Noise
4.10 NOISE

This section describes and assesses the potential adverse impacts associated with noise generated by the Project on sensitive receptors in its vicinity or the impacts of ambient and ambient plus Project noise generated in the Project vicinity of the Project on potential Project residents. The Project consists of the development of a 465-unit mixed residential development project (Village at Los Carneros) and rezoning/lot line changes that will impact the parking lots of Lots 1 and 3 of Tract 14,500 and portions of the undeveloped Village at Los Carneros site along its southern boundary. Since Lots 1 and 3 are currently fully developed with research/office buildings, and do not house sensitive receptors, this portion of the Project site will not be included in this analysis. The terms “Project” or “Project site,” when used in this Section, refer solely to the currently undeveloped Village at Los Carneros Project site on Lots 2, 4, 5, 6, and 7 of Tract 14,500.

The information presented in this section is based upon a Noise Report assessment prepared by Giroux and Associates, and associated modeling, which included noise measurements taken at specific locations on, or in the immediate vicinity of, the Project site to identify existing conditions (baseline measurements), modeling of future noise levels derived from both Project activities as they would affect surrounding land uses and the impact of the ambient noise environment upon the Project and its future residents (see Appendix H). Measures to reduce or minimize any adverse impacts were suggested by common industry practices, by the Goleta General Plan Noise Element, and by acoustical reports produced for other nearby projects.

4.10.1 Existing Conditions

Sound v. Noise

Sound is mechanical energy transmitted by pressure waves in a compressible medium such as air. Sound is characterized by various parameters that describe the physical properties of sound waves. These properties include the rate of oscillation (frequency), the distance between successive troughs or crests, the speed of propagation, and the pressure level or energy content of a given sound wave. In particular, the sound pressure level has become the most common descriptor used to characterize the loudness of an ambient sound level. Noise is generally defined as unwanted sound. The unit of sound pressure expressed as a ratio to the faintest sound detectable to a person with normal hearing is called a decibel (dB). Sound or noise can vary in intensity by over one million times within the range of human hearing. The human ear is not equally sensitive to all sound frequencies within the entire sound spectrum. Noise levels at maximum human sensitivity (from around 500 to 2,000 cycles per second) are factored more heavily into sound descriptions in a process called “A-weighting,” written as “dBA.” Any further reference to “decibels” written as dB in this analysis should be understood to be A-weighted. A logarithmic loudness scale, similar to the Richter scale for earthquake magnitude, is used to measure sound intensity numbers and to allow the establishment of measurable standards that maintain noise ambient sound at a convenient and manageable levels in specific environments.

Alternatively, a statistical description of the sound level that is exceeded over some fraction of a given observation period can also be used to describe typical time-varying instantaneous noise. Because community receptors are more sensitive to unwanted noise intrusion during 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). A similar metric called the "day-night level" written as Ldn is also commonly used. In practice, CNEL and Ldn are almost identical.

Noise Sound levels from a particular source decline as the distance to the receptor increases. Other factors, such as weather and reflecting or shielding, also help to lower intensity or reduce noise sound levels at any given location. A commonly used rule of thumb for sound generated on roadways, or traffic-related noise is that for every doubling of distance from the source, the noise level is reduced by about 3 dBA acoustically at “hard” locations (i.e., the area between the noise source and the receptor is nearly complete asphalt, concrete, hard-packed soil, or other solid materials) and 4.5 dBA at acoustically “soft” locations (i.e., the area between the source and receptor is normal earth or has vegetation, including grass) (Caltrans, 2009: p. 2-31). Noise from stationary or point sources is reduced by about 6 to 7.5 dBA for every doubling of distance at acoustically hard and soft locations, respectively. When the noise sound source is a continuous line, such as vehicle traffic on a highway, sound levels decrease by about 3 dBA for every doubling of distance. Noise Sound levels may also be reduced by intervening structures; generally a single row of buildings between the receptor and the noise source reduces the noise sound level by about 5 dBA, while a solid wall or berm reduces noise sound levels by 5 to 10 dBA. The exterior-to-interior reduction of noise levels for newer residential units is generally 20 dBA or more.

**Baseline Noise Levels**

Existing ambient noise levels at the Project site are predominantly generated by vehicular traffic noise generated on nearby roadways. These roadways include Los Carneros Road, the U.S. Highway 101 southbound off-ramp, and traffic on the U.S. Highway 101 freeway. Other sources include industrial noise to the west and south, distant aircraft over flight, and intermittent trains on UPRR tracks along the north boundary. The site is outside the Santa Barbara Municipal Airport (SBA) noise impact zone, but individual noise events from aircraft are sometimes audible on the Project site. The effect of off-site generated on-site noise on the Project site conditions are depicted shown in a series of Figures that depict the difference in ambient noise conditions as contour lines based on the assumptions regarding freight train activity along the UPRR tracks at the sites north boundary.

The effects of these various sources of sound vary dramatically across the site due to with distance across the site because of the impact of distance and due to the propagation blocking effects of variable terrain or intervening physical structures. There is also substantial day-to-night variation of sound generation that may not be adequately characterized by brief discrete sound measurements.

**Measured Noise**

Noise measurements were conducted over a 24-hour period from April 3, 2012 to April 4, 2012. Short-term measurements were made at 3 locations and long-term measurements (24-hour) were made at 3 locations. Short-term and long-term measurement locations are shown in Figure 4.10-1.

**Short-term Meters**

Short-term measurements were made using a Larson-Davis Sound Level Meter. Short Term Meter ST1 covered the strip of land along the western Project boundary adjacent to existing industrial uses. Short Term Meter ST2 was also located near existing industrial uses along the northwest Project border. Short Term Meter ST3 was placed in the eastern Project perimeter
adjacent to Los Carneros Road and was setback approximately 50 feet from the road’s centerline of Los Carneros Road. The results of the short-term meter measurements are shown in Table 4.10-1.

### Table 4.10-1
**Short-term Measured Noise Levels (dBA)**

<table>
<thead>
<tr>
<th>Short Term Meter</th>
<th>Leq</th>
<th>Lmax</th>
<th>Lmin</th>
<th>L10*</th>
<th>L33*</th>
<th>L50*</th>
<th>L90*</th>
</tr>
</thead>
<tbody>
<tr>
<td>ST1</td>
<td>55.4</td>
<td>72.0</td>
<td>49.5</td>
<td>55.0</td>
<td>52.0</td>
<td>51.5</td>
<td>50.5</td>
</tr>
<tr>
<td>ST2</td>
<td>58.4</td>
<td>79.0</td>
<td>52.0</td>
<td>59.0</td>
<td>58.0</td>
<td>57.0</td>
<td>55.5</td>
</tr>
<tr>
<td>ST3</td>
<td>67.6</td>
<td>81.5</td>
<td>48.0</td>
<td>70.5</td>
<td>67.5</td>
<td>64.0</td>
<td>52.5</td>
</tr>
</tbody>
</table>

*Levels measured for 10, 33, 50, and 90 percent of readings, respectively.

Short-term noise levels along the Project’s western Project boundary (Meters ST1 and ST2), adjacent to existing industrial uses, are dominated by freeway noise rather than the adjacent office industrial uses. Based upon long-term measurement results, where freeway noise is the sound source, ambient CNEL noise levels can generally be estimated by adding 5 dBA to mid-day Leq noise levels. The resulting CNEL noise levels along the western site boundary are in the range of 60-63 dBA. Land uses to the west and south of the residential component of the Project support office and light industrial uses. Section 35-85.7 of the City Zoning Regulations establishes performance standards for such uses in the industrial zone and requires that the volume of sound, measured during calm air conditions, inherently and recurrently generated by or resulting from any use, other than motor vehicles, operated on any lot, cannot exceed seventy (70) decibels dB at any point along the boundary or outside of the lot upon which such use is located.

Short-term Meter ST3 was placed along the eastern Project boundary, adjacent to Los Carneros Road. The noise meter was located approximately 50 feet from the Los Carneros centerline. Ambient noise levels due to roadway vehicle traffic at this location are higher than along the more sheltered western boundary. Along arterial roadways, CNEL is estimated by adding 3 dBA to the mid-day Leq. Adding a factor of 3 dBA, the CNEL along the eastern boundary would be approximately 71 dBA.

### Long-term Noise Meters

Three long-term meters were used to provide a 24-hour CNEL, and were placed along the Project’s northern boundary to record noise levels generated by trains on the UPRR tracks and traffic on the U.S. 101 freeway. The results of the long-term meter measurements are shown in Table 4.10-2.

Long Term Meter LT1 was placed at the Project’s northwestern boundary to record existing ambient noise levels that would be experienced by the residential units located closest to the train tracks. This meter was placed about 65 feet from the railroad tracks on top of a berm located along the UPRR right-of-way (ROW) with a direct line of sight to the U.S. 101 freeway, so as to record ambient noise without terrain shielding effects. The 24-hour CNEL was 69 dBA.
at this location. This noise level is indicative of what would be experience at any north-facing patios or balconies at the closest Project residence adjacent closest to the railroad tracks. The monitoring data indicates that all train noise “pulses” were 15 seconds or shorter. This suggests that there were zero freight trains passing the site during the 24-hour period when measurements were taken because freight trains typically have much longer noise spikes.

Long Term Meter (LT2) was placed approximately midway along the Project’s northern boundary, on top of the berm at the southern limit of the UPRR ROW. Noise measurements for this location were lower than the levels recorded by LT1 as the distance to US Highway 101 was greater and there is increased shielding from other land features, such as the U.S. 101 freeway off-ramp as it begins to incline, and the raised Los Carneros Road/US Highway 101 overpass to the east. At this meter location, existing ambient noise levels were measured at approximately 65 dBA CNEL at the top of the berm.

Long-Term Meter LT3 was placed near LT2, but was located on relatively level ground at a distance of about 125 feet from the railroad tracks approximately midway along the northern boundary. This meter was aligned with the approximate location of one of the Project’s 4-plex buildings. At this location, the meter was shielded from a direct line-of-sight to the U.S. 101 freeway due to the freeway off-ramp incline and the Los Carneros Road/US Highway 101 overpass to the east. Additional shielding was provided by the berm that runs the length of UPRR ROW. LT3 recorded a noise level of 61 dBA CNEL.

<table>
<thead>
<tr>
<th>Long Term Meter</th>
<th>Distance from railroad tracks</th>
<th>24-Hour CNEL</th>
</tr>
</thead>
<tbody>
<tr>
<td>LT1</td>
<td>65 ft.</td>
<td>69.0</td>
</tr>
<tr>
<td>LT2</td>
<td>65 ft.</td>
<td>65.0</td>
</tr>
<tr>
<td>LT3</td>
<td>125 ft.</td>
<td>61.0</td>
</tr>
</tbody>
</table>

**Vertical Profile Measurement**

While ground level residential units may benefit from some noise shielding due to terrain, measurements show that upper level units are typically exposed to a higher level of noise. Several measurements were conducted to determine vertical profiling of short-term noise. For To establish the vertical profiling, the noise meter microphone was positioned at three locations along the northeastern boundary, labeled Profile 1, Profile 2, and Profile 3. Vertical profiles for each of the measurements included a 5-foot, 15-foot, and 25-foot elevation above ground surface. The purpose of the profiling was to predict noise exposure at multiple stories of the residential buildings and, in particular, the noise exposure experienced by residential units located at the third level of the Project’s affordable housing apartment units, which would be located in the northeast corner of the Project site, closest to the U.S. 101 freeway and UPRR tracks. The results of the vertical profiling are shown in Table 4.10.3.
Table 4.10-3

<table>
<thead>
<tr>
<th>Locations</th>
<th>Time of Day</th>
<th>Elevation Above Ground (feet)</th>
<th>Leq (dBA)</th>
<th>L50 (dBA)</th>
<th>L90 (dBA)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Profile 1</td>
<td>14:00-14:15</td>
<td>5</td>
<td>51</td>
<td>50</td>
<td>49</td>
</tr>
<tr>
<td></td>
<td></td>
<td>15</td>
<td>53</td>
<td>52</td>
<td>50</td>
</tr>
<tr>
<td></td>
<td></td>
<td>25</td>
<td>56</td>
<td>54</td>
<td>53</td>
</tr>
<tr>
<td>Profile 2</td>
<td>14:40-14:55</td>
<td>5</td>
<td>54</td>
<td>52</td>
<td>51</td>
</tr>
<tr>
<td></td>
<td></td>
<td>15</td>
<td>56</td>
<td>55</td>
<td>54</td>
</tr>
<tr>
<td></td>
<td></td>
<td>25</td>
<td>59</td>
<td>57</td>
<td>56</td>
</tr>
<tr>
<td>Profile 3</td>
<td>15:25-15:40</td>
<td>5</td>
<td>54</td>
<td>52</td>
<td>51</td>
</tr>
<tr>
<td></td>
<td></td>
<td>15</td>
<td>56</td>
<td>55</td>
<td>54</td>
</tr>
<tr>
<td></td>
<td></td>
<td>25</td>
<td>59</td>
<td>58</td>
<td>56</td>
</tr>
</tbody>
</table>

Vertical Profile 3 is located closest to Los Carneros Road. Residences at this location would experience the greatest ambient noise impacts on the Project site, resulting from the result of the combined noise generated by traffic on the U.S. 101 freeway and its off-ramp, and Los Carneros Road, which is elevated at this location as it inclines to bridge the railroad tracks and freeway. At a 25-foot vertical elevation, which is approximately the height of a 3rd story balcony, noise levels were as much as 5 dBA greater than those experienced at ground level. Adding 5 dBA to a mid-day Leq would indicate future CNELs of 59 dBA at ground level and up to 64 dBA at the 3rd story.

Roadway Traffic and Measured Noise

In addition to analysis of actual noise measurements, traffic noise modeling was conducted as part of the Noise study. The three primary sources of road noise were modeled with the FHWA\(^1\) Traffic Noise Model (TNM) Version 2.5. Modeling was first conducted using data estimates for average daytime hourly traffic volumes and subsequently with average nighttime hourly traffic volumes. Both existing and future conditions were modeled. For purposes of calculating Ldn, the 24-hour day was divided into the daytime period, which is between 7:00 a.m. and 10:00 p.m., and the nighttime period, which is between 10:00 p.m. and 7:00 a.m.

Four noise analysis locations were selected to represent the northernmost buildings across the site, closest to roadway noise sources. These locations are shown in Figure 4.10-2. At each modeled receiver location, two points were measured: one at a height of about 5 feet above the Project’s first floor elevation, and a second point five feet above the second story floor elevation. Finally, a modeled receiver was placed at an elevation 25 feet above the ground level to simulate the height of the third floor of the Project’s apartments located in the northeast corner of the Project site.

Current Average Daily Traffic (ADT) volumes were obtained from the California Department of Transportation (Caltrans) for both U.S. Highway 101 and U.S. Highway 101/Los Carneros Road southbound off-ramp. An estimate of the future volume on the U.S. 101 freeway and U.S. 101/Los Carneros Road southbound off-ramp were calculated by projecting approximately a one percent per year increase through year 2024. This is the average of the annual rates of increase on the highway from 1995 through 2010 (30,000 ADT in 1995 and 34,500 ADT in 2010).

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\(^1\) Federal Highway Administration.
ADT values for Los Carneros Road were obtained from the Project’s Traffic Impact Study, prepared by Linscott, Law, and Greenspan (LLG), (LLG, 2012), which is included in Appendix J.

For Los Carneros Road, the ADT value was split between as follows: 85 percent for the daytime and 15 percent for the nighttime. The percentages for automobiles, medium duty trucks, and heavy-duty trucks were determined from the traffic counts conducted during the analysis of Los Carneros Road provided in the Community Noise Analysis for Willow Springs Phase II Report (URS, 2009).

To determine the daytime and nighttime ADT split on the U.S. 101 freeway on-site noise readings were analyzed. Daytime noise readings were compared with nocturnal measurements at the two-berm locations with a view of the U.S. 101 freeway. Assuming that truck percentages and travel speeds are relatively similar, any observed noise level differences in hourly average Leq levels are assumed to be mainly due primarily to diurnal variation in traffic volumes. Some train traffic noise effects may slightly skew the analysis. However, train noise was treated as a short-term phenomenon transient impact rather a continuing source of noise sufficiently frequent to affect than affecting the hourly average.

Examination of the hourly ADT records shows that evening (7 p.m. to 10 p.m.) traffic-generated sound levels are almost identical to the daytime average, when the difference in sensitivity is factored in to account for the reduction in actual traffic. For this reason, the analysis was therefore structured into a “daytime” period from 7 a.m. to 10 p.m. and a nocturnal period from 10 p.m. to 7 a.m. The day/night volume breakdown that best matches the available measurement data is provided in Table 4.10-4.

<table>
<thead>
<tr>
<th>Table 4.10-4</th>
<th>ADT and Noise Measurements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Day-Night Difference</td>
<td>West Meter</td>
</tr>
<tr>
<td>+3 dBA</td>
<td>+2 dBA</td>
</tr>
<tr>
<td>Daytime Percentage*</td>
<td>77%</td>
</tr>
<tr>
<td>Nocturnal Percentage*</td>
<td>23%</td>
</tr>
</tbody>
</table>

*ADT distribution that would yield the observed day-night measured difference.

Within the limits of noise measurement accuracy, twenty-five percent of freeway ADT was therefore assumed to travel from 10 p.m. to 7 a.m. and seventy-five percent from 7 a.m. to 10 p.m.

The current and future roadway traffic-generated noise levels were computed separately as Leq values for the daytime hours and for the nighttime hours. These values were then combined to yield the Day-Night Equivalent Noise Level or Ldn. In computing the Ldn, an extra 10 dBA “penalty” is added to the nighttime Leq values to account for the added nuisance of noise in the quiet hours of the night during this time of day.

The calculation uses the following equation:

\[ Ldn = 10 \times \log \left( \frac{1}{24} \times \left( 15 \times 10^{Ld/10} + 9 \times 10^{Ln+10/10} \right) \right) \]

Where:
- Ldn = Day-Night Average Noise Level
- Ld = Hourly equivalent noise level for hours during the daytime
- Ln = Hourly equivalent noise level for hours during the nighttime.
Results of this computation for current and future noise levels are summarized in Table 4.10-5.

**Table 4.10-5**

<table>
<thead>
<tr>
<th>Receiver Location</th>
<th>Description</th>
<th>Ldn (dBA)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Current</td>
</tr>
<tr>
<td>R1</td>
<td>Westernmost Ground Level</td>
<td>69.1</td>
</tr>
<tr>
<td></td>
<td>Westernmost Second Story</td>
<td>72.2</td>
</tr>
<tr>
<td>R2</td>
<td>West-Center Ground Level</td>
<td>65.8</td>
</tr>
<tr>
<td></td>
<td>West-Center Second Story</td>
<td>65.9</td>
</tr>
<tr>
<td>R3</td>
<td>East-Center Ground Level</td>
<td>59.1</td>
</tr>
<tr>
<td></td>
<td>East-Center Second Story</td>
<td>59.5</td>
</tr>
<tr>
<td>R4</td>
<td>Easternmost Ground Level</td>
<td>58.5</td>
</tr>
<tr>
<td></td>
<td>Easternmost Second Story</td>
<td>63.1</td>
</tr>
<tr>
<td></td>
<td>Easternmost Third Story</td>
<td>63.7</td>
</tr>
</tbody>
</table>

**Railroad Noise**

The Union Pacific Railroad Company provides service through the Goleta area. The Santa Barbara County portion of the Coast (LOSSAN or San Luis Obispo to San Diego) Line parallels the U.S. 101 freeway on a narrow coastal plain in very close proximity to the Pacific Ocean. In the Central Coast, this line is primarily a single track with passing sidings in Guadalupe, Surf, and Santa Barbara. This segment of the corridor traverses a mix of small coastal residential clusters, rural zones, coastal recreation, and some light industry, focused on oil industry operations. The combined UPRR and U.S. 101 freeway corridor traverses the City of Carpentaria, the community of Montecito, the City of Santa Barbara, and the City of Goleta. Based on knowledge of the corridor documented in several studies, the corridor infrastructure in the corridor has not kept pace with the revival and subsequent increases in rail service north of Los Angeles. Improvements, financed by Caltrans, have focused on upgrading the poor and failing infrastructure that was already in place and did not emphasize expansion of capacity. As a result, the capacity of the Central Coast segment of the line remains a limiting factor determining in the amount of passenger and freight service that can be provided. In 2008, the date of the most current SCAG study of this segment of the LOSSAN corridor, UPRR operated approximately six to ten through trains, and a handful of local freight trains, with freight operations focused primarily in Oxnard, with a local short-haul line (Ventura County Railroad) serving the expanding Port of Hueneme.

Based on The SCAG Ventura–Santa Barbara Rail Study, Final Report, March 2008, prepared by Sharon Greene Associates states for SCAG:

“The UPRR has seen significant growth in freight traffic in recent years. The UPRR moves significant volumes of freight from Northern California to Southern California through the Central Valley Line. Much of this freight traffic flows through the Tehachapi Pass, then into Los Angeles and West Colton and on east via the "sunset" route to points east. Rail congestion in the Tehachapi Pass, which is also shared with BNSF (Burlington Northern Santa Fe) Railway, has caused increased traffic in recent years on the Coast Line. This condition is likely to increase in the future. The anticipated growth in rail freight traffic may affect both the operational and institutional arrangements...
necessary to accommodate freight as well as increased passenger services. UPRR officials have also indicated that they view the Coast Line as a “safety valve” should the Central Valley Line be blocked for any reason.\(^2\)

While an increase in freight traffic in the LOSSAN corridor is anticipated, the referenced SCAG report points out that north of Ventura County the route of the Coast Line faces both habitat issues and geologic hazards that make it highly unlikely that the infrastructure improvements needed to increase capacity could or will occur. Accordingly, references to increased freight traffic on any but an emergency bypass basis apply only to the LOSSAN segments from Ventura County south. Even an increase in passenger train traffic within the Santa Barbara segment is considered unlikely. The 2007 SCrrra Strategic Assessment, intended to guide Metrolink expansion over the next 25 years, neither proposed nor considered service expansions to Santa Barbara. Planned expansion of passenger service assumes 6 round trips between Goleta and Los Angeles and 1 between Goleta and San Luis Obispo by 2015 and 8 total round trips by 2025. Freight service expansion north of Los Angeles was estimated to reach 6 in 2015 and 8 by 2025, but with focus, as noted, on increased service to Port Hueneme rather than increasing traffic north of that point.\(^3\) Amtrak also utilizes the tracks, operating four trips (northbound and southbound) daily. No sound levels are available for an Amtrak train, but the sound levels are expected to be similar to Union Pacific’s.

The City’s GP/CLUP FEIR and the Technical Background Studies prepared for the General Plan both assume that the maximum sound level of passing trains ranges from 96 to 100 dBA at 100 feet from the tracks; however, the technical data on which those noise assumptions are based is well over a decade old, dating to 1998. Current verifiable metered measurements of freight and passenger rail traffic (Chula Vista 2013, SANDAG 2011) would limit the CNEL dBA at 100 feet from the tract to approximately 70 dBA, reducing to 65 CNEL dBA at 200 feet and 60 CNEL dBA at 350 feet, and below 60 dBA at 500 feet from the tracks.\(^4\) In contrast, the GP/CLUP FSEIR assumes CNEL ranges from 70 to 75 dBA at 100 feet from the centerline of the tracks and a CNEL dBA that does not reduce to less than 60 dBA until approximately 800 feet from the tracks. Amtrak also utilizes the tracks, operating four trips (northbound and southbound) daily. No sound levels are available for an Amtrak train, but the sound levels are expected to be similar to Union Pacific’s. Exhibits provided in the Technical Background Report that noise levels along the rail corridor generally overlap the 70dB – 60dB corridor’s contours for vehicular noise generated by the U.S. 101 freeway.

The Santa Barbara County General Plan Noise Element rail noise contours presume 12 freight trains and 2 passenger trains between Santa Barbara and San Luis Obispo adjacent to the Project site; however, these assumptions are not consistent with the most current traffic estimates provided by other studies, most notably the LOSSAN Business Plan (2007) and the SCAG Santa Barbara Rail study. For purposes of this analysis, it was assumed that ten passenger Amtrak Surfliner trains will be in service within the analysis horizon (2025) with any increase in passenger demand accommodated by adding an extra car to the existing trains rather than adding more trains. The freight service demand is more speculative. An impact analysis was performed in 2008 for a wide spectrum of freight scenarios. Calculations using the

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\(^4\) City of Chula Vista, Palomar Gateway District Specific Plan PEIR, June 2013.
CREATE model were made at the closest proposed residences for a variety of permutations of day-night mixes and total freight volume demand as shown in Table 4.10-6.

### Table 4.10-6

<table>
<thead>
<tr>
<th>Daytime Freights</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nighttime Freights</td>
<td>0 60/00</td>
<td>69/68</td>
<td>71/71</td>
<td>73/73</td>
<td>74/74</td>
<td>75/75</td>
</tr>
<tr>
<td>1</td>
<td>62/65</td>
<td>69/69</td>
<td>71/71</td>
<td>73/73</td>
<td>74/74</td>
<td>75/75</td>
</tr>
<tr>
<td>2</td>
<td>64/66</td>
<td>69/70</td>
<td>72/72</td>
<td>74/74</td>
<td>75/75</td>
<td>75/75</td>
</tr>
<tr>
<td>3</td>
<td>66/67</td>
<td>70/70</td>
<td>72/72</td>
<td>74/74</td>
<td>75/75</td>
<td>75/75</td>
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<tr>
<td>4</td>
<td>68/68</td>
<td>71/71</td>
<td>72/72</td>
<td>74/74</td>
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</tr>
<tr>
<td>5</td>
<td>68/69</td>
<td>71/71</td>
<td>73/73</td>
<td>74/74</td>
<td>75/75</td>
<td>75/75</td>
</tr>
</tbody>
</table>

*xx/yy = noise level from freight only/combined freight and passenger noise.

*Noise levels calculated by the FRA CREATE model.*

*Estimated noise exposures at 65 feet from the railroad tracks.*

Because community receptors are more sensitive to unwanted noise intrusion during evening and nighttime hours, the calculation model is more sensitive to nighttime freight traffic than to overall freight volumes. For example, the model estimates that a combination of passenger service plus one daytime freight train would result in an overall 24-hour Ldn of 62 dBA, while modeling the same scenario, but with the freight train traveling at night, would raise the Ldn to 69 dBA. While modeling for the General Plan scenario that estimated 12 daily freight trains, with an assumption that three to four freight trains would pass the Project site at night, resulting in a predicted noise level of 74-75 dBA at a 100-foot distance from the tracks. Therefore, Based on these assumptions, should train operations in the site vicinity increase to 10+ freight trains per day in the future, as predicted in the General Plan technical study, train noise exposure would be the primary source of ambient noise experienced at the Project site, which is not the case.

Unfortunately for purposes of current analysis, However, the City’s General Plan Noise Element relies on a technical study that dates to 2003 and, therefore, makes route use assumptions that are not borne out by more current studies of the LOSSAN Coast Line, which date to 2007 and 2008. It is appropriate, in this EIR, to update the assumptions underlying the General Plan EIR and underlying technical studies with the more current data. In addition, recent studies in Chula Vista and elsewhere on the LOSSAN include actual metered measurements of freight and passenger train noise and vibration impacts. Those assumptions differ from the conclusions used in the assigning dBA CNEL corridors to combined transportation and rail operations. Consistent with CEQA Guidelines, this analysis uses the most current, verifiable data (Chula Vista 2013) is referenced in this analysis on which to base its conclusions regarding existing and predicted future conditions.
Based on both of the current (2007, 2008) analysis of line capacity and projected use north of Ventura County, the more likely scenario would be an increase to 2 freight trains in the site vicinity divided equally between day and night. At this level of rail activity, U.S. Highway 101 traffic noise would remain the primary ambient noise experienced at the Project site and the predicted noise level of combined rail and transportation traffic would be at maximum 71 dBA CNEL, derived almost exclusively from traffic on U.S. Highway 101.

**Aircraft Noise**

Runway 25 (RY 25) at the Santa Barbara Municipal Airport (SBA) is located approximately 0.5 mile south of the Project site. Runway 25 is the longest runway at the airport and is used for commercial airlines and most business jet traffic. Take-offs and landings are usually into the wind. Prevailing winds are west to east in Goleta. The west end of the main runway is, therefore, a noisier area than the east end because takeoffs produce more noise than landings, the noisiest operation.

Noise contours for existing and future airport operations have been included as part of the Airport Land Use Plan (ALUP) and incorporated into the City GP/CLUP. Contours have been developed for airport noise levels of 65 dBA CNEL and 60 dBA CNEL.

The Project site is located north of the 60 dBA CNEL contour predicted for 2025 in the City’s GP/CLUP Noise Element (Figure 9-4, Future Noise Contours-Airport (2025) and Railroad (2030), updated November 2009). Although single event noise generated by airport operations can be audible within the Project site, the southernmost point of the Project site is several hundred feet north of the closest point of the current 60dBA airport noise contour from the airport, while the 65 dBA CNEL is predicted to remain south of Hollister Avenue.

Single event aircraft noises monitored near the Project site for previous acoustical studies completed for nearby projects recorded maximum noise levels that ranged from 60-74 dBA Lmax during RY25 departures by regional jets. These levels are generally lower than single event traffic noise, especially closer to the Project periphery. The Project site experiences some light aircraft noise from general aviation takeoffs from Runways 33L and 33R that overfly the site before following US Highway 101 along its east - west alignment. Limited measurements of light aircraft noise indicate Lmax levels that are normally less than from the loudest jets. However, aircraft takeoff noise levels may be more noticeable within the proposed Project interior, as perimeter units would block local traffic noise and thus reduce the acoustic baseline.

The future noise contours reported in the City GP/CLUP Noise Element presumes a small reduction in future noise levels from the airport, as the future (2025) 60 dBA CNEL noise contour is located further from the Project site than in 2003 for then existing (2003) conditions. While airport operations may be audible at the Project site, they would not exceed applicable thresholds or guidelines. Using the City Noise Element standards, the airport related noise levels at this site are compatible with residential uses.

**Noise from Castilian Technical Center**

Noise levels from the industrial uses to the east of the Project site are well below the City noise performance standards and do not contribute significantly to noise on the Project site. The Leq value at the property line during measurements at points ST1 and ST2 were 55-58 dBA. This

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5 City of Goleta GP/CLUP, Noise Element, Amended and Republished November 17, 2009.
noise was largely attributable to These were likely due to background freeway traffic and minimally due to any light industry activity. The Project's residential units would be setback at least 100 feet from the locations of the noise monitors that were placed along the western boundary, on the west side of Tecolotito Creek. While the industrial facilities are not expected to may generate periodic nuisance noise from regular truck deliveries, As such, any noise generated from the adjacent office and industrial uses are would not likely to exceed ambient conditions dominated by U.S. Highway 101 traffic noise, and would be expected to decay below 60 dBA before reaching the location of the Project's closest residential unit.

On-site Ambient Noise from Combined Sources
The primary sources of ambient noise affecting the Project site are different in nature. Roadway noise is generally constant in the background, while railroad noise is distinctly episodic. The difference leads to one of the dilemmas in analyzing community noise impacts, since some standards (Noise Element) are more suitable for longer-term noise while others (Zoning) are developed to address short-term and peak noise levels. The use of CNEL or Ldn to establish noise standards or thresholds is a compromise. This type of 24-hour average noise level is effective for characterizing more or less continuous noise sources, such as roadway traffic.

When noise events are discrete and episodic in nature it is still possible to compute a 24-hour average based on the loudness of individual events and their number of occurrences during a day. The result, however, is less accurate in predicting the response of people or the annoyance of individual noise events. Nevertheless, CNEL and Ldn have become the most widely used descriptors or metrics for community noise and they form the basis for almost all noise standards used in General Plan Noise Elements and in many other regulatory programs.

The General Plan Noise Element suggests that the combined effect of the railroad and highway is to create a corridor up to 600 feet wide within which noise levels exceed 70-dBA, and a corridor three times that width where noise levels exceed 65-dBA. If true in all cases, this would mean the 65-dBA contour would extend 900 feet into the Project site. The 75-dBA CNEL/CNEL/Ldn contour would extend to the first tier of proposed residences closest to the freeway and train tracks. A level of 65-dBA CNEL or Ldn is considered “normally unacceptable” for residential use. A level of 75-dBA is considered “clearly unacceptable.” Figures 4.10-3 and 4.10-4 show the on-site noise contours using the actual number of freight and Amtrak passenger trains that occur now for both first floor and upper floor levels, respectively. Figures 4.10-5 and 4.10-6 show the on-site noise contours assuming the GP/CLUP number of freight trains for both first floor and upper floor levels, respectively.

---

### Typical Levels of Ground-borne Vibration

<table>
<thead>
<tr>
<th>Human/Structural Response</th>
<th>Velocity Level*</th>
<th>Typical Sources (50 ft from source)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Threshold, minor cosmetic damage fragile buildings</td>
<td>100</td>
<td>Blasting from construction projects</td>
</tr>
<tr>
<td>Difficulty with tasks such as reading a VDT screen</td>
<td>90</td>
<td>Bulldozers and other heavy tracked construction equipment</td>
</tr>
<tr>
<td>Residential annoyance, infrequent events (e.g. commuter rail)</td>
<td>80</td>
<td>Commuter rail, upper range</td>
</tr>
<tr>
<td>Residential annoyance, frequent events (e.g. rapid transit)</td>
<td>70</td>
<td>Rapid transit, upper range</td>
</tr>
<tr>
<td>Limit for vibration sensitive equipment. Approx. threshold for human perception of vibration</td>
<td>60</td>
<td>Commuter rail, typical</td>
</tr>
<tr>
<td></td>
<td>50</td>
<td>Bus or truck over bump</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Rapid transit, typical</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Bus or truck, typical</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Typical background vibration</td>
</tr>
</tbody>
</table>

* RMS Vibration Velocity Level in VdB relative to $10^{-6}$ inches/second

Source: Train Vibration Table, Federal Transit Authority Noise and Vibration Manual (FTA-VA-90-1003-06).
*The above curves represent the upper range of measurement data and it is rare that groundborne vibration will exceed these curves.

### Combined Rail and Roadway Noise Projections

<table>
<thead>
<tr>
<th>Receiver Location</th>
<th>Description</th>
<th>Ldn (dBA)</th>
<th>Traffic</th>
<th>Train</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>R1</td>
<td>Westernmost Ground Level</td>
<td>70</td>
<td>62</td>
<td>71</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Westernmost Second Story</td>
<td>73</td>
<td>62</td>
<td>73</td>
<td></td>
</tr>
<tr>
<td>R2</td>
<td>West-Center Ground Level</td>
<td>66</td>
<td>62</td>
<td>67</td>
<td></td>
</tr>
<tr>
<td></td>
<td>West-Center Second Story</td>
<td>67</td>
<td>62</td>
<td>68</td>
<td></td>
</tr>
<tr>
<td>R3</td>
<td>East-Center Ground Level</td>
<td>60</td>
<td>58</td>
<td>62</td>
<td></td>
</tr>
<tr>
<td></td>
<td>East-Center Second Story</td>
<td>60</td>
<td>60</td>
<td>63</td>
<td></td>
</tr>
<tr>
<td>R4</td>
<td>Easternmost Ground Level</td>
<td>60</td>
<td>56</td>
<td>61</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Easternmost Second Story</td>
<td>64</td>
<td>58</td>
<td>65</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Easternmost Third Story</td>
<td>65</td>
<td>59</td>
<td>66</td>
<td></td>
</tr>
</tbody>
</table>

In areas where non-train noise levels would exceed the City of Goleta noise standard of 65 dBA Ldn for outdoor recreational space, railroad activity contributes negligibly (+1 dBA) to the total combined noise environment. At a lesser roadway noise impact (<65 dBA Ldn), railroad noise will not significantly increase (+3 dBA Ldn) the baseline. The addition of railroad noise to the freeway background will not substantially degrade the non-rail ambient background noise, or create any new areas of noise incompatibility. As noted previously, combined rail-roadway noise impacts essentially the same as freeway/arterial traffic noise impacts alone.

The additional contributions of noise from aircraft over-flights of the Project site, and from industrial uses immediately to the west would not change the significance of impacts from combined noise sources on the site. The Project is well outside of the 60-dBA CNEL contour for the Santa Barbara Airport, and a reasonable estimate for the CNEL at the closest Project residential unit is about 55.9 dBA, while the nearby industrial uses would add less than one dBA.

### Groundborne Vibration

Railroads generate ground-borne vibration that would be perceptible at adjacent residences. The effects of ground-borne vibration include perceptible movement of the building floors, rattling of windows, shaking of items on shelves or hanging on walls, and rumbling sounds. At stronger vibration levels cosmetic damage can occur in fragile buildings, but generally not in newer construction. Building damage, even minor cosmetic damage, is not a factor for typical transportation sources such as the UPRR. Figure 4.10-5 illustrates common vibration sources and the human and structural response to ground-borne vibration.

At certain levels, perceptible vibration can become an annoyance. A vibration level that causes annoyance will be well below the damage threshold for normal buildings. Ground-borne vibration is almost never annoying to people who are outdoors. Although the motion of the ground may be perceived, without the effects associated with the shaking of a building, the motion does not provoke the same adverse human reaction. In addition, the rumble noise that usually accompanies the building vibration is perceptible only inside buildings.

Vibration is most commonly expressed in terms of the root mean square (RMS) velocity of a vibrating object. RMS velocities are quantified in units of vibration decibels (VdB). Although the perceptibility threshold is about 65 VdB, human response to vibration is not usually considered significant unless the vibration exceeds 70 VdB. The response range of humans to various vibration levels is summarized below:
65 VdB - threshold of human perception
72 VdB - annoyance due to frequent events (>70 occurrences/day)
75 VdB - annoyance due to occasional events (30-70 occurrences/day)
80 VdB - annoyance due to infrequent events (<30 occurrences/day)
100 VdB - minor cosmetic damage

The US Department of Transportation (DOT) Guideline, “Transit Noise and Vibration Impact Assessment” (2006, Chapter 8, Ground-Borne Vibration and Noise Impact Criteria) suggests a residential significance threshold of 80 VdB for train vibrations if there are fewer than 30 train movements per day. As provided above, According to the Amtrak Schedule, there are approximately currently 10 passenger train movements adjacent to the Project site per day according to the Amtrak Schedule. Current data shows minimal freight volumes of only one train per day, which is expected to continue into the foreseeable future. The total number of trains is anticipated to be less than 30. Therefore, 80 VdB is an appropriate significance threshold for vibration generated along the UPRR/U.S.101 transportation corridor.

As shown in Figure 4.10-6, using DOT guidelines vibration levels at the Project site at a distance of 100 feet from the track centerline would be approximately 67 VdB for passenger/commuter and 77 VdB for freight trains. According to these guidelines, these numbers represent the upper range of measurement data and more commonly experienced generally levels may be up to 10 VdB less.

### Regulatory Framework

#### Federal

**Noise Control Act of 1972**

The *Federal Noise Control Act (NCA) of 1972 (Public Law 92-574)* established a requirement that all federal agencies administer their programs to promote an environment free of noise that jeopardizes public health or welfare. As Congress has the authority to regulate interstate and foreign commerce, regulation of noise generated by such commerce also falls under congressional authority. The federal government specifically preempts local control of noise emissions from aircraft, railroad, and interstate highways.

Under the NCA, the United States Environmental Protection Agency (USEPA) was given the responsibility for the following:

- providing information to the public regarding identifiable effects of noise on public health or welfare;
- publishing information on the levels of environmental noise that will protect the public health and welfare with an adequate margin of safety;
- coordinating federal research and activities related to noise control; and
- establishing federal noise emission standards for selected products distributed in interstate commerce.

The NCA also directed that all federal agencies comply with applicable federal, state, interstate, and local noise control regulations.

Although the USEPA was given major public information and federal agency coordination roles, each federal agency retains authority to adopt noise regulations pertaining to agency programs.
The USEPA can require other federal agencies to justify their noise regulations in terms of NCA policy requirements. The following is a summary of key federal agencies and the jurisdiction that they have related to noise:

- **U.S. Department of Housing and Urban Development (HUD):** noise standards for federally funded housing projects;
- **Federal Aviation Administration (FAA):** noise standards for aircraft noise;
- **Federal Highway Administration (FHWA):** noise standards for federally funded highway projects; and
- **Federal Transit Authority (FTA):** noise standards for federally funded transit projects.

**USEPA**

In 1974, in response to the requirements of the federal NCA, the USEPA identified indoor and outdoor noise limits to protect public health and welfare (communication disruption, sleep disturbance, and hearing damage). Outdoor Ldn limits of 55 dBA and indoor Ldn limits of 45 dBA are identified as desirable to protect against speech interference and sleep disturbance for residential, educational, and healthcare areas. Sound-level criteria to protect against hearing damage in commercial and industrial areas are identified as 24-hour Leq values of 70 dBA (both outdoors and indoors).

**HUD**

HUD has established guidelines for evaluating noise impacts on residential projects seeking financial support under various grant programs (44 FR 135:40860-40866, January 23, 1979). Sites are generally considered acceptable for residential use if they are exposed to outdoor Ldn values of 65 dBA or less. Sites are considered normally unacceptable if they are exposed to outdoor Ldn values of 65 to 75 dBA. Sites are considered unacceptable if they are exposed to outdoor Ldn values above 75 dBA. The HUD goal for the interior noise level in residences is that noise levels not exceed an Ldn value of 45 dBA.

**FAA**

14 Code of Federal Regulations (CFR) Part 150, “Airport Noise Compatibility Planning,” establishes the procedures, standards, and methodology to be applied airport noise compatibility planning activities. Noise levels below 65 Ldn are normally considered to be acceptable for noise sensitive land uses.

**FHWA**

FHWA regulations (23 CFR 772) specify procedures for evaluating noise impacts associated with federally funded highway projects and for determining whether these impacts are sufficient to justify funding noise abatement actions. The FHWA noise abatement criteria are based on worst hourly Leq sound levels, not Ldn or CNEL values. The worst-hour 1-hour Leq criteria for residential, educational, and healthcare facilities are 67-dBA outdoors and 52-dBA indoors. The worst-hour 1-hour Leq criterion for commercial and industrial areas is 72-dBA (outdoors).

**FTA**

FTA procedures for the evaluation noise from transit projects are specified in the document titled “Transit Noise and Vibration Impact Assessment” (FTA 1995). The FTA Noise Impact Criteria group noise-sensitive land uses into the following three categories:
4.10 NOISE

• Category 1: Buildings or parks where quiet is an essential element of their purpose.
• Category 2: Residences and buildings where people normally sleep. This includes residences, hospitals, and hotels where nighttime sensitivity is assumed to be of utmost importance.
• Category 3: Institutional land uses with primarily daytime and evening use. This category includes schools, libraries, churches, and active parks.

Ldn is used to characterize noise exposure for residential areas (Category 2). For other noise sensitive land uses, such as outdoor amphitheaters and school buildings (Categories 1 and 3), the maximum 1-hour Leq during the facility’s operating period is used.

The noise impacts are identified based on absolute predicted noise levels and increases in noise associated with the Project.

State

Title 24

Part 2 Title 24 of the California Code of Regulations, “California Noise Insulation Standards,” establishes minimum noise insulation standards to protect persons within new hotels, motels, dormitories, long-term care facilities, apartment houses, and dwellings other than single family residences. Under this regulation, interior noise levels attributable to exterior noise sources cannot exceed 45 Ldn in any habitable room. Where such residences are located in an environment where exterior noise is 60 Ldn or greater, an acoustical analysis is required to ensure that interior levels do not exceed the 45 Ldn interior standard.

Since noise attenuation of at least 20 dB is typically provided within residential structures of typical construction materials with closed windows, an exterior noise exposure of 65 dB CNEL is generally the noise compatibility guideline for new residential dwellings in California. Because commercial and industrial uses are not occupied on a 24-hour basis, the exterior noise exposure standard for less sensitive land uses generally is somewhat less stringent.

1207.11.4 Other noise sources

Residential structures to be located where the Ldn or CNEL exceeds 60 dbA shall require an acoustical analysis showing that the proposed design will limit exterior noise to the prescribed allowable interior level. The noise element of the local general plan shall be used to the greatest extent possible to identify sites with noise levels potentially greater than 60 dbA.

1207.11.2 Allowable interior noise levels

Interior noise levels attributable to exterior sources shall not exceed 45 dbA 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.

Local

City of Goleta General Plan

The City requires that potential noise effects be evaluated in terms of either the Community Noise Equivalent Level (CNEL) or the Day-Night Average Noise Level (Ldn), and establishes maximum noise levels that are considered compatible with various land uses. The GP/CLUP
Noise Element has established noise standards and provides policies to ensure compatibility of land uses with noise exposure levels, and to neither introduce new development in areas with unacceptable noise levels nor allow new noise sources that would impact existing development. The following policies included in the GP/CLUP Noise Element may be applicable to this Project:

**NE 1.1 Land Use Compatibility Standards.**
The City shall use the standards and criteria of Table 9-2 to establish compatibility of land use and noise exposure. The City shall require appropriate mitigation, if feasible, or prohibit development that would subject proposed or existing land uses to noise levels that exceed acceptable levels as indicated in this table. Proposals for new development that would cause standards to be exceeded shall only be approved if the project would provide a substantial benefit to the City (including but not limited to provision of affordable housing units or as part of a redevelopment project), and if adequate mitigation measures are employed to reduce interior noise levels to acceptable levels.

Table 4.10-8 shows the community noise exposure levels recommended for various types of land use, provided by Table 9-2 in the GP/CLUP.

**NE 1.2 Location of New Residential Development.** Where sites, or portions of sites, designated by the land use element for residential use exceed 60 dBA CNEL, the City shall require measures to be incorporated into the design of projects that will mitigate interior noise levels and noise levels for exterior living and play areas to an acceptable level. In the event that a proposed residential or mixed-use project exceeds these standards, the project may be approved only if it would provide a substantial benefit to the City, including, but not limited to, provision of affordable residential units. Mitigation measures shall reduce interior noise levels to 45 dBA CNEL or less, while noise levels at exterior living areas and play areas should in general not exceed 60 dBA CNEL and 65 dBA CNEL, respectively.

The above policy and criteria in the Noise Element establish that 60 dBA is the maximum exterior CNEL (or Ldn) that is normally compatible with residential development without a need for mitigation. This limit may be extended up to 65 dBA if noise mitigation features are included within Project designs. With respect to interior noise levels in residences, the 45 dBA threshold set forth in the above policy reflects the identical standard in the California Building Code that applies to multifamily residences (Title 24 Code of California Regulations Section 1207.11.12).

The exterior and interior noise standards are consistent with one another since normal wood frame residential construction usually provides from 12 to 18 dBA of reduction from exterior to interior areas, and well over 20 dBA is commonly achieved in modern structures that meet current energy conservation requirements. Recent field measurements at an apartment complex with similar construction as proposed for this Project showed an exterior to interior noise reduction of 19.7 dBA with windows open in an unfurnished bedroom. It can be reasonably, predicted that an exterior Ldn of 65 dBA will be reduced to an interior Ldn of 45 dBA using basic construction techniques and materials. The State standards also require an acoustical analysis for all multi-family units located in areas where the Ldn exceeds 60 dBA, in order to demonstrate that the interior standard will be met.

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7 City of Goleta General Plan, 2006, Table 9-2.
8 Revised Community Noise Analysis for Willow Springs Phase II, URS Corporation, June 2010.
Table 4.10-8
City of Goleta Land Use Compatibility Criteria

<table>
<thead>
<tr>
<th>Land Use</th>
<th>Community Noise Exposure (Ldn or CNEL, dBA)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Normally Acceptable</td>
</tr>
<tr>
<td>Single Family, Duplex, Mobile Homes</td>
<td>50-60</td>
</tr>
<tr>
<td>Multi-Family Homes</td>
<td>50-60</td>
</tr>
<tr>
<td>Schools, Libraries, Churches, Hospitals, Nursing Homes</td>
<td>50-60</td>
</tr>
<tr>
<td>Transient Lodging: Motels, Hotels</td>
<td>50-65</td>
</tr>
<tr>
<td>Auditoriums, Concert Halls, Amphitheaters</td>
<td>-</td>
</tr>
<tr>
<td>Sports Arena, Outdoor Spectator Sports</td>
<td>-</td>
</tr>
<tr>
<td>Playgrounds, Neighborhood Parks</td>
<td>50-70</td>
</tr>
<tr>
<td>Golf Courses, Riding Stables, Water Recreation, Cemeteries</td>
<td>50-70</td>
</tr>
<tr>
<td>Office Buildings, Business and Professional Commercial</td>
<td>50-67.5</td>
</tr>
<tr>
<td>Industrial, Manufacturing, Utilities, Agriculture</td>
<td>50-70</td>
</tr>
</tbody>
</table>

**Normally Acceptable**: Specified land use is satisfactory based upon the assumption that any buildings involved are of normal conventional construction, without any special noise insulation requirements.

**Conditionally Acceptable**: New construction or development should be undertaken only after a detailed analysis of the noise reduction requirements is made and needed noise insulation features included in the design. Conventional construction, but with closed windows and fresh air supply systems or air conditioning will normally suffice.

**Normally Unacceptable**: New construction or development should generally be discouraged. If new construction or development does proceed, a detailed analysis of the noise reduction requirements must be made and needed noise insulation features included in the design.

**Clearly Unacceptable**: New construction or development should generally not be undertaken.

Source: Goleta General Plan/Coastal Land Use Plan, adopted October 2006.

**NE 1.4 Acoustical Studies.**
An acoustical study that includes field measurement of noise levels may be required for any proposed project that would: a) locate a potentially intrusive noise source near an existing sensitive receptor, or b) locate a noise-sensitive land use near an existing known or potentially intrusive noise source such as a freeway, arterial roadway, railroad, industrial facility, or airport traffic pattern. Acoustical studies should identify noise sources, magnitudes, and potential noise mitigation measures and describe existing and future noise exposure. The acoustical study shall be funded by the applicant and conducted by a qualified person or firm that is experienced in the fields of environmental noise assessment and architectural acoustics. The determination of applicability of this requirement shall be made by the Planning and Environmental Services Department by applying the standards and criteria of Table 9-2.

**NE 6.4 Restrictions on Construction Hours.**
The City shall require, as a condition of approval for any land use permit or other planning permit, restrictions on construction hours. Noise-generating construction activities for projects near or adjacent to residential buildings and neighborhoods or other sensitive receptors shall be
limited to Monday through Friday, 8:00 a.m. to 5:00 p.m. Construction in nonresidential areas away from sensitive receivers shall be limited to Monday through Friday, 7:00 a.m. to 4:00 p.m. Construction shall generally not be allowed on weekends and state holidays. Exceptions to these restrictions may be made in extenuating circumstances (in the event of an emergency, for example) on a case by case basis at the discretion of the Director of Planning and Environmental Services. All construction sites subject to such restrictions shall post the allowed hours of operation near the entrance to the site, so that workers on site are aware of this limitation. City staff shall closely monitor compliance with restrictions on construction hours, and shall promptly investigate and respond to all noncompliance complaints.

NE 6.5 Other Measures to Reduce Construction Noise.
The following measures shall be incorporated into grading and building plan specifications to reduce the impact of construction noise:

a. All construction equipment shall have properly maintained sound-control devices, and no equipment shall have an unmuffled exhaust system.
b. Contractors shall implement appropriate additional noise mitigation measures including but not limited to changing the location of stationary construction equipment, shutting off idling equipment, and installing acoustic barriers around significant sources of stationary construction noise.
c. To the extent practicable, adequate buffers shall be maintained between noise generating machinery or equipment and any sensitive receivers. The buffer should ensure that noise at the receiver site does not exceed 65 dBA CNEL. For equipment that produces a noise level of 95 dBA at 50 feet, a buffer of 1600 feet is required for attenuation of sound levels to 65 dBA.

NE 7.6 Noise-Insulation Standards for Multi-Family Dwellings.
In compliance with state law, the City shall require all multi-family residential developments that are proposed within the 60-dBA-CNEL noise contour to include appropriate noise insulation measures.

NE 7.7 Acoustic Design Manual Requirements.
For residential projects where mitigation is required to reduce interior noise levels to 45 dBA CNEL, the City Building Official shall require incorporation of measures listed in the current version of the Acoustic Design Manual for the appropriate amount of noise reduction.

4.10.2 THRESHOLDS OF SIGNIFICANCE

Noise Thresholds
Based on Section 12 (Noise Thresholds) of the City of Goleta’s Environmental Thresholds and Guidelines Manual, Section 12 Noise Thresholds, the following thresholds are used to determine whether significant noise impacts would occur:

a. A development that would generate noise levels in excess of 65 dBA CNEL and could affect sensitive receptors would generally be presumed to have a significant impact.
b. Outdoor living areas of noise sensitive uses that are subject to noise levels in excess of 65 dBA CNEL would generally be presumed to be significantly impacted by ambient noise. A significant impact would also generally occur where interior noise levels cannot be reduced to 45 dBA CNEL or less.
c. A Project would generally have a significant effect on the environment if it would increase substantially the ambient noise levels for noise sensitive receptors in adjoining areas. Per Threshold 1 above, this may generally be presumed to occur when ambient noise levels affecting sensitive receptors are increased to 65 dBA CNEL or more. However, a significant affect may also occur when ambient noise levels affecting sensitive receptors increase substantially but remain less than 65 dBA CNEL, as determined on a case-by-case level.

d. Noise from grading and construction activity proposed within 1,600 feet of sensitive receptors, including schools, residential development, commercial lodging facilities, hospitals or care facilities, would generally result in a potentially significant impact. According to USEPA guidelines, the average construction noise is 95 dBA at a 50-foot distance from the source. A 6 dB drop occurs with a doubling of the distance from the source. Therefore, only locations within 1,600 feet of the construction site would be affected by noise levels over 65 dBA. Construction within 1,600 feet of sensitive receptors on weekdays outside of the hours of 8 a.m. to 5 p.m. and on weekends would generally be presumed to have a significant effect. Noise attenuation barriers and muffling of grading equipment may also be required. Construction equipment generating noise levels above 95 dBA may require additional mitigation.

Vibration Threshold

The City’s Environmental Thresholds and Guidelines Manual does not include thresholds for vibration impacts. The CEQA Guidelines Appendix G provides a vibration threshold that was used to evaluate the significance of potential vibration impacts that would result from the Project’s close proximity to the UPRR rail lines.

The Project would result in a significant vibration impact if it would result in:

e. Exposure of persons to, or generation of, excessive ground borne vibration or ground borne noise level.

4.10.3 PROJECT IMPACTS

Potential noise issues include the suitability of the existing noise environment for residential development the Project’s residents and the potential for increases in area-wide noise levels due to Project-generated noise, which would primarily result from traffic generation. The Project could also result in short term construction noise levels that could impact nearby sensitive receptors, such as existing residential uses. Each of these potential impacts is discussed below.

Project Generated Noise

N-1: Would the Project generate noise levels in excess of 65 dBA CNEL that could affect sensitive receptors?

Significance Before Mitigation: Less Than Significant

Construction Period Noise

Noise levels from heavy equipment used for earth moving during construction typically range from 80-90 dBA at distances of 50 feet. An assumption of 95 dBA at 50 feet is used in the City’s Environmental Thresholds and Guidelines Manual to define areas of potential impact. Based on this assumption, any sensitive receptor, such as residences within 1,600 feet of a construction site, may be subject to significant noise impacts.
The nearest sensitive receptor site would be the Willow Springs apartments, located southeast of the Project site, north of Hollister Avenue, and east of Los Carneros Road. The distance between the southeastern corner of the Project site and the nearest existing residences would be approximately 550 feet. The peak construction equipment noise, based on the City’s Environmental Thresholds and Guidelines Manual, could reach 95-dBA at a distance of 50 feet. This noise level would decay to 74-dBA over a direct path of 550 feet, which is the shortest distance measured to the nearest existing apartment. This noise level would be further reduced by the presence of an existing earthen stockpile located between the Project site and the nearest residences, which would attenuate the noise levels by redirecting and partially absorbing the sound waves.

The barrier attenuation provided by the intervening stockpile was calculated in terms of the path length difference for a direct sound wave versus a sound wave refracted over the top of the earthen mound. This calculation was performed for both a ground floor and second story receiver in Willow Springs, with the following results (assuming a 6-foot source height, 5 feet above grade for the ground floor and 15 feet for upstairs units):

- Ground Floor 0.75 ft. path length difference = 15-dB noise reduction level*
- Second Story 0.15 ft. path length difference = 10-dB noise reduction level*

* Including a 3-dB enhanced reduction due to absorption by the earthen berm compared to a less effective solid wall construction.

The presence of the intervening stockpile would sufficiently reduce construction equipment noise levels at the closest residence to below the significance threshold, even during maximum activity along the Project site’s eastern perimeter, making impacts related to the generation of construction noise impacts levels or increasing the ambient noise levels of on adjoining areas due to construction activity would be less than significant (Class III).

**Operational Noise - Project Traffic Noise Generation**
**Significance Before Mitigation: Less Than Significant**

The Project would generate a total of 2,902 daily vehicle trips that would be added to the existing traffic volumes on the local roadway system. At each turning opportunity, the Project contribution to the total traffic volume would be progressively diluted, along with the potential to contribute to noise levels. The Project’s traffic noise impacts have been calculated 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 using traffic volumes provided in the Project traffic report. Traffic noise levels at 50 feet from nearby roadway intersections were calculated with and without the Project under existing and cumulative conditions, and are summarized in Table 4.10-9.
Table 4.10-9
Traffic Noise dB CNEL 50 feet from Roadway Centerline

<table>
<thead>
<tr>
<th>Roadway</th>
<th>Existing</th>
<th>Existing + Project</th>
<th>Cumulative</th>
<th>Cumulative + Project</th>
</tr>
</thead>
<tbody>
<tr>
<td>Storke Rd/ South of US 101 SB Ramps</td>
<td>73.1</td>
<td>73.1</td>
<td>74.0</td>
<td>74.0</td>
</tr>
<tr>
<td>Storke Rd/ South of Hollister Ave.</td>
<td>71.1</td>
<td>71.2</td>
<td>72.3</td>
<td>72.3</td>
</tr>
<tr>
<td>Storke Rd/ South of Whittier Drive</td>
<td>69.0</td>
<td>69.1</td>
<td>70.2</td>
<td>70.2</td>
</tr>
<tr>
<td>Hollister Ave/ West of Storke Rd.</td>
<td>72.0</td>
<td>72.1</td>
<td>72.7</td>
<td>72.8</td>
</tr>
<tr>
<td>Hollister Ave/ East of Storke Rd</td>
<td>71.1</td>
<td>71.2</td>
<td>72.5</td>
<td>72.6</td>
</tr>
<tr>
<td>Hollister Ave/ West of Los Carneros Rd</td>
<td>70.5</td>
<td>70.6</td>
<td>72.2</td>
<td>72.3</td>
</tr>
<tr>
<td>Hollister Ave/ East of Los Carneros Way</td>
<td>69.9</td>
<td>70.0</td>
<td>70.5</td>
<td>70.6</td>
</tr>
<tr>
<td>Los Carneros Rd/ South of US 101 SB Ramps</td>
<td>71.7</td>
<td>71.9</td>
<td>72.9</td>
<td>73.0</td>
</tr>
<tr>
<td>Los Carneros Rd/ South of Hollister Ave.</td>
<td>69.7</td>
<td>69.8</td>
<td>71.1</td>
<td>71.2</td>
</tr>
<tr>
<td>Fairview Ave/ South of US 101 SB Ramps</td>
<td>71.8</td>
<td>71.8</td>
<td>72.2</td>
<td>72.3</td>
</tr>
<tr>
<td>Fairview Ave/ North of Fowler Rd</td>
<td>65.1</td>
<td>65.2</td>
<td>65.9</td>
<td>65.9</td>
</tr>
</tbody>
</table>

The maximum Project-related noise contribution to any roadway is 0.2-dBA CNEL at 50 feet from the roadway centerline; well below the 65-dBA evaluated threshold for this impact. As such Project-related traffic noise impacts would be diluted and are not expected to be detectable, so that this impact would be less than significant (Class III).

N-2: Would outdoor living areas be subject to noise levels in excess of 65 dBA CNEL, or indoor areas be subject to noise levels of 45 dBA CNEL or greater?

Residential Units Indoor Noise Exposure
Significance Before Mitigation: Potentially Significant

The Project would develop residential uses in an area that is affected by roadway noise from off-site uses at levels that could exceed City thresholds. As such Therefore, noise compatibility impacts associated with surrounding roadway noise could be potentially significant.

Figures 4.10-4 and 4.10-5 are drawn from the General Plan and show noise contours from the UPRR/U.S. Highway 101 corridor that incorporate the levels of freight train operations reported in the GP/CLUP. The noise contours shown in these figures are used in this analysis to provide a conservative assessment of potential impacts with the understanding that studies subsequent to the General Plan FEIR and accompanying technical reports support a much lower level of railroad traffic. The contours are considered reasonable as a basis for analysis because traffic studies support the level of use projected for U.S. 101 and the freeway is known to be the primary source of ambient noise at the Project site, with only minor impacts associated with railroad traffic. At build-out, Project site structures located along the perimeter would act as a de facto sound wall that will reduce the noise penetration into the site from the UPRR/U.S. Highway 101 corridor and Los Carneros Road. However, as shown in Figures 4.10-4 and 4.10-5, proposed residential units could be exposed to noise levels greater than 65-dBA, particularly
for upper story residential units located in proximity to the corridor even with buildings absorbing or deflecting sound.

Noise generated from the UPRR/U.S. Highway 101 corridor along the northern boundary could expose the upper floors of most of the two-story, alley-loaded homes and many of the two-story triplex, four-plex, and townhome buildings to 70-dB, while portions of the two-story Two-Pac homes and two-story four-plex buildings along the northern perimeter could be exposed to 75-dBA. The three-story apartments could be exposed to UPRR/U.S. Highway 101 corridor noise levels above 65-dBA. Accordingly, additional noise reduction measures will be required for all residential units that are not shielded from UPRR/U.S. Highway 101 corridor noise by the elevation differential, noise wall, or due to their interior location within a building.

Noise generated from Los Carneros Road shown in contours on Figures 4.10-4 and 4.10-5 could expose proposed residential units to noise levels between 65- and 70-dBA. Specifically, the 65-dBA contour could extend into the southernmost units of the Podium Flat building near the southern boundary of the Project site. Similarly, the 65-dBA contour could extend into portions of the apartments along the site’s eastern boundary.

To reduce these impacts to a less than significant level, noise attenuation measures would be required to reduce interior noise levels to below 45-dBA CNEL, as mandated by the California Noise Insulation Standards (CCR, Title 24, Part 6, Section T25-28) for all habitable rooms in residential use. As stated under Regulatory Framework, it can reasonably be predicted that an exterior Ldn of 65-dBA will be reduced to an interior Ldn of 45-dBA using basic construction techniques and materials with closed windows, while additional insulation and other measures would be required to reduce interior noise to 45 dBA where outside noise is in excess of 65-dBA.

The State standards and the City’s General Plan Policy also require an acoustical analysis to comply with the California Building Code for all multi-family units located in areas where the Ldn exceeds 60-dBA, in order to demonstrate that the interior standard will be met. Therefore, a detailed acoustical analysis will be required to determine precise noise exposures levels for each of the residential units constructed pursuant to Project mitigation measures.

The results of the acoustical report must be submitted during plan check for a building permit, and the report must identify any noise attenuation features that would be included in the building design. In addition to exterior noise attenuation, the report must also document that the building construction would meet a Code requirement to provide a sound transmission class (STC) of 50 or better in any shared (“party”) wall assemblies.9 Stacked units must also have a floor/ceiling assembly rated at STC=50 or better, and also an impact isolation class10 (IIC) rating of 50 or better to reduce sound transmission between units. Based on the requirement that the acoustical analysis measurements indicate that the building construction with any specified noise reduction features would reduce interior noise to no more than the 45-dBA threshold, impacts related to interior noise of the proposed residences would remain be potentially significant and its Class II finding considered “conditional” until completion of the acoustical study that demonstrates and demonstration of the effectiveness of the proposed mitigations.

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9 STC is a single number rating of a wall’s noise barrier effect. The rating assesses the airborne sound transmission performance in the frequency range of human speech.

10 IIC is a single number rating of a floor-ceiling assembly’s ability to attenuate impact noise from footsteps, dropped objects, etc.
If mitigation cannot be demonstrated, the impact would be considered significant and unavoidable and an appropriate finding and Statement of Overriding Considerations would need to be adopted before the City issues building permits.

If the acoustical analysis indicates that window closure is a requirement to meet interior noise standards, supplemental ventilation must be provided to allow adequate fresh air circulation for units that require such closure. A similar ventilation requirement that includes air filtration is contained in the Air Quality section of this report for all units located within a specified distance of the UPRR/101 corridor.

Use of dual-paned windows, which is now required for residential construction by the California Building Code for energy conservation, would also provide additional noise attenuation to reduce interior noise. However, an the required acoustical study referenced above is still required even with the use of dual pane windows (Class II), demonstrating the effectiveness of the proposed mitigation would be required before the City issues building permits demonstrating compliance with this requirement to reduce impacts to a less than significant level. If this cannot be demonstrated permits for the affected unit(s) cannot be issued (Class II).

Remaining portions of these buildings, and the other buildings within the Project, would all be farther from the roadways and partially shielded from traffic noise by structures within the Project and noise impacts to these units would be less than significant without further mitigation (Class III).

**Residential Units Outdoor Living Space Noise Exposure**

*Significance Before Mitigation: Less Than Significant*

Most of the residential building locations would not be exposed to exterior noise levels exceeding 65-dBA CNEL, however, some of the proposed Two-Pac single-family units would have backyards that could be exposed to noise levels exceeding 75-dBA, which would exceed the threshold of 65-dBA CNEL for outdoor living spaces.

Most of the townhomes, triplex, and four-plex buildings constructed along the northern property line would be oriented so that either the back or sides of the residences would face the transportation corridor, with no outdoor living spaces directly exposed to traffic or train generated noise levels. However, one townhome building would be located with a front entrance and partially enclosed porch/front yard facing the transportation corridor, which may be subject to outdoor noise levels from the UPRR/U.S. Highway 101 corridor that exceed 65-dBA.

The market-rate apartments include outdoor partially enclosed porches and interior-facing porches that may not be shielded from the Los Carneros Road noise within the 65-dBA contour. The rent-restricted apartments would include outdoor patios that would be within the 65-dBA contour for noise generated from the UPRR/U.S. Highway 101 corridor along the north elevation and the Los Carneros Road along the east elevation. For all of these units the acoustical study must demonstrate compliance with interior and exterior noise standards before building permits can be issued.

For outside living spaces oriented to the interior common areas of the Project shielding by the buildings would reduce outdoor noise by 5 to 10-dBA. Unshielded rear yards of the Two-Pac units, and the upper and first story, porches, patios, or balconies located with a direct line of sight to UPPR/U.S. Highway 101 ROW or the Los Carneros roadway may be exposed to noise.
levels that exceed the City’s standards. Installation of five-foot high Plexiglas around outdoor living space would be expected to provide noise attenuation of 5-dBA that would reduce noise levels to below the 65-dBA CNEL threshold for outdoor living space. An acoustical analysis would be required to conclusively demonstrate that implementation of design features will achieve the required noise attenuation before the City issues a building permit for an affected unit. Failure to meet this standard requires withholding of a permit to building the affected unit. With this mitigation, the impact would be reduced to a less than significant level (Class II).

The Project includes areas designated for outdoor recreational uses, including pool areas, basketball courts, and trails, that could be located within the 70-dBA CNEL contours. These features would be shielded from noise generated by the UPRR/U.S. Highway 101 corridor by grade elevation differences, a noise wall, and perimeter buildings. The combination of these features would reduce noise levels that reach these outdoor areas by 5-10-dBA, which would be compliant with the 65-dBA noise level threshold for outdoor living spaces.

A neighborhood park outdoor area with active use combined with neighborhood open space is planned for the northwest corner of the site. The park elevation would be approximately ten feet below the railroad track elevation by approximately 10 feet, which would provide some noise attenuation. In addition, the trails and recreational amenities of this park would be set back from the adjacent railway line and the U.S. Highway 101 transportation corridor ROW. Modeling peak noise levels indicates the active park location would be subject to a 72-dBA CNEL noise level, based on City GP/CLUP Noise Element contours. Accounting for site conditions, the grade separating the park from the rail and freeway alignment will provide approximately 5-dBA of noise attenuation. Shielded noise levels would be less than 70-dBA CNEL at all planned outdoor active recreational space and impacts would be less than significant (Class III).

**Impact N-3: Would the Project substantially increase the ambient noise levels for sensitive receptors in adjoining areas?**

*Significance Before Mitigation: Less than Significant*

With regard to this impact, the term "substantial increase" is not defined within the City’s Thresholds Manual. The limit of perceptibility by ambient grade instrumentation (sound meters), or by humans in a laboratory environment, is approximately 1.5-dBA. Under ambient conditions, people generally do not perceive that noise has clearly changed until there is a 3-dBA difference. A threshold of 3-dBA is commonly used to define "substantial increase." Therefore, for purposes of this analysis, an increase of +3-dBA CNEL in traffic noise would be considered a significant impact. Increases of +3.0-dBA require a doubling of traffic volumes on already noise-impacted roadways. Development projects usually do not, of themselves, cause traffic volumes to double. Offsite traffic noise impacts are therefore almost always cumulative in nature rather than individually significant.

The Willow Springs Apartments, located southeast of the Project site, is the only residential development in close proximity to the proposed Project and represents the nearest sensitive receptor land use. As discussed in Impact N-1, the Project’s only potential contribution to noise level increases off site would be due to traffic increases. Also, as stated above, the potential increases in traffic noise due to Project operations would diminish with distance from the Project site.

Table 4.10-9 provides a summary of the Project’s contribution to nearby intersection traffic noise. In addition to those intersections studied, Project residents could potentially utilize the
Calle Koral/Camino Vista intersection, which could impact adjacent residences at the Willow Springs development. The following traffic noise levels are calculated for a 35 mph travel speed (dB Leq at 50 feet from the centerline) at that intersection using peak PM turning movements from the Project traffic report:

- Existing - No Project = 60.5-dBA
- Existing - With Project* = 61.1-dBA
- Cumulative – No Project* = 62.4-dBA
- Cumulative - With Project* = 62.6-dBA

Peak hour Project traffic would not create a zone of noise incompatibility, or create any clearly perceptible noise increase. The Project would add a maximum of 0.6-dBA of noise at 50 feet from the nearest intersection with adjacent sensitive receptors. This impact is considerably less than the +3-dBA CNEL significance threshold. Therefore, impacts related to increasing the ambient noise levels of adjoining areas resulting from Project operations would be less than significant (Class III).

**N-4: Would the Project result in grading or construction activity within 1,600 feet of sensitive receptors, including schools, residential development, commercial lodging facilities, hospitals or care facilities outside of the hours of 8 a.m. to 5 p.m. or on weekends?**

*Significance Before Mitigation: Less than Significant*

The Project would result in construction activities occurring within 550 feet of an existing apartment complex as described in Impact N-1, however, the City GP/CLUP includes a Policy NE 6.4, Restrictions on Construction Hours, which is required as a condition of approval for any land use permit, or other planning permit, restrictions on construction hours that would make this impact less than significant (Class III).

**Vibration**

**V-1: Would the Project expose residential units to vibration generated along the UPPR?**

*Significance Before Mitigation: Potentially Significant*

The US DOT Guideline *Transit Noise and Vibration Impact Assessment* (2006, Chapter 8, Ground-Borne Vibration and Noise Impact Criteria) suggests a residential significance threshold of 80-VdB for train vibrations if there are fewer than 30 train movements per day. This criterion is used in this analysis.

The proposed residences along the Project’s northern boundary would be at least 68 feet from the centerline of the nearest railway tracks. Based on DOT guidelines, this would result in estimated vibration levels at the nearest residence of 82-VdB for freight trains and 72-VdB for non-freight trains. These vibration levels are estimated for ground floor elevations. Upper level floors will experience less vibration due to dispersion and attenuation of the vibration energy as it propagates through a building. The table below shows the vibration levels at each floor level for units closest to the track. Estimated VdB at the northernmost proposed residences from train operations are shown in Table 4.10-10.
Table 4.10-10
Estimated Vibrations at Residences Nearest the UPRR from Freight Train Operations

<table>
<thead>
<tr>
<th>Floor</th>
<th>Expected VdB Level (freight trains/ passenger trains) at closest structure</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>82/72</td>
</tr>
<tr>
<td>2</td>
<td>80/70</td>
</tr>
<tr>
<td>3</td>
<td>78/68</td>
</tr>
</tbody>
</table>

Vibration levels would be below the structural damage threshold of 100 VdB. Passenger trains would not result in vibration impacts that would exceed significance for infrequent events. However, ground floor residences nearest the UPRR ROW would experience freight train vibration levels above the threshold of annoyance due to infrequent events of 80-VdB and above, based on the default vibration estimations as shown in Table 4.10-10 above.

The following Project specific conditions were considered in determining the level of significance of freight train vibration impacts:

- They occur very infrequently;
- When they occur at all, they are only marginally above the adopted significance threshold; and
- Structural features such as wood-framed construction and central carpeting would reduce vibration.

The vibration impacts at the Project residences closest in proximity to the UPRR track are considered potentially significant impacts. However, a vibration assessment analyzing the effectiveness of design features incorporated into the construction drawings to reduce vibration impacts pursuant to Mitigation Measure V-1 would be required before the issuance of building permits, demonstrating that the impacts are reduced to a less than significant level. (Class II).

4.10.4 CUMULATIVE IMPACTS

Significance Before Mitigation: Less than Significant

The potential for cumulative noise impacts is associated with traffic increases that would occur as a result of the Project in combination with other projects in the area. The analysis of traffic noise above considers future year traffic volumes that include this combined traffic generation. As shown in the traffic calculations summarized in Table 4.10-9, noise levels generated by cumulative traffic increases would not exceed 65-dBA Ldn and a significant cumulative noise impact would not occur. As shown in Table 4.10-9, cumulative traffic noise levels with and without the Project would not differ by more than 0.1dBA, and consequently, the Project’s contribution to cumulative traffic noise would be less than cumulatively considerable (Class III).

4.10.5 MITIGATION MEASURES

Nearly all identified potential impacts associated with noise effects are addressed in the State’s Building Codes and in the Codes followed by the City. These building codes require construction equipment features and practices that minimize temporary noise generation by
construction activities and their impact to offsite sensitive receptors. The Building Code also requires the preparation of a detailed acoustical analysis sufficient to identify any Project specific noise attenuation design features that would be required to reduce potential indoor noise impacts to below applicable thresholds. The applicable Codes also require adherence to all recommendations contained in the report. Regulatory requirements are not considered mitigation measures under CEQA.

Mitigation Measures

**N2** Outdoor living areas be subject to noise levels in excess of 65 dBA CNEL, or indoor areas be subject to noise levels of 45-dBA CNEL or greater

**N 2-1:** Residential outdoor living space (e.g., patios and balconies) associated with residential units located within the 65-dBA CNEL and with a line of sight to the UPRR/U.S. Highway 101 ROW, must be protected from sound intrusion so that they meet the City's standard of 65-dBA CNEL for outdoor living spaces. Protective measures may consist of, but are not limited to, installation of glass, Plexiglas, wood, or metal sound attenuation barriers along the perimeter of outdoor living spaces for those residential units. The sound attenuation barriers must be of a size and material to adequately mitigate this impact as determined by an acoustical study to be performed to determine Project specific requirements for each proposed residential building. Failure to conclusively demonstrate the effectiveness of the proposed noise attenuation measures shall result in the denial of a permit to build the affected unit.

**Plan Requirements and Timing:** These requirements must be incorporated into all construction documents submitted for approval before the issuance of a Land Use Permit for the residential units located within the 75 to 65-dBA CNEL and with a line of sight to the UPRR/U.S. Highway 101 corridor.

**Monitoring:** The Planning and Environmental Review Director, or designee, must verify compliance before the issuance of a Land Use Permit for the residential units located within the 65-dBA CNEL and with a line of sight to the UPRR/U.S. Highway 101 corridor. The City building inspectors must verify compliance in the field before issuance of a certificate of occupancy for an affected unit. No certificate of occupancy shall be issued unless compliance is achieved.

**V-1:** The Project would expose residential units to vibration generated along the UPPR

**V 1-1:** Residences with foundations within 70 feet of the UPRR track centerline must be designed with vibration mitigating features incorporated into the construction documents. The Permittee must provide a vibration assessment, prepared by a qualified consultant. The vibration assessment must include a survey of existing vibration to characterize the VdB vertical velocity level as a function of distance from the tracks and evaluate the effectiveness of the final design to mitigate vibration to below 80-VdB. Possible design features to reduce vibration impacts to below 80-VdB could include supporting the building foundation on elastomer pads or installing trenches between the rail line and the foundation of the new residences.
Plan Requirements and Timing: The vibration mitigating features must be incorporated into all construction documents submitted for approval before the issuance of City issues Land Use Permits building permits for the residential units located within 70 feet of the UPRR track centerline.

Monitoring: The Planning and Environmental Review Director, or designee, must verify compliance with this requirement before the City issues issuance of building permits Land Use Permits for the residential units located within 70 feet of the UPRR track centerline.

4.10.6 RESIDUAL IMPACTS

With implementation of mitigation measures N 3-1, and N 3-2 described above, the Project’s noise impacts would be reduced to less than significant (Class II) assuming that acoustical studies conclusively demonstrate the effectiveness of the proposed mitigation measures. The vibration impacts created by freight trains utilizing the UPRR tracks on buildings within 70 feet of the centerline of the UPRR tracks would be reduced to less than significant assuming the vibration assessment demonstrates that the design features included in the final construction drawings adequately mitigate the potential vibration impacts (Class II).