NOISE IMPACT ANALYSIS

HUNTINGTON PARK TARGET PROJECT

CITY OF HUNTINGTON PARK, CALIFORNIA

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NOISE SETTING

Sound is mechanical energy transmitted by pressure waves in a compressible medium such as air. Noise is generally considered to be unwanted sound. Sound is characterized by various parameters that describe the rate of oscillation of sound waves, the distance between successive troughs or crests, the speed of propagation, and the pressure level or energy content of a given sound. In particular, the sound pressure level has become the most common descriptor used to characterize the loudness of an ambient sound level.

Loud or soft, noisy or quiet, high-and-low pitch are all qualitative terms used to describe sound. These terms are relative descriptions. The science of acoustics attempts to quantify the human perception of sound into a quantitative and measurable basis. Amplitude is the measure of the pressure exerted by sound waves. Amplitude may be so small as to be inaudible by humans, or so great as to be painful. Frequency refers to pitch or tone. The unit of measure is in cycles per second called “hertz”. Very low frequency bass tones and ultra-high frequency treble are difficult for humans to detect. Many noise generators in the ambient world are multi-spectral.

The decibel (dBA) scale is used to quantify sound pressure levels. Although decibels are most commonly associated with sound, "dBA" is a generic descriptor that is equal to ten times the logarithmic ratio of any physical parameter versus some reference quantity. For sound, the reference level is the faintest sound detectable by a young person with good auditory acuity.

Since the human ear is not equally sensitive to all sound frequencies within the entire auditory spectrum, human response is factored into sound descriptions by weighting sounds within the range of maximum human sensitivity more heavily in a process called “A-weighting,” written as dB(A). Any further reference in this discussion to decibels written as "dB" should be understood to be A-weighted.

Leq is a time-averaged sound level; a single-number value that expresses the time-varying sound level for the specified period as though it were a constant sound level with the same total sound energy as the time-varying level. Its unit is the decibel (dB). The most common averaging period for Leq is hourly.

Because community receptors are more sensitive to unwanted noise intrusion during more sensitive evening and nighttime hours, state law requires that an artificial dBA increment be added to quiet time noise levels. The 24-hour noise descriptor with a specified evening and nocturnal penalty is called the Community Noise Equivalent Level (CNEL). CNEL’s are a weighted average of hourly Leq’s.

For “stationary” noise sources operating on private property, the City does have legal authority to establish noise performance standards designed to not adversely impact adjoining uses. These standards are articulated in Section 9 of the Huntington Park City Code.

PLANNING STANDARDS

The State of California has established guidelines for acceptable community noise levels that are based upon the CNEL rating scale to insure that noise exposure is considered in any development. CNEL-based standards apply to noise sources whose noise generation is preempted from local control (such as from on-road vehicles, trains, airplanes, etc.) and are used to make land use decisions as to the suitability of a given site for its intended use. These CNEL-based standards are typically articulated in the Noise Element of the General Plan.

The City of Huntington Park Noise Element calls out CNEL-based standards based on the state standards, which are typical of most jurisdictions and were used as a guideline. The recommended guidelines for noise and land use compatibility are illustrated in Figure 1, Land Use Compatibility Guidelines for Noise.

The guidelines indicate that an exterior noise level of 70 dB CNEL is considered to be a "clearly compatible" noise level for siting commercial retail uses involving normal conventional construction, without any special noise insulation requirements. Exterior noise levels up to 80 dB CNEL are considered "normally compatible", and construction should only occur after a noise analysis is made and needed noise attenuation features are included in the project design. These standards apply to any outdoor recreational areas such as an eating area. Both fast food restaurants have small outdoor patios.

Huntington Park is pre-empted from regulating on-road traffic noise. However, when traffic noise exceeds the planning standard for an affected land use, CNEL-based standards are the accepted significance threshold for any CEQA environmental analysis.

Figure 1

Land Use Noise Compatibility Matrix

Land Use Categories		Community Noise Equivalent Level CNEL						
Categories	**Uses**	**<55**	**60**	**65**	**70**	**75**	**80>**	
RESIDENTIAL	Single Family, Duplex, Multiple Family	A	A	B	C	C	D	D
RESIDENTIAL	Mobile Home	A	A	B	C	C	D	D
COMMERCIAL Regional, District	Hotel, Motel, Transient Lodging	A	A	B	B	C	C	D
COMMERCIAL Regional, Village District, Special	Commercial Retail, Bank, Restaurant, Movie Theatre	A	A	A	A	B	B	C
COMMERCIAL INDUSTRIAL INSTITUTIONAL	Office Building, Research and Development, Professional Offices, City Office Building	A	A	A	B	B	C	D
COMMERCIAL Recreation INSTITUTIONAL Civic Center	Amphitheater, Concert Hall Auditorium, Meeting Hall	B	B	C	C	D	D	D
COMMERCIAL Recreation	Children's Amusement Park, Miniature Golf Course, Go-cart Track, Equestrian Center, Sports Club	A	A	A	B	B	D	D
COMMERCIAL General, Special INDUSTRIAL, INSTITUTIONAL	Automobile Service Station, Auto Dealership, Manufacturing, Warehousing, Wholesale, Utilities	A	A	A	A	B	B	B
INSTITUTIONAL General	Hospital, Church, Library, Schools Classroom	A	A	B	C	C	D	D
OPEN SPACE	Parks	A	A	A	B	C	D	D
OPEN SPACE	Golf Course, Cemetaries, Nature Centers Wildlife Reserves, Wildlife Habitat	A	A	A	A	B	C	C
AGRICULTURE	Agriculture	A	A	A	A	A	A	A

Interpretation:

Zone A: Clearly Compatible	Specified land use is satisfactory, based upon the assumption that any buildings involved are of normal conventional construction without any special noise insulation requirements.
Zone B: Normally Compatible	New construction or development should be undertaken only after detailed analysis of the noise reduction requirements are made and needed noise insulation features in the design are determined. Conventional construction, with closed windows and fresh air supply systems or air conditioning, will normally suffice.
Zone C: Normally Incompatible	New construction or development should generally be discouraged. If new construction or development does proceed, a detailed analysis of noise reduction requirements must be made and needed noise insulation features included in the design.
Zone D: Clearly Incompatible	New construction or development should generally be undertaken.

NOISE ORDINANCE STANDARDS

For stationary noise sources located proximate to residential uses, the City of Huntington Park has adopted a detailed Noise Ordinance. Noise from one land use crossing the property line of an adjacent property, are regulated by Section 9-4.203 Zoning district development standards of the Municipal Code. These standards are expressed in terms of a mean (50th percentile) noise level, which is the noise level allowed for up to 30 minutes in any hour. Some short-term noise levels may exceed the 50^{th} percentile standard, up to a maximum of 20 dB above the allowable mean.

The Huntington Park City Noise Ordinance allowable exterior noise levels for various land uses are shown in Table 1. A mean noise level of 50 dB L_{50} (50^{th} percentile, or "L_{50}") by day and 45 dB L_{50} for residential areas at night is the standard applicable at the nearest existing homes to the proposed project site. However, when these noise levels are already exceeded by ambient noise levels, then the ambient level becomes the standard. The ordinance also establishes the maximum allowable noise exposure for all land uses. In residential areas, daytime noise exposure is not to exceed 70 dB for any period of time, and nighttime noise exposure is not to exceed 65 dB for any period of time.

According to Ordinance 9-3.506 (exceptions to provisions) in the Municipal Code, (Special Provisions) exempts the following activities from the provisions of this Article:

1. Activities conducted on the grounds of any public or private nursery school, elementary, intermediate or secondary school or college, and
2. Noise sources associated with construction, repair, remodeling or grading of any real property, provided the activities do not take place between the hours of 7:00 p.m. and 7:00 a.m. on weekdays, including Saturdays, or at any time on Sundays or Federal holidays.

Unless this project is within proximity to sensitive uses the private property noise standards will not apply.

Table 1

Huntington Park Noise Standards

Noise Standard Which Shall Not Be Exceeded

Nature or Character of Intrusive Noise	Commercial Areas	Residential Areas
Cumulative period of 30 minutes in any hour	45 dB(A)	40 dB(A)
Cumulative period of 15 minutes in any hour	50	50
Cumulative period of 5 minutes in any hour	55	50
Cumulative period of 1 minute in any hour	60	55
Any time	65	60

If the ambient sound level within the adjacent area exceeds the applicable standards for the cumulative period specified in subsection (2) of this subsection, the applicable standards for that period shall be the ambient sound level.

BASELINE NOISE LEVELS

Noise measurements were made in order to document existing baseline levels in the area. These help to serve as a basis to determine noise exposure from ambient noise activities upon the proposed project. Short term noise measurements were conducted on Thursday, October 8 at three locations. Noise measurement locations were selected to document the daily trend in noise levels generated by area roadways. Measurement locations are shown in Figure 2 and the results in Table 2.

Table 2
Existing Noise Measurements (dBA)

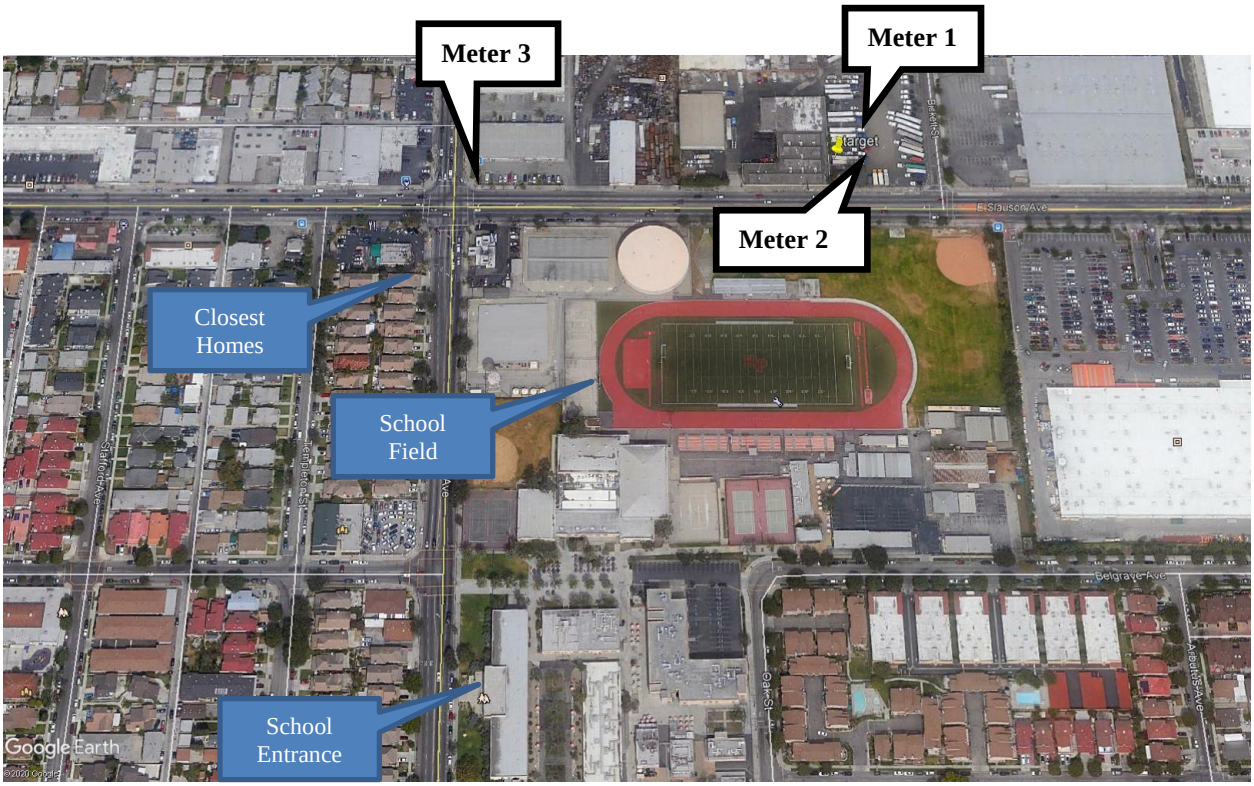
Meter	Location	Leq	Lmax	Lmin
Meter 1	On-site 100 ft to Slauson	69	76	52
Meter 2	On-site 50 ft to Slauson	75	78	59
Meter 3	Corner Soto & Slauson	76	78	68

Within 50 feet of Slauson Avenue the observed Leqs were 75-76 dBA.

With a 620-foot separation distance to the site the closest residence is at 5911 Miles Avenue. This home is behind the Andy's Restaurant on Slauson. The noise measurement at Soto and Slauson would be representative of noise levels at this location after adjusting for distance. The noise monitoring site was approximately 50 feet from the edge of roadway, but 5911 Miles Avenue has a greater setback distance and has some noise protection provided by the Andy's Restaurant. It is estimated that the noise loading at 5911 Miles Avenue, which is about 100 feet from the edge of roadway, is around 72-73 dBA Leq. The Huntington Park High School is approximately 600 feet south of the site and about 430 feet from the edge of roadway. The estimated exterior noise level at the High School buildings is around 65 dBA Leq.

Both these sensitive uses have a large setback to the site and are across a major roadway and as a result, traffic noise from Slauson Avenue would dominate their noise environment. Unless project construction and operational noise were louder than the ambient traffic there would likely be no project related impact at the closest sensitive uses.

Figure 2
Noise Monitor Locations and Sensitive Use Locations



NOISE IMPACTS

NOISE SIGNIFICANCE CRITERIA

According to the current CEQA Appendix G guidelines, noise impacts are considered potentially significant if they result in:

1. Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of a project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?
2. Generation of excessive groundborne vibration or groundborne noise levels?
3. For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?

The terms "substantial" or "excessive" are not defined in most environmental compliance guidelines. Noise analysis methodology is accurate only to the nearest whole decibel and the human ear can only clearly detect changes of around 3 dBA; changes of less than 3 dBA, while audible under controlled circumstances, are not readily discernable in an outdoor environment. Thus, a change of 3 dBA is considered as a perceptible audible change. It would require a doubling of traffic to create a +3 dBA noise increase due to the logarithmic nature of noise calculations. The project is not within the vicinity of an airport.

CONSTRUCTION NOISE SIGNIFICANCE

According to the Huntington Park Noise Ordinance, noise associated with construction activities is restricted to the hours of lesser noise sensitivity (Municipal Code Section 9-3.506 (5)). Permissible hours are 7 a.m. to 7 p.m. on Monday through Saturday. There are no noise thresholds as long as construction is limited to these hours.

CONSTRUCTION NOISE IMPACTS

Temporary construction noise impacts vary markedly because the noise strength of construction equipment ranges widely as a function of the equipment used and its activity level. Short-term construction noise impacts tend to occur in discrete phases dominated by large, earth-moving equipment sources for demolition and grading. During construction and paving, equipment is generally less noisy.

In 2006, the Federal Highway Administration (FHWA) published the Roadway Construction Noise Model that includes a national database of construction equipment reference noise emissions levels. In addition, the database provides an acoustical usage factor to estimate the fraction of time each piece of construction equipment is operating at full power during a construction phase. The usage factor is a key input variable that is used to calculate the average Leq noise levels.

Table 3 identifies highest (Lmax) noise levels associated with each type of equipment identified for use, then adjusts this noise level for the extent of equipment usage (usage factor), which is represented as Leq. The table is organized by construction activity and equipment associated with each activity.

Quantitatively, the primary noise prediction equation is expressed as follows for the hourly average noise level (Leq) at distance D between the source and receiver (dBA):

Leq = Lmax @ 50' – 20 log (D/50') + 10log (U.F%/100) – I.L.(bar)
Where:
Lmax @ 50' is the published reference noise level at 50 feet
U.F.% is the usage factor for full power operation per hour
I.L.(bar) is the insertion loss for intervening barriers

For the proposed project, the construction fleet would include equipment as shown in Table 3. Table 3 describes the noise level for each piece of equipment at a reference 50-foot distance after adjusting for usage.

Table 3
Construction Equipment Noise Levels

Phase Name	Equipment	Usage Factor[1]	Max Noise @ 50 feet (dBA)[2]	Average Noise Level @ 50 feet (dBA)
Demolition	Concrete Saw	20%	90	84
	Excavator	40%	81	77
	Dozer	40%	85	82
Grading	Grader	40%	85	81
	Dozer	40%	85	82
	Excavator	40%	81	77
	Loader/Backhoe	37%	78	74
Construction	Crane	16%	81	73
	Loader/Backhoe	37%	78	74
	Welder	46%	74	71
	Generator Set	50%	81	78
	Forklift	20%	75	69
Paving	Paver	50%	77	74
	Paving Equipment	40%	76	72
	Roller	20%	80	74

Source: FHWA's Roadway Construction Noise Model, 2006

1. Estimates the fraction of time each piece of equipment is operating at full power during a construction operation
2. The Lmax values presented are the actual measured values summarized in the Roadway Noise Model User Guide (FHWA 2006) unless the actual is unavailable in which case the equipment specifications were used.

The closest residential use to the project site is at 5911 Miles Avenue with a 620-foot separation distance. The Huntington Park High School Campus is more than 600 feet from the site. After adjusting for setback distance, the construction noise levels shown in Table 4 would likely be observed at receptors. These shown noise levels are mitigated due to distance alone and do not take into account intervening structures and ambient noise levels. Therefore, they represent a maximum noise level that would be observed.

Table 4
Maximum Construction Noise Equipment Levels at Off-Site Sensitive Uses (dBA Leq)

Phase Name	Equipment	Noise @ Closest Residence 620'	Noise at HS Campus 600'
Demolition	Concrete Saw	62	62
	Excavator	55	55
	Dozer	60	60
Grading	Grader	59	59
	Dozer	60	60
	Excavator	55	55
	Loader/Backhoe	52	52
Construction	Crane	51	51
	Loader/Backhoe	52	52
	Welder	49	49
	Generator Set	56	56
	Forklift	47	47
Paving	Paver	52	52
	Paving Equipment	50	50
	Roller	52	52

As discussed, the distances modeled in Table 4 are not inclusive of all mitigation. Nevertheless, the noisiest piece of equipment, a concrete saw, would be less than the observed ambient noise levels at the closest receptors.

Construction noise is mitigated by construction by compliance to the allowable hours of operation of 7 a.m. and 7 p.m. on weekdays and Saturday. Construction is not permitted on Sundays and Federal Holidays. The temporary nature of construction noise and reasonable distance set-back from noisiest activities are expected to maintain short-term construction noise impacts at less-than-significant levels.

CONSTRUCTION TRAFFIC

At the peak phase of construction there will be an estimated 50 daily worker trips (one-way trips for 25 workers) and10 vendor truck trips (again one-way so 5 round trips). Trips will be spread out over an allowable daily 12 hours of construction. With the high number of vehicles on area roadways the impact of construction related trips will be minimal. In addition, not all construction trips will travel the same route so trips will be disbursed over various roadways such that any individual roadway would not bear the entire burden.

CONSTRUCTION ACTIVITY VIBRATION

Typical background vibration levels in residential areas are usually 50 VdB or lower, and are below the threshold of human perception. Perceptible vibration levels inside residences are typically attributed to the operation of heating and air conditioning systems, door slams or street traffic. Construction activities and street traffic are some of the most common external sources of vibration that can be perceptible inside residences.

Construction activities generate ground-borne vibration when heavy equipment travels over unpaved surfaces or when it is engaged in soil movement. The effects of ground-borne vibration include discernable movement of building floors, rattling of windows, shaking of items on shelves or hanging on walls, and rumbling sounds. Vibration related problems generally occur due to resonances in the structural components of a building because structures amplify groundborne vibration. Within the "soft" sedimentary surfaces of much of Southern California, ground vibration is quickly damped out. Groundborne vibration is almost never annoying to people who are outdoors (FTA 2006).

Groundborne vibrations from construction activities rarely reach levels that can damage structures. Because vibration is typically not an issue, very few jurisdictions have adopted vibration significance thresholds. Vibration thresholds have been adopted for major public works construction projects, but these relate mostly to structural protection (cracking foundations or stucco) rather than to human annoyance.

Vibration is most commonly expressed in terms of the root mean square (RMS) velocity of a vibrating object. RMS velocities are expressed in units of vibration decibels. The range of vibration decibels (VdB) is as follows:

65 VdB	-	threshold of human perception
72 VdB	-	annoyance due to frequent events
80 VdB	-	annoyance due to infrequent events
94-98 VdB	-	minor cosmetic damage

To determine potential impacts of the project's construction activities, estimates of vibration levels induced by the construction equipment at various distances are presented in Table 5.

Table 5
Approximate Vibration Levels Induced by Construction Equipment

Equipment	25 feet	50 feet	100 feet	600 feet
Large Bulldozer	87	81	75	59
Loaded Truck	86	80	74	58
Jackhammer	79	73	67	51
Small Bulldozer	58	52	46	31

* (FTA Transit Noise & Vibration Assessment, Chapter 12, Construction, 2006)

The on-site construction equipment that will create the maximum potential vibration is a large bulldozer. The stated vibration source level in the FTA Handbook for such equipment is 81 VdBA at 50 feet from the source. With typical vibrational energy spreading loss, the vibration annoyance standard second is met at 56 feet. Effects of vibration perception such as rattling windows could only occur at the nearest residential structures, though vibration resulting from project construction would not exceed cosmetic damage thresholds.

At the closest sensitive uses, vibration levels would be less than the level of human perception. Additionally, traffic vibration from heavily traveled area roadways such as Slauson Avenue would mask any project impact. Construction activity vibration impacts are judged as less-than-significant.

PROJECT-RELATED VEHICULAR NOISE IMPACTS

Long-term noise concerns from the reuse development a Target and fast-food restaurant center primarily on mobile source emissions on project area roadways. These concerns were addressed using the California specific vehicle noise curves (CALVENO) in the federal roadway noise model (the FHWA Highway Traffic Noise Prediction Model, FHWA-RD-77-108). The model calculates the Leq noise level for a particular reference set of input conditions, and then makes a series of adjustments for site-specific traffic volumes, distances, roadway speeds, or noise barriers.

Table 6 summarizes the calculated 24-hour CNEL level at 50 feet from the roadway centerline along project area roadway segments for which data was provided. Existing conditions, with and without project, were evaluated using data from the traffic report prepared for this project.

As shown, the largest project impact is on Bickett Street. This is because background traffic is relatively low on Bickett Street as compared to Slauson Avenue. Nevertheless, the maximal project impact is seen to be +0.9 dBA CNEL. Not only is this less than the +3 dBA CNEL threshold but there are no adjacent sensitive receptors. Therefore, the project traffic impact on area roadways will be much less than significant. Because the area is already built out, the incremental traffic noise associated with the project is diluted.

Table 6

Near Term Traffic Noise Impact Analysis
(CNEL in dBA at 50 feet from Centerline)

Road Segment		***Existing No Project***	***Existing W Project***	***Project Impact***
Slauson Ave/	W of Drive Thru Exit	71.3	71.6	0.3
	Drive Thru Exit-W Slauson Driveway	71.3	71.6	0.3
	W Slauson Driveway-E Slauson Driveway	71.3	71.6	0.3
	E Slauson Driveway-Bickett St	71.4	71.7	0.3
Bickett St/	Slauson Ave-S Bicket Driveway	69.4	70.1	0.7
	S Bicket Driveway-N Bickett Driveway	63.2	64.1	0.9

PROJECT OPERATIONAL NOISE

There are two primary noise sources associated with project use. One is noise resulting with the increased travel in and out of the site and the other is noise associated with the two proposed drive-thru restaurants.

The largest peak hour traffic volume will be in the afternoon with an estimated 242 retail trips. The fast-food restaurants will generate 263 one-way trips during the same peak hour. After accounting for internal trip capture which presumes that many patrons that visit Target will also visit the drive thru restaurants there are 328 peak hour trips attributed to both uses. However, to provide a conservative estimate, all 505 trips were analyzed as having original origins which discounts the impact of internal trip capture

The noise associated with 505 vehicles is 57.3 dBA Leq assuming a speed of 25 miles per hour or less at a 50-foot reference distance. This assumes all vehicles enter and leave the site via a single drive aisle through in reality there are five separate paths of entry along two roadways. The closest sensitive receptor is more than 600 feet from the site which would minimally provide -11 dBA of noise attenuation without taking into account intervening structures. The resulting 46.3 dBA Leq would be much less than ambient noise during the same afternoon peak hour. The number of vehicles entering and leaving the lot during off-peak hours would be much less. If peak hour project traffic does not create a noise disturbance, then off-peak hours would similarly have no impact.

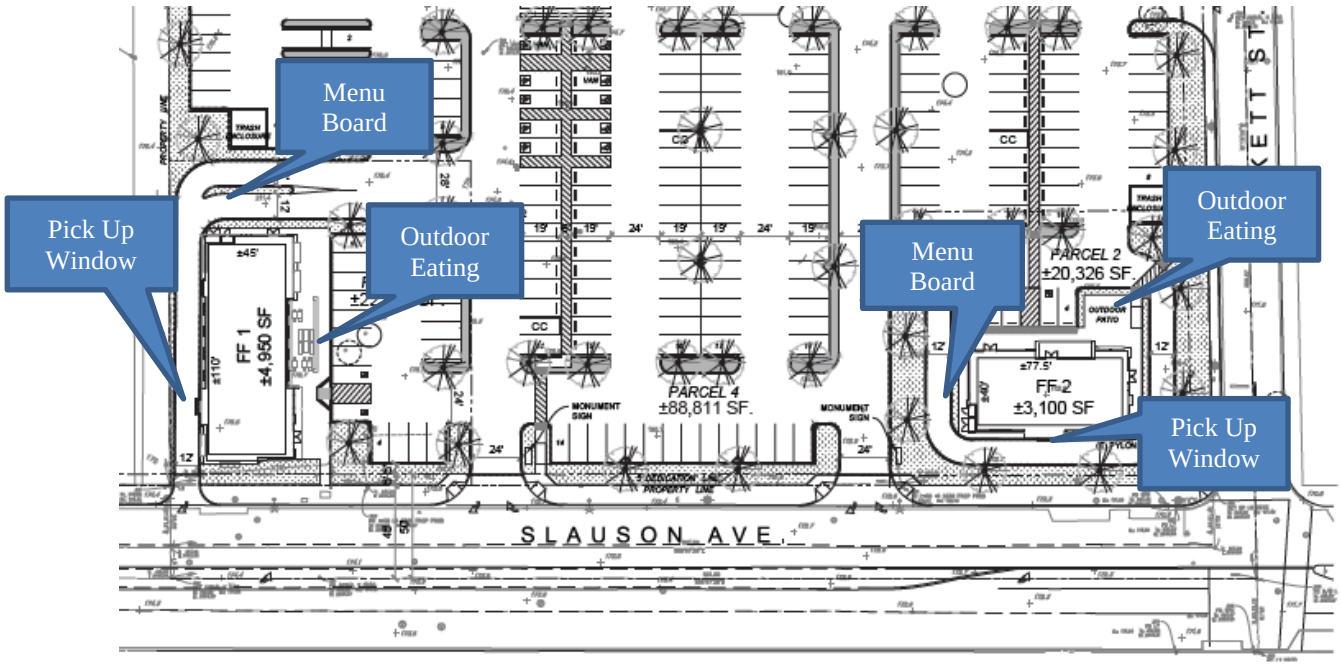
The drive-thru restaurants are another potential noise source for off-site sensitive uses. The most significant noise generator at a fast-food restaurants is the menu board used for ordering. Figure 3 shows the location of the menu boards, pickup windows and outdoor dining areas.

The patio dining at Fast Food 1 is along the eastern façade and is partially recessed into the building. The estimated noise level is approximately 72 dBA Leq. If the City wishes to keep noise levels below 70 dBA, a plexiglass shield or combination masonry and plexiglass shield 5-6 feet in height would provide at least 5 dBA of noise mitigation. The plexiglass would need to surround the outdoor dining area on both the south and east perimeter.

The outdoor dining at Fast Food 2 is along the northern building façade. The structure itself would provide at least 5 dBA of noise mitigation so no additional features would be necessary to reduce outdoor eating area noise to below 70 dBA.

The order boards for Fast Food 1 is along the northern perimeter and the pickup window is along the western façade. For Fast Food 2 the menu board is along the western façade and the pickup window is along the southern building façade.

Figure 3 Menu Board Location



Menu board data was obtained from a representative menu board manufacturer, HM Electronics though this vendor has not been selected for use at this project site. The data is presented in terms of Sound Pressure Levels (SPL). SPL is the noise generated when the menu sound board is operating.

An option offered by the manufacturer incorporates automatic volume control (AVC). AVC can adjust the outbound volume based on the outdoor ambient noise level. When ambient noise levels naturally decrease at night, AVC will reduce the outbound volume on the system. The following data in Table 7 are provided by the manufacturer for different distances from the speaker post, with and without AVC:

Table 7
Menu Board Sound Levels

Distance from Speaker	Decibel Level of Standard System with 45 dB of outside noise without AVC 1 Unit/ 2 Units	Decibel Level of Standard System with 45 dB of outside noise with AVC 1 Unit/ 2 Units
1 foot	84/87 dBA	60/63 dBA
2 feet	78/81 dBA	54/57 dBA
4 feet	72/75 dBA	48/51 dBA
8 feet	66/69 dBA	42/45 dBA
16 feet	60/63 dBA	36/39 dBA

32 feet	54/57 dBA	-
50 feet	50/53 dBA	-
100 feet	44/47 dBA	
140 feet	41/44 dBA	-
200 feet	38/41 dBA	-

The vendor data assumes that the menu board is operating continuously and is therefore higher than actual noise levels from typical use. In reality, the speaker operates for a short time and then there is a delay while the cars queue.

Utilizing the vendor data, even without AVC, soundboard noise decays to 44-47 dBA Leq at about 100 feet for two menu boards. This assumes that a receiver is within line of sight of the menu board speaker. The closest sensitive uses would not observe any impact due to the menu boards due to distance separation, speaker orientation and ambient noise levels.

SUMMARY AND MITIGATION

The closest sensitive uses to the site are across Slauson Avenue. The closest residential use is at 5911 Miles Avenue with a 620-foot separation distance and is behind the Andy's Restaurant. The Huntington Park High School Campus is 600 feet south of the site. Observed noise levels along Slauson Avenue were 75-76 dBA Leq in mid-afternoon at an approximate 50-foot reference distance.

Construction activities from project development are exempt from development standards as long as they occur within the hours of 7:00 a.m. and 7:00 p.m. on weekdays, including Saturdays. Construction noise would not create a noise disturbance any adjacent sensitive use.

Noise associated with worker and vendor vehicles traveling to and from the site will not be noticeable due to the high quantity of background traffic on area roadways and distance from the site of sensitive uses.

Vibration levels from heavy construction equipment will not exceed the damage or perception level at any off- site use.

The project noise impact study indicates a less-than-significant noise impact from project-related traffic on area roadways. Project-related traffic will not cause noise standards to be exceeded, nor make substantially worse any existing violations.

For off-site uses, noise associated with project operation is not expected to be perceptible. This includes noise from vehicles entering or leaving the site as well as noise generated by the fast-food restaurant menu boards. A combination of distance attenuation, project orientation and background noise levels all contribute to this conclusion.

If the noise level for patio dining at Fast Food 1 is to be below 70 dBA Leq, a plexiglass and or combination masonry/plexiglass barrier 5-6 feet high along the southern and eastern perimeter would provide the necessary mitigation.