Appendix E –
Noise Assessment, February 19, 2009

prepared by Mestre Greve Associates

Noise Assessment For The HUNTINGTON BEACH DOWNTOWN SPECIFIC PLAN
CITY OF HUNTINGTON BEACH

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1.0 EXISTING SETTING

1.1 Project Description

The Huntington Beach Downtown Specific Plan area covers approximately 336 acres located within downtown Huntington Beach. No change to the existing Specific Plan boundary is proposed. The Specific Plan Area extends from the intersection of Golden West Street with Pacific Coast Highway and curves along the coastline, including the Huntington Beach Pier, down to Beach Boulevard. The eastern boundary of the Specific Plan Area follows Pacific View Avenue from Beach Boulevard to 1st Street where the boundary curves around the traditional downtown up to Palm Avenue and down along 6th Street. From 6th Street to Golden West Street, parcels located within the first block adjacent to Pacific Coast Highway are included in the Specific Plan Area. All boundary lines follow the centerline of the affected street. Exhibit 1 shows the project location within the City of Huntington Beach.

The proposed Huntington Beach Downtown Specific Plan (hereafter, "DTSP") project includes revising the existing 11 Specific Plan districts into 7 districts. The Specific Plan boundaries, which are not proposed to change, are shown in Exhibit 2. The DTSP was designed to create a unique and identifiable Downtown for Huntington Beach that is an economically vibrant, pedestrian-oriented destination. The proposed Specific Plan amendments update the Downtown Specific Plan originally adopted on November 16, 1983 (Ordinance No's. 2646-A, B & C, Resolution No. 5308-A, B & C) and subject to amendments through October 10, 2007. This proposed update builds upon the information contained in the original Specific Plan (and amendments) and adapts the standards and guidelines in response to the many changes in Downtown over the past 25 years. The intent is to generate a regulating document in order to promote more amenities, enhanced architecture and aesthetics, more compatible and complementary uses, a strategic approach to parking in the Downtown area, and an overall improved identity for Downtown Huntington Beach.

The Specific Plan would revise the existing 11 Specific Plan districts by dividing the downtown area into 7 new districts. Within each district there is a particular vision for future development and character. Permitted land uses and development standards give direction for each of these districts to achieve the future state envisioned by the community.

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Exhibit 1 - Project Location

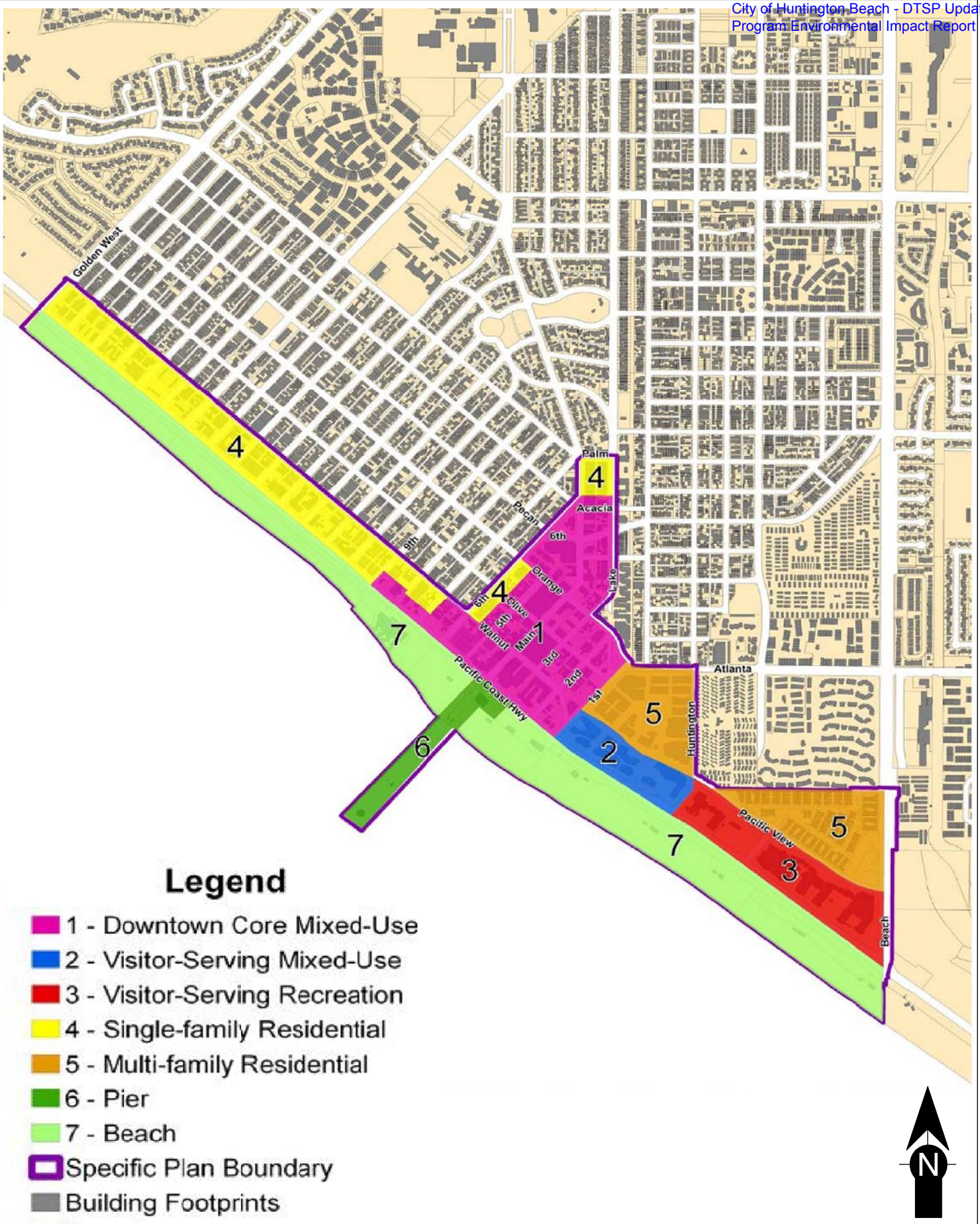


Exhibit 2 - Proposed Districts

1.2 Background Information on Noise

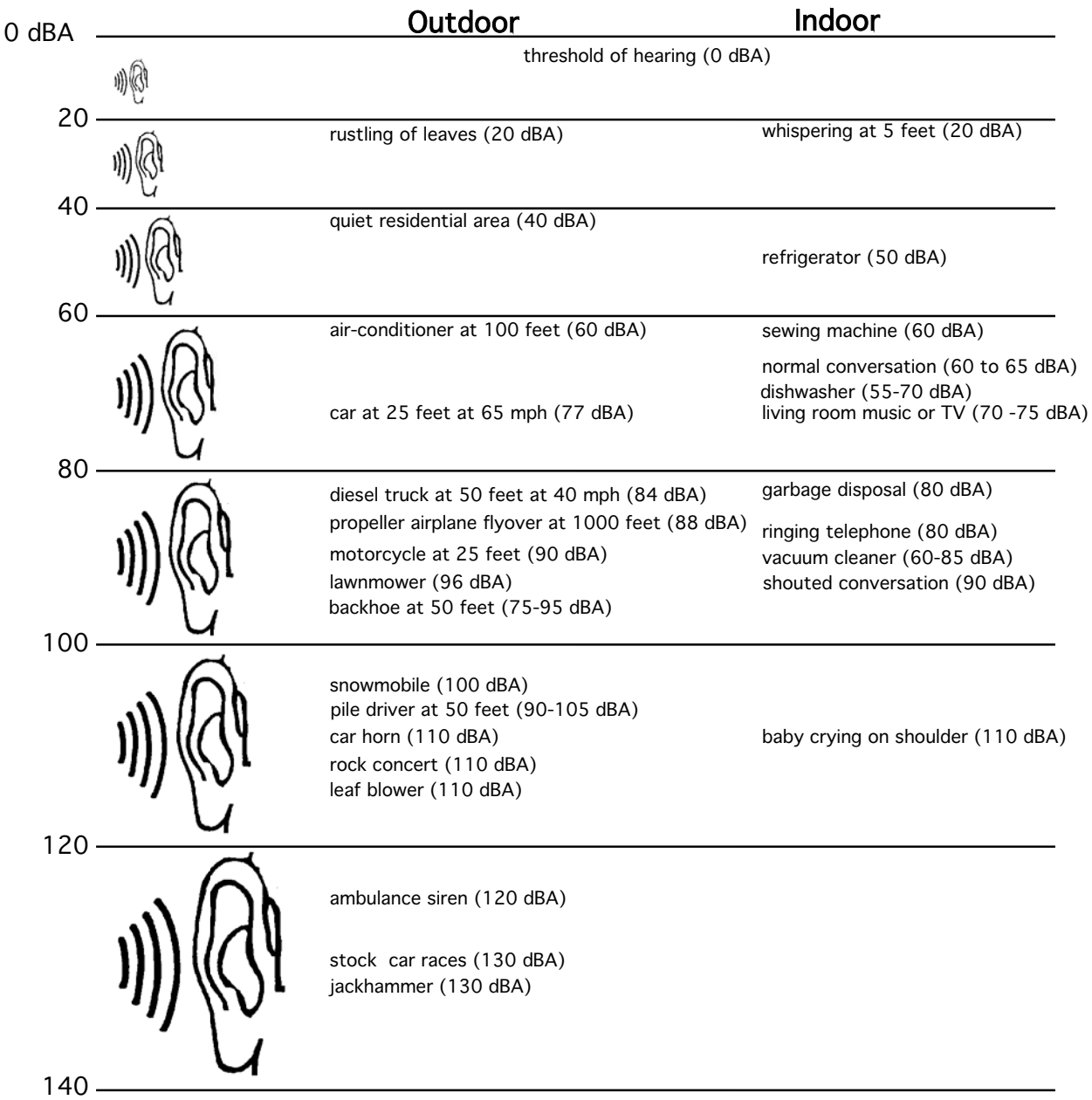
1.2.1 Noise Criteria Background

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; and 20 dB higher 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. Exhibit 3 provides examples of various noises and their typical A-weighted noise level.

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, temperature and humidity 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.

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. These criteria are based on such known impacts of noise on people 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:



Sources: League for the Hard Of Hearing, www.lhh.org
Handbook of Noise Control, McGraw Hill, Edited by Cyril Harris, 1979
Measurements by Mestre Greve Associates

Exhibit 3
Typical A-Weighted Sound Levels

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 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 traffic noise. 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 not known to which these physiological responses cause harm or are sign of harm.

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.

1.2.2 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 will be 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. Two of the predominant noise scales are the Equivalent Noise Level (LEQ) and the Community Noise Equivalent Level (CNEL). These scales are described in the following paragraphs.

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). It is the energy sum 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 for occurring at these times. 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 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 Exhibit 4.

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. For example since 5 minutes is 25% of 20 minutes, L(25) is the noise level that is equal to or exceeded for five minutes in a twenty-minute measurement period. It is L(%) that is used for most Noise Ordinance standards. For example most daytime County, 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 that fifty percent of a given period.

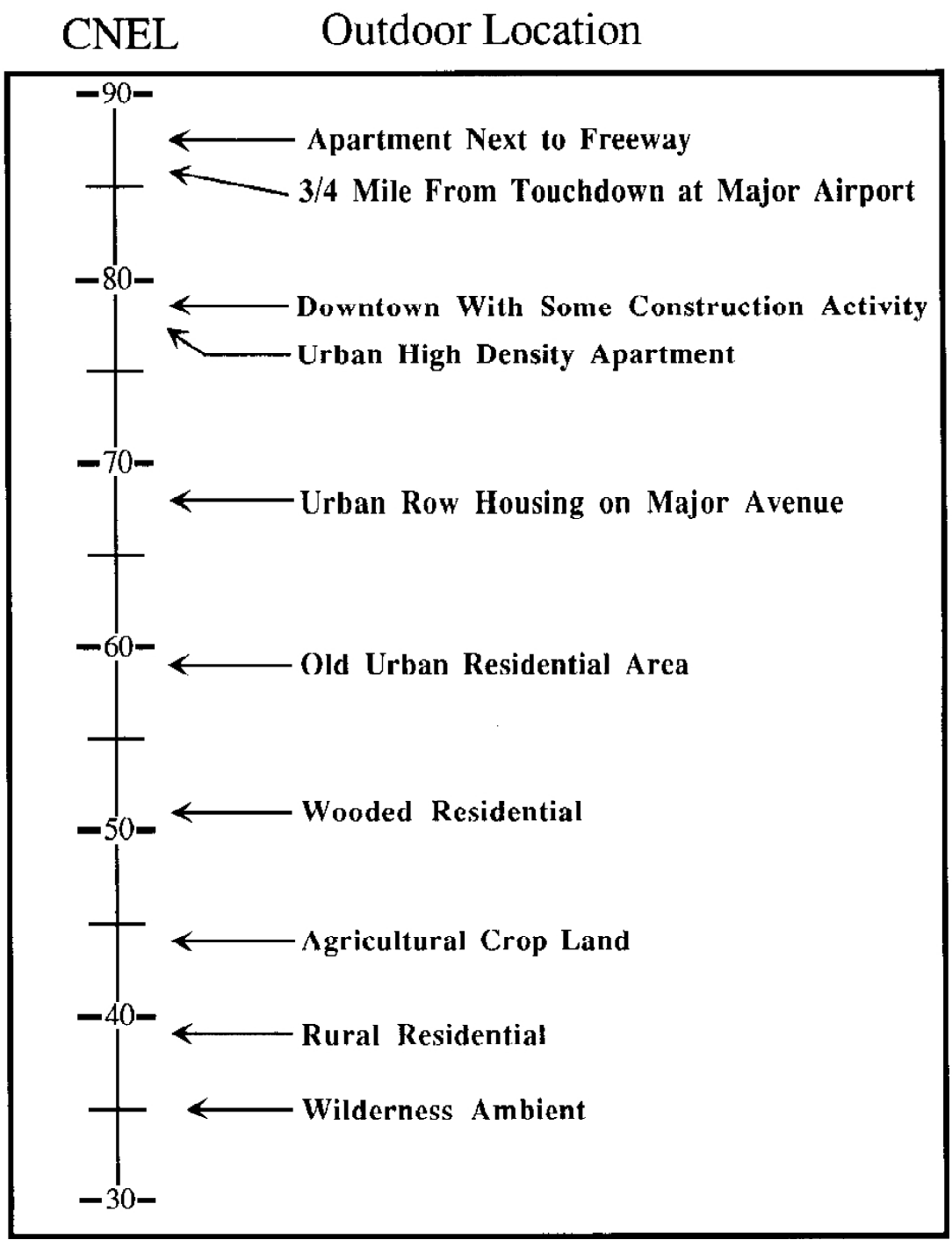


Exhibit 4
Typical Outdoor Noise Levels

1.3 Noise Criteria

1.3.1 City of Huntington Beach Noise Element

The City of Huntington Beach Noise Element of the General Plan specifies outdoor noise level limits for land uses impacted by transportation noise sources. The exterior noise level limit is expressed in terms of the Community Noise Equivalent Level (CNEL). The Noise Element states that for residential land use, the "Optimum Noise Level" for residential exterior areas is 60 CNEL. The "Optimum Noise Level" for residential interior areas is 45 CNEL. The City has adopted a 75 CNEL noise standard for office or professional uses, and an 80 CNEL noise standard for commercial and industrial uses.

1.3.2 City of Huntington Beach Noise Ordinance

A noise ordinance is designed to control unnecessary, excessive and annoying sounds from stationary (non-transportation) noise sources. Noise ordinance requirements cannot be applied to mobile noise sources such as heavy trucks when traveling on public roadways. Federal and state laws preempt control of mobile noise sources on public roads. Noise ordinance standards typically apply to industrial and commercial noise sources impacting residential areas. They are also applicable to noise generated at parks and schools impacting residential areas. The City of Huntington Beach's municipal code prohibits the production of excessive noise, and will be applied to this project to determine potential noise impacts. The City of Huntington Beach Noise Ordinance limits for exterior areas are shown below in Table 1 and Table 2.

Table 1 City of Huntington Beach Daytime Noise Ordinance Limits

Affected Land Uses	Lmax	L1.7	L8.3	L25	L50
Residential Properties	75 dBA	70 dBA	65 dBA	60 dBA	55 dBA
Professional Offices and Institutional	75 dBA	70 dBA	65 dBA	60 dBA	55 dBA
Commercial	80 dBA	75 dBA	70 dBA	65 dBA	60 dBA
Industrial Properties	90 dBA	85 dBA	80 dBA	75 dBA	70 dBA

The ordinance limits daytime noise levels attributed to fixed (stationary) noise sources to a maximum of 55 dBA at residential properties and professional offices. Higher noise levels are allowed at commercial areas and industrial areas.

Table 2 City of Huntington Beach Nighttime Noise Ordinance Limits

Affected Land Uses	Lmax	L1.7	L8.3	L25	L50
Residential Properties	70 dBA	65 dBA	60 dBA	55 dBA	50 dBA
Professional Offices and Institutional	75 dBA	70 dBA	65 dBA	60 dBA	55 dBA
Commercial	80 dBA	75 dBA	70 dBA	65 dBA	60 dBA
Industrial Properties	90 dBA	85 dBA	80 dBA	75 dBA	70 dBA

The ordinance limits nighttime noise levels attributed to fixed (stationary) noise sources to a maximum of 50 dBA at residential properties. Higher noise levels are allowed at professional offices, commercial areas, and industrial areas.

The ordinance applies a 50 dBA L50 nighttime (10 p.m. to 7 a.m.) standard to fixed (stationary) noise sources. This means that a fixed noise source cannot cause the noise level to exceed 50 dBA for 30 minutes during a 1-hour period at the nearest residential property line or other sensitive land uses. Additionally, the Lmax noise levels cannot exceed 70 dBA at the nearest residential land uses.

The Noise Ordinance exempts noise from temporary construction, repair, or remodeling, or grading activities between 7:00 a.m. and 8:00 p.m., except Sundays and Federal Holidays.

1.4 Existing Noise Measurements

The existing noise levels in the vicinity of the proposed project are needed to establish the current baseline noise levels. A noise measurement survey of the project site and the surrounding area was conducted to determine the location of a set of noise measurement sites that would provide a noise profile of the area in the vicinity of the project site. Several criteria were used in the site selection process including, but not limited to, the proximity of a measurement site to sensitive land uses as well as its proximity to significant noise generators. To provide noise measurement coverage of the area, measurement sites were chosen within the confines of the project site, and at the border of the project site. After the site selection process was over, a series of short-term noise measurements were taken at the chosen sites. The measurement sites are displayed in Exhibit 5.

Ten short-term noise measurements were taken. All ten measurement sites were within, or adjacent to the project site. The first six of the short-term measurements were taken on December 2, 2008 between the hours of 10:38 a.m. and 2:36 p.m. The remaining four measurements were taken on December 3, 2008 between the hours of 10:47 a.m. and 1:00 p.m. The site locations are listed below in Table 3.

Table 3 Existing Noise Measurement Locations

Site	Location
1	3rd Street between Orange Avenue and Olive Avenue
2	Corner of Walnut Avenue and 2nd Street
3	Corner of Beach Boulevard and Pacific Coast Highway
4	Corner of Palm Avenue and Lake Street
5	Corner of Twin Dolphin Drive and Pacific View Avenue
6	Corner of Main Street and Orange Avenue
7	Corner of Pacific Coast Highway and 9th Street
8	Corner of Golden West Street and Walnut Avenue
9	Pecan Avenue
10	Alley between 5th and 6th street near Walnut

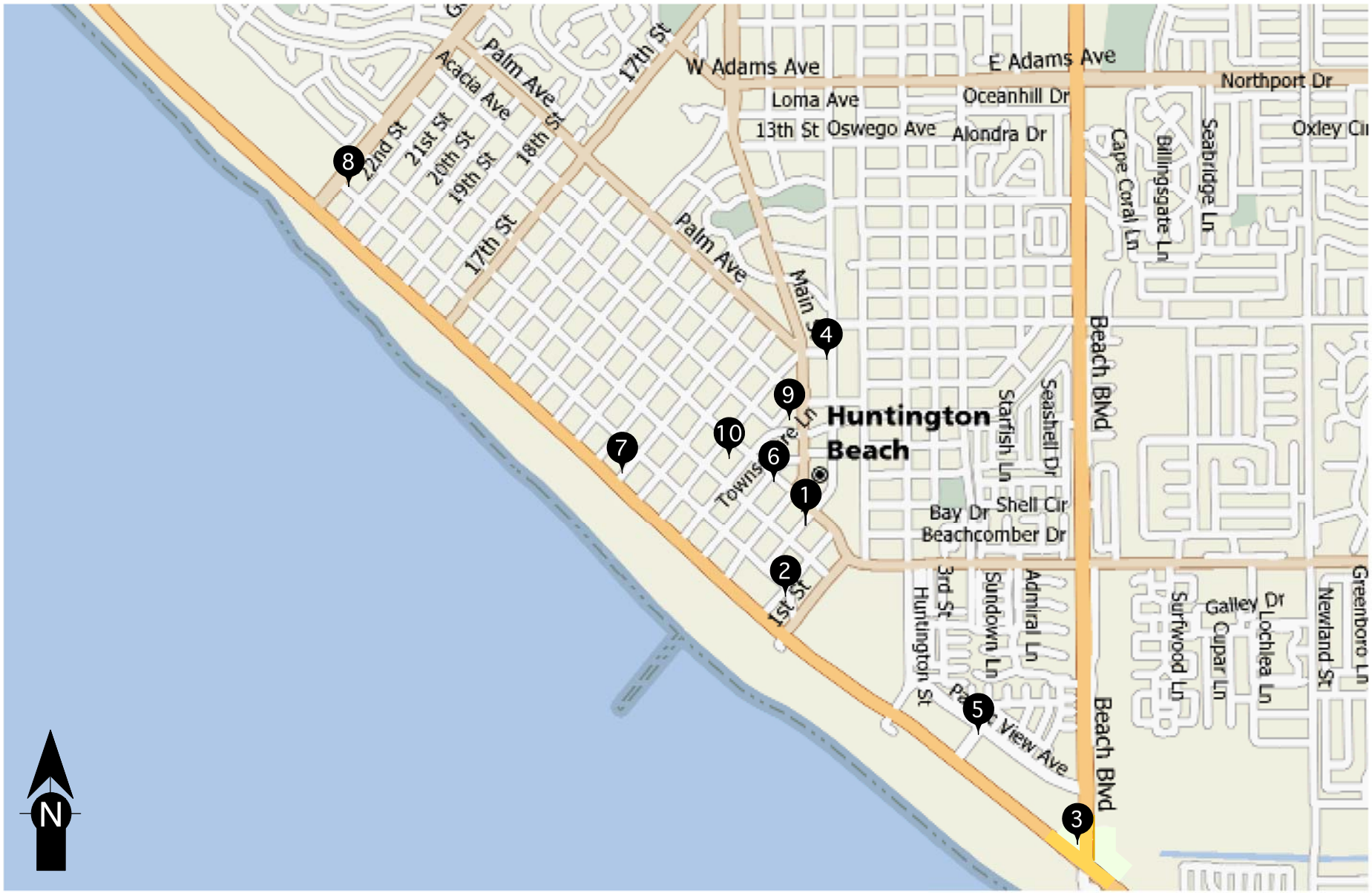


Exhibit 5
Measurement Site Locations

MESTRE GREVE ASSOCIATES

Measurements at all measurement sites were performed using a Brüel & Kjær Model 2236 automated digital noise data acquisition system and sound 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, at least 15 minutes of data were 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 calibration 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 Leq, Lmin, Lmax, L25, L50 and L90 values for the full time period were written down on a data sheet and the buffer on the sound meter was reset to prepare it for the measurements at the next site. Prevailing weather conditions were noted, along with any other factors that might adversely affect the noise measurements. Table 4 shows the results of the measurements.

Table 4 Existing Noise Measurement Results (dBA)

Site	Date	Time	Leq	Lmax	Lmin	L25	L50	L90
1	12-2-08	2:20 p.m.	60.0	70.0	50.6	61.0	58.0	53.0
2	12-3-08	11:21 a.m.	58.2	74.2	49.5	56.5	53.5	51.0
3	12-3-08	12:41 p.m.	72.2	88.6	48.3	73.0	67.0	59.0
4	12-2-08	12:41 p.m.	62.6	75.7	40.1	63.5	58.5	47.5
5	12-3-08	12:00 p.m.	58.1	76.9	42.7	53.5	50.5	46.0
6	12-3-08	10:47 a.m.	64.4	81.2	49.0	64.0	60.5	56.0
7	12-2-08	11:15 a.m.	68.0	81.2	50.5	69.0	65.0	55.5
8	12-2-08	10:38 a.m.	66.3	79.8	44.9	67.5	62.5	50.0
9	12-2-08	12:08 p.m.	60.0	82.8	42.5	55.5	51.0	46.5
10	12-2-08	1:43 p.m.	56.8	71.2	45.3	55.0	50.5	47.0

Site 1: 3rd Street Between Orange Avenue and Olive Avenue

Site 1 is located on the sidewalk adjacent to a single-family home and a vacant lot, between Orange Avenue and Olive Avenue on 3rd Street. The constant noise was produced by an air compressor across the street, and noise from construction work across the street plus construction noise at a distant unseen location accounted for the majority of the noise that occurred at this site. During the measurement period, music from a band could be heard but it was not significant compared to other noise sources in the area. Construction and local traffic were the dominant sources in the area. Pneumatic hammers and electric saws across the street produced the highest noise levels at this site. The Lmax was 70.0 dBA. The Leq at this site measured 60.0 dBA.

Site 2: Corner of Walnut Avenue and 2nd Street

Site 2 is located on a sidewalk at the southeast corner of the intersection of Walnut and 2nd, in front of a single-family residence and across the street from some oil wells. Except for the noise of one or two aircraft flying at high altitude overhead, this site was generally quiet. Local traffic accounted for most of the noise that occurred at this site. Noise emanating from pumping equipment at oil wells across the street at both the northeast and northwest corners of the intersection was negligible. The traffic at this location was light in comparison to other measurement sites for the project. A passing truck produced the highest noise level at this site. The Lmax was 74.2 dBA. The Leq at this site measured 58.2 dBA.

Site 3: Corner of Beach Boulevard and Pacific Coast Highway

Site 3 is located on a sidewalk on the north side of the street at the west corner of the intersection of Beach Boulevard and Pacific Coast Highway, near a bus stop. The meter was set up on the sidewalk facing the intersection of Beach Boulevard and Pacific Coast Highway. Heavy truck traffic was observed at this site. Many of these trucks were observed traveling southeast on Pacific Coast Highway and turning north onto Beach Boulevard. Buses were also observed passing in both directions on Pacific Coast Highway. A helicopter flew over the beach during the measurement period. To the north, on the east side of Beach Boulevard, concrete was being poured from a cement truck. A passing truck, heading northbound on Pacific Coast Highway, produced the highest noise level at this site. The Lmax was 88.6 dBA. The Leq at this site measured 72.2 dBA. Being adjacent to Pacific Coast Highway, this was by far the loudest site.

Site 4: Corner of Palm Avenue and Lake Street

Site 4 is located on a sidewalk near the corner of Palm Avenue and Lake Street, near a stop sign adjacent to apartment dwellings, and across the street from the Masonic Temple. Local traffic was the dominant noise source. A large truck passing by the measurement location accounted for the Lmax, which was 75.7 dBA. The Leq at this site measured 62.6 dBA. This site had the lowest Lmin, which was 40.1 dBA.

Site 5: Corner of Twin Dolphin Drive and Pacific View Avenue

Site 5 is located at the north end of a center divider, very near the light pole, at the "T" of the intersection of Twin Dolphin Drive and Pacific View Avenue. On the east side of the street is the current location of the Hyatt Regency Hotel. The future hotel site is located on the west side of this street. Local traffic was the dominant source of noise at this site. The site was generally very quiet, with an occasional vehicle passing by. An armored truck accounted for the highest noise level at the site. The Lmax was 76.9 dBA. The Leq at this site measured 58.1 dBA.

Site 6: Corner of Main Street and Orange Avenue

Site 8 is located at the northeast corner of Main Street and Orange Avenue, on a sidewalk very near a light pole in front of a bike shop. This site was very busy with pedestrians and vehicles. The dominant noise source was traffic. Some music could occasionally be heard coming from the bike shop, but this noise level was insignificant compared to local traffic. A passing truck accounted for the highest noise level at the site. The Lmax was 81.2 dBA. The Leq at this site measured 64.4 dBA.

Site 7: Corner of Pacific Coast Highway and 9th Street

Site 7 is located on a sidewalk at the northwest corner of the intersection of Pacific Coast Highway and 9th Street. Local traffic on PCH was the dominant noise source for this site. As with Site 3, heavy truck traffic was observed. Beginning at 12:25 p.m., beeping from a backing trash truck could be heard until 12:26:30 p.m. This noise seemed to be insignificant compared to other sources of noise. A passing motorcycle accounted for the highest noise level at the site. The Lmax was 81.2 dBA. The Leq at this site measured 68.0 dBA.

Site 8: Corner of Golden West Street and Walnut Avenue

Site 8 is located on a sidewalk at the northeast corner of the intersection of Golden West Street and Walnut Avenue, near a stop sign in front of multi-family homes. Local traffic from Golden West Street was the dominant noise source at this site. During the measurement period, several large trucks passed by. A passing fire truck (without siren) accounted for the highest noise level at the site. The Lmax was 79.8 dBA. The Leq at this site measured 66.3 dBA.

Site 9: Pecan Avenue

Site 9 is located on a grass section of park land near a driveway leading to a community center, about 20 feet from Pecan Avenue. Local traffic was the major noise source at this site. During the measurement period, gardening equipment could be heard at times from across the street. Other sources such as conversation could be heard. Emergency vehicles with sirens accounted for the highest noise level at this site. The Lmax was 82.8 dBA. The Leq at this site measured 60.0 dBA.

Site 10: Alley between 5th and 6th Street near Walnut

Site 10 is located in an alley between 5th and 6th street, slightly nearer to Walnut Avenue than Olive Avenue, in the entry and parking area to a multi-family complex. This was a mixed-use area with an auto shop nearby. Several significant noise events occurred during the measurement period. A person whistling loudly could be heard about one minute into the measurement period. The sound of an air compressor at the nearby auto shop could be heard beginning at about five minutes into the measurement and lasting about 1-1/2 minutes. Other sources of noise included light local traffic through the alley, distant local traffic, the sound of a power saw, and aircraft. A helicopter flying directly overhead accounted for the two peak noise levels at this site. The Lmax was 71.2 dBA. The Leq at this site measured 56.8 dBA.

1.5 Existing Traffic Noise Levels

The highway noise levels projected 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 time 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, 70, and 75 CNEL contours are found. For the roadway analysis, worst-case assumptions about future motor vehicle traffic and noise levels have been made and were incorporated in the modeling effort. Specifically, no reductions in motor vehicle noise have been assumed in spite of legislation requiring quieter vehicles at the time of manufacture.

Traffic volumes and estimated speeds were used with the FHWA Model to estimate the noise levels in terms of CNEL. Existing traffic volumes for arterials utilized were obtained from the traffic study prepared by Kimley-Horn. The distances to the CNEL contours for the roadways in the vicinity of the project site are given in Table 5. These numbers represent the distance from the centerline of the road to the contour value shown. Note that the values given in Table 5 do not take into account the effect of any noise barriers or topography that may affect ambient noise levels.

Table 5 Modeled Existing Roadway Traffic Noise Levels

Roadway Segment	CNEL @ 100' †	Distance To CNEL Contour from Centerline of Roadway (feet) 70 CNEL	65 CNEL	60 CNEL	55 CNEL
6th Street					
Main Street to Olive Avenue	54.4	RW	20	42	91
Olive Avenue to Pacific Coast Highway	55.1	RW	22	47	101
Main Street					
6th Street to Orange Avenue	59.7	21	44	95	205
Orange Avenue to Olive Avenue	60.0	22	47	101	217
Olive Avenue to Walnut Avenue	59.5	20	43	92	199
Walnut Avenue to Pacific Coast Highway	59.6	20	44	94	203
Lake Street / 3rd Street					
Acacia Avenue to Orange Avenue	55.6	RW	24	51	109
Orange Avenue to Olive Avenue	54.5	RW	20	43	92
Olive Avenue to Walnut Avenue	55.1	RW	22	48	102
1st Street					
Orange Avenue to Pacific Coast Highway	56.6	RW	27	59	127
Orange Avenue					
6th Street to Main Street	56.8	RW	29	62	133
Main Street and 3rd Street	56.8	RW	29	62	133
Walnut Avenue					
6th Street to Main Street	51.9	RW	13	29	63
Main Street and 3rd Street	54.9	RW	21	46	99
3rd Street and 1st Street	50.9	RW	12	25	54
Pacific Coast Highway					
North of 6th Street	68.4	78	169	363	783
6th Street to Main Street	68.4	78	169	363	783
Main Street and 1st Street	68.9	84	182	392	845
South of 1st Street	68.9	84	182	392	845
Golden West Street					
North of Pacific Coast Highway	65.0	46	100	215	463
Beach Boulevard					
North of Pacific Coast Highway	65.8	52	113	243	523

† From roadway centerline
RW – Noise contour falls within roadway right-of-way.

Table 5 shows the major noise corridors occur along Pacific Coast Highway, Golden West Street, and Beach Boulevard. Other lesser noise corridors within the vicinity of the project site are also included in the table.

1.6 Existing Aircraft Noise Levels

The closest major airports to the project site are John Wayne Airport (JWA) and Long Beach (LGB) Airport. John Wayne Airport is over 7 miles from the project site. Long Beach International is over 9 miles from the project site. Aircraft noise is not expected to significantly impact the project site.

There are heliports scattered throughout the City, and the project will be subject to helicopter over flights. However, there is not a sufficient quantity of flights to generate a significant level in terms of CNEL. Helicopter noise is not expected to significantly impact the project area.

2.0 POTENTIAL NOISE IMPACTS

Potential noise impacts are commonly divided into two groups; temporary and long term. Temporary impacts are usually associated with noise generated by construction activities. Long-term impacts are further divided into impacts on surrounding land uses generated by the proposed project and those impacts that occur at the proposed project site.

2.1 Noise Impact Criteria

Off-site impacts from on-site activities, short-term and long-term, are measured against the Noise Ordinance criteria discussed in Section 1.3.2. Construction activities for the proposed project and any noise-generating activities associated with the operation of the project will be required to meet the Noise Ordinance standards. Inability to comply with the restrictions in the Noise Ordinance would result in a significant impact.

Long-term off-site impacts from traffic noise are measured against two criteria. Both criteria must be met for a significant impact to be identified. First, project traffic must cause a substantial noise level increase (greater than 3 dB) on a roadway segment adjacent to a noise sensitive land use. Second, the resulting future with project noise level must exceed the criteria level for that land use. In this case, the criteria level is 65 CNEL for residential land uses.

In community noise assessment, changes in noise levels greater than 3 dB are often identified as significant, 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. Note that there is no scientific evidence available to support the use of 3 dB as the significance threshold. In laboratory testing situations, humans are able to detect noise level changes of slightly less than 1 dB. In a community noise situation, however, noise exposures are over a long time 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 appears to be appropriate for most people.

2.2 Temporary Impacts

2.2.1 Demolition And Construction Noise

Construction noise represents a short-term impact on ambient noise levels. Noise generated by construction equipment, including trucks, graders, bulldozers, concrete mixers and portable generators can reach high levels. Demolition and grading activities will have similar noise levels.

Worst-case examples of construction noise at 50 feet are presented in Exhibit 6. The peak noise level for most of the equipment that would be used during construction is 70 to 95 dBA at a distance of 50 feet. Noise levels at further distances are less. For example, at 200 feet, the peak construction noise levels range from 58 to 83 dBA.

Noise measurements made by Mestre Greve Associates 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 Exhibit 6. That is, our measurements show that construction noise levels are usually in the low range to mid range shown in Exhibit 6. However, the noise levels shown in Exhibit 6 will be used as the basis for the estimates presented here, and represent a worst-case estimate.

The nearest existing residential areas could be as close as 50 feet from where construction would be taking place. Based on this distance, the nearest homes may experience worst-case unmitigated peak construction noise levels up to 95 dBA. The average noise levels are typically 5 to 15 dB lower than the peak noise levels. Average noise levels (Leq) at the nearest residences could be in the range of 85 dBA (Leq). However, it should be noted that the Huntington Beach noise ordinance exempts construction noise between the hours of 7 a.m. and 8 p.m. on any day except Sunday or a national holiday. Although the ambient noise levels will increase, this does not necessarily mean inconsistency with the noise levels allowed by the City. The ordinance establishes what is acceptable in the community. As long as demolition or construction occurs during these periods, no exceedance of the Noise Ordinance will occur. Mitigation measures such as limiting demolition and construction hours are presented in Section 3.3.

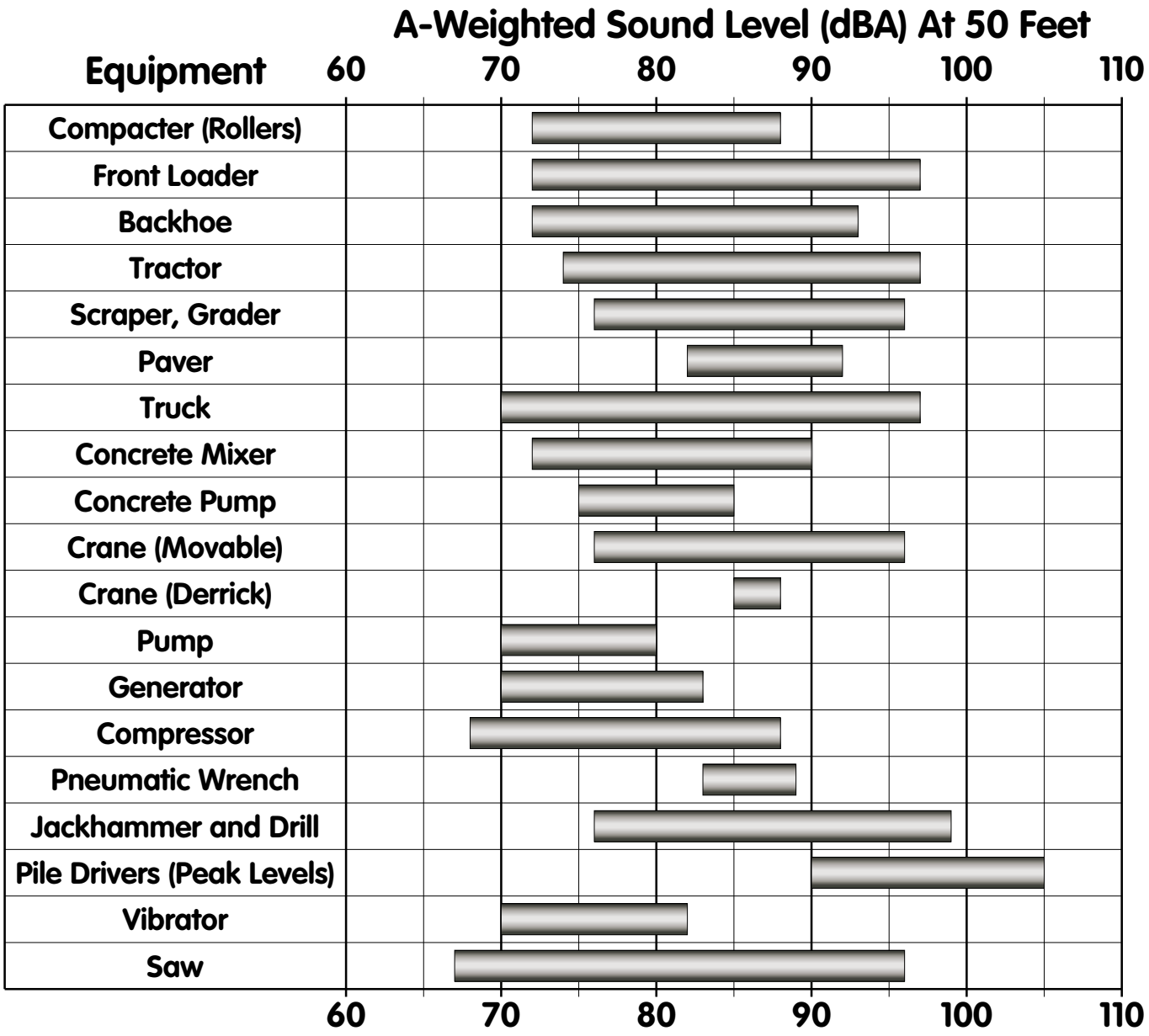
Ground borne vibration and noise can also be a potential impact during construction. However, pile driving is the only type of activity that is likely to cause a significant impact. As long as pile driving does not occur at the site, ground borne vibration and noise are not expected to be a significant concern. If any projects plan to include pile driving, then a further analysis will be needed to determine any impacts from this activity.

2.3 Long-Term Off-Site Impacts

Increased traffic caused by the project could increase traffic noise levels along the roadways in the vicinity of the project. This section examines noise impacts from the proposed project on the surrounding land uses. Specifically traffic noise increases due to the project are examined.

2.3.1 Traffic Noise Impacts Due to Project

Traffic volumes for several scenarios were compared in order to determine potential traffic noise increases. The future data were provided for the year 2020 and the year 2030. All significant traffic noise increases (i.e., noise increases greater than 3 dB) due to the project in the year 2020 were found to be less than the traffic noise increases that would be experienced in the year 2030 due to the project, so the results of the year 2020 traffic noise analysis are not included in this section. Table 6 shows the expected incremental traffic noise level increases on adjacent roadways for the project in the year 2030. The noise level increases were calculated using the traffic volumes provided by Kimley-Horn in January 2009.



Source: "Handbook of Noise Control," by Cyril Harris, 1979

Exhibit 6 - Construction Equipment Noise Levels

Table 6 Traffic Noise CNEL Increases in 2030 (dB)

Roadway Segment	2030 Increase Due To Project	2030 Increase Over Existing
6th Street		
Main Street to Olive Avenue	1.2	1.9
Olive Avenue to Pacific Coast Highway	0.7	2.0
Main Street		
6th Street to Orange Avenue	1.3	1.4
Orange Avenue to Olive Avenue	1.5	0.5
Olive Avenue to Walnut Avenue	1.9	0.3
Walnut Avenue to Pacific Coast Highway	1.9	0.2
Lake Street / 3rd Street		
Acacia Avenue to Orange Avenue	1.3	-0.2
Orange Avenue to Olive Avenue	1.9	-0.4
Olive Avenue to Walnut Avenue	1.5	0.2
1st Street		
Orange Avenue to Pacific Coast Highway	0.6	3.9
Orange Avenue		
6th Street to Main Street	1.0	1.0
Main Street and 3rd Street	1.7	1.5
Walnut Avenue		
6th Street to Main Street	0.9	2.2
Main Street and 3rd Street	1.2	-0.8
3rd Street and 1st Street	2.3	1.4
Pacific Coast Highway		
North of 6th Street	0.3	0.8
6th Street to Main Street	0.3	0.7
Main Street and 1st Street	0.3	0.3
South of 1st Street	0.4	0.2
Golden West Street		
North of Pacific Coast Highway	0.1	1.0
Beach Boulevard		
North of Pacific Coast Highway	0.2	1.0

RW – Noise contour falls within roadway right-of-way.

† From Roadway Centerline

Examining the noise increases due to the project only (column 1 entitled "Increase Due To Project") shows that the project is not projected to result in a substantial noise increase (i.e., increases greater than 3 dB) along any roadway segments. The largest increase is 2.3 dB along Walnut Avenue between 1st Street and 3rd Street. Since this increase is less than 3 dB, this is not considered a significant impact.

The second column represents the cumulative noise increases that would occur due to all growth expected in the area. As Table 6 shows, much of the noise increase that will occur in 2030 along roadways adjacent to the project will be due to the regional growth in traffic that would have occurred independently of the project. The only area that is projected to experience a noise level increase greater than 3 dB is along 1st Street, between Orange Avenue and Pacific Coast Highway. Aerial maps of the area show that residential development occurs along 1st Street. The development could occur as close as 40 feet from the roadway centerline. At this distance, the future (2030) with project noise levels would be about 67.0 CNEL. Residences in this area could be exposed to noise levels greater than 65 CNEL. The "optimum noise level" specified by the City of Huntington Beach Noise Element for residential areas is 60 CNEL. Of the 3.9 dB cumulative increase, only 0.6 dB is caused by the project.

The City has adopted a 75 CNEL noise standard for office or professional uses, and an 80 CNEL noise standard for commercial and industrial uses. If these types of land uses are constructed along 1st Street, the noise levels will be below the City's requirements. Therefore, there would not be a significant impact.

In conclusion, the project itself will not result in significant traffic noise impacts. The cumulative noise level increase could cause noise levels in excess of 65 CNEL, which may be a significant impact for residential areas developed along 1st Street.

The distances to the future (2030) with project 60, 65, 70 and 75 CNEL contours for the roadways in the vicinity of the proposed project site are presented in Table 7. The values shown under the 55, 60, 65 and 70 CNEL columns represent the distance from the centerline of the roadway to the respective contour value. The CNEL at 100 feet from the roadway centerline is also presented. These contours do not take into account the effect of any noise barriers or topography that may reduce traffic noise levels. The noise levels were calculated using traffic volumes presented in the previously referenced traffic study prepared for the project by Kimley-Horn. The traffic mix used in the CNEL calculations was compiled by the Orange County Environmental Management Agency, and is based on traffic counts at 31 intersections throughout the Orange County area. Arterial traffic distribution estimates can be considered typical for arterials in Southern California. The traffic volumes and the traffic mix used are presented in the appendix.

Table 7 Future 2030 With Project Traffic Noise Levels

Roadway Segment	CNEL @ 100' †	Distance To CNEL Contour from Centerline of Roadway (feet) 70 CNEL	65 CNEL	60 CNEL	55 CNEL
6th Street					
Main Street to Olive Avenue	57.5	15	32	69	148
Olive Avenue to Pacific Coast Highway	57.8	15	33	71	154
Main Street					
6th Street to Orange Avenue	62.3	31	66	143	309
Orange Avenue to Olive Avenue	62.0	29	63	136	292
Olive Avenue to Walnut Avenue	61.7	28	60	130	279
Walnut Avenue to Pacific Coast Highway	61.7	28	61	131	282
Lake Street / 3rd Street					
Acacia Avenue to Orange Avenue	56.7	13	28	60	129
Orange Avenue to Olive Avenue	56.0	12	25	54	117
Olive Avenue to Walnut Avenue	56.9	13	29	62	134
1st Street					
Orange Avenue to Pacific Coast Highway	61.0	25	55	118	253
Orange Avenue					
6th Street to Main Street	58.8	18	39	84	180
Main Street and 3rd Street	60.1	22	47	102	219
Walnut Avenue					
6th Street to Main Street	55.0	10	22	47	100
Main Street and 3rd Street	55.3	10	23	49	105
3rd Street and 1st Street	54.7	10	21	44	95
Pacific Coast Highway					
North of 6th Street	69.5	93	201	432	931
6th Street to Main Street	69.4	92	197	425	916
Main Street and 1st Street	69.5	93	200	430	926
South of 1st Street	69.5	92	199	429	925
Golden West Street					
North of Pacific Coast Highway	66.1	55	119	257	553
Beach Boulevard					
North of Pacific Coast Highway	67.0	63	136	292	630

2.3.2 Off-site Impacts From On-site Activities

In addition to roadway traffic noise, on-site activities have the potential to generate off-site impacts. Specifically, the activities associated with retail establishments such as large air conditioning units, parking lots, and delivery trucks are of concern. Retail establishments may be built in Districts 1, 2, and 3. The closest distance from retail activities to any off-site sensitive use location may be as little as 50 feet. However, all the Districts that are zoned for retail uses are separated from existing adjacent residential areas by roadways. Typically this separation, along with the ambient noise levels from the roadway is sufficient to render any impacts from the retail areas insignificant. In conclusion, no significant noise impacts would occur.

2.4 Long-Term On-Site Impacts

This section examines noise impacts to the project site itself due to activities that occur exterior to the project as well as activities that are confined within the project's boundaries. Specifically, we will examine traffic noise levels that might impact the proposed uses.

2.4.1 On-Site Roadway Traffic Noise Exposure

The project site is adjacent to busy arterial roadways. The distances to the future 55, 60, 65 and 70 CNEL contours for the roadways in the vicinity of the proposed project site were presented previously in Table 7. Exhibit 7 shows the on-site noise exposure for the project site. Note that the contours do not include the shielding effects of buildings, topography, or sound barriers that would lower the noise levels from what is shown in the Exhibit 7, and therefore, represent a worst-case estimate.

At some point, new residential units may be built within the Specific Plan area. Those residential units that could be impacted the most will be located within those areas that are adjacent to major roadways. In particular, any residential units bordering major roadways will experience high traffic noise levels. Noise levels along Pacific Coast Highway are as high as 73.2 CNEL at the edge of the roadway. Along Beach Boulevard, the noise levels are as high as 67.6 CNEL, and along Golden West Street, the noise levels are as high as 68.5 CNEL. Noise levels along Main Street are as high as 69.2 CNEL. Along 1st Street, the noise levels are as high as 67.0 CNEL, and along Orange Avenue, the noise levels are as high as 66.6 CNEL. Any new residences that experience noise levels in excess of 65 CNEL may require some form of mitigation to reduce the noise to an acceptable level. Noise levels would exceed the outdoor noise standard of 65 CNEL for the roadways listed above, and may exceed the indoor noise criteria of 45 CNEL without some form of mitigation. Any new residential areas constructed along 1st Street or along Orange Avenue may experience CNEL noise levels in excess of 65 CNEL. See Section 3.3 for mitigation measures.

Retail establishments are planned for some areas, and may include offices. The City has a 75 CNEL standard for offices and professional uses. Noise levels along Pacific Coast Highway are as high as 73.2 CNEL at the edge of the roadway. Noise levels along Beach Boulevard and Main Street are as high as 67.6 CNEL and 68.2 CNEL, respectively, at the edge of the roadway. All these noise levels are less than the 75 CNEL limit for office uses. No impact is identified for the proposed retail areas.

Exhibit 7
Traffic Noise CNEL Contours

MESTRE GREVE ASSOCIATES

2.4.2 Noise Conflicts Within The Specific Plan

Residential uses directly adjacent to less noise-sensitive land uses, such as commercial or industrial uses, can result in noise impacts to the residences. For the proposed project, residences are separated from commercial uses by roadways except for two areas. District 1 (the Downtown Core Mixed-Use zone) may have some retail use areas, and these could be directly adjacent to the residential portion of the District 2 (Visitor-Serving Mixed-Use zone). While hotels are not technically considered residential land uses, the level of noise sensitivity is comparable to a residential use, and the hotels would need to meet the same standards as for residential use. Conversely, the District 2 zone may have some retail use areas that could be directly adjacent to the residential uses in District 1.

District 2 may have some retail uses areas that could be directly adjacent to the residential (hotel) portion of the District 3 (Visitor-Serving Recreation zone) and District 5 (multi-family residential). Residential areas in District 4 will be separated from District 1 by an alley, so no significant impacts are expected at this location.

The retail use main noise generators are likely to be parking lots, truck deliveries, and air conditioning equipment. Each of these potential sources of noise is evaluated in the following paragraphs.

Residences adjacent to or near a parking lot could be impacted by activities that would occur in the parking lot. Traffic associated with parking lots is not usually of sufficient volume to exceed community noise standards that are based on a time-averaged scale such as the CNEL scale. However, the instantaneous maximum sound levels generated by car door slamming, engine start-up, alarm activation and car pass-bys can exceed the noise standard. Tire squeal may also be a problem depending on the type of parking surface. Estimates of the maximum noise levels associated with parking lot activities are presented in Table 8. These levels are based on measurements conducted by Mestre Greve Associates. The noise levels presented are for a distance of 50 feet from the source, and are the maximum noise level generated. A range is given to reflect the variability of noise generated by various automobile types and driving styles.

Table 8 Maximum Noise Levels Generated By Parking Lots (dBA at 50 feet)

Event	Lmax
Door Slam	60 to 70
Car Alarm Activation	65 to 70
Engine Start-up	60 to 70
Car pass-by	55 to 70

At this level of analysis, detailed plans are generally not available, so the exact locations of any parking areas that may be constructed within the project are not yet known. Any plans that are currently available are subject to change. For the purposes of determining worst-case noise impacts to residences due to parking lot related activities, it will be assumed that a parking lot could be located anywhere within the confines of the property containing the parking lot.

Parking lots may be included in Districts 1, 2, and 3. The distance between these parking lots and the adjacent residential units could be closer than 50 feet. For residential areas, the noise ordinance specifies that the maximum noise level (Lmax) cannot exceed 75 dBA. At 50 feet from the noise source, Table 8 shows that the maximum noise level due to parking lot related activities would be 70 dBA. Extrapolation of this data shows that the maximum noise level at 28 feet would be 75 dBA. For any residential areas farther than 28 feet from the parking areas, there are no parking lot noise impacts foreseen. If parking areas are located closer than 28 feet from residential areas, a significant impact may occur. Typically, the noise levels would not be a significant impact as long as the residences are more than 50 feet from the noise source. For areas where the residences are less than 50 feet from the noise source, see Section 3.3 for mitigation measures.

Truck deliveries, loading dock activities and air conditioning noise are difficult to assess at this stage of the project. Loading dock noise includes the movement of the goods into the store and possibly forklifts operations. Truck delivery noise is generated when the truck drives to, or from, the loading dock. Delivery truck drivers also formerly could leave the truck idling during unloading operations, however, trucks are now prohibited from idling for more than 5 minutes per the South Coast Air Quality Management District regulations.

Residential uses directly adjacent to areas where truck deliveries, loading dock activities and air conditioning units would exist could experience a significant noise impact. Detailed plans are not yet available, so the exact locations of any areas that may be adjacent to truck deliveries, loading dock activities and air conditioning units are not yet known. District 1, District 2, and District 3 may have some retail areas where these noise sources could impact adjacent residential areas.

The number of truck deliveries and the time of day that unloading would occur is not known. Nighttime operations can be particularly annoying to residences. Noise levels could be loud enough that they would be disturbing to the adjacent residences. Mitigation measures such as requiring further studies for loading docks and truck delivery routes are presented in Section 3.3.

Mechanical equipment noise is associated with the heating, ventilation, and air conditioning system (HVAC). HVAC equipment is sometimes located on the ground and sometimes located on the roof of the buildings. The type, size and number of mechanical equipment units is not known at this time. If the equipment is located on the roof, often parapet walls are used to control the noise from the equipment. Similarly, sound walls can be located around HVAC equipment that is located on the ground. Without mitigation, impacts could occur. Mitigation measures such as providing sound walls and requiring further studies for the commercial zone are presented in Section 3.3.

Music and other noise from concert halls, theaters and similar establishments can also be a potential impact on adjacent land uses. There is a concert hall/theater planned within the project. However, the performances would all be held in the interior of the performing arts building, which will be sound attenuated. Noise from the concert hall/theater is not expected to be a significant impact.

Amplified music and other noise at restaurants can also be a potential impact on adjacent land uses. However, these noise sources will be required to meet the City's Noise Ordinance limits, and so should not be a significant impact.

3.0 MITIGATION MEASURES

3.1 Temporary Impacts

3.1.1 Construction Noise

The analysis presented in Section 2.2.1 shows that project demolition and construction noise could result in significant impacts to nearby residences if uncontrolled. The most effective method of controlling construction noise is through limiting construction hours. The City of Huntington Beach Noise Ordinance does have restrictions on construction hours. Therefore, the following mitigation measure which is also a City of Huntington Beach code requirement is proposed and is consistent with the Noise Ordinance.

> **Mitigation Measure N-1:**
> Control of Construction Hours – All construction activities should be limited to the hours between 7 a.m. and 8 p.m. Monday through Saturday. Construction shall be prohibited on Sundays or Federal holidays. Additionally, noise attenuation devices such as mufflers should be used on all construction equipment, and construction staging areas should be located as far as possible from any residences or other noise-sensitive receptors.

3.2 Long Term Off-Site Impacts

3.2.1 Traffic Noise

The analysis presented in Section 2.3.1 showed that the noise levels along the roadways impacted by the project would increase by less than 3 dB due to the increase in traffic as a result of the project. Therefore, there would be no noise significant impacts to nearby residences due to the project. No mitigation is necessary.

3.2.2 On-Site Activities Impacting Off-Site Areas

The analysis of Section 2.3.2 showed that retail establishments at District 1, District 2, and District 3 will be far enough from off-site sensitive locations to avoid a significant noise impact. Therefore, no mitigation is required.

3.2.3 Cumulative Impacts

In one area (along the east side of 1st Street), cumulative traffic noise impacts will be significant, but the project will not contribute significantly to this increase, Therefore, no mitigation is proposed.

3.3 Long Term On-Site Impacts

The analysis presented in Section 2.4 concluded that lots containing newly constructed residential units facing Pacific Coast Highway, Golden West Street, Main Street, or Beach Boulevard may be subject to noise levels from roadway traffic in excess of 65 CNEL. Therefore, noise reduction measures (e.g., plexiglass, masonry material) may be required to achieve the noise standard along some of these roads. Since the plans for any potential new individual developments are not yet available, the exact specifics of the noise reduction measures to attenuate noise cannot yet be calculated. Mitigation Measure N-2 will ensure that these uses meet the City's noise standards and mitigate the potential significant impact.

Mitigation Measure N-2:
Prior to issuance of building permits for residences located within the 65 CNEL noise contour, a detailed noise assessment with noise reduction measures specified shall be prepared to show that noise levels in those areas will not exceed the 65 CNEL outdoor noise criteria and the 45 CNEL indoor noise standard. The noise assessment shall be prepared by a qualified acoustical consultant and shall document the sources of noise impacting the areas and describe any measures required to meet the standard. These measures will be incorporated into the project plans. The report shall be completed and approved by the City prior to issuance of building permits.

The analysis presented in Section 2.4.2 concluded that loading docks, parking lots, and mechanical equipment in Districts 1, 2, and 3 have the potential to generate excessive noise levels at adjacent residential areas. At this time, there is not enough project detail to determine if the specific project design could result in significant impacts. The following mitigation measure will ensure a significant impact is not created as a result of these sources.

Mitigation Measure N-3:
Prior to issuance of building permits, city staff will review the proposed commercial center design. Loading docks, truck delivery routes, parking lots, and mechanical equipment within 50 feet of any residence may result in impacts. A detailed noise assessment shall be prepared to ensure that these sources do not exceed the City's Noise Ordinance limits. The assessment shall be prepared by a qualified acoustical engineer and shall document the noise generation characteristics of the proposed equipment and the projected noise levels at the nearest use. Compliance with the these levels shall be demonstrated and any measures required to comply with the Noise Ordinance will be included in the project plans.

4.0 UNAVOIDABLE SIGNIFICANT IMPACTS

The mitigation measures described above will mitigate all significant impacts to a level of insignificance. There are no unavoidable significant impacts.

APPENDIX

Table A-1 Traffic Volumes Used For Noise Modeling (ADT's)

Road Segment	Speed (mph)	Existing Year 2008	Without Project Year 2020	With Project Year 2020	Without Project Year 2030	With Project Year 2030
6th Street						
Main Street to Olive Avenue	35	3,192	5,567	7,165	5,000	6,598
Olive Avenue to PCH	35	3,759	4,236	5,250	6,000	7,014
Main Street						
6th Street to Orange Avenue	45	5,810	8,797	11,499	8,000	10,702
Orange Avenue to Olive Avenue	45	6,301	7,484	10,346	7,000	9,862
Olive Avenue to Walnut Avenue	45	5,541	6,244	9,450	6,000	9,206
Walnut Avenue to PCH	45	5,720	6,445	9,779	6,000	9,334
Lake Street / 3rd Street						
Acacia Avenue to Orange Avenue	35	4,207	5,580	6,972	4,000	5,392
Orange Avenue to Olive Avenue	35	3,266	5,680	5,356	3,000	4,676
Olive Avenue to Walnut Avenue	35	3,807	4,290	5,966	4,000	5,676
1st Street						
Orange Avenue to PCH	35	5,278	8,108	9,918	13,000	14,810
Orange Avenue						
6th Street to Main Street	35	5,613	6,566	8,480	7,000	8,914
Main Street to 3rd Street	35	5,629	7,398	11,302	8,000	11,904
Walnut Avenue						
6th Street to Main Street	35	1,821	3,891	4,583	3,000	3,692
Main Street to 3rd Street	35	3,622	5,536	6,468	3,000	3,932
3rd Street to 1st Street	35	1,445	3,083	4,499	2,000	3,416
Pacific Coast Highway						
North of 6th Street	50	33,000	38,805	41,599	40,000	42,794
6th Street to Main Street	50	33,000	38,969	41,761	39,000	41,792
Main Street to 1st Street	50	37,000	43,396	45,890	40,000	42,494
South of 1st Street	50	37,000	42,958	46,324	39,000	42,366
Golden West Street						
North of PCH	50	15,000	16,400	16,900	19,100	19,600
Beach Boulevard						
North of PCH	50	18,000	20,900	22,000	22,700	23,800

Table A-2 Vehicle Mix Used For Noise Modeling

	Day	Eve	Night
Auto	75.51%	12.57%	9.34%
Medium Truck	1.56%	0.09%	0.19%
Heavy Truck	0.64%	0.02%	0.08%