Noise Assessment

APPENDIX

ENVIRONMENTAL NOISE ASSESSMENT

HECKER PASS SUBDIVISION
GILROY, CALIFORNIA

WJVA Report No. 24-61

PREPARED FOR

EMC PLANNING
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MONTEREY, CA 93940

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1. INTRODUCTION

Project Description

The project will include the construction of 116 single-family homes of which 20% will be sold as affordable housing. A large portion of the surrounding infrastructure is in place. The development of this project will follow City of Gilroy municipal code in terms of construction hours and other rules and regulations. The total buildout of this project will take approximately 2.5 to 3 years to complete. There will be no retail or commercial component to this project. The project site plan is provided as Figure 1.

Environmental Noise Assessment

This environmental noise assessment has been prepared to determine if significant noise impacts would be produced by the project and to describe mitigation measures for noise if significant impacts are determined. This environmental noise assessment, prepared by WJV Acoustics, Inc. (WJVA), is based upon the project site plan provided by the project applicant (dated 2/15/2024), project-related traffic data provided by Hexagon Transportation Consultants, Inc., and a project site visit on December 4 and 5, 2024. Revisions to the site plan, project-related traffic data or other project-related information available to WJVA at the time the analysis was prepared may require a reevaluation of the findings and/or recommendations of the report.

Appendix A provides definitions of the acoustical terminology used in this report. Unless otherwise stated, all sound levels reported in this analysis are A-weighted sound pressure levels in decibels (dB). A-weighting de-emphasizes the very low and very high frequencies of sound in a manner similar to the human ear. Most community noise standards utilize A-weighted sound levels, as they correlate well with public reaction to noise. Appendix B provides typical A-weighted sound levels for common noise sources.

In terms of human perception, a 5 dB increase or decrease is considered to be a noticeable change in noise levels. Additionally, a 10 dB increase or decrease is perceived by the human ear as half as loud or twice as loud. In terms of perception, generally speaking the human ear cannot perceive an increase (or decrease) in noise levels less than 3 dB.

2. THRESHOLDS OF SIGNIFICANCE

The CEQA Guidelines apply the following questions for the assessment of significant noise impacts for a project:

a. Would the project result in generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?

b. Would the project result in generation of excessive groundborne vibration or groundborne noise levels?

c. For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?

a. Noise Level Standards

City of Gilroy General Plan-

Section 9 (Potential Hazards) of the City of Gilroy General Plan[1] (adopted November 2, 2020) establishes land use compatibility criteria in terms of the Day-Night Average Level (DNL or L_{dn}). The L_{dn} is the time-weighted energy average noise level for a 24-hour day, with a 10 dB penalty added to noise levels occurring during the nighttime hours (10:00 p.m.-7:00 a.m.). The L_{dn} represents cumulative exposure to noise over an extended period of time and is therefore calculated based upon *annual average* conditions.

Goal PH6: Protect Gilroy residents from exposure to excessive noise and its effects through appropriate mitigation measures and responsive land use planning, especially in regard to noise-sensitive land uses such as schools, hospitals, and housing for seniors.

PH 6.1 Noise and Land Use: Establish a physical development pattern that is compatible with the noise environment of Gilroy, ensuring that residential neighborhoods and park areas are the quietest areas in the community.

PH 6.2 Noise Standard Consistency: Review development proposals to assure consistency with noise standards, using the Future Noise Contours map to determine if additional noise studies are needed for proposed development.

PH 6.3 Maximum Permissible Noise Levels: Ensure that outdoor and indoor noise levels are within the maximum permitted levels. Prohibit further development of sensitive uses in areas where the current or projected future noise levels exceed these standards and feasible mitigation is not available to reduce the noise level to meet the standards identified in Table 9-1 (provided below as Table I).

PH 6.4 Noise Study and Mitigation: Require proposed development projects in areas where future residents or visitors may be exposed to major noise sources (e.g. roadways, rail lines, industrial activities) to conduct an environmental noise analysis. The noise analysis shall determine noise exposure and noise standard compatibility with respect to the noise standards identified in Table 9-1 and shall incorporate noise mitigation when located in noise environments that are not compatible with the proposed uses of the project.

PH 6.5 Acoustical Design: Consider the acoustical design of projects in the development review process to reduce noise to an acceptable level. Ensure that noise mitigation features are designed and implemented in an aesthetically pleasing and consistent manner.

PH 6.6 Setbacks and Earth Berms: Require landscaped setbacks and earth berms as an alternative to soundwalls where feasible to buffer noise along major thoroughfares and rail lines adjacent to residential areas. Where an adequate setback and earth berm is not feasible, a masonry wall screened with drought tolerant, low maintenance landscaping will be required.

PH 6.7 Residential Noise Standards: Require the design of new residential development to comply with the noise standards found in Table 9-1 (provided below as Table I). Maximum outdoor sound levels for residential properties shall be 60 dBA LDN, in areas where outdoor use is a major consideration (e.g., backyards in single family housing and common recreational areas in multi-family developments). In the Downtown Specific Plan Area, the maximum outdoor noise level in common recreation areas of multi-family residential uses shall be 65 dBA LDN. In outdoor use areas where the City determines that maintaining the outdoor noise levels mentioned above cannot be achieved after the application of reasonable and feasible mitigation, a level of up to 70 dBA LDN may be permitted, if the following findings are made:

- That feasible sound attenuation measures have been incorporated in the project design;
- That potential noise levels are part of the developer's disclosure to future residents;
- That interior noise limits established by the General Plan are strictly maintained; and
- Potential noise levels will not jeopardize the health, safety, and general welfare of the public.

PH 6.8 Incremental Noise Impacts of Commercial and Industrial Development: Review of proposed new or expanding commercial and industrial development shall consider potential noise impacts on nearby residential uses and, as necessary, shall require noise mitigation measures as a condition of project approval.

PH 6.9 Transportation Noise: Consider potential noise impacts when evaluating proposals for transportation projects, including road, freeway, and transit projects, and incorporate mitigation measures to meet General Plan standards.

PH 6.10 Construction Noise: Require proposed development projects subject to discretionary

approval to assess potential construction noise impacts on nearby sensitive uses and to minimize impacts on those uses, to the extent feasible.

6.13 Transportation Vibration: Require proposed residential and commercial projects located within 200 feet of existing major freeways and railroad lines (e.g. freight, Amtrak, and Caltrain) to conduct a ground vibration and vibration noise evaluation consistent with City-approved methodologies (e.g. Caltrans, Federal Transportation Authority).

TABLE I

CITY OF GILROY MAXIMUM PERMITTED OUTDOOR AND INDOOR NOISE LEVELS

Land Use Category	Maximum Outdoor L_{dn}, dBA	Maximum Indoor L_{dn}, dBA
Residential	60	45
Commercial	65	61
Industrial	76	See Note 2

[1]The Outdoor sound levels for residential properties shall be held to 60-dBA LDN, or a maximum of 70-dBA if ALL of the following FINDINGS can be made:

- That feasible sound attenuation measures have been incorporated in the project design;
- That potential noise levels are part of the developer's disclosure to future residents;
- That interior noise limits established by the General Plan are strictly maintained; and
- Potential noise levels will not jeopardize the health, safety, and general welfare of the public.

[2]The indoor standards for industrial land uses have been set by the Occupational Safety and Health Administration. The maximum level to be exceeded no more than 10 percent of the time (L10) is 65 dBA, while the maximum level to be exceeded no more than 50 percent of the time (L50) is 60 dBA.

Source: City of Gilroy General Plan

The City of Gilroy General Plan provides an interior noise level standard of 45 dB L_{dn}, within residential land uses. This is consistent with Title 24 of the California Code of Regulations for residential construction and consistent with U.S. Department of Housing and Urban Development (HUD). The intent of the interior noise level guideline is to provide an acceptable noise environment for indoor communication and sleep.

City of Gilroy Zoning Ordinance-

Additionally, Section 30.41.31 (Specific Provisions-Noise) of the City of Gilroy Zoning Ordinance[2] establishes noise level standards for non-transportation noise sources (stationary/fixed sources).

- For residential noise sources, the ordinance establishes an L_{max} (maximum) noise level criterion of 60 dB and an L_{10} statistical performance standard of 70 dB.

- For commercial noise sources (impacting residential properties), the ordinance establishes an L_{10} statistical performance standard of 70 dB between the hours of 7:00 a.m. and 10:00 p.m. Such noise is limited to the hours of 7:00 a.m. to 10:00 p.m., and prohibited between the hours of 10:00 p.m. and 7:00 a.m.

Hecker Pass Specific Plan-
The project site is located within the Hecker Pass Specific Plan (HPSP) Area. The HPSP provides the following noise-related policies applicable to the proposed project:

Policy 5-68: To eliminate the use of soundwalls along Hecker Pass Highway, all residential and commercial development shall mitigate noise by employing City approved mitigation measures such as setbacks, building, orientation, landscape berming, architectural sound attenuation, etc.

Policy 5-96: All proposed residential development should be setback a minimum of 250 feet from Hecker Pass Highway Centerline. If 250 feet cannot be accomplished, lesser setbacks that still meet the City of Gilroy noise policies may be implemented or alternative sound attenuation measures may be utilized. Mitigation measures must not interfere with views over the site and must be consistent with the scenic highway criteria and design standards.

Policy 5-98: Sound walls shall not be permitted along the Hecker Pass Highway Corridor.

Policy 5-99: No sensitive noise receptors should be located within 115- feet of the existing centerline of Hecker Pass Highway unless adequately mitigated.

b. Construction Noise and Vibration

Section 9 (Potential Hazards) of the City of Gilroy General Plan also provides some guidance in regards to construction noise and vibration:

PH 6.11 Construction and Maintenance Noise Limits: Limit the hours of construction and maintenance activities to the less sensitive hours of the day (7:00am to 7:00pm Monday through Friday and 9:00am to 7:00 pm on Saturdays). Construction hours that vary from these timeframes may be approved by the Building Official, in conformance with Article XVI. Hours of Construction of the Gilroy City Code.

PH 6.12 Vibration Impact Assessment: Require a vibration impact assessment for proposed development projects in which heavy-duty construction equipment would be used (e.g. pile driving, bulldozing) within 200 feet of an existing structure or sensitive receptor. If applicable, require all feasible mitigation measures to be implemented to ensure that no damage or disturbance to structures or sensitive receptors would occur.

Some further guidance related to vibration is provided by the Caltrans Transportation and Construction Vibration Guidance Manual[3]. The Manual provides guidance for determining annoyance potential criteria and damage potential threshold criteria. These criteria are provided below in Table III and Table IV, and are presented in terms of peak particle velocity (PPV) in inches per second (in/sec).

TABLE II

GUIDELINE VIBRATION ANNOYANCE POTENTIAL CRITERIA

Human Response	Maximum PPV (in/sec)	
	Transient Sources	Continuous/Frequent Intermittent Sources
Barely Perceptible	0.04	0.01
Distinctly Perceptible	0.25	0.04
Strongly Perceptible	0.9	0.1
Severe	2.0	0.4

Source: Caltrans

TABLE III

GUIDELINE VIBRATION DAMAGE POTENTIAL THRESHOLD CRITERIA

Structure and Condition	Maximum PPV (in/sec)	
	Transient Sources	Continuous/Frequent Intermittent Sources
Extremely fragile, historic buildings, ancient monuments	0.12	0.08
Fragile buildings	0.2	0.1
Historic and some old buildings	0.5	0.25
Older residential structures	0.5	0.3
New residential structures	1.0	0.5
Modern industrial/commercial buildings	2.0	0.5

Source: Caltrans

3. SETTING

The proposed project (Hecker Pass Subdivision) would include the construction of 116 single family homes of which 20% will be sold as affordable housing. A large portion of the surrounding infrastructure is in place. The project site is located south of Hecker Pass Highway (SR 152), an approximately 17.9 acres of undeveloped land located within the City of Gilroy, California.

The project site is generally bound to the north by Hecker Pass Highway (SR 152), Gilroy Golf Course and rural residential land uses, to the east by undeveloped land and commercial land uses, to the south by existing residential land uses and Eagle Ridge Golf Club, and to the west by undeveloped land and Gilroy Gardens.

The project site is located within the Hecker Pass Specific Plan Area. The western half of the parcel has a Hecker Pass Specific Plan land use designation of "Agri-Tourist Commercial Overlay (10% Maximum Building Coverage)" and the eastern half is designated "Hecker Pass Agriculture (HPA)."

a. Background Noise Level Measurements

Existing ambient noise levels in the project vicinity are dominated by traffic noise associated with vehicles traveling along Hecker Pass Highway (SR 152), and to a lesser extent, Lone Oak Court, and 3rd Street. Additional sources of noise observed during the site visit included noise associated with residential land uses (landscaping activities, construction activities, barking dogs, human voices, etc.), as well as occasional aircraft overflights.

Measurements of existing ambient noise levels in the project vicinity were conducted on December 3 and 4, 2024. Long-term (24-hour) ambient noise level measurements were conducted at two (2) locations (sites LT-1 and LT-2). LT-1 was located within the northwest portion of the project site, and was predominantly exposed to traffic noise associated with vehicles on Hecker Pass Highway. Site LT-2 was located within the southeast portion of the project site, and wad predominantly exposed to traffic on 3rd Street, Hecker Pass Highway, and noise associated with typical residential land uses (landscaping activities, barking dogs, human voices, etc.).

Additionally, short-term (15-minute) ambient noise level measurements were conducted at four (4) locations (Sites ST-1 through ST-4). The project vicinity and locations of the noise monitoring sites are shown on Figure 2. Two (2) individual measurements were taken at each of the four short-term sites to quantify ambient noise levels in the morning and afternoon hours.

Noise monitoring equipment consisted of Larson-Davis Laboratories Model LDL-820 sound level analyzers equipped with B&K Type 4176 1/2" microphones. The equipment complies with the specifications of the American National Standards Institute (ANSI) for Type I (Precision) sound level meters. The meters were calibrated with a B&K Type 4230 acoustic calibrator to ensure the accuracy of the measurements.

Measured hourly energy average noise levels (L_{eq}) at site LT-1 ranged from a low of 39.8 dB

between 2:00 a.m. and 3:00 a.m. to a high of 58.5 dB between 4:00 a.m. and 5:00 p.m. Hourly maximum (L_{max}) noise levels at site LT-1 ranged from 59.6 to 76.4 dB. Residual noise levels at the monitoring site, as defined by the L_{90} statistical descriptor ranged from 27.2 to 49.3 dB. The L_{90} is a statistical descriptor that defines the noise level exceeded 90% of the time during each hour of the sample period. The L_{90} is generally considered to represent the residual (or background) noise level in the absence of identifiable single noise events from traffic, aircraft and other local noise sources. The measured L_{dn} value at site LT-1 during the 24-hour noise measurement period was 59.1 dB L_{dn}. Figure 3 graphically depicts hourly variations in ambient noise levels at the LT-1 long-term monitoring site as well as a site photograph.

Measured hourly energy average noise levels (L_{eq}) at site LT-2 ranged from a low of 42.6 dB between 1:00 a.m. and 2:00 a.m. to a high of 57.2 dB between 5:00 a.m. and 6:00 p.m. Hourly maximum (L_{max}) noise levels at site LT-1 ranged from 58.1 to 87.1 dB. Residual noise levels at the monitoring site, as defined by the L_{90} statistical descriptor ranged from 36.0 to 48.2 dB. The measured L_{dn} value at site LT-1 during the 24-hour noise measurement period was 56.5 dB L_{dn}. Figure 4 graphically depicts hourly variations in ambient noise levels at the LT-1 long-term monitoring site as well as a site photograph.

The short-term site noise measurement data included energy average (L_{eq}) maximum (L_{max}) as well as five (5) individual statistical parameters. Observations were made of the dominant noise sources affecting the measurements. The statistical parameters describe the percent of time a noise level was exceeded during the measurement period. Table IV summarizes short-term noise measurement results.

TABLE IV

SUMMARY OF SHORT-TERM NOISE MEASUREMENT DATA
HECKER PASS SUBDIVISION, GILROY
DECEMBER 3 & 4, 2024

Site	Time	A-Weighted Decibels, dBA							Sources
		L_{eq}	L_{max}	L_2	L_8	L_{25}	L_{50}	L_{90}	
ST-1	9:05 a.m.	46.8	70.6	57.1	50.9	42.0	36.7	31.8	TR, L, H, B
ST-1	3:10 p.m.	45.5	69.2	55.5	49.2	40.8	35.0	31.1	TR, H, B
ST-2	9:30 a.m.	64.5	81.4	68.8	66.0	61.4	56.5	50.4	TR, AC
ST-2	3:25 p.m.	65.1	77.9	67.0	64.0	60.1	54.7	48.2	TR, L, B
ST-3	9:50 a.m.	49.1	73.8	59.3	54.6	46.2	40.0	38.2	TR, H, AC
ST-3	3:45 p.m.	50.8	74.4	56.0	51.1	45.7	41.4	40.9	TR, B, H
ST-4	10:10 a.m.	63.8	72.9	55.7	51.4	43.8	42.0	40.1	TR, C, AC
ST-4	4:05 p.m.	64.9	77.2	58.1	52.0	43.3	41.7	39.9	TR, AC

TR: Traffic AC: Aircraft V: Voices C: Commercial Activities L: Landscaping Activities B: Barking Dogs H: Human Voices
Source: WJV Acoustics, Inc.

Short-term noise measurements were conducted for 15-minute periods. Sites ST-2 and ST-4 were located in relatively close proximity to Hecker Pass Highway (SR 152), and as such noise levels were elevated as compared to the remaining ambient noise measurement sites. Short-term measurement sites ST-1 and ST-3 were located in the vicinity of Loan Oak Court and existing residential land uses south of the project site.

4. PROJECT IMPACTS AND MITIGATION MEASURES

a. Project Traffic Noise Impacts on Existing Noise-Sensitive Land Uses Outside Project Site (Less Than Significant)

WJVA utilized the FHWA Traffic Noise Model[4] to quantify expected project-related increases in traffic noise exposure at representative noise-sensitive receptor locations in the project vicinity. Traffic noise exposure levels for Background, Background Plus Project, 2040 and 2040 Plus Project traffic conditions were calculated based upon the FHWA Model and traffic volumes provided by Hexagon Transportation Consultants, Inc. The percentages of trucks on SR 152 were obtained from Caltrans. The day/night distribution of traffic and the percentages of trucks on the remaining roadways used for modeling were obtained from previous studies WJVA has conducted along similar roadways as such data was not available from governmental sources. The Noise modeling assumptions used to calculate project traffic noise are provided as Appendix C.

Project-related significant impacts would occur if an increase in traffic noise associated with the project would result in noise levels exceeding the City's applicable noise level standards at the location(s) of sensitive receptors. For the purpose of this analysis a significant impact is also assumed to occur if traffic noise levels were to increase by 3 dB at sensitive receptor locations where noise levels already exceed the City's applicable noise level standards (without the project), as 3 dB generally represents the threshold of perception in change for the human ear. This analysis of project traffic noise focuses on residential land uses, as they represent the most restrictive noise level criteria by land use type provided in the General Plan. The City's exterior noise level standard for residential land uses is 60 dB L_{dn}.

Traffic noise was modeled at seven (7) receptor locations (R-1 through R-7). The seven modeled receptors are located at roadway setback distances representative of the sensitive receptors (residences) along each analyzed roadway segment. The receptor locations are described below and provided graphically on Figure 5.

- R-1: Approximately 70 feet from the centerline of Loan Oak Court
- R-2: Approximately 70 feet from the centerline of Plum Street
- R-3: Approximately 100 feet from the centerline of 3rd Street.
- R-4: Approximately 150 feet from the centerline of Hecker Pass Highway
- R-5: Approximately 140 feet from the centerline of Hecker Pass Highway
- R-6: Approximately 75 feet from the centerline of Santa Teresa Blvd.
- R-7: Approximately 85 feet from the centerline of Santa Teresa Blvd.

Table V provides a comparison of traffic noise levels at the seven modeled receptor locations for Background, Background Plus Project, 2040 and 2040 Plus Project traffic conditions. Noise levels described in Table V do not take into account any localized acoustic shielding that may result from intervening topography, existing buildings or existing sound walls, and should be considered a worst-case assessment of traffic noise exposure levels.

TABLE V

PROJECT-RELATED INCREASES IN TRAFFIC NOISE, dB, L_{dn}
HECKER PASS SUBDIVISION, GILROY

Modeled Receptor	Background	Background Plus Project	2040	2040 Plus Project	Change (Maximum)	Significant Impact?
R-1	46	50	46	50	4	No
R-2	46	46	46	46	0	No
R-3	44	44	52	53	0	No
R-4	62	62	61	62	0	No
R-5	63	63	62	62	0	No
R-6	67	67	68	68	0	No
R-7	66	66	67	67	0	No

Source: WJV Acoustics, Inc.
Hexagon Transportation Consultants, Inc.

As described in Table V, project-related traffic is not expected to result in noise levels at any sensitive receptors to exceed the City's noise level standard, nor result in an increase of 3 dB in any sensitive receptor locations where noise levels already exceed the City's noise level standard without the implementation of the project. An increase of approximately 4 dB would be expected at residential land uses in the vicinity of R-1, but would remain well below the 60 dB L_{dn} noise level criterion. The project would not be expected to result in an increase in traffic noise exposure along any other roadway in the project vicinity. Therefore, project-related increases in traffic noise exposure are not considered to be a significant impact.

b. Noise Impacts from On-Site Noise Sources (No Impact)

As described above, the project would include the construction of 116 single-family homes. For residential land uses, sources of project-related noise levels would generally be limited to mechanical (HVAC) equipment, on-site vehicle movements as well as other noise sources typical of residential land uses (barking dogs, landscaping activities, human voices, etc.). The proposed single-family residential land uses would be located in the vicinity of other existing residential land uses, producing the similar sources and levels of ongoing noise associated with residential land uses. As such, ongoing noise levels associated with the proposed project would not be expected to exceed existing ambient noise levels at nearby sensitive receptor (residential land uses) locations.

c. Noise From Construction (Less Than Significant)

Construction noise would occur at various locations within and near the project site through the build-out period. Table VI provides typical construction-related noise levels at distances of 100 feet, 200 feet, and 300 feet.

Construction noise is not considered to be a significant impact if construction is limited to the daytime hours and construction equipment is adequately maintained and muffled. The City of Gilroy provides a restriction on the hours that construction activities may occur, between 7:00am to 7:00pm Monday through Friday and 9:00am to 7:00 pm on Saturdays. Construction noise impacts could result in annoyance or sleep disruption for nearby residents if nighttime operations were to occur or if equipment is not properly muffled or maintained.

TABLE VI

TYPICAL CONSTRUCTION EQUIPMENT MAXIMUM NOISE LEVELS, dBA

Type of Equipment	100 Ft.	200 Ft.	300 Ft.
Concrete Saw	84	78	74
Crane	75	69	65
Excavator	75	69	65
Front End Loader	73	67	63
Jackhammer	83	77	73
Paver	71	65	61
Pneumatic Tools	79	73	69
Dozer	76	70	66
Rollers	74	68	64
Trucks	80	72	70
Pumps	74	68	64
Scrapers	81	75	71
Portable Generators	74	68	64
Backhoe	80	74	70
Grader	80	74	70

Source: FHWA
Noise Control for Buildings and Manufacturing Plants, Bolt, Beranek & Newman, 1987

Potential Impact:
A noise impact could occur if construction activities do not incorporate appropriate mitigation measures and best management practices.

Mitigation Measures:
Noise levels associated with construction activities may be effectively mitigated by incorporating noise mitigation measures and appropriate best management practices. The following mitigation measures and best management practices should be applied during periods of project construction.

- Per the City of Gilroy Municipal Code, construction activities should not occur outside the hours of 7:00am to 7:00pm Monday through Friday and 9:00am to 7:00 pm on Saturdays.

- All construction equipment shall be properly maintained and muffled as to minimize noise generation at the source.

- Noise-producing equipment shall not be operating, running, or idling while not in immediate use by a construction contractor.

- All noise-producing construction equipment shall be located and operated, to the extent possible, at the greatest possible distance from any noise-sensitive land uses.

- Locate construction staging areas, to the extent possible, at the greatest possible distances from any noise-sensitive land uses.

- Signs shall be posted at the construction site and near adjacent sensitive receptors displaying hours of construction activities and providing the contact phone number of a designated noise disturbance coordinator.

d. Vibration Impacts (Less Than Significant)

The dominant sources of man-made vibration are sonic booms, blasting, pile driving, pavement breaking, demolition, diesel locomotives, and rail-car coupling. Typical vibration levels at distances of 100 feet and 300 feet are summarized by Table VII. These levels would not be expected to exceed any significant threshold levels for annoyance or damage, as provided above in Table II and Table III.

TABLE VII

TYPICAL VIBRATION LEVELS DURING CONSTRUCTION

	PPV (in/sec)	
Equipment	**@ 100´**	**@ 300´**
Bulldozer (Large)	0.011	0.006
Bulldozer (Small)	0.0004	0.00019
Loaded Truck	0.01	0.005
Jackhammer	0.005	0.002
Vibratory Roller	.03	0.013
Caisson Drilling	.01	0.006

Source: *Caltrans*

After full project build out, it is not expected that ongoing operational activities will result in any vibration impacts at nearby sensitive uses. Activities involved in trash bin collection could result in minor on-site vibrations as the bin is placed back onto the ground. Such vibrations would not be expected to be felt at the closest off-site sensitive uses and would generally not be expected to be felt at on-site sensitive receptors as well. Additional mitigation is not required.

e. Noise Impacts from Nearby Airports or Airstrips (No Impact)

The Project site is not located within two miles of a public airport or private airstrip. The San Martin Airport and Frazier Lake Airpark are located approximately five miles and nine miles from project site, respectively.

f. Noise Impacts to On-Site Proposed Noise-Sensitive Uses (Less Than Significant, With Mitigation)

Exterior Noise Exposure:

The City of Gilroy General Plan Noise Element establishes an exterior noise level standard of 60 dB L_{dn} for outdoor activity areas of residential uses. Outdoor activity areas generally include backyards of single-family residences and individual patios or decks and common outdoor activity areas of multi-family developments. The noise element also requires that interior noise levels attributable to exterior noise sources not exceed 45 dB L_{dn}.

The proposed project includes sensitive receptors (residential land uses) that could be impacted by traffic noise exposure adjacent to Hecker Pass Highway (SR 152). WJVA used the above-described FHWA traffic noise model and traffic noise modeling assumptions to determine the distances from the center of Hecker Pass Highway to the 60 dB L_{dn} and the 65 dB L_{dn} noise exposure contours.

Table VIII provides the distances from the center of Heckper Pass Highway (adjacent to the project site) to the 60 dB L_{dn} and the 65 dB L_{dn} noise exposure contours. Table VIII provides the contour distances for 2040 Plus Project conditions as they represent a worst-case assessment of noise exposure at proposed sensitive receptor locations.

TABLE VIII

DISTANCES TO TRAFFIC NOISE CONTOURS
HECKER PASS SUBDIVISION, GILROY
2040 PLUS PROJECT TRAFFIC CONDITIONS

Roadway Segment (At Project Site Frontage)	Distance (feet) From Roadway Centerline to 60 dB L_{dn} Contour	Distance (feet) From Roadway Centerline to 65 dB L_{dn} Contour
Hecker Pass Highway	145	67

Source: WJV Acoustics, Inc.

Based upon the provided site plan (Figure 1), single-family residential backyards would be located as close as approximately ninety (90) feet from the centerline of Hecker Pass Highway. At this setback distance, exterior noise exposure was calculated to be approximately 63 dB L_{dn} for 2040 traffic conditions. Additionally, ambient noise levels at site LT-1 were measured to be approximately 59 dB L_{dn}, at a setback distance of approximately 130 feet from the centerline of Hecker Pass Highway. Applying the 24-hour measured noise levels to a setback distance of 90

feet from the centerline of Hecker Pass Highway results in a noise exposure level of approximately 62 dB L_{dn}, providing further validation of the calculated noise exposure of 63 dB L_{dn} for 2040 traffic conditions, at the closest proposed residential land uses to Hecker Pass Highway.

It should be noted, according to the project landscaping plan, a portion (if not all) of the lots adjacent to Hecker Pass Highway would include what is described as a "6'0" high good neighbor fence" along the rear of the residential lots. It is assumed this would consist of standard residential wooden fencing. While the fencing would provide a small level of noise attenuation, wood fencing is not typically assumed to provide any substantial or quantifiable attenuation of traffic noise. The level of attenuation it could potentially provide would vary widely based upon wood thickness and quality of construction, and would likely deteriorate over time. As such, wooden fencing is not considered to be a viable method of mitigating traffic noise exposure.

Potential Impact:
A noise impact would occur if the outdoor activity areas of proposed sensitive receptors (residential land uses) are located within the 60 dB L_{dn} traffic noise contours. As described in Table VIII, exterior noise levels would be expected to exceed 60 dB L_{dn} at residential setbacks of less than 145 feet from the centerline of Hecker Pass Highway. Based upon the provided project site plan (Figure 1), the project would include residential land uses located approximately 90 feet from the centerline of Hecker Pass Highway. At this setback distance, exterior noise exposure would be approximately 63 dB L_{dn} (2040 traffic conditions), and mitigation measures must be considered.

The project site is located within the Hecker Pass Specific Plan (HPSP) area. HPSP provides the following noise mitigation guidelines and policies applicable to the project:

Policy 4-5: *Soundwalls to attenuate sound generated by traffic on Hecker Pass Highway or any other roadway in the Specific Plan Area are strictly prohibited*

Policy 5-98: *Soundwalls shall not be permitted along the Hecker Pass Highway Corridor.*

Policy 5-68: *To eliminate the use of soundwalls along Hecker Pass Highway, all residential and commercial development shall mitigate noise by employing City approved mitigation measures such as setbacks, building, orientation, landscape berming, architectural sound attenuation, etc.*

Mitigation Measures:
As described above, based upon the residential setbacks provided in the project site plan (Figure 1), traffic data provided by the project traffic engineer (Hexagon) and Caltrans, and findings of on-site noise level measurements, exterior noise exposure levels at the closest residential setbacks to Hecker Pass Highway would be expected to be approximately 63 dB L_{dn} for 2040 traffic conditions. Policies established in the Hecker Pass Specific Plan (HPSP) state that the use of sound wall along the Hecker Pass Highway corridor are not permitted. Based upon these findings and conditions, potential mitigation options are summarized below:

1. **Earthen Berm:** While the implementation of sound walls is not permitted along Hecker Pass Highway, an earthen berm could provide noise attenuation of traffic noise at the proposed residential land uses.

   A sound wall insertion loss program based on the FHWA Model was used to calculate the insertion loss (noise reduction) provided by the earthen berms. The model calculates the insertion loss of a barrier of a given height based on the effective height of the noise source, height of the receiver, distance from the receiver to the barrier, and distance from the noise source to the barrier. The standard assumptions used in the sound wall calculations are effective source heights of 8, 2 and 0 feet above the roadway for heavy trucks, medium trucks, and automobiles, respectively. The standard height of a residential receiver is five (5) feet above the ground elevation.

   Based upon the above-described assumptions and method of analysis, the noise level insertion loss values for barriers of various heights were calculated. The calculations indicated that an earthen berm barrier along the northern project site property line (residential land uses adjacent to Hecker Pass Highway), at a height of six (6) feet relative to the closest building pad elevations to the roadway would reduce traffic noise exposure within individual backyards by approximately 6 dB, resulting in a projected future noise exposure of approximately 57 dB L_{dn} at the closest residential lots along Hecker Pass Highway.

   It should be noted, the above-described noise reduction provided by a 6-foot earthen berm would also occur if a 6-foot sound wall were to be constructed at the same location. Suitable construction materials for an effective sound wall would include concrete blocks, masonry, or stucco on both sides of a wood or steel stud wall.

2. **Increased Setback:** As described above, the current site plan indicates that the closest proposed residential land uses would be located approximately 90 feet from the centerline of Hecker Pass Highway (as measured from the approximate centerline of residential lot backyards to the centerline of the roadway). At this setback distance, worst-case exterior noise exposure was calculated to be approximately 63 dB L_{dn}. The exterior noise exposure level would be reduced with an increased setback from the roadway. As described above in Table VII, a minimum setback of 145 feet would be required to comply with the 60 dB L_{dn} exterior noise standard.

3. **Lot Design/Orientation:** The City of Gilroy exterior noise level standard of 60 dB L_{dn} applies to the "outdoor activity area". For single-family residential land uses, the outdoor activity area is generally considered to be the backyard of the residence. The current site plan indicates that the residential backyards of the proposed lots adjacent to Hecker Pass Highway would be located along the north side of the home, directly facing the roadway. The exterior noise levels could be mitigated if the orientation of these lots were switched with the front of the homes facing the roadway and the home providing noise attenuation to the backyard.

4. **Policy PH 6.7 (Residential Noise Standards):** The City of Gilroy General Plan does allow for discretion by the City to approve residential projects in areas where the exterior noise exposure levels exceed 60 dB L_{dn}. In outdoor use areas where the City determines that maintaining the outdoor noise levels mentioned above cannot be achieved after the application of reasonable and feasible mitigation, a level of up to 70 dBA L_{dn} may be permitted, if the following findings are made:

    - That feasible sound attenuation measures have been incorporated in the project design;

    - That potential noise levels are part of the developer's disclosure to future residents;

    - That interior noise limits established by the General Plan are strictly maintained; and

    - Potential noise levels will not jeopardize the health, safety, and general welfare of the public.

Interior Noise Exposure:

The City of Gilroy interior noise level standard is 45 dB L_{dn}. The worst-case noise exposure within the proposed residential development would be approximately 63 dB L_{dn} This means that the proposed residential construction must be capable of providing a minimum outdoor-to-indoor noise level reduction (NLR) of approximately 18 dB (63-45=18).

A specific analysis of interior noise levels was not performed. However, it may be assumed that residential construction methods complying with current building code requirements will reduce exterior noise levels by approximately 25 dB if windows and doors are closed. This will be sufficient for compliance with the City's 45 dB L_{dn} interior standard at all proposed lots. Requiring that it be possible for windows and doors to remain closed for sound insulation means that air conditioning or mechanical ventilation will be required.

5. IMPACT SUMMARY

Based upon the analysis provided above, the exterior noise level exposure at the closest proposed single-family residential lots to Hecker Pass Highway would be expected to be approximately 63 dB L_{dn} for 2040 traffic conditions (worst-case scenario). Such levels exceed the City of Gilroy exterior noise level standard of 60 dB L_{dn} for residential land uses, and mitigation measures must be considered.

EXTERIOR NOISE COMPLIANCE:

The project site is located within the Hecker Pass Specific Plan (HPSP) Area, and must comply with guidelines and policies established in the HPSP. The HPSP prohibits the implantation of sound walls along Hecker Pass Highway, and specifically states the following; "*To eliminate the use of soundwalls along Hecker Pass Highway, all residential and commercial development shall mitigate noise by employing City approved mitigation measures such as setbacks, building, orientation, landscape berming, architectural sound attenuation, etc."* Potential mitigation measures appropriate for the proposed project are summarized below:

1. **Earthen Berm:** While the implementation of sound walls is not permitted along Hecker Pass Highway, an earthen berm could provide noise attenuation of traffic noise at the proposed residential land uses.

   A sound wall insertion loss program based on the FHWA Model was used to calculate the insertion loss (noise reduction) provided by the earthen berms. The model calculates the insertion loss of a barrier of a given height based on the effective height of the noise source, height of the receiver, distance from the receiver to the barrier, and distance from the noise source to the barrier. The standard assumptions used in the sound wall calculations are effective source heights of 8, 2 and 0 feet above the roadway for heavy trucks, medium trucks, and automobiles, respectively. The standard height of a residential receiver is five (5) feet above the ground elevation.

   Based upon the above-described assumptions and method of analysis, the noise level insertion loss values for barriers of various heights were calculated. The calculations indicated that an earthen berm barrier along the northern project site property line (residential land uses adjacent to Hecker Pass Highway), at a height of six (6) feet relative to the closest building pad elevations to the roadway would reduce traffic noise exposure within individual backyards by approximately 6 dB, resulting in a projected future noise exposure of approximately 57 dB L_{dn} at the closest residential lots along Hecker Pass Highway.

   It should be noted, the above-described noise reduction provided by a 6-foot earthen berm would also occur if a 6-foot sound wall were to be constructed at the same location. Suitable construction materials for an effective sound wall would include concrete blocks, masonry, or stucco on both sides of a wood or steel stud wall.

2. **Increased Setback:** As described above, the current site plan indicates that the closest proposed residential land uses would be located approximately 90 feet from the centerline of Hecker Pass Highway (as measured from the approximate centerline of residential lot backyards to the centerline of the roadway). At this setback distance, worst-case exterior noise exposure was calculated to be approximately 63 dB L_{dn}. The exterior noise exposure level would be reduced with an increased setback from the roadway. As described above in Table VII, a minimum setback of 145 feet would be required to comply with the 60 dB L_{dn} exterior noise standard.

3. **Lot Design/Orientation:** The City of Gilroy exterior noise level standard of 60 dB L_{dn} applies to the "outdoor activity area". For single-family residential land uses, the outdoor activity area is generally considered to be the backyard of the residence. The current site plan indicates that the residential backyards of the proposed lots adjacent to Hecker Pass Highway would be located along the north side of the home, directly facing the roadway. The exterior noise levels could be mitigated if the orientation of these lots were switched with the front of the homes facing the roadway and the home providing noise attenuation to the backyard.

4. **Policy PH 6.7 (Residential Noise Standards):** The City of Gilroy General Plan does allow for discretion by the City to approve residential projects in areas where the exterior noise exposure levels exceed 60 dB L_{dn}. In outdoor use areas where the City determines that maintaining the outdoor noise levels mentioned above cannot be achieved after the application of reasonable and feasible mitigation, a level of up to 70 dBA L_{dn} may be permitted, if the following findings are made:

    - That feasible sound attenuation measures have been incorporated in the project design;

    - That potential noise levels are part of the developer's disclosure to future residents;

    - That interior noise limits established by the General Plan are strictly maintained; and

    - Potential noise levels will not jeopardize the health, safety, and general welfare of the public.

INTERIOR NOISE COMPLIANCE:

The City of Gilroy interior noise level standard is 45 dB L_{dn} for residential land uses. The worst-case exterior noise level at the closest proposed residential lots to Hecker Pass Highway was calculated to be approximately 63 dB L_{dn}. Residential construction methods complying with current building code requirements will reduce exterior noise levels by approximately 25 dB if windows and doors are closed. This will be sufficient for compliance with the City's 45 dB L_{dn} interior standard at all proposed lots. Therefore, the following must be included in proposed residential design:

- Mechanical ventilation or air conditioning must be provided for all homes so that windows and doors can remain closed for sound insulation purposes.

CONSTRUCTION NOISE:

Construction noise is not considered to be a significant impact if construction is limited to the daytime hours and construction equipment is adequately maintained and muffled. The City of Gilroy provides a restriction on the hours that construction activities may occur, between 7:00am to 7:00pm Monday through Friday and 9:00am to 7:00 pm on Saturdays. Construction noise impacts could result in annoyance or sleep disruption for nearby residents if nighttime operations were to occur or if equipment is not properly muffled or maintained.

Potential Impact:

A noise impact could occur if construction activities do not incorporate appropriate mitigation measures and best management practices.

Mitigation Measures:

Noise levels associated with construction activities may be effectively mitigated by incorporating noise mitigation measures and appropriate best management practices. The following mitigation measures and best management practices should be applied during periods of project construction.

- Per the City of Gilroy Municipal Code, construction activities should not occur outside the hours of 7:00am to 7:00pm Monday through Friday and 9:00am to 7:00 pm on Saturdays.

- All construction equipment shall be properly maintained and muffled as to minimize noise generation at the source.

- Noise-producing equipment shall not be operating, running, or idling while not in immediate use by a construction contractor.

- All noise-producing construction equipment shall be located and operated, to the extent possible, at the greatest possible distance from any noise-sensitive land uses.

- Locate construction staging areas, to the extent possible, at the greatest possible distances from any noise-sensitive land uses.

- Signs shall be posted at the construction site and near adjacent sensitive receptors displaying hours of construction activities and providing the contact phone number of a designated noise disturbance coordinator.

The conclusions and recommendations of this acoustical analysis are based upon the best information known to WJV Acoustics Inc. (WJVA) at the time the analysis was prepared concerning the proposed lot layout plan, project site elevation, traffic volumes and roadway configurations. Any significant changes in these factors will require a reevaluation of the findings of this report. Additionally, any significant future changes in motor vehicle technology, noise regulations or other factors beyond WJVA's control may result in long-term noise results different from those described by this analysis.

Respectfully submitted,

Walter J. Van Groningen
President

WJV:wjv

6. SOURCES CONSULTED

1. City of Gilroy General Plan, November 2, 2020.

2. City of Gilroy Zoning Ordinance, April 2022.

3. California Department of Transportation, *Transportation and Construction Vibration Guidance Manual,* April 2020.

4. Federal Highway Administration, *Traffic Noise Model, Version 2.5,* April 14, 2004

FIGURE 1: PROJECT SITE PLAN

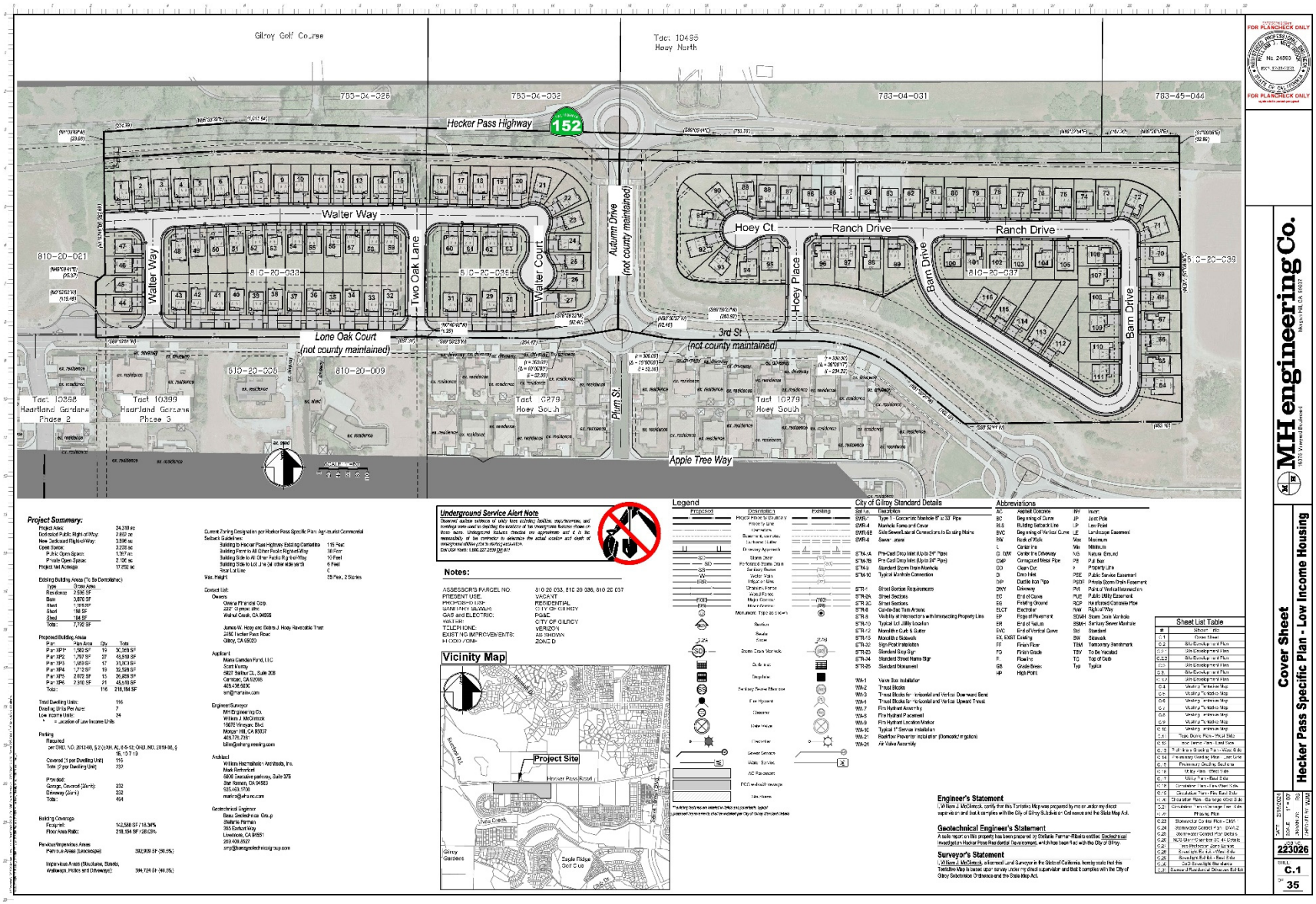


FIGURE 2: PROJECT VICINITY AND AMBIENT NOISE MONITORING SITES

FIGURE 3: HOURLY NOISE LEVELS AT LONG-TERM MONITORING SITE LT-1

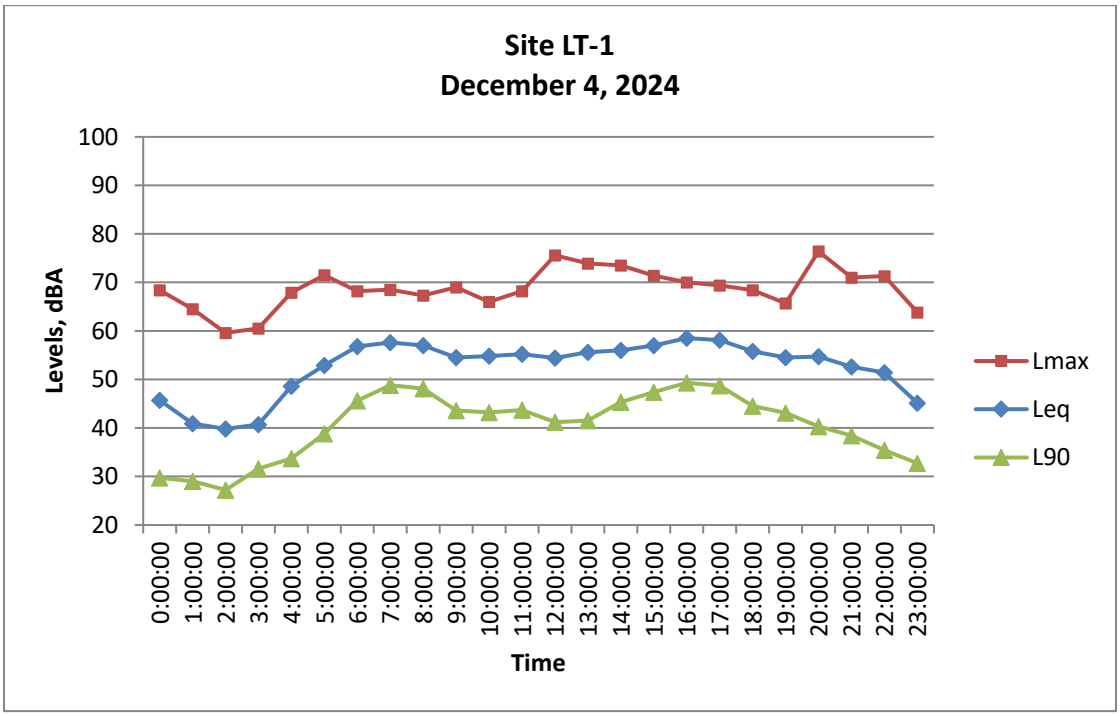


FIGURE 4: HOURLY NOISE LEVELS AT LONG-TERM MONITORING SITE LT-2

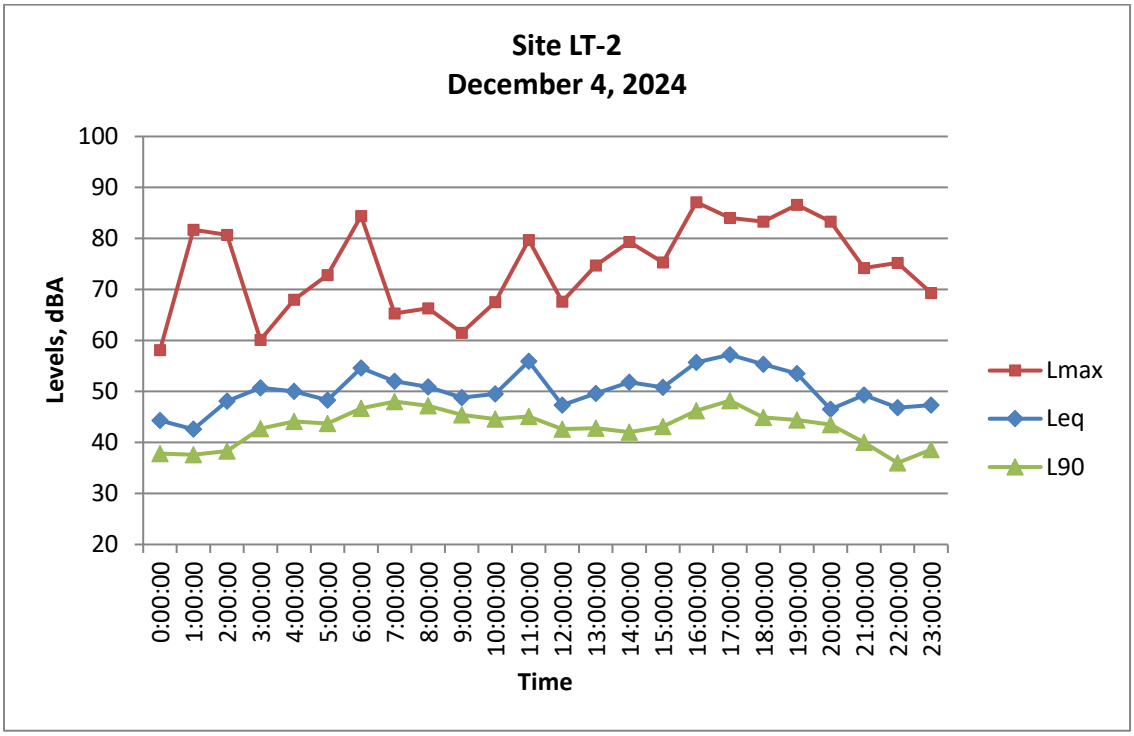
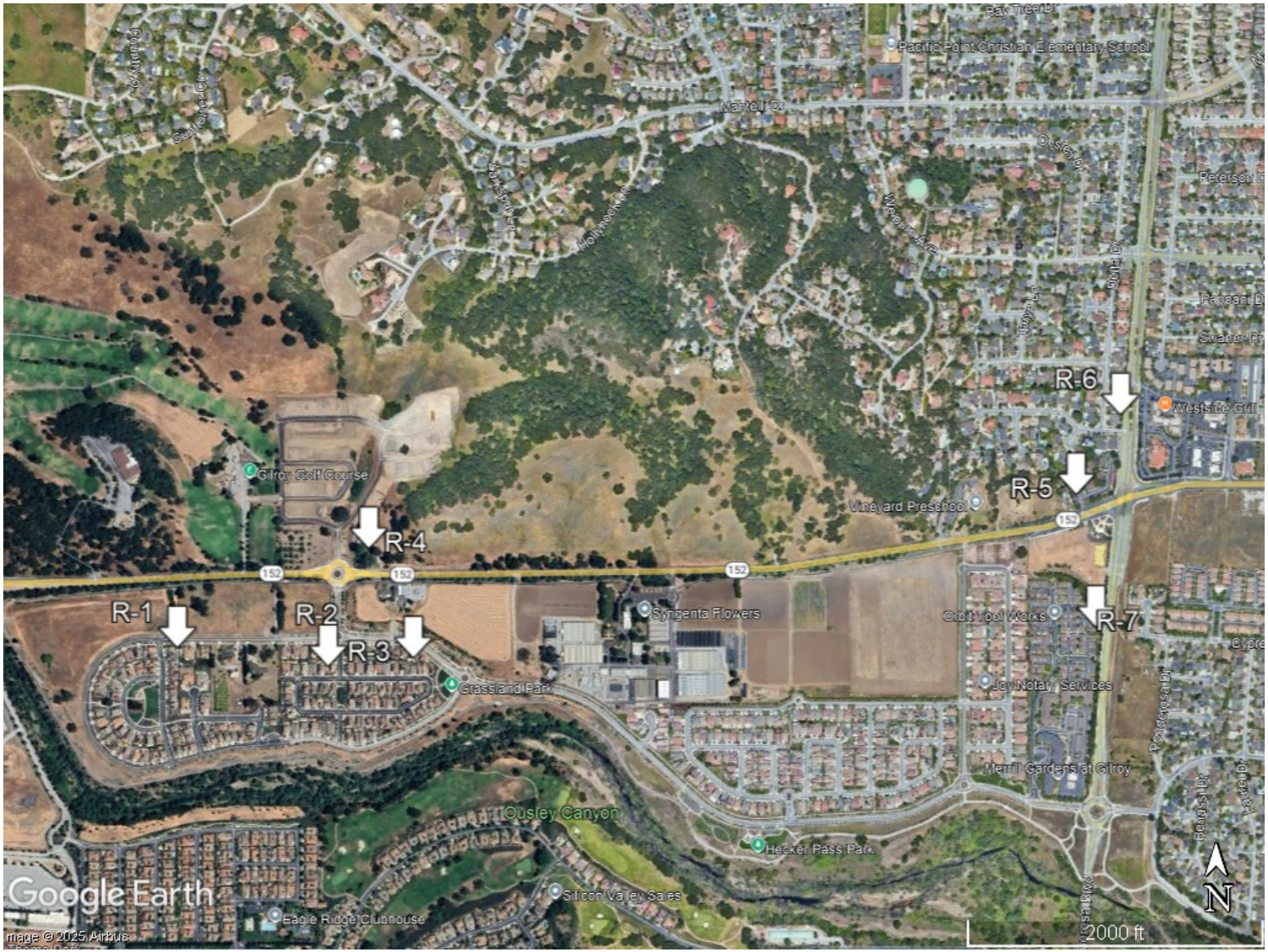


FIGURE 5: LOCATIONS OF MODELED TRAFFIC NOISE RECEPTORS



APPENDIX A-1

ACOUSTICAL TERMINOLOGY

AMBIENT NOISE LEVEL: The composite of noise from all sources near and far. In this context, the ambient noise level constitutes the normal or existing level of environmental noise at a given location.

CNEL: Community Noise Equivalent Level. The average equivalent sound level during a 24-hour day, obtained after addition of approximately five decibels to sound levels in the evening from 7:00 p.m. to 10:00 p.m. and ten decibels to sound levels in the night before 7:00 a.m. and after 10:00 p.m.

DECIBEL, dB: A unit for describing the amplitude of sound, equal to 20 times the logarithm to the base 10 of the ratio of the pressure of the sound measured to the reference pressure, which is 20 micropascals (20 micronewtons per square meter).

DNL/L_{dn}: Day/Night Average Sound Level. The average equivalent sound level during a 24-hour day, obtained after addition of ten decibels to sound levels in the night after 10:00 p.m. and before 7:00 a.m.

L_{eq}: Equivalent Sound Level. The sound level containing the same total energy as a time varying signal over a given sample period. L_{eq} is typically computed over 1, 8 and 24-hour sample periods.

NOTE: The CNEL and DNL represent daily levels of noise exposure averaged on an annual basis, while L_{eq} represents the average noise exposure for a shorter time period, typically one hour.

L_{max}: The maximum noise level recorded during a noise event.

L_n: The sound level exceeded "n" percent of the time during a sample interval (L_{90}, L_{50}, L_{10}, etc.). For example, L_{10} equals the level exceeded 10 percent of the time.

A-2

ACOUSTICAL TERMINOLOGY

NOISE EXPOSURE CONTOURS: Lines drawn about a noise source indicating constant levels of noise exposure. CNEL and DNL contours are frequently utilized to describe community exposure to noise.

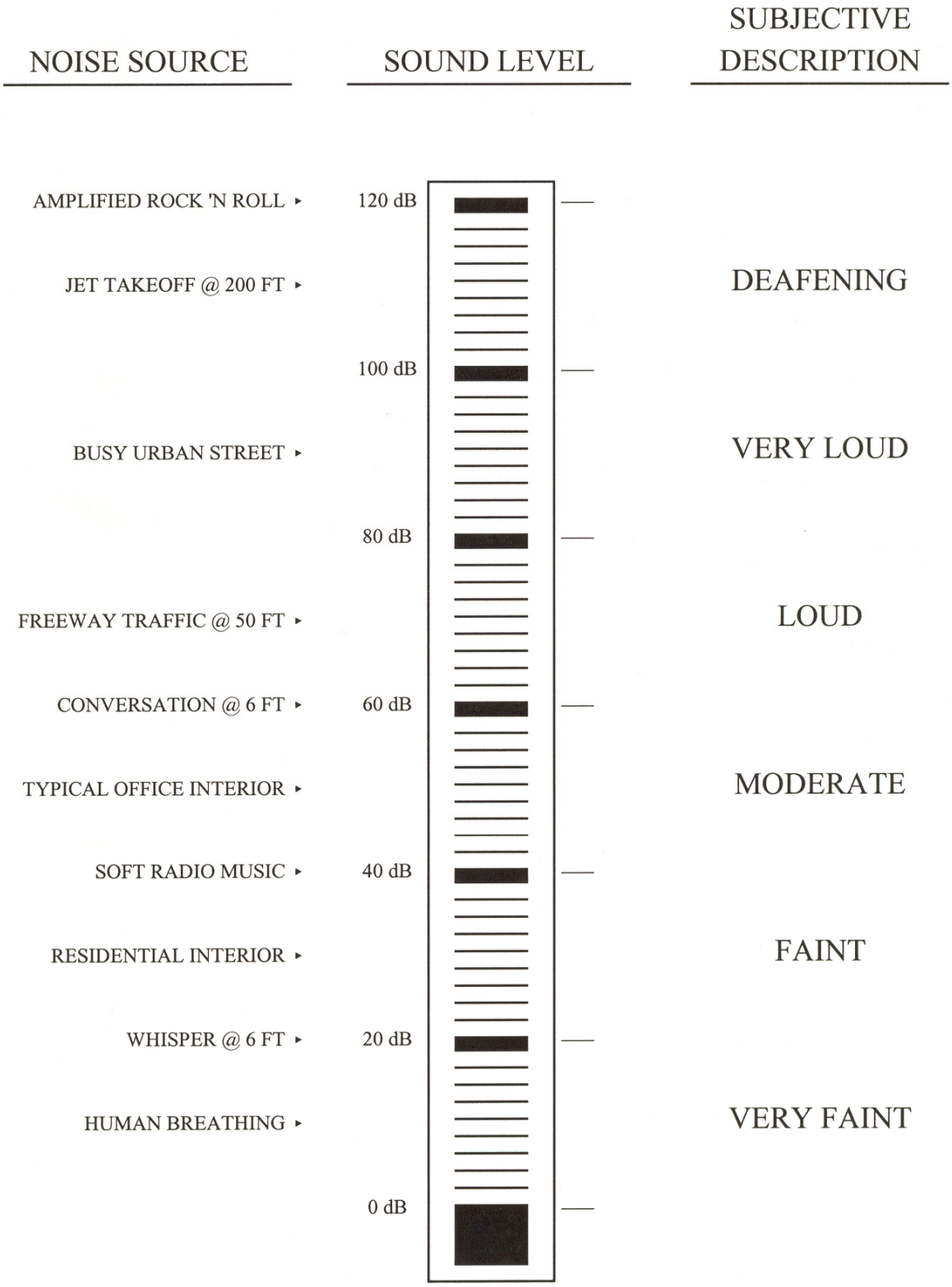
NOISE LEVEL REDUCTION (NLR): The noise reduction between indoor and outdoor environments or between two rooms that is the numerical difference, in decibels, of the average sound pressure levels in those areas or rooms. A measurement of Anoise level reduction" combines the effect of the transmission loss performance of the structure plus the effect of acoustic absorption present in the receiving room.

SEL or SENEL: Sound Exposure Level or Single Event Noise Exposure Level. The level of noise accumulated during a single noise event, such as an aircraft overflight, with reference to a duration of one second. More specifically, it is the time-integrated A-weighted squared sound pressure for a stated time interval or event, based on a reference pressure of 20 micropascals and a reference duration of one second.

SOUND LEVEL: The sound pressure level in decibels as measured on a sound level meter using the A-weighting filter network. The A-weighting filter de-emphasizes the very low and very high frequency components of the sound in a manner similar to the response of the human ear and gives good correlation with subjective reactions to noise.

SOUND TRANSMISSION CLASS (STC): The single-number rating of sound transmission loss for a construction element (window, door, etc.) over a frequency range where speech intelligibility largely occurs.

APPENDIX B
EXAMPLES OF SOUND LEVELS



APPENDIX C

TRAFFIC NOISE MODELING CALCULATIONS

WJV Acoustics, Inc
FHWA-RD-77-108
Calculation Sheets
January 15, 2025

Project #:	24-61
Description:	Background
Ldn/Cnel:	Ldn
Site Type:	Soft

Contour Levels (dB)	60	65	70	75					

Segment	Roadway Name	Segment Description	ADT	%Day	%Evening	%Night	%Med	%Heavy	Speed	Distance	Offset
1	Loan Oak Ct	R-1	380	90		10	2	1	30	70	
2	Plum St	R-2	390	90		10	2	1	30	70	
3	3rd St	R-3	430	90		10	2	1	30	100	
4	Hecker Pass Hwy	R-4	11320	90		10	3.6	0.7	55	150	
5	Hecker Pass Hwy	R-5	12160	90		10	3.6	0.7	55	140	
6	Santa Teresa Bkvd	R-6	21090	90		10	2	1	45	75	
7	Santa Teresa Bkvd	R-7	19640	90		10	2	1	45	85	

WJV Acoustics, Inc
FHWA-RD-77-108
Calculation Sheets
January 15, 2025

Project #:	24-61
Description:	Background + Project
Ldn/Cnel:	Ldn
Site Type:	Soft

Contour Levels (dB)	60	65	70	75					

Segment	Roadway Name	Segment Description	ADT	%Day	%Evening	%Night	%Med	%Heavy	Speed	Distance	Offset
1	Loan Oak Ct	R-1	1000	90		10	2	1	30	70	
2	Plum St	R-2	390	90		10	2	1	30	70	
3	3rd St	R-3	430	90		10	2	1	30	100	
4	Hecker Pass Hwy	R-4	11320	90		10	3.6	0.7	55	150	
5	Hecker Pass Hwy	R-5	12160	90		10	3.6	0.7	55	140	
6	Santa Teresa Bkvd	R-6	21090	90		10	2	1	45	75	
7	Santa Teresa Bkvd	R-7	19640	90		10	2	1	45	85	

WJV Acoustics, Inc
FHWA-RD-77-108
Calculation Sheets
January 15, 2025

Project #:	24-61
Description:	2040_No Project
Ldn/Cnel:	Ldn
Site Type:	Soft

Contour Levels (dB)	60	65	70	75					

Segment	Roadway Name	Segment Description	ADT	%Day	%Evening	%Night	%Med	%Heavy	Speed	Distance	Offset
1	Loan Oak Ct	R-1	380	90		10	2	1	30	70	
2	Plum St	R-2	390	90		10	2	1	30	70	
3	3rd St	R-3	2590	90		10	2	1	30	100	
4	Hecker Pass Hwy	R-4	9840	90		10	3.6	0.7	55	150	
5	Hecker Pass Hwy	R-5	9300	90		10	3.6	0.7	55	140	
6	Santa Teresa Bkvd	R-6	29520	90		10	2	1	45	75	
7	Santa Teresa Bkvd	R-7	28470	90		10	2	1	45	85	

WJV Acoustics, Inc
FHWA-RD-77-108
Calculation Sheets
January 15, 2025

Project #:	24-61
Description:	2040_Plus Project
Ldn/Cnel:	Ldn
Site Type:	Soft

Contour Levels (dB)	60	65	70	75					

Segment	Roadway Name	Segment Description	ADT	%Day	%Evening	%Night	%Med	%Heavy	Speed	Distance	Offset
1	Loan Oak Ct	R-1	1000	90		10	2	1	30	70	
2	Plum St	R-2	390	90		10	2	1	30	70	
3	3rd St	R-3	3140	90		10	2	1	30	100	
4	Hecker Pass Hwy	R-4	10470	90		10	3.6	0.7	55	150	
5	Hecker Pass Hwy	R-5	9920	90		10	3.6	0.7	55	140	
6	Santa Teresa Bkvd	R-6	29920	90		10	2	1	45	75	
7	Santa Teresa Bkvd	R-7	28470	90		10	2	1	45	85	
8	Hecker Pass Hwy	Proj site	11220	90		10	3.6	0.7	45	90	