

4.10 NOISE

This section assesses the project's construction and operational noise impacts. Operational noise issues include project-generated traffic noise and well as impacts on noise-sensitive uses. The analysis of traffic-generated noise is based on the traffic volumes provided in the project's Traffic, Circulation and Parking Study (September 14, 2010) prepared by Associated Transportation Engineers (ATE) on behalf of the applicant and provided in Appendix G.

4.10.1 Existing Conditions

Noise

Sound is created when vibrating objects produce pressure variations that move rapidly outward into the surrounding air, and it is technically described in terms of amplitude (loudness) and frequency (pitch). The standard unit of sound amplitude measurement is the decibel (dB). The decibel scale is a logarithmic scale that describes the physical intensity of the pressure vibrations that make up any sound. The pitch of the sound is related to the frequency of the pressure vibration. Because the human ear is not equally sensitive to a given sound level at all frequencies, a special frequency-dependent rating scale, called the A-weighted decibel scale (dBA), has been devised to relate noise to human sensitivity. The dBA is most widely used for environmental noise assessments. Typical A-weighted noise levels for various types of sound sources are summarized in **Table 4.10-1**.

Noise is generally considered unwanted, intrusive, or unpleasant sound. A typical noise environment consists of a base of steady "background" noise that is the sum of many distant and indistinguishable noise sources. Superimposed on this background, noise is the sound from individual local sources. These can vary from the occasional aircraft or train passing by to virtually continuous noise from traffic on a major highway.

Table 4.10-1
Representative Environmental Noise Levels

Common Outdoor Activities	Noise Level dBA	Common Indoor Activities
Jet Fly-over at 300 m (1,000 ft.)	110	Rock Band
Gas Lawn Mower at 1 m (3 ft.)	100	
Diesel Truck at 15 m (50 ft.), at 50 mph	90	Food Blender at 1 m (3 ft.)
Noisy Urban Area, Daytime	80	Garbage Disposal at 1 m (3 ft.)
Gas Lawn Mower, 30 m (100 ft.)	70	Vacuum Cleaner at 3 m (10 ft.)
Commercial Area	60	Normal Speech at 1 m (2 ft.)
Heavy Traffic at 90 m (300 ft.)	60	Large Business Office
Quiet Urban Daytime	50	Dishwasher Next Room
Quiet Urban Nighttime	40	Theater, Large Conference Room (Background)

Common Outdoor Activities	Noise Level dBA	Common Indoor Activities
Quiet Suburban Nighttime	30	Library
Quiet Rural Nighttime	20	Bedroom at Night, Concert Hall (Background)
	10	Broadcast/Recording Studio
Lowest Threshold of Human Hearing	0	Lowest Threshold of Human Hearing
Source: California Department of Transportation, <i>Technical Noise Supplement</i> , October 1998, p.18.		

Several measures are used to analyze the adverse effect of community noise on people. Because environmental noise fluctuates over time, these scales consider that the effect of noise upon people is largely dependent upon the total acoustical energy content of the noise, as well as the time of day when the noise occurs. They include the following:

- L_{eq} , the equivalent energy noise level, is the average acoustic energy content of noise for a stated period of time. Thus, the L_{eq} of a time-varying noise and that of a steady noise are the same if they deliver the same acoustic energy to the ear during exposure. For evaluating community impacts, this rating scale does not vary, regardless of whether the noise occurs during the day or the night.
- L_{dn} , the Day-Night Average Level, is a 24-hour average L_{eq} with a 10 dBA “weighting” added to the noise during the hours of 10:00 PM to 7:00 AM to account for noise sensitivity in the nighttime. The logarithmic effect of these additions is that a 60 dBA 24-hour L_{eq} would result in a measurement of 66.4 L_{dn} .
- **CNEL**, the Community Noise Equivalent Level, is a 24-hour average L_{eq} with a 5 dBA “weighting” during the hours of 7:00 PM to 10:00 PM and a 10 dBA “weighting” added to noise during the hours of 10:00 PM to 7:00 AM to account for noise sensitivity in the evening and nighttime, respectively. The logarithmic effect of these additions is that a 60 dBA 24-hour L_{eq} would result in a measurement of 66.7 dBA CNEL.
- L_{min} is the minimum instantaneous noise level experienced during a given period of time.
- L_{max} is the maximum instantaneous noise level experienced during a given period of time.

Noise environments and consequences of human activities are usually well represented by average noise levels during the day or night, or over a 24-hour period. Environmental noise levels are generally considered low when the CNEL is below 60 dBA, moderate in the 60 to 70 dBA range, and high above 70 dBA. Noise levels above 45 dBA at night can disrupt sleep. Examples of low to moderate-level noise environments are urban residential or semi-commercial areas (typically 55 to 60 dBA) and commercial locations (typically 60 dBA). People may consider louder environments adverse, but most will accept the higher noise levels associated with more noisy urban residential or residential-commercial area (60 to 75 dBA)(Caltrans, 2009: p. 2-47).

When evaluating changes in 24-hour community noise levels, a difference of 3 dBA is the minimum increase that is perceptible to most people. A 5 dBA increase is readily noticeable,

while a difference of 10 dBA would be perceived as a doubling of loudness. (Caltrans, 2009: p. 2-48)

Noise 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 levels at any given location. A commonly used rule of thumb for roadway 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 source is a continuous line, such as vehicle traffic on a highway, sound levels decrease by about 3 dB for every doubling of distance. Noise levels may also be reduced by intervening structures; generally a single row of buildings between the receptor and the noise source reduces the noise level by about 5 dBA, while a solid wall or berm reduces noise levels by 5 to 10 dBA. The exterior-to-interior reduction of noise for newer residential units is generally 20 dBA or more.

Noise-sensitive land uses are generally defined as locations where people reside or where the presence of unwanted sound could adversely affect the use of the land. Noise-sensitive land uses typically include residences, hospitals, schools, guest lodging, libraries, and certain types of recreational uses. Per the City of Goleta General Plan/Coastal Land Use Plan Noise Element, “*sensitive noise receptors*” are users or types of uses that are interrupted (rather than merely annoyed) by relatively low levels of noise. Such receptors include residential neighborhoods, certain open space areas, among other uses and places. The limit of acceptable noise exposure for sensitive noise receptors is typically 60 dBA CNEL. Noise-sensitive receptors are found throughout the action area.

Existing Noise Levels at the Project Site

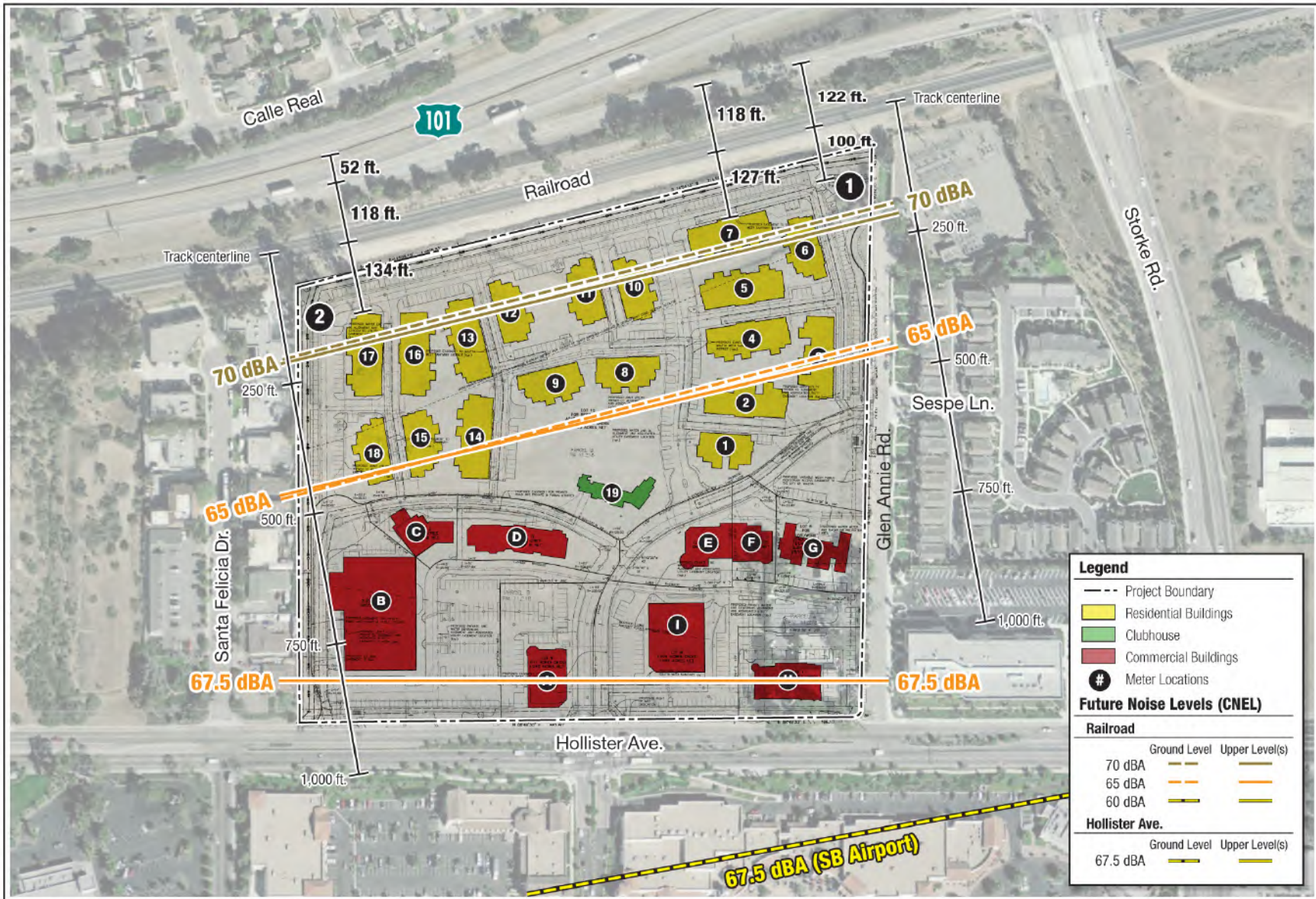
Existing noise levels at the project site are primarily affected by the UPRR and US 101 to the north, and by Hollister Avenue to the south. Noise generated by aircraft traveling to and from the Santa Barbara Municipal Airport (located southeast of the project site) also affects noise levels at the site but not substantially, as described further below.

Noise measurements were taken in order to characterize the existing noise environment. As described below, these measurements were taken during a single day and may not reflect worst-case railway noise. Therefore, measured noise levels were adjusted based on available noise data provided in the City’s General Plan/Coastal Land Use Plan in order to assure a conservative analysis.

The following describes the noise measurement results and the calculated noise contours in the northern and southern portions of the site.

Noise Measurements

Existing 24-hour noise levels were measured at three locations, as shown in **Figure 4.10-1**. Measurements were taken on December 14 and December 15, 2010. The locations of Meters 1 and 2 approximate the locations of the north side of northern-most residential structures. Meter 3 approximates the location of the live-work condominiums. All three meters provide noise



Aerial Photo Source: Ventura County, 2005. Noise Contour Source: City of Goleta General Plan FEIR, Figure 3.11-4, September 2006.

WESTAR MIXED-USE VILLAGE

Noise Monitoring Locations and General Plan Contours



FIGURE 4.10-1

measurements at five feet above ground level. The measured noise levels and calculated CNELs are provided in **Table 4.10-2**. The readings were shielded somewhat by terrain and the absence of any major full-speed train movements (trains were diverted to the siding because of maintenance). Therefore, while the meter locations are shown in Figure 4.10-1, and the respective noise measurements are shown in Table 4.10-2, this data was deemed to not fully represent actual conditions that may be experienced upon development of the project with unobstructed lines-of-sight between the railroad/Highway 101 corridor and upper story levels of residential units, and with maximum train-generated noise. The contours in Figure 4.10-1 represent upper story noise exposure with full-speed train passages.

Table 4.10-2
Existing On-Site Hourly L_{eq} 's and CNEL

Time Interval	Meter 1 L_{eq}	Meter 2 L_{eq}	Meter 3 L_{eq}
16:00-17:00	56.5	56.8	55.5
17:00-18:00	65.1	62.7	53.4
18:00-19:00	55.9	57.2	54.0
19:00-20:00	51.5	55.3	52.9
20:00-21:00	52.4	55.2	52.1
21:00-22:00	48.9	55.1	49.9
22:00-23:00	48.3	54.6	47.6
23:00-24:00	46.3	52.9	45.6
0:00-1:00	45.7	51.6	44.3
1:00-2:00	45.1	49.8	45.9
2:00-3:00	42.6	48.2	39.7
3:00-4:00	42.4	49.5	40.6
4:00-5:00	47.4	52.0	43.0
5:00-6:00	50.1	54.8	44.3
6:00-7:00	54.3	57.5	49.5
7:00-8:00	53.4	58.6	52.3
8:00-9:00	54.7	59.1	53.8
9:00-10:00	54.3	56.7	52.1
10:00-11:00	61.4	57.7	48.2
11:00-12:00	55.1	58.6	54.2
12:00-13:00	52.0	56.4	53.5
13:00-14:00	56.9	58.1	56.9
14:00-15:00	53.6	56.7	54.5
15:00-16:00	53.7	56.6	54.7
24-hour CNEL	58.1	61.0	55.0

Noise Contours in the Northern Portion of the Site

Noise contours identified in Figure 4.10-1 are based on measured noise levels and railway noise contours identified in the General Plan/Coastal Land Use Plan Noise Element Figures 9-2 and 9-4, which depict the existing and future railroad noise levels, respectively.

The measured noise levels at Meter 1 (located approximately 47 feet south of the north property line, at the east end of the project site) result in a CNEL of 58.1 dBA. These measurements represent noise levels at five feet above ground level. However, obstructions that exist towards

the eastern end of the site between the noise meter and noise sources along US 101/UPRR corridor shield noise from these sources (by about 3dBA). Noise levels at heights above these obstructions (e.g., at the heights of a second or third story structure) would be about 61.1 dBA CNEL. These obstructions include terrain differences (i.e., the train tracks are at a lower elevation than the noise monitoring location) and the earthen berm supporting the US 101 southbound off-ramp, which rises along an eastern incline to the Storke Road overpass to the east.

Measurements at Meter 2 (located approximately 82 feet south of the north property line at the west end of the project site) resulted in a CNEL of 61.0dBA. There is minimal terrain differential at this end of the site (the railroad tracks are not as depressed in this location) and the offramp does not begin its incline at this location. The noise levels measured at this location are considered more representative of the ambient traffic noise levels that could be experienced along the northern property line without the off-ramp and grade shielding that affected Meter 1 readings.

Given the effects of ground-level shielding, two noise contours are shown on Figure 4.10-1; one for ground/first-story elevations and one for upper-story elevations. These contours are based on the measured noise levels as well as estimated additional railway noise as described below.

The UPRR line north of the project site includes a main through-track (closest to the site's northern boundary) as well as a railroad siding (north of the through-track). Trains traveling along the through-track travel at approximately 50 to 60 miles per hour (mph), while trains traveling along the siding travel at about 5 to 10 mph. When the noise measurements described above were taken (December 15, 2010), approximately eight Amtrak trains traveled along the railway past the project site based upon recorded maximum readings and the Amtrak train schedule. Based upon relative maxima, it appears that five trains were traveling along the siding and three trains were possibly traveling along the through-tracks. The monitoring data shows that five trains passed the site during daytime hours (between 7:00 AM and 7:00 PM), one train during evening hours (7:00 PM to 10:00 PM), and two trains during nighttime hours (10:00 PM to 7:00 AM). These daytime and nighttime timeframes are based on CNEL definitions and are independent of sunrise or sunset.

Train noise CNEL values are a function of a number of factors including the peak noise level as a train passes, the number of trains per day, the times during which trains pass the site (nighttime noise is weighted heavier in the CNEL calculation), and the travel speed. Other factors, such as rail condition, may also influence noise levels to a lesser degree. Since project site noise was monitored for only one day, the information contained in the General Plan/Coastal Land Use Plan Noise Element was considered.

The Noise Element of the General Plan/Coastal Land Use Plan states that maximum instantaneous noise levels (L_{max}) from passing trains range from 96 to 100 dBA at a distance of 100 feet, and that the average CNEL at a distance of 100 feet ranges from 70 to 75 dBA.¹ However, the single event maxima observed during the measurements taken for this study were considerably less than the levels suggested in the General Plan/Coastal Land Use Plan Noise Element. No observed single event noise exceeded 84 dB, and most maxima were less than 80 dB. Most likely the train noise contours in the General Plan/Coastal Land Use Plan Noise Element are based upon high-speed fully loaded freight trains, which occur infrequently on this

¹ City of Goleta General Plan Noise Element, 2006, page 9-3.

line. The brief duration of train noise events and the much lower levels than typically anticipated from trains is such that the measurement data primarily reflects US 101 traffic noise. The hourly average noise level during a train passage was almost identical to a non-train hour. For purposes of analysis, the measured noise was considered to be the current traffic noise baseline. Because CNELs can vary based on a number of factors not observed during the limited on-site measurements, the railway noise estimates in the General Plan/Coastal Land Use Plan were combined with the traffic noise measurements in order to calculate a total railroad and traffic noise contour.

There are also expectations that the number of freight trains may increase in the future, based on the Sharon Greene Associates, Ventura – Santa Barbara Rail Study, Final Report, March 2008:

“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.”

This coastal line is also referred to as the Los Angeles – San Diego – San Luis Obispo I-5 North Coast Corridor or LOSSAN (NCC) and provides both regular freight service and acts as a back-up route in the event that there are problems with the inland freight route. According to the LOSSAN Rail Corridor Agency², the growth in goods imported to the United States from overseas (largely Asia) has been increasing and the “bulk of goods are shipped in containers, which are carried by train to centralized locations, and delivered by truck to their ultimate destinations. Given this increased demand for freight service, and the utility and additional capacity for moving this freight provided by the Coast Route, it is likely that the number of average daily freight trains operating on the LOSSAN North corridor could rise over the next 20 years, depending on business conditions.”

While it cannot be precisely known how many freight trains will ultimately use the nearby rails over the life of the project, for the purposes of a long-term projection in this EIR, however, the assumptions in the County Noise Element of 12 freight trains per day likely remain valid and is considered ~~and~~ a reasonable maximum potential scenario.

Noise contour levels were calculated by combining the measured noise contributions from the freeway (assumed to grow by 40 percent between now and build-out of the General Plan/Coastal Land Use Plan) and the train noise predicted in the General Plan/Coastal Land Use Plan. A distinction was made between ground floor noise levels at the western and eastern project perimeters because freeway traffic noise is somewhat shielded by the rising off-ramp

² LOSSAN Rail Corridor Agency, California Department of Transportation, LOSSAN North Strategic Plan, 2007, p. 4-5.

and the roadway overpass on the eastern side of the project. At the upper floor elevations, this distinction is negated by a clearer line-of-sight.

At the northern site boundary, presumed railroad noise is as much as 14 dB louder than projected freeway traffic noise. Freeway traffic thus contributes negligibly to the contour distance. However, because the freeway is farther from the project site than the train tracks, the rate of freeway noise decay is less than from the closer trains. Farther south, the relative train to freeway noise thus changes somewhat, but train noise continues to dominate. Even at 500 feet from the tracks, train noise is still 7-8 dB higher than noise from US 101. Although traffic noise was added to train noise to calculate future contours for completeness, the contour distance calculation can be made from train noise alone with little loss of accuracy. Combined train and traffic noise as a function of set-back from the centerline of the southernmost track are as shown in **Table 4.10-3** and 70, 65, and 60 dB CNEL noise contour distances are shown in **Table 4.10-4**.

Table 4.10-3
Train and Traffic Noise Levels (dB CNEL) at the Project Site

Distance from RR ^a	West Side			East Side		
	Train	U.S. 101	Total ^b	Train	U.S. 101	Total ^b
100'	74	63	74.3	74	60	74.2
200'	69	61	69.6	69	58	69.3
400'	65	58	65.8	65	56	65.5
800'	60	56	61.5	60	53	60.8

^aDistance from centerline of southernmost track.
^b Shown on the scale of Figure 4.10-1.

Table 4.10-4
**Combined Train and Traffic Ground-Level Noise Contours
in Northern Portion of the Project Site**

	Distance to Noise Contour ^a	
	Westside	Eastside
Distance to 70 dB CNEL ^b	200'	180'
Distance to 65 dB CNEL ^b	450'	430'
Distance to 60 dB CNEL ^c	970'	950'

^a Distance from centerline of southernmost track.
^b These contours are shown in Figure 4-10.1.
^c Theoretical noise level at these locations, as noise from Hollister Avenue to the south would overlap causing the actual level to be higher.

The measurements taken at the east and west ends of the site were used to provide two points for estimating noise contours and a straight line was drawn between them. However, it is noted that noise attenuating features between noises within the US 101/UPRR corridor and the northern portion of the project site vary from east to west, such that the actual noise contours at the site may not be represented by a straight line.

The northern portion of the site is proposed for residential development. As depicted in Figure 4.10-1, noise contours were estimated within the project site for noise levels specific in the

General Plan/Coastal Land Use Plan for residential use. The General Plan/Coastal Land Use Plan specifies that noise levels for outdoor common (private) play areas (recreation) shall generally not exceed 65 dB CNEL (this is also the level at which indoor noise would be reduced to 45 dB using standard construction methods without mitigation); 60 dB for exterior living areas, and 45 dB CNEL for interior noise levels.

The “normally unacceptable” noise levels for outdoor playgrounds and neighborhood park recreation areas begins at 70 dB CNEL at which noise attenuation measures would be required. This level would be considered for project involving the creation of outdoor public playgrounds or parks, including where such uses are ancillary to a residential development.

The distance from the railroad centerline to the 65 dB CNEL contour at ground level would be 430 feet at the east end of the site and 450 feet at the west end of the site. For upper-story elevations the distance to the 65 dB CNEL contour would be 450 feet across the site, as shown in Figure 4.10-1.

The distance from the railroad centerline to the 70 dB CNEL contour at ground level would be 180 feet at the east end of the site and 200 feet at the west end of the site. For upper-story elevations the distance to the 70 dB CNEL contour would be 200 feet across the site, as shown in Figure 4.10-1.

Noise Contour in the Southern Portion of the Site Including Roadway Noise

Meter 3 was placed at five feet above ground level, approximately 315 feet north of the south property line and approximately 155 west of the east property. Meter 3 measured the combined ambient noise from both the US 101/UPRR corridor to the north, Hollister Avenue to the south, and Glen Annie Road to the east. Noise measurements at Meter 3 produced a CNEL of 55.0 dBA.

The southern portion of the site is proposed for commercial development. The normally acceptable noise level for commercial use is 67.5 dB CNEL. According to the project’s traffic report, the ADT along Hollister Avenue is 32,416. This equates to a noise level of 72.9 dB CNEL at 50 feet (assuming travel speeds of 45 mph). The 67.5 db CNEL contour would occur at about 115 feet from the centerline of Hollister Avenue, as shown on Figure 4.10-1.

Aircraft Noise

The Santa Barbara Municipal Airport (SBMA), a regional airport, is located approximately 0.7 miles southeast of the project site (measured nearest property line to nearest property line). The closest runway within the Airport is Runway 7-25 (RY 7-25). The departure pattern from this runway extends westward. It is used for airlines and most business jet traffic. Two shorter runways (15R and 15L) are oriented north-south, and are used predominantly for general aviation. The project site is located north of the 60 dBA CNEL contour of RY 7-25 as shown in the Airport Land Use Plan (ALUP) (Santa Barbara County Association of Governments, 1993), and the City of Goleta Noise Element (Figure 9-2) (City of Goleta, 2006). The ~~City-Goleta~~ General Plan/Coastal Land Use Plan Noise Element projects a very small reduction in future noise levels from the airport, so the future 60 dBA CNEL noise contour is expected to be further from the project site than depicted.

Single event noise from Westward (Runway 25) business jet take-offs is sometimes audible on the project site. However, these aircraft are sufficiently high and are turning toward the ocean

such that their maximum noise levels are lower than from many local sources (trains, truck horns, motorcycles, etc.) The observed peak aircraft noise during manned on-site noise monitoring was 55 dB L_{max} . The instantaneous maximum was less than the 60 dB CNEL airport noise level that is considered to have a possible impact. Aircraft noise, both in terms of average and peak levels, does not measurably change the projected noise level or noise contour distances described above and is not considered to be a constraint to residential development as proposed at the Westar site.

Groundborne Vibration

Railroads generate ground-borne vibration that may 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 not in newer construction. Building damage, even minor cosmetic damage is not a factor for typical transportation sources such as the UPRR. **Figure 4.10-2** illustrates common vibration sources and the human and structural response to ground-borne vibration.

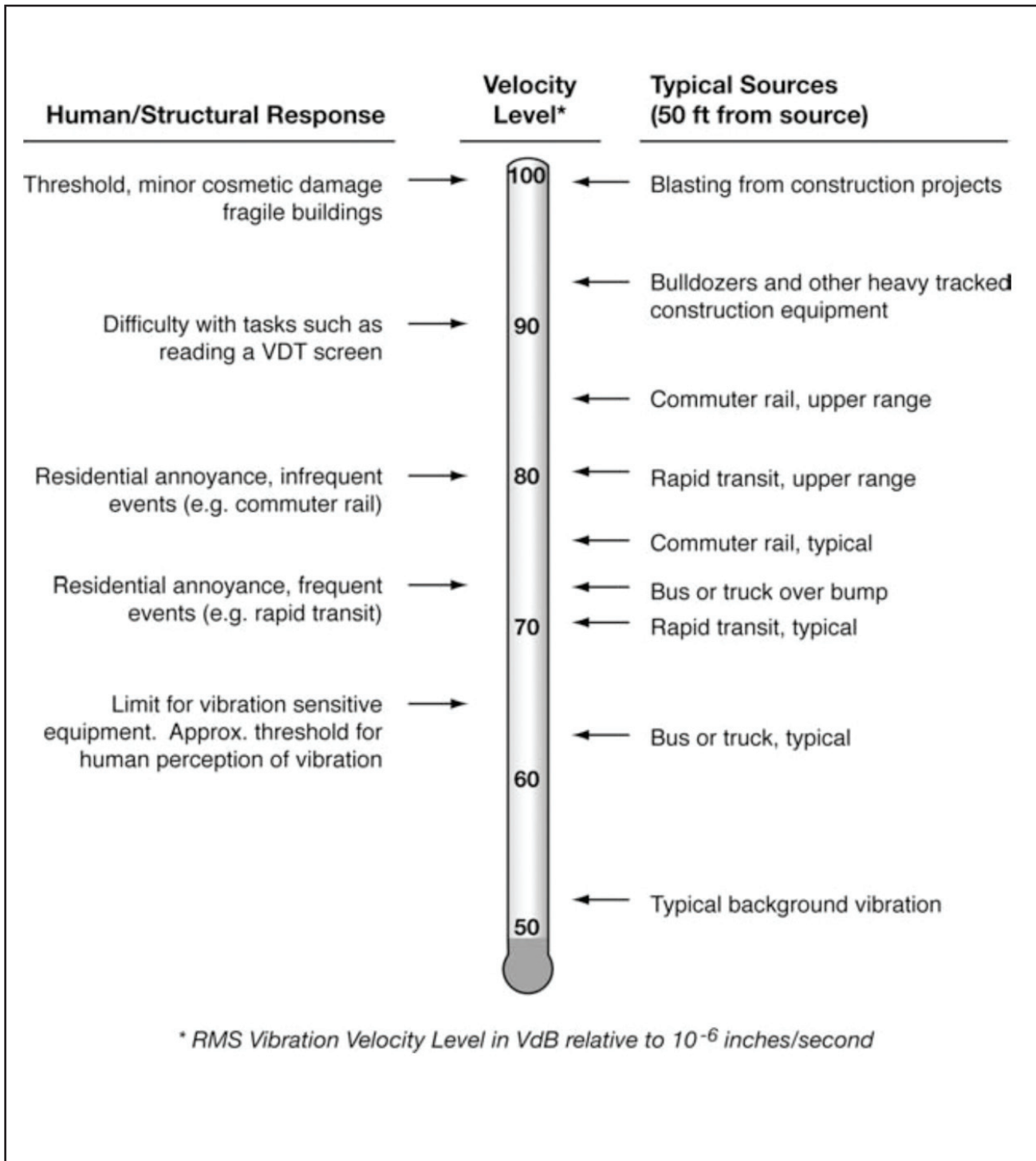
At certain levels, perceptible vibration can become an annoyance. A vibration level that causes annoyance will be well below the damage threshold for normal buildings. Ground-borne vibration is almost never annoying to people who are outdoors. Although the motion of the ground may be perceived, without 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 expressed in units of vibration decibels (VdB). Although the perceptibility threshold is about 65 VdB, human response to vibration is not usually significant unless the vibration exceeds 70 VdB. The response range of various vibration levels is summarized below:

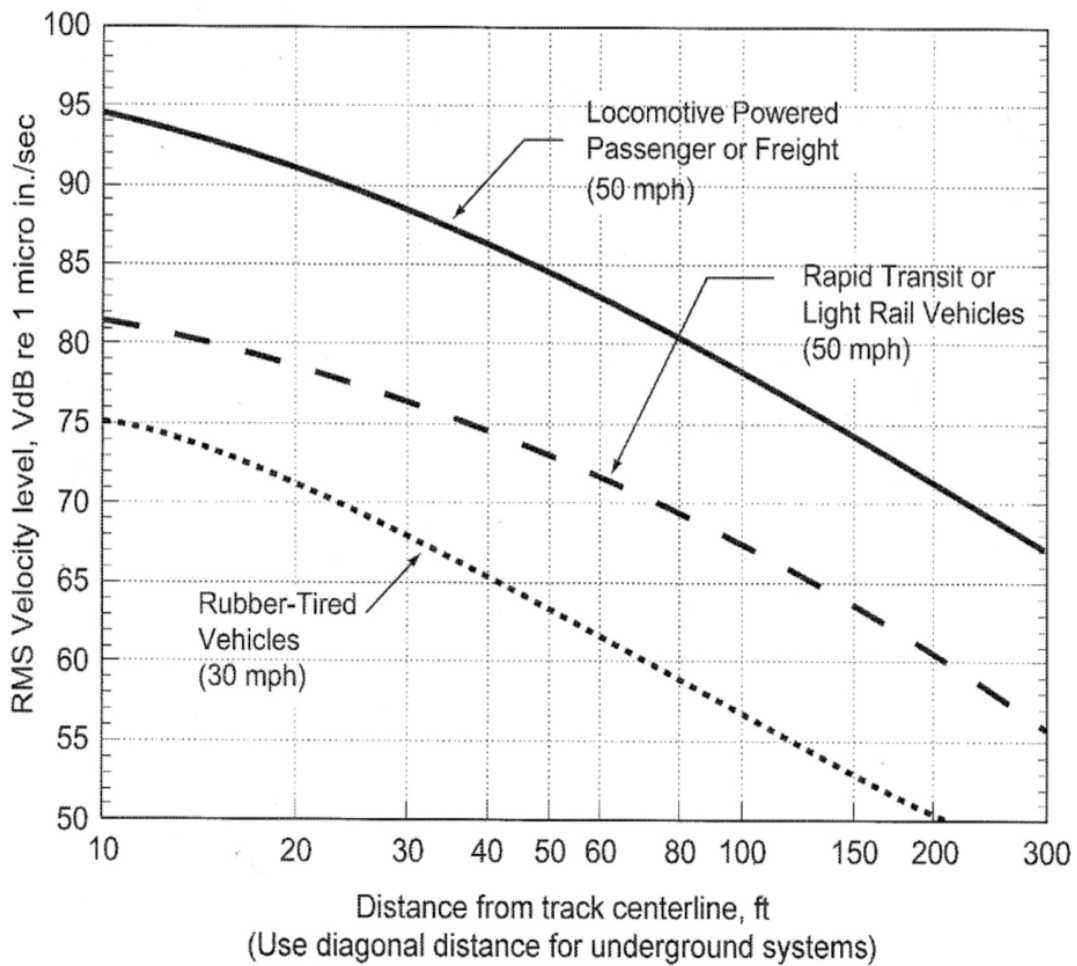
- 65 VdB - threshold of human perception
- 72 VdB - annoyance due to frequent events (>70/day)
- 75 VdB - annoyance due to occasional events (30-70/day)
- 80 VdB - annoyance due to infrequent events (<30/day)
- 100 VdB - minor cosmetic damage

The US Department of Transportation (DOT) Guideline called "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). There are currently 8 passenger train movements adjacent to the project site per day according to the Amtrak Schedule. Freight trains also use the track. The number of freight trains is not known. The County of Santa Barbara General Plan/Coastal Land Use Plan Noise Element (2006) identifies 12 freight trains. The total number of trains is anticipated to be less than 30. Therefore 80 VdB is an appropriate threshold for vibration generated along the UPRR.

As shown in **Figure 4.10-3**, 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



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.

Source: Federal Transit Authority Noise and Vibration Manual, 1995.

passenger/commuter and 77 VdB for freight trains. According to these guidelines, these numbers represent the upper range of measurement data and generally levels may be up to 10 VdB less. California coastline marine sediment on the ocean terraces are geologically soft and offer good vibration absorption. Such conditions are better than average for dampening vibrations.

Regulatory Framework

Federal

Noise Control Act

The Federal *Noise Control Act* of 1972 (42 U.S.C. 4901 to 4918) ~~addressed~~ addresses the issue of noise as a threat to human health and welfare, particularly in urban areas. In response to the *Noise Control Act*, the EPA published Information of Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety.³ **Table 4.10-5** summarizes EPA recommendations for residential and other noise-sensitive land uses. The EPA intent was that these findings not necessarily be considered as standards, criteria, or regulatory goals, but as advisory exposure levels below which there is no reason to suspect that the general population would be at risk from any of the identified health or welfare effects of noise.

Table 4.10-5
Summary of Noise Levels Identified as Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety

Effect	Level	Area
Hearing	Leq ≤ 70 dBA	All areas
Outdoor activity interference and annoyance	Ldn ≤ 55 dBA	Outdoors in residential area and farms and other outdoor areas where people spend widely varying amounts of time and other places in which quiet is a basis for use.
Outdoor activity interference and annoyance	Leq ≤ 55 dBA	Outdoor areas where people spend limited amounts of time, such as school yards, playgrounds, etc.
Indoor activity interference and annoyance	Ldn ≤ 45 dBA	Indoor residential areas.
Indoor activity interference and annoyance	Leq ≤ 45 dBA	Other indoor areas with human activities such as schools, etc.

³ US Environmental Protection Agency, Office of Noise Abatement and Control, *Information of Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety*, March 1974.

State

State Department of Health Services

The State Office of Noise Control in the State Department of Health Services has established guidelines to provide a community with a noise environment that it deems to be generally acceptable based on land use categories to serve as a primary tool a city uses to assess the compatibility between land uses and outdoor noise. These standards are used in the City of Goleta General Plan/Coastal Land Use Plan and are shown in Table 4.10-6, below.

State of California Noise Insulation Standards

An interior CNEL of 45dB is mandated by the State of California Noise Insulation Standards (24 CCR, ~~Title 24~~, Part 6, ~~Section §§~~ T25-28) for multiple family dwellings, hotel and motel rooms. In 1988, the State Building Standards Commission expanded that standard to include all habitable rooms in residential use, including single-family dwelling units. Since typical noise attenuation within residential structures with closed windows is about 20dB, an exterior noise exposure of 65dB CNEL is generally the noise land-use 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.

Local

City of Goleta General Plan/Coastal Land Use Plan – Land Use Compatibility Standards

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 (L_{dn}), and establishes maximum noise levels that are considered compatible with various land uses. The Noise Element of the City of Goleta General Plan/Coastal Land Use Plan has established noise quality standards for land use categories as articulated in the Noise Element of the City's Goleta General Plan/Coastal Land Use Plan.

For residential uses, Policy NE 1.2 provides that,

“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 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 60 dBA exterior limit may be exceeded up to 65 dBA if noise mitigation features are included as part of the project design.⁴ The City's interior noise standard is consistent with the Title 24 standard of 45 dBA for multifamily residences.⁵ The State standards also require an acoustical analysis for all multi-family units located in areas where the L_{dn} exceeds 60 dBA, in order to demonstrate that the interior standard will be met.

⁴ City of Goleta General Plan, 2006, Table 9-2.

⁵ Title 24 Code of California Regulations Section 1207.11.12.

Table 4.10-6 shows the CNELs recommended for various types of land uses within the City.

**Table 4.10-6
City of Goleta Land Use Compatibility Criteria**

Land Use	Community Noise Exposure (Ldn or CNEL, dBA)			
	Normally Acceptable	Conditionally Acceptable	Normally Unacceptable	Clearly Unacceptable
Single Family, Duplex, Mobile Homes	50-60	60-65	65-75	75-85+
Multi-Family Homes	50-60	60-65	65-75	75-85+
Schools, Libraries, Churches, Hospitals, Nursing Homes	50-60	60-65	65-80	80-85+
Transient Lodging: Motels, Hotels	50-65	65-70	70-80	80-85+
Auditoriums, Concert Halls, Amphitheaters	-	50-65	-	65-85+
Sports Arena, Outdoor Spectator Sports	-	50-70	-	70-85+
Playgrounds, Neighborhood Parks	50-70	-	70-75	75-85+
Golf Courses, Riding Stables, Water Recreation, Cemeteries	50-70	-	70-80	80-85+
Office Buildings, Business and Professional Commercial	50-67.5	67.5-75	75-85+	-
Industrial, Manufacturing, Utilities, Agriculture	50-70	70-75	75-85+	-
<p>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.</p> <p>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.</p> <p>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.</p> <p>Clearly Unacceptable: New construction or development should generally not be undertaken.</p> <p>Source: Goleta General Plan/Coastal Land Use Plan, October, 2006.</p>				

4.10.2 Thresholds of Significance

Noise Thresholds

Based on 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, 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 8:00AM to 5:00PM 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.

With regard to Threshold 3 (c), the term "substantial increase" is not defined within the Thresholds Manual. The limits of perceptibility by ambient grade instrumentation (sound meters) or by humans in a laboratory environment is around 1.5 dB. Under ambient conditions, people generally do not perceive that noise has clearly changed until there is a 3 dB difference. A threshold of 3 dB 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 dB require a doubling of traffic volumes on already noise-impacted roadways. Projects usually do not, ~~of~~ by themselves, cause traffic volumes to double. Offsite traffic noise impacts are therefore almost always cumulative in nature rather than individually significant.

In addition to the above, the impact analysis takes into account the noise and land use compatibility criteria discussed above (see Table 4.10-6) as they pertain to playgrounds and neighborhood parks. These criteria set forth a maximum noise level of 70 dBA CNEL for these facilities. Noise levels up to 67.5 dBA are considered normally acceptable for office buildings, business commercial, or professional uses.

Vibration Threshold

The City's *Environmental Thresholds and Guidelines Manual* does not include thresholds for vibration impacts. Given the proximity of the project to the UPRR, CEQA Appendix G guidelines were used to establish a vibration threshold. The project would result in a significant impact if it would result in:

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

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.

4.10.3 Project Impacts

Potential noise issues associated with operation of the project include the suitability of the noise environment for the residential and commercial uses, including indoor and outdoor areas, and the increases in area-wide noise levels due to project generated noise, which would primarily result from the project's traffic generation. Construction activities, especially heavy equipment, can create short-term noise increases near a project site that may affect nearby noise-sensitive receptors such. Each of these potential impacts is discussed below.

Construction Noise⁶

Impact N-1: Construction of the project would generate noise in the adjacent community.

Significance Before Mitigation: Significant

According to the City's Noise thresholds, noise from grading and construction activity within 1,600 feet of sensitive receptors would generally result in a potentially significant impact. This is based on the assumptions that the average noise levels from construction equipment range from 80-90 dB at 50 feet and that a distance of 1,600 feet is necessary to reduce these levels to 65 dB. The closest sensitive noise receptors to the project site are residents of the existing, 60-unit Pacific Glen residential development located across Glen Annie Road to the east of the project site (approximately 50 feet east of the project site), the Jubilee Christian Church on Hollister Avenue (identified as noise monitoring location 33 in Figures 9-1 and 9-2 of the General Plan/Coastal Land Use Plan Noise Element) 700 feet west of the project site, Girsh Park located approximately 1,300 feet south of the Camino Real Marketplace, and Dos Pueblos High School located approximately 1,600 feet northwest of the project site.

The project involves the construction of a 23.55-acre site with a mixed-use residential and commercial development. The development initially would require demolition of an existing office building and ATM kiosk; site grading involving 49,100-cubic yards of cut and 48,800-cubic yards of compacted fill, with a potential net export of 300-cubic yards of dirt from the project site; and the construction of ~~49~~ 18 apartment buildings containing a total of approximately ~~383,744~~ 391,323 gross square feet (sf) of residential area, 10 commercial buildings containing 90,054 sf, including 3,294 sf of live-work condominium living space, together with associated paved parking, landscaped open space, recreational amenities and a club house. The total duration for all construction phases for the project is estimated to be 15 months. It is assumed that the commercial construction duration would be 10 months and the residential construction duration would be ~~44~~ 15 months. Both portions would be built concurrently. Construction activities would involve the use of heavy equipment. Construction activities would also involve the use of smaller power tools, generators, and other equipment that are sources of noise. Each stage of

⁶ -Addresses Thresholds "a", "c", and "d."

construction would involve a different mix of operating equipment, and noise levels would vary based on the amounts and types of equipment in operation and the location of the activity.

Construction noise impacts vary markedly because the noise strength of construction equipment ranges widely as a function of the equipment used, which changes during the course of the project. Construction noise tends to occur in discrete phases dominated initially by demolition and/or earth-moving sources and later by finish construction. Heavy equipment noise can exceed 90 dB(A) and averages about 85 dB(A) at 50 feet from the source when the equipment is operating at typical loads. Most heavy equipment operates with varying load cycles over any extended period of time.

Construction noise exposure can be increased when several pieces of equipment operate in close proximity. Because of the logarithmic nature of decibel addition, two equally loud pieces of equipment will be +3 dB louder than either one individually. Three simultaneous sources are +5 dB louder than any single source. Thus, while average operational equipment noise levels are perhaps 5 dB less than at peak power, simultaneous equipment operation can still yield an apparent noise strength equal to any individual source at peak noise output. Whereas the average heavy equipment reference noise level is 85 dB(A), short-term levels from either peak power or from several pieces operating in close proximity can be as high as 90 dB(A).

Point sources of noise emissions are atmospherically attenuated by a factor of 6 dB per doubling of distance. The closest existing residences are approximately 100 feet to the east, across Glen Annie Road and may therefore experience construction noise levels above 65 dB at times since they would be within the 1,600-foot impact radius. Construction noise impacts at the closest residences are therefore considered significant.

Other sensitive receptors within 1,600 feet of the site (the Jubilee Christian Church, Girsh Park, and Dos Pueblos High School) would be shielded from construction noise generated at the site by intervening structures; the maximum construction noise exposure experienced at these sensitive uses would be less than 65 dBA. Therefore, construction-period impacts at these locations would be less than significant.

Operational Noise - Project Traffic Noise Generation⁷

Impact N-2: The project would generate traffic, which would increase noise levels along local roads.

Significance Before Mitigation: Less than Significant

Hollister Avenue

Traffic noise levels from Hollister Avenue and Storke Road under existing conditions and with the project were calculated using data from the project traffic report assuming a 45 mph travel speed, as shown in **Table 4.10-7**.

⁷ Addresses Thresholds "a" and "c."

**Table 4.10-7
Hollister and Storke Intersection Traffic Noise
(dBA CNEL at 100 feet from centerline)**

<i>Existing Configuration</i>	Existing	Existing & Project	Future	Future & Project
Hollister east of Storke	67.6	68.3	68.1	68.8
Hollister west of Storke	66.7	66.9	68.7	68.8
Storke north of Hollister	69.0	69.2	69.5	69.8

According to the calculations provided in Table 4.10-7, the project would increase noise levels on Hollister Avenue by up to +0.7 dB. The existing elevated baseline noise serves to mask the small incremental contribution of project-generated traffic on Hollister Avenue. The project's traffic noise increase would be less than +3.0 dB and therefore would result in a less than significant impact.

Glenn Annie Road

The project would generate traffic along Glen Annie Road where the primary access driveway to the project's residential area and a secondary access to the shopping center are located. Future increases in roadway noise may be associated with vehicles using the new access driveways. Accordingly, traffic related noise potentially associated with site access via Glen Annie Road was evaluated to determine the extent of noise impacts to the existing residences along the east side of Glenn Annie Road.

The project traffic report estimates that during the peak afternoon hour, 114 cars would enter the project site via Glen Annie Road. Most of this traffic would turn left into the project's commercial parking lot prior to passing the existing homes. Thirty percent of project-generated traffic would be generated by the residential uses. Therefore, during a peak hour it is assumed that 35 vehicles could pass by the homes east of Glen Annie. The noise level associated with this volume is 50 dB Leq. Existing daytime noise levels, as previously shown in Table 4.10-2 are in excess of 60 dB such that peak hour project traffic would not result in a significant impact on residential uses east of Glen Annie Road. The increased noise from added traffic on Glen Annie would be less than 0.5 dB, which is an imperceptible change.

Commercial Operations Noise⁸

Impact N-3: The proposed commercial uses would generate noise that may result in on-site noise nuisance impacts.

Significance Before Mitigation: Potentially Significant

A project would generally have a significant effect on the environment if it would substantially increase the ambient noise levels for noise sensitive receptors in adjoining areas. This would occur when ambient noise levels affecting sensitive receptors are increased to 65 dBA CNEL or more or when noise levels are increased by 3 dBA. Noise generated by the commercial uses would not result in a significant noise impact upon on-site or adjacent off-site residences based on these criteria. However, various activities associated with the commercial uses would result in the potential for noise nuisance impacts. Such impacts would be significant if they interfered with the comfort and repose of residential use.

⁸ -Addresses Thresholds "a" and "c."

The project proposes the development of commercial land uses within the southern third of the project site. The commercial component is made up of nine buildings, Buildings A through I. Buildings C, D, E, F, and G (live-work units) would be located along the interior with the rear of the buildings backing up to the internal roadway that separates the residential and commercial components. Buildings A, B, H, and I, would be located closer to Hollister Avenue with parking between. Building B would contain a grocery market-type use and is situated at the western end with rear loading dock(s) adjacent to the driveway along the west boundary. Specific occupants of these commercial buildings would be subject to prevailing market conditions and would change over the life the development. Potential internal noise nuisance issues from various sources are discussed below.

Market Loading Dock Noise

Building B at the west end of the site is designed to accommodate a market. Such use would involve delivery/unloading of heavy goods using a forklift and early morning truck traffic that could result in a noise nuisance for adjacent residential uses on the project site. Typical loading dock activity noise for a medium sized grocery store is 60 dB at 30 feet. For this reason, the loading dock is located along the western side of the market and is partially enclosed within a well. The nearest residential use would be located approximately 300 feet north of the load dock and would be approximately 10 feet up-slope of the market building. Distance alone would provide approximately -40 dB of noise attenuation. Additionally, the slope itself would function as a noise dampening berm, reducing ambient noise from the commercial center between 5 to 10 dBA while the loading dock well would reduce noise by at least +3 dBA. Noise from unloading is, therefore not anticipated to create a significant noise nuisance impact.

Trucking Along East-West Driveway and Turnaround

The project includes two access points along Hollister Avenue that could be used by trucks traveling to and from commercial buildings – the central driveway and a secondary access at the west end of the site. Trucks traveling along the western driveway between Hollister Avenue and Building B would be sufficiently removed from residential uses, such that noise nuisance impacts would not occur. However trucks traveling along the east-west driveways that separate the project's commercial and residential components may result in a noise nuisance at the residential uses.

Of most concern are heavy-duty (five-axle) delivery trucks that would typically serve a larger commercial use such as a market. Heavy-duty delivery trucks would likely enter the site from the main Hollister Avenue entrance, turn left to travel along the driveway between the commercial and residential uses, turn left at the turn-around, and back into the loading dock. Smaller commercial uses in Buildings C, D, E, or F would normally receive their deliveries from medium duty (two-axle) delivery trucks (e.g., UPS trucks) or vans.

The driveway between the commercial and residential uses in the west portion of the site and truck turnaround at the west end of the driveway would be located 50 to 70 feet from the nearest residential building(s). On the east side of the site, the distance between the driveway and closest residential buildings to the north would be about 20 feet

Maximum pass-by noise during heavy-duty delivery truck movement is typically 78 dB at 50 feet or 72 dB at 100 feet (FHWA 1998). Maximum pass-by noise generated by medium-duty trucks is in the low 70 dB range at 50 feet. This noise, which would occur for 5-10 seconds for each truck, would not ~~cause an exceedance of~~ exceed Goleta noise standards based on CNELs,

which is a daily weighted average. However, pass-by truck noise could be a nuisance at the residential units closest to the roadway if it occurs between 7:00PM and 7:00AM when there is greater noise sensitivity. This is considered a potentially significant noise nuisance impact.

Rear-of-Store Activities

Rear-of-store activities including deliveries and trash collection could generate noise that would be perceptible from sensitive uses on-site. Typical shopping center rear-of-store activities generate hourly Leqs of 55 dB at 25 feet based on observations at similar centers. Distance separation would reduce this level to 49 dB Leq at 50 feet or 43 dB Leq at 100 feet. West of the main driveway, the closest commercial buildings (Buildings C and D) and residential uses are separated by a horizontal distance of approximately 70 feet (between Buildings 4 15 and C) and eight to ten feet of grade separation between. This could provide between a 8 to 10+ dBA reduction in noise levels at ground level and above within the residential area west of the main driveway. East of the main driveway, about six feet of grade separation and 110 feet of horizontal separation would exist between the closest commercial and residential buildings, resulting in noise attenuation of approximately 13 dBA. Accordingly, noise generated by rear-of-store activities would be approximately 44 dBA at the closest residence west of the main driveway and 42 dBA east of the main driveway. Even if rear-of-store activity occurred for 12 daytime hours, the CNEL would be 44 dB, which is less than the 65 dB CNEL significance threshold. Also, the noise levels associated with rear-of-store activities at the closest residences would not be high enough to result in a significant nuisance impact.

Parking Lot Noise

Most shopping center parking is closest to Hollister Avenue away from the on-site residences and vehicle noise would be shielded by the commercial structures themselves. There is limited parking availability behind the commercial uses. All noise generated in the parking lot would be of short duration. The sound of starting an automobile lasts a few seconds and produces noise of approximately 50 dB at 200 feet. Impulsive horn sounds occur mostly due to remote door locking systems and car alarms activation, and can create noise levels of 60 dB at 200 feet. Door slams also can create very short duration noise, which can also provide noise levels up to 44 dB at 200 feet. The hourly average noise level resulting from the sum of these noise generating activities in a busy shopping center parking lot could range from 35 to 40 dB L_{eq} at 200 feet assuming no intervening structures. These levels would be further reduced by the shielding that the commercial buildings would provide. As such, parking lot noise may be heard occasionally at the closest residential use but is not considered a significant noise nuisance impact.

Noise from Commercial Equipment

Commercial uses would be equipped with electrical or mechanical equipment that could create audible noise at the nearest residences. Heating, ventilation, and air conditioning (HVAC) equipment is typically roof-mounted. Acoustical shielding (such as a roof-parapet wall) of roof-mounted equipment. ~~The roof-parapet wall normally acts as an~~ efficient sound barrier that reduces HVAC equipment noise at ground level to well below the ambient level.

Measured HVAC noise shows a wide variation in noise ratings depending upon equipment size, orientation, and function. Newer equipment tends to be quieter, reflecting more modern noise suppression technology. Representative noise measurements taken on the roof of commercial structures similar to the project shows the following noise levels at 20 feet from the equipment (Giroux & Associates, 2008):

6-fan condenser rack	-	63 dB
Freezer compressor	-	57 dB
A/C “packaged unit”	-	55 dB
Kitchen exhaust ventilator	-	54 dB

Individual roof-top mechanical equipment at the commercial buildings closest to on-site residences would be on the smaller size, but may include several pieces on adjoining roofs. A reference level of 60 dB at 20 feet is assumed to accommodate possible multiple equipment sources. Daytime background noise levels on the project site near the commercial/residential interface are about 40 dB. Geometrical spreading losses would reduce equipment “hum” to 40 dB at 200 feet from the source. Where there is a line of sight between rooftop equipment and upper story residences and less than 200 feet of separation, equipment humming or on/off cycling noise could be a nuisance. This is considered a potentially significant noise nuisance impact.

Electrical equipment (transformers, controllers, panels) may have a humming noise, but audibility is usually reduced by distance spreading losses within a few feet. The anticipated uses are not expected to require installation of emergency generators.

Special Outdoor Events

Commercial uses may sometimes accommodate public gatherings that could include music or other entertainment. Because of residential proximity, such activities could cause noise nuisance. Any planned activity that includes outdoor assembly, especially if amplified voice or music are to be used, would be required to apply for a permit from the City of Goleta which would place limits as to location, time, duration, and type of activity. Given this requirement, along with the anticipated limited frequency of such events, noise nuisance impacts from special outdoor events would not be significant.

On-Site Ambient Noise Exposure⁹

The following assesses potential interior and exterior noise exposure levels at residential and commercial uses and compares these to significance thresholds in order to identify the potential for significant impacts.

Residential Units Indoor Noise Exposure¹⁰

Impact N-4: Residential units (apartment interiors) would be exposed to noise from existing sources.

Significance Before Mitigation: Significant

The project would develop residential uses in the northern portion of the site, where noise levels are affected by the US 101/UPRR corridor. The existing noise contours associated with these sources are provided in Figure 4.10-1.

Existing noise levels at the site would be altered by the project due to on-site grading, the development of a 6-foot sound wall to be built on top of four-foot retaining walls along the project site’s northern perimeter, and by the placement of structures within the site. As shown in Figure 2-4 (Section 2.0 *Project Description*), grading would reduce the elevation of the site in

⁹ -Addresses Threshold “b.”

¹⁰ -Addresses Threshold “b.”

the northern portion of the site. The combination sound and retaining walls along the project's northern boundary would completely shield the first story of structures.

The future elevation differences and noise wall would eliminate line-of-sight at ground-floor locations within the site and therefore provide noise shielding from noise generated along the UPRR and US 101. Approximately 12dBA of shielding would be created for a ground-floor receiver near Building 13. However, upper story receivers at this location would have a line-of-sight relationship at least to train engines, which would reduce noise screening. Near the western site boundary at Building 2, the track elevation is six feet above the planned site grade. Ground floor receivers would be slightly less noise-shielded (approximately 8 dB). Buildings within the interior of the site would be shielded from US 101/UPRR noise by the northernmost buildings.

A detailed acoustical analysis would be necessary to determine precise noise exposures levels for each of the residential units, taking all of the above factors into consideration. For purposes of this analysis, the noise contours on Figure 4.10-1 are used to provide a conservative assessment of potential impacts, particularly for upper story residential units. As shown in Figure 4.10-1, all of the residential buildings except building 49_1 may include units exposed to noise levels greater than 65 dB. Standard construction typically achieves an exterior to interior noise reduction of about 20 dB. As such, additional noise reduction measures may be required for residential units that are not shielded from US 101/UPRR noise (by the elevation differential, noise wall, or other buildings or due to their interior location within a building).

Construction of multi-family residences must comply with the California Building Code, which requires documentation that interior standards will be met as part of an acoustical report submitted during plan check for a building permit. The acoustical report would specify any required noise attenuation features that would be included in the building design. If window closure is required to meet interior standards, the code requires provision of supplemental fresh air ventilation in any affected livable space.

That same report must document that the Building Code requirement of a sound transmission class (STC)¹¹ of 50 or better would be met in any shared ("party") wall assemblies. Stacked units must also have a floor/ceiling assembly rated at STC=50 or better, and an impact isolation class (IIC) rating of 50 or better.¹²

~~Prior to implementation of Building Code requirements and design based on the recommendations of the required acoustical analysis, the project would result in the potential for a significant interior noise impact unless it complies with the California Building Code and is designed in accordance with the acoustical analysis.~~

¹¹ 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.

¹² IIC is a single number rating of a floor-ceiling assembly's ability to attenuate impact noise from footsteps, dropped objects, etc.

Residential Units Outdoor Noise Exposure¹³

Impact N-5: Private outdoor living space (e.g., balconies and patios) of the apartment units would be exposed to noise from existing noise sources.

Significance Before Mitigation: Significant

As discussed above and depicted in Figure 4.10-1, all of the residential buildings except building 49 1 would be located within the 65 dBA CNEL contour. Buildings constructed parallel to the north property line are oriented so that they either back to or side onto the adjacent transportation corridor. The outside living spaces (e.g., balconies and patios) of buildings would be oriented to the interior common area of the apartment complex and would be shielded by the buildings themselves, which would reduce outdoor noise by 5 – 10 dBA. While no patios or balconies would be located on the north facades of residential buildings along the north boundary, otherwise unshielded upper story patios or balconies located within the 65 dBA CNEL contour and with a direct line of sight to US 101 may be exposed to noise levels above 65 dBA CNEL. This is considered a significant impact.

Non-Commercial Common Area Outdoor Noise Exposure¹⁴

Impact N 6: Outdoor recreational space would be exposed to noise from existing sources.

Significance Before Mitigation: Less than Significant

As shown on Figure 4.10-1, the project includes areas designated for recreational and open space uses within the 70 dBA CNEL contours. Predicted peak noise levels at the northernmost outdoor uses (the walking path along the site's northern boundary) are 72 dB CNEL (based on General Plan/Coastal Land Use Plan Noise Element contours). As discussed above with regard to indoor residential noise, noise generated along the US 101/UPRR would be shielded by grade elevation differences, the noise wall, and interior buildings. The combination of these features would reduce noise levels by 5-10 dB. Shielded noise levels would be less than 70 dB CNEL at all planned outdoor recreational space. Therefore, noise exposure impacts at outdoor recreational space would be less than significant.

Commercial Area Noise Exposure¹⁵

Impact N-7: Commercial uses would be exposed to noise from existing noise sources.

Significance Before Mitigation: Less than Significant

Commercial uses are generally not considered noise sensitive uses. Noise levels up to 67.5 dBA are considered normally acceptable for office buildings, business commercial, or professional uses, as shown above in Table 4.10-6. As shown in Figure 4.10-1, portions of buildings J and H along Hollister Avenue would be located within the 67.5 dBA CNEL contour. However, the potential uses for these buildings would be shopping center uses, likely restaurants. They would not provide office buildings or other noise sensitive use. Therefore, noise exposure impacts at these commercial uses would be less than significant.

¹³ Addresses Threshold "b."

¹⁴ Addresses Threshold "b."

¹⁵ Addresses Threshold "a."

Vibration

Impact V-1: The project could expose residential units to vibration generated along the UPPR.¹⁶

Significance Before Mitigation: Less than Significant

As described above, DOT guidelines estimate the maximum freight train vibration levels of 77 VdB at 100 feet from the track centerline for a locomotive-powered freight train and 67 VdB per train event for passenger trains. **Table 4.10-8** lists and **Figure 4.10-4** depicts vibration levels for both Amtrak Passenger and freight trains at various distances from the centerline of the southerly-most track. These are vibration levels at ground floor elevation. Upper level floors will experience less vibration due to dispersion and attenuation of the vibration energy as it propagates through a building. **Table 4.10-9** shows the vibration levels at each floor level. Vibration levels would be well below the damage threshold of 100 VdB. This level is also below the threshold of annoyance due to infrequent events of 80 VdB and therefore, potential vibration impacts would be less than significant.

Table 4.10-8
Expected VdB from Trains Within Project Site

Train Type	90 VdB	85 VdB	80 VdB	75 VdB	70 VdB
Freight Train	22'	40'	71'	126'	224'
Amtrak Train	7'	13'	22'	40'	71'

Source: Dept. of Transportation, *Transit Noise & Vibration Impact Assessment*, FTA-VA-90-1003-06, May, 2006

Table 4.10-9
Expected VdB from Trains at Structures

Floor	Expected VdB Level (freight trains/ passenger trains)_at closest structure
1	77/67
2	75/65
3	73/63

4.10.4 Cumulative Impacts

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, as shown in Table 4.10-7, considers future year traffic volumes that include this combined traffic generation plus the project. Noise increases from these combined sources would be less than 3 dB. Therefore, significant cumulative noise impacts would not occur.

¹⁶ -Addresses Threshold "e."



Aerial Photo Source: Ventura County, 2005.

WESTAR MIXED-USE VILLAGE



Train Vibration Contours



4.10.5 Mitigation Measures

Impact N-1: Construction of the project would generate noise in the adjacent community.

N 1-1: All noise-generating project construction activities ~~are shall be~~ limited to Monday thru Friday, 8:00 a.m. to 5:00 p.m. Construction ~~shall is~~ generally ~~prohibited not~~ be allowed on weekends, ~~and state holidays and federal holidays~~. Exceptions to these restrictions may be made ~~for good cause in extenuating circumstances (in the event of an emergency, for example) on a case by case basis shown~~ at the ~~sole discretion of the Director of Planning and Environmental Services Director,~~ ~~or designee~~. The permittee ~~shall must~~ post the allowed hours of operation near the entrance to the site, so that workers on site are aware of this limitation.

Plan Requirements and Timing: Three (3) signs stating these restrictions ~~shall must be~~ provided by the applicant and posted on site ~~at each entrance to the project~~. Such signs shall be ~~at least minimum size of 24" x 48"~~. All such signs ~~shall must be~~ in place ~~prior before~~ beginning commencement of any grading/demolition and maintained through to occupancy clearance. Violations of the ~~prohibited construction days and hours may result in stop work orders and/or suspension of permits at the sole discretion of the Planning and Environmental Services Director, or designee~~.

Monitoring: ~~City~~ ~~The Planning and Environmental Services Director, or designee, must staff shall~~ monitor compliance with restrictions on construction hours and ~~shall investigate and respond to all complaints~~.

N 1-2: The following measures ~~shall must be~~ incorporated into grading and building plan specifications to reduce the impact of construction noise:

- a. All construction equipment, ~~fixed or mobile, must be equipped with shall~~ have ~~properly operating and maintained sound control devices, and no equipment shall have an unmufflers~~. Noise attenuation barriers and mufflers ~~of grading equipment must be required for construction equipment generating noise levels above 95 dB at 50 feet from the source exhaust system;~~
- b. ~~Construction noise reduction methods such as but not limited to 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 sources, maximizing the distance between equipment and staging areas occupied residential areas, and use of electric air compressors and similar power tools (rather than diesel equipment) must be used when feasible;~~
- c. ~~During construction, stationary construction equipment must be placed such that emitted noise is directed away from sensitive noise receivers;~~
- e. ~~Noise attenuation barriers and mufflers of grading equipment shall be required for construction equipment generating noise levels above 95 dB at 50 feet from the source.~~
- d. ~~Stationary equipment that generates noticeable noise, such as large air compressors or generators, shall be located as far away from adjacent~~

~~residences as practical. Temporary barriers or shelters may also be used. The combination of location and/or temporary barriers shall reduce noise levels from such equipment to no more than 70 dBA (one hour Leq, similar to the performance standard in the adjacent M-1 zone) at the property lines nearest to the adjacent existing residences.~~

- ~~d. During construction, Construction access, stockpiling and vehicle staging activities areas must be located as far as practicable from noise sensitive receptors dwellings.~~
- ~~e. Earthmoving equipment operating on the construction site, must be as far away from vibration-sensitive sites as possible; and~~
- ~~f. Construction hours, allowable workdays, and the telephone number of the job superintendent and the telephone number of City staff contact(s) must be clearly posted at all construction entrances to enable surrounding owners and residents to contact the job superintendent directly. If the job superintendent receives a complaint, the superintendent must notify the Planning and Environmental Services Director, or designee, and investigate, take appropriate corrective action, and report the action taken to the reporting party and the Planning and Environmental Services Director, or designee.~~

Plan Requirements and Timing: ~~The location of the three signs stating these restrictions must be identified on a site plan. Two~~ The three signs stating these restrictions must ~~shall~~ be provided by the permittee and posted on site at each entrance to the project. All signs must be in place before the start of site preparation and grading activities and maintained through to occupancy clearance. In addition, the signs shall provide City of Goleta contact information. ~~Requirements a-fd shall~~ must be incorporated as text into all plan sets and ~~requirement e shall~~ must be incorporated graphically into all plan sets submitted for approval of any Land Use, building, or grading permits ~~prior before to~~ permit approval.

Monitoring: The Planning and Environmental Services Director, or designee, must ~~City staff shall~~ verify compliance ~~before prior to~~ Land Use, building, or grading permit approval. The Planning and Environmental Services Director, or designee, must ~~City staff shall~~ periodically inspect the site to verify ensure compliance with all noise attenuation requirements.

N 1-3: Stationary construction equipment that generates noise which exceeds 65 dBA at the project boundaries ~~shall~~ must be shielded to the Planning and Environmental Services Director, or designee, City of Goleta's satisfaction and/or ~~shall~~ be located a minimum of 1,600 feet from sensitive receptors.

Plan Requirements and Timing: The permittee ~~shall~~ must submit a list of all stationary equipment to be used in project construction which includes manufacturer's specifications on equipment noise levels as well as recommendations from the project acoustical engineer to shielding such stationary equipment so that it complies with this requirement for review and approval by the Planning and Environmental Services Director, City staff. ~~City staff.~~ The equipment area with appropriate acoustic shielding ~~shall~~ must be designated on

building and grading plans. Equipment and shielding ~~shall~~ must remain in the designated location throughout construction activities. This information ~~shall~~ must be reviewed and approved by the Planning and Environmental Services Director, or designee, before City staff prior to LUP issuance of any Land Use Permit. All City approved noise attenuation measures for stationary equipment used in any construction and/or demolition activities ~~shall~~ must be implemented and maintained for the duration of the period when such equipment is on-site.

Monitoring: ~~The City of Goleta compliance staff shall~~ Planning and Environmental Services Director, or designee, must perform site inspections to ensure verify compliance.

Impact N-2: The project would generate traffic, which would increase noise levels along local roads.

This impact would be less than significant, and therefore mitigation measures are not required.

Impact N-3: The commercial uses would generate noise that may result in on-site noise nuisance impacts.

N 3-1: A noise mitigation plan ~~must~~ shall be prepared for the commercial component of the project to avoid potential noise nuisance. While the specific design of a noise mitigation plan ~~will~~ depends upon the types of commercial uses that are ultimately in operation, a prototype plan that assumes noise-generating uses such as high volume retail or late evening entertainment, would include the following:

- Rear-of-store activities including deliveries and trash collection ~~shall~~ must be restricted to daytime hours (7:00AM to 7:00PM).
- Retail deliveries ~~shall be~~ are prohibited between the hours of 7:00PM to 7:00AM.
- Idling of delivery trucks or of refrigeration units at the loading dock ~~shall~~ are ~~be~~ prohibited at all times.
- Acoustical shielding ~~shall~~ must be provided for roof-top mechanical equipment visible to any resident within 200 feet. This shielding ~~shall~~ must achieve a 10 dB noise reduction. Shielding shall also result in a noise reduction at the ground level to below ambient levels.
- A Land Use Permit and, as appropriate, a Live n-eEntertainment or Outdoor Festival licensepermit in accordance with Goleta Municipal Code Chapters 9.07 (Live Entertainment) or 9.08 (Outdoor Festival) must be obtained from the City of Goleta for any outdoor assembly involving the use of amplified voice or music shall be required.

Plan Requirements and Timing: A draft copy of the noise mitigation plan must be reviewed and approved by the Planning and Environmental Services Director, or designee, before the issuance of any certificate of occupancy for the commercial buildings.

Monitoring: The Planning and Environmental Services Director, or designee, must verify compliance upon the issuance of certificate of occupancy for the commercial buildings. The Planning and Environmental Services Director, or

designee, must periodically inspect the site to verify compliance with the noise mitigation plan.

Impact N-4: Residential units (apartment interiors) would be exposed to noise from existing sources.

N 4-1: Pursuant to ~~State requirements under Title 24~~the California Building Code, as adopted by the Goleta Municipal Code, an acoustical study performed by an acoustical engineer ~~shall be~~is required for all residential buildings located within the residential component of the project to determine what construction techniques and design recommendations should be incorporated into the project design to reduce interior noise to achieve the 45 dB CNEL building code standard required by ~~Chapter 2-35 of the California State Building Code Title 24, Section 3501, et seq. (Title 24)~~with standard upgraded construction practice and the ability to close windows, and candidate structural mitigation. Examples of building materials and construction specifications that may be used to meet the interior noise standard include the following:

- a. Air conditioning or a mechanical ventilation system should be installed so that windows and doors may remain closed;
- b. Windows and sliding glass doors must be double-paned, mounted in frames with low rates of air filtration (0.5 cubic foot per minute or less, per American National Standard Institute specifications) and a sound transmission coefficient rating of 30 or greater;
- c. Solid-core exterior doors must be constructed with perimeter weather stripping and threshold seals; and
- d. Roof or attic vents must be baffled.

Design measures include:

- b. ~~Exterior Walls: Exterior walls shall have a laboratory sound transmission class rating of at least STC=44. Masonry walls having a surface weight of at least 25 pounds per square foot does not require a furred stud interior wall. Frame walls must have at least a 4 inch nominal depth and shall be finished on the exterior with siding on sheathing, stucco, brick or brick veneer. The interior surface of exterior stud walls shall be of gypsum board or plaster at least ½ inch thick, installed on studs. Continuous composition board, plywood or gypsum board sheathing at least ½ inch thick shall cover the exterior side of the wall studs behind the wood, aluminum, vinyl or other siding. Sheathing panels shall be butted tightly and covered on the exterior with overlapping building paper. The top and bottom edges of the sheathing shall be sealed airtight. Insulation material at least 2 inch thick shall be installed continuously throughout the cavity space behind the exterior sheathing and between wall studs. Insulation shall be glass fiber or mineral wool.~~
- c. ~~Roof / Ceiling Assemblies: Combined roof and ceiling construction shall have a minimum laboratory STC rating of at least 39. The attic or rafter space shall consist of closely butted ½ inch composition board, plywood or gypsum board sheathing topped by roofing as required. If the underside of the roof is~~

~~exposed over a habitable room (as with a cathedral ceiling) or if the attic or rafter spacing is at less than 6 inches, the roof construction shall have surface weight of at least 40 lbs. per square foot. Rafters, joists or other framing may not be included in the surface weight calculation.~~

- ~~d. Glazed Windows and Sliding Doors: Stationary Windows: 1/8 3/4 inch airspace 1/8 inch insulating glass (or similar) within assemblies carrying laboratory sound transmission class (STC) ratings of at least 30.~~
- ~~e. Kitchen and Bathroom Ventilation: Kitchen and bathroom ventilation ducts should include at least two elbows.~~
- ~~f. Chimney/Fireplace Closures: Flue dampers and glass fireplace screens are recommended.~~

Plan Requirements and Timing: An acoustical analysis, prepared by a licensed engineer with expertise in environmental noise assessment and architectural acoustics, ~~shall~~ must be submitted to the Planning and Environmental Services Director, or designee, City for and approval as part of the of the project's construction drawings at the time of submission of plans for plan check. Design measures recommended by the analysis ~~shall~~ must be incorporated into the architectural and structural design in order to meet the 45dBA CNEL interior standard in perimeter residences.

Monitoring: ~~Prior to~~ Before the City issues a certificate of occupancy for each residential building final inspection, the Planning and Environmental Services Director, or designee, City staff shall must be provided with a written certification by the project acoustical engineer that the project has been constructed per the approved report's recommendations and that a maximum interior noise level of 45 dB(A) has been attained.

Impact N-5: Private outdoor living space (e.g., balconies and patios) of the apartment units would be exposed to noise from existing noise sources.

N 5-1: ~~Residential o~~ Outdoor living space within residential units (e.g., patios, balconies, etc.) associated with residential units located within the 65 dBA CNEL and with a line of sight to the US 101/UPRR, shall must be protected from sound intrusion so that they meet the City's standard of 60 dBA CNEL for outdoor living spaces. ~~This may require~~ Protective measures may consist of, but are not limited to, a 6-foot high glass, Plexiglas, wood, or metal sound attenuation barrier along the residential unit's outdoor living space perimeter. Shields shall may enclose almost the entire balcony. The acoustical study identified in Mitigation Measure N 4-1, above, shall determine specific requirements.

Plan Requirements and Timing: These requirements ~~shall~~ 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 65 dBA CNEL and with a line of sight to the US 101/UPRR ~~prior to permit approval.~~

Monitoring: ~~City staff shall~~ The Planning and Environmental Services Director, or designee, must verify compliance prior 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 US 101/UPRR. ~~The to permit approval. City building inspectors shall must verify spot check to ensure compliance in the field.~~

N 5-2: ~~The permittee must provide a R rail line real-estate disclosure to potential buyers and occupants is required for anyone buying or leasing a Westar property within the project site informing of the site's proximity to the Union Pacific Railroad a rail line in the vicinity and that associated noise and vibration may be perceptible.~~

Plan Requirements and Timing: ~~The permittee must provide Aa draft copy of the real-estate disclosure notice including this information of the rail line and associated noise and vibration to the Planning and Environmental Services Director, or designee, and the City Attorney for review and approval. shall be reviewed and approved by City of Goleta prior to issuance of certificate of occupancy. This disclosure must be accompanied by a plan for keeping the notification documents updated and distributed by facility property management to tenants upon signing of lease agreements and to future owners upon sale of the units. The disclosure must be included in the project CC&Rs, which must be reviewed and approved by the City Attorney before recordation of the final map.~~

Monitoring: ~~The Planning and Environmental Services Director must verify compliance with this requirement before final map recordation. City staff shall verify compliance prior to permit approval. City building inspectors shall spot check to ensure compliance in the field.~~

Impact N 6: Outdoor recreational space would be exposed to noise from existing sources.

This impact would be less than significant, and therefore mitigation measures are not required.

Impact N-7: Commercial uses would be exposed to noise from existing noise sources.

This impact would be less than significant, and therefore mitigation measures are not required.

Vibration

Impact V-1: The project could expose residential units to vibration generated along the UPRR.

This impact would be less than significant, and therefore mitigation measures are not required.

4.10.6 Residual Impacts

With implementation of mitigation measures described above, the project's noise impacts would be reduced to less than significant (**Class II**).