APPENDIX E - ACOUSTIC ANALYSIS

ACOUSTICAL ANALYSIS

TORTUGA BAY WATER PARK PROJECT
BAKERSFIELD, CALIFORNIA

WJVA Report No. 24-47

PREPARED FOR

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1. INTRODUCTION

1.1 Project Description

PROJECT SUMMARY

Tortuga Bay Water Park, LLC (Property Owner and Applicant) has applied to amend the City of Bakersfield's Metropolitan Bakersfield General Plan land use designation and the Municipal Code zone classification for a 152 gross acre site located at the southeast corner of the Hageman Road and Mohawk Street intersection, in the northwest portion of Bakersfield, California.

The proposed Project includes a General Plan Amendment that would change the land use designation on the Project site from the existing LI (Light Industrial), SI (Service Industrial), and HI (Heavy Industrial) to LI, SI, GC (General Commercial), and P (Parks). The proposed Zone Change would change the zone classification on the Project site from M-1 (Light Manufacturing), M-2 (General Manufacturing), and M-3 (Heavy Industrial) to M-1, M-2, C-2 (General Commercial), and OS-P (Open Space – Parks).

The Project consists of the following uses:

- Northeast—General commercial uses consisting of a surgery center, medical offices, and two hotels.

- Northwest—General commercial uses consisting of a commercial retail village, restaurants, and a gas station.

- Central – Water park, state-of-the-art golf range, and parking.

- Southwest—Light Industrial[1] uses consisting of contractor storage yards, tool rental and equipment, truck repairing and overhauling shops, welding, metal fabricating, blacksmith shops, wholesale businesses, storage buildings and warehouses, and light manufacturing.

- Southeast—Service Industrial[2] uses, such as alcohol and alcoholic beverages manufacture, automobile and truck parts manufacturer, freighting and trucking yards and terminals, and glass product manufacture (Section 17.30.020 of the Bakersfield Municipal Code).

PROJECT CHARACTERISTICS

The Proposed Project uses existing land use entitlements, together with proposed land use modifications, to design a project that would be internally integrated and compatible with

1 Uses listed are typical of Light Industrial zoning; however, no specific uses are identified in the Project.
2 Uses listed are typical of Service Industrial zoning; however, no specific uses are identified in the Project.

surrounding off-site uses, particularly the existing residential areas to the north and west of the site. The proposed Project achieves this by downgrading the existing entitled medium and heavy industrial designations along the north, west, and south portions of the Project site to recreational, commercial, light and service industrial, and by siting a surgery center and medical offices on the northern portion of the site near existing elderly care facilities. The proposed water park would be located in the center of the site, giving ample distance from existing residential uses to the north and southwest.

Currently, the Project site is accessed from Hageman Road and Mohawk Street. However, the proposed Project would also complete the remaining west portion of the newly constructed Landco Drive along the Project's eastern boundary, as well as the extension of Krebs Road, which bisects the Project from east to west. The proposed Project would also create a series of internal streets to provide access to future parcels.

The proposed Project would include a variety of land uses developed in three phases, with full buildout forecasted for 2040. Based on internal roads and right-of-way requirements, the total amount of developable area would include 104.28 acres. Table I provides the overall phasing of the project.

TABLE I

PROPOSED PROJECT PHASING
TORTUGA BAY DEVELOPMENT, BAKERSFIELD

Proposed Project Component	Proposed Development		
	Phase I (2025-2030)	Phase II (2030-2035)	Phase III (2035-2040)
Water Park	26.5 acres		
Golf Range	4.4 acres		
Medical Offices/Surgery Center		5.31 acres (37,000 sq ft)	3.12 acres (150 Beds)
Hotel (2)			4.75 acres (120 Rooms Per)
General Commercial	18.61 acres (235,000 sq ft)	6.39 acres (90,000 sq ft)	2.86 acres (35,000 sq ft)
Light Industrial	6.35 acres	6.17 acres	3.23 acres
Service Industrial	9.95 acres	10.52 acres	9.39
Development Subtotal	**65.81 acres**	**28.39 acres**	**23.35 acres**

Source: Project Applicant

Proposed Water Park

The water park is proposed to encompass approximately 26 acres, including 322 parking spaces, a wave pool, a lazy river, three slide towers, multiple children's and spray areas, associated mechanical facilities, and administrative, locker, restroom, and concession facilities. Approximately six acres of the 26-acre site are proposed to be set aside for the additional slides

at a later date; this area would be landscaped and utilized for stormwater retention during the first phase.

The water park would use an estimated 800,000 gallons of water for initiation, and 500,000 gallons of water annually, which is roughly equivalent to the consumption of 2 to 3 single family residences per year. The water park is proposed to operate between the hours of 10:00 a.m. to 8:00 p.m. (natural light permitting) seasonally; other than lighting for after- hours maintenance and security, permanent lighting sufficient to permit the operation of the park after dark is not proposed.

Parking is proposed via paid public parking for the water park. The primary rationale for controlled, paid parking includes education and enforcement of water park policies and prevention of negative activities such as loitering to better facilitate a safe and positive entertainment experience for park patrons.

Based upon parking demand at similar parks, a total of 300-350 parking spaces to serve the first phase of development would be sufficient to accommodate the estimated 1,900 to 2,100 daily guests and the 35 to 40 park staff on-site during a typical shift. In comparison, a larger water park in Irvine, California typically operates at twice the estimated attendance of the proposed facility and has only 50 percent more parking than is proposed for this facility. A drop-off area adjacent to the water park entrance is proposed; vehicles entering the parking lot to drop off patrons will be issued a temporary pass and will not be charged a parking fee regardless of the number of occupants.

Since no rear yards of single-family residences are situated within 150 feet of the proposed development, the overlook regulations of the City's zoning ordinance (Section 17.08.090) do not apply to the proposed development. The nearest rear yards of single-family residences are approximately 450 feet from the site, to the southwest of the adjacent canal. The tallest proposed water park attraction is 60 feet in height.

Additional recreational and entertainment uses are proposed as accessory and incidental to the water park. These uses include: outdoor concerts, business events, weddings, bridal showers, etc. It is proposed that the water park could be rented out for such private events during non-peak season hours. As these uses would occur during non-business hours, no additional parking would be required. It is anticipated that these events would be limited to a total of 10-15 per year. Additionally, on Independence Day, July 4th, it is proposed that the park would remain open until 10:00 p.m. and patrons would be treated to a professional style firework show, similar to the Riverwalk Park, Bakersfield College, or various private country clubs around town.

Architectural Character

The Proposed Project will include coordinated architectural design throughout the commercial village retail and restaurant area. The project would also incorporate pedestrian-friendly paseos linking the commercial and recreational uses. Additionally, the colors and types of exterior

building materials of the building facades are anticipated to be reasonably complementary to the exterior of adjoining structures.

Lighting

Lighting will be used as a design tool to highlight architectural elements, and landscaping, as well as for building tenant and Project signage. Lighting also will be an important tool for providing security and safety in parking areas, service passages, and common areas of the Project. Lighting facilities for surface parking areas, vehicular access ways, and walkways within the Project site would not exceed a height of 40 feet as per City's zoning code (Section 17.58.060 Parking Lots) for the project. All lighting, including lighting of parking lots and parking structures (if required), would be designed to be compatible with surrounding development; directed onto driveways, walkways and parking; and shielded away from adjacent properties and public rights-of-way to minimize spillage of the illumination into the surrounding areas and to minimize glare or interference with vehicular traffic.

In addition to lighting associated with proposed development, the Proposed Project would include lighted areas within the water park, and lighted fields associated with the proposed golf range facility to be located in the central area of the Project site. These facilities would be located in an area of the Project site surrounded by commercial and industrial uses. All lighting on the project site would be in accordance with the Bakersfield Municipal Code and be directed away from residential uses.

Signage

The Proposed Project's signage program would be implemented in accordance with the provisions of Section 17.60 of the Bakersfield Municipal Code. A comprehensive sign plan will be developed to regulate sign areas, heights, lighting, color, and materials, following carefully designed principles and design guidelines. Signage will be coordinated and designed depending on the type of signage (i.e., Project identification, tenant identification, directional, etc.) and the area of the Project in which the signage would be located (i.e., commercial, water park, etc.).

Building Heights

All roof heights in the Project site would conform to the Bakersfield Municipal Code. Anticipated heights for buildings within the proposed zones include:

Commercial Retail/Service 22'0" – 36'0"
One-story Office 22'0" – 24'0"
Two-story Office 32'0" – 35'0"
Surgery Center 26'0" – 55'0"
Hotel 44'0" – 50'0"
Recreation 48'0" – 60'0"
Light Industrial 25'0"-35'0"
Service Industrial 25'0"-35'0"

Sustainable Practices

The proposed project will be constructed in compliance with state laws regarding water and energy conservation, including Title 24 as well as Executive Orders regarding drought conditions, will result in increased efficiency and sustainability. Vegetation, trees, and structures would be used to create shaded walkways and shelters as well as the use of water features to cool and shade the outdoor experience for the pedestrian. Shading in portions of the parking areas also would be accomplished through structures that incorporate solar panels for green power, as well as shading.

All buildings would comply with CalGreen sustainable construction practices and commissioning requirements. Additionally, the Proposed Project would encourage use of alternate forms of transportation by providing pedestrian, bicycle, and transit facilities (where available) on site. Although the Project site is not currently served by public transit, it is anticipated that the site would be served in the future, and facilities would be provided within the Project boundaries to promote transit service.

Landscaping and Open Space

Within the commercial village and recreational areas, the project will incorporate design features to create a walkable urban environment by utilizing combinations of landscape, architecture, pedestrian pass-ways, gardens, plazas, and street plantings. Water quality facilities and design features would be integrated into the Project's design by filtering drainage along landscaped bio-swales and retention features within landscape corridors, street parkways, medians, paseos, gardens, active recreation fields and perimeter plantings.

All landscaped areas would have a complete water-conserving irrigation system and would incorporate native vegetation and drought tolerant plants. Street trees appropriate to the location and approved by the City of Bakersfield Recreation and Parks Department would be planted in public rights -of-way in accordance with City ordinances and standards for both street landscaping and parking lot shading.

Access and Circulation

The Proposed Project's on-site circulation improvements would include interior roadways/driveways that would provide access to the, hotel, employment uses, and destination recreation uses from Hageman Road, Mohawk Street and Knudsen/Landco Drive. Internal roadways would be constructed to the standards of the Public Works Department and would conform to the requirements of the City. Final configuration of the Project's transportation and circulation system would be reviewed by the Bakersfield Fire Department to ensure adequate emergency vehicle access and turning movements and to ensure compliance with all applicable Fire Department requirements.

Parking

All required parking for the Proposed Project would be provided in surface parking lots; however, parking lots may include parking structures if necessary to accommodate required parking on site

for specific land uses. Parking and shading in the parking areas would be provided in accordance with the Bakersfield Municipal Code.

Construction

The proposed Project's construction schedule and construction equipment mix has not been established as of the preparation of this EIR; however, construction equipment for such projects generally include a mixture of diesel trucks, dump trucks, concrete trucks, material hauling equipment, graders, water towers, water pulls and water trucks, grading scrapers/blades, crawler loaders, bulldozers, cranes, backhoes, excavators, scissor lifts, forklifts, hand tools, and other miscellaneous equipment that will ultimately be used as individual permits are issued for the construction activities. For the estimated construction schedule, construction will occur in various phases. Typical construction sequence entails site preparation followed by grading, installation of infrastructure and utilities, followed by construction of the building shells, paving, landscaping, and then painting and other architectural coatings. Tenant improvements inside the buildings and the installation of exterior signage would typically occur after users/tenants are identified and enter into lease agreements. Where applicable and required by the City of Bakersfield, all necessary onsite and offsite improvements, such as infrastructure and utilities, must be in place prior to issuance of occupancy. Because the Project site has already undergone prior development activities, and due to the relatively flat topography found onsite, earthwork activities are anticipated to be nominal to moderate. No soil import/export or cut/fill activities are likely to be required. Minimal excavation activities would be required to expand and upgrade underground utilities that currently serve the Project site.

1.2 Environmental Noise Assessment

This environmental noise assessment has been prepared to determine if significant noise impacts will be produced by the project and to describe mitigation measures for noise if significant impacts are determined. The environmental noise assessment, prepared by WJV Acoustics, Inc. (WJVA), is based upon the project description (described above) provided by the project applicant, a project Traffic Study[3] and a project site visit on November 6 and November 8, 2018. Revisions to the project description, traffic study 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 examples of sound levels for reference.

In terms of human perception, a 5 dB increase or decrease is considered to be a noticeable

[3] Ruettgers & Schuler*, Traffic Study for Tortuga Resort, SE Corner of Mohawk Street & Hageman Road, May 2026*.

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. REGULATORY SETTING

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?

2.1 Thresholds of Significance

City of Bakersfield

The project site lies within the City of Bakersfield. The applicable standards for noise levels that apply to this project are contained within Chapter VII of the Metropolitan Bakersfield General Plan[4].

For transportation noise sources (e.g., traffic and railway noise), the Metropolitan Bakersfield General Plan establishes noise level criteria in terms of the Community Noise Equivalent Level (CNEL) metric. The CNEL is the time-weighted energy average noise level for a 24-hour day, with a 4.77 dB penalty added to noise levels occurring during the evening hours (7:00 p.m.-10:00 p.m.) and a 10 dB penalty added to noise levels occurring during the nighttime hours (10:00 p.m.-7:00 a.m.). The CNEL represents cumulative exposure to noise over an extended period of time and is therefore calculated based upon *annual average* conditions.

The Noise Element establishes a land use compatibility criterion of 65 dB CNEL for exterior noise levels in outdoor activity areas of new residential developments. Outdoor activity areas generally include backyards of single-family residences, individual patios or decks of multi-family developments and common outdoor recreation areas of multi-family developments. The intent of the exterior noise level requirement is to provide an acceptable noise environment for outdoor activities and recreation.

[4] City of Bakersfield, Metropolitan Bakersfield General Plan, December 2002.

The Noise Element also requires that interior noise levels attributable to exterior noise sources not exceed 45 dB CNEL. The intent of the interior noise level standard is to provide an acceptable noise environment for indoor communication and sleep.

For non-transportation noise sources, the noise element applies hourly noise level performance standards at residential and other noise-sensitive uses. Table I summarizes the applicable hourly noise level standards. According the General Plan, the noise level standards apply to the following noise-sensitive land uses:

- Residential Areas
- Schools
- Convalescent and Acute Care Hospitals
- Parks and Recreational Areas

TABLE II

HOURLY NOISE LEVEL PERFORMANCE STANDARDS
STATIONARY NOISE SOURCES
METROPOLITAN BAKERSFIELD GENERAL PLAN

Maximum Acceptable Noise Level, dB		
Min./Hr. (L_n)	Day (7a-10p)	Night (10p-7a)
30 (L_{50})	55	50
15 (L_{25})	60	55
5 ($L_{8.3}$)	65	60
1 ($L_{1.7}$)	70	65
0 (L_{max})	75	70

Note: L_n means the percentage of time the noise level is exceeded during an hour. L_{50} means the level exceed 50% of the hour, L_{25} is the level exceed 25% of the hour, etc.

Source: Metropolitan Bakersfield General Plan

Additionally, The City of Bakersfield General Plan Noise Element sets standards for cumulative noise impacts from mobile (transportation-related) noise sources affecting existing noise-sensitive land uses. The City utilizes the standards listed below in impact determination in regards to increases in ambient noise levels at existing noise-sensitive land uses resulting from project-related transportation noise sources.

Standards For Cumulative Noise Impacts From Mobile Sources

The project's contribution to noise increases would normally be considered cumulatively considerable and significant when ambient noise levels affect noise sensitive land uses (receptors) and when the following occurs.

- *A project increases the ambient (cumulative without project) noise level by 1 dB or more;*

and

- *The cumulative with project noise level cause the following:*

    - *An increase of the existing ambient noise level by 5 dB or more, where the existing ambient level is less than 60 dB CNEL;*
    - *An increase of the existing ambient noise level by 3 dB or more, where the existing ambient level is 60 to 65 dB CNEL;*
    - *An increase on the existing ambient noise level by 1.5 dB or more, where the existing ambient level is greater than 65 dB CNEL.*

State of California

There are no state noise standards that are applicable to the project.

Federal Noise Standards

There are no federal noise standards that are applicable to the project.

2.2 Construction Noise and Vibration

The Bakersfield Municipal Code[5] limits construction to the hours of 6:00 a.m. to 9:00 p.m. on weekdays, and between 8:00 a.m. and 9:00 p.m. on weekends, when construction is within 1,000 feet of a residence. Certain exceptions to these hours are specified in the code.

The City of Bakersfield does not have regulations that define acceptable levels of vibration. One of the most recent references suggesting vibration guidelines is provided by the California Department of Transportation (Caltrans)[6]. 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).

[5] City of Bakersfield, Municipal Code Section 9.22.050, *Noise During Construction*, 1999

[6] California Department of Transportation, *Transportation and Construction Vibration Guidance Manual,* April 2020

TABLE III

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 IV

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 project is planned for an approximately 152 gross-acre site in northwest Bakersfield, California. The project site is bordered by Mohawk Street to the west, Hageman Road to the north. Additionally, a San Joaquin Valley Railroad spur line runs along the eastern portion of the site, in a northeast to southwest general direction. The project site is currently undeveloped, tilled soil. The project location is provided as Figure 1. The project site plan is provided as Figure 2.

Existing sensitive receptors are located to the north (residential, assisted living facility, nursing facility), and to the west (residential, park) of the overall project site. These sensitive receptors are generally located at setback distances as close as approximately 175 to 200 feet from the overall project site.

3.1 Background Noise Level Measurements

Existing noise levels in the project vicinity are dominated by traffic noise along Hageman Road and Mohawk Street, train noise (San Joaquin Valley Railroad), aircraft overflight noise levels associated with Meadows Field Airport (BFL) as well as noise sources associated with birds, human activities, landscaping activities, HVAC equipment and other sources.

Measurements of existing ambient noise levels in the project vicinity were conducted on September 16-17, 2026. Long-term (24-hour) ambient noise level measurements were conducted at four (4) locations (sites LT-1, LT-2, LT-3 and LT-4) for a continuous period of 24 hours.

Site LT-1 was located within the project site, along the east side of Mohawk Street near the terminus of Krebs Road. Site LT-1 was exposed to noise associated with vehicle traffic on Mohawk Street and Krebs Road, human activities at Tortuga Bay Park, and aircraft overflights. Site LT-2 was located with the southern portion of the project site, approximately 1,500 feet east of Mohawk Street, and was exposed to noise associated with distant vehicle traffic, nearby industrial activities, SJVR railroad activities, and aircraft overflights. Site LT-3 was located in the northern portion of the project site, near the intersection of Knudsen Drive and Hageman Road, and was exposed to noise associated with vehicle traffic, railroad noise, construction activities and aircraft overflights. Site LT-4 was located near the intersection of Hageman Road and Mohawk Street, and was exposed to noise associated with vehicle traffic, nearby residential land uses (including HVAC equipment and landscaping activities) and aircraft overflights.

Additionally, short-term (15-minute) ambient noise level measurements were conducted at six (6) locations (Sites ST-1 through ST-6). Two (2) individual measurements were taken at each of the six short-term noise measurement sites to quantify ambient noise levels in the morning and afternoon hours. The locations of the long-term and short-term noise monitoring sites are shown in Figure 3.

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 52.2 dB between 1:00 a.m. and 2:00 a.m. on November 8th to a high of 65.4 dB between 5:00 p.m. and 6:00 p.m. Hourly maximum (L_{max}) noise levels at site LT-1 ranged from 72.6 to 86.3 dB. Residual noise levels at the monitoring site, as defined by the L_{90}, ranged from 44.8 to 56.7 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 and calculated 24-hour CNEL at site LT-1 was 66.4 dB CNEL. Figure 4 graphically depicts hourly variations in ambient noise levels at site LT-1. Figure 5 provides a photograph of site LT-1.

Measured hourly L_{eq} noise levels at site LT-2 ranged from a low of 42.0 dB between 1:00 a.m. and 2:00 a.m. to a high of 55.8 dB between 2:00 p.m. and 3:00 p.m. Hourly L_{max} noise levels at site LT-2 ranged from 56.4 to 67.8 dB. Residual noise levels at the monitoring site, as defined by the L_{90}, ranged from 35.0 to 44.4 dB. The measured and calculated 24-hour CNEL value at site LT-2 was 54.9 dB CNEL. Figure 6 graphically depicts hourly variations in ambient noise levels at site LT-2. Figure 7 provides a photograph of site LT-2.

Measured hourly L_{eq} noise levels at site LT-3 ranged from a low of 48.6 dB between 3:00 a.m. and 4:00 a.m. to a high of 64.0 dB between 7:00 a.m. and 8:00 a.m. Hourly L_{max} noise levels at site LT-3 ranged from 60.7 to 77.2 dB. Residual noise levels at the monitoring site, as defined by the L_{90}, ranged from 45.2 to 57.4 dB. The measured and calculated 24-hour CNEL value at site LT-3 was 63.1 dB CNEL. Figure 8 graphically depicts hourly variations in ambient noise levels at site LT-3. Figure 9 provides a photograph of site LT-3.

Measured hourly L_{eq} noise levels at site LT-4 ranged from a low of 54.9 dB between 2:00 a.m. and 3:00 a.m. to a high of 66.0 dB between 6:00 a.m. and 7:00 a.m. Hourly L_{max} noise levels at site LT-4 ranged from 72.8 to 89.5 dB. Residual noise levels at the monitoring site, as defined by the L_{90}, ranged from 46.0 to 59.4 dB. The measured and calculated 24-hour CNEL value at site LT-4 was 67.9 dB CNEL. Figure 10 graphically depicts hourly variations in ambient noise levels at site LT-4. Figure 11 provides a photograph of site LT-4.

Table V summarizes short-term noise measurement results. The noise measurement data included energy average (L_{eq}) maximum (L_{max}) as well as five 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. For instance, the L_{90} describes the noise level exceeded 90 percent of the time during the measurement period and 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.

TABLE V

SUMMARY OF SHORT-TERM NOISE MEASUREMENT DATA
TORTUGA BAY MIXED-USE DEVELOPMENT
SEPTEMBER 16 & 17, 2026

Site	Time	A-Weighted Decibels, dBA							Sources
		L_{eq}	L_{max}	L_2	L_8	L_{25}	L_{50}	L_{90}	
ST-1	8:45 a.m.	68.9	79.4	76.8	74.4	68.2	66.4	55.1	TR
ST-1	4:50 p.m.	70.2	81.1	77.4	75.0	70.2	65.5	53.8	TR
ST-2	9:05 a.m.	68.8	81.0	74.5	72.3	67.4	63.5	51.2	TR, AC, R
ST-2	5:10 p.m.	70.0	83.6	76.2	73.8	68.6	62.0	49.9	TR
ST-3	9:25 a.m.	53.4	69.0	63.2	57.1	53.7	52.0	46.4	TR, D
ST-3	5:30 p.m.	57.0	73.4	66.6	61.0	57	53.8	47.6	TR, AC, V
ST-4	8:25 a.m.	57.8	69.7	64.1	61.2	55.5	51.8	45.6	TR, C, H
ST-4	4:30 p.m.	55.9	66.2	63.3	60.5	53.9	50.6	42.8	TR, H
ST-5	8:05 a.m.	63.1	70.7	66.2	64.0	62.2	56.4	51.1	TR, AC
ST-5	4:10 p.m.	60.8	69.9	65.7	64.4	62.2	56.0	52.1	TR, H
ST-6	9:45 a.m.	57.4	69.3	66.5	63.2	58.7	53.0	45.1	TR, L, B
ST-6	5:50 p.m.	60.6	72.5	68.0	65.7	61.1	54.6	46.6	TR, H, D

TR: Traffic AC: Aircraft V: Voices D: Dogs Barking B: Birds C: Construction Activities H: HVAC R: Railroad L: Landscaping Activities
Source: WJV Acoustics, Inc.

Short-term noise measurements were conducted for 15-minute periods. Sites ST-1 and ST-2 were located in close proximity to higher traffic roadways, Hageman Road and Mohawk Street. Site ST-3 and ST-6 were in the vicinity of Tortuga Bay Park. Site ST-4 was located within an existing residential neighborhood north of the project site, and site ST-5 was located in the parking lot of a development under construction. The overall noise measurement data indicate that noise in the project vicinity is highly influenced by vehicular traffic on Hageman Road and Mohawk Street.

4. PROJECT IMPACT ASSESSMENT

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

WJVA utilized the Federal Highway Administration's (FHWA) Highway Noise Prediction Model (FHWA-RD-77-108) to quantify expected project-related increases in traffic noise exposure along roadways in the project vicinity. In order to validate the accuracy of the noise model, noise level measurements and concurrent traffic counts were conducted by WJVA along Hageman Road and Mohawk Street, near the project site, on September 17, 2016.

The FHWA Model is a standard analytical method used by state and local agencies for roadway traffic noise prediction. The model is based upon reference energy emission levels for automobiles, medium trucks (2 axles) and heavy trucks (3 or more axles), with consideration given to vehicle volume, speed, roadway configuration, distance to the receiver, and the acoustical characteristics of the site. The FHWA Model was developed to predict hourly L_{eq} values for free-flowing traffic conditions, and is generally considered to be accurate within ±1.5 dB. To predict CNEL values, it is necessary to determine the hourly distribution of traffic for a typical day and adjust the traffic volume input data to yield an equivalent hourly traffic volume.

Noise measurements were conducted in terms of the equivalent energy sound level (L_{eq}). Measured L_{eq} values were compared to L_{eq} values calculated (predicted) by the FHWA Model using as inputs the traffic volumes, truck mix and vehicle speed observed during the noise measurements. The results of that comparison are shown in Table VI.

TABLE VI

COMPARISON OF MEASURED AND PREDICTED (FHWA MODEL) NOISE LEVELS TORTUGA BAY DEVELOPMENT SEPTEMBER 17, 2016

	Hageman Road	Mohawk Street
Start Time	3:15 p.m.	3:35 p.m.
Microphone Height, Ft. (above the ground)	5	5
Observed # Autos/Hr.	1,124	752
Observed # Medium Trucks/Hr.	28	12
Observed # Heavy Trucks/Hr.	12	4
Posted Speed (MPH)	50	55
Distance, ft.	65	55
L_{eq}, dBA (Measured)	68.5	68.1
L_{eq}, dBA (Predicted)	67.5	67.5
Difference between Measured and Predicted L_{eq}, dB	**1.0**	**0.6**

Note: FHWA "soft site" assumed for calculations
Source: WJV Acoustics, Inc.

From Table VI it may be determined that the predicted traffic noise levels were between 0.6 and 1.0 dB lower than the measured noise levels for the traffic conditions observed at the time of the noise measurements. This is considered reasonable agreement between modeled and measured noise levels, therefore an adjustment (offset) to modeled noise levels in the project vicinity is not required.

Traffic noise exposure levels for 2030, 2035 and 2045 conditions, both with and without the project, were calculated based upon the FHWA Model and project traffic volumes provided by the above-described Traffic Study. The posted vehicle speed limit on the analyzed roadway segments in the vicinity of the project site range from 40 to 55 miles per hour (mph). The intent of the analysis is the demonstrate relative project-related changes in traffic noise exposure that would be expected to occur along roadways in the project vicinity. The noise modeling assumptions used to calculate project traffic noise are provided as Appendix C.

Table VII provides 2030 and 2030 plus Phase I project traffic noise levels. Table VIII provides 2035 and 2035 plus Phase I & Phase II project traffic noise levels. Table IX provides 2045 and 2045 plus Phase I, Phase II and Phase III (full buildout) project traffic noise levels. The noise exposure levels were calculated at a reference distance of 100 feet from the center of each roadway segment.

TABLE VII

TORTUGA BAY MIXED-USE DEVELOPMENT
PROJECT TRAFFIC NOISE EXPOSURE
2030 CONDITIONS

Roadway Name (Description)	CNEL, dB[1]		Change	Significant Impact?
	No Project	With Project (Phase I)		
Norris Road (Coffee Road to Patton Way)	61	61	0	No
Olive Drive (Calloway Drive to Riverlakes Drive)	67	67	0	No
Olive Drive (Riverlakes Drive to Coffee Road)	67	67	0	No
Olive Drive (Coffee Road to Patton Way)	66	66	0	No
Olive Drive (Patton Way to Fruitvale Avenue)	66	66	0	No
Olive Drive (Fruitvale Avenue to Mohawk Street)	65	66	1	No[2]
Olive Drive (Mohawk Street to Knudsen Avenue)	65	66	1	No[2]
Olive Drive (Knudsen Avenue to SR 99 NB Ramps)	69	69	0	No
Olive Drive (SR 99 to Roberts Lane)	65	66	1	No[2]
Olive Drive (Roberts Lane to Airport Drive)	63	64	1	No
Hageman Road (Calloway Drive to Riverlakes Drive)	66	66	0	No
Hageman Road (Riverlakes Drive to Coffee Road)	66	66	0	No
Hageman Road (Coffee Road to Patton Way)	66	67	1	No
Hageman Road (Patton Way to Fruitvale Avenue)	66	67	1	No
Hageman Road (Fruitvale Avenue to Mohawk Street)	64	65	1	No[2]
Hageman Road (Mohawk Street to Knudsen Avenue)	64	65	1	No[2]
Rosedale Highway (Coffee Road to Fruitvale Avenue)	69	69	0	No
Rosedale Highway (Fruitvale Avenue to Mohawk Street)	70	70	0	No
Rosedale Highway (Mohawk Street to SR 99)	69	69	0	No
24th Street (SR 99 to Oak Street)	68	68	0	No
Calloway Drive (Hageman Road to Olive Drive)	67	67	0	No
Riverlakes Drive (Coffee Road to Hageman Road)	61	61	0	No
Coffee Road (Meany Avenue to Hageman Road)	69	69	0	No
Coffee Road (Hageman Road to Olive Drive)	69	69	0	No
Coffee Road (Olive Drive to Norris Road)	69	69	0	No
Patton Way (North of Rosedale Highway)	67	67	0	No
Patton Way (Hageman Road to Olive Drive)	55	55	0	No
Patton Way (Olive Drive to Norris Road)	55	55	0	No
Fruitvale Avenue (Rosedale Highway to Meany Avenue)	62	62	0	No
Fruitvale Avenue (Meany Avenue to Hageman Road)	62	62	0	No
Fruitvale Avenue (Hageman Road to Olive Drive)	60	60	0	No
Mohawk Street (Westside Parkway to Rosedale Highway)	69	70	1	No
Mohawk Street (Rosedale Highway to Hageman Road)	67	68	1	No
Knudsen Avenue (Hageman Road to Olive Drive)	64	66	2	No[3]

[1]At a typical residential setback (assumed to be 100 feet from the center of the roadway).
[2]All homes either have sound wall or front roadway
[3]There are no sensitive receivers located along this roadway segment.

Source: WJV Acoustics, Inc., Ruettgers & Schuler

TABLE VIII

TORTUGA BAY MIXED-USE DEVELOPMENT
PROJECT TRAFFIC NOISE EXPOSURE
2035 CONDITIONS

Roadway Name (Description)	CNEL, dB[1]		Change	Significant Impact?
	No Project	With Project (Phase I & II)		
Norris Road (Coffee Road to Patton Way)	61	61	0	No
Olive Drive (Calloway Drive to Riverlakes Drive)	67	68	1	No
Olive Drive (Riverlakes Drive to Coffee Road)	67	67	0	No
Olive Drive (Coffee Road to Patton Way)	66	66	0	No
Olive Drive (Patton Way to Fruitvale Avenue)	66	66	0	No
Olive Drive (Fruitvale Avenue to Mohawk Street)	65	66	1	No[2]
Olive Drive (Mohawk Street to Knudsen Avenue)	65	66	1	No[2]
Olive Drive (Knudsen Avenue to SR 99 NB Ramps)	68	69	1	No
Olive Drive (SR 99 to Roberts Lane)	65	66	1	No[2]
Olive Drive (Roberts Lane to Airport Drive)	63	65	2	No
Hageman Road (Calloway Drive to Riverlakes Drive)	66	66	0	No
Hageman Road (Riverlakes Drive to Coffee Road)	67	67	0	No
Hageman Road (Coffee Road to Patton Way)	67	67	0	No
Hageman Road (Patton Way to Fruitvale Avenue)	66	67	1	No
Hageman Road (Fruitvale Avenue to Mohawk Street)	65	66	1	No
Hageman Road (Mohawk Street to Knudsen Avenue)	65	65	0	No
Rosedale Highway (Coffee Road to Fruitvale Avenue)	69	69	0	No
Rosedale Highway (Fruitvale Avenue to Mohawk Street)	70	70	0	No
Rosedale Highway (Mohawk Street to SR 99)	69	69	0	No
24th Street (SR 99 to Oak Street)	68	68	0	No
Calloway Drive (Hageman Road to Olive Drive)	68	68	0	No
Riverlakes Drive (Coffee Road to Hageman Road)	61	61	0	No
Coffee Road (Meany Avenue to Hageman Road)	69	69	0	No
Coffee Road (Hageman Road to Olive Drive)	69	70	1	No
Coffee Road (Olive Drive to Norris Road)	69	70	1	No
Patton Way (North of Rosedale Highway)	68	68	0	No
Patton Way (Hageman Road to Olive Drive)	55	56	1	No
Patton Way (Olive Drive to Norris Road)	55	55	0	No
Fruitvale Avenue (Rosedale Highway to Meany Avenue)	62	62	0	No
Fruitvale Avenue (Meany Avenue to Hageman Road)	62	63	1	No
Fruitvale Avenue (Hageman Road to Olive Drive)	60	61	1	No
Mohawk Street (Westside Parkway to Rosedale Highway)	70	70	1	No
Mohawk Street (Rosedale Highway to Hageman Road)	67	68	1	No
Knudsen Avenue (Hageman Road to Olive Drive)	64	67	3	No[3]

[1]At a typical residential setback (assumed to be 100 feet from the center of the roadway).
[2]All homes either have sound wall or front roadway
[3]There are no sensitive receivers located along this roadway segment.

Source: WJV Acoustics, Inc., Ruettgers & Schuler

TABLE IX

TORTUGA BAY MIXED-USE DEVELOPMENT
PROJECT TRAFFIC NOISE EXPOSURE
2045 CONDITIONS

Roadway Name (Description)	CNEL, dB[1]		Change	Significant Impact?
	No Project	With Project (Phase I, II & III)		
Norris Road (Coffee Road to Patton Way)	61	61	0	No
Olive Drive (Calloway Drive to Riverlakes Drive)	68	68	0	No
Olive Drive (Riverlakes Drive to Coffee Road)	68	68	0	No
Olive Drive (Coffee Road to Patton Way)	66	66	0	No
Olive Drive (Patton Way to Fruitvale Avenue)	66	66	0	No
Olive Drive (Fruitvale Avenue to Mohawk Street)	65	66	1	No[2]
Olive Drive (Mohawk Street to Knudsen Avenue)	64	65	1	No[2]
Olive Drive (Knudsen Avenue to SR 99 NB Ramps)	68	68	0	No
Olive Drive (SR 99 to Roberts Lane)	65	66	1	No[2]
Olive Drive (Roberts Lane to Airport Drive)	64	65	1	No
Hageman Road (Calloway Drive to Riverlakes Drive)	66	66	0	No
Hageman Road (Riverlakes Drive to Coffee Road)	67	67	0	No
Hageman Road (Coffee Road to Patton Way)	67	68	1	No
Hageman Road (Patton Way to Fruitvale Avenue)	67	68	1	No
Hageman Road (Fruitvale Avenue to Mohawk Street)	66	67	1	No
Hageman Road (Mohawk Street to Knudsen Avenue)	65	66	1	No[2]
Rosedale Highway (Coffee Road to Fruitvale Avenue)	69	70	1	No
Rosedale Highway (Fruitvale Avenue to Mohawk Street)	70	70	0	No
Rosedale Highway (Mohawk Street to SR 99)	68	69	1	No
24th Street (SR 99 to Oak Street)	69	69	0	No
Calloway Drive (Hageman Road to Olive Drive)	69	69	0	No
Riverlakes Drive (Coffee Road to Hageman Road)	61	61	0	No
Coffee Road (Meany Avenue to Hageman Road)	69	69	0	No
Coffee Road (Hageman Road to Olive Drive)	70	70	0	No
Coffee Road (Olive Drive to Norris Road)	70	71	1	No
Patton Way (North of Rosedale Highway)	69	69	0	No
Patton Way (Hageman Road to Olive Drive)	55	56	1	No
Patton Way (Olive Drive to Norris Road)	55	56	1	No
Fruitvale Avenue (Rosedale Highway to Meany Avenue)	63	63	0	No
Fruitvale Avenue (Meany Avenue to Hageman Road)	62	63	1	No
Fruitvale Avenue (Hageman Road to Olive Drive)	61	62	1	No
Mohawk Street (Westside Parkway to Rosedale Highway)	71	71	0	No
Mohawk Street (Rosedale Highway to Hageman Road)	68	69	1	No[2]
Knudsen Avenue (Hageman Road to Olive Drive)	65	67	2	No[3]

[1]At a typical residential setback (assumed to be 100 feet from the center of the roadway).
[2]All homes either have sound wall or front roadway
[3]There are no sensitive receivers located along this roadway segment.

Source: WJV Acoustics, Inc., Ruettgers & Schuler

Reference to Table VII, Table VIII and Table IX indicate that traffic noise exposure at existing land uses adjacent to roadways in the vicinity of the project would generally be expected to increase by approximately 0 to 1 dB as a result of the project. This is not considered to be a significant impact. It should be noted, although the traffic noise exposure levels along several roadway segments described in Table VII, Table VIII and Table IX exceed the City's applicable 65 dB CNEL exterior noise level standard, the exceedances are either 1.) not a result of the project or 2.) the residences either have existing sound walls or the homes that face the roadway, and acoustical shielding (not taken into account in the tables) would result in exterior noise exposure levels less than 65 dB CNEL, and therefore do not indicate a project-related impact.

Additionally, all noise levels described in Table VII, Table VIII and Table IX do not take into consideration any site-specific shielding that may occur, and are considered to be a generalized worst-case assessment of traffic noise levels in the project area.

Traffic noise levels along Knudsen Avenue (between Hageman Road and Olive Drive) would be expected to increase by approximately 2-3 dB at full project buildout. The noise levels described in Table IX (full project buildout) are calculated based upon a generalized reference setback distance of 100 feet from the centerline of each roadway segment. Kern River Transitional Care (nursing home) is located along the west side of this roadway segment.

The City of Bakersfield exterior noise level standards for transportation noise sources apply to the outdoor activity areas of sensitive receptors. The outdoor activity areas at Kern River Transitional Care are located approximately 400 feet west of Knudsen Avenue (grass area along western portion of facility) and areas centrally located within interior courtyards at each building of the facility. Noise attenuation is provided by the building construction at each outdoor activity location.

The closest of these outdoor activity areas at Kern River Transitional Care is located approximately 170 feet from the centerline of Knudsen Avenue. Taking into account the distance from the roadway and the noise attenuation provided by the building (approximately 10 dB of noise attenuation), noise exposure was calculated to be approximately 52 dB L_{dn} for 2045 without project conditions and approximately 55 dB L_{dn} for 2045 plus project conditions. This is not considered to be a significant impact by the City of Bakersfield.

The above-described 10 dB of noise reduction provided by the building was calculated using a sound wall insertion loss program based on the FHWA Model. The model calculates the insertion loss (noise level reduction) 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 barrier 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. The typical height of a single-story residential building is approximately 10-15 feet. WJVA assumed a conservative barrier height of ten feet for noise attenuation calculations.

4.2 Project Noise Impacts from Operational On-Site Sources (Less Than Significant With Mitigation)

The proposed mixed-use development would include several potential noise sources associated with the various proposed land uses. Phase I would include the development of a water park, golf range and general commercial land uses. Phase II would include the development of medical offices/surgery center and general commercial land uses. Phase III would include the development of medical offices/surgery center, hotel land uses and general commercial land uses. Each proposed land use and associated sources of noise are discussed below.

The project would include proposed General Plan land use designations of Parks. Two specific land uses are proposed within the Parks parcel, a water park and golf range.

Water Park

Phase I of the project would include a water park facility, consisting of approximately 25.84 acres, and would be located within the proposed General Plan Designation "Parks and Recreation Facilities" (see Figure 12). The water park would include 322 parking spaces, wave pool, lazy river, three slide towers, multiple children's and spray areas, associated mechanical facilities, and administrative, locker, restroom, and concession facilities.

Additional recreational and entertainment uses are proposed as accessory and incidental to the water park. These uses include: outdoor concerts, business events, weddings, bridal showers, etc. A July 4th fireworks show is also proposed for the water park facility.

Operational Noise-

In order to assess potential noise levels associated with a water park, WJVA conducted reference noise level measurements at Island Waterpark in Fresno. One (1) automated sound level meter collected continuous noise level measurements within the water park property on June 27, 2019. The 24-hour noise level meter (Site IWP-LT) was located adjacent to existing residential land uses, and located approximately 375 feet from the perimeter gate of the water park (and within the water park parking lot). Additionally, WJVA conducted short-term noise level measurements at five (5) additional locations (IWP-1 through IWP-5) within and near Island Waterpark on June 27, 2019. During the short-term measurements, WJVA staff made notes of audible noise sources. Figure 13 graphically provides the measured noise levels at 24-hour measurement site IWP-LT and Figure 14 provides the locations of the reference noise measurement sites at Island Waterpark, in Fresno.

During the water park reference noise level measurements, the park was open for business between the hours of 11:00 a.m. to 7:00 p.m. Table X provides the measured noise levels in terms of the City's statistical noise level performance standards (as presented in Table II of this report). The proposed water park would be at least 700 feet from the closest noise-sensitive land uses (single-family residences located along Hageman Road). Table X provides the average noise levels measured at Island Water Park in Fresno, during the hours of operations (11:00 a.m. to 7:00 p.m.)

calculated to the distance of the closest noise-sensitive receptors at the proposed water park facility. To conservatively calculate the noise levels at the distance of the closest sensitive receptors, WJVA applied the standard rate of noise attenuation with increased distance from a line source (-3 dB/doubling of distance).

TABLE X

WATER PARK REFERENCE NOISE LEVEL MEASUREMENTS AT CLOSEST SENSITIVE RECEPTORS TORTUGA BAY MIXED-USE DEVELOPMENT, BAKERSFIELD

	Maximum Acceptable Noise Level, dB			
Min./Hr. (L_n)	Day (7a-10p)	Night (10p-7a)	Measured Noise Levels	Complies Yes/No?
30 (L_{50})	55	50	41	Yes
15 (L_{25})	60	55	45	Yes
5 ($L_{8.3}$)	65	60	48	Yes
1 ($L_{1.7}$)	70	65	51	Yes
0 (L_{max})	75	70	60	Yes

Note: L_n means the percentage of time the noise level is exceeded during an hour. L_{50} means the level exceed 50% of the hour, L_{25} is the level exceed 25% of the hour, etc.

Source: WJV Acoustics, Inc.

Reference to Table X indicates that noise levels associated with water park activities (as measured at the Island Water Park in Fresno) would not exceed applicable City of Bakersfield noise level standards.

WJVA also conducted noise level measurements at numerous locations around the perimeter of the Island Water Park in Fresno, and one location within the water park facility. Within the water park, the dominant source of noise is human voice, often screams, as park patrons utilize the slides and other water features. Noise levels associated with human voices (screams) would not exceed the applicable noise level standards or exceed existing ambient noise levels at the closest off-site noise-sensitive land uses.

Noise levels were observed at monitoring sites IWP-1 through IWP-4. Noise associated with water park activities (human voices) was occasionally audible at sites IWP-1 and IWP-3. However, water park noise sources at sites IWP-1 through IWP-3 did not significantly contribute to measured ambient noise levels. At site IWP-2 and IWP-4, noise associated with water park activities was not audible above existing ambient noise levels (generally dominated by vehicle traffic noise).

In regards to operational equipment utilized at the water park, WJVA staff interviewed Island Waterpark staff, who indicated that the only source of significant noise associated with operational equipment is the pump equipment used to operate the wave pool. WJVA staff walked the entirety of the water park and confirmed no additional significant operational equipment noise sources. The wave pool pump equipment is located behind a barrier that provides

acoustical shielding of the pump noise to patrons utilizing the wave pool. WJVA staff measured noise levels of the equipment behind the barrier wall. Noise levels were measured to be approximately 82 dB at a distance of 75 feet from the equipment (measurement site IWP-5). The wave pool equipment runs intermittently, based upon settings selected by the water park staff. The precise location of the water park wave pool was not known at the time this analysis was prepared. However, the closest portion of the water park footprint to any sensitive receptor location would be located at setback distance of at least 700 feet (along Hageman Road). At this distance, the noise associated with the wave poot equipment would be approximately 63 dB. Such levels do not take into account acoustic shielding that would be provided by intervening buildings that would be constructed as part of the project. Additionally, such levels are comparable to existing ambient noise levels, as measured at ambient noise measurement site LT-4.

The water park would also include 332 parking spaces. Noise due to traffic in parking lots is typically limited by low speeds and is not usually considered to be significant. Human activity in parking lots that can produce noise includes voices, stereo systems and the opening and closing of car doors and trunk lids. Such activities can occur at any time. The noise levels associated with these activities cannot be precisely defined due to variables such as the number of parking movements, time of day and other factors. It is typical for a passing car in a parking lot to produce a maximum noise level of 60 to 65 dBA at a distance of 50 feet, which is comparable to the level of a raised voice. Noise levels associated with vehicle movements would not exceed any applicable noise level standards or result in an increase over existing ambient noise levels at nearby off-site sensitive receiver locations. Parking lot vehicle movement and human activity noise would not be considered a significant impact.

Outdoor Events-

The applicant also proposes the inclusion of outdoor private events such as outdoor concerts, business events, weddings, bridal showers, etc. Additionally, on Independence Day, a July 4th fireworks show is proposed at the water park site.

The precise location of outdoor events that would use amplified speech and music (outdoor concerts, weddings, etc.) within the water park area was not known at the time this analysis was prepared. Furthermore, the type and location of any amplified sound system was not known at the time this analysis was prepared. As described above, the closest sensitive receptors to the overall water park footprint are located at setback distances of 700 feet or greater.

WJVA has conducted noise level measurements of multiple outdoor events using amplified music (live bands and DJs) for numerous projects over the years. Noise levels associated with live music events vary widely based upon the type of sound system, the locations and directions of the speakers, the presence of intervening acoustical shielding provided by existing buildings or topography, and the volume to which the sound system is set. Noise levels measured by WJVA during outdoor events with amplified music, noise levels could be expected to be in the range of approximately 70-80 dB at a setback distance of 100 feet facing the speakers. Speaker noise levels

are directional in nature, and WJVA has observed that noise levels measured behind a speaker system are typically 10 to 15 dB lower than those measured in front a speaker system, as measured at the same setback distance.

Based upon these various reference noise level measurements collected by WJVA, such noise levels (without any acoustical shielding) would be expected to be approximately 55-65 dB at 700 feet, if speakers were pointed toward the direction of the receptor, and approximately 40 to 55 dB at 700 feet, if speakers were pointed away from the receptor.

The exact location(s) of outdoor private events and concerts (and speaker systems) within the overall water park footprint was not known at the time of this analysis. However, the water park land use would be bordered by commercial and light industrial land uses to the north and west, in the directions of the closest residential land uses to the water park area. As described in the project description, these parcels would include buildings constructed to heights of approximately 22-36 feet in height, which would provide noise attenuation (acoustic shielding) to the residential land uses closest to the water park area. The buildings would provide substantial acoustic shielding, and noise levels associated with these activities within the water park area would not exceed City of Bakersfield noise standards or existing ambient noise levels at nearby residential land uses.

The applicant proposes an annual July 4th fireworks show, to take place within the water park footprint. Noise levels within the City of Bakersfield are generally elevated during the evening hours of the July 4th Holiday due to multiple professional fireworks shows as well as residential neighborhood fireworks. Additionally, noise levels associated with July 4th professional fireworks show (as proposed at the Water Park) are temporal in nature, typically lasting 20-30 minutes in length.

Noise levels associated with fireworks shows vary widely, and a cursory search of fireworks noise levels indicates that such events can often exceed 100 dB L_{max} when in close proximity to the fireworks event. For the purpose of this analysis, it is assumed that any fireworks show at the Water Park would exceed local noise standards, and would require a permitted variance from the City of Bakersfield, and would be subject to appropriate approvals by the City.

Golf Range

The proposed project would include a “state-of-the-art golf range.” The golf range would be located in the general vicinity of water park, in the area proposed as General Plan Designation “Parks and Recreation Facilities” (see Figure 2 and Figure 12). At the time of this analysis, specific details associated with the golf range were not known. However, sources of noise at golf ranges are typically limited to human voice, noise that occurs as a golf club strikes a golf ball, amplified speech and music, and parking lot activities (described above).

In order to estimate noise levels that could occur from the proposed Golf Range, WJVA reviewed available noise data from similar land uses (Source: City of Roseville TopGolf Noise Monitoring

Survey, 2016). The reviewed data included noise level measurements at an existing TopGolf facility, in Roseville, California. The noise level measurements took into account all associated noise sources (club strikes on golf balls, human voices, amplified music within each individual driving range bay).

The closest existing residential land uses to the proposed Golf Range are located at setback distances of 800 feet or greater from the Golf Range footprint. Based upon noise levels reviewed within the above-described TopGolf Noise Monitoring Survey, noise levels associated with similar Golf Range facilities would be in the range of approximately 50-60 dB L_{max} and approximately 45-50 dB L_{50}, at a setback distance of 800 feet. Such levels do not exceed City of Bakersfield noise level standards, and do not exceed existing ambient noise levels in the vicinity of the nearby residential land uses (see noise levels measured at LT-1 and LT-4).

Additionally, the proposed commercial and industrial land uses west and north of the Golf Range area will include buildings constructed to heights of approximately 22-36 feet. While (as described above) noise levels associated with the proposed Golf Range would not exceed City of Bakersfield noise standards or existing ambient noise levels, further noise attenuation would be provided by the intervening buildings, resulting in noise levels lower than those described above.

Hotel/Medical Offices/General Commercial Land Uses

General Commercial (GC) zone typically permits a wide range of commercial uses, including retail stores, restaurants, service businesses, and other commercial establishments. At the time this analysis was prepared, information regarding specific tenants for the medical offices and general commercial land uses was not known. Additionally, the precise type or location of the hotel land use was not known.

The portions of the project that would be included in these land use types would generally be located within the northern and western portions of the project site, with the hotels located within the northeastern portion of the project site. The closest sensitive receptors to any of these proposed land uses would be located at distances of 175-200 feet or greater (along Hageman Road and Mohawk Street).

Sources of project-related operational noise potentially associated with hotel, medical office and general commercial land uses could typically include truck movements, mechanical/HVAC systems, loading dock activities and trash compactors. The location and frequency of such sources (if included) were not specifically known at the time of this analysis. Noise levels associated with such activities, at a reference distance of 200 feet from the noise source (approximate setback distance of closest sensitive receptors to these land uses), can be generalized as follows:

- HVAC equipment: 45-56 dB

- Loading dock activities: 65-75 dB
- Trash compactor: 45-50 dB
- Truck movements: 55-65 dB
- Idling refrigerated truck trailers: 45-50 dB

*The above-described noise levels were based upon reference noise levels collected by WJVA at various project sites in the greater Central Valley area over the course of many years.

*It should be noted; typical medical offices and surgery centers do not have regular ambulance service, unless there is a medical emergency, and such noise sources are not anticipated for the project.

Noise levels associated with such sources would not exceed any applicable noise levels standards or result in a substantial increase of current (without project) ambient noise levels, at existing off-site noise-sensitive land uses. However, such operational noise levels should be assessed once a detailed site plan and knowledge of proposed equipment are known.

Light Industrial/Service Industrial

The proposed General Plan Amendment would include land use designations of Light Industrial, located within the southwestern portion of the project site. Light Industrial uses consisting of contractor's plants and storage yards, tool rental and equipment, truck repairing and overhauling shops, welding, metal fabricating and blacksmith shops, wholesale businesses, storage buildings and warehouses, and light manufacturing.

The exact tenants and precise associated industrial and service-related activities are not known at the time of this analysis. The distance from the closest proposed light industrial parcels to nearby sensitive receptors would be approximately 200 feet, along Mohawk Street.

Typical land uses associated with the above-described zoning categories would generally include warehousing, contractor's yards, trucking yards, indoor light manufacturing, storage facilities, and other similar land uses. Noise associated with operational activities may include (but is not limited to) HVAC equipment, ventilation fans, generators, air compressors, pneumatic tools, trash compactors, loading dock activities and on-site vehicle and truck movements. Noise levels associated with such sources vary widely based upon equipment size, type, and manufacturer. Noise levels associated with such activities, at a reference distance of 200 feet from the noise source (the approximate distance of the closest sensitive receptors to proposed light industrial land uses), can be generalized as follows:

- Passing car in parking lot: 37-42 dB

- HVAC equipment: 32-52 dB
- Ventilation fans: 7-27 dB

- Loading dock activities: 52-62 dB

- Trash compactor: 32-37 dB
- Truck movements: 42-52 dB

- Idling refrigerated truck trailers: 32-37 dB

- Diesel Generator: 47-57 dB

- Pneumatic Tools: 56-61 dB

- Air Compressor: 20-50 dB

*The above-described noise levels were based upon reference noise levels collected by WJVA at various project sites in the greater Central Valley area over the course of many years.

Such levels do not exceed City of Bakersfield noise level standards. Furthermore, such noise levels do not exceed existing ambient noise levels, as measured at ambient noise site LT-1. Additionally, many of the above-described noise sources and activities would be expected to occur indoors, where exterior noise levels would be significantly diminished, at represent a worst-case assessment of project-related noise levels.

Potential Impact:
Noise levels from new stationary noise sources cannot be predicted with any certainty at this time since specific uses have not yet been proposed and the locations of stationary noise sources relative to the locations of noise sensitive uses are not known. However, under some circumstances there is a potential for such uses exceed the City's noise standards for stationary noise sources at the locations of sensitive receptors.

Mitigation Measures:
Noise levels from new stationary noise sources may be effectively mitigated by incorporating noise mitigation measures into the project design that consider the geographical relationship between the noise sources of concern and potential receptors, the noise-producing characteristics of the sources and the path of transmission between noise sources and sensitive receptors. Options for noise mitigation include the use of building setbacks, the construction of sound walls and the use of noise source equipment enclosures.

When specific uses within the study area are proposed that could result in a noise-related conflict between a commercial or other stationary noise source and existing or proposed noise-sensitive receptor, an acoustical analysis should be required that quantifies project-related noise levels and recommends appropriate mitigation measures to achieve compliance with the City's noise standards. The acoustical analysis should be the responsibility of the project applicant and should be completed prior to issuance of a building permit.

4.3 Noise from Construction (Less Than Significant)

Construction noise could occur at various locations within the project site through the build-out period. The majority of construction activities would occur at distances of greater than 300 feet from nearby noise-sensitive land uses (residences/surgery center/medical offices). Table XI provides typical construction-related noise levels at reference distances of 200 feet, 300 feet, and 500 feet.

Noise associated with construction is exempt from City of Bakersfield noise standards if all construction activities are limited to between the hours of 6:00 a.m. to 9:00 p.m. on weekdays, and between 8:00 a.m. and 9:00 p.m. on weekends, when construction is within 1,000 feet of a residence. In addition to these allowable hours of construction, the incorporation of best management practices related to construction noise should be considered.

TABLE XI

TYPICAL CONSTRUCTION EQUIPMENT MAXIMUM NOISE LEVELS, dBA

Type of Equipment	200 Ft.	300 Ft.	500 Ft.
Backhoe	66	62	58
Concrete Saw	78	74	70
Crane	69	65	61
Excavator	69	65	61
Front End Loader	67	63	59
Jackhammer	77	73	69
Paver	65	61	57
Pneumatic Tools	73	69	65
Dozer	70	66	62
Rollers	68	64	60
Trucks	74	70	66
Pumps	68	64	60
Scrapers	75	71	67
Portable Generators	68	64	60
Front Loader	74	70	66
Excavator	74	70	66
Grader	74	70	66

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

Construction Best Management Practices:

- Limit construction to the hours of 6:00 a.m. to 9:00 p.m. on weekdays, and between 8:00 a.m. and 9:00 p.m. on weekends, when construction is within 1,000 feet of a residence (required by City of Bakersfield)

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

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

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

- Signs should be posted at the construction site displaying hours of construction activities and a contact phone number.

4.4 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. Vibration from construction activities could be detected at the closest sensitive land uses, especially during movements by heavy equipment or loaded trucks and during some paving activities. There are no existing sensitive receptors located within 100 feet of the overall project site. As a point of reference, typical vibration levels at distances of 20 feet, 100 feet, and 300 feet are summarized by Table XII.

TABLE XII

TYPICAL VIBRATION LEVELS DURING CONSTRUCTION

	PPV (in/sec)		
Equipment	@ 25´	@ 100´	@ 300´
Bulldozer (Large)	0.089	0.019	0.006
Bulldozer (Small)	0.003	0.0006	0.0002
Loaded Truck	0.076	0.017	0.005
Jackhammer	0.035	0.008	0.002
Vibratory Roller	0.210	0.046	0.013
Caisson Drilling	0.089	0.019	0.006

Source: *Caltrans*

Table XII indicates that the equipment with the highest potential vibration levels would be a vibratory roller. While in use, a roller could produce vibration levels of approximately 0.046 PPV (in/sec) at a distance of 100 feet. As described in Table III and Table IV, such levels would not cause damage to any of the described building types and could be "barely noticeable" at the closest residence if the equipment was used continuously or frequently. Such levels are not considered to be a significant impact.

4.5 Noise Impacts to On-Site Proposed Noise-Sensitive Uses (Less Than Significant)

The proposed mixed-use development includes two proposed hotels as well as a surgery center/medical offices facility, to be located within the northeast portion of the project site. Transient lodging (hotels and motels) as well as the surgery center/medical offices are considered to be a noise-sensitive land use. The Noise Element establishes an exterior noise level standard of 65 dB CNEL and an interior noise level standard of 45 dB CNEL.

The exterior noise level standard of 65 dB CNEL would be applied to common outdoor activity areas of the hotel such as the pool area, picnic/BBQ area or common courtyard. Based upon the project site plan (Figure 1) the proposed hotels would not be located near any arterial roadways, and traffic noise exposure would not exceed 65 dB CNEL.

The surgery center/medical offices facility would not typically include any outdoor activity areas to where the exterior noise standard would apply. However, using the above-described FHWA model and the distance from the surgery center to Hageman Road (approximately 200 feet), exterior noise levels in the vicinity of the surgery center were calculated to be approximately 62 dB CNEL (2045 plus project traffic conditions).

A specific analysis of interior noise levels was not performed for the surgery center building. However, it may be assumed that construction methods complying with current building code requirements will reduce exterior noise levels by a minimum of 20 dB if windows and doors are closed. This will be sufficient for compliance with the City's 45 dB CENL interior standard (62 dB-20 dB=42 dB).

4.6 Noise Impacts from Nearby Airports or Airstrips (Less Than Significant)

The Project site is located less than two (2) miles from the Bakersfield Meadows Field Airport. WJVA reviewed the airport noise contours provided in the Airport Land Use Compatibility Plan[7] which indicated that the airport noise contours (60-70 dB CNEL) do not encompass any portion of the project site. Therefore, noise levels associated with the Meadows Field Airport would not be considered a significant noise impact at proposed land uses within the project site. The airport CNEL noise contours are provided as Figure 15.

[7] *Airport Land Use Compatibility Plan*, County of Kern, November 13, 2012

5. IMPACT SUMMARY

- Project-related increases in traffic noise exposure would not result in any significant impacts along roadways in the project vicinity.

- Noise associated with proposed July 4th fireworks show could exceed City of Bakersfield stationary noise standards at nearby noise-sensitive land uses. As such, permitting of any such fireworks show would require a specific variance from the City of Bakersfield and not subject to the environmental noise assessment provided in this analysis and report.

- **Potential Impact**:
  Noise levels from new stationary noise sources cannot be predicted with any certainty at this time since specific uses have not yet been proposed and the locations of stationary noise sources relative to the locations of noise sensitive uses are not known. However, under some circumstances there is a potential for such uses exceed the City's noise standards for stationary noise sources at the locations of sensitive receptors.

- **Mitigation Measures:**
  Noise levels from new stationary noise sources may be effectively mitigated by incorporating noise mitigation measures into the project design that consider the geographical relationship between the noise sources of concern and potential receptors, the noise-producing characteristics of the sources and the path of transmission between noise sources and sensitive receptors. Options for noise mitigation include the use of building setbacks, the construction of sound walls and the use of noise source equipment enclosures.

  When specific uses within the study area are proposed that could result in a noise-related conflict between a commercial or other stationary noise source and existing or proposed noise-sensitive receptor, an acoustical analysis should be required that quantifies project-related noise levels and recommends appropriate mitigation measures to achieve compliance with the City's noise standards. The acoustical analysis should be the responsibility of the project applicant and should be completed prior to issuance of a building permit.

FIGURE 1: PROJECT LOCATION

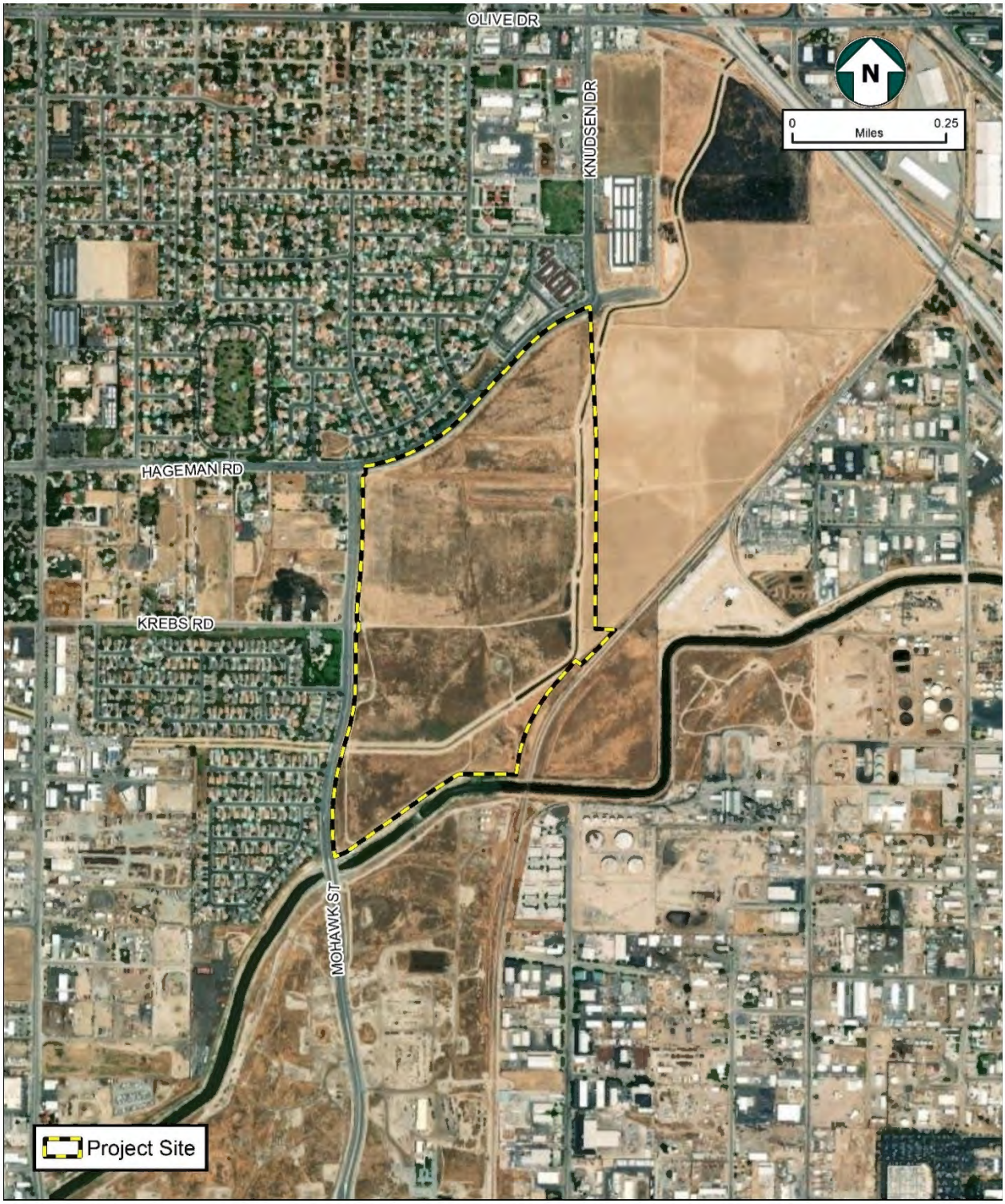


FIGURE 2: PROJECT SITE PLAN

FIGURE 3: PROJECT VICINITY AND AMBIENT NOISE MONITORING SITES

FIGURE 4: HOURLY NOISE LEVELS AT SITE LT-1

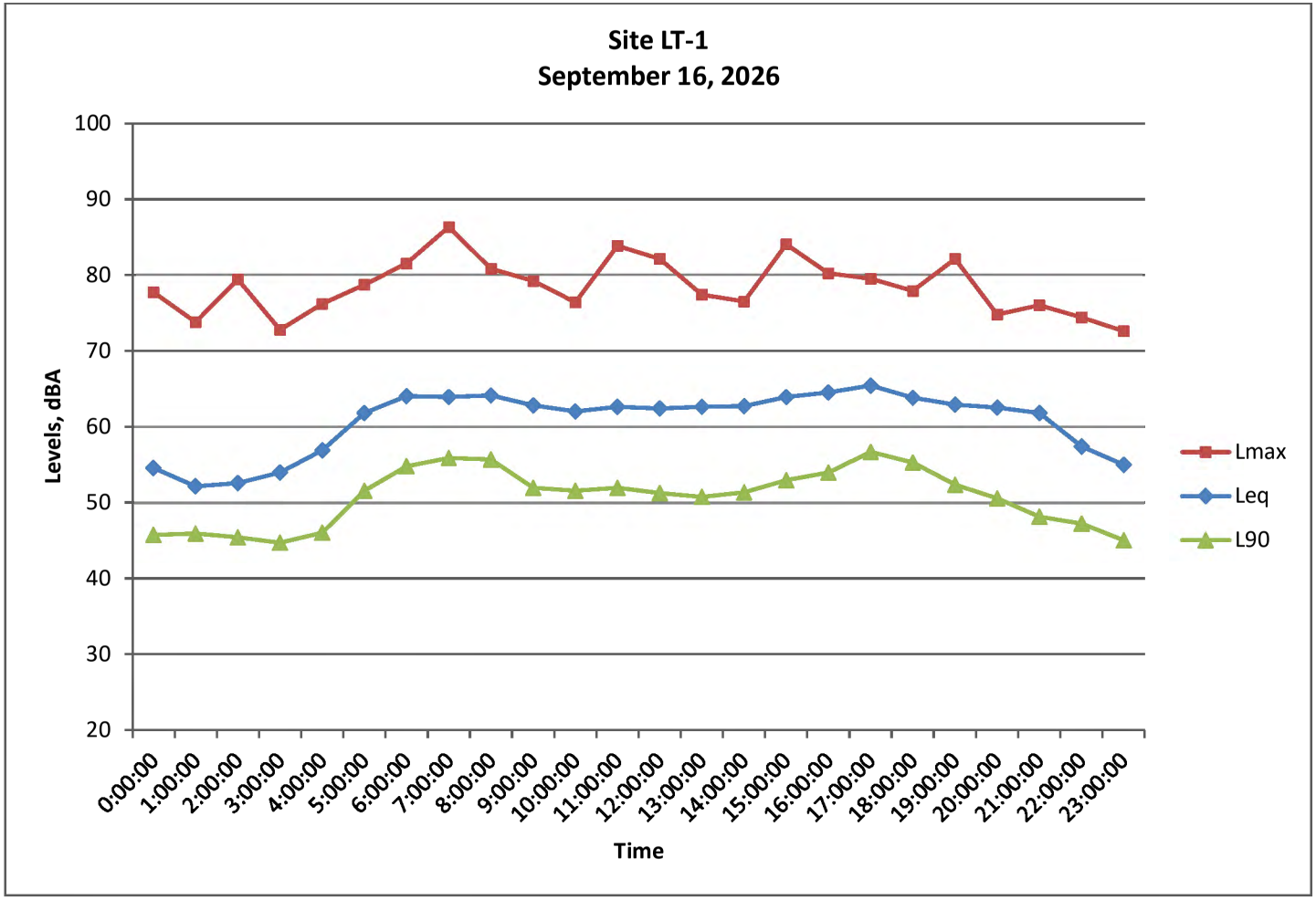


FIGURE 5: SITE LT-1

FIGURE 6: HOURLY NOISE LEVELS AT SITE LT-2

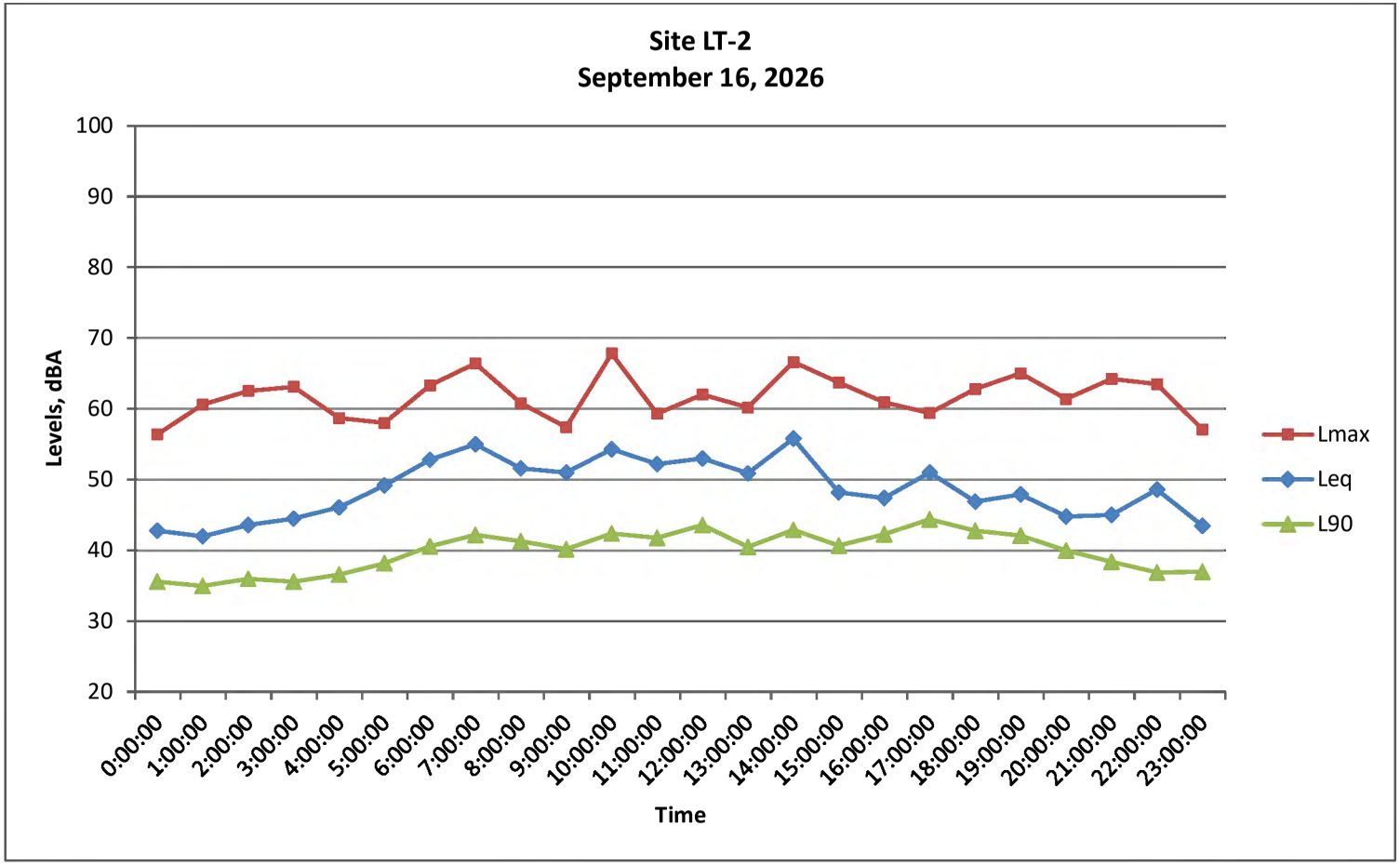


FIGURE 7: SITE LT-2

FIGURE 8: HOURLY NOISE LEVELS AT SITE LT-3

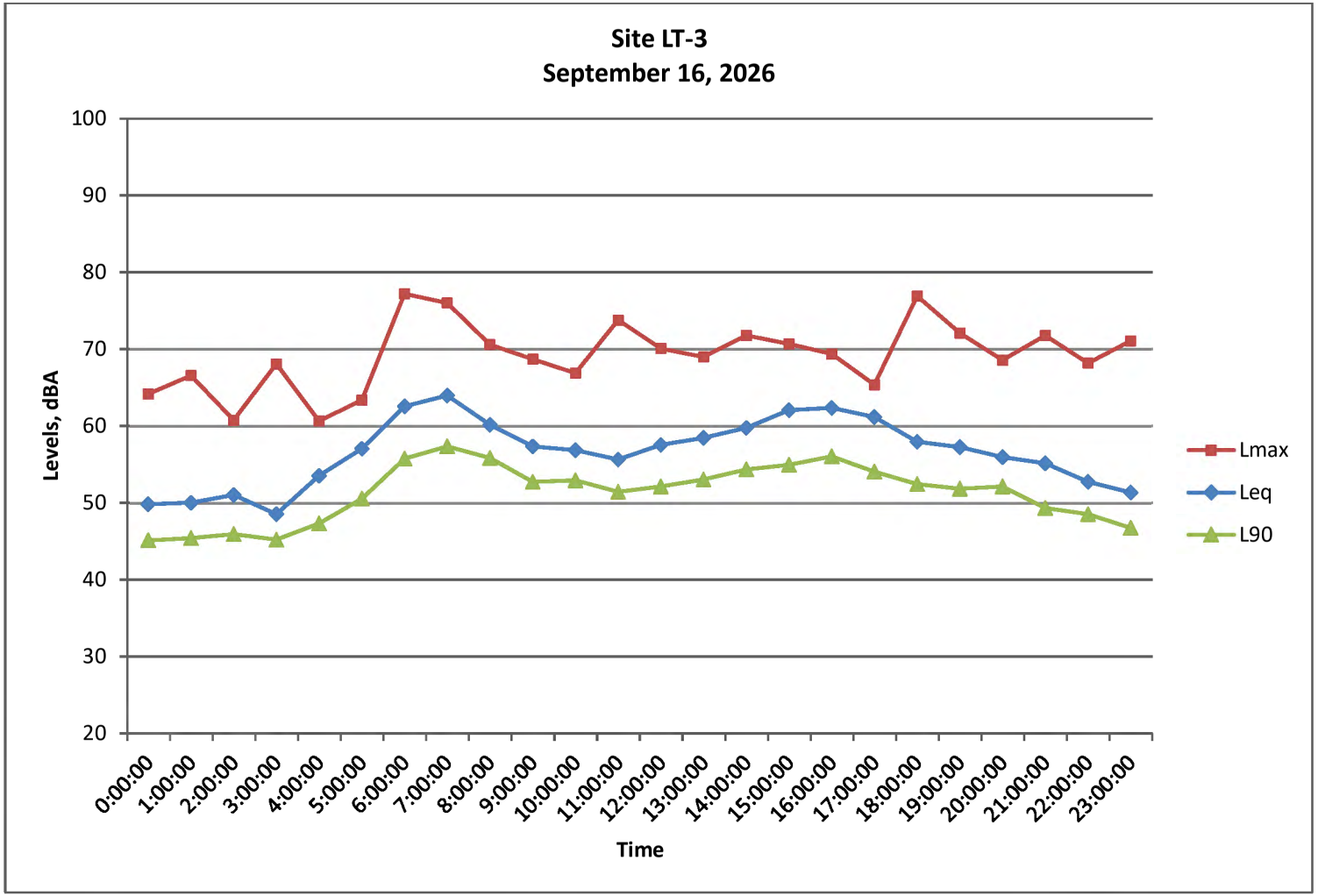


FIGURE 9: SITE LT-3

FIGURE 10: HOURLY NOISE LEVELS AT SITE LT-4

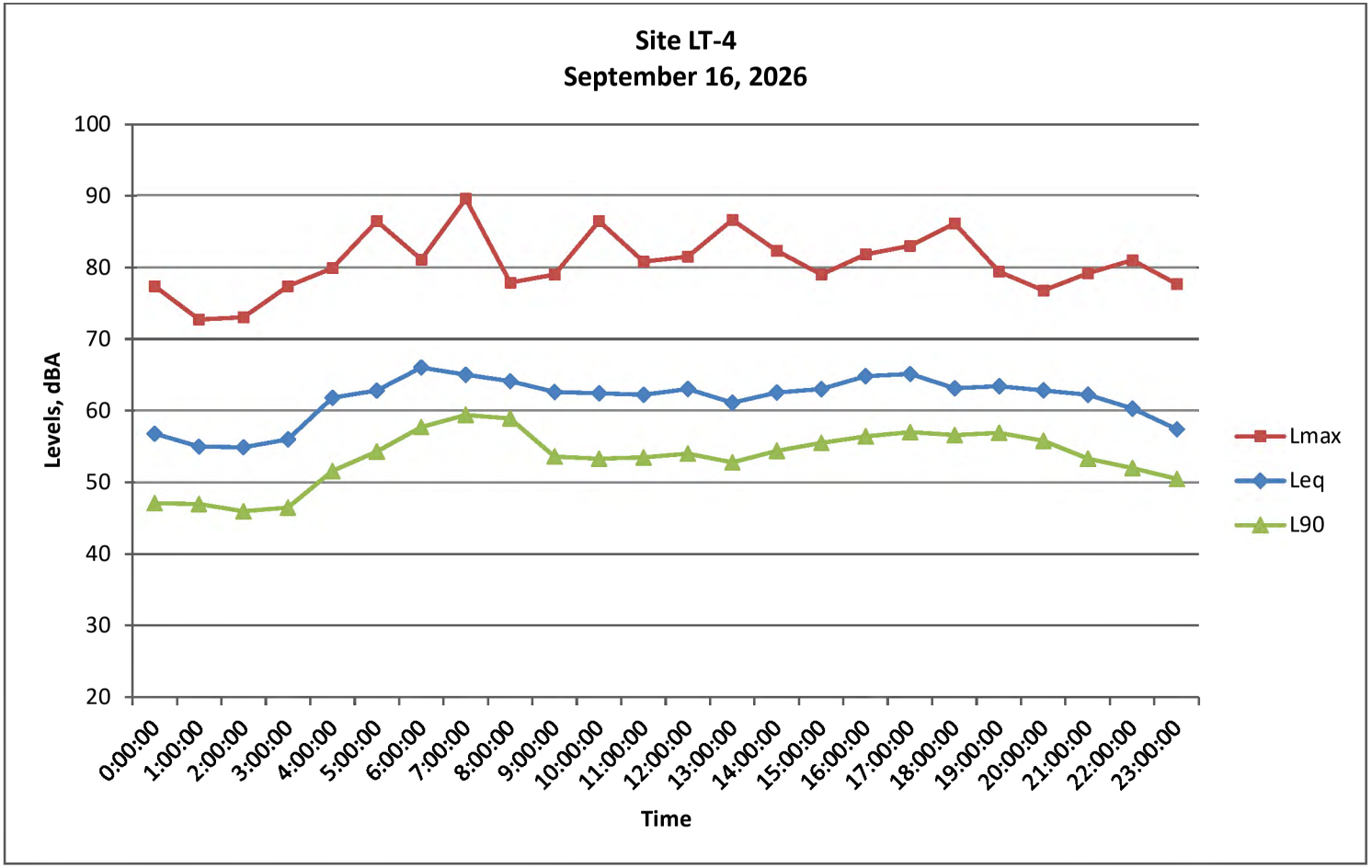


FIGURE 11: SITE LT-4

FIGURE 12: PROPOSED GENERAL PLAN LAND USE DESIGNATIONS

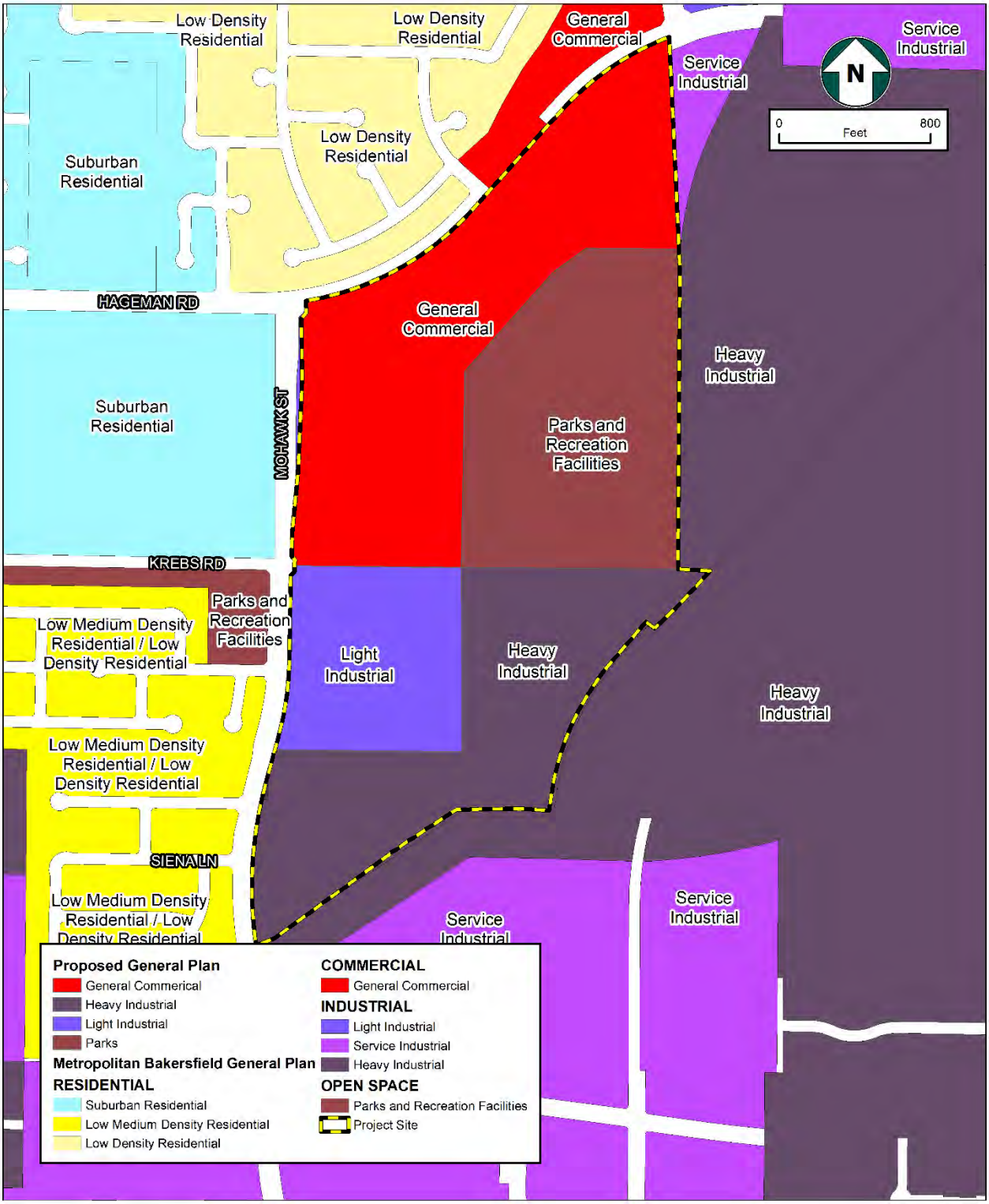


FIGURE 13: HOURLY NOISE LEVELS AT SITE IWP-LT

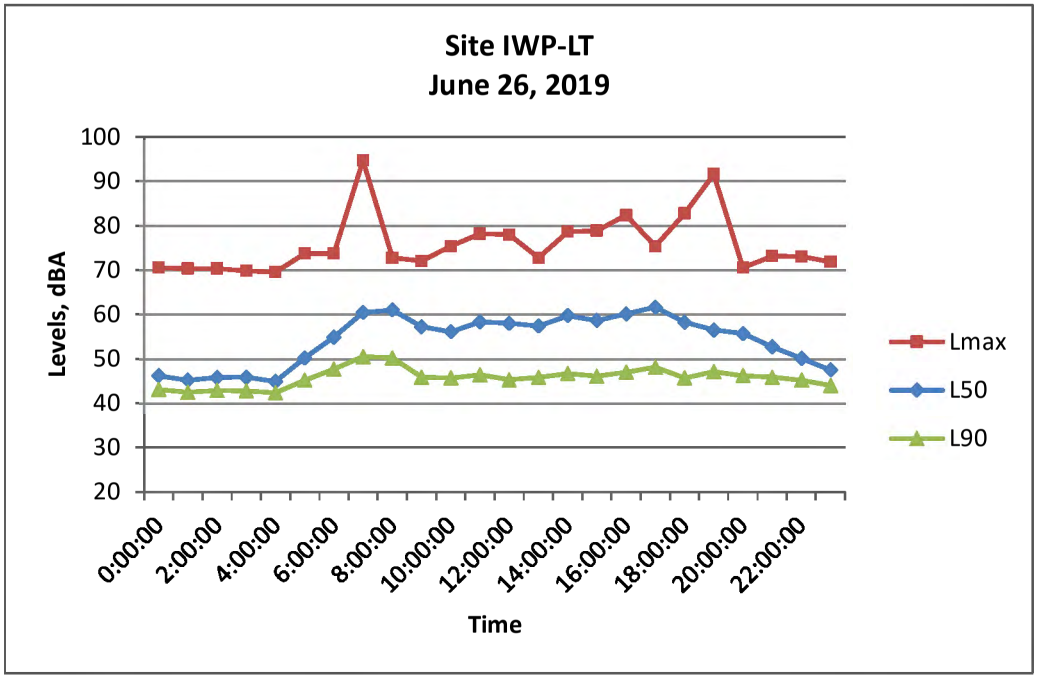


FIGURE 14: REFERENCE NOISE MONITORING SITES, ISLAND WATERPARK, FRESNO

FIGURE 15: MEADOWS FIELD AIRPORT NOISE CONTOURS (1993)

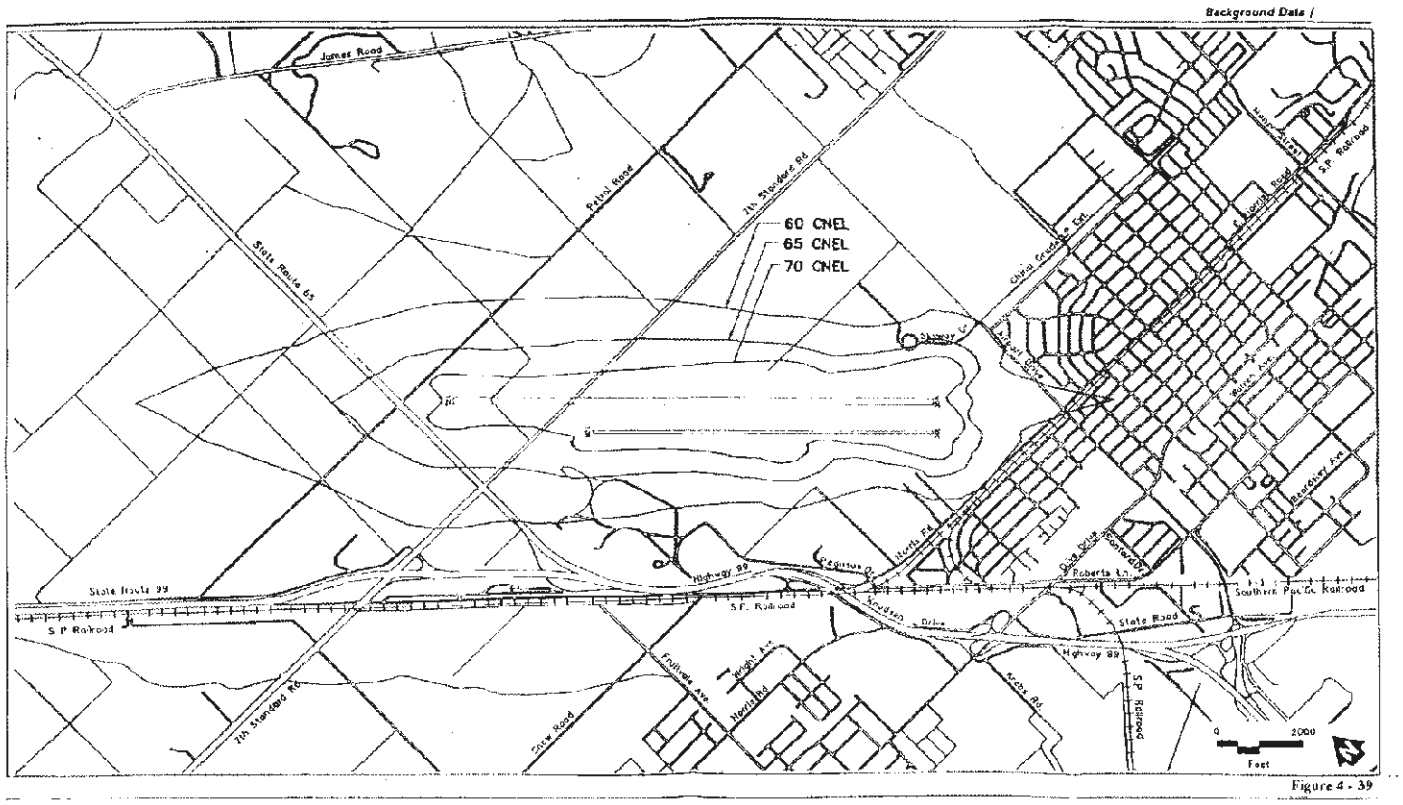


Figure 4 - 39

Noise Contours
Meadows Field Airport

4 - 76

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.

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.

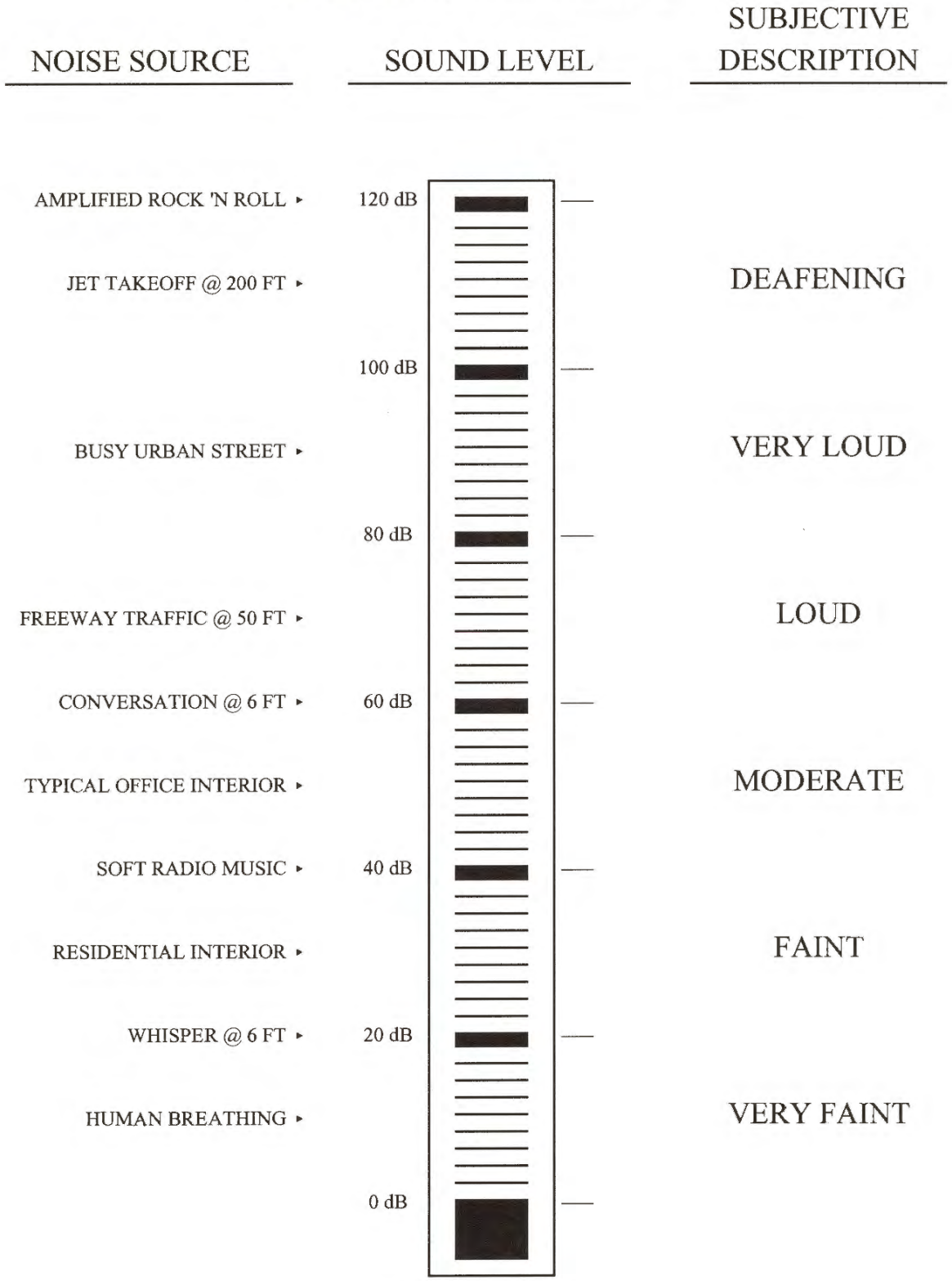
NOISE LEVEL REDUCTION (NLR): The noise reduction between indoor and outdoor environments or between two rooms that is the numerical difference, in decibels, of the average sound pressure levels in those areas or rooms. A measurement of Anoise level reduction" combines the effect of the transmission loss 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
September 23, 2026

Project #:	24-47 Tortuga Bay Dev.
Description:	2030
Ldn/Cnel:	CNEL
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	Norris Road	Coffee Road to Patton Way	6807	77	14	9	1	1.5	45	100	
2	Olive Drive	Calloway Drive to Riverlakes Drive	22458	77	14	9	1	1.5	50	100	
3	Olive Drive	Riverlakes Drive to Coffee Road	22003	77	14	9	1	1.5	50	100	
4	Olive Drive	Coffee Road to Patton Way	21865	77	14	9	1	1.5	45	100	
5	Olive Drive	Patton Way to Fruitvale Avenue	22894	77	14	9	1	1.5	45	100	
6	Olive Drive	Fruitvale Avenue to Mohawk Street	20244	77	14	9	1	1.5	45	100	
7	Olive Drive	Mohawk Street to Knudsen Avenue	18665	77	14	9	1	1.5	45	100	
8	Olive Drive	Knudsen Avenue to SR 99 NB Ramps	44019	77	14	9	1	1.5	45	100	
9	Olive Drive	SR 99 to Roberts Lane	18135	77	14	9	1	1.5	45	100	
10	Olive Drive	Roberts Lane to Airport Drive	11776	77	14	9	1	1.5	45	100	
11	Hageman Road	Calloway Drive to Riverlakes Drive	21515	77	14	9	1	1.5	45	100	
12	Hageman Road	Riverlakes Drive to Coffee Road	24552	77	14	9	1	1.5	45	100	
13	Hageman Road	Coffee Road to Patton Way	24587	77	14	9	1	1.5	45	100	
14	Hageman Road	Patton Way to Fruitvale Avenue	23752	77	14	9	1	1.5	45	100	
15	Hageman Road	Fruitvale Avenue to Mohawk Street	15308	77	14	9	1	1.5	45	100	
16	Hageman Road	Mohawk Street to Knudsen Avenue	15091	77	14	9	1	1.5	45	100	
17	Rosedale Highway (SR 58)	Coffee Road to Fruitvale Avenue	36668	77	14	9	1	1.5	50	100	
18	Rosedale Highway (SR 58)	Fruitvale Avenue to Mohawk Street	43355	77	14	9	1	1.5	50	100	
19	Rosedale Highway (SR 58)	Mohawk Street to SR 99	37393	77	14	9	1	1.5	50	100	
20	24th Street (SR 178)	SR 99 to Oak Street	48997	77	14	9	1	1.5	40	100	
21	Calloway Drive	Hageman Road to Olive Drive	24780	77	14	9	1	1.5	50	100	
22	Riverlakes Drive	Coffee Road to Hageman Road	6968	77	14	9	1	1.5	45	100	
23	Coffee Road	Rosedaly Highway (SR 58) to Meany Avenue	27383	77	14	9	1	1.5	55	100	
24	Coffee Road	Meany Avenue to Hageman Road	29129	77	14	9	1	1.5	55	100	
25	Coffee Road	Hageman Road to Olive Drive	27791	77	14	9	1	1.5	55	100	
26	Coffee Road	Olive Drive to Norris Road	18478	77	14	9	1	1.5	55	100	
27	Patton Way	Hageman Road to Olive Drive	2358	77	14	9	1	1.5	40	100	
28	Patton Way	Olive Drive to Norris Road	2300	77	14	9	1	1.5	40	100	
29	Fruitvale Avenue	Rosedaly Highway (SR 58) to Meany Avenue	9872	77	14	9	1	1.5	45	100	
30	Fruitvale Avenue	Meany Avenue to Hageman Road	9769	77	14	9	1	1.5	45	100	
31	Fruitvale Avenue	Hageman Road to Olive Drive	5948	77	14	9	1	1.5	45	100	
32	Mohawk Street	Westside Parkway to Rosedaly Highway (SR 58)	31744	77	14	9	1	1.5	55	100	
33	Mohawk Street	Rosedaly Highway (SR 58) to Hageman Road	16094	77	14	9	1	1.5	55	100	
34	Knudsen Avenue	Hageman Road to Olive Drive	11509	77	14	9	1	1.5	50	100	

WJV Acoustics, Inc
FHWA-RD-77-108
Calculation Sheets
September 23, 2026

Project #: 24-47 Tortuga Bay Dev.
Description: 2030
Ldn/Cnel: CNEL
Site Type: Soft

Segment	Roadway Name	Segment Description	Autos	Medium Trucks	Heavy Trucks	Cumulative CNEL
1	Norris Road	Coffee Road to Patton Way	59.3	47.7	53.9	60.7
2	Olive Drive	Calloway Drive to Riverlakes Drive	65.8	53.6	59.5	66.9
3	Olive Drive	Riverlakes Drive to Coffee Road	65.7	53.5	59.5	66.9
4	Olive Drive	Coffee Road to Patton Way	64.4	52.8	59.0	65.7
5	Olive Drive	Patton Way to Fruitvale Avenue	64.6	53.0	59.2	65.9
6	Olive Drive	Fruitvale Avenue to Mohawk Street	64.1	52.4	58.7	65.4
7	Olive Drive	Mohawk Street to Knudsen Avenue	63.7	52.1	58.3	65.0
8	Olive Drive	Knudsen Avenue to SR 99 NB Ramps	67.4	55.8	62.0	68.8
9	Olive Drive	SR 99 to Roberts Lane	63.6	51.9	58.2	64.9
10	Olive Drive	Roberts Lane to Airport Drive	61.7	50.1	56.3	63.0
11	Hageman Road	Calloway Drive to Riverlakes Drive	64.3	52.7	58.9	65.7
12	Hageman Road	Riverlakes Drive to Coffee Road	64.9	53.3	59.5	66.2
13	Hageman Road	Coffee Road to Patton Way	64.9	53.3	59.5	66.2
14	Hageman Road	Patton Way to Fruitvale Avenue	64.8	53.1	59.4	66.1
15	Hageman Road	Fruitvale Avenue to Mohawk Street	62.8	51.2	57.5	64.2
16	Hageman Road	Mohawk Street to Knudsen Avenue	62.8	51.1	57.4	64.1
17	Rosedale Highway (SR 58)	Coffee Road to Fruitvale Avenue	68.0	55.7	61.7	69.1
18	Rosedale Highway (SR 58)	Fruitvale Avenue to Mohawk Street	68.7	56.4	62.4	69.8
19	Rosedale Highway (SR 58)	Mohawk Street to SR 99	68.0	55.8	61.8	69.2
20	24th Street (SR 178)	SR 99 to Oak Street	66.4	55.5	62.0	68.0
21	Calloway Drive	Hageman Road to Olive Drive	66.3	54.0	60.0	67.4
22	Riverlakes Drive	Coffee Road to Hageman Road	59.4	47.8	54.0	60.8
23	Coffee Road	Rosedaly Highway (SR 58) to Meany Avenue	67.9	55.1	60.8	68.8
24	Coffee Road	Meany Avenue to Hageman Road	68.1	55.4	61.1	69.1
25	Coffee Road	Hageman Road to Olive Drive	67.9	55.2	60.9	68.9
26	Coffee Road	Olive Drive to Norris Road	66.2	53.4	59.1	67.1
27	Patton Way	Hageman Road to Olive Drive	53.2	42.3	48.9	54.8
28	Patton Way	Olive Drive to Norris Road	53.1	42.2	48.8	54.7
29	Fruitvale Avenue	Rosedaly Highway (SR 58) to Meany Avenue	60.9	49.3	55.6	62.3
30	Fruitvale Avenue	Meany Avenue to Hageman Road	60.9	49.3	55.5	62.2
31	Fruitvale Avenue	Hageman Road to Olive Drive	58.7	47.1	53.4	60.1
32	Mohawk Street	Westside Parkway to Rosedaly Highway (SR 58)	68.5	55.7	61.4	69.5
33	Mohawk Street	Rosedaly Highway (SR 58) to Hageman Road	65.6	52.8	58.5	66.5
34	Knudsen Avenue	Hageman Road to Olive Drive	62.9	50.7	56.6	64.0

WJV Acoustics, Inc
FHWA-RD-77-108
Calculation Sheets
September 23, 2026

Project #:	24-47 Tortuga Bay Dev.
Description:	2030 + Phase I Project
Ldn/Cnel:	CNEL
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	Norris Road	Coffee Road to Patton Way	6983	77	14	9	1	1.5	45	100	
2	Olive Drive	Calloway Drive to Riverlakes Drive	23747	77	14	9	1	1.5	50	100	
3	Olive Drive	Riverlakes Drive to Coffee Road	23269	77	14	9	1	1.5	50	100	
4	Olive Drive	Coffee Road to Patton Way	23264	77	14	9	1	1.5	45	100	
5	Olive Drive	Patton Way to Fruitvale Avenue	24744	77	14	9	1	1.5	45	100	
6	Olive Drive	Fruitvale Avenue to Mohawk Street	23184	77	14	9	1	1.5	45	100	
7	Olive Drive	Mohawk Street to Knudsen Avenue	21671	77	14	9	1	1.5	45	100	
8	Olive Drive	Knudsen Avenue to SR 99 NB Ramps	47025	77	14	9	1	1.5	45	100	
9	Olive Drive	SR 99 to Roberts Lane	21625	77	14	9	1	1.5	45	100	
10	Olive Drive	Roberts Lane to Airport Drive	15226	77	14	9	1	1.5	45	100	
11	Hageman Road	Calloway Drive to Riverlakes Drive	22363	77	14	9	1	1.5	45	100	
12	Hageman Road	Riverlakes Drive to Coffee Road	25675	77	14	9	1	1.5	45	100	
13	Hageman Road	Coffee Road to Patton Way	26922	77	14	9	1	1.5	45	100	
14	Hageman Road	Patton Way to Fruitvale Avenue	26328	77	14	9	1	1.5	45	100	
15	Hageman Road	Fruitvale Avenue to Mohawk Street	18611	77	14	9	1	1.5	45	100	
16	Hageman Road	Mohawk Street to Knudsen Avenue	17811	77	14	9	1	1.5	45	100	
17	Rosedale Highway (SR 58)	Coffee Road to Fruitvale Avenue	38276	77	14	9	1	1.5	50	100	
18	Rosedale Highway (SR 58)	Fruitvale Avenue to Mohawk Street	45007	77	14	9	1	1.5	50	100	
19	Rosedale Highway (SR 58)	Mohawk Street to SR 99	39265	77	14	9	1	1.5	50	100	
20	24th Street (SR 178)	SR 99 to Oak Street	49889	77	14	9	1	1.5	40	100	
21	Calloway Drive	Hageman Road to Olive Drive	24946	77	14	9	1	1.5	50	100	
22	Riverlakes Drive	Coffee Road to Hageman Road	6990	77	14	9	1	1.5	45	100	
23	Coffee Road	Rosedaly Highway (SR 58) to Meany Avenue	27636	77	14	9	1	1.5	55	100	
24	Coffee Road	Meany Avenue to Hageman Road	29547	77	14	9	1	1.5	55	100	
25	Coffee Road	Hageman Road to Olive Drive	28661	77	14	9	1	1.5	55	100	
26	Coffee Road	Olive Drive to Norris Road	18610	77	14	9	1	1.5	55	100	
27	Patton Way	Hageman Road to Olive Drive	2644	77	14	9	1	1.5	40	100	
28	Patton Way	Olive Drive to Norris Road	2538	77	14	9	1	1.5	40	100	
29	Fruitvale Avenue	Rosedaly Highway (SR 58) to Meany Avenue	9916	77	14	9	1	1.5	45	100	
30	Fruitvale Avenue	Meany Avenue to Hageman Road	10370	77	14	9	1	1.5	45	100	
31	Fruitvale Avenue	Hageman Road to Olive Drive	6565	77	14	9	1	1.5	45	100	
32	Mohawk Street	Westside Parkway to Rosedaly Highway (SR 58)	35312	77	14	9	1	1.5	55	100	
33	Mohawk Street	Rosedaly Highway (SR 58) to Hageman Road	20983	77	14	9	1	1.5	55	100	
34	Knudsen Avenue	Hageman Road to Olive Drive	18005	77	14	9	1	1.5	50	100	

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Project #: 24-47 Tortuga Bay Dev.
Description: 2030 + Phase I Project
Ldn/Cnel: CNEL
Site Type: Soft

Segment	Roadway Name	Segment Description	Autos	Medium Trucks	Heavy Trucks	Cumulative CNEL
1	Norris Road	Coffee Road to Patton Way	59.4	47.8	54.1	60.8
2	Olive Drive	Calloway Drive to Riverlakes Drive	66.1	53.8	59.8	67.2
3	Olive Drive	Riverlakes Drive to Coffee Road	66.0	53.7	59.7	67.1
4	Olive Drive	Coffee Road to Patton Way	64.7	53.0	59.3	66.0
5	Olive Drive	Patton Way to Fruitvale Avenue	64.9	53.3	59.5	66.3
6	Olive Drive	Fruitvale Avenue to Mohawk Street	64.6	53.0	59.3	66.0
7	Olive Drive	Mohawk Street to Knudsen Avenue	64.4	52.7	59.0	65.7
8	Olive Drive	Knudsen Avenue to SR 99 NB Ramps	67.7	56.1	62.3	69.0
9	Olive Drive	SR 99 to Roberts Lane	64.3	52.7	59.0	65.7
10	Olive Drive	Roberts Lane to Airport Drive	62.8	51.2	57.4	64.1
11	Hageman Road	Calloway Drive to Riverlakes Drive	64.5	52.8	59.1	65.8
12	Hageman Road	Riverlakes Drive to Coffee Road	65.1	53.4	59.7	66.4
13	Hageman Road	Coffee Road to Patton Way	65.3	53.7	59.9	66.6
14	Hageman Road	Patton Way to Fruitvale Avenue	65.2	53.6	59.8	66.5
15	Hageman Road	Fruitvale Avenue to Mohawk Street	63.7	52.1	58.3	65.0
16	Hageman Road	Mohawk Street to Knudsen Avenue	63.5	51.9	58.1	64.8
17	Rosedale Highway (SR 58)	Coffee Road to Fruitvale Avenue	68.1	55.9	61.9	69.3
18	Rosedale Highway (SR 58)	Fruitvale Avenue to Mohawk Street	68.8	56.6	62.6	70.0
19	Rosedale Highway (SR 58)	Mohawk Street to SR 99	68.3	56.0	62.0	69.4
20	24th Street (SR 178)	SR 99 to Oak Street	66.5	55.5	62.1	68.1
21	Calloway Drive	Hageman Road to Olive Drive	66.3	54.0	60.0	67.4
22	Riverlakes Drive	Coffee Road to Hageman Road	59.4	47.8	54.1	60.8
23	Coffee Road	Rosedaly Highway (SR 58) to Meany Avenue	67.9	55.1	60.8	68.9
24	Coffee Road	Meany Avenue to Hageman Road	68.2	55.4	61.1	69.2
25	Coffee Road	Hageman Road to Olive Drive	68.1	55.3	61.0	69.0
26	Coffee Road	Olive Drive to Norris Road	66.2	53.4	59.1	67.2
27	Patton Way	Hageman Road to Olive Drive	53.7	42.8	49.4	55.3
28	Patton Way	Olive Drive to Norris Road	53.6	42.6	49.2	55.2
29	Fruitvale Avenue	Rosedaly Highway (SR 58) to Meany Avenue	61.0	49.3	55.6	62.3
30	Fruitvale Avenue	Meany Avenue to Hageman Road	61.2	49.5	55.8	62.5
31	Fruitvale Avenue	Hageman Road to Olive Drive	59.2	47.5	53.8	60.5
32	Mohawk Street	Westside Parkway to Rosedaly Highway (SR 58)	69.0	56.2	61.9	69.9
33	Mohawk Street	Rosedaly Highway (SR 58) to Hageman Road	66.7	53.9	59.6	67.7
34	Knudsen Avenue	Hageman Road to Olive Drive	64.9	52.6	58.6	66.0

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September 23, 2026

Project #:	24-47 Tortuga Bay Dev.
Description:	2035
Ldn/Cnel:	CNEL
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	Norris Road	Coffee Road to Patton Way	7037	77	14	9	1	1.5	45	100	
2	Olive Drive	Calloway Drive to Riverlakes Drive	24208	77	14	9	1	1.5	50	100	
3	Olive Drive	Riverlakes Drive to Coffee Road	23269	77	14	9	1	1.5	50	100	
4	Olive Drive	Coffee Road to Patton Way	22087	77	14	9	1	1.5	45	100	
5	Olive Drive	Patton Way to Fruitvale Avenue	22970	77	14	9	1	1.5	45	100	
6	Olive Drive	Fruitvale Avenue to Mohawk Street	20224	77	14	9	1	1.5	45	100	
7	Olive Drive	Mohawk Street to Knudsen Avenue	17184	77	14	9	1	1.5	45	100	
8	Olive Drive	Knudsen Avenue to SR 99 NB Ramps	40526	77	14	9	1	1.5	45	100	
9	Olive Drive	SR 99 to Roberts Lane	18512	77	14	9	1	1.5	45	100	
10	Olive Drive	Roberts Lane to Airport Drive	12217	77	14	9	1	1.5	45	100	
11	Hageman Road	Calloway Drive to Riverlakes Drive	22502	77	14	9	1	1.5	45	100	
12	Hageman Road	Riverlakes Drive to Coffee Road	26475	77	14	9	1	1.5	45	100	
13	Hageman Road	Coffee Road to Patton Way	26521	77	14	9	1	1.5	45	100	
14	Hageman Road	Patton Way to Fruitvale Avenue	25849	77	14	9	1	1.5	45	100	
15	Hageman Road	Fruitvale Avenue to Mohawk Street	17048	77	14	9	1	1.5	45	100	
16	Hageman Road	Mohawk Street to Knudsen Avenue	16569	77	14	9	1	1.5	45	100	
17	Rosedale Highway (SR 58)	Coffee Road to Fruitvale Avenue	37582	77	14	9	1	1.5	50	100	
18	Rosedale Highway (SR 58)	Fruitvale Avenue to Mohawk Street	43986	77	14	9	1	1.5	50	100	
19	Rosedale Highway (SR 58)	Mohawk Street to SR 99	35452	77	14	9	1	1.5	50	100	
20	24th Street (SR 178)	SR 99 to Oak Street	52567	77	14	9	1	1.5	40	100	
21	Calloway Drive	Hageman Road to Olive Drive	27203	77	14	9	1	1.5	50	100	
22	Riverlakes Drive	Coffee Road to Hageman Road	7057	77	14	9	1	1.5	45	100	
23	Coffee Road	Rosedaly Highway (SR 58) to Meany Avenue	27904	77	14	9	1	1.5	55	100	
24	Coffee Road	Meany Avenue to Hageman Road	31374	77	14	9	1	1.5	55	100	
25	Coffee Road	Hageman Road to Olive Drive	31111	77	14	9	1	1.5	55	100	
26	Coffee Road	Olive Drive to Norris Road	21286	77	14	9	1	1.5	55	100	
27	Patton Way	Hageman Road to Olive Drive	2454	77	14	9	1	1.5	40	100	
28	Patton Way	Olive Drive to Norris Road	2358	77	14	9	1	1.5	40	100	
29	Fruitvale Avenue	Rosedaly Highway (SR 58) to Meany Avenue	10121	77	14	9	1	1.5	45	100	
30	Fruitvale Avenue	Meany Avenue to Hageman Road	9908	77	14	9	1	1.5	45	100	
31	Fruitvale Avenue	Hageman Road to Olive Drive	6371	77	14	9	1	1.5	45	100	
32	Mohawk Street	Westside Parkway to Rosedaly Highway (SR 58)	34877	77	14	9	1	1.5	55	100	
33	Mohawk Street	Rosedaly Highway (SR 58) to Hageman Road	18209	77	14	9	1	1.5	55	100	
34	Knudsen Avenue	Hageman Road to Olive Drive	12358	77	14	9	1	1.5	50	100	

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Project #: 24-47 Tortuga Bay Dev.
Description: 2035
Ldn/Cnel: CNEL
Site Type: Soft

Segment	Roadway Name	Segment Description	Autos	Medium Trucks	Heavy Trucks	Cumulative CNEL
1	Norris Road	Coffee Road to Patton Way	59.5	47.8	54.1	60.8
2	Olive Drive	Calloway Drive to Riverlakes Drive	66.2	53.9	59.9	67.3
3	Olive Drive	Riverlakes Drive to Coffee Road	66.0	53.7	59.7	67.1
4	Olive Drive	Coffee Road to Patton Way	64.4	52.8	59.1	65.8
5	Olive Drive	Patton Way to Fruitvale Avenue	64.6	53.0	59.2	65.9
6	Olive Drive	Fruitvale Avenue to Mohawk Street	64.1	52.4	58.7	65.4
7	Olive Drive	Mohawk Street to Knudsen Avenue	63.3	51.7	58.0	64.7
8	Olive Drive	Knudsen Avenue to SR 99 NB Ramps	67.1	55.4	61.7	68.4
9	Olive Drive	SR 99 to Roberts Lane	63.7	52.0	58.3	65.0
10	Olive Drive	Roberts Lane to Airport Drive	61.9	50.2	56.5	63.2
11	Hageman Road	Calloway Drive to Riverlakes Drive	64.5	52.9	59.1	65.8
12	Hageman Road	Riverlakes Drive to Coffee Road	65.2	53.6	59.8	66.6
13	Hageman Road	Coffee Road to Patton Way	65.2	53.6	59.8	66.6
14	Hageman Road	Patton Way to Fruitvale Avenue	65.1	53.5	59.7	66.4
15	Hageman Road	Fruitvale Avenue to Mohawk Street	63.3	51.7	57.9	64.6
16	Hageman Road	Mohawk Street to Knudsen Avenue	63.2	51.5	57.8	64.5
17	Rosedale Highway (SR 58)	Coffee Road to Fruitvale Avenue	68.1	55.8	61.8	69.2
18	Rosedale Highway (SR 58)	Fruitvale Avenue to Mohawk Street	68.7	56.5	62.5	69.9
19	Rosedale Highway (SR 58)	Mohawk Street to SR 99	67.8	55.6	61.5	68.9
20	24th Street (SR 178)	SR 99 to Oak Street	66.7	55.8	62.3	68.3
21	Calloway Drive	Hageman Road to Olive Drive	66.7	54.4	60.4	67.8
22	Riverlakes Drive	Coffee Road to Hageman Road	59.5	47.8	54.1	60.8
23	Coffee Road	Rosedaly Highway (SR 58) to Meany Avenue	68.0	55.2	60.9	68.9
24	Coffee Road	Meany Avenue to Hageman Road	68.5	55.7	61.4	69.4
25	Coffee Road	Hageman Road to Olive Drive	68.4	55.6	61.3	69.4
26	Coffee Road	Olive Drive to Norris Road	66.8	54.0	59.7	67.7
27	Patton Way	Hageman Road to Olive Drive	53.4	42.5	49.0	55.0
28	Patton Way	Olive Drive to Norris Road	53.2	42.3	48.9	54.8
29	Fruitvale Avenue	Rosedaly Highway (SR 58) to Meany Avenue	61.0	49.4	55.7	62.4
30	Fruitvale Avenue	Meany Avenue to Hageman Road	61.0	49.3	55.6	62.3
31	Fruitvale Avenue	Hageman Road to Olive Drive	59.0	47.4	53.7	60.4
32	Mohawk Street	Westside Parkway to Rosedaly Highway (SR 58)	68.9	56.1	61.8	69.9
33	Mohawk Street	Rosedaly Highway (SR 58) to Hageman Road	66.1	53.3	59.0	67.1
34	Knudsen Avenue	Hageman Road to Olive Drive	63.2	51.0	57.0	64.4

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Project #:	24-47 Tortuga Bay Dev.
Description:	2035 + Phase I & II project
Ldn/Cnel:	CNEL
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	Norris Road	Coffee Road to Patton Way	7261	77	14	9	1	1.5	45	100	
2	Olive Drive	Calloway Drive to Riverlakes Drive	25846	77	14	9	1	1.5	50	100	
3	Olive Drive	Riverlakes Drive to Coffee Road	24879	77	14	9	1	1.5	50	100	
4	Olive Drive	Coffee Road to Patton Way	23865	77	14	9	1	1.5	45	100	
5	Olive Drive	Patton Way to Fruitvale Avenue	25322	77	14	9	1	1.5	45	100	
6	Olive Drive	Fruitvale Avenue to Mohawk Street	23961	77	14	9	1	1.5	45	100	
7	Olive Drive	Mohawk Street to Knudsen Avenue	21006	77	14	9	1	1.5	45	100	
8	Olive Drive	Knudsen Avenue to SR 99 NB Ramps	44348	77	14	9	1	1.5	45	100	
9	Olive Drive	SR 99 to Roberts Lane	22949	77	14	9	1	1.5	45	100	
10	Olive Drive	Roberts Lane to Airport Drive	16654	77	14	9	1	1.5	45	100	
11	Hageman Road	Calloway Drive to Riverlakes Drive	23581	77	14	9	1	1.5	45	100	
12	Hageman Road	Riverlakes Drive to Coffee Road	27902	77	14	9	1	1.5	45	100	
13	Hageman Road	Coffee Road to Patton Way	29849	77	14	9	1	1.5	45	100	
14	Hageman Road	Patton Way to Fruitvale Avenue	29124	77	14	9	1	1.5	45	100	
15	Hageman Road	Fruitvale Avenue to Mohawk Street	21248	77	14	9	1	1.5	45	100	
16	Hageman Road	Mohawk Street to Knudsen Avenue	20027	77	14	9	1	1.5	45	100	
17	Rosedale Highway (SR 58)	Coffee Road to Fruitvale Avenue	39626	77	14	9	1	1.5	50	100	
18	Rosedale Highway (SR 58)	Fruitvale Avenue to Mohawk Street	46087	77	14	9	1	1.5	50	100	
19	Rosedale Highway (SR 58)	Mohawk Street to SR 99	37832	77	14	9	1	1.5	50	100	
20	24th Street (SR 178)	SR 99 to Oak Street	53701	77	14	9	1	1.5	40	100	
21	Calloway Drive	Hageman Road to Olive Drive	27414	77	14	9	1	1.5	50	100	
22	Riverlakes Drive	Coffee Road to Hageman Road	7086	77	14	9	1	1.5	45	100	
23	Coffee Road	Rosedaly Highway (SR 58) to Meany Avenue	28226	77	14	9	1	1.5	55	100	
24	Coffee Road	Meany Avenue to Hageman Road	31906	77	14	9	1	1.5	55	100	
25	Coffee Road	Hageman Road to Olive Drive	32216	77	14	9	1	1.5	55	100	
26	Coffee Road	Olive Drive to Norris Road	21454	77	14	9	1	1.5	55	100	
27	Patton Way	Hageman Road to Olive Drive	2818	77	14	9	1	1.5	40	100	
28	Patton Way	Olive Drive to Norris Road	2660	77	14	9	1	1.5	40	100	
29	Fruitvale Avenue	Rosedaly Highway (SR 58) to Meany Avenue	10177	77	14	9	1	1.5	45	100	
30	Fruitvale Avenue	Meany Avenue to Hageman Road	10672	77	14	9	1	1.5	45	100	
31	Fruitvale Avenue	Hageman Road to Olive Drive	7155	77	14	9	1	1.5	45	100	
32	Mohawk Street	Westside Parkway to Rosedaly Highway (SR 58)	39413	77	14	9	1	1.5	55	100	
33	Mohawk Street	Rosedaly Highway (SR 58) to Hageman Road	24424	77	14	9	1	1.5	55	100	
34	Knudsen Avenue	Hageman Road to Olive Drive	20617	77	14	9	1	1.5	50	100	

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Project #: 24-47 Tortuga Bay Dev.
Description: 2035 + Phase I & II project
Ldn/Cnel: CNEL
Site Type: Soft

Segment	Roadway Name	Segment Description	Autos	Medium Trucks	Heavy Trucks	Cumulative CNEL
1	Norris Road	Coffee Road to Patton Way	59.6	48.0	54.2	60.9
2	Olive Drive	Calloway Drive to Riverlakes Drive	66.4	54.2	60.2	67.6
3	Olive Drive	Riverlakes Drive to Coffee Road	66.3	54.0	60.0	67.4
4	Olive Drive	Coffee Road to Patton Way	64.8	53.1	59.4	66.1
5	Olive Drive	Patton Way to Fruitvale Avenue	65.0	53.4	59.6	66.4
6	Olive Drive	Fruitvale Avenue to Mohawk Street	64.8	53.1	59.4	66.1
7	Olive Drive	Mohawk Street to Knudsen Avenue	64.2	52.6	58.8	65.5
8	Olive Drive	Knudsen Avenue to SR 99 NB Ramps	67.5	55.8	62.1	68.8
9	Olive Drive	SR 99 to Roberts Lane	64.6	53.0	59.2	65.9
10	Olive Drive	Roberts Lane to Airport Drive	63.2	51.6	57.8	64.5
11	Hageman Road	Calloway Drive to Riverlakes Drive	64.7	53.1	59.3	66.0
12	Hageman Road	Riverlakes Drive to Coffee Road	65.4	53.8	60.1	66.8
13	Hageman Road	Coffee Road to Patton Way	65.7	54.1	60.4	67.1
14	Hageman Road	Patton Way to Fruitvale Avenue	65.6	54.0	60.3	67.0
15	Hageman Road	Fruitvale Avenue to Mohawk Street	64.3	52.6	58.9	65.6
16	Hageman Road	Mohawk Street to Knudsen Avenue	64.0	52.4	58.6	65.3
17	Rosedale Highway (SR 58)	Coffee Road to Fruitvale Avenue	68.3	56.0	62.0	69.4
18	Rosedale Highway (SR 58)	Fruitvale Avenue to Mohawk Street	68.9	56.7	62.7	70.1
19	Rosedale Highway (SR 58)	Mohawk Street to SR 99	68.1	55.8	61.8	69.2
20	24th Street (SR 178)	SR 99 to Oak Street	66.8	55.9	62.4	68.4
21	Calloway Drive	Hageman Road to Olive Drive	66.7	54.4	60.4	67.8
22	Riverlakes Drive	Coffee Road to Hageman Road	59.5	47.9	54.1	60.8
23	Coffee Road	Rosedaly Highway (SR 58) to Meany Avenue	68.0	55.2	60.9	69.0
24	Coffee Road	Meany Avenue to Hageman Road	68.5	55.8	61.5	69.5
25	Coffee Road	Hageman Road to Olive Drive	68.6	55.8	61.5	69.5
26	Coffee Road	Olive Drive to Norris Road	66.8	54.0	59.7	67.8
27	Patton Way	Hageman Road to Olive Drive	54.0	43.1	49.6	55.6
28	Patton Way	Olive Drive to Norris Road	53.8	42.8	49.4	55.4
29	Fruitvale Avenue	Rosedaly Highway (SR 58) to Meany Avenue	61.1	49.4	55.7	62.4
30	Fruitvale Avenue	Meany Avenue to Hageman Road	61.3	49.6	55.9	62.6
31	Fruitvale Avenue	Hageman Road to Olive Drive	59.5	47.9	54.2	60.9
32	Mohawk Street	Westside Parkway to Rosedaly Highway (SR 58)	69.5	56.7	62.4	70.4
33	Mohawk Street	Rosedaly Highway (SR 58) to Hageman Road	67.4	54.6	60.3	68.3
34	Knudsen Avenue	Hageman Road to Olive Drive	65.5	53.2	59.2	66.6

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September 23, 2026

Project #:	24-47 Tortuga Bay Dev.
Description:	2045
Ldn/Cnel:	CNEL
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	Norris Road	Coffee Road to Patton Way	7520	77	14	9	1	1.5	45	100	
2	Olive Drive	Calloway Drive to Riverlakes Drive	28129	77	14	9	1	1.5	50	100	
3	Olive Drive	Riverlakes Drive to Coffee Road	26025	77	14	9	1	1.5	50	100	
4	Olive Drive	Coffee Road to Patton Way	22540	77	14	9	1	1.5	45	100	
5	Olive Drive	Patton Way to Fruitvale Avenue	23122	77	14	9	1	1.5	45	100	
6	Olive Drive	Fruitvale Avenue to Mohawk Street	20183	77	14	9	1	1.5	45	100	
7	Olive Drive	Mohawk Street to Knudsen Avenue	14565	77	14	9	1	1.5	45	100	
8	Olive Drive	Knudsen Avenue to SR 99 NB Ramps	34349	77	14	9	1	1.5	45	100	
9	Olive Drive	SR 99 to Roberts Lane	19289	77	14	9	1	1.5	45	100	
10	Olive Drive	Roberts Lane to Airport Drive	13151	77	14	9	1	1.5	45	100	
11	Hageman Road	Calloway Drive to Riverlakes Drive	24615	77	14	9	1	1.5	45	100	
12	Hageman Road	Riverlakes Drive to Coffee Road	30785	77	14	9	1	1.5	45	100	
13	Hageman Road	Coffee Road to Patton Way	30856	77	14	9	1	1.5	45	100	
14	Hageman Road	Patton Way to Fruitvale Avenue	30614	77	14	9	1	1.5	45	100	
15	Hageman Road	Fruitvale Avenue to Mohawk Street	21144	77	14	9	1	1.5	45	100	
16	Hageman Road	Mohawk Street to Knudsen Avenue	19974	77	14	9	1	1.5	45	100	
17	Rosedale Highway (SR 58)	Coffee Road to Fruitvale Avenue	39481	77	14	9	1	1.5	50	100	
18	Rosedale Highway (SR 58)	Fruitvale Avenue to Mohawk Street	45278	77	14	9	1	1.5	50	100	
19	Rosedale Highway (SR 58)	Mohawk Street to SR 99	31869	77	14	9	1	1.5	50	100	
20	24th Street (SR 178)	SR 99 to Oak Street	60508	77	14	9	1	1.5	40	100	
21	Calloway Drive	Hageman Road to Olive Drive	32782	77	14	9	1	1.5	50	100	
22	Riverlakes Drive	Coffee Road to Hageman Road	7237	77	14	9	1	1.5	45	100	
23	Coffee Road	Rosedaly Highway (SR 58) to Meany Avenue	28976	77	14	9	1	1.5	55	100	
24	Coffee Road	Meany Avenue to Hageman Road	36395	77	14	9	1	1.5	55	100	
25	Coffee Road	Hageman Road to Olive Drive	38989	77	14	9	1	1.5	55	100	
26	Coffee Road	Olive Drive to Norris Road	28246	77	14	9	1	1.5	55	100	
27	Patton Way	Hageman Road to Olive Drive	2657	77	14	9	1	1.5	40	100	
28	Patton Way	Olive Drive to Norris Road	2478	77	14	9	1	1.5	40	100	
29	Fruitvale Avenue	Rosedaly Highway (SR 58) to Meany Avenue	10639	77	14	9	1	1.5	45	100	
30	Fruitvale Avenue	Meany Avenue to Hageman Road	10192	77	14	9	1	1.5	45	100	
31	Fruitvale Avenue	Hageman Road to Olive Drive	7309	77	14	9	1	1.5	45	100	
32	Mohawk Street	Westside Parkway to Rosedaly Highway (SR 58)	42099	77	14	9	1	1.5	55	100	
33	Mohawk Street	Rosedaly Highway (SR 58) to Hageman Road	23309	77	14	9	1	1.5	55	100	
34	Knudsen Avenue	Hageman Road to Olive Drive	14248	77	14	9	1	1.5	50	100	

WJV Acoustics, Inc
FHWA-RD-77-108
Calculation Sheets
September 23, 2026

Project #: 24-47 Tortuga Bay Dev.
Description: 2045
Ldn/Cnel: CNEL
Site Type: Soft

Segment	Roadway Name	Segment Description	Autos	Medium Trucks	Heavy Trucks	Cumulative CNEL
1	Norris Road	Coffee Road to Patton Way	59.8	48.1	54.4	61.1
2	Olive Drive	Calloway Drive to Riverlakes Drive	66.8	54.6	60.5	67.9
3	Olive Drive	Riverlakes Drive to Coffee Road	66.5	54.2	60.2	67.6
4	Olive Drive	Coffee Road to Patton Way	64.5	52.9	59.1	65.9
5	Olive Drive	Patton Way to Fruitvale Avenue	64.6	53.0	59.3	66.0
6	Olive Drive	Fruitvale Avenue to Mohawk Street	64.0	52.4	58.7	65.4
7	Olive Drive	Mohawk Street to Knudsen Avenue	62.6	51.0	57.2	64.0
8	Olive Drive	Knudsen Avenue to SR 99 NB Ramps	66.4	54.7	61.0	67.7
9	Olive Drive	SR 99 to Roberts Lane	63.8	52.2	58.5	65.2
10	Olive Drive	Roberts Lane to Airport Drive	62.2	50.5	56.8	63.5
11	Hageman Road	Calloway Drive to Riverlakes Drive	64.9	53.3	59.5	66.2
12	Hageman Road	Riverlakes Drive to Coffee Road	65.9	54.2	60.5	67.2
13	Hageman Road	Coffee Road to Patton Way	65.9	54.2	60.5	67.2
14	Hageman Road	Patton Way to Fruitvale Avenue	65.9	54.2	60.5	67.2
15	Hageman Road	Fruitvale Avenue to Mohawk Street	64.2	52.6	58.9	65.6
16	Hageman Road	Mohawk Street to Knudsen Avenue	64.0	52.4	58.6	65.3
17	Rosedale Highway (SR 58)	Coffee Road to Fruitvale Avenue	68.3	56.0	62.0	69.4
18	Rosedale Highway (SR 58)	Fruitvale Avenue to Mohawk Street	68.9	56.6	62.6	70.0
19	Rosedale Highway (SR 58)	Mohawk Street to SR 99	67.3	55.1	61.1	68.5
20	24th Street (SR 178)	SR 99 to Oak Street	67.3	56.4	63.0	68.9
21	Calloway Drive	Hageman Road to Olive Drive	67.5	55.2	61.2	68.6
22	Riverlakes Drive	Coffee Road to Hageman Road	59.6	47.9	54.2	60.9
23	Coffee Road	Rosedaly Highway (SR 58) to Meany Avenue	68.1	55.3	61.0	69.1
24	Coffee Road	Meany Avenue to Hageman Road	69.1	56.3	62.0	70.1
25	Coffee Road	Hageman Road to Olive Drive	69.4	56.6	62.3	70.4
26	Coffee Road	Olive Drive to Norris Road	68.0	55.2	60.9	69.0
27	Patton Way	Hageman Road to Olive Drive	53.8	42.8	49.4	55.4
28	Patton Way	Olive Drive to Norris Road	53.5	42.5	49.1	55.1
29	Fruitvale Avenue	Rosedaly Highway (SR 58) to Meany Avenue	61.3	49.6	55.9	62.6
30	Fruitvale Avenue	Meany Avenue to Hageman Road	61.1	49.4	55.7	62.4
31	Fruitvale Avenue	Hageman Road to Olive Drive	59.6	48.0	54.2	61.0
32	Mohawk Street	Westside Parkway to Rosedaly Highway (SR 58)	69.7	57.0	62.7	70.7
33	Mohawk Street	Rosedaly Highway (SR 58) to Hageman Road	67.2	54.4	60.1	68.1
34	Knudsen Avenue	Hageman Road to Olive Drive	63.8	51.6	57.6	65.0

WJV Acoustics, Inc
FHWA-RD-77-108
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September 23, 2026

Project #:	24-47 Tortuga Bay Dev.
Description:	2045+Phase I, II & III project
Ldn/Cnel:	CNEL
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	Norris Road	Coffee Road to Patton Way	7805	77	14	9	1	1.5	45	100	
2	Olive Drive	Calloway Drive to Riverlakes Drive	30212	77	14	9	1	1.5	50	100	
3	Olive Drive	Riverlakes Drive to Coffee Road	28072	77	14	9	1	1.5	50	100	
4	Olive Drive	Coffee Road to Patton Way	24801	77	14	9	1	1.5	45	100	
5	Olive Drive	Patton Way to Fruitvale Avenue	26113	77	14	9	1	1.5	45	100	
6	Olive Drive	Fruitvale Avenue to Mohawk Street	24934	77	14	9	1	1.5	45	100	
7	Olive Drive	Mohawk Street to Knudsen Avenue	19424	77	14	9	1	1.5	45	100	
8	Olive Drive	Knudsen Avenue to SR 99 NB Ramps	39208	77	14	9	1	1.5	45	100	
9	Olive Drive	SR 99 to Roberts Lane	24931	77	14	9	1	1.5	45	100	
10	Olive Drive	Roberts Lane to Airport Drive	18793	77	14	9	1	1.5	45	100	
11	Hageman Road	Calloway Drive to Riverlakes Drive	25986	77	14	9	1	1.5	45	100	
12	Hageman Road	Riverlakes Drive to Coffee Road	32600	77	14	9	1	1.5	45	100	
13	Hageman Road	Coffee Road to Patton Way	34630	77	14	9	1	1.5	45	100	
14	Hageman Road	Patton Way to Fruitvale Avenue	34778	77	14	9	1	1.5	45	100	
15	Hageman Road	Fruitvale Avenue to Mohawk Street	26483	77	14	9	1	1.5	45	100	
16	Hageman Road	Mohawk Street to Knudsen Avenue	24370	77	14	9	1	1.5	45	100	
17	Rosedale Highway (SR 58)	Coffee Road to Fruitvale Avenue	42080	77	14	9	1	1.5	50	100	
18	Rosedale Highway (SR 58)	Fruitvale Avenue to Mohawk Street	47948	77	14	9	1	1.5	50	100	
19	Rosedale Highway (SR 58)	Mohawk Street to SR 99	34895	77	14	9	1	1.5	50	100	
20	24th Street (SR 178)	SR 99 to Oak Street	61950	77	14	9	1	1.5	40	100	
21	Calloway Drive	Hageman Road to Olive Drive	33050	77	14	9	1	1.5	50	100	
22	Riverlakes Drive	Coffee Road to Hageman Road	7273	77	14	9	1	1.5	45	100	
23	Coffee Road	Rosedaly Highway (SR 58) to Meany Avenue	29385	77	14	9	1	1.5	55	100	
24	Coffee Road	Meany Avenue to Hageman Road	37071	77	14	9	1	1.5	55	100	
25	Coffee Road	Hageman Road to Olive Drive	40394	77	14	9	1	1.5	55	100	
26	Coffee Road	Olive Drive to Norris Road	28460	77	14	9	1	1.5	55	100	
27	Patton Way	Hageman Road to Olive Drive	3120	77	14	9	1	1.5	40	100	
28	Patton Way	Olive Drive to Norris Road	2863	77	14	9	1	1.5	40	100	
29	Fruitvale Avenue	Rosedaly Highway (SR 58) to Meany Avenue	10711	77	14	9	1	1.5	45	100	
30	Fruitvale Avenue	Meany Avenue to Hageman Road	11163	77	14	9	1	1.5	45	100	
31	Fruitvale Avenue	Hageman Road to Olive Drive	8306	77	14	9	1	1.5	45	100	
32	Mohawk Street	Westside Parkway to Rosedaly Highway (SR 58)	47866	77	14	9	1	1.5	55	100	
33	Mohawk Street	Rosedaly Highway (SR 58) to Hageman Road	31210	77	14	9	1	1.5	55	100	
34	Knudsen Avenue	Hageman Road to Olive Drive	24749	77	14	9	1	1.5	50	100	

WJV Acoustics, Inc
FHWA-RD-77-108
Calculation Sheets
September 23, 2026

Project #: 24-47 Tortuga Bay Dev.
Description: 2045+Phase I, II & III project
Ldn/Cnel: CNEL
Site Type: Soft

Segment	Roadway Name	Segment Description	Autos	Medium Trucks	Heavy Trucks	Cumulative CNEL
1	Norris Road	Coffee Road to Patton Way	59.9	48.3	54.5	61.2
2	Olive Drive	Calloway Drive to Riverlakes Drive	67.1	54.9	60.8	68.2
3	Olive Drive	Riverlakes Drive to Coffee Road	66.8	54.5	60.5	67.9
4	Olive Drive	Coffee Road to Patton Way	64.9	53.3	59.6	66.3
5	Olive Drive	Patton Way to Fruitvale Avenue	65.2	53.5	59.8	66.5
6	Olive Drive	Fruitvale Avenue to Mohawk Street	65.0	53.3	59.6	66.3
7	Olive Drive	Mohawk Street to Knudsen Avenue	63.9	52.2	58.5	65.2
8	Olive Drive	Knudsen Avenue to SR 99 NB Ramps	66.9	55.3	61.5	68.3
9	Olive Drive	SR 99 to Roberts Lane	65.0	53.3	59.6	66.3
10	Olive Drive	Roberts Lane to Airport Drive	63.7	52.1	58.4	65.1
11	Hageman Road	Calloway Drive to Riverlakes Drive	65.1	53.5	59.8	66.5
12	Hageman Road	Riverlakes Drive to Coffee Road	66.1	54.5	60.7	67.5
13	Hageman Road	Coffee Road to Patton Way	66.4	54.7	61.0	67.7
14	Hageman Road	Patton Way to Fruitvale Avenue	66.4	54.8	61.0	67.7
15	Hageman Road	Fruitvale Avenue to Mohawk Street	65.2	53.6	59.8	66.6
16	Hageman Road	Mohawk Street to Knudsen Avenue	64.9	53.2	59.5	66.2
17	Rosedale Highway (SR 58)	Coffee Road to Fruitvale Avenue	68.6	56.3	62.3	69.7
18	Rosedale Highway (SR 58)	Fruitvale Avenue to Mohawk Street	69.1	56.9	62.8	70.2
19	Rosedale Highway (SR 58)	Mohawk Street to SR 99	67.7	55.5	61.5	68.9
20	24th Street (SR 178)	SR 99 to Oak Street	67.4	56.5	63.1	69.0
21	Calloway Drive	Hageman Road to Olive Drive	67.5	55.3	61.2	68.6
22	Riverlakes Drive	Coffee Road to Hageman Road	59.6	48.0	54.2	60.9
23	Coffee Road	Rosedaly Highway (SR 58) to Meany Avenue	68.2	55.4	61.1	69.1
24	Coffee Road	Meany Avenue to Hageman Road	69.2	56.4	62.1	70.2
25	Coffee Road	Hageman Road to Olive Drive	69.6	56.8	62.5	70.5
26	Coffee Road	Olive Drive to Norris Road	68.0	55.3	61.0	69.0
27	Patton Way	Hageman Road to Olive Drive	54.5	43.5	50.1	56.1
28	Patton Way	Olive Drive to Norris Road	54.1	43.1	49.7	55.7
29	Fruitvale Avenue	Rosedaly Highway (SR 58) to Meany Avenue	61.3	49.7	55.9	62.6
30	Fruitvale Avenue	Meany Avenue to Hageman Road	61.5	49.8	56.1	62.8
31	Fruitvale Avenue	Hageman Road to Olive Drive	60.2	48.5	54.8	61.5
32	Mohawk Street	Westside Parkway to Rosedaly Highway (SR 58)	70.3	57.5	63.2	71.3
33	Mohawk Street	Rosedaly Highway (SR 58) to Hageman Road	68.4	55.7	61.4	69.4
34	Knudsen Avenue	Hageman Road to Olive Drive	66.2	54.0	60.0	67.4