking the line of sight, and in other areas the receptor will have direct line-of-sight conditions and the noise level will not be reduced. This occurs most often where sensitive uses are set back from Lakewood Boulevard, and along side streets that intersect the road. The openings for the side streets allow for direct line-of-sight from the residences to a portion of the roadway but the line-of-sight to most of the roadway is blocked.

The rightmost four columns of Table 4 present the range of noise levels estimated at the sensitive receptors for loader operations and jackhammer operation, respectively. Noise levels are given for equipment operating at the nearest sidewalk and at the furthest sidewalk. Noise levels from work within the roadway (e.g. the median) will be between these two values. All of the values listed under either the "Nearest" or the "Furthest" heading exceed the residential noise standard of 65 dBA.

According to the Noise Ordinance, noise from construction activities is not exempt even if it takes place during the permissible hours of construction, which are between 7:00 a.m. and 7:00 p.m. Monday through Saturday, and 9:00 a.m. and 7:00 p.m. on Sunday. Construction contracts for the project will be let by the City and will require compliance with permissible hours section of the Ordinance.

The noise levels presented in Table 4 represent the noise levels at the receptors while the equipment is operating at the closest point to the receptors. If all of the residential receivers which have wall were to receive 10 dB of noise reduction, most of the residences along Lakewood Boulevard would still be impacted by noise from construction equipment. Construction even during the daytime hours would result in a significant noise impact. Mitigation is discussed in Section 4.1

Table 4
Estimated Construction Noise Levels (dBA)

Road Segment	Side of Road	Land Use	Distance from Curb (ft.)	Noise Barriers?	Loader Noise Levels		Jackhammer Noise Levels	
					Nearest	Furthest	Nearest	Furthest
Del Amo Blvd. to Hardwick St.	West	Residential	425	Yes - Broken	66	65	69	68
	East	Commercial	- -	- -	- -	- -	- -	- -
Hardwick St. to Candlewood St.	West	Residential	409	Yes - Broken	67	65	70	68
	East	Commercial	- -	- -	- -	- -	- -	- -
Candlewood St. to Camerino St.	West	Residential	110	Yes - Broken	78	74	81	77
	East	Residential	10	Yes - Broken	99	80	102	83
Camerino St. to Michelson St.	West	Residential	47	No	86	77	89	80
	East	Residential	47	No	86	77	89	80
Michelson St. to South St.	West	Residential	47	No	86	77	89	80
	East	Residential	47	No	86	77	89	80
South St. to Andy St.	West	Residential	54	Yes - Broken	84	77	87	80
	East	Residential	10	Yes - Broken	99	80	102	83
Andy St. to Hedda St.	West	Residential	54	No	84	77	87	80
	East	Residential	15	Yes	95	80	98	83
Hedda St. to Ashworth St.	West	Residential	55	No	84	77	87	80
	East	Residential	15	Yes	95	80	98	83

3.3 Long-Term Impacts

The following sections assess the long-term operational noise impacts from the project. This section examines the traffic noise level increases caused by the project and evaluates their significance. As discussed in Section 3.1, traffic noise impacts are measured against two criteria: the change in traffic noise levels, and the absolute noise levels. Table 5 presents the projected change in traffic noise levels relative to existing traffic volumes.

Table 5 shows the projected traffic noise CNEL level changes due to the project on the roadways in the vicinity of the project site for existing year (2017) conditions. The first column of data lists the "Existing" traffic volumes for each of the roadway segments. The second column of data lists the "Existing + Project" traffic volume, and the third column lists the volume of traffic due to the project. The last column of data lists the increase in noise level due to the addition of project traffic.

Table 5
Existing Traffic Noise Level Changes with the Project (dB CNEL)

Roadway & Segment	Existing (2017) ADT	Existing + Project ADT	Project Increase ADT	Increase in Noise Level (dB)
Lakewood Blvd.				
n/o Ashworth Street	34,438	34,438	0	0.0
Ashworth St. to South St.	34,438	34,438	0	0.0
South St. to Candlewood St.	34,438	34,438	0	0.0
Candlewood St. to Del Amo Blvd.	35,509	35,509	0	0.0
s/o Del Amo Blvd.	35,509	35,509	0	0.0
Ashworth St.				
w/o Lakewood Blvd.	2,279	2,279	0	0.0
e/o Lakewood Blvd.	2,607	2,607	0	0.0
South St.				
w/o Lakewood Blvd.	29,715	29,715	0	0.0
e/o Lakewood Blvd.	29,729	29,729	0	0.0
Candlewood St.				
w/o Lakewood Blvd.	22,153	22,153	0	0.0
e/o Lakewood Blvd.	25,709	25,709	0	0.0

This data presents the change in traffic noise CNEL levels over current conditions with no other changes to the traffic volumes. This represents the theoretical condition where the project immediately begins operation at full capacity with no changes to the surrounding area. The noise level increases were calculated using traffic volume data provided by the traffic engineer for the proposed project, Willdan Engineering. The traffic volumes used are presented in the Appendix of this report.

Table 5 shows that there are no roadway segments with a projected traffic noise level increase. Since the project will not increase the capacity of this roadway, the

project ADT is the same as the existing ADT. Therefore, the worst case increase due to the project is 0.0 dB.

Table 7 presents the projected change in traffic noise levels relative to the opening year (2022) traffic volumes with and without the proposed project. The data in Table 7 shows that there are no roadway segments with a projected traffic noise level increase due to the project. Therefore the worst case increase due to the project is 0.0 dB. This data shows there will be no long-term noise impacts due to the project.

The distances to the opening year (2022) 60, 65 and 70 dB CNEL contours with the proposed project are presented in Table 7. These represent the distance from the centerline of the road to the contour value shown. The CNEL at 100 feet from the roadway centerline is also presented. The contours do not take into account the effect of any noise barriers, buildings or topography that may affect ambient noise levels. The traffic data used to calculate these noise levels is presented in the Appendix of this report.

Table 6
Opening Year (2022) Traffic Noise Level Changes with the Project (dB CNEL)

Roadway & Segment	Opening Year (2022) No Project ADT	Opening Year (2022) + Project ADT	Project Increase ADT	Increase in Noise Level (dB)
Lakewood Blvd.				
n/o Ashworth Street	34,438	34,438	0	0.0
Ashworth St. to South St.	34,438	34,438	0	0.0
South St. to Candlewood St.	34,438	34,438	0	0.0
Candlewood St. to Del Amo Blvd.	35,509	35,509	0	0.0
s/o Del Amo Blvd.	35,509	35,509	0	0.0
Ashworth St.				
w/o Lakewood Blvd.	2,356	2,356	0	0.0
e/o Lakewood Blvd.	2,694	2,694	0	0.0
South St.				
w/o Lakewood Blvd.	30,711	30,711	0	0.0
e/o Lakewood Blvd.	30,725	30,725	0	0.0
Candlewood St.				
w/o Lakewood Blvd.	22,895	22,895	0	0.0
e/o Lakewood Blvd.	26,570	26,570	0	0.0

The data in Table 7 shows that there are no sensitive receptors that will be exposed to traffic noise level increases greater than 3 dB over existing conditions and be exposed to traffic noise levels exceeding the City's standards. Therefore, no significant cumulative traffic noise impacts are anticipated.

Table 7 Opening Year (2022) Roadway Traffic Noise Levels

Road Segment	CNEL @ 100'†	Distance To CNEL Contour (ft.)† 70 CNEL	65 CNEL	60 CNEL
Lakewood Blvd.				
n/o Ashworth Street	67.2	65	141	303
Ashworth St. to South St.	67.2	65	141	303
South St. to Candlewood St.	67.2	65	141	303
Candlewood St. to Del Amo Blvd.	67.4	67	144	310
s/o Del Amo Blvd.	67.4	67	144	310
Ashworth St.				
w/o Lakewood Blvd.	52.7	RW	RW	32
e/o Lakewood Blvd.	53.3	RW	RW	36
South St.				
w/o Lakewood Blvd.	66.6	59	128	275
e/o Lakewood Blvd.	66.6	59	128	275
Candlewood St.				
w/o Lakewood Blvd.	64.0	40	86	185
e/o Lakewood Blvd.	64.6	44	95	204

† From Centerline of Road
RW – Contour does not extend beyond the Right-of-Way

4. Mitigation Measures

4.1 Short-Term Impacts

The analysis presented in Section 3.2 shows that construction activities could generate noise levels in excess of limits defined in the Noise Ordinance. The Noise Ordinance exempts construction activities occurring between the hours of between 7:00 a.m. and 7:00 p.m. Monday through Saturday, and 9:00 a.m. and 7:00 p.m. on Sunday. Therefore, construction occurring during the daytime hours will not result in a significant noise impact.

Therefore, the following mitigation measure is proposed and will result in construction activities being conducted during the hours allowed by the City of Lakewood Ordinance.

> **Mitigation Measure N-1: Control of Construction Hours** – All noise generating construction activities shall be limited to the allowable hours between 7:00 a.m. and 7:00 p.m. Monday through Saturday, and 9:00 a.m. and 7:00 p.m. on Sunday. As long as the project construction occurs within these hours, it will be in compliance with the construction hours portion of the Ordinance.

4.2 Long-Term Impacts

4.2.1 On-Site Activities

The analysis presented in Section 3.3 concludes that the project will not result in any significant long-term on-site noise impacts from activities within the project site. Therefore, no mitigation is required.

4.2.2 Off-Site Activities

The analysis presented in Section 3.3 concludes that the project will not result in any significant long-term off-site traffic noise impacts. Therefore, no mitigation is required.

5. Unavoidable Significant Impacts

With the mitigation measures currently in place at the existing residential land uses along Lakewood Boulevard and the one described in Section 4, all significant impacts will be minimized where feasible. However even with the mitigation measures in place, the noise levels from construction activities will still exceed the noise ordinance level of 65 dBA at many of the residential land uses. Therefore noise from construction of the project will result in unavoidable significant impacts.

Appendix

Data Used to Predict Traffic Noise Levels

Table A-1
Traffic Mix

Vehicle Type	Time of Day Daytime (7 a.m. to 7 p.m.)	Evening (7 p.m. to 10 p.m.)	Night (10 p.m. to 7 a.m.)
1. Del Amo Blvd. to Candlewood St.			
Auto	71.42%	12.71%	10.01%
Medium Trucks	4.21%	0.75%	0.59%
Heavy Trucks	0.24%	0.04%	0.03%
2. Candlewood St. to Ashworth St.			
Auto	71.50%	12.72%	10.02%
Medium Trucks	3.79%	0.67%	0.53%
Heavy Trucks	0.58%	0.10%	0.08%

Table A-2
Average Daily Traffic Volumes and Speeds

Roadway Segment	ADT	Speed
Lakewood Boulevard		
n/o Ashworth Street	34,438	40
Ashworth St. to South St.	34,438	40
South St. to Candlewood St.	34,438	40
Candlewood St. to Del Amo Blvd.	35,509	40
s/o Del Amo Blvd.	35,509	40
Ashworth Street		
w/o Lakewood Blvd.	2,279	30
e/o Lakewood Blvd.	2,607	30
South Street		
w/o Lakewood Blvd.	29,715	40
e/o Lakewood Blvd.	29,729	40
Candlewood St.		
w/o Lakewood Blvd.	22,153	35
e/o Lakewood Blvd.	25,709	35

APPENDIX F:
TRAFFIC IMPACT ASSESSMENT MEMORANDUM
WILLDAN ENGINEERING

WILLDAN Engineering

Memorandum

TO:	Robert Sun
FROM:	Joanne Itagaki Nicolle Spann
DATE:	December 14, 2017
SUBJECT:	CEQA – City of Lakewood; Lakewood Boulevard Regional Corridor Capacity Enhancement Project **DRAFT TECHNICAL MEMORANDUM**

Willdan Engineering (Willdan) has completed the following Technical Memorandum to address the traffic impacts of the proposed installation of a Class I bike path in the street parkway and minor roadway capacity enhancements on Lakewood Boulevard between Hardwick Street and Ashworth Street in the City of Lakewood. Preliminary plans are found in ***Attachment A***.

The addition of a Class I bike path on Lakewood Boulevard will not affect the vehicle capacity along the corridor. While the installation of the bike path may reduce the traffic volumes on Lakewood Boulevard, this traffic study conducted a conservative analysis and assumed no reduction in traffic volumes as a result of the proposed project.

Along with the Class I bike path, the proposed project will add a 2nd northbound left turn lane on Lakewood Boulevard at Hardwick Street. Due to this increased capacity, the level of service for Lakewood Boulevard at Hardwick Street was analyzed. All other intersections were not analyzed since there is no change in the lane configurations or capacity. Mid-block level of service analyses was also conducted at two mid-block segments along Lakewood Boulevard.

A future 2022 turn pocket analysis was conducted at 6 study intersections along Lakewood Boulevard. This analysis was conducted to insure the proposed pocket lengths would be adequate for the anticipated turn volumes.

I. Project Description

Lakewood Boulevard is North-South primary arterial roadway with 3 travel lanes in each direction separated by a raised median. The posted speed limit is 40 mph. There is a shopping center between Del Amo Boulevard and Candlewood Street and residential uses between Candlewood Street and Ashworth Street.

A Class I bike path will be installed on the East and West sides along Lakewood Boulevard between Del Amo Boulevard and Ashworth Street. There will be one traffic capacity enhancement on Lakewood Boulevard at Hardwick Street where a 2nd Northbound left turn lane will be added.

Two street segments were analyzed using the Volume to Capacity (V/C) Level of Service (LOS) analysis methodology from the *City of Lakewood Comprehensive General Plan Circulation Element.* The Lakewood General Plan analyzed street segments using their peak hour volumes compared to a capacity of 1600 vehicles per hour per lane. For the three lanes on Lakewood Boulevard, the capacity was 4800 vehicles per hour (vph). More information on the V/C methodology and LOS thresholds are in ***Attachment B***.

The study intersection at Lakewood Boulevard at Hardwick Street was analyzed using the Intersection Capacity Utilization (ICU) methodology for signalized intersections and the significant impact threshold from the Los Angeles County *Traffic Impact Analysis Report Guidelines*, January 1, 1997. More information on the ICU methodology and LOS thresholds are in ***Attachment B***.

The *City of Lakewood Comprehensive General Plan Circulation Element* provides direction on the acceptable LOS for roadway segments and intersections. Policy 1.6 states "Maintain a Level of Service (LOS) D or better for all roadway segments and intersections." Therefore, if a roadway segment or intersection is operating at LOS A, B, C, or D with the project, it is acceptable.

II. Analysis

Traffic counts were collected on October 5, 2017 (***Attachment C***). Peak hour turning movement counts were collected at the 6 intersections listed below along Lakewood Boulevard.

1. Lakewood Boulevard & Hardwick Street
2. Lakewood Boulevard & Candlewood Street
3. Lakewood Boulevard & Michelson Street
4. Lakewood Boulevard & South Street
5. Lakewood Boulevard & Hedda Street
6. Lakewood Boulevard & Ashworth Street

Average daily traffic (ADT) vehicle classification volume counts were collected at 2 street segments on Lakewood Boulevard. The ADT volume on Lakewood Boulevard between Ashworth Street and Candlewood Street was 34,438 vehicles per day (vpd) with 5.76% trucks. The ADT volume on Lakewood Boulevard between Candlewood Street and Del Amo Boulevard was 35,509 vpd with 5.86% trucks. The detailed count data are contained in ***Attachment C.***

To account for the presence of large trucks in the traffic stream, the HCM 2010 includes a Passenger Car Equivalent (PCE) value. Consistent with the HCM 2010 Methodologies, a PCE value of 2.0 was applied for all trucks, with no distinction between different sizes of trucks. For example, the PCE for the volume on Lakewood Boulevard between Ashworth Street and Candlewood Street is 38,405 vpd. In terms of the analysis, all segments and intersections between Ashworth Street and Candlewood Street, a PCE

value was applied to all counts using a truck percentage of 5.76%. For segments and intersections between Candlewood Street and Del Amo Boulevard, a PCE value was applied to all counts using a truck percentage of 5.86%.

The LA County Congestion Management Program's (CMP) growth rates predict a growth rate of 0.67% per year. Using this information, a 3.35% (0.67% x 5 years = 3.35%) growth rate was applied to the 2017 volumes to predict the 2022 future volumes along the segment and intersections along Lakewood Boulevard.

Intersection Analysis

The intersection of Lakewood Boulevard at Hardwick Street was analyzed and the results are shown in ***Table 1***. Based on ***Table 1***, the traffic impact of adding a second northbound left turn lane will be insignificant. The ICU analysis forms are in ***Attachment D***.

Table 1
Level of Service for
Lakewood Boulevard / Hardwick Street

Scenario		ICU Value	LOS
Existing LOS (2017)	AM Pk Hr	0.502	A
	PM Pk Hr	0.677	B
Existing Plus Project LOS (2017)	AM Pk Hr	0.473	A
	PM Pk Hr	0.677	B
Pre-Project LOS (2022)	AM Pk Hr	0.515	A
	PM Pk Hr	0.696	B
Post Project LOS (2022)	AM Pk Hr	0.486	A
	PM Pk Hr	0.696	B

Segment Analysis

The 3.35% increase to 2017 traffic volumes provided an estimate of traffic traveling on Lakewood Boulevard between Ashworth Street and Candlewood Street in 2022 to be 39,692 vpd (PCE). The estimated traffic travelling on Lakewood Boulevard between Candlewood Street and Del Amo Boulevard in 2022 is 41,000 vpd (PCE). The peak hours from the 24-hour volume counts were determined by the largest volumes in a 1-hour period for the AM, Mid-day and PM peak.

Table 2 displays the segment LOS analysis for Lakewood Boulevard. Based on ***Table 2***, the traffic impact of the proposed alternatives on Lakewood Boulevard is insignificant. The Segment V/C spreadsheets are in ***Attachment E***.

Table 2

Summary of Lakewood Boulevard Segment Level of Service Analysis

Scenario	Peak Hour	Roadway Segment: Del Amo Blvd to Candlewood St V/C[1] Ratio NB	SB	Level of Service NB	SB	Ashworth St to Candlewood St V/C Ratio NB	SB	Level of Service NB	SB
Existing (2017)	AM	0.178	0.299	A	A	0.230	0.312	A	A
	MD	0.309	0.261	A	A	0.265	0.256	A	A
	PM	0.357	0.274	A	A	0.329	0.261	A	A
Existing With Project (2017)	AM	0.178	0.299	A	A	0.230	0.312	A	A
	MD	0.309	0.261	A	A	0.265	0.256	A	A
	PM	0.357	0.274	A	A	0.329	0.261	A	A
Pre-Project (2022)	AM	0.184	0.309	A	A	0.238	0.323	A	A
	MD	0.319	0.270	A	A	0.274	0.265	A	A
	PM	0.369	0.283	A	A	0.340	0.270	A	A
Opening Year With Project (2022)	AM	0.184	0.309	A	A	0.238	0.323	A	A
	MD	0.319	0.270	A	A	0.274	0.265	A	A
	PM	0.369	0.283	A	A	0.340	0.270	A	A

[1] Capacity= 4,800 vehicles/ hour

III. Left Turn Pocket Length Analysis

The left turn pocket analysis method used was from the *Highway Design Manual* (HDM). The HDM methodology for signalized intersections requires the use of signal timing sheets. Since signal timing sheets were not readily available, the storage length analysis for unsignalized intersections was used: "The storage length may be based on the number of turning vehicles likely to arrive in an average 2-minute period during the peak hour. At a minimum, space for 2 vehicles should be provided at 25 feet per vehicle." The minimum recommended turn pocket length was calculated using the following equation:

$$Pocket\ Length = peak\ hour\ volume \frac{vehicle}{hour} \times 25 \frac{feet}{vehicle} \times 2\ minute\ cycle \times \frac{1\ hour}{60\ minutes}$$

Table 3 summarizes the recommended left turn pocket lengths. The left turn pocket analysis concluded that there should be no changes in the left turn pocket lengths except for the Northbound direction on Lakewood Boulevard at Hardwick Street. This requires that there be 2 left turn lanes of the existing length of 164 feet, shown on ***Table 3***. The

addition of a second left turn lane in the Southbound direction on Lakewood Boulevard is already in the project scope, so there will be no changes to the project due to our findings.

Table 3
Recommended Left Turn Pocket Lengths
on Lakewood Boulevard

Intersection with	Left Turn Pocket Length (ft)		
	Existing	Recommended	Designed Length
Hardwick St.			
Northbound	164	190	164-ft dual
Southbound	143-ft dual	110-ft dual	143-ft dual
Candlewood St.			
Northbound	180	160	180
Southbound	300-ft dual	150	300-ft dual
Michelson St.			
Northbound	125	60	125
Southbound	156	60	156
South St.			
Northbound	240	230	240
Southbound	234	210	234
Hedda St.			
Northbound	145	70	145
Southbound	163	60	163
Ashworth St.			
Northbound	155	50	155
Southbound	140	50	140

IV. Conclusion

The proposed project does not have a significant impact on the LOS for the study segments and the study intersection at Lakewood Boulevard and Hardwick Street. The segment LOS at Lakewood Boulevard and Hardwick Street remained an LOS A or B in the opening year (2022) with the project. The segment LOS remained the same with the proposed project and maintained a segment LOS A in the opening year (2022) with the project.

The proposed turn pocket lengths along Lakewood Boulevard meet the minimum recommended length with the project volumes. It is recommended that the additional left turn lane on Hardwick Street should be added as it is scoped in the project.

Attachments:

- Attachment A- Preliminary Plans
- Attachment B- LOS Description
- Attachment C- Count Data
- Attachment D- ICU Intersection Analysis Forms
- Attachment E- V/C Segment Analysis Forms

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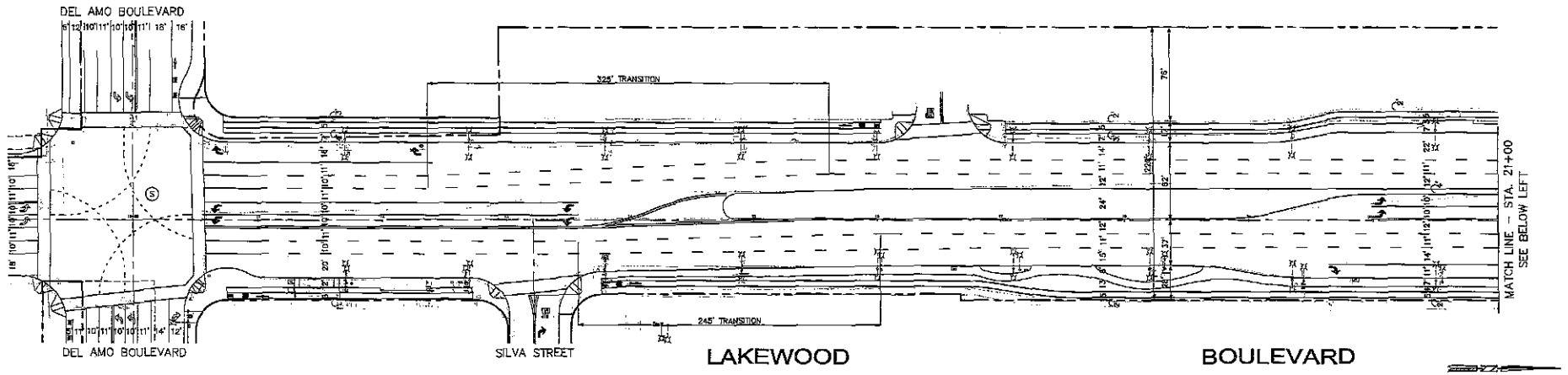
Attachment A-1



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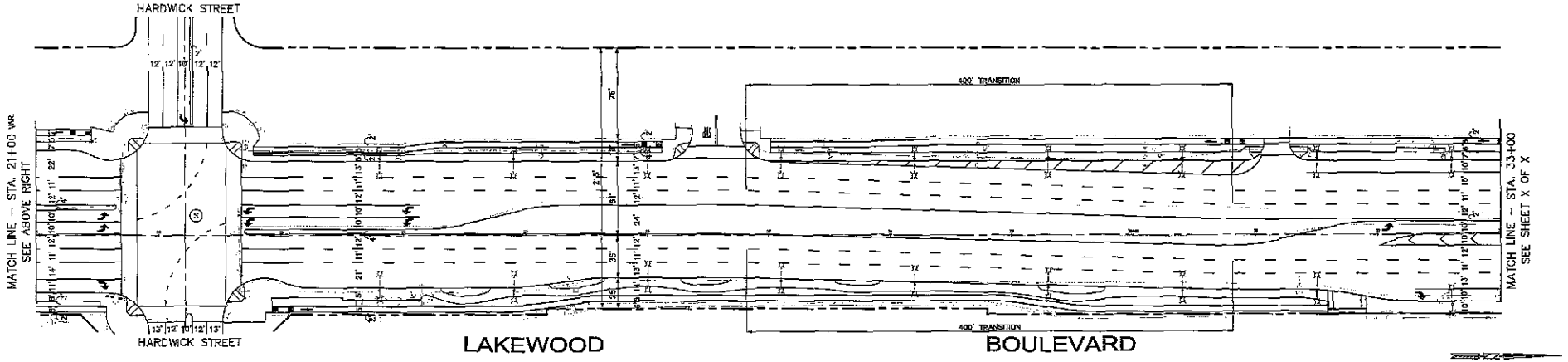


SCALE: 1" = 40'

GENERAL NOTES

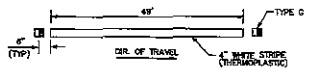
1. TRAFFIC SIGNING AND STRIPING SHALL SHALL CONFORM TO THE STATE OF CALIFORNIA STANDARD SPECIFICATION AND STANDARD PLANS, DATED 2015, CALIFORNIA MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (CA MUTCD), DATED 2014, THIS PLAN, AND THE SPECIAL PROVISIONS.
2. ALL STRIPING DETAILS AND PAVEMENT MARKINGS SHALL BE THERMOPLASTIC, UNLESS OTHERWISE NOTED.
3. INSTALL TWO-WAY BLUE REFLECTIVE MARKER AT EVERY FIRE HYDRANT.

CONSTRUCTION NOTES

1. INSTALL STRIPING DETAIL INCLUDING RAISED PAVEMENT MARKERS, AS NOTED.
2. INSTALL ARROW OR PAVEMENT LEGEND AS NOTED.
3. INSTALL 12" WHITE CROSSWALK OR LIMIT LINE AS SHOWN. UNLESS OTHERWISE INDICATED, CROSSWALK SHALL BE 10' IN WIDTH (INSIDE TO INSIDE).
4. INSTALL 4" WHITE LINE PER DETAIL "A".
5. REMOVE SIGN AND/OR POST AS NOTED.
6. INSTALL SIGN AND/OR POST AS NOTED.
7. RELOCATE SIGN AND/OR POST AS NOTED.
8. REMOVE EXISTING STRIPING.
9. INSTALL 12" WHITE CHEVRON AT 45', 25' O.C.
10. INSTALL 4" YELLOW LINE AT 50' IN LENGTH.

LEGEND

(S) – SIGNALIZED INTERSECTION



DETAIL "A"
(No Scale)

PROFESSIONAL ENGINEER – VANESSA MUNOZ – No. 87563 – CIVIL – 09-30-19 – STATE OF CALIFORNIA

PLANS PREPARED BY:
WILLDAN Engineering
13191 CROSSROADS PARKWAY NORTH
SUITE 405 INDUSTRY, CA 91746-3497
(562) 908-6200
UNDER THE SUPERVISION OF:

VANESSA MUNOZ RCE 87563 DATE:

REVISIONS			
NO.	DESCRIPTION	APP.	DATE

CITY OF LAKEWOOD

SIGNING AND STRIPING PLAN

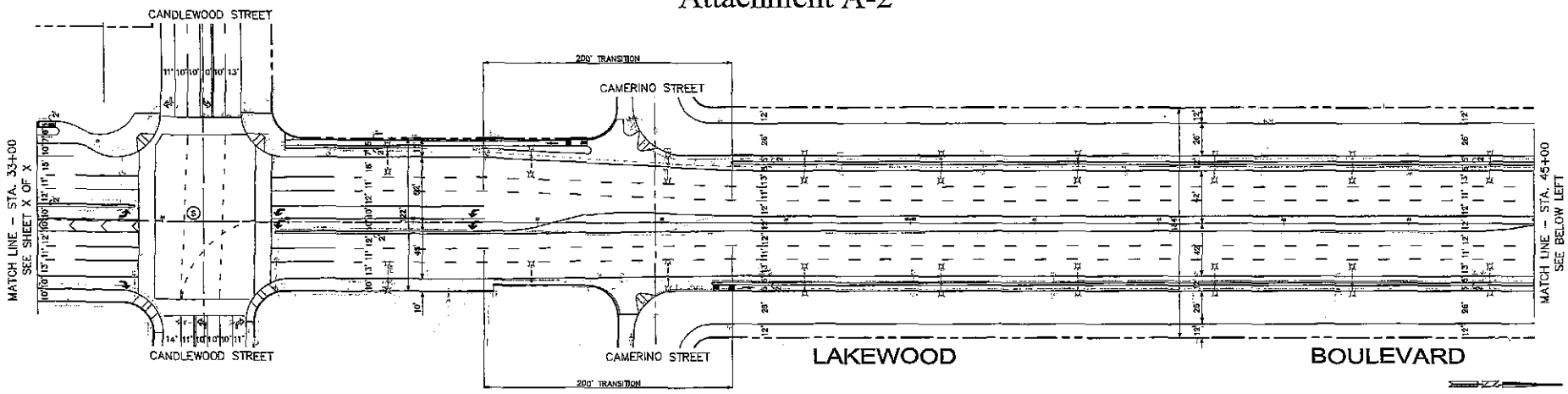
LAKEWOOD BOULEVARD

FROM DEL AMO BOULEVARD TO STA. 33+00

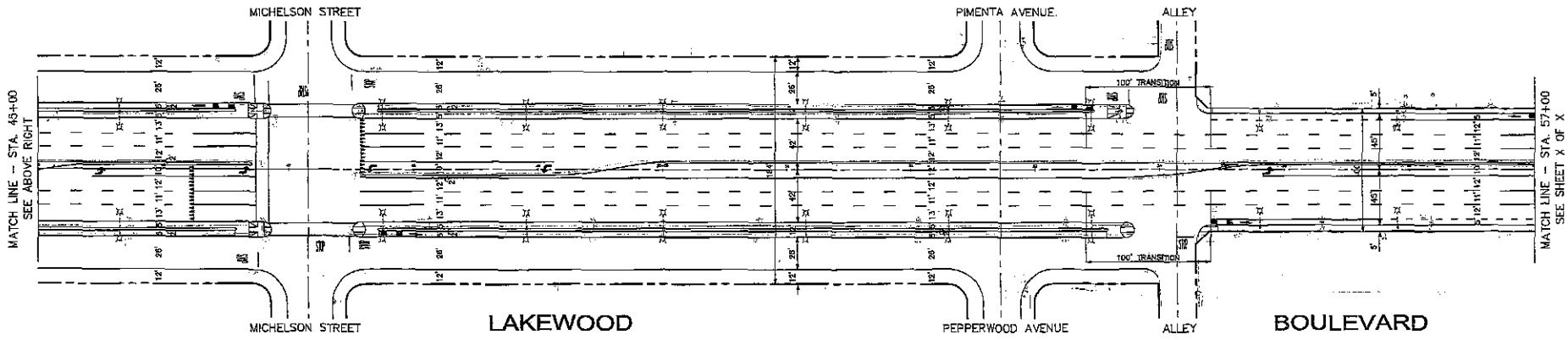
DRAWN BY:	KG	SHT. X OF X SHTS.	PLAN NO. SS-1
DESIGNED BY:	KC		
CHECKED BY:	JL/VM		

E:\CIVIL\... – LAKEWOOD BLVD\SS-PLAN\SS-Plan.dwg Dec 20, 17 – 10:56am

Attachment A-2



SCALE: 1" = 40'



SCALE: 1" = 40'

GENERAL NOTES

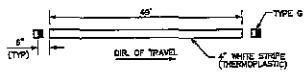
1. TRAFFIC SIGNING AND STRIPING SHALL SHALL CONFORM TO THE STATE OF CALIFORNIA STANDARD SPECIFICATION AND STANDARD PLANS, DATED 2015, CALIFORNIA MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (CA MUTCD), DATED 2014, THIS PLAN, AND THE SPECIAL PROVISIONS.
2. ALL STRIPING DETAILS AND PAVEMENT MARKINGS SHALL BE THERMOPLASTIC, UNLESS OTHERWISE NOTED.
3. INSTALL TWO-WAY BLUE REFLECTIVE MARKER AT EVERY FIRE HYDRANT.

CONSTRUCTION NOTES

1. INSTALL STRIPING DETAIL INCLUDING RAISED PAVEMENT MARKERS, AS NOTED.
2. INSTALL ARROW OR PAVEMENT LEGED AS NOTED.
3. INSTALL 12" WHITE CROSSWALK OR LIMIT LINE AS SHOWN. UNLESS OTHERWISE INDICATED, CROSSWALK SHALL BE 10' IN WIDTH (INSIDE TO INSIDE).
4. INSTALL 4" WHITE LINE PER DETAIL "A".
5. REMOVE SIGN AND/OR POST AS NOTED.
6. INSTALL SIGN AND/OR POST AS NOTED.
7. RELOCATE SIGN AND/OR POST AS NOTED.
8. REMOVE EXISTING STRIPING.
9. INSTALL 12" WHITE CHEVRON AT 45°, 25' O.C.
10. INSTALL 4" YELLOW LINE AT 50' IN LENGTH.

LEGEND

(S) – SIGNALIZED INTERSECTION



DETAIL "A"
(No Scale)

REGISTERED PROFESSIONAL ENGINEER
VANESSA MUNOZ
No. 67583
EXP. 06-30-18
CIVIL
STATE OF CALIFORNIA

PLANS PREPARED BY:
WILLDAN Engineering
17191 CROSSROADS PARKWAY NORTH
SUITE 400 INDUSTRY, CA 91748-5407
(562) 906-8200
UNDER THE SUPERVISION OF:
VANESSA MUNOZ RCE 67583 DATE

REVISIONS			
NO.	DESCRIPTION	APP.	DATE

CITY OF LAKEWOOD

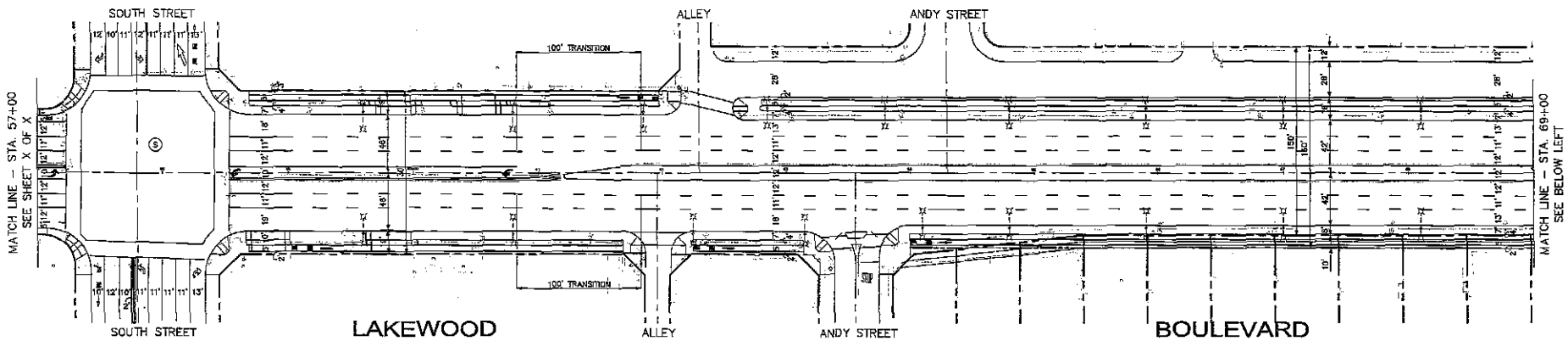
SIGNING AND STRIPING PLAN

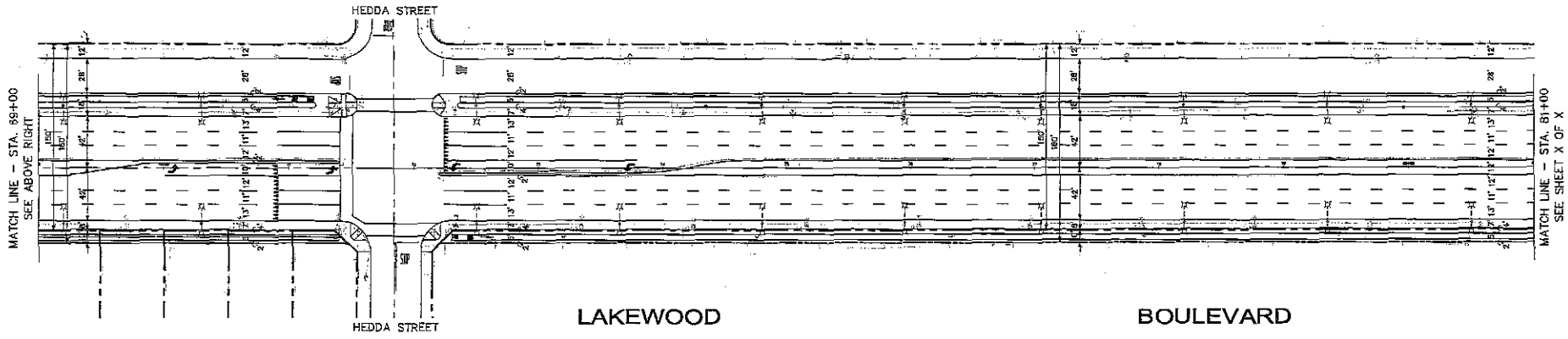
LAKEWOOD BOULEVARD

FROM STA. 33+00 TO STA. 57+00

DRAWN BY:	KC	SHT. X OF X SHTS.	PLAN NO. SS-2
DESIGNED BY:	KC		
CHECKED BY:	JL/VM		

Attachment A-3





GENERAL NOTES

1. TRAFFIC SIGNING AND STRIPING SHALL SHALL CONFORM TO THE STATE OF CALIFORNIA STANDARD SPECIFICATION AND STANDARD PLANS, DATED 2015, CALIFORNIA MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (CA MUTCD), DATED 2014, THIS PLAN, AND THE SPECIAL PROVISIONS.
2. ALL STRIPING DETAILS AND PAVEMENT MARKINGS SHALL BE THERMOPLASTIC, UNLESS OTHERWISE NOTED.
3. INSTALL TWO-WAY BLUE REFLECTIVE MARKER AT EVERY FIRE HYDRANT.

CONSTRUCTION NOTES

1. INSTALL STRIPING DETAIL INCLUDING RAISED PAVEMENT MARKERS, AS NOTED.
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7. RELOCATE SIGN AND/OR POST AS NOTED.
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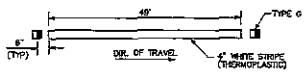
9. INSTALL 12" WHITE CHEVRON AT 45', 25' O.C.
10. INSTALL 4" YELLOW LINE AT 50' IN LENGTH.

LEGEND

(S) – SIGNALIZED INTERSECTION



DETAIL "A"
(No Scale)

PLANS PREPARED BY:
WILLDAN Engineering
1790 CROSSROADS PARKWAY NORTH
SUITE 400, INDUSTRY, CA 91748-3487
(562) 908-6200
UNDER THE SUPERVISION OF:
VANESSA MUNOZ RCE 67583 DATE

REGISTERED PROFESSIONAL ENGINEER – VANESSA MUNOZ – No. 67583 – EXP. 06-30-19 – CIVIL – STATE OF CALIFORNIA

REVISIONS			
NO.	DESCRIPTION	APP.	DATE

CITY OF LAKEWOOD

SIGNING AND STRIPING PLAN

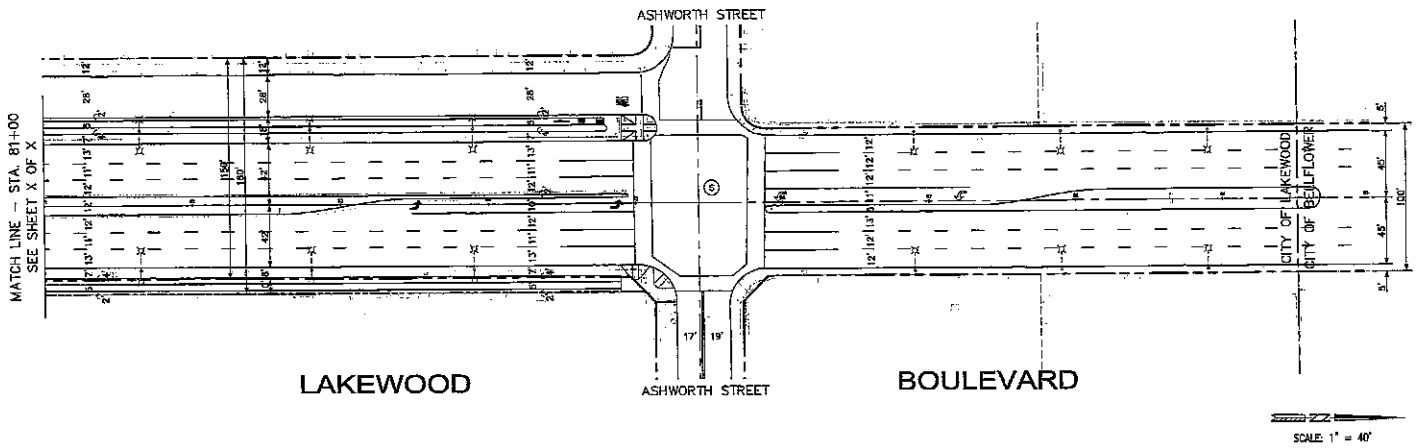
LAKEWOOD BOULEVARD

FROM STA. 57+00 TO STA. 81+00

DRAWN BY:	KC	SHT. X OF X SHTS.	PLAN NO. SS-3
DESIGNED BY:	KC		
CHECKED BY:	JL/VM		

C:\JOBS\... – BKM-Lakewood 16\009-PMS\100-mxrd\SS1of2.dwg Sep 20, 17 – 08:38am

Attachment A-4



GENERAL NOTES

1. TRAFFIC SIGNING AND STRIPING SHALL SHALL CONFORM TO THE STATE OF CALIFORNIA STANDARD SPECIFICATION AND STANDARD PLANS, DATED 2015, CALIFORNIA MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (CA MUTCD), DATED 2014, THIS PLAN, AND THE SPECIAL PROVISIONS.
2. ALL STRIPING DETAILS AND PAVEMENT MARKINGS SHALL BE THERMOPLASTIC, UNLESS OTHERWISE NOTED.
3. INSTALL TWO-WAY BLUE REFLECTIVE MARKER AT EVERY FIRE HYDRANT.

CONSTRUCTION NOTES

1. INSTALL STRIPING DETAIL INCLUDING RAISED PAVEMENT MARKERS, AS NOTED.
2. INSTALL ARROW OR PAVEMENT LEGEND AS NOTED.
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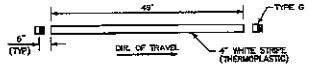
7. RELOCATE SIGN AND/OR POST AS NOTED.
8. REMOVE EXISTING STRIPING.
9. INSTALL 12" WHITE CHEVRON AT 45', 25' O.C.
10. INSTALL 4" YELLOW LINE AT 90' IN LENGTH.

LEGEND

(S) – SIGNALIZED INTERSECTION



DETAIL "A"
(No Scale)

REGISTERED PROFESSIONAL ENGINEER VANESSA MUNOZ No. 67953 EXP. 06-30-19 CIVIL STATE OF CALIFORNIA

PLANS PREPARED BY:
WILLDAN Engineering
13191 CROSSROADS PARKWAY NORTH
SUITE 405 INDUSTRY, CA 91746-3487
(562) 908-6200
UNDER THE SUPERVISION OF:
VANESSA MUNOZ RCE 67953 DATE

REVISIONS			
NO.	DESCRIPTION	APP.	DATE

CITY OF LAKEWOOD

SIGNING AND STRIPING PLAN

LAKEWOOD BOULEVARD

FROM STA. 81+00 TO STA. 90+00

DRAWN BY:	KC	SHT. X OF X SHTS.	PLAN NO. SS-4
DESIGNED BY:	KC		
CHECKED BY:	JL/VM		

I:\18550 - LWB-Lakewood BV\900-PS&E\PS\Plans\SS\SS-4.dwg Sep 20, 17 - 10:36am

analysis, use the established significant impact thresholds for two-lane roadways as shown on page 6.

5. Significant Impact Threshold

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 below.

INTERSECTIONS		
Preproject		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

The project is deemed to have a significant impact on two-lane roadways when it adds the following percentages based on LOS of the preproject conditions.

TWO-LANE ROADWAYS				
		Percentages Increase in Passenger Car Per Hour (PCPH) by Project		
		Preproject LOS		
Directional Split	Total Capacity (PCPH)	C	D	E/F
50/50	2,800	4	2	1
60/40	2,650	4	2	1
70/30	2,500	4	2	1
80/20	2,300	4	2	1
90/10	2,100	4	2	1
100/0	2,000	4	2	1

EXPLANATION OF INTERSECTION CAPACITY UTILIZATION (ICU)

The capacity of a street is nearly always greater between intersections and less at intersections. The reason for this is that traffic flows continuously between intersections but only part of the time at intersections. To study intersection capacity, a technique known as Intersection Capacity Utilization (ICU) was developed. An ICU analysis consists of (a) determining the proportion of signal time needed to serve each conflicting movement; (b) summing the times needed for the conflicting movements; and (c) comparing the total time required to the total time available. Conflicting movements are those that cannot go at the same time, such as through traffic on one street in the intersection vs. through traffic on the other street forming the intersection. For example, if for north-south traffic the northbound traffic is 1,000 vehicles per hour, the southbound traffic is 800 vehicles per hour, and the capacity of either approach is 2,000 vehicles per hour of green, then northbound traffic is critical and requires 1,000/2000 or 50 percent of the signal time. If for the east-west traffic, 40 percent of the signal time is required, then it can be seen that the ICU is 50 plus 40, or 90 percent. When left-turn lanes exist, they are incorporated into the analysis. As ICU values approach 100 percent, the quality of traffic flow through an intersection approaches Level of Service (LOS) E, as defined in the *Highway Capacity Manual, Special Report 87*, Highway Research Board, 1965.

"Level of Service" is used to describe the quality of traffic flow. For Levels of Service A through C, an intersection operates well. Level of Service D is typically the Level of Service for which an urban street is designed, having tolerable operating speed. Level of Service E represents the maximum volume of traffic an intersection can accommodate and is the level at which one or more vehicles will have to wait through more than one signal cycle. Level of Service F occurs when an intersection is overloaded, and is characterized by long queues of traffic with stoppages of long duration. A description of the various Levels of Service is on the following page.

The ICU calculations assume that an intersection is signalized and that the signal is ideally timed. It is possible, however, to have an ICU value well below 1.0, yet have severe traffic congestion. This would occur because one or more movements is not getting enough time to satisfy its demand, with excess time existing for other movements. Although calculating the ICU for an unsignalized intersection is not necessarily valid, it can be performed with the presumption that a signal can be installed and the calculations show whether the geometrics are capable of accommodating the expected volumes.

Capacity is often defined in terms of roadway width. However, standard lanes have approximately the same capacity whether they are 11-foot or 14-foot lanes. Our data indicates that a typical lane, whether a through lane or a left-turn lane, has a capacity as high as approximately 2200 vehicles per lane per hour of green time. The *1985 Highway Capacity Manual* found capacities of 1800 vehicles per lane per hour of green time. These studies show that values in the 1600 and 1700 range as used in this analysis, should result in a conservative analysis.

INTERSECTION CAPACITY UTILIZATION (ICU)

LEVEL OF SERVICE DESCRIPTIONS FOR INTERSECTIONS

LEVEL OF SERVICE	DESCRIPTION	NOMINAL RANGE OF ICU VALUES[(a)]
A	Low volumes; high speeds; speed not restricted by other vehicles; all signal cycles clear with no vehicles waiting through more than one signal cycle.	0.00-0.60
B	Operating speeds beginning to be affected by other traffic; between one and ten percent of the signal cycles have one or more vehicles which wait through more than one signal cycle during peak traffic periods.	0.61-0.70
C	Operating speeds and maneuverability closely controlled by other traffic; between 11 and 30 percent of the signal cycles have one more vehicles which wait through more than one signal cycle during peak traffic periods; recommended ideal design standard.	0.71-0.80
D	Tolerable operating speeds; 31 to 70 percent of signal cycles have one or more vehicles which wait through more than one signal cycle during peak traffic periods; often used as design standard in urban areas.	0.81-0.90
E	Capacity; the maximum traffic volumes an intersection can accommodate; restricted speeds; 71 to 100 percent of the signal cycles have one or more vehicles which wait through more than one signal cycle during peak traffic periods.	0.91-1.00
F	Long queues of traffic; unstable flow; stoppages of long duration; traffic volume and traffic speed can drop to zero; traffic volume will be less than the volume which occurs at Level of Service E.	Not Meaningful

(a) ICU (Intersection Capacity Utilization) at various Levels of Service versus Level of Service E for urban arterial streets.

SOURCE: *Highway Capacity Manual, Special Report 87;* Highway Research Board, 1955.

CLASSIFICATION

Lakewood Blvd Bet. Del Amo Blvd & Candlewood St

Attachment C-1

Day: Thursday
Date: 10/5/2017

City: Lakewood
Project #: CA17_5663_001

Summary

Time	# 1	# 2	# 3	# 4	# 5	# 6	# 7	# 8	# 9	# 10	# 11	# 12	# 13	Total
00:00 AM	0	246	27	0	13	0	0	0	0	0	0	0	0	286
01:00	0	143	21	0	9	0	0	0	0	0	0	0	0	173
02:00	0	102	10	0	10	1	0	0	1	0	0	0	0	124
03:00	0	110	11	0	5	0	0	0	0	0	0	0	0	126
04:00	2	214	13	0	20	0	0	0	1	0	0	0	0	250
05:00	1	532	51	6	39	0	0	0	1	0	0	0	0	630
06:00	6	919	89	9	60	1	0	0	1	0	0	0	0	1085
07:00	1	1629	153	9	97	0	2	3	1	0	0	0	0	1895
08:00	3	1674	160	9	119	0	1	4	1	0	0	0	0	1971
09:00	3	1498	149	10	104	1	0	5	0	0	0	0	0	1770
10:00	3	1627	182	10	110	1	1	3	0	0	0	0	0	1937
11:00	7	1833	181	8	119	3	0	6	1	0	0	0	0	2158
12:00 PM	2	2077	231	9	123	1	0	4	4	0	0	0	0	2451
13:00	1	1957	197	5	106	1	0	5	0	0	0	0	0	2272
14:00	3	2033	194	10	132	1	0	5	2	0	0	0	0	2380
15:00	2	2159	223	5	123	1	0	4	5	0	0	0	0	2522
16:00	4	2171	225	9	139	0	0	5	3	0	0	0	0	2556
17:00	0	2317	210	9	130	3	0	4	4	0	0	0	0	2677
18:00	3	2048	182	5	107	0	0	5	1	0	0	0	0	2351
19:00	0	1703	170	7	91	0	0	5	1	0	0	0	0	1977
20:00	0	1419	140	8	74	0	0	3	0	0	0	0	0	1644
21:00	0	1022	89	4	53	0	0	5	0	0	0	0	0	1173
22:00	0	572	58	2	35	0	0	1	0	0	0	0	0	668
23:00	0	380	34	1	17	0	0	0	1	0	0	0	0	433
Totals	41	30385	3000	135	1835	14	4	67	28					35509
% of Totals	0%	86%	8%	0%	5%	0%	0%	0%	0%					100%

AM Volumes	26	10527	1047	61	705	7	4	21	7	0	0	0	0	12405
% AM	0%	30%	3%	0%	2%	0%	0%	0%	0%					35%
AM Peak Hour	11:00	11:00	10:00	09:00	08:00	11:00	07:00	11:00	02:00					11:00
Volume	7	1833	182	10	119	3	2	6	1					2158
PM Volumes	15	19858	1953	74	1130	7	0	46	21	0	0	0	0	23104
% PM	0%	56%	6%	0%	3%	0%		0%	0%					65%
PM Peak Hour	16:00	17:00	12:00	14:00	16:00	17:00		13:00	15:00					17:00
Volume	4	2317	231	10	139	3		5	5					2677

Directional Peak Periods All Classes	AM 7-9			NOON 12-2			PM 4-6			Off Peak Volumes		
	Volume	↔	%	Volume	↔	%	Volume	↔	%	Volume	↔	%
	3866		11%	4723		13%	5233		15%	21687		61%

Classification Definitions

1 Motorcycles
asser rs
4 Buses
xle, ingle
7 > =4-Axle Single Units
<=4-A ingle T
10 >=6-Axle Single Trailers
1 <=5 Multi
13 >=7-Axle Multi-Trailers

CLASSIFICATION

Lakewood Blvd Bet. Ashworth St & Candlewood St

Attachment C-2

Day: Tuesday
Date: 11/14/2017

City: Lakewood
Project #: CA17_5747_001

Summary

Time	# 1	# 2	# 3	# 4	# 5	# 6	# 7	# 8	# 9	# 10	# 11	# 12	# 13	Total
0:00 AM	0	221	16	0	5	0	0	0	0	0	0	0	0	242
1:00	0	104	11	0	5	0	0	0	0	0	0	0	0	120
2:00	0	87	7	1	6	0	0	2	0	0	0	0	0	103
3:00	0	102	11	0	10	0	0	2	0	0	0	0	0	125
4:00	0	230	26	0	13	0	0	3	1	0	0	0	0	273
5:00	0	529	91	1	56	0	0	4	2	0	0	0	0	683
6:00	1	1060	104	4	63	2	0	5	3	0	0	0	0	1242
7:00	0	1816	169	12	100	12	0	11	3	0	0	0	0	2123
8:00	0	1792	173	8	109	1	0	17	1	0	0	0	0	2101
9:00	2	1467	143	6	88	0	0	9	1	0	0	0	0	1716
10:00	0	1579	176	11	105	5	0	11	2	0	0	0	0	1889
11:00	1	1687	158	5	117	4	1	13	1	0	0	0	0	1987
12:00 PM	2	1986	194	11	109	0	1	18	1	0	0	0	0	2322
13:00	1	1846	191	8	132	9	0	12	1	0	0	0	0	2200
14:00	1	1990	186	11	111	0	1	10	0	0	0	0	0	2310
15:00	1	2043	220	10	112	3	0	17	1	0	0	0	0	2407
16:00	2	2160	199	6	109	6	0	13	0	0	0	0	0	2495
17:00	2	2208	203	3	99	3	1	16	0	0	0	0	0	2535
18:00	0	1876	150	9	76	1	0	11	2	0	0	0	0	2125
19:00	0	1535	125	4	66	3	0	5	0	0	0	0	0	1738
20:00	0	1310	91	3	49	3	0	3	1	0	0	0	0	1460
21:00	0	1003	76	0	32	0	0	4	0	0	0	0	0	1115
22:00	0	616	56	1	22	0	0	0	1	0	0	0	0	696
23:00	0	383	34	0	13	0	0	1	0	0	0	0	0	431
Totals	13	29630	2810	114	1607	52	4	187	21					34438
% of Totals	0%	86%	8%	0%	5%	0%	0%	1%	0%					100%
AM Volumes	4	10674	1085	48	677	24	1	77	14	0	0	0	0	12604
% AM	0%	31%	3%	0%	2%	0%	0%	0%	0%					37%
AM Peak Hour	9:00	7:00	10:00	7:00	11:00	7:00	11:00	8:00	6:00					7:00
Volume	2	1816	176	12	117	12	1	17	3					2123
PM Volumes	9	18956	1725	66	930	28	3	110	7	0	0	0	0	21834
% PM	0%	55%	5%	0%	3%	0%	0%	0%	0%					63%
PM Peak Hour	12:00	17:00	15:00	12:00	13:00	13:00	12:00	12:00	18:00					17:00
Volume	2	2208	220	11	132	9	1	18	2					2535

Directional Peak Periods All Classes	AM 7-9		NOON 12-2		PM 4-6		Off Peak Volumes	
	Volume	%	Volume	%	Volume	%	Volume	%
	4224 ⟷	12%	4522 ⟷	13%	5030 ⟷	15%	20662 ⟷	60%

Classification Definitions

1 Motorcycles
2 Passenger Cars
4 Buses
5 2-Axle, 6-Tire Single Units
7 > =4-Axle Single Units
8 <=4-Axle Single Trailers
10 >=6-Axle Single Trailers
11 <=5-Axle Multi-Trailers
13 >=7-Axle Multi-Trailers

Prepared by National Data & Surveying Services

Attachment C-3

Lakewood Blvd & Hardwick St

Peak Hour Turning Movement Count

ID: 17-05662-001
City: Lakewood

Day: Thursday
Date: 10/05/2017

PEAK HOURS

AM: 07:45 AM - 08:45 AM
NOON: NONE
PM: 05:00 PM - 06:00 PM

COUNT PERIODS

AM: 07:00 AM - 09:00 AM
NOON: NONE
PM: 04:00 PM - 06:00 PM

Lakewood Blvd — SOUTHBOUND

AM	38	1236	40	4	766	AM
NOON	0	0	0	0	0	NOON
PM	107	903	190	28	1560	PM
	0	3	2	0		

Hardwick St — EASTBOUND

AM	NOON	PM	
135	0	373	
0	0	0	0
38	0	130	1
16	0	57	2
100	0	113	0
AM	NOON	PM	

CONTROL

Signalized

TEV	2338 AM	0 NOON	3417 PM
PHF	0.90		0.99

Hardwick St — WESTBOUND

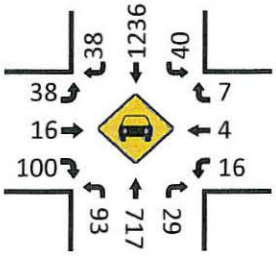
PM	NOON	AM	
144	0	7	0
70	0	4	2
98	0	16	0
0	0	0	0
370	0	85	
PM	NOON	AM	

0 1 3 1

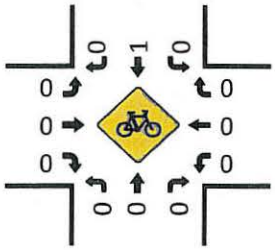
Lakewood Blvd — NORTHBOUND

PM	1114	0	196	1258	123	PM
NOON	0	0	0	0	0	NOON
AM	1352	0	93	717	29	AM

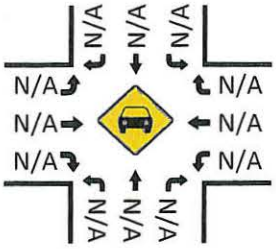
Total Vehicles (AM)



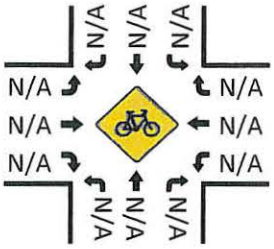
Bikes (AM)



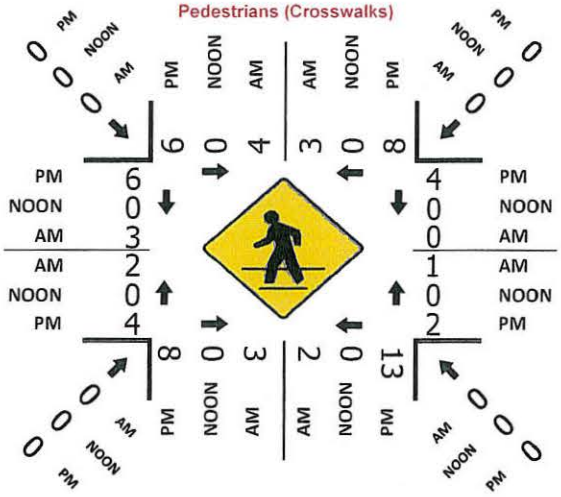
Total Vehicles (NOON)



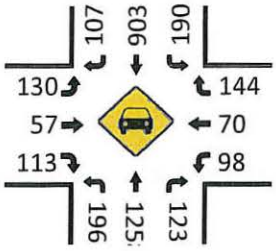
Bikes (NOON)



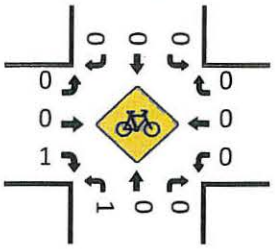
Pedestrians (Crosswalks)



Total Vehicles (PM)



Bikes (PM)



Lakewood Blvd & Candlewood St

Peak Hour Turning Movement Count

ID: 17-05662-002
City: Lakewood

Day: Thursday
Date: 10/05/2017

PEAK HOURS	COUNT PERIODS
07:30 AM - 08:30 AM	07:00 AM - 09:00 AM
NONE	NONE
05:00 PM - 06:00 PM	04:00 PM - 06:00 PM

Lakewood Blvd — SOUTHBOUND

AM	83	1037	147	0	801	AM
NOON	0	0	0	0	0	NOON
PM	64	861	309	0	1575	PM
	0	3	2	0		

Candlewood St — EASTBOUND

AM	NOON	PM	
684	0	767	
0	0	0	0
94	0	152	1
505	0	754	2
138	0	152	1
AM	NOON	PM	

CONTROL

Signalized

TEV	3517 AM	0 NOON	4813 PM
PHF	0.97		0.97

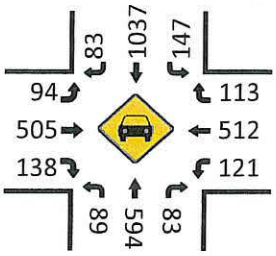
Candlewood St — WESTBOUND

PM	NOON	AM	
282	0	113	1
552	0	512	2
172	0	121	1
0	0	0	0
1280	0	735	
PM	NOON	AM	

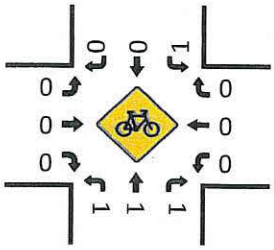
Lakewood Blvd — NORTHBOUND

PM	1191	6	151	1141	217	PM
NOON	0	0	0	0	0	NOON
AM	1297	1	89	594	83	AM
		0	1	3	1	

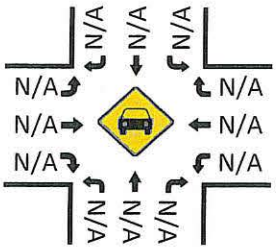
Total Vehicles (AM)



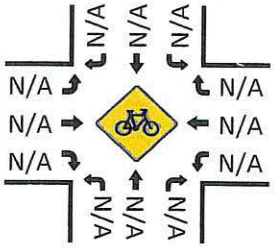
Bikes (AM)



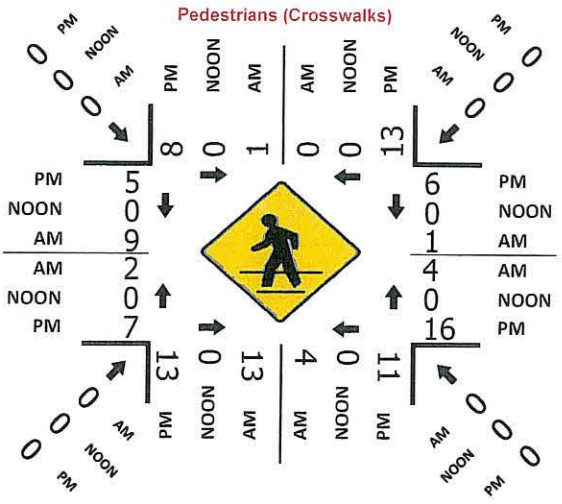
Total Vehicles (NOON)



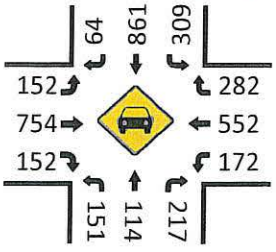
Bikes (NOON)



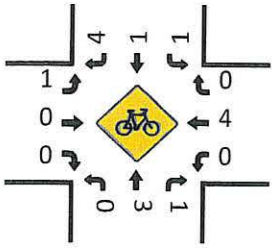
Pedestrians (Crosswalks)



Total Vehicles (PM)



Bikes (PM)



Prepared by National Data & Surveying Services

Attachment C-5

Lakewood Blvd & Michelson St

Peak Hour Turning Movement Count

ID: 17-05662-003
City: Lakewood

Day: Thursday
Date: 10/05/2017

PEAK HOURS

AM: 07:30 AM - 08:30 AM
NOON: NONE
PM: 05:00 PM - 06:00 PM

COUNT PERIODS

AM: 07:00 AM - 09:00 AM
NOON: NONE
PM: 04:00 PM - 06:00 PM

Lakewood Blvd — SOUTHBOUND

AM	16	1230	53	4	839	AM
NOON	0	0	0	0	0	NOON
PM	16	1173	18	11	1555	PM

Michelson St — EASTBOUND

AM	NOON	PM		
45	0	71	⇦	
0	0	0	↶	0
7	0	1	↰	0
3	0	1	→	1
48	0	51	↱	0
AM	NOON	PM		

CONTROL

2-Way Stop(EB/WB)

TEV	2249 AM	0 NOON	2911 PM
PHF	0.91		0.96

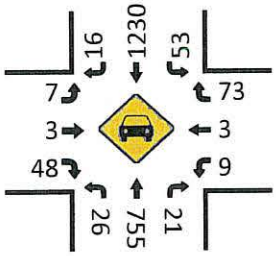
WESTBOUND — Michelson St

PM	NOON	AM		
39	0	73	↰	0
0	0	3	←	1
6	0	9	↲	0
0	0	0	↶	0
51	0	77	⇨	
PM	NOON	AM		

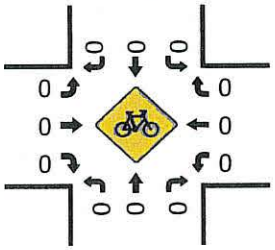
Lakewood Blvd — NORTHBOUND

PM	1234	4	55	1504	32	PM
NOON	0	0	0	0	0	NOON
AM	1288	1	26	755	21	AM

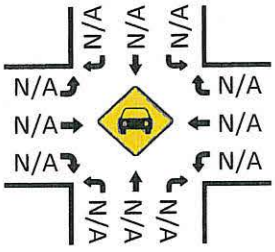
Total Vehicles (AM)



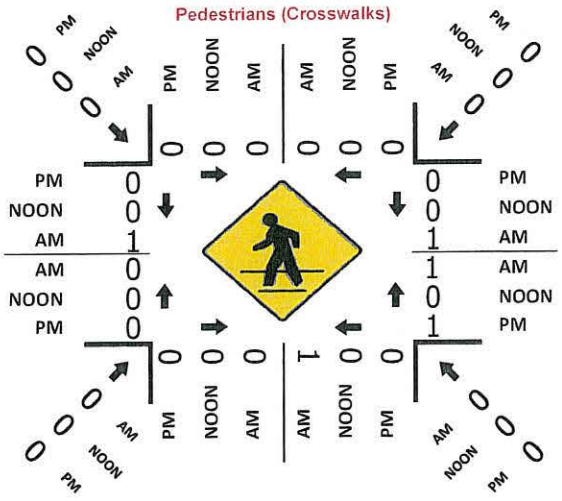
Bikes (AM)



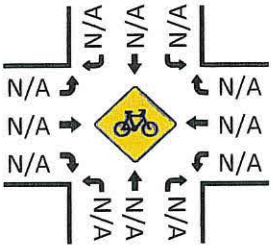
Total Vehicles (NOON)



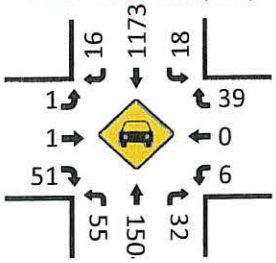
Pedestrians (Crosswalks)



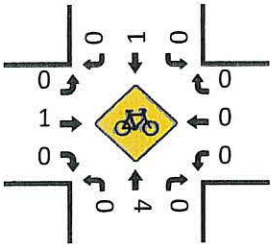
Bikes (NOON)



Total Vehicles (PM)



Bikes (PM)



Prepared by National Data & Surveying Services

Attachment C-6

Lakewood Blvd & South St

Peak Hour Turning Movement Count

ID: 17-05662-004
City: Lakewood

Day: Thursday
Date: 10/05/2017

PEAK HOURS

AM: 07:30 AM - 08:30 AM
NOON: NONE
PM: 05:00 PM - 06:00 PM

COUNT PERIODS

AM: 07:00 AM - 09:00 AM
NOON: NONE
PM: 04:00 PM - 06:00 PM

Lakewood Blvd

SOUTHBOUND

AM	147	1036	172	6	931	AM
NOON	0	0	0	0	0	NOON
PM	133	890	206	12	1454	PM

0 3 1 0

EASTBOUND

AM	NOON	PM	
1183	0	1094	⇦
0	0	1	↶ 0
118	0	190	↱ 1
610	0	914	→ 2
90	0	156	↴ 1
AM	NOON	PM	

CONTROL

Signalized

TEV	4239 AM	0 NOON	5057 PM
PHF	0.95		0.97

WESTBOUND

PM	NOON	AM	
110	0	164	1 ↰
738	0	897	3 ←
158	0	150	1 ↰
0	0	0	0 ↶
1295	0	844	⇨
PM	NOON	AM	

1 3 1 0

NORTHBOUND

PM	1214	10	222	1142	175	PM
NOON	0	0	0	0	0	NOON
AM	1281	5	139	643	62	AM

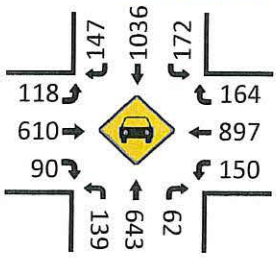
0 1 3 0

Lakewood Blvd

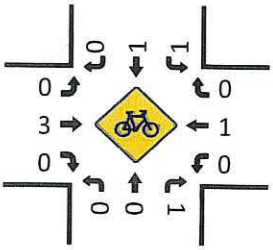
South St

South St

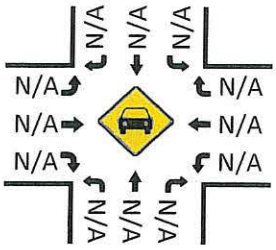
Total Vehicles (AM)



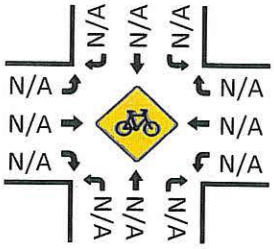
Bikes (AM)



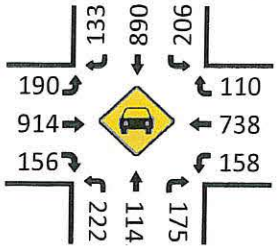
Total Vehicles (NOON)



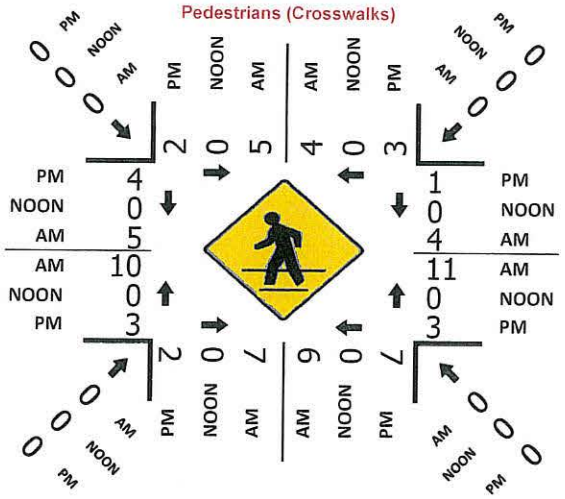
Bikes (NOON)



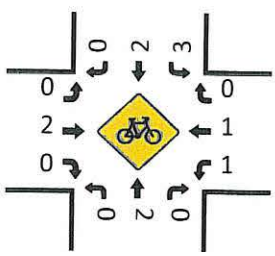
Total Vehicles (PM)



Pedestrians (Crosswalks)



Bikes (PM)



Lakewood Blvd & Hedda St

Peak Hour Turning Movement Count

ID: 17-05662-005
City: Lakewood

Day: Thursday
Date: 10/05/2017

PEAK HOURS

AM	07:30 AM - 08:30 AM
NOON	NONE
PM	05:00 PM - 06:00 PM

COUNT PERIODS

AM	07:00 AM - 09:00 AM
NOON	NONE
PM	04:00 PM - 06:00 PM

Lakewood Blvd — SOUTHBOUND

AM	4	1301	50	0	957 AM
NOON	0	0	0	0	0 NOON
PM	8	1152	61	1	1446 PM

0 3 1 0

Hedda St — EASTBOUND

AM	NOON	PM	
35	0	65	
0	0	0	0
8	0	4	0
1	0	3	1
84	0	78	0
AM	NOON	PM	

CONTROL

2-Way Stop(EB/WB)

TEV	2457 AM	0 NOON	2856 PM
PHF	0.94		0.98

Hedda St — WESTBOUND

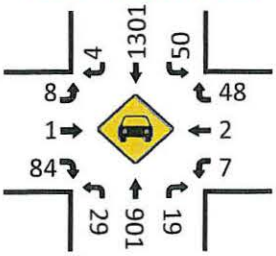
PM	NOON	AM	
0	29	0	48
1	0	0	2
0	1	0	7
0	0	0	0
	106	0	70
PM	NOON	AM	

0 1 3 0

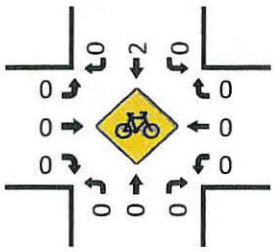
Lakewood Blvd — NORTHBOUND

PM	1239	8	57	1412	42 PM
NOON	0	0	0	0	0 NOON
AM	1395	3	29	901	19 AM

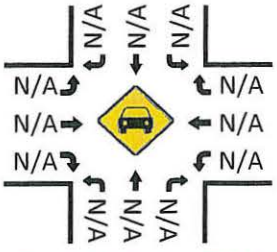
Total Vehicles (AM)



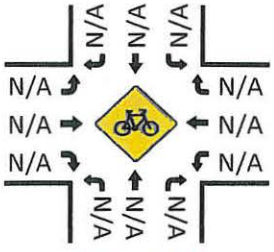
Bikes (AM)



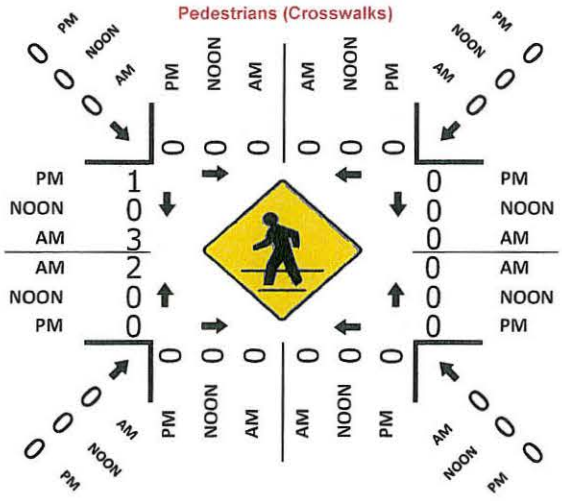
Total Vehicles (NOON)



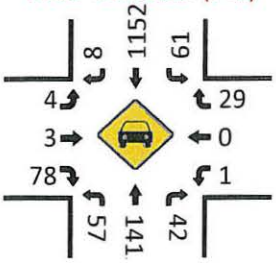
Bikes (NOON)



Pedestrians (Crosswalks)



Total Vehicles (PM)



Bikes (PM)

Prepared by National Data & Surveying Services

Attachment C-8

Lakewood Blvd & Ashworth St

Peak Hour Turning Movement Count

ID: 17-05662-006
City: Lakewood

Day: Thursday
Date: 10/05/2017

PEAK HOURS

AM	07:30 AM - 08:30 AM
NOON	NONE
PM	05:00 PM - 06:00 PM

COUNT PERIODS

AM	07:00 AM - 09:00 AM
NOON	NONE
PM	04:00 PM - 06:00 PM

Lakewood Blvd — SOUTHBOUND

AM	36	1296	25	4	1060	AM
NOON	0	0	0	0	0	NOON
PM	39	1193	44	4	1471	PM

0 3 1 0

Ashworth St — EASTBOUND

AM	NOON	PM	
60	0	84	
0	0	0	0
43	0	32	0
28	0	45	1
20	0	22	0
AM	NOON	PM	

CONTROL

Signalized

TEV	2516 AM	0 NOON	2901 PM
PHF	0.95		0.97

Ashworth St — WESTBOUND

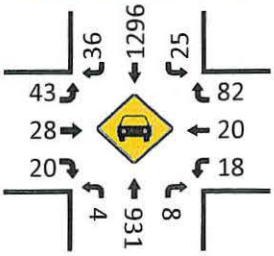
PM	NOON	AM	
0	41	0	82
1	33	0	20
0	14	0	18
0	0	0	0
	113	0	61
PM	NOON	AM	

0 1 3 0

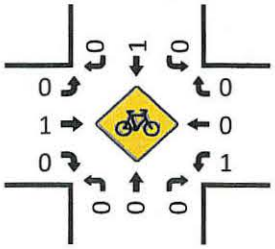
Lakewood Blvd — NORTHBOUND

PM	1233	4	12	1394	24	PM
NOON	0	0	0	0	0	NOON
AM	1335	1	4	931	8	AM

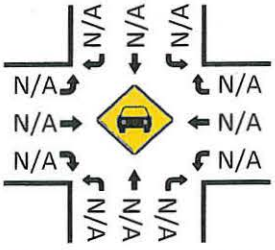
Total Vehicles (AM)



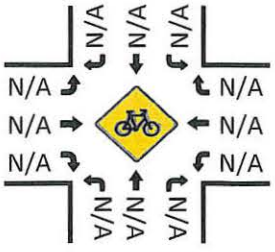
Bikes (AM)



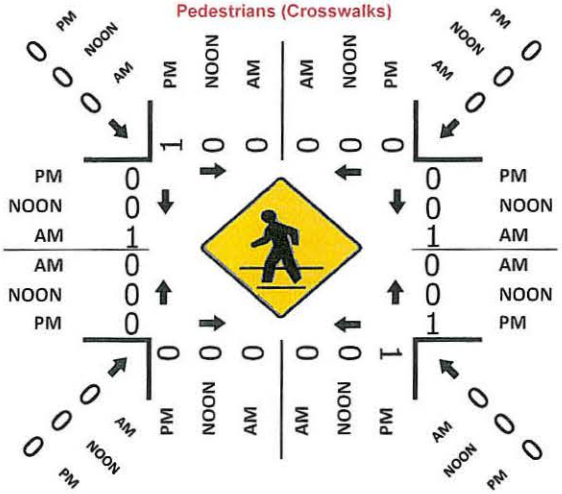
Total Vehicles (NOON)



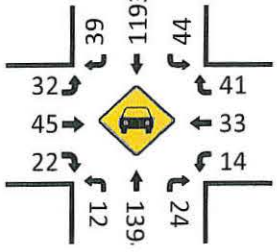
Bikes (NOON)



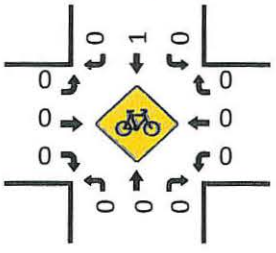
Pedestrians (Crosswalks)



Total Vehicles (PM)



Bikes (PM)



INTERSECTION CAPACITY UTILIZATION CALCULATION SHEET

Intersection:	Lakewood Boulevard at Hardwick Street	**Peak Hour:**	AM
Scenario:	Existing	**Date Collected:**	10/5/2017
Analyst:	NS	**Agency:**	City of Lakewood

Movement	Volume	Number of Lanes	Capacity	V/C Ratio	Critical Movements	Total
NB Left	104	1	1600	0.065	x	
NB Thru	801	3	4800	0.167		
NB Right	32	1	1600	0.020		
						0.361
SB Left	49	2	2880	0.017		
SB Thru	1381	3	4800	0.296	x	
SB Right	42	0	0	0.000		
EB Left	42	1	1600	0.026		
EB Thru	18	2	3200	0.041	x	
EB Right	112	0	0	0.000		
						0.041
WB Left	18	0	0	0.000	x	
WB Thru	4	2	3200	0.009		
WB Right	8	0	0	0.000		

Sum of Critical V/C Ratios	0.402
Adjustment for Lost Time	0.100
Intersection Capacity Utilization (ICU)	0.502
Level of Service (LOS) - Refer to table below	A

Notes:				Comments:	LOS	Maximum V/C Ratio
					A	0.6
1. Per lane Capacity	=	1,600	VPH		B	0.7
2. Dual turn lane Capacity	=	2,880	VPH		C	0.8
3. Intersection Type:	4-Way	X			D	0.9
	T				E	1.0
	Split N/S				F	n/a
	Split E/W					

INTERSECTION CAPACITY UTILIZATION CALCULATION SHEET

Intersection:	**Lakewood Boulevard at Hardwick Street**	**Peak Hour:**	**PM**
Scenario:	**Existing**	**Date Collected:**	**10/5/2017**
Analyst:	**NS**	**Agency:**	**City of Lakewood**

Movement	Volume	Number of Lanes	Capacity	V/C Ratio	Critical Movements	Total
NB Left	219	1	1600	0.137		
NB Thru	1405	3	4800	0.293	x	
NB Right	137	1	1600	0.086		
						0.377
SB Left	244	2	2880	0.085	x	
SB Thru	1009	3	4800	0.235		
SB Right	120	0	0	0.000		
EB Left	145	1	1600	0.091	x	
EB Thru	64	2	3200	0.059		
EB Right	126	0	0	0.000		
						0.199
WB Left	109	0	0	0.000		
WB Thru	78	2	3200	0.109	x	
WB Right	161	0	0	0.000		
Sum of Critical V/C Ratios						0.577
Adjustment for Lost Time						0.100
Intersection Capacity Utilization (ICU)						0.677
Level of Service (LOS) - Refer to table below						B

Notes:				Comments:	LOS	Maximum V/C Ratio
					A	0.6
1. Per lane Capacity	=	1,600	VPH		B	0.7
2. Dual turn lane Capacity	=	2,880	VPH		C	0.8
3. Intersection Type:	4-Way	X			D	0.9
	T				E	1.0
	Split N/S				F	n/a
	Split E/W					

INTERSECTION CAPACITY UTILIZATION CALCULATION SHEET

Intersection:	Lakewood Boulevard at Hardwick Street	**Peak Hour:**	AM
Scenario:	Existing plus Project	**Date Collected:**	10/5/2017
Analyst:	NS	**Agency:**	City of Lakewood

Movement	Volume	Number of Lanes	Capacity	V/C Ratio	Critical Movements	Total
NB Left	104	2	2880	0.036	x	
NB Thru	801	3	4800	0.167		
NB Right	32	1	1600	0.020		
						0.333
SB Left	49	2	2880	0.017		
SB Thru	1381	3	4800	0.296	x	
SB Right	42	0	0	0.000		
EB Left	42	1	1600	0.026		
EB Thru	18	2	3200	0.041	x	
EB Right	112	0	0	0.000		
						0.041
WB Left	18	0	0	0.000	x	
WB Thru	4	2	3200	0.009		
WB Right	8	0	0	0.000		
Sum of Critical V/C Ratios						0.373
Adjustment for Lost Time						0.100
Intersection Capacity Utilization (ICU)						0.473
Level of Service (LOS) - Refer to table below						A

Notes:				Comments:	LOS	Maximum V/C Ratio
					A	0.6
1. Per lane Capacity	=	1,600	VPH		B	0.7
2. Dual turn lane Capacity	=	2,880	VPH		C	0.8
3. Intersection Type:	4-Way	X			D	0.9
	T				E	1.0
	Split N/S				F	n/a
	Split E/W					

INTERSECTION CAPACITY UTILIZATION CALCULATION SHEET

Intersection:	Lakewood Boulevard at Hardwick Street	**Peak Hour:**	PM
Scenario:	Existing plus Project	**Date Collected:**	10/5/2017
Analyst:	NS	**Agency:**	City of Lakewood

Movement	Volume	Number of Lanes	Capacity	V/C Ratio	Critical Movements	Total
NB Left	219	2	2880	0.076		
NB Thru	1405	3	4800	0.293	x	
NB Right	137	1	1600	0.086		
						0.377
SB Left	244	2	2880	0.085	x	
SB Thru	1009	3	4800	0.235		
SB Right	120	0	0	0.000		
EB Left	145	1	1600	0.091	x	
EB Thru	64	2	3200	0.059		
EB Right	126	0	0	0.000		
						0.199
WB Left	109	0	0	0.000		
WB Thru	78	2	3200	0.109	x	
WB Right	161	0	0	0.000		

Sum of Critical V/C Ratios	0.577
Adjustment for Lost Time	0.100
Intersection Capacity Utilization (ICU)	0.677
Level of Service (LOS) - Refer to table below	B

Notes:				Comments:	LOS	Maximum V/C Ratio
					A	0.6
1. Per lane Capacity	=	1,600	VPH		B	0.7
2. Dual turn lane Capacity	=	2,880	VPH		C	0.8
3. Intersection Type:	4-Way	X			D	0.9
	T				E	1.0
	Split N/S				F	n/a
	Split E/W					

INTERSECTION CAPACITY UTILIZATION CALCULATION SHEET

Intersection:	Lakewood Boulevard at Hardwick Street	**Peak Hour:** AM	
Scenario:	Existing plus future regional growth (2022)	**Date Collected:** 10/5/2017	**Agency:** City of Lakewood

Movement	Volume	Number of Lanes	Capacity	V/C Ratio	Critical Movements	Total
NB Left	107	1	1600	0.067	x	
NB Thru	828	3	4800	0.173		
NB Right	33	1	1600	0.021		
						0.373
SB Left	51	2	2880	0.018		
SB Thru	1427	3	4800	0.306	x	
SB Right	43	0	0	0.000		
EB Left	43	1	1600	0.027		
EB Thru	19	2	3200	0.042	x	
EB Right	116	0	0	0.000		
						0.042
WB Left	19	0	0	0.000	x	
WB Thru	4	2	3200	0.010		
WB Right	8	0	0	0.000		
Sum of Critical V/C Ratios						0.415
Adjustment for Lost Time						0.100
Intersection Capacity Utilization (ICU)						0.515
Level of Service (LOS) - Refer to table below						A

Notes:

1. Per lane Capacity = 1,600 VPH
2. Dual turn lane Capacity = 2,880 VPH
3. Intersection Type: 4-Way X
   T
   Split N/S
   Split E/W

Comments:

LOS	Maximum V/C Ratio
A	0.6
B	0.7
C	0.8
D	0.9
E	1.0
F	n/a

INTERSECTION CAPACITY UTILIZATION CALCULATION SHEET

Intersection:	Lakewood Boulevard at Hardwick Street	Peak Hour: PM
Scenario:	Existing plus future regional growth (2022)	Date Collected: 10/5/2017
		Agency: City of Lakewood

Movement	Volume	Number of Lanes	Capacity	V/C Ratio	Critical Movements	Total
NB Left	226	1	1600	0.141		
NB Thru	1452	3	4800	0.303	x	
NB Right	142	1	1600	0.089		
						0.390
SB Left	252	2	2880	0.088	x	
SB Thru	1043	3	4800	0.243		
SB Right	124	0	0	0.000		
EB Left	150	1	1600	0.094	x	
EB Thru	66	2	3200	0.061		
EB Right	130	0	0	0.000		
						0.206
WB Left	113	0	0	0.000		
WB Thru	81	2	3200	0.113	x	
WB Right	166	0	0	0.000		
Sum of Critical V/C Ratios						0.596
Adjustment for Lost Time						0.100
Intersection Capacity Utilization (ICU)						0.696
Level of Service (LOS) - Refer to table below						B

Notes:				Comments:	LOS	Maximum V/C Ratio
					A	0.6
1. Per lane Capacity	=	1,600	VPH		B	0.7
2. Dual turn lane Capacity	=	2,880	VPH		C	0.8
3. Intersection Type:	4-Way	X			D	0.9
	T				E	1.0
	Split N/S				F	n/a
	Split E/W					

INTERSECTION CAPACITY UTILIZATION CALCULATION SHEET

Intersection:	**Lakewood Boulevard at Hardwick Street**	**Peak Hour:**	**AM**
Scenario:	**Existing plus future regional growth (2022) plus project**	**Date Collected:**	**10/5/2017**
		Agency:	**City of Lakewood**

Movement	Volume	Number of Lanes	Capacity	V/C Ratio	Critical Movements	Total
NB Left	107	2	2880	0.037	X	
NB Thru	828	3	4800	0.173		
NB Right	33	1	1600	0.021		
						0.343
SB Left	51	2	2880	0.018		
SB Thru	1427	3	4800	0.306	X	
SB Right	43	0	0	0.000		
EB Left	43	1	1600	0.027		
EB Thru	19	2	3200	0.042	X	
EB Right	116	0	0	0.000		
						0.042
WB Left	19	0	0	0.000	X	
WB Thru	4	2	3200	0.010		
WB Right	8	0	0	0.000		
Sum of Critical V/C Ratios						0.386
Adjustment for Lost Time						0.100
Intersection Capacity Utilization (ICU)						0.486
Level of Service (LOS) - Refer to table below						A

Notes:				Comments:	LOS	Maximum V/C Ratio
					A	0.6
1. Per lane Capacity	=	1,600	VPH		B	0.7
2. Dual turn lane Capacity	=	2,880	VPH		C	0.8
3. Intersection Type:	4-Way	X			D	0.9
	T				E	1.0
	Split N/S				F	n/a
	Split E/W					

INTERSECTION CAPACITY UTILIZATION CALCULATION SHEET

Intersection:	Lakewood Boulevard at Hardwick Street	**Peak Hour:** PM	
Scenario:	Existing plus future regional growth (2022) plus project	**Date Collected:**	10/5/2017
		Agency:	City of Lakewood

Movement	Volume	Number of Lanes	Capacity	V/C Ratio	Critical Movements	Total
NB Left	226	2	2880	0.078		
NB Thru	1452	3	4800	0.303	x	
NB Right	142	1	1600	0.089		
						0.390
SB Left	252	2	2880	0.088	x	
SB Thru	1043	3	4800	0.243		
SB Right	124	0	0	0.000		
EB Left	150	1	1600	0.094	x	
EB Thru	66	2	3200	0.061		
EB Right	130	0	0	0.000		
						0.206
WB Left	113	0	0	0.000		
WB Thru	81	2	3200	0.113	x	
WB Right	166	0	0	0.000		
Sum of Critical V/C Ratios						0.596
Adjustment for Lost Time						0.100
Intersection Capacity Utilization (ICU)						0.696
Level of Service (LOS) - Refer to table below						B

Notes:				Comments:	LOS	Maximum V/C Ratio
					A	0.6
1. Per lane Capacity	=	1,600	VPH		B	0.7
2. Dual turn lane Capacity	=	2,880	VPH		C	0.8
3. Intersection Type:	4-Way	X			D	0.9
	T				E	1.0
	Split N/S				F	n/a
	Split E/W					

Table E-1

Roadway Segment Level of Service Analysis[1]

Del Amo Boulevard - Candlewood Street

Scenario	Peak Hour[2]	Capacity per Lane[3]	Number of Lanes		Volume		Capacity		V/C Ratio		Level of Service	
			NB	SB	NB	SB	NB	SB	NB	SB	NB	SB
Existing	AM	1600	3	3	856	1,437	4800	4800	0.178	0.299	A	A
	MD	1600	3	3	1,484	1,255	4800	4800	0.309	0.261	A	A
	PM	1600	3	3	1,712	1,314	4800	4800	0.357	0.274	A	A
Existing + Project	AM	1600	3	3	856	1,437	4800	4800	0.178	0.299	A	A
	MD	1600	3	3	1,484	1,255	4800	4800	0.309	0.261	A	A
	PM	1600	3	3	1,712	1,314	4800	4800	0.357	0.274	A	A
Pre-Project (2022)	AM	1600	3	3	884	1,486	4800	4800	0.184	0.309	A	A
	MD	1600	3	3	1,533	1,297	4800	4800	0.319	0.270	A	A
	PM	1600	3	3	1,769	1,358	4800	4800	0.369	0.283	A	A
Opening Year + Project (2022)	AM	1600	3	3	884	1,486	4800	4800	0.184	0.309	A	A
	MD	1600	3	3	1,533	1,297	4800	4800	0.319	0.270	A	A
	PM	1600	3	3	1,769	1,358	4800	4800	0.369	0.283	A	A

[1] Based on the Level of Service analysis methodology used in the *Lakewood General Plan Circulation Element*.

[2] The peak hour was determined by the largest volumes in a 1-hour period from the 24-hour counts.

[3] Peak hour capacity for a Primary Arterial from the *Lakewood General Plan Circulation Element*.

Table E-2

Roadway Segment Level of Service Analysis[1]

Candlewood Street - Ashworth Street

Scenario	Peak Hour[2]	Capacity per Lane[3]	Number of Lanes		Volume		Capacity		V/C Ratio		Level of Service	
			NB	SB	NB	SB	NB	SB	NB	SB	NB	SB
Existing	AM	1600	3	3	1,106	1,498	4800	4800	0.230	0.312	A	A
	MD	1600	3	3	1,272	1,231	4800	4800	0.265	0.256	A	A
	PM	1600	3	3	1,577	1,255	4800	4800	0.329	0.261	A	A
Existing + Project	AM	1600	3	3	1,106	1,498	4800	4800	0.230	0.312	A	A
	MD	1600	3	3	1,272	1,231	4800	4800	0.265	0.256	A	A
	PM	1600	3	3	1,577	1,255	4800	4800	0.329	0.261	A	A
Pre-Project (2022)	AM	1600	3	3	1,143	1,549	4800	4800	0.238	0.323	A	A
	MD	1600	3	3	1,315	1,273	4800	4800	0.274	0.265	A	A
	PM	1600	3	3	1,630	1,297	4800	4800	0.340	0.270	A	A
Opening Year + Project (2022)	AM	1600	3	3	1,143	1,549	4800	4800	0.238	0.323	A	A
	MD	1600	3	3	1,315	1,273	4800	4800	0.274	0.265	A	A
	PM	1600	3	3	1,630	1,297	4800	4800	0.340	0.270	A	A

[1] Based on the Level of Service analysis methodology used in the *Lakewood General Plan Circulation Element*.

[2] The peak hour was determined by the largest volumes in a 1-hour period from the 24-hour counts.

[3] Peak hour capacity for a Primary Arterial from the *Lakewood General Plan Circulation Element*.

APPENDIX G:
AB 52 CONSULTATION LETTERS

March 15, 2018

Gabrielino Tongva Indians of California Tribal Council
Robert F. Dorame, Tribal Chair/Cultural Resources
P.O. Box 490
Bellflower, CA 90707

RE: AB-52 Notification for the Lakewood Boulevard Capacity Enhancement Project, Lakewood, California

Dear Mr. Dorame:

Under Assembly Bill 52 (AB-52), codified as Section 21080.3.1 of the California Environmental Quality Act (CEQA), the City of Lakewood is required to provide formal notification to California Native American Tribes of proposed projects within 14 days of determining that a project's application is complete. We are sending you this notice because you had requested notification of certain projects that are subject to CEQA. The preliminary engineering and planning process for this project has begun and includes preparation of an Initial Study/Mitigated Negative Declaration for CEQA compliance. As part of this planning process, you have the opportunity to review this project.

Project Location: The project site is Lakewood Boulevard, from North City Limits to Del Amo Boulevard

Enclosed please find a project description and a vicinity map of the project area. The proposed project consists of a Class I bikeway, roadway, storm drain, utility undergrounding (overhead power lines) and streetscape improvements along Lakewood Boulevard. The project will occur in two phases as the proposed utility undergrounding will be performed by Southern California Edison in the first phase of construction, and thereafter, followed by the proposed bike/roadway, storm drain and streetscape improvements in the second phase of the project.

If there is information regarding sites, traditional cultural properties, or other cultural resource considerations within the project area that you would like to share, or request further information, please contact Max Withrow as soon as possible at:

City of Lakewood
Attention: Max Withrow, Assistant Director of Public Works
5050 Clark Avenue
Lakewood, CA 90712
mwithrow@lakewoodcity.org

Please reference "Lakewood Boulevard Capacity Enhancement Project" in any e-mails and correspondence.

CITY OF LAKEWOOD

Sincerely,

Max Withrow, P.E.
Assistant Director of Public Works

Attachments: Project Description, Project Location Map, and Site Layout Exhibit

March 15, 2018

Gabrielino/Tongva Nation
Sam Dunlap, Cultural Resources Director
P.O. Box 86908
Los Angeles, CA 90086

RE: AB-52 Notification for the Lakewood Boulevard Capacity Enhancement Project, Lakewood, California

Dear Mr. Dunlap:

Under Assembly Bill 52 (AB-52), codified as Section 21080.3.1 of the California Environmental Quality Act (CEQA), the City of Lakewood is required to provide formal notification to California Native American Tribes of proposed projects within 14 days of determining that a project's application is complete. We are sending you this notice because you had requested notification of certain projects that are subject to CEQA. The preliminary engineering and planning process for this project has begun and includes preparation of an Initial Study/Mitigated Negative Declaration for CEQA compliance. As part of this planning process, you have the opportunity to review this project.

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If there is information regarding sites, traditional cultural properties, or other cultural resource considerations within the project area that you would like to share, or request further information, please contact Max Withrow as soon as possible at:

City of Lakewood
Attention: Max Withrow, Assistant Director of Public Works
5050 Clark Avenue
Lakewood, CA 90712
mwithrow@lakewoodcity.org

COPY

Please reference "Lakewood Boulevard Capacity Enhancement Project" in any e-mails and correspondence.

CITY OF LAKEWOOD

Sincerely,

Max Withrow, P.E.
Assistant Director of Public Works

Attachments: Project Description, Project Location Map, and Site Layout Exhibit

March 15, 2018

Gabrielino/Tongva Nation
Sandonne Goad, Chairperson
106 ½ Judge John Aiso Street, #231
Los Angeles, CA 90012

RE: AB-52 Notification for the Lakewood Boulevard Capacity Enhancement Project, Lakewood, California

Dear Ms. Goad:

Under Assembly Bill 52 (AB-52), codified as Section 21080.3.1 of the California Environmental Quality Act (CEQA), the City of Lakewood is required to provide formal notification to California Native American Tribes of proposed projects within 14 days of determining that a project's application is complete. We are sending you this notice because you had requested notification of certain projects that are subject to CEQA. The preliminary engineering and planning process for this project has begun and includes preparation of an Initial Study/Mitigated Negative Declaration for CEQA compliance. As part of this planning process, you have the opportunity to review this project.

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City of Lakewood
Attention: Max Withrow, Assistant Director of Public Works
5050 Clark Avenue
Lakewood, CA 90712
mwithrow@lakewoodcity.org

Lakewood COPY

Please reference "Lakewood Boulevard Capacity Enhancement Project" in any e-mails and correspondence.

CITY OF LAKEWOOD

Sincerely,

Max Withrow, P.E.
Assistant Director of Public Works

Attachments: Project Description, Project Location Map, and Site Layout Exhibit

March 15, 2018

Tongva Ancestral Territorial Tribal Nation
John Tommy Rosas, Tribal Administrator.
Email: tattnlaw@gmail.com

RE: AB-52 Notification for the Lakewood Boulevard Capacity Enhancement Project, Lakewood, California

Dear Mr. Rosas:

Under Assembly Bill 52 (AB-52), codified as Section 21080.3.1 of the California Environmental Quality Act (CEQA), the City of Lakewood is required to provide formal notification to California Native American Tribes of proposed projects within 14 days of determining that a project's application is complete. We are sending you this notice because you had requested notification of certain projects that are subject to CEQA. The preliminary engineering and planning process for this project has begun and includes preparation of an Initial Study/Mitigated Negative Declaration for CEQA compliance. As part of this planning process, you have the opportunity to review this project.

Project Location: The project site is Lakewood Boulevard, from North City Limits to Del Amo Boulevard

Enclosed please find a project description and a vicinity map of the project area. The proposed project consists of a Class I bikeway, roadway, storm drain, utility undergrounding (overhead power lines) and streetscape improvements along Lakewood Boulevard. The project will occur in two phases as the proposed utility undergrounding will be performed by Southern California Edison in the first phase of construction, and thereafter, followed by the proposed bike/roadway, storm drain and streetscape improvements in the second phase of the project.

If there is information regarding sites, traditional cultural properties, or other cultural resource considerations within the project area that you would like to share, or request further information, please contact Max Withrow as soon as possible at:

City of Lakewood
Attention: Max Withrow, Assistant Director of Public Works
5050 Clark Avenue
Lakewood, CA 90712
mwithrow@lakewoodcity.org

COPY

Please reference "Lakewood Boulevard Capacity Enhancement Project" in any e-mails and correspondence.

CITY OF LAKEWOOD

Sincerely,

Max Withrow, P.E.
Assistant Director of Public Works

Attachments: Project Description, Project Location Map, and Site Layout Exhibit

March 15, 2018

Gabrieleno/Tongva
San Gabriel Band of Mission Indians
Anthony Morales, Chairperson
P.O. Box 693
San Gabriel, CA 91778

RE: AB-52 Notification for the Lakewood Boulevard Capacity Enhancement Project, Lakewood, California

Dear Mr. Morales:

Under Assembly Bill 52 (AB-52), codified as Section 21080.3.1 of the California Environmental Quality Act (CEQA), the City of Lakewood is required to provide formal notification to California Native American Tribes of proposed projects within 14 days of determining that a project's application is complete. We are sending you this notice because you had requested notification of certain projects that are subject to CEQA. The preliminary engineering and planning process for this project has begun and includes preparation of an Initial Study/Mitigated Negative Declaration for CEQA compliance. As part of this planning process, you have the opportunity to review this project.

Project Location: The project site is Lakewood Boulevard, from North City Limits to Del Amo Boulevard

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If there is information regarding sites, traditional cultural properties, or other cultural resource considerations within the project area that you would like to share, or request further information, please contact Max Withrow as soon as possible at:

City of Lakewood
Attention: Max Withrow, Assistant Director of Public Works
5050 Clark Avenue
Lakewood, CA 90712
mwithrow@lakewoodcity.org

COPY

Please reference "Lakewood Boulevard Capacity Enhancement Project" in any e-mails and correspondence.

CITY OF LAKEWOOD

Sincerely,

Max Withrow, P.E.
Assistant Director of Public Works

Attachments: Project Description, Project Location Map, and Site Layout Exhibit

March 15, 2018

Gabrieleno Bank of Mission Indians – Kizh Nation
Andrew Salas, Chairperson
P.O. Box 393
Covina, CA 91723

RE: AB-52 Notification for the Lakewood Boulevard Capacity Enhancement Project, Lakewood, California

Dear Mr. Salas:

Under Assembly Bill 52 (AB-52), codified as Section 21080.3.1 of the California Environmental Quality Act (CEQA), the City of Lakewood is required to provide formal notification to California Native American Tribes of proposed projects within 14 days of determining that a project's application is complete. We are sending you this notice because you had requested notification of certain projects that are subject to CEQA. The preliminary engineering and planning process for this project has begun and includes preparation of an Initial Study/Mitigated Negative Declaration for CEQA compliance. As part of this planning process, you have the opportunity to review this project.

Project Location: The project site is Lakewood Boulevard, from North City Limits to Del Amo Boulevard

Enclosed please find a project description and a vicinity map of the project area. The proposed project consists of a Class I bikeway, roadway, storm drain, utility undergrounding (overhead power lines) and streetscape improvements along Lakewood Boulevard. The project will occur in two phases as the proposed utility undergrounding will be performed by Southern California Edison in the first phase of construction, and thereafter, followed by the proposed bike/roadway, storm drain and streetscape improvements in the second phase of the project.

If there is information regarding sites, traditional cultural properties, or other cultural resource considerations within the project area that you would like to share, or request further information, please contact Max Withrow as soon as possible at:

City of Lakewood
Attention: Max Withrow, Assistant Director of Public Works
5050 Clark Avenue
Lakewood, CA 90712
mwithrow@lakewoodcity.org

COPY

Please reference "Lakewood Boulevard Capacity Enhancement Project" in any e-mails and correspondence.

CITY OF LAKEWOOD

Sincerely,

Max Withrow, P.E.
Assistant Director of Public Works

Attachments: Project Description, Project Location Map, and Site Layout Exhibit

March 15, 2018

Gabrielino-Tongva Tribe
Linda Candelaria, Co-Chairperson
1999 Avenue of the Stars, Suite 1100
Los Angeles, CA 90067

RE: AB-52 Notification for the Lakewood Boulevard Capacity Enhancement Project, Lakewood, California

Dear Ms. Candelaria:

Under Assembly Bill 52 (AB-52), codified as Section 21080.3.1 of the California Environmental Quality Act (CEQA), the City of Lakewood is required to provide formal notification to California Native American Tribes of proposed projects within 14 days of determining that a project's application is complete. We are sending you this notice because you had requested notification of certain projects that are subject to CEQA. The preliminary engineering and planning process for this project has begun and includes preparation of an Initial Study/Mitigated Negative Declaration for CEQA compliance. As part of this planning process, you have the opportunity to review this project.

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City of Lakewood
Attention: Max Withrow, Assistant Director of Public Works
5050 Clark Avenue
Lakewood, CA 90712
mwithrow@lakewoodcity.org

COPY

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CITY OF LAKEWOOD

Sincerely,

Max Withrow, P.E.
Assistant Director of Public Works

Attachments: Project Description, Project Location Map, and Site Layout Exhibit

March 15, 2018

Gabrielino-Tongva Tribe
Bernie Acuna, Co-Chairperson
1999 Avenue of the Stars, Suite 1100
Los Angeles, CA 90067

RE: AB-52 Notification for the Lakewood Boulevard Capacity Enhancement Project, Lakewood, California

Dear Mr. Acuna:

Under Assembly Bill 52 (AB-52), codified as Section 21080.3.1 of the California Environmental Quality Act (CEQA), the City of Lakewood is required to provide formal notification to California Native American Tribes of proposed projects within 14 days of determining that a project's application is complete. We are sending you this notice because you had requested notification of certain projects that are subject to CEQA. The preliminary engineering and planning process for this project has begun and includes preparation of an Initial Study/Mitigated Negative Declaration for CEQA compliance. As part of this planning process, you have the opportunity to review this project.

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City of Lakewood
Attention: Max Withrow, Assistant Director of Public Works
5050 Clark Avenue
Lakewood, CA 90712
mwithrow@lakewoodcity.org

COPY

Please reference "Lakewood Boulevard Capacity Enhancement Project" in any e-mails and correspondence.

CITY OF LAKEWOOD

Sincerely,

Max Withrow, P.E.
Assistant Director of Public Works

Attachments: Project Description, Project Location Map, and Site Layout Exhibit

March 15, 2018

Gabrielino-Tongva Tribe
Conrad Acuna
1999 Avenue of the Stars, Suite 1100
Los Angeles, CA 90067

RE: AB-52 Notification for the Lakewood Boulevard Capacity Enhancement Project, Lakewood, California

Dear Mr. Acuna:

Under Assembly Bill 52 (AB-52), codified as Section 21080.3.1 of the California Environmental Quality Act (CEQA), the City of Lakewood is required to provide formal notification to California Native American Tribes of proposed projects within 14 days of determining that a project's application is complete. We are sending you this notice because you had requested notification of certain projects that are subject to CEQA. The preliminary engineering and planning process for this project has begun and includes preparation of an Initial Study/Mitigated Negative Declaration for CEQA compliance. As part of this planning process, you have the opportunity to review this project.

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City of Lakewood
Attention: Max Withrow, Assistant Director of Public Works
5050 Clark Avenue
Lakewood, CA 90712
mwithrow@lakewoodcity.org

COPY

Please reference "Lakewood Boulevard Capacity Enhancement Project" in any e-mails and correspondence.

CITY OF LAKEWOOD

Sincerely,

Max Withrow, P.E.
Assistant Director of Public Works

Attachments: Project Description, Project Location Map, and Site Layout Exhibit

GABRIELEÑO BAND OF MISSION INDIANS - KIZH NATION
Historically known as The San Gabriel Band of Mission Indians
recognized by the State of California as the aboriginal tribe of the Los Angeles basin

City of Lakewood
5050 Clark Ave
Lakewood, CA 9012

March 21, 2018

Re: AB52 Consultation request for the Lakewood Blvd Capacity Enhancement Project

Dear Max Withrow,

Please find this letter as a written request for consultation regarding the above-mentioned project pursuant to Public Resources Code § 21080.3.1, subd. (d). Your project lies within our ancestral tribal territory, meaning belonging to or inherited from, which is a higher degree of kinship than traditional or cultural affiliation. Your project is located within a sensitive area and may cause a substantial adverse change in the significance of our tribal cultural resources. Most often, a records search for our tribal cultural resources will result in a "no records found" for the project area. The Native American Heritage Commission (NAHC), ethnographers, historians, and professional archaeologists can only provide limited information that has been previously documented about California Native Tribes. This is the reason the NAHC will always refer the lead agency to the respective Native American Tribe of the area because the NAHC is only aware of general information and are not the experts on each California Tribe. Our Elder Committee & tribal historians are the experts for our Tribe and are able to provide a more complete history (both written and oral) regarding the location of historic villages, trade routes, cemeteries and sacred/religious sites in the project area. Therefore, to avoid adverse effects to our tribal cultural resources, we would like to consult with you and your staff to provide you with a more complete understanding of the prehistoric use(s) of the project area and the potential risks for causing a substantial adverse change to the significance of our tribal cultural resources.

Consultation appointments are available on Wednesdays and Thursdays at our offices at 910 N. Citrus Ave. Covina, CA 91722 or over the phone. Please call toll free 1-844-390-0787 or email gabrielenoindians@yahoo.com to schedule an appointment.

** Prior to the first consultation with our Tribe, we ask all those individuals participating in the consultation to view a video produced and provided by CalEPA and the NAHC for sensitivity and understanding of AB52. You can view their videos at: http://calepa.ca.gov/Tribal/Training/ or http://nahc.ca.gov/2015/12/ab-52-tribal-training/

With Respect,

Andrew Salas, Chairman

Andrew Salas, Chairman | Nadine Salas, Vice-Chairman | Christina Swindall Martinez, secretary
Albert Perez, treasurer I | Martha Gonzalez Lemos, treasurer II | Richard Gradias, Chairman of the Council of Elders
PO Box 393, Covina, CA 91723 | www.gabrielenoindians.org | gabrielenoindians@yahoo.com

Robert Sun

From: Max Withrow <MWithrow@lakewoodcity.org>
Sent: Thursday, March 15, 2018 2:57 PM
To: Robert Sun
Cc: Bill Pagett
Subject: FW: AB-52 Notification Lakewood Boulevard Capacity Enhancement Project

Hi Robert. We mailed the letters yesterday and have a copy here that we will give to Bill P. As you know, Mr. Rosas only had an email address listed. Karen emailed his copy and he replied back right away per below. Max

From: Johntommy Rosas [mailto:tattnlaw@gmail.com]
Sent: Wednesday, March 14, 2018 6:03 PM
To: Karen Mahr <KMahr@lakewoodcity.org>
Cc: Max Withrow <MWithrow@lakewoodcity.org>
Subject: Re: AB-52 Notification Lakewood Boulevard Capacity Enhancement Project

thanks
there is some utility excavation s
so please have an archaeological monitor test and monitor those excavation[s] areas -
we can also do the monitoring -we are qualified and insured for that work as well -
we support the project as described and have no negative comments or objections on it
-
thanks jt

On Wed, Mar 14, 2018 at 5:09 PM, Karen Mahr <KMahr@lakewoodcity.org> wrote:

Please be green! Print this e-mail only when necessary. Thank you for helping Lakewood be environmentally responsible.

--
JOHN TOMMY ROSAS
TRIBAL ADMINISTRATOR
TRIBAL LITIGATOR -TATTN JUDICIAL # 0001
TONGVA ANCESTRAL TERRITORIAL TRIBAL NATION
A TRIBAL SOVEREIGN NATION UNDER THE UNDRIP AND AS A TREATY [s] SIGNATORIES RECOGNIZED TRIBE, WITH HISTORICAL & DNA AUTHENTICATION ON CHANNEL ISLANDS AND COASTAL VILLAGES - AND AS A CALIFORNIA NATIVE AMERICAN TRIBE / SB18-AB 52-AJR 42-ACHP/NHPA - CALIFORNIA INDIANS JURISDICTIONAL ACT U S CONGRESS APPROVED MAY 18, 1928 45 STAT. L 602

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WWW.TONGVANATION.ORG

Please be green! Print this e-mail only when necessary. Thank you for helping Lakewood be environmentally responsible.

April 17, 2018

Gabrieleno Band of Mission Indians – Kizh Nation
Mr. Andrew Salas, Chairperson
P.O. Box 393
Covina, CA 91723
Email: gabrielenoindians@yahoo.com

Subject: Consultation Request for Del Amo Boulevard and Lakewood Boulevard Intersection Improvements Project, Lakewood, California

Dear Mr. Salas:

The City has reviewed your request for a full-time Native American (NA) monitor during project implementation for the Del Amo Boulevard and Lakewood Boulevard Intersection Improvements and after further consideration, we believe that a full-time NA monitor is not warranted based on the following conclusions:

- A certified archaeologist will be available on site during ground disturbing activities and are trained to identify NA cultural resources.

- Project area is not located within an area that is known to be sensitive for tribal cultural resources according to local archives and the Native American Heritage Commission.

- The proposed mitigations for this project are the same mitigations to be implemented for a recently approved project in the vicinity which required significantly greater expanse and depth of excavation (up to 20 feet below grade) in comparison to the currently proposed intersection improvements whose ground disturbing activities are mostly limited to more shallow excavations for roadway resurfacing, signal upgrades and minor culvert improvements. Additionally, the similarly proposed mitigations to provide full-time archaeological monitoring during earthmoving activities on-site were considered to be satisfactory based on consultation w/other local tribes as a result of the City's effort to protect NA cultural resources during project implementation.

Nonetheless, the City is committed to fulfill its responsibility in respect to protecting NA cultural resources but unless there is further demonstrable evidence that potentially sensitive NA cultural resource underlie the project area, the City believes that the proposed archaeological monitoring program for the project (to be performed by a licensed archaeologist on-site during any earthmoving activities) will be adequate. As such, the following mitigation measure will be incorporated into the Initial Study/Mitigated Negative Declaration and implemented as part of the project's Mitigation Monitoring and Reporting Program:

Mitigation Measure CUL-1

a) *The City shall conduct an archaeological monitoring program during any earthmoving involving excavations into younger Quaternary Alluvial deposits'*

b) *The archaeological monitoring program shall be conducted in a manner consistent with archaeological standards and, in this case, conducted on a full-time or part-time bases, at the discretion of the Lead Agency;*

c) *Should evidence of archaeological resources be uncovered, the archaeological monitoring program shall continue on a full-time basis until it is determined no more younger alluvium is being impacted;*

d) *If evidence of Native American resources is identified, a Native American Monitor or Gabrielino descent shall be added to the remainder of the monitoring program;*

e) *If, at any time, evidence of human remains is uncovered, the County Coroner must be notified immediately and permitted to examine the find in situ. If the remains are determined to be of Native American descent, the Native American Heritage Commission shall be contacted and the Most Likely Descendent (MLD) named. In consultation with the MLD, City, Coroner, and archaeological consultant, the disposition of the remains will be determined.*

If you have any questions or can provide additional information of NA cultural resources in regards to the proposed project for consideration, please contact Max Withrow, mwithrow@lakewoodcity.org for further assistance.

Sincerely,

Max Withrow, P.E.
Assistant Director of Public Works

April 17, 2018

Tongva Ancestral Territorial Tribal Nation
Mr. John Tommy Rosas, Tribal Administrator
Email: tattnlaw@gmail.com

Subject: Consultation Request for Lakewood Boulevard Capacity Enhancement Project, from North City Limits to Del Amo Boulevard, Lakewood California

Dear Mr. Rosas:

Thank you for your March 14, 2018 response (via email), indicating your support for the project and requesting on-site archaeological monitoring during excavation for the utility undergrounding activities.

As described in our notification letter, the proposed project will require excavation for proposed roadway paving, utility undergrounding and parkway improvements along Lakewood Boulevard. More specifically, roadway paving and median removal will require 1 to 1.5 feet of excavation but deeper excavation will be required to relocate existing overhead utilities to underground location below the roadway which can range from 4 to 6 feet below grade.

In response to your request for archaeological monitoring for the undergrounding activities, the City will coordinate with Southern California Edison who is the responsible agency to implement this phase of the project. As such, appropriate mitigation measures will include an archaeological monitoring program that will be performed by a licensed archaeologist as part of any excavation required for the utility undergrounding. In the event that Native American resources are identified during such earthmoving activities, a Native American Monitor of Gabrielino descent will be added for the remainder of the monitoring program. Thus, the following mitigation measure will be incorporated into the Initial Study/Mitigated Negative Declaration and implemented as part of the project's Mitigation Monitoring and Reporting Program:

Mitigation Measure CUL-1

a) *The City shall coordinate with Southern California Edison to conduct an archaeological monitoring program during any excavations required for undergrounding of overhead utilities,*

b) *The archaeological monitoring program shall be conducted in a manner consistent with archaeological standards and, in this case, conducted on a full-time or part-time bases, at the discretion of the Lead Agency;*

c) *Should evidence of archaeological resources be uncovered, the archaeological monitoring program shall continue on a full-time basis until it is determined no more younger alluvium is being impacted;*

d) *If evidence of Native American resources is identified, a Native American Monitor or Gabrielino descent shall be added to the remainder of the monitoring program;*

e) *If, at any time, evidence of human remains is uncovered, the County Coroner must be notified immediately and permitted to examine the find in situ. If the remains are determined to be of Native American descent, the Native American Heritage Commission shall be contacted and the Most Likely Descendent (MLD) named. In consultation with the MLD, City, Coroner, and archaeological consultant, the disposition of the remains will be determined.*

We hope that the above mitigation measure has addressed your concerns and fulfilled your request to protect tribal cultural resources that may be encountered during project implementation. If you have any questions or concerns, please contact Max Withrow at mwithrow@lakewoodcity.org within fourteen (14) days from the date of this letter for further assistance. Otherwise, if we do not receive your response within the time period stated above, we will assume you no longer have any interest to pursue NA consultation with respect to this project. Nevertheless, you may also submit your comments regarding the project when the City circulates the Initial Study/Mitigated Negative Declaration document for its 30-day public review as part of the project's CEQA compliance.

CITY OF LAKEWOOD

Sincerely,

Max Withrow, P.E.
Assistant Director of Public Works