4.10 NOISE

This section evaluates both temporary noise impacts associated with construction activity and long-term noise impacts associated with operation of the proposed project.

4.10.1 Setting

a. Overview of Sound Measurement. Noise level (or volume) is generally measured in decibels (dB) using the A-weighted sound pressure level (dBA). The A-weighting scale is an adjustment to the actual sound pressure levels to be consistent with that of human hearing response, which is most sensitive to frequencies around 4,000 Hertz (about the highest note on a piano) and less sensitive to low frequencies (below 100 Hertz). In addition to the instantaneous measurement of sound levels, the duration of sound is important since sounds that occur over a long period of time are more likely to be an annoyance or cause direct physical damage or environmental stress. One of the most frequently used noise metrics that considers both duration and sound pressure level is the equivalent noise level (Leq). The Leq is defined as the single steady A-weighted level that is equivalent to the same amount of energy as that contained in the actual fluctuating levels over a period of time. Typically, Leq is summed over a one-hour period.

The sound pressure level is measured on a logarithmic scale with the 0 dB level based on the lowest detectable sound pressure level that people can perceive (an audible sound that is not zero sound pressure level). Decibels cannot be added arithmetically, but rather are added on a logarithmic basis. Based on the logarithmic scale, a doubling of sound energy is equivalent to an increase of 3 dB and a sound that is 10 dB less than the ambient sound level would result in a negligible increase (less than 0.5 dB) in total ambient sound levels. Because of the nature of the human ear, a sound must be about 10 dB greater than the reference sound to be judged as twice as loud. In general, a 3 dB change in community noise levels is noticeable, while 1-2 dB changes generally are not perceived. Quiet suburban areas typically have noise levels in the range of 40 to 50 dBA, while those along arterial streets are in the 50 to 60+ dBA range. Normal conversational levels are in the 60-65 dBA range and ambient noise levels greater than that can interrupt conversations.

Noise levels typically attenuate at a rate of 6 dB per doubling of distance from point sources such as industrial machinery. Noise from lightly traveled roads typically attenuates at a rate of about 4.5 dB per doubling of distance. Noise from heavily traveled roads typically attenuates at about 3 dB per doubling of distance.

The time period in which noise occurs is also important since noise that occurs at night tends to be more disturbing than that which occurs during the daytime. To evaluate community noise on a 24-hour basis, the day-night average sound level was developed (Ldn). Ldn is the average of all A-weighted levels for a 24-hour period with a 10 dB upward adjustment added to those noise levels occurring between 10:00 PM and 7:00 AM to account for the general increased sensitivity of people to nighttime noise levels. The Community Noise Equivalent Level (CNEL) is identical to the Ldn with one exception. The CNEL adds 5 dB to evening noise levels (7:00 PM to 10:00 PM). Thus, both the Ldn and CNEL noise measures represent a 24-hour average of A-weighted noise levels with Ldn providing a nighttime adjustment and CNEL providing both an evening and nighttime adjustment.

b. Noise Sources. The project site is located south of U.S. 101 and the Union Pacific Railroad (UPRR) tracks and east of Storke Road. The project site is also in an area characterized primarily by business park development. Consequently, noise sources affecting noise levels onsite and in the project site vicinity include traffic noise, railroad noise, and noise associated with business park operations, such as vehicles, truck loading and unloading, HVAC systems, and conversations.

c. Current Noise Levels. The Noise Element of the Goleta General Plan shows the northern half of the project site as being within the 65 dBA CNEL noise contour for U.S. 101 and the remainder of the project site as being within the 60 dBA CNEL noise contour. The Noise Element also shows the northern part of the project site as within the 70 dBA CNEL noise contour for the railroad, the central part of the project site as within the 65 dBA CNEL noise contour, and the southern part of the project site as within the 60 dBA CNEL noise contour.

Four noise measurements were taken on and near the project site on June 5, 2013. The noise measurement locations are shown on Figure 4.10-1. The results of the noise measurements are summarized in Table 4.10-1 (see Appendix H for complete results of noise measurements). Measured Leq's ranged from 50.4 to 56.9 dBA. All measurements were taken mid-day and do not reflect the likely highest noise levels onsite that would be expected to occur during peak traffic periods.

Table 4.10-1
Noise Measurement Results

Location	Measured Ambient Noise (dBA)	
	Leq [a]	Lmax [b]
1. South side of the project site near Cortona Drive (80 feet from Cortona Drive centerline)	51.7	69.6
2. East side of the project site	50.4	63.0
3. West side of the project site	49.2	67.9
4. North side of the project site	56.9	80.8

All measurements were conducted for 20 minutes using an integrating sound level meter.
[a] Leq is essentially the average sound level over the measurement period.
[b] Lmax is the maximum sound level over the measurement period.

Measured onsite noise levels are lower than what is shown in the Noise Element of the General Plan. This is likely because the generalized noise contours developed as part of the Noise Element do not account for site-specific conditions that affect noise propagation. Various factors tend to reduce noise from U.S. 101 and the UPRR on the project site. Notably, the U.S. 101 onramp at Storke Road serves as a partial barrier that reduces noise from U.S. 101. In addition, Storke Road serves as a partial barrier to approaching and departing vehicle traffic on U.S. 101 as well as rail traffic on the UPRR line.

d. Sensitive Noise Receptors. The General Plan Noise Element defines sensitive receptors as users or types of uses that are interrupted (rather than merely annoyed) by relatively low levels of noise. These include: residential neighborhoods, schools, libraries, hospitals and rest homes, auditoriums, certain open space areas, and public assembly places. Uses in the immediate vicinity of the project site consist primarily

Legend

Project Location

Noise Measurement Location

N

0 100 200

Scale in Feet

Noise Measurement Locations

Figure 4.10-1

of business park development, including 'ZAD Fashion Inc. and GE Sensing, Inc. southwest of the project site, Toyon Research Corporation east of the project site, and Raytheon south of the project site across Cortona Drive. Such uses are not generally considered noise sensitive. Sensitive receptors near the project site include residential uses (the Pacific Glen townhomes) approximately 500 feet southwest of the project site across Storke Road. In addition, a 149-room hotel has been approved at the northwest corner of Hollister Avenue and Cortona Drive, approximately 400 feet south of the project site (the Rincon Palms Hotel and Conference Center). This hotel would be considered a noise sensitive use. In addition, the proposed residential units on the site are considered noise-sensitive.

e. Fundamentals of Groundborne Vibration. Vibration is sound radiated through the ground. The rumbling sound caused by the vibration of room surfaces is called groundborne noise. The ground motion caused by vibration is measured as particle velocity in inches per second and, in the U.S., is referenced as vibration decibels (VdB).

The background vibration velocity level in residential areas is usually around 50 VdB. The vibration velocity level threshold of perception for humans is approximately 65 VdB. A vibration velocity level of 75 VdB is the approximate dividing line between barely perceptible and distinctly perceptible levels for many people. Most perceptible indoor vibration is caused by sources within buildings, such as operation of mechanical equipment, movement of people, or the slamming of doors. Typical outdoor sources of perceptible groundborne vibration are construction equipment, steel-wheeled trains, and traffic on rough roads. If a roadway is smooth, the groundborne vibration from traffic is rarely perceptible. The range of interest is from approximately 50 VdB, which is the typical background vibration velocity level, to 100 VdB, which is the general threshold where minor damage can occur in fragile buildings.

The general human response to different levels of groundborne vibration velocity levels is described in Table 4.10-2.

Table 4.10-2
Human Response to Different Levels of Groundborne Vibration

Vibration Velocity Level	Human Reaction
65 VdB	Approximate threshold of perception for many people.
75 VdB	Approximate dividing line between barely perceptible and distinctly perceptible. Many people find transit vibration at this level annoying.
85 VdB	Vibration acceptable only if there are an infrequent number of events per day.
90 VdB	Difficulty with tasks such as reading computer screens.

Source: FTA, 2006.

f. Regulatory Setting. The Noise Element of the Goleta General Plan establishes noise standards for various land use categories based on the U.S. Department of Housing and Urban Development Guidelines and standards from the California Office of Noise Control. The City recommends 50-60 dBA as the "normally acceptable" range and 60-65 dBA as the "conditionally acceptable" range for multi-family

residential uses. According to the Goleta General Plan, multi-family residences within the "normally acceptable range" are deemed satisfactory, based upon the assumption that any buildings involved are of normal conventional construction, without any special noise insulation requirements. Development of multi-family residences within the "conditionally acceptable" range should be undertaken only after a detailed analysis of the noise reduction requirements is made and needed noise insulation features are included in the design.

Table 4.10-3 shows the noise and land use compatibility criteria in the City's Noise Element.

Table 4.10-3
Goleta Noise and Land Use Compatibility Criteria

Land Use Category	Community Noise Exposure (Ldn or CNEL, dBA)			
	Normally Acceptable	Conditionally Acceptable	Normally Unacceptable	Clearly Unacceptable
Residential - low density	50-60	60-65	65-75	75-85+
Residential – multiple family	50-60	60-65	65-75	75-85+
Transient Lodging – motels and hotels	50-65	65-70	70-80	80-85+
Schools, libraries, churches, hospitals, and nursing homes	50-60	60-65	65-80	80-85+
Auditoriums, concert halls, and amphitheaters	NA	50-65	NA	65-85+
Sports arenas and outdoor spectator sports	NA	50-70	NA	70-85+
Playgrounds and neighborhood parks	50-70	NA	70-75	75-85+
Golf courses, riding stables, water recreation, and cemeteries	50-70	NA	70-80	80-85+
Office buildings, business commercial, and professional	50-67.5	67.5-75	75-85+	NA
Industrial, manufacturing, utilities, and agriculture	50-75	70-75	75-85+	NA

Source: Table 9-2, Noise Element, Goleta General Plan (September 2006)
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 are 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 be discouraged. If new construction or development does proceed, a detailed analysis of the noise reduction requirements shall be made and needed noise insulation features shall be included in the design.*
Clearly Unacceptable: *New construction or development should generally not be undertaken.*
NA: *Not applicable.*

According to Noise Element policy NE 1.1, the City requires mitigation for development that would subject proposed land uses to noise levels that exceed the acceptable levels shown in Table 4.10-2. Policy NE 1.2 requires new development in areas over 60 dBA CNEL to include mitigation measures to reduce interior noise levels to 45 dBA CNEL or less. The Noise Element also restricts construction activities near or adjacent to residential buildings and other sensitive receptors to the hours of 8:00 AM to 5:00 PM Monday through Friday and 7:00 AM to 4:00 PM Monday through Friday for construction in nonresidential areas (Policy NE 6.4). Noise Element Policy NE 6.5 requires noise mitigation for construction equipment.

The Goleta Municipal Code ("GMC") Chapter 9.09 regulates noise in the City. The purpose of the Chapter is to preserve public peace and comfort of citizens of Goleta from unwarranted noise and disturbances. The GMC prohibits loud and unreasonable noise between the hours of 10:00 PM and 7:00 AM Sunday through Thursday and between 12:00 midnight and 7:00 AM Friday and Saturday. Loud and unreasonable noise is defined as sound which is clearly discernible at a distance of 100 feet from the property line of the property upon which it is broadcast or sound which is above 60 dBA at the edge of the property line upon which the sounds is broadcast. The City does not have any code requirements related to noise from construction activities but the GMC noise regulations would apply to construction noise.

4.10.2 Impact Analysis

a. Methodology and Significance Thresholds. Noise levels associated with existing and future traffic along area roadways were calculated using the Federal Highway Administration's Traffic Noise Model (TNM) version 2.5 (noise modeling data sheets can be viewed in Appendix H). The model calculations are based on traffic data from the EIR traffic study (see Appendix I) and Caltrans traffic counts (http://traffic-counts.dot.ca.gov/). Estimates of noise on the project site account for topography, offsite barriers (U.S. 101 ramp, Storke Road), and the proposed 8-foot sound wall along the northern site boundary, but do not account for attenuation due to onsite buildings due to model limitations. Cumulative conditions correspond to the assumed buildout of pending development within the City as indicated in Section 3.0, *Environmental Setting*, Tables 3-1 and Table 3-2.

Noise associated with rail activities on the adjacent UPRR line was calculated using a spreadsheet model developed by Rincon Consultants and based upon methodologies and noise emission factors from the Handbook of Noise Control (Harris, 1979). Estimates of rail operations (12 freight trains with 3 occurring at night, and 6 passenger trains with all occurring during the day) were obtained from the Westar Mixed-Use FEIR (City of Goleta, 2012) and Amtrak's online train schedule.

Overall onsite noise levels were calculated by standard decibel addition (logarithmically). Based on logarithmic addition, a doubling of sound energy translates to a 3 dBA increase in noise (e.g., an increase from 65 dBA to 68 dBA represents a doubling of sound energy). Estimated onsite noise accounts for both vehicle traffic noise and railroad noise.

Construction noise and groundborne vibration levels were estimated based on estimates from the Federal Transit Administration's (FTA) *Transit Noise and Vibration Impact Assessment* (May 2006). Reference noise and vibration levels from that document were used to estimate noise levels at nearby sensitive receptor locations based on the distance between the construction site and receptors and a standard noise attenuation rate of 6 dB per doubling of distance and vibration attenuation rate of approximately 9 VdB per doubling of distance. Construction noise and vibration level estimates do not

account for the presence of intervening structures or topography, which could further reduce noise and vibration levels at receptor locations. Therefore, the noise and vibration levels presented herein represent a worst-case estimate of actual construction noise.

The following thresholds are based on Appendix G of the *CEQA Guidelines*. Impacts would be potentially significant if the proposed project would result in:

- *Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies;*
- *Exposure of persons to or generation of excessive ground-borne vibration or ground-borne noise levels;*
- *A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project;*
- *A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project;*
- *For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, exposure of people residing or working in the project area to excessive noise levels; or*
- *For a project within the vicinity of private airstrip, would the project expose people residing or working the project area to excessive noise levels.*

According to the City's *Environmental Thresholds and Guidelines Manual,* impacts would be significant if the proposed project would result in:

- *Noise levels in excess of 65 dBA CNEL that could affect sensitive receptors;*
- *Exposure to outdoor noise levels in excess of 65 dBA CNEL and/or exposure to interior noise levels in excess of 45 dBA CNEL.*
- *A substantial increase in ambient noise levels for noise-sensitive receptors generally presumed to be an increase to 65 dBA CNEL or more; or a substantial increase in ambient noise levels for noise-sensitive receptors that is less than 65 dBA CNEL, as determined on a case-by-case basis.*
- *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.*

With respect to traffic noise increases due to project-generated traffic, impacts are considered significant if traffic-generated noise associated with development of the project would result in exposure of sensitive receptors to unacceptable noise levels. The May 2006 FTA document *Transit Noise and Vibration Impact Assessment* recommendations were used to determine whether or not increases in roadway noise would be considered significant. The allowable noise exposure increase changes with increasing noise exposure, such that lower ambient noise levels have a higher allowable noise exposure increase. Table 4.10-4 shows the significance thresholds for increases in traffic-related noise levels caused by the project. If residential development or other sensitive receptors would be exposed to traffic noise increases exceeding the FTA criteria, impacts would be considered significant.

Table 4.10-4
Significance of Changes in Operational Roadway Noise Exposure

Ldn or Leq in dBA	
Existing Noise Exposure	**Allowable Noise Exposure Increase**
45-50	7
50-55	5
55-60	3
60-65	2
65-75	1
75+	0

Source: Federal Transit Administration (FTA), May 2006

Goleta has not adopted specific thresholds for groundborne vibration impacts. Therefore, this analysis uses the FTA's vibration impact thresholds to determine whether groundborne vibration would be "excessive." A vibration velocity level of 75 VdB is the approximate dividing line between barely perceptible and distinctly perceptible levels for many people. Consequently, the FTA recommends an 80 VdB threshold for infrequent events at residences and buildings where people normally sleep (e.g., the future on-site residences and the residences 500 feet southwest of the project site). The FTA does not consider most commercial and industrial uses to be noise-sensitive (except for those that depend on quiet as an important part of operations, such as sound recording studios) and therefore does not recommend thresholds for groundborne vibration impacts to such uses. In terms of groundborne vibration impacts on structures, the FTA states that groundborne vibration levels in excess of 100 VdB would damage fragile buildings and levels in excess of 95 VdB would damage extremely fragile historic buildings.

According to the Goleta General Plan, the project site is located outside of the current and the anticipated 2030 60 dBA CNEL noise contour of the Santa Barbara Municipal Airport. There are no private airports within the vicinity of the City. No impact related to airport noise would occur and airport noise impacts are discussed in Section 4.15, *Effects Found Not to be Significant.*

b. Project Impacts and Mitigation Measures.

Impact N-1 **Construction activities would be located within 1,600 feet of sensitive receptors, including existing residential uses approximately 500 feet to the southwest and a proposed hotel about 400 feet to the south; therefore, temporary construction-related noise could exceed City of Goleta Municipal Code Chapter 9.09 noise regulations. However, general mitigation is available to address construction noise; therefore, impacts would be Class II, *significant but mitigable*.**

The proposed project would be constructed in approximately 14 months. Table 4.10-5 shows typical noise levels associated with various construction equipment at distances of 50, 100, 200, 400, and 500 feet from the noise source. Typical construction noise levels at 50 feet from the source range from about 76 to 89 dBA. The grading/excavation phase of project construction tends to create the highest construction noise levels because of the operation of heavy equipment, although only a limited amount of equipment can operate near a given location at a particular time.

Table 4.10-5
Typical Noise Levels at Construction Sites

Equipment Onsite	Typical Level (dBA) 50 Feet from the Source	Typical Level (dBA) 100 Feet from the Source	Typical Level (dBA) 200 feet from the Source	Typical Level (dBA) 400 feet from the Source	Typical Level (dBA) 500 feet from the Source
Air Compressor	81	75	69	63	61
Backhoe	80	74	68	62	60
Concrete Mixer	85	79	73	67	65
Crane, mobile	83	77	71	65	63
Dozer	85	79	73	67	65
Jack Hammer	88	82	76	70	68
Paver	89	83	77	71	69
Saw	76	70	64	58	56
Scraper Laying	89	83	77	71	69
Truck	88	82	76	70	68

Noise levels assume a noise attenuation rate of 6dBA per doubling of distance.
Source: Federal Transit Administration (FTA), May 2006.

The most affected adjacent uses consist of neighboring business park development. Immediately abutting properties (including 'ZAD Fashion Inc. and GE Sensing, Inc. to the southwest and Toyon Research Corporation to the east) could be exposed to temporary noise in the 76-89 dBA range during some periods of construction. However, these types of facilities are not considered noise sensitive because they are not sensitive receptors.

Sensitive receptors located within 1,600 feet of the project site include the residences approximately 500 feet southwest of the project site across Storke Road. At 500 feet from the project site, noise levels could reach up to 69 dBA. The proposed hotel approximately 400 feet south of the project site could experience noise levels up to 71 dBA. Since construction activities would be located within 1,600 feet of sensitive receptors and noise could exceed 65 dBA, impacts would be potentially significant.

These estimates do not account for the presence of intervening structures or topography, which could further reduce noise levels at receptor locations. The construction noise levels experienced at the Pacific Glen townhomes would be reduced by the intervening business park development as well as Storke Road. The Storke Road overpass is approximately 35 feet high relative to the project site at the northern part of the project site near U.S. 101. The presence of this barrier and traffic noise along Storke Road are expected to make onsite construction noise inaudible at that location. Construction noise levels experienced at the proposed hotel south of the project site would be reduced by the intervening

business park development. Therefore, the noise levels presented herein represent a worst-case estimate of actual construction noise.

The proposed project would involve approximately 5,700 cubic yards of cut and 8,500 cubic yards of fill, for a net import of 2,800 cubic yards of material. Assuming approximately 20 cubic yards of material per truck trip, the proposed project would result in approximately 140 round-trip hauling truck trips. As shown in Table 4.10-5, noise from trucks can reach up to 88 dBA at 50 feet from the source. If hauling trucks traveled through residential neighborhoods or by sensitive receptors, noise levels may exceed 65 dBA and impacts would be potentially significant.

Mitigation Measures. Construction activity associated with the proposed project would occur within 1,600 feet of sensitive receptors and could therefore generate noise that exceeds City standards. Therefore, the following mitigation measures are required to minimize construction-related noise.

N-1(a) **Construction Timing.** Construction activity and equipment maintenance must be limited to the hours between 8 AM and 5 PM, Monday through Friday. No construction can occur on State holidays (e.g., Thanksgiving, Labor Day). Non-noise generating construction activities such as interior painting are not subject to these restrictions.

Plan Requirements and Timing: At least one sign near the project site entrance on Cortona Drive stating these restrictions must be posted on the site. Signs must be a minimum size of 24" x 48." Signs must be in place before the beginning of and throughout grading and construction activities. Violations may result in suspension of permits.

Monitoring: City Planning and Environmental Review staff must monitor compliance with restrictions on construction hours and must promptly investigate and respond to all complaints.

N-1(b) **Construction Vehicle Travel Route.** Construction vehicles and haul trucks must utilize roadways which avoid residential neighborhoods and sensitive receptors where possible.

Plan Requirements and Timing: The permittee must submit a proposed construction vehicle and hauling route. This information must be reviewed and approved by City staff before issuance of grading permit for the project. The approved route must be used for the duration of construction.

Monitoring: City Planning and Environmental Review staff must periodically inspect the site to ensure compliance.

N-1(c) **Electrical Power.** Electrical power must be used to run air compressors and similar power tools.

Plan Requirements and Timing: The equipment area with appropriate acoustic shielding must be designated on building and grading plans.

Equipment and shielding must remain in the designated location throughout construction activities.

Monitoring: City Planning and Environmental Review staff must periodically inspect the site to ensure compliance with all noise attenuation requirements.

N-1(d) **Construction Noise Complaint Line.** The permittee must provide a non-automated telephone number for local residents and employees to call to submit complaints associated with construction noise before issuance of a grading permit.

Plan Requirements and Timing: The telephone number must be included in the notice indicated in Measure N-1(a) and posted on the project site and must be easily viewed from adjacent public areas. Proof of mailing the notices must be provided to the Planning and Environmental Review Department before the City issues a grading permit. At least one sign near the project site entrance on Cortona Drive with the phone number must be posted onsite. The permittee must inform the Planning and Environmental Review Department of any complaints within one week of receipt of the complaint. Signs must be in place before beginning of and throughout grading and construction activities. Violations may result in suspension of permits as determined by the Planning and Environmental Review Director.

Monitoring: Planning and Environmental Review Department staff may periodically inspect and respond to complaints.

Residual Impact. With the above mitigation measures, construction-related noise would be reduced to a less than significant level.

Impact N-2 **Project construction activities could generate intermittent levels of groundborne vibration affecting surrounding business park development. Impacts would be Class III, *less than significant.***

Construction activities that would occur at the project site have the potential to generate low levels of groundborne vibration. Table 4.10-6 identifies various vibration velocity levels for the types of construction equipment that would operate at the project site during construction activities.

The project site is surrounded by business park uses to the east, west, and south. The closest buildings are office buildings approximately 50 southwest and 50 feet east of the project site. There is also a warehouse building adjacent to the western project boundary. However, this building does not contain any offices or other uses that would be sensitive to vibrations. The FTA recommends a threshold of 83 VdB at institutional buildings with primarily daytime uses such as office buildings.

Based on the information presented in Table 4.10-6, vibration levels could reach approximately 78 VdB at the office buildings located approximately 50 feet from the eastern and western project site boundaries. This would not exceed the FTA's threshold of 83 VdB for buildings with primarily daytime uses. The nearest residential uses located 500 feet southwest of the project site would experience

vibration levels below 65 VdB, which is below the level needed to perceive vibration for most people. Impacts would be less than significant.

Table 4.10-6
Vibration Levels for Construction Equipment

Equipment	Approximate VdB		
	25 Feet	50 Feet	100 Feet
Hoe Ram	87	78	69
Large Bulldozer	87	78	69
Caisson Drilling	87	78	69
Loaded Trucks	86	77	68
Jackhammer	79	70	61
Small Bulldozer	58	48	39

Source: FTA, Transit Noise and Vibration Assessment, May 2006.

Mitigation Measures. Mitigation is not required since vibration levels would not exceed significance thresholds.

Residual Impact. Impacts would be less than significant without mitigation.

Impact N-3 **Project-generated traffic would incrementally increase traffic-related noise on study area roadway segments. However, the change in noise levels would not exceed significance thresholds. Therefore, the effect of increased traffic noise on existing uses would be Class III, *less than significant*.**

The proposed project would generate an estimated 1,170 average daily vehicle trips to and from the site, including 90 AM peak hour trips and 109 PM peak hour trips. These trips would incrementally increase traffic noise on study area roadways. The project could therefore incrementally increase noise at neighboring uses, particularly those located along Cortona Drive.

Estimated peak hour traffic values from the traffic study were used to model the change in noise levels resulting from increased traffic on seven roadway segments. Table 4.10-7 indicates noise levels at 50 feet from the centerline the first six roadway segments and 32.8 feet from the centerline for segment 7 (Cortona Drive). Noise levels at distances greater than 50 or 32.8 feet from the centerline would be lower due to distance attenuation. As noted in the *Setting*, noise from lightly traveled roads typically attenuates at a rate of about 4.5 dB per doubling of distance and noise from heavily traveled roads typically attenuates at about 3 dB per doubling of distance.

As shown in Table 4.10-7, the highest noise level increase due to the proposed project would be 0.8 dBA under existing plus project conditions on Cortona Drive north of Hollister Avenue (Segment 7 in Table 4.10-7). The only other roadway segment that would experience a measurable noise increase would be Hollister Avenue east of Los Carneros Road (Segment 5), which would have a 0.2 dBA noise increase

under existing plus project conditions. All other roadway segments would have no measurable noise level increases due to project traffic. These segments show no measurable noise increase because the number of new project-related trips is incremental relative to existing roadway traffic. For example, there are 21,400 existing average daily trips on Storke Road south of Hollister Avenue (Segment 2). The proposed project would add 176 new trips on that roadway segment, which is a 0.8% increase.

Table 4.10-7
Calculated Noise Associated with Traffic on Surrounding Roadways

Roadway	Projected Noise Level (dBA Leq)				Change In Noise Level (dBA Leq)	
	Existing	Existing + Project	Cumulative	Cumulative + Project	Due to Project Traffic	Due to Project Traffic Under Future Conditions
1. Storke Road north of Hollister Avenue	75.5	75.5	76.3	76.3	0	0
2. Storke Road south of Hollister Avenue	73.5	73.5	74.6	74.6	0	0
3. Hollister Avenue west of Storke Road	74.4	74.4	75.1	75.1	0	0
4. Hollister Avenue east of Storke Road	73.5	73.5	74.9	74.9	0	0
5. Hollister Avenue east of Los Carneros Road	72.2	72.4	72.9	72.9	0.2	0
6. Los Carneros Road south of U.S. 101 SB Ramps	74.1	74.1	75.3	75.3	0	0
7. Cortona Drive north of Hollister Avenue	60.9	61.7	61.6	62.2	0.8	0.6

Estimates of noise generated by traffic from roadway centerline at 50 feet.
Refer to Appendix H for full noise model output. Noise levels presented do not account for attenuation provided by existing barriers or future barriers; therefore, actual noise levels at sensitive receptor locations influenced by study area roadways may in many cases be lower than presented herein.
Source: Federal Highway Administration Traffic Noise Model Version 2.5 Look-Up Tables; ATE, 2012.

The increase in noise of 0.8 dBA under existing conditions and 0.6 dBA under cumulative conditions on Cortona Drive north of Hollister Avenue would be less than the 2.0 dBA threshold for significant increases in noise where existing noise levels are between 60 and 65 dBA, as shown in Table 4.10-3. Further, the 0.2 dBA noise increase on Hollister Avenue east of Los Carneros Road would be less than the 1.0 dBA threshold for significant noise increases where existing noise levels are between 65 and 75 dBA. No other roadway segments would experience measurable noise increases due to project-related traffic. Therefore, impacts related to project-generated traffic noise would be less than significant.

Mitigation Measures. Mitigation is not required since traffic noise increases would not occur along any study road segments.

Residual Impact. Impacts would be less than significant without mitigation.

Impact N-4 **Operation of the proposed project would generate noise typically associated with residential development. However, noise would not affect sensitive receptors and noise levels would not exceed City thresholds. Impacts would be Class III, *less than significant.***

The new parking areas and associated with the project would bring vehicular activity and associated noise to the area, with resulting increased noise at offices immediately adjacent to the project site. Sources of noise would include general vehicular movement, periodic instantaneous sounds such as car honking and car alarms, and conversations. Table 4.10-8 shows exterior noise levels typically associated with parking lots.

Table 4.10-8
Parking Lot Noise Sources at 50 Feet

Source	Level (dBA)
Autos at 14 mph	50
Sweepers	72
Car Alarm Signal	69
Car Alarm Chirp	54
Car Horns	69
Door Slams	64
Talking	36
Radios	64
Tire Squeals	66

Source: Gordon Bricken & Associates, 1996. Estimates based on noise measurements taken at various parking lots.

As shown in Table 4.10-8, noise levels at parking areas onsite could reach 72 dBA 50 feet from the parking areas when street sweeping occurs. Additionally, the project would involve maintenance associated with typical residential uses, such as lawn mowers, vacuum cleaners, and leaf blowers. Lawn mowers generate noise levels of approximately 70 dBA 100 feet from the source (95 dBA three feet from the source) and vacuum cleaners generate noise levels of approximately 70 dBA 10 feet from the source (California Department of Transportation, Technical Noise Supplement, 2009). According to the environmental thresholds for operational noise a significant impact would occur if the proposed project would generate noise levels in excess of 65 dBA CNEL.

As discussed in the *Setting*, the CNEL measurement is a 24-hour average A-weighted noise level providing an evening and nighttime adjustment to account for impacts to sensitive receptors during the evening and nighttime. As shown in Table 4.10-8, intermittent noise levels, such as street sweeping, car alarm signals, and tire squeals would exceed 65 dBA. Additionally, general maintenance of residences onsite, including lawn mowers and vacuum cleaners, would generate intermittent noise levels exceeding 65 dBA. However, adjacent business park uses are not noise sensitive and these intermittent activities would not result in a noise level in excess of 65 dBA CNEL. Therefore, the 24-hour average noise level associated with the proposed project would not exceed the City's threshold of 65 dBA CNEL. Further, the proposed project includes six-foot high masonry walls on the east and west site boundaries. These walls would serve to reduce noise levels at adjacent business park developments. Impacts would be less than significant.

Mitigation Measures. Mitigation is not required because impacts would be less than significant.

Residual Impact. Impacts would be less than significant without mitigation.

Impact N-5 **Development of the proposed project near the Union Pacific Railroad, U.S. 101, and existing business park development could expose future residents on the project site to noise levels exceeding City standards. This impact would be Class II, *potentially significant unless mitigation is incorporated.***

The Union Pacific Railroad (UPRR) borders the project site to the north. In addition, U.S. 101 is immediately north of the UPRR and Storke Road borders the site to the west. Residential units would be located as close as 120 feet from the railroad tracks, 300 feet from the centerline of U.S. 101, and 180 feet from the centerline of Storke Road. Therefore, future residents could be exposed to noise produced by passenger and freight trains on the UPRR and from vehicle traffic on the U.S. 101 and Storke Road. The project site is also surrounded on three sides by existing business park development. Future residents could be exposed to noise produced by vehicles, truck loading and unloading, forklifts, conversations, HVAC systems, and other mechanical units needed to support ongoing business park activities.

As shown in Table 4.10-1 on page 4.10-2, existing noise levels measured on site range between 50.4 to 56.9 dBA Leq, which is below the City of Goleta threshold of 65 dBA for noise-sensitive land uses. These noise readings were taken during the day during normal operational hours for the surrounding business park development. Therefore, the surrounding business park development would not expose future residents to noise levels above City standards. Further, a six-foot high masonry wall is proposed on the east and west sides of the project site. These walls would serve to limit noise associated with the business park uses adjacent to the project site.

Table 4.10-9 shows estimated noise levels (CNELs) at the proposed residential buildings that would be most affected by noise from roadway and railroad noise (buildings 3, 4, 5, and 6). Noise levels were calculated for roadways and the UPRR, and were then combined for an estimate of the overall onsite CNEL. In Table 4.10, overall onsite noise levels estimated to exceed the City's exterior standard of 65 dBA were bolded. Estimated CNELs are somewhat higher than the levels that were measured onsite, presumably because onsite measurements were conducted during off-peak traffic periods.

With the proposed 8-foot sound wall along the northern site boundary, the overall ground floor exterior CNEL associated with roadway noise is estimated at from about 61 dBA for Building 3 to about 66 dBA for Building 6. Third floor CNELs due to roadway noise are projected to range from about 66 dBA at Building 6 to 70 dBA at Building 3. The CNEL due to UPRR noise is projected to be about 64 dBA at the ground floor and 65 dBA at the third floor for buildings 3, 4, 5, and 6. The combined CNEL from roadways and the UPRR is estimated at 66-68 dBA at the ground floor and 69-71 dBA on the third floor.

The projected sound levels at Building 6 does not vary much between the first and third floors (68 dBA on the first floor and 69 dBA on the third floor), whereas the variation between the first and third floors is greater on Building 3 (66 dBA on the first floor and 71 dBA on the third floor). This is due to two factors. First, both the first and third floors of Building 6 are partially shielded from U.S. 101 noise by the U.S. 101 on-ramp and from UPRR noise by the Storke Road overpass. The effects of these two existing barriers are less pronounced farther east where Building 3 would be located. Second, the first floor of

Building 3 derives greater benefits from the proposed 8-foot sound wall than does Building 6 because more of the noise affecting that building (traffic from U.S. 101) would be shielded by the wall. By comparison, much of the noise affecting Building 6 (traffic from the Storke Road overpass and the U.S. 101 on-ramp) would not be blocked by the 8-foot wall.

Table 4.10-9
Calculated Sound Levels Associated with U.S. 101, Storke Road, and the UPRR

	Roadway CNEL							
	Night		Day		CNEL		Railroad CNEL with 8' Sound Wall	Combined CNEL (Roadways + Railroad)
Receiver	No Sound Wall	With 8' Sound Wall	No Sound Wall	With 8' Sound Wall	No Sound Wall	With 8' Sound Wall		
Bldg 6 1st Floor W	59.9	59.9	60.8	60.7	66.5	66.4	64.1	**68**
Bldg 6 1st Floor E	55.5	55.2	59.1	58.5	62.6	62.3	64.0	**66**
Bldg 5 1st Floor	55.6	54.4	60.1	58.3	63.0	61.6	64.0	**66**
Bldg 4 1st Floor	56.0	54.3	60.9	58.5	63.5	61.6	64.0	**66**
Bldg 3 1st Floor	56.0	53.6	61.7	58.9	63.8	61.3	64.1	**66**
Bldg 6 3rd E	59.2	59.2	63.3	63.3	66.5	66.5	65.5	**69**
Bldg 5 3rd	59.5	60.2	64.7	64.7	67.1	67.6	65.5	**70**
Bldg 4 3rd	60.2	61.3	65.7	65.7	68.0	68.7	65.5	**70**
Bldg 3 3rd	61.3	62.7	67.1	67.1	69.2	70.1	65.5	**71**

Sound levels calculated using Traffic Noise Model Version 2.5. Note that roadway CNELs at the third floor actually increases slightly with the proposed 8' sound wall. This is due to loss of ground attenuation with the sound wall.

Overall exterior levels are projected to exceed the City's 65 dBA CNEL exterior standard for noise sensitive uses at both the ground floor and third floor of the most affected buildings onsite, including Buildings 3, 4, 5, and 6. Exterior levels at other proposed buildings, which would be located farther from U.S. 101 and the UPRR and would be partially shielded by intervening buildings, would be expected to remain within the 65 dBA CNEL standard. The exterior level at some proposed exterior spaces (such as the volleyball court) may exceed 65 dBA CNEL, but would remain within the acceptable range (up to 70 dBA CNEL) for recreational uses. Nevertheless, throughout the project site, occupants would be subject to periodic elevated noise levels associated with train pass-bys on the UPRR. In particular, events occurring at night could be disturbing to some residents.

Because exterior noise levels would exceed 65 dBA CNEL at the most affected residential units, impacts related to exposure of site residents to noise are considered significant. Mitigation would be required to ensure that interior noise levels would remain under 45 dBA CNEL. Mitigation also would be warranted to ensure that noise levels at usable exterior spaces at onsite residences (such as upper floor balconies) can be reduced to 65 dBA CNEL or lower.

Mitigation Measures. The following mitigation measure would be required to reduce interior noise levels in onsite residences to a less than significant level.

Balconies and patios of Buildings 3, 4, 5, and 6 within line of sight of U.S. 101 and/or the UPRR line may be subject to noise exceeding 65 dBA CNEL. Use of balconies is optional for site occupants and noise disturbance in these areas can generally be avoided by limiting use of these areas to times when noise

levels are not excessive. Nevertheless, Mitigation Measure N-5(a) is required to ensure that noise levels in such areas do not exceed City standards.

N-5(a) Outdoor Living Area Noise Attenuation. Residential outdoor living space (e.g., patios and balconies) associated with residential units located in the proposed Buildings 3, 4, 5, and 6, and with a line of sight of U.S. 101 and/or the UPRR line (second floor or above), 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, without limitation, 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. The acoustical study must conclusively demonstrate the effectiveness of the proposed noise attenuation measures.

Plan Requirements and Timing: These requirements must be incorporated into all construction documents submitted for approval before the issuance of a building permit for the residential units in Buildings 3, 4, 5, and 6 that include a line of sight of U.S. 101 and/or the UPRR line.

Monitoring: The Planning and Environmental Review Director, or designee~~,~~ must review and approve acoustical report and recommendations and must verify compliance before the issuance of a building permit for the residential units in Buildings 3, 4, 5, and 6 that are have a line of sight of U.S. 101 and/or the UPRR line. The City Planning and Environmental Review Department staff must verify compliance in the field, including acoustical testing provided by the permittee before the City issues a certificate of occupancy for an affected unit. No certificate of occupancy will be issued unless compliance is achieved.

Implementation of Mitigation Measure N-5(b) is required to reduce interior noise levels in the proposed buildings to acceptable levels.

N-5(b) Interior Noise Attenuation. The permittee must include features in the design of all onsite buildings that will attenuate the interior noise levels of all onsite residences to levels not exceeding 45 dBA. Specific features may include, without limitation:

- *Windows and sliding glass doors facing the noise source with a minimum Standard Transmission Class (STC) of 35 that are properly installed, weather stripped, and insulated.*
- *Exterior doors facing noise sources with a minimum STC of 35 and insulated in conformance with Title 24 of the California Code of Regulations requirements.*
- *Exterior wall facing material designed for a minimum STC of 35 (this can typically be achieved by adding absorptive insulation [i.e., fiberglass batts] in the wall cavity).*
- *Roof or attic vents either facing away from the noise source or baffled.*

- *Air conditioning or a mechanical ventilation system so that windows and doors may remain closed.*

Buildings 3, 4, 5, and 6 would experience the greatest level of noise exposure and, therefore, may require all of the above or their equivalent in order to achieve an acceptable interior noise levels on second and higher floors. Other onsite buildings/units may not require all of the above in order to achieve an acceptable interior noise environment.

Plan Requirements and Timing: The permittee must submit an acoustical analysis, prepared by a licensed engineer with expertise in environmental noise assessment and architectural acoustics, before the City issues any building permits for the proposed project. Noise attenuation features must address interior noise levels resulting from the project's proximity to the railroad and U.S. 101 corridor as well as noise generated by adjacent business parks.

Monitoring: During construction, Planning and Environmental Review staff must confirmation that adequate noise attenuation measures for apartment units pursuant to the acoustical analysis noted above are being installed per plans.

Residual Impact. Measure N-5(a) would achieve an acceptable exterior noise level in outdoor living spaces. Implementation of the design requirements in Measure N-5(b) would achieve an acceptable interior noise environment in all onsite residences. With implementation of these measures, noise levels experienced by future residents on the project site from traffic on U.S. 101 and the UPRR line would be reduced to a less than significant level.

Additionally, the following condition of approval to notify potential site occupants of the UPRR and associated noise is recommended to further reduce impacts.

- The permittee must provide a rail line real-estate disclosure to potential occupants, providing notice of the site's proximity to the Union Pacific Railroad and that associated noise and vibration may be perceptible.

Impact N-6 Development of the proposed project near the Union Pacific Railroad could expose future residents to groundborne vibration generated by passing trains. Impacts would be Class III, *less than significant.*

Table 4.10-10 shows the approximate VdB from passenger and freight trains at 30, 50, 100, 200, and 300 feet from the track centerline traveling at 50 miles per hour. The closest residential units to the train tracks would be approximately 120 feet from the track centerline. These are vibration levels at ground floor elevation. Upper level floors would experience less vibration due to dispersion and attenuation of the vibration energy as it propagates through a building. Vibration typically attenuates by 1 to 2 VdB for each floor.

Vibration levels at 120 feet would be approximately 76 VdB, which is below the structural damage threshold of 100 VdB and below the FTA threshold of 80 VdB for residential uses where people normally sleep. Therefore, at the proposed residential units 120 feet from the track centerline, impacts would be less than significant.

Table 4.10-10
Vibration Levels for Rail Transit

	Approximate VdB					
	30 Feet	**50 Feet**	**100 Feet**	**120 Feet**	**200 Feet**	**300 Feet**
Locomotive Powered Passenger or Freight Train (50 mph)	88	85	78	76	72	67

Source: FTA, Transit Noise and Vibration Assessment, May 2006.

Mitigation Measures. Mitigation is not required as impacts would be less than significant.

Residual Impact. Impacts would be less than significant without mitigation.

c. Cumulative Impacts. Table 4.10-7 on page 4.10-13 shows cumulative noise increases along roadways near the project site due to cumulative traffic growth. Noise level increases along the seven study roadway segments due to cumulative traffic would range between 0.7 and 1.4 dBA. The proposed project would add 0.6 dBA to the noise increase from cumulative development on Cortona Drive north of Hollister Avenue. This increase is not considered significant pursuant to the FTA's significance thresholds (see Table 4.10-4). No other study area roadway segments would experience measurable noise level increases due to project traffic in cumulative conditions. Therefore, the project's contribution would not be cumulatively considerable or significant.

Construction and operation of other projects in the vicinity of the project site would likely generate noise levels in excess of existing measured noise levels and may affect sensitive receptors. As mentioned, there is a 149-room hotel proposed at the northwest corner of Cortona Drive and Hollister Avenue 400 feet south of the project site (the Rincon Palms Hotel and Conference Center). This cumulative project may be exposed to construction noise from the proposed project. Alternately, the Rincon Palms project construction may expose future sensitive receptors on the proposed project site to construction noise, depending on which project is developed first. However, construction and operational noise would be localized in nature and would not contribute to cumulative noise impacts.

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