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## **APPENDIX P**

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# Environmental Noise Assessment

## Willowgrove EIR

City of Davis, California

September 19, 2025

Project #240201

Prepared for:



**Raney Planning & Management**

1501 Sports Drive  
Sacramento, California 95834

Prepared by:

**Saxelby Acoustics LLC**

**Luke Saxelby, INCE Bd. Cert.**

**Principal Consultant**

**Board Certified, Institute of Noise Control Engineering (INCE)**



(916) 760-8821  
[www.SaxNoise.com](http://www.SaxNoise.com) | [Luke@SaxNoise.com](mailto:Luke@SaxNoise.com)  
915 Highland Pointe Drive, Suite 250  
Roseville, CA 95678

## Table of Contents

|                                                                                    |           |
|------------------------------------------------------------------------------------|-----------|
| <b>INTRODUCTION .....</b>                                                          | <b>1</b>  |
| <b>ENVIRONMENTAL SETTING .....</b>                                                 | <b>1</b>  |
| <i>BACKGROUND INFORMATION ON NOISE .....</i>                                       | <i>1</i>  |
| <b>EXISTING NOISE AND VIBRATION ENVIRONMENTS.....</b>                              | <b>5</b>  |
| <i>EXISTING NOISE RECEPTORS .....</i>                                              | <i>5</i>  |
| <i>EXISTING GENERAL AMBIENT NOISE LEVELS .....</i>                                 | <i>6</i>  |
| <b>FUTURE TRAFFIC NOISE ENVIRONMENT AT OFF-SITE RECEPTORS .....</b>                | <b>7</b>  |
| <i>OFF-SITE TRAFFIC NOISE IMPACT ASSESSMENT METHODOLOGY.....</i>                   | <i>7</i>  |
| <b>EVALUATION OF PROJECT STATIONARY NOISE ON EXISTING SENSITIVE RECEPTORS.....</b> | <b>9</b>  |
| <i>COMMUNITY PARK .....</i>                                                        | <i>9</i>  |
| <i>NEIGHBORHOOD RETAIL .....</i>                                                   | <i>9</i>  |
| <i>GYM/CLASSROOM BUILDING.....</i>                                                 | <i>10</i> |
| <i>MINI PARK.....</i>                                                              | <i>10</i> |
| <i>HIGH DENSITY RESIDENTIAL .....</i>                                              | <i>10</i> |
| <i>METHODOLOGY AND RESULTS .....</i>                                               | <i>11</i> |
| <b>CONSTRUCTION NOISE ENVIRONMENT .....</b>                                        | <b>14</b> |
| <b>CONSTRUCTION VIBRATION ENVIRONMENT .....</b>                                    | <b>16</b> |
| <b>REGULATORY CONTEXT .....</b>                                                    | <b>16</b> |
| <i>FEDERAL .....</i>                                                               | <i>16</i> |
| <i>STATE.....</i>                                                                  | <i>16</i> |
| <i>LOCAL.....</i>                                                                  | <i>16</i> |
| <i>CRITERIA FOR ACCEPTABLE VIBRATION .....</i>                                     | <i>19</i> |
| <b>IMPACTS AND MITIGATION MEASURES.....</b>                                        | <b>21</b> |
| <i>THRESHOLDS OF SIGNIFICANCE .....</i>                                            | <i>21</i> |
| <i>PROJECT-SPECIFIC IMPACTS AND MITIGATION MEASURES .....</i>                      | <i>22</i> |
| <b>REFERENCES .....</b>                                                            | <b>32</b> |

## List of Figures

|                                                                    |    |
|--------------------------------------------------------------------|----|
| Figure 1: Site Plan.....                                           | 2  |
| Figure 2: Noise Measurement Sites and Receptor Locations .....     | 3  |
| Figure 3: Project Maximum Noise Contours, $L_{max}$ .....          | 12 |
| Figure 4: Project Day/Night Average Noise Contours, $L_{DN}$ ..... | 13 |
| Figure 5: Construction Barrier.....                                | 27 |

## List of Tables

|                                                                                                 |    |
|-------------------------------------------------------------------------------------------------|----|
| Table 1: Typical Noise Levels.....                                                              | 4  |
| Table 2: Summary of Existing Background Noise Measurement Data .....                            | 6  |
| Table 3: Predicted Traffic Noise Levels and Project-Related Traffic Noise Level Increases.....  | 8  |
| Table 4: Cumulative Traffic Noise Levels and Project-Related Traffic Noise Level Increases..... | 8  |
| Table 5: Construction Equipment Noise Levels .....                                              | 15 |
| Table 6: Vibration Levels for Various Construction Equipment.....                               | 16 |
| Table 7: Standards for Exterior Noise Exposure .....                                            | 17 |
| Table 8: Standards for Interior Noise Levels.....                                               | 17 |
| Table 9: Effects of Vibration on People and Buildings.....                                      | 20 |
| Table 10: Significance of Changes in Noise Exposure .....                                       | 22 |
| Table 11: Traffic Noise Increase over Existing Significance Analysis .....                      | 23 |
| Table 12: Traffic Noise Increase over Existing Significance Analysis .....                      | 24 |
| Table 13: Construction Noise at Existing Sensitive Receptors.....                               | 28 |
| Table 14: Construction Noise at Existing Sensitive Receptors with Temporary Barriers.....       | 30 |

## Appendices

|                                          |
|------------------------------------------|
| Appendix A: Acoustical Terminology       |
| Appendix B: Field Noise Measurement Data |
| Appendix C: Traffic Noise Calculations   |

## INTRODUCTION

The Willowgrove project is proposed to be incorporated into the City of Davis, California. The project proposes residential uses in a wide variety of products and densities, from high density attached products to traditional single family homes. Additionally, the project includes a community park, community garden, daycare site, mini-park, dog park, transit stops, small neighborhood retail, neighborhood greenbelts, and urban agricultural transition areas. The primary existing noise source in the project area is East Covell Boulevard.

**Figure 1** shows the project site plan. **Figure 2** shows an aerial photo of the project site and noise measurement locations.

## ENVIRONMENTAL SETTING

### BACKGROUND INFORMATION ON NOISE

#### *Fundamentals of Acoustics*

Acoustics is the science of sound. Sound may be thought of as mechanical energy of a vibrating object transmitted by pressure waves through a medium to human (or animal) ears. If the pressure variations occur frequently enough (at least 20 times per second), then they can be heard and are called sound. The number of pressure variations per second is called the frequency of sound and is expressed as cycles per second or Hertz (Hz).

Noise is a subjective reaction to different types of sounds. Noise is typically defined as (airborne) sound that is loud, unpleasant, unexpected or undesired, and may therefore be classified as a more specific group of sounds. Perceptions of sound and noise are highly subjective from person to person.

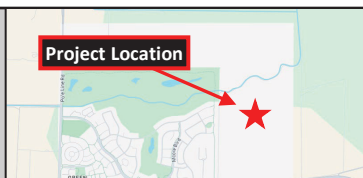
Measuring sound directly in terms of pressure would require a very large and awkward range of numbers. To avoid this, the decibel scale was devised. The decibel scale uses the hearing threshold (20 micropascals), as a point of reference, defined as 0 dB. Other sound pressures are then compared to this reference pressure, and the logarithm is taken to keep the numbers in a practical range. The decibel scale allows a million-fold increase in pressure to be expressed as 120 dB, and changes in levels (dB) correspond closely to human perception of relative loudness.

The perceived loudness of sounds is dependent upon many factors, including sound pressure level and frequency content. However, within the usual range of environmental noise levels, perception of loudness is relatively predictable, and can be approximated by A-weighted sound levels. There is a strong correlation between A-weighted sound levels (expressed as dBA) and the way the human ear perceives sound. For this reason, the A-weighted sound level has become the standard tool of environmental noise assessment.



**Willowgrove EIR**  
City of Davis, California

Figure 1  
Project Site Plan





\*Figure not OCR compatible

The decibel scale is logarithmic, not linear. In other words, two sound levels 10-dB apart differ in acoustic energy by a factor of 10. When the standard logarithmic decibel is A-weighted, an increase of 10-dBA is generally perceived as a doubling in loudness. For example, a 70-dBA sound is half as loud as an 80-dBA sound, and twice as loud as a 60-dBA sound.

Community noise is commonly described in terms of the ambient noise level, which is defined as the all-encompassing noise level associated with a given environment. A common statistical tool is the average, or equivalent, sound level ( $L_{eq}$ ), which corresponds to a steady-state A-weighted sound level containing the same total energy as a time varying signal over a given time period (usually one hour). The  $L_{eq}$  is the foundation of the composite noise descriptor,  $L_{dn}$ , and shows very good correlation with community response to noise.

The day/night average level (DNL or  $L_{dn}$ ) is based upon the average noise level over a 24-hour day, with a +10-decibel weighing applied to noise occurring during nighttime (10:00 p.m. to 7:00 a.m.) hours. The nighttime penalty is based upon the assumption that people react to nighttime noise exposures as though they were twice as loud as daytime exposures. Because  $L_{dn}$  represents a 24-hour average, it tends to disguise short-term variations in the noise environment.

**Table 1** lists several examples of the noise levels associated with common situations. **Appendix A** provides a summary of acoustical terms used in this report.

**TABLE 1: TYPICAL NOISE LEVELS**

| Common Outdoor Activities                                   | Noise Level (dBA) | Common Indoor Activities                                       |
|-------------------------------------------------------------|-------------------|----------------------------------------------------------------|
|                                                             | --110--           | Rock Band                                                      |
| Jet Fly-over at 300 m (1,000 ft.)                           | --100--           |                                                                |
| Gas Lawn Mower at 1 m (3 ft.)                               | --90--            |                                                                |
| Diesel Truck at 15 m (50 ft.),<br>at 80 km/hr. (50 mph)     | --80--            | Food Blender at 1 m (3 ft.)<br>Garbage Disposal at 1 m (3 ft.) |
| Noisy Urban Area, Daytime<br>Gas Lawn Mower, 30 m (100 ft.) | --70--            | Vacuum Cleaner at 3 m (10 ft.)                                 |
| Commercial Area<br>Heavy Traffic at 90 m (300 ft.)          | --60--            | Normal Speech at 1 m (3 ft.)                                   |
| Quiet Urban Daytime                                         | --50--            | Large Business Office<br>Dishwasher in Next Room               |
| Quiet Urban Nighttime                                       | --40--            | Theater, Large Conference Room (Background)                    |
| Quiet Suburban Nighttime                                    | --30--            | Library                                                        |
| Quiet Rural Nighttime                                       | --20--            | Bedroom at Night, Concert Hall (Background)                    |
|                                                             | --10--            | Broadcast/Recording Studio                                     |
| Lowest Threshold of Human Hearing                           | --0--             | Lowest Threshold of Human Hearing                              |

Source: Caltrans, Technical Noise Supplement, Traffic Noise Analysis Protocol. September, 2013.

## ***Effects of Noise on People***

The effects of noise on people can be placed in three categories:

- Subjective effects of annoyance, nuisance, and dissatisfaction
- Interference with activities such as speech, sleep, and learning
- Physiological effects such as hearing loss or sudden startling

Environmental noise typically produces effects in the first two categories. Workers in industrial plants can experience noise in the last category. There is no completely satisfactory way to measure the subjective effects of noise or the corresponding reactions of annoyance and dissatisfaction. A wide variation in individual thresholds of annoyance exists and different tolerances to noise tend to develop based on an individual's past experiences with noise.

Thus, an important way of predicting a human reaction to a new noise environment is the way it compares to the existing environment to which one has adapted: the so-called ambient noise level. In general, the more a new noise exceeds the previously existing ambient noise level, the less acceptable the new noise will be judged by those hearing it.

With regards to increases in A-weighted noise level, the following relationships occur:

- Except in carefully controlled laboratory experiments, a change of 1-dBA cannot be perceived;
- Outside of the laboratory, a 3-dBA change is considered a just-perceivable difference;
- A change in level of at least 5-dBA is required before any noticeable change in human response would be expected; and
- A 10-dBA change is subjectively heard as approximately a doubling in loudness and can cause an adverse response.

Stationary point sources of noise – including stationary mobile sources such as idling vehicles – attenuate (lessen) at a rate of approximately 6-dB per doubling of distance from the source, depending on environmental conditions (i.e. atmospheric conditions and either vegetative or manufactured noise barriers, etc.). Widely distributed noises, such as a large industrial facility spread over many acres or a street with moving vehicles, would typically attenuate at a lower rate.

## **EXISTING NOISE AND VIBRATION ENVIRONMENTS**

### **EXISTING NOISE RECEPTORS**

Some land uses are considered more sensitive to noise than others. Land uses often associated with sensitive receptors generally include residences, schools, libraries, hospitals, and passive recreational areas. Sensitive noise receptors may also include threatened or endangered noise-sensitive biological species, although many jurisdictions have not adopted noise standards for wildlife areas. Noise sensitive land uses are typically given special attention in order to achieve protection from excessive noise.

Sensitivity is a function of noise exposure (in terms of both exposure duration and insulation from noise) and the types of activities involved. In the immediate vicinity of the project site, sensitive land uses include residential uses to the west and south of the project site.

## EXISTING GENERAL AMBIENT NOISE LEVELS

The existing noise environment in the project area is primarily defined by traffic on East Covell Boulevard. To quantify the existing ambient noise environment in the project vicinity, Saxelby Acoustics conducted continuous (24-hr.) noise level measurements at two locations on the project site. Noise measurement locations are shown on **Figure 2**. A summary of the noise level measurement survey results is provided in **Table 2**. **Appendix B** contains the complete results of the noise monitoring.

The sound level meters were programmed to record the maximum, median, and average noise levels at each site during the survey. The maximum value, denoted  $L_{max}$ , represents the highest noise level measured. The average value, denoted  $L_{eq}$ , represents the energy average of all the noise received by the sound level meter microphone during the monitoring period. The median value, denoted  $L_{50}$ , represents the sound level exceeded 50 percent of the time during the monitoring period.

Larson Davis Laboratories (LDL) model 820 precision integrating sound level meters were used for the ambient noise level measurement survey. The meters were calibrated before and after use with a CAL200 acoustical calibrator to ensure the accuracy of the measurements. The equipment used meets all pertinent specifications of the American National Standards Institute for Type 1 sound level meters (ANSI S1.4).

**TABLE 2: SUMMARY OF EXISTING BACKGROUND NOISE MEASUREMENT DATA**

| Site | Date                    | $L_{dn}$  | Daytime<br>$L_{eq}$ | Daytime<br>$L_{50}$ | Daytime<br>$L_{max}$ | Nighttime<br>$L_{eq}$ | Nighttime<br>$L_{50}$ | Nighttime<br>$L_{max}$ |
|------|-------------------------|-----------|---------------------|---------------------|----------------------|-----------------------|-----------------------|------------------------|
| LT-1 | Saturday, April 5, 2025 | 62        | 61                  | 58                  | 77                   | 54                    | 43                    | 72                     |
|      | Sunday, April 6, 2025   | 62        | 61                  | 57                  | 79                   | 54                    | 45                    | 73                     |
|      | Monday, April 7, 2025   | 63        | 62                  | 59                  | 78                   | 54                    | 45                    | 71                     |
|      | <b>Average</b>          | <b>63</b> | <b>61</b>           | <b>58</b>           | <b>78</b>            | <b>54</b>             | <b>44</b>             | <b>72</b>              |
| LT-2 | Saturday, April 5, 2025 | 46        | 42                  | 38                  | 60                   | 39                    | 37                    | 54                     |
|      | Sunday, April 6, 2025   | 48        | 45                  | 41                  | 62                   | 40                    | 39                    | 53                     |
|      | Monday, April 7, 2025   | 50        | 48                  | 42                  | 63                   | 42                    | 40                    | 56                     |
|      | <b>Average</b>          | <b>48</b> | <b>45</b>           | <b>40</b>           | <b>62</b>            | <b>40</b>             | <b>38</b>             | <b>54</b>              |

**Notes :**

- All values shown in dBA
- Daytime hours: 7:00 a.m. to 10:00 p.m.
- Nighttime Hours: 10:00 p.m. to 7:00 a.m. per the definition of  $L_{dn}$  and industry standard. This is not to be confused with the City's Municipal Code Section 24 noise limits which define nighttime as 9 :00 p.m. to 7 :00 a.m.
- Source: Saxelby Acoustics, 2025.

## **FUTURE TRAFFIC NOISE ENVIRONMENT AT OFF-SITE RECEPTORS**

### **OFF-SITE TRAFFIC NOISE IMPACT ASSESSMENT METHODOLOGY**

To assess noise impacts due to project-related traffic increases on the local roadway network, traffic noise levels are predicted at sensitive receptors for existing and future, project and no-project conditions.

Existing and Cumulative noise levels due to traffic are calculated using the Federal Highway Administration Highway Traffic Noise Prediction Model (FHWA RD-77-108). The model is based upon the Calven reference noise factors for automobiles, medium trucks and heavy trucks, 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. To predict traffic noise levels in terms of  $L_{dn}$ , for comparison to the City's General Plan exterior noise standards, it is necessary to adjust the input volume to account for the day/night distribution of traffic.

Project trip generation volumes were provided by the project traffic engineer (Fehr & Peers 2025), truck usage and vehicle speeds on the local area roadways were estimated from field observations. The predicted increases in traffic noise levels on the local roadway network for Existing and Cumulative conditions which would result from the project are provided in terms of  $L_{dn}$ .

Traffic noise levels are predicted at the sensitive receptors located at the closest typical setback distance along each project-area roadway segment. In some locations sensitive receptors may not receive full shielding from noise barriers or may be located at distances which vary from the assumed calculation distance.

**Tables 3 and 4** summarize the modeled traffic noise levels at the nearest sensitive receptors along each roadway segment in the Project area. **Appendix C** provides the complete inputs and results of the FHWA traffic modeling.

**TABLE 3: PREDICTED TRAFFIC NOISE LEVELS AND PROJECT-RELATED TRAFFIC NOISE LEVEL INCREASES**

| Roadway       | Segment                | Existing no Project (dBA L <sub>dn</sub> ) | Existing + Project (dBA L <sub>dn</sub> ) | Change |
|---------------|------------------------|--------------------------------------------|-------------------------------------------|--------|
| Alhambra Dr   | South of E Covell Blvd | 48.7                                       | 50.2                                      | 1.5    |
| Alhambra Dr   | West of Mace Blvd      | 57.3                                       | 57.4                                      | 0.1    |
| E Covell Blvd | West of Market Ave     | 65.9                                       | 66.5                                      | 0.6    |
| E Covell Blvd | East of Cannery Ave    | 60.3                                       | 60.8                                      | 0.5    |
| E Covell Blvd | East of Pole Line Road | 62.4                                       | 63.7                                      | 1.3    |
| E Covell Blvd | West of Baywood Ln     | 60.8                                       | 62.1                                      | 1.3    |
| E Covell Blvd | West of Manzanita Ln   | 60.7                                       | 62.1                                      | 1.4    |
| E Covell Blvd | West of Wright Blvd    | 61.8                                       | 63.2                                      | 1.4    |
| E Covell Blvd | West of Monarch Ln     | 63.4                                       | 64.7                                      | 1.3    |
| E Covell Blvd | East of Alhambra Dr    | 56.8                                       | 57.9                                      | 1.1    |
| E Covell Blvd | West of Alhambra Dr    | 58.4                                       | 59.7                                      | 1.3    |
| Pole Line Rd  | South of E Covell Blvd | 60.3                                       | 60.8                                      | 0.5    |
| Pole Line Rd  | North of Picasso Ave   | 63.4                                       | 63.5                                      | 0.1    |
| Pole Line Rd  | North of Donner Ave    | 64.4                                       | 64.6                                      | 0.2    |
| Pole Line Rd  | North of Moore Blvd    | 66.9                                       | 67.1                                      | 0.2    |

**TABLE 4: CUMULATIVE TRAFFIC NOISE LEVELS AND PROJECT-RELATED TRAFFIC NOISE LEVEL INCREASES**

| Roadway       | Segment                | Cumulative no Project (dBA L <sub>dn</sub> ) | Cumulative + Project (dBA L <sub>dn</sub> ) | Change |
|---------------|------------------------|----------------------------------------------|---------------------------------------------|--------|
| Alhambra Dr   | South of E Covell Blvd | 51.6                                         | 52.5                                        | 0.9    |
| Alhambra Dr   | West of Mace Blvd      | 60.7                                         | 60.8                                        | 0.1    |
| E Covell Blvd | West of Market Ave     | 67.3                                         | 67.7                                        | 0.4    |
| E Covell Blvd | East of Cannery Ave    | 61.5                                         | 61.9                                        | 0.4    |
| E Covell Blvd | East of Pole Line Road | 64.7                                         | 65.5                                        | 0.8    |
| E Covell Blvd | West of Baywood Ln     | 63.2                                         | 64.0                                        | 0.8    |
| E Covell Blvd | West of Manzanita Ln   | 63.2                                         | 64.0                                        | 0.8    |
| E Covell Blvd | West of Wright Blvd    | 64.3                                         | 65.1                                        | 0.8    |
| E Covell Blvd | West of Monarch Ln     | 66.1                                         | 66.8                                        | 0.7    |
| E Covell Blvd | East of Alhambra Dr    | 59.1                                         | 59.8                                        | 0.7    |
| E Covell Blvd | West of Alhambra Dr    | 60.9                                         | 61.7                                        | 0.8    |
| Pole Line Rd  | South of E Covell Blvd | 62.0                                         | 62.3                                        | 0.3    |
| Pole Line Rd  | North of Picasso Ave   | 64.9                                         | 64.9                                        | 0.0    |
| Pole Line Rd  | North of Donner Ave    | 65.6                                         | 65.7                                        | 0.1    |
| Pole Line Rd  | North of Moore Blvd    | 68.0                                         | 68.1                                        | 0.1    |

Based upon the **Tables 3 and 4** data, the proposed project is predicted to result in an increase in a maximum traffic noise level increase of 1.5 dBA.

## EVALUATION OF PROJECT STATIONARY NOISE ON EXISTING SENSITIVE RECEPTORS

The proposed project includes several noise-generating components which could affect existing neighboring residential uses. These uses include the proposed Community Park, neighborhood retail, gym/classroom building, Mini Park, and high density residential.

### COMMUNITY PARK

The Community Park is located at the southern portion of the project site. The park will include a jungle gym play area, dog parks, two softball fields, one soccer field, and six pickleball courts. Based upon data collected at existing parks, a jungle gym would generate levels of 55 dBA  $L_{max}$  at a distance of 65 feet to the center. The small and large dog parks would generate 52 dBA  $L_{eq}$  and 73 dBA  $L_{max}$  at 15 feet to the edge. A softball or baseball game is predicted to generate up to 54 dBA  $L_{eq}$  and 67 dBA  $L_{max}$  at a distance of 150 feet from the edge of the field. This includes noise emanating from gameplay, players, and spectators. A soccer game is predicted to generate 58 dBA  $L_{eq}$  and 76 dBA  $L_{max}$  as measured 200 feet from the center of the field based upon measurements of youth tournament games. Pickleball gameplay is predicted to generate 56 dBA  $L_{eq}$  at 25 feet to the side of a court and 61 dBA  $L_{eq}$  at 25 feet to the end of a court. Pickleball generates maximum noise levels of up to 90 dBA  $L_{max}$  at 25 feet to the end of a court. It should be noted that this pickleball noise level is based on the more conservative use of the fast sound meter response which measures sound every 125 milliseconds (ms), whereas the City's noise ordinance utilizes slow (1-second) sound meter response. The use of fast response results in higher measured sound levels versus slow response and is therefore more conservative than that allowed by the City. All amenities were modeled as operating continuously during daytime hours.

The proposed park also includes a parking lot. It was assumed that the parking lot could fill or empty in a busy hour for a total of approximately 250 vehicle movements during a peak hour of use. One heavy vehicle movement was included to account for garbage collection or deliveries to the neighborhood retail amenities. Parking lot movements are predicted to generate a sound exposure level (SEL) of 71 dBA SEL at 50 feet for passenger vehicles and 85 dBA SEL at 50 feet for heavy trucks. Typical maximum noise levels due to car startups or car doors closing were predicted to be 74 dBA  $L_{max}$  at 15 feet. Nighttime traffic was assumed to be 25% of daytime peak hour volumes to account for trips to the neighborhood retail amenities.

### NEIGHBORHOOD RETAIL

The project proposes approximately 1.5 acres of neighborhood retail space north of the transit station. Based on the project description, the commercial space would be up to 5,000 square feet in size and could include uses such as food and beverage sales.

The primary noise source associated with the retail uses would be vehicle trips. The retail uses would share a parking lot with the Community Park. Vehicle circulation noise is analyzed under the Community Park analysis. Additional noise sources could include mechanical equipment such as packaged HVAC units, chiller condensers, and rooftop grease vents. Saxelby Acoustics assumed that the retail buildings would be serviced by up to three 10-ton HVAC units. Typical units of this size have a sound rating of 88 dBA per manufacturer data. Maximum noise levels are predicted to be approximately equal to average sound levels. It was assumed that the mechanical equipment would run continuously during daytime hours and at 25% capacity during nighttime hours.

## **GYM/CLASSROOM BUILDING**

The project includes a proposed structure to be used as a community gym or classroom. Saxelby Acoustics assumed that the building would be serviced by up to three 10-ton HVAC units. Typical units of this size have a sound rating of 88 dBA per manufacturer data. Maximum noise levels are predicted to be approximately equal to average sound levels. It was assumed that the mechanical equipment would run continuously during daytime hours and at 25% capacity during nighttime hours.

## **MINI PARK**

The project proposes a small neighborhood park at the northern portion of the project site. Proposed uses are expected to include a small jungle gym area. Based on previously collected data, jungle gyms produce up to 55 dBA  $L_{eq}$  and 67 dBA  $L_{max}$  at 65 feet to the center of the play area during a peak hour of use.

## **HIGH DENSITY RESIDENTIAL**

The proposed project includes the development of up to 538 high-density residential (HDR) uses. Noise sources associated with HDR include vehicle circulation and HVAC noise. It was assumed that each residential unit would be serviced by one mini-split condensing unit (64 dBA). Sound level data was obtained from manufacturer data for similar units.

Saxelby Acoustics assumed that each residential unit would generate one vehicle movement in the peak hour. Two heavy vehicle trips were included to account for garbage collection or deliveries. Parking lot movements are predicted to generate a sound exposure level (SEL) of 71 dBA SEL at 50 feet for passenger vehicles and 85 dBA SEL at 50 feet for heavy trucks. Typical maximum noise levels due to car startups or car doors closing were predicted to be 74 dBA  $L_{max}$  at 15 feet.

The HDR parcel also includes a daycare facility. The daycare facility would be included within the HDR parcel, centrally located between the two affordable housing areas. The daycare would include an approximately 6,300 square foot (sf) building and 2,700 sf outdoor play area. Based on previously collected data, outdoor play areas typically produce up to 55 dBA  $L_{eq}$  and 67 dBA  $L_{max}$  at 65 feet to the center of the play area during a peak hour of use. It was assumed that daycare facility would be serviced by a 10-ton packaged HVAC unit (88 dBA). Sound level data was obtained from manufacturer data for similar units.

## **PUBLIC SAFETY CENTER**

The Fire Department has also identified the potential need for a 2.5-3.0 acre Public Safety Center (PSC) in the northeastern portion of the City. If the facility is not accommodated elsewhere, the Willowgrove project will reserve land to accommodate the PSC on the southwestern HDR site (see Proposed General Plan Land Use Plan). The PSC would ultimately be designed and implemented by the Fire Department but could consist of a 4-bay fire station, training capabilities, classrooms/Emergency Operations Center (EOC) and police substation. The PSC is not included as part of the proposed project and would be subject to independent environmental review if constructed. However, this potential noise generator has been included here.

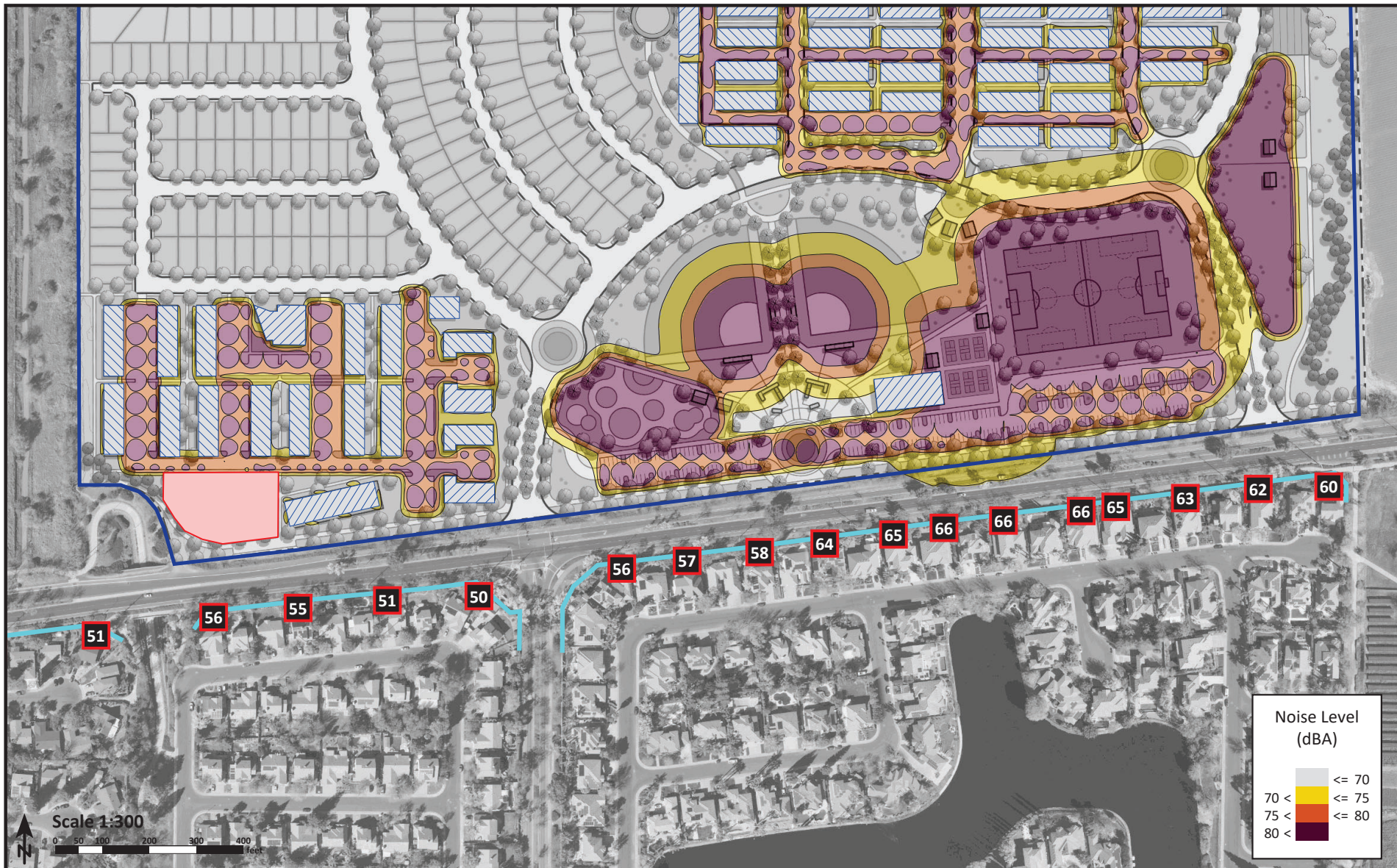
To assess noise generated by the potential fire station on the Project site, Saxelby Acoustics assumed an average of four events on the fire station site during a peak hour. Parking lot movement for heavy trucks such as a fire engine is predicted to generate a sound exposure level (SEL) of 85 dBA at 50 feet. It is assumed that the four trips per hour could occur during either daytime or nighttime hours. Based on field observations of similar facilities, siren noise occurs off-site and is considered exempt under section 24.02.040.e of the City's

Code of Ordinances noise limits which states that “Aural warning devices which are required by law to protect the health, safety and welfare of the community shall be exempt from the provisions of this chapter.”

## **METHODOLOGY AND RESULTS**

Saxelby Acoustics used the SoundPLAN noise prediction model. Inputs to the model included sound power levels for the proposed amenities, existing and proposed buildings, terrain type, and locations of sensitive receptors. These predictions are made in accordance with International Organization for Standardization (ISO) standard 9613-2:2024-01 (Acoustics – Attenuation of sound during propagation outdoors). ISO 9613 is the most commonly used method for calculating exterior noise propagation. **Figure 3** shows the maximum noise level contours resulting from operation of the project noise sources. **Figure 4** shows the day/night average noise levels generated by the project.





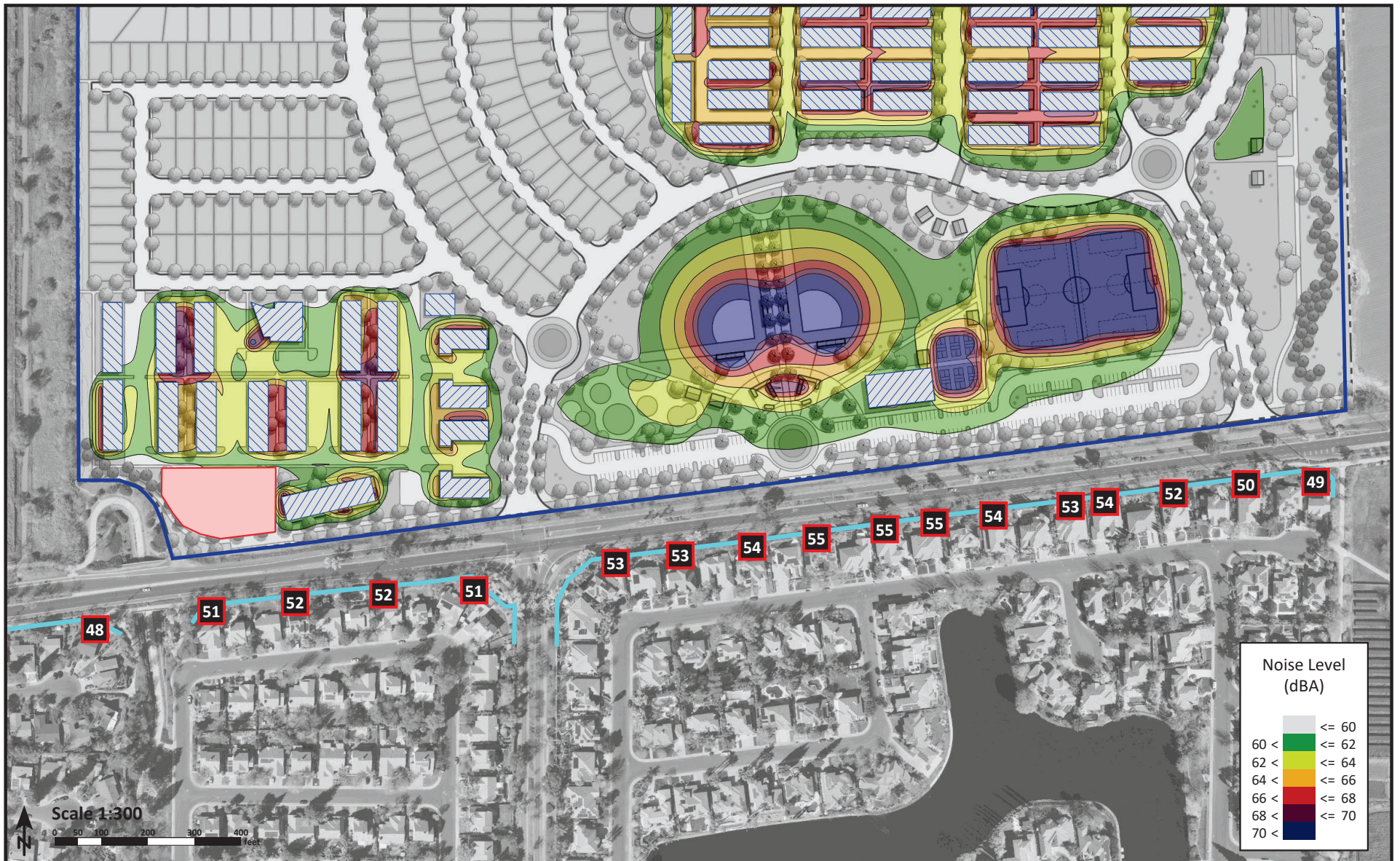
## Willowgrove EIR

City of Davis, California

**Figure 3**  
Maximum Project Generated Noise Levels (Lmax, dBA)

- Legend**
- Project Building
  - Project Boundary
  - Existing Sound Wall
  - Fire Station





## Willowgrove EIR

City of Davis, California

Figure 4  
Day/Night Average Project Generated Noise Levels (Ldn, dBA)

- Legend**
- Project Building
  - Project Boundary
  - Existing Sound Wall
  - Fire Station



## CONSTRUCTION NOISE ENVIRONMENT

The Federal Highway Administration's (FHWA) Roadway Construction Noise Model (RCNM) was used to predict noise levels for standard construction equipment used for roadway improvement projects. The assessment of potential significant noise effects due to construction is based on the standards and procedures described in the Federal Transit Authority (FTA) guidance manual and FHWA's RCNM.

The RCNM is a Windows-based noise prediction model that enables the prediction of construction noise levels for a variety of construction equipment based on a compilation of empirical data and the application of acoustical propagation formulas. It enables the calculation of construction noise levels in more detail than the manual methods, which eliminates the need to collect extensive amounts of project-specific input data. RCNM allows for the modeling of multiple pieces of construction equipment working either independently or simultaneously, the character of noise emission, and the usage factors for each piece of equipment.

Construction noise varies depending on the construction process, type of equipment involved, location of the construction site with respect to sensitive receptors, the schedule proposed to carry out each task (e.g., hours and days of the week), and the duration of the construction work.

Noise sources in the RCNM database include actual noise levels and equipment usage percentages. This source data was used in this construction noise analysis. **Table 5** shows predicted construction noise levels for the project site.

**TABLE 5: CONSTRUCTION EQUIPMENT NOISE LEVELS**

| Equipment                    | Quantity | Usage (%) | Maximum, L <sub>max</sub><br>(dBA at 25 feet) | Maximum, L <sub>max</sub><br>(dBA at 50 feet) | Hourly Average,<br>Leq (dBA at 50<br>feet) |
|------------------------------|----------|-----------|-----------------------------------------------|-----------------------------------------------|--------------------------------------------|
| <b>Site Preparation</b>      |          |           |                                               |                                               |                                            |
| Dozer                        | 3        | 40        | 88                                            | 82                                            | 83                                         |
| Tractor/Loader/Backhoe       | 4        | 40        | 90                                            | 84                                            | 86                                         |
| <b>Total:</b>                |          |           |                                               |                                               | <b>88</b>                                  |
| <b>Grading</b>               |          |           |                                               |                                               |                                            |
| Excavator                    | 3        | 40        | 87                                            | 81                                            | 82                                         |
| Grader                       | 1        | 40        | 91                                            | 85                                            | 81                                         |
| Dozer                        | 2        | 40        | 88                                            | 82                                            | 81                                         |
| Scraper                      | 2        | 40        | 90                                            | 84                                            | 83                                         |
| Tractor/Loader/Backhoe       | 2        | 40        | 90                                            | 84                                            | 83                                         |
| Dump Truck                   | 1        | 40        | 82                                            | 76                                            | 72                                         |
| <b>Total:</b>                |          |           |                                               |                                               | <b>88</b>                                  |
| <b>Building Construction</b> |          |           |                                               |                                               |                                            |
| Crane                        | 1        | 16        | 87                                            | 81                                            | 73                                         |
| Fork Lift                    | 3        | 40        | 89                                            | 83                                            | 84                                         |
| Generator                    | 1        | 50        | 87                                            | 81                                            | 78                                         |
| Tractor/Loader/Backhoe       | 3        | 40        | 90                                            | 84                                            | 85                                         |
| Welder / Torch               | 1        | 40        | 80                                            | 74                                            | 70                                         |
| <b>Total:</b>                |          |           |                                               |                                               | <b>88</b>                                  |
| <b>Paving</b>                |          |           |                                               |                                               |                                            |
| Paver                        | 2        | 50        | 83                                            | 77                                            | 77                                         |
| Paving Equipment             | 2        | 50        | 83                                            | 77                                            | 77                                         |
| Roller                       | 2        | 20        | 86                                            | 80                                            | 76                                         |
| <b>Total:</b>                |          |           |                                               |                                               | <b>81</b>                                  |
| <b>Architectural Coating</b> |          |           |                                               |                                               |                                            |
| Air Compressor               | 1        | 40        | 85                                            | 79                                            | 75                                         |
| <b>Total:</b>                |          |           |                                               |                                               | <b>75</b>                                  |

Source: FHWA, Roadway Construction Noise Model (RCNM), January 2006.

Based upon the **Table 5** data, the loudest phases of construction on the project site would be grading, site preparation, and building construction with an average noise exposure of 88 dBA Leq at 50 feet from the center of activity.

## CONSTRUCTION VIBRATION ENVIRONMENT

The primary vibration-generating activities associated with the proposed project would occur during construction when activities such as grading, utilities placement, and parking lot construction occur. **Table 6** shows the typical vibration levels produced by construction equipment.

**TABLE 6: VIBRATION LEVELS FOR VARIOUS CONSTRUCTION EQUIPMENT**

| Type of Equipment          | Peak Particle Velocity at<br>25 feet<br>(inches/second) | Peak Particle Velocity at<br>50 feet<br>(inches/second) | Peak Particle Velocity at<br>100 feet<br>(inches/second) |
|----------------------------|---------------------------------------------------------|---------------------------------------------------------|----------------------------------------------------------|
| Large Bulldozer            | 0.089                                                   | 0.031                                                   | 0.011                                                    |
| Loaded Trucks              | 0.076                                                   | 0.027                                                   | 0.010                                                    |
| Small Bulldozer            | 0.003                                                   | 0.001                                                   | 0.000                                                    |
| Auger/drill Rigs           | 0.089                                                   | 0.031                                                   | 0.011                                                    |
| Jackhammer                 | 0.035                                                   | 0.012                                                   | 0.004                                                    |
| Vibratory Hammer           | 0.070                                                   | 0.025                                                   | 0.009                                                    |
| Vibratory Compactor/roller | 0.210<br>(Less than 0.20 at 26 feet)                    | 0.074                                                   | 0.026                                                    |

Source: Transit Noise and Vibration Impact Assessment Guidelines. Federal Transit Administration. May 2006.

## REGULATORY CONTEXT

### FEDERAL

There are no federal noise standards that apply to the proposed project.

### STATE

#### ***California Environmental Quality Act***

The California Environmental Quality Act (CEQA) Guidelines, Appendix G, indicate that a significant noise impact may occur if a project exposes persons to noise or vibration levels in excess of local general plans or noise ordinance standards, or cause a substantial permanent or temporary increase in ambient noise levels. CEQA standards are discussed more below under the Thresholds of Significance section.

### LOCAL

#### ***City of Davis General Plan***

The Davis General Plan goals and policies relating to noise and vibration that are applicable to the proposed project are presented in **Table 7** and **Table 8**.

**TABLE 7: STANDARDS FOR EXTERIOR NOISE EXPOSURE**

| Land Use Category                                          | Community Noise Exposure Ldn or CNEL, dBA |                          |              |                      |
|------------------------------------------------------------|-------------------------------------------|--------------------------|--------------|----------------------|
|                                                            | Normally Acceptable                       | Conditionally Acceptable | Unacceptable | Clearly Unacceptable |
| Residential                                                | Under 60                                  | 60 to 70*                | 70 to 75     | Above 75             |
| Transient Lodging - Motels, Hotels                         | Under 60                                  | 65 to 75                 | 75 to 80     | Above 80             |
| Schools, Libraries, Churches, Hospitals, Nursing Homes     | Under 60                                  | 60 to 70                 | 70 to 80     | Above 80             |
| Auditoriums, Concert Halls, Amphitheaters                  | Under 50                                  | 50 to 70                 | N/A          | Above 70             |
| Sports Arenas, Outdoor Spectator Sports                    | N/A                                       | Under 75                 | N/A          | Above 75             |
| Playgrounds, Neighborhood Parks                            | Under 70                                  | N/A                      | 70 to 75     | Above 75             |
| Golf Courses, Riding Stables, Water Recreation, Cemeteries | Under 70                                  | N/A                      | 70 to 80     | Above 80             |
| Office Buildings, Business Commercial and Professional     | Under 65                                  | 65 to 75                 | Above 75     | N/A                  |
| Industrial, Manufacturing, Utilities, Agriculture          | Under 65                                  | 70 to 80                 | Above 80     | N/A                  |

Notes:  
*Normally Acceptable:* Specified land use is satisfactory based upon the assumption that any buildings involved are of normal conventional construction, without special noise insulation requirements.  
*Conditionally Acceptable:* New construction or development should be undertaken only after a detailed analysis of the noise reduction requirements is conducted, and needed noise attenuation features are included in the construction or development.  
*Normally Unacceptable:* New construction or development should be discouraged. If new construction or development does proceed, a detailed analysis of the noise reduction requirements must be conducted and needed noise attenuation features shall be included in the construction or development.  
*Clearly Unacceptable:* New construction or development shall not be undertaken.  
N/A: Not applicable  
\* The City Council shall have discretion within the “conditionally acceptable” range for residential use to allow levels in outdoor spaces to go up to 65 dBA if cost effective or aesthetically acceptable measures are not available to reduce noise levels in outdoor spaces to the “normally acceptable” levels. Outdoor spaces which are designed for visual use only (for example, streetside landscaping in an apartment project), rather than outdoor use space may be considered acceptable up to 70 dBA.

Source: City of Davis. Davis General Plan. Table 19. Adopted May 2001. Amended through January 2007.

**TABLE 8: STANDARDS FOR INTERIOR NOISE LEVELS**

| Use                                                          | Noise Level (dBA) |
|--------------------------------------------------------------|-------------------|
| Residences, schools through grade 12, hospitals and churches | 45                |
| Offices                                                      | 55                |

Source: City of Davis. Davis General Plan. Table 20. Adopted May 2001. Amended through January 2007.

### ***City of Davis Noise Ordinance***

Section 24 of the City of Davis Municipal Code establishes a maximum noise level standard of 55 dB during the hours of 7:00 AM to 9:00 PM, and 50 dB during the hours of 9:00 PM to 7:00 AM. Section 24.02.030 increases these limits by 20 dBA. Therefore, it is interpreted that the City's maximum noise limit is 75 dBA  $L_{max}$  for the hours of 7:00 AM to 9:00 PM and 70 dBA  $L_{max}$  during the hours of 9:00 PM to 7:00 AM.

The Municipal Code makes exemptions for certain typical activities which may occur within the City. The exemptions are listed in Article 24.02.040, Special Provisions, and are summarized below:

- a) Normal operation of power tools for non-commercial purposes are typically exempted between the hours of 8 AM and 8 PM unless the operation unreasonably disturbs the peace and quiet of any neighborhood.
- b) Construction or landscape operations would be exempt during the hours of 7 AM to 7 PM Mondays through Fridays and between the hours of 8 AM to 8 PM Saturdays and Sundays assuming that the operations are authorized by valid city permit or business license, or carried out by employees or contractors of the city and one of the following conditions apply:
  - (1) No individual piece of equipment shall produce a noise level exceeding eighty-three dBA at a distance of twenty-five feet. If the device is housed within a structure on the property, the measurement shall be made outside the structure at a distance as close to twenty feet from the equipment as possible.
  - (2) The noise level at any point outside of the property plane of the project shall not exceed eighty-six dBA.
  - (3) The provisions of subdivisions (1) and (2) of this subsection shall not be applicable to impact tools and equipment; provided, that such impact tools and equipment shall have intake and exhaust mufflers recommended by manufacturers thereof and approved by the director of public works as best accomplishing maximum noise attenuation, and that pavement breakers and jackhammers shall also be equipped with acoustically attenuating shields or shrouds recommended by the manufacturers thereof and approved by the director of public works as best accomplishing maximum noise attenuation. In the absence of manufacturer's recommendations, the director of public works may prescribe such means of accomplishing maximum noise attenuation as he or she may determine to be in the public interest.
  - (4) Construction projects located more than two hundred feet from existing homes may request a special use permit to begin work at 6:00 AM on weekdays from June 15th until September 1st. No percussion type tools (such as ramsets or jackhammers) can be used before 7:00 AM. The permit shall be revoked if any noise complaint is received by the police department.
  - (5) No individual powered blower shall produce a noise level exceeding seventy dBA measured at a distance of fifty feet.
  - (6) No powered blower shall be operated within one hundred feet radius of another powered blower simultaneously.

- (7) On single-family residential property, the seventy dBA at fifty feet restriction shall not apply if operated for less than ten minutes per occurrence.
- c) The City Code also exempts air conditioners, pool pumps, and similar equipment from the noise regulations, provided that they are in good working order.
  - d) Work related to public health and safety is exempt from the noise requirements.
  - e) Safety devices are exempt from the noise requirements.
  - f) Emergencies are exempt from the noise requirements.

In addition, Section 24 of the City of Davis Municipal Code establishes the noise violations which can be issued by the Davis Police Department. A Sound (Noise) Permit from the Police Department is required for the following uses:

- Amplified sound at any indoor or outdoor event and more than 100 people will attend; and
- Install, use or operate within the City a loudspeaker or other amplifying equipment in a fixed or moveable position or mounted upon any sound truck for purposes of giving instruction, directions, talks, addresses, lectures or transmitting music to any persons upon a street, alley, sidewalk, park, place or other outdoor property.

#### **CRITERIA FOR ACCEPTABLE VIBRATION**

Vibration is like noise in that it involves a source, a transmission path, and a receiver. While vibration is related to noise, it differs in that noise is generally considered to be pressure waves transmitted through air, whereas vibration usually consists of the excitation of a structure or surface. As with noise, vibration consists of an amplitude and frequency. A person's perception to the vibration will depend on their individual sensitivity to vibration, as well as the amplitude and frequency of the source and the response of the system which is vibrating.

Vibration can be measured in terms of acceleration, velocity, or displacement. A common practice is to monitor vibration measures in terms of peak particle velocities in inches per second. Standards pertaining to perception as well as damage to structures have been developed for vibration levels defined in terms of peak particle velocities.

Human and structural response to different vibration levels is influenced by a number of factors, including ground type, distance between source and receptor, duration, and the number of perceived vibration events. **Table 9**, which was developed by Caltrans, shows the vibration levels which would normally be required to result in damage to structures. The vibration levels are presented in terms of peak particle velocity in inches per second.

**Table 9** indicates that the threshold for architectural damage to structures is 0.20 in/sec p.p.v. A threshold of 0.20 in/sec p.p.v. is considered to be a reasonable threshold for short-term construction projects.

**TABLE 9: EFFECTS OF VIBRATION ON PEOPLE AND BUILDINGS**

| Peak Particle Velocity |             | Human Reaction                                                                                                                                                            | Effect on Buildings                                                                                                                                                                                                                                  |
|------------------------|-------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| mm/second              | in/second   |                                                                                                                                                                           |                                                                                                                                                                                                                                                      |
| 0.15-0.30              | 0.006-0.019 | Threshold of perception; possibility of intrusion                                                                                                                         | Vibrations unlikely to cause damage of any type                                                                                                                                                                                                      |
| 2.0                    | 0.08        | Vibrations readily perceptible                                                                                                                                            | Recommended upper level of the vibration to which ruins and ancient monuments should be subjected                                                                                                                                                    |
| 2.5                    | 0.10        | Level at which continuous vibrations begin to annoy people                                                                                                                | Virtually no risk of “architectural” damage to normal buildings                                                                                                                                                                                      |
| 5.0                    | 0.20        | Vibrations annoying to people in buildings (this agrees with the levels established for people standing on bridges and subjected to relative short periods of vibrations) | Threshold at which there is a risk of “architectural” damage to normal dwelling - houses with plastered walls and ceilings. Special types of finish such as lining of walls, flexible ceiling treatment, etc., would minimize “architectural” damage |
| 10-15                  | 0.4-0.6     | Vibrations considered unpleasant by people subjected to continuous vibrations and unacceptable to some people walking on bridges                                          | Vibrations at a greater level than normally expected from traffic, but would cause “architectural” damage and possibly minor structural damage                                                                                                       |

Source: *Transportation Related Earthborne Vibrations*. Caltrans. TAV-02-01-R9601. February 20, 2002.

## IMPACTS AND MITIGATION MEASURES

### THRESHOLDS OF SIGNIFICANCE

Appendix G of the CEQA Guidelines states that a project would normally be considered to result in significant noise impacts if noise levels conflict with adopted environmental standards or plans or if noise generated by the project would substantially increase existing noise levels at sensitive receivers on a permanent or temporary basis. Significance criteria for noise impacts are drawn from CEQA Guidelines Appendix G (Items XI [a-c]).

Would the project:

- a. Generate 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. Generate 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?

### *Noise Level Increase Criteria for Long-Term Project-Related Noise Level Increases*

The California Environmental Quality Act (CEQA) guidelines define a significant impact of a project if it “increases substantially the ambient noise levels for adjoining areas.” Generally, a project may have a significant effect on the environment if it will substantially increase the ambient noise levels for adjoining areas or expose people to severe noise levels. In practice, more specific professional standards have been developed. These standards state that a noise impact may be considered significant if it would generate noise that would conflict with local project criteria or ordinances, or substantially increase noise levels at noise sensitive land uses. The potential increase in traffic noise from the project is a factor in determining significance. Research into the human perception of changes in sound level indicates the following:

- A 3-dB change is barely perceptible,
- A 5-dB change is clearly perceptible, and
- A 10-dB change is perceived as being twice or half as loud.

A limitation of using a single noise level increase value to evaluate noise impacts is that it fails to account for pre-project noise conditions. **Table 10** is based upon recommendations made by the Federal Interagency Committee on Noise (FICON) to provide guidance in the assessment of changes in ambient noise levels resulting from aircraft operations. The recommendations are based upon studies that relate aircraft noise levels to the percentage of persons highly annoyed by the noise. Although the FICON recommendations were specifically developed to assess aircraft noise impacts, it has been accepted that they are applicable to all sources of noise described in terms of cumulative noise exposure metrics such as the  $L_{dn}$ .

**TABLE 10: SIGNIFICANCE OF CHANGES IN NOISE EXPOSURE**

| Ambient Noise Level Without Project, $L_{dn}$ | Increase Required for Significant Impact |
|-----------------------------------------------|------------------------------------------|
| <60 dB                                        | +5.0 dB or more                          |
| 60-65 dB                                      | +3.0 dB or more                          |
| >65 dB                                        | +1.5 dB or more                          |

Source: Federal Interagency Committee on Noise (FICON).

Based on the **Table 10** data, an increase in the traffic noise level of 5 dB or more would be significant where the pre-project noise levels are less than 60 dB  $L_{dn}$ , or 3 dB or more where existing noise levels are between 60 to 65 dB  $L_{dn}$ . Extending this concept to higher noise levels, an increase in the traffic noise level of 1.5 dB or more may be significant where the pre-project traffic noise level exceeds 65 dB  $L_{dn}$ . The rationale for the **Table 10** criteria is that, as ambient noise levels increase, a smaller increase in noise resulting from a project is sufficient to cause annoyance.

### **Temporary Construction Noise Impacts**

With temporary noise impacts (construction), identification of “substantial increases” depends upon the duration of the impact, the temporal daily nature of the impact, and the absolute change in decibel levels. The City of Davis Municipal Code exempts construction noise between 7 AM to 7 PM Monday through Friday and between the hours of 8 AM to 8 PM Saturdays and Sundays.

In terms of determining the temporary noise increase due to project-related construction activities, an impact would occur if construction activity would noticeably increase ambient noise levels above background levels. The threshold of perception of the human ear is approximately 3.0 to 5.0 dB, and a 5.0 dB change is considered to be clearly noticeable. Therefore, for the purposes of this analysis, a noticeable increase in existing ambient noise levels is assumed to occur when noise levels increase by 5.0 dB or more.

### **PROJECT-SPECIFIC IMPACTS AND MITIGATION MEASURES**

**Impact 1:** *Would the project generate 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?*

### **Traffic Noise Increases at Off-Site Receptors**

Based upon the **Table 10** FICON criteria, where existing traffic noise levels are greater than 65 dBA  $L_{dn}$ , at the outdoor activity areas of noise-sensitive uses, a +1.5 dBA  $L_{dn}$  increase in roadway noise levels will be considered significant. Where traffic noise levels are between 60 dBA  $L_{dn}$  and 65 dBA  $L_{dn}$ , a +3.0 dB  $L_{dn}$  increase in roadway noise levels will be considered significant. Where traffic noise levels are less than 60 dBA  $L_{dn}$ , a +5.0 dB  $L_{dn}$  increase in roadway noise levels will be considered significant. Additionally, if existing noise levels are below the City’s normally acceptable 60 dBA  $L_{dn}$  standard, increases causing traffic noise to exceed this threshold are also considered significant.

Tables 11 and 12 list each roadway segment in the project vicinity notably affected by project traffic. These roadway segments are analyzed to determine if project-related traffic noise increases constitute a significant impact as defined by the FICON criteria.

**TABLE 11: TRAFFIC NOISE INCREASE OVER EXISTING SIGNIFICANCE ANALYSIS**

| Roadway       | Segment                | Existing<br>(dBA L <sub>dn</sub> ) | Existing +<br>Project<br>(dBA L <sub>dn</sub> ) | Change | Significance<br>Threshold | Significant? |
|---------------|------------------------|------------------------------------|-------------------------------------------------|--------|---------------------------|--------------|
| Alhambra Dr   | South of E Covell Blvd | 48.7                               | 50.2                                            | 1.5    | >60 or +5.0 dB            | No           |
| Alhambra Dr   | West of Mace Blvd      | 57.3                               | 57.4                                            | 0.1    | >60 or +5.0 dB            | No           |
| E Covell Blvd | West of Market Ave     | 65.9                               | 66.5                                            | 0.6    | +1.5 dB                   | No           |
| E Covell Blvd | East of Cannery Ave    | 60.3                               | 60.8                                            | 0.5    | +3.0 dB                   | No           |
| E Covell Blvd | East of Pole Line Road | 62.4                               | 63.7                                            | 1.3    | +3.0 dB                   | No           |
| E Covell Blvd | West of Baywood Ln     | 60.8                               | 62.1                                            | 1.3    | +3.0 dB                   | No           |
| E Covell Blvd | West of Manzanita Ln   | 60.7                               | 62.1                                            | 1.4    | +3.0 dB                   | No           |
| E Covell Blvd | West of Wright Blvd    | 61.8                               | 63.2                                            | 1.4    | +3.0 dB                   | No           |
| E Covell Blvd | West of Monarch Ln     | 63.4                               | 64.7                                            | 1.3    | +3.0 dB                   | No           |
| E Covell Blvd | East of Alhambra Dr    | 56.8                               | 57.9                                            | 1.1    | >60 or +5.0 dB            | No           |
| E Covell Blvd | West of Alhambra Dr    | 58.4                               | 59.7                                            | 1.3    | >60 or +5.0 dB            | No           |
| Pole Line Rd  | South of E Covell Blvd | 60.3                               | 60.8                                            | 0.5    | +3.0 dB                   | No           |
| Pole Line Rd  | North of Picasso Ave   | 63.4                               | 63.5                                            | 0.1    | +3.0 dB                   | No           |
| Pole Line Rd  | North of Donner Ave    | 64.4                               | 64.6                                            | 0.2    | +3.0 dB                   | No           |
| Pole Line Rd  | North of Moore Blvd    | 66.9                               | 67.1                                            | 0.2    | +1.5 dB                   | No           |

**TABLE 12: TRAFFIC NOISE INCREASE OVER CUMULATIVE SIGNIFICANCE ANALYSIS**

| Roadway       | Segment                | Cumulative<br>(dBA L <sub>dn</sub> ) | Cumulative +<br>Project<br>(dBA L <sub>dn</sub> ) | Change | Significance<br>Threshold | Significant? |
|---------------|------------------------|--------------------------------------|---------------------------------------------------|--------|---------------------------|--------------|
| Alhambra Dr   | South of E Covell Blvd | 51.6                                 | 52.5                                              | 0.9    | >60 or +5.0 dB            | No           |
| Alhambra Dr   | West of Mace Blvd      | 60.7                                 | 60.8                                              | 0.1    | +3.0 dB                   | No           |
| E Covell Blvd | West of Market Ave     | 67.3                                 | 67.7                                              | 0.4    | +1.5 dB                   | No           |
| E Covell Blvd | East of Cannery Ave    | 61.5                                 | 61.9                                              | 0.4    | +3.0 dB                   | No           |
| E Covell Blvd | East of Pole Line Road | 64.7                                 | 65.5                                              | 0.8    | +3.0 dB                   | No           |
| E Covell Blvd | West of Baywood Ln     | 63.2                                 | 64.0                                              | 0.8    | +3.0 dB                   | No           |
| E Covell Blvd | West of Manzanita Ln   | 63.2                                 | 64.0                                              | 0.8    | +3.0 dB                   | No           |
| E Covell Blvd | West of Wright Blvd    | 64.3                                 | 65.1                                              | 0.8    | +3.0 dB                   | No           |
| E Covell Blvd | West of Monarch Ln     | 66.1                                 | 66.8                                              | 0.7    | +1.5 dB                   | No           |
| E Covell Blvd | East of Alhambra Dr    | 59.1                                 | 59.8                                              | 0.7    | >60 or +5.0 dB            | No           |
| E Covell Blvd | West of Alhambra Dr    | 60.9                                 | 61.7                                              | 0.8    | +3.0 dB                   | No           |
| Pole Line Rd  | South of E Covell Blvd | 62.0                                 | 62.3                                              | 0.3    | +3.0 dB                   | No           |
| Pole Line Rd  | North of Picasso Ave   | 64.9                                 | 64.9                                              | 0.0    | +3.0 dB                   | No           |
| Pole Line Rd  | North of Donner Ave    | 65.6                                 | 65.7                                              | 0.1    | +1.5 dB                   | No           |
| Pole Line Rd  | North of Moore Blvd    | 68.0                                 | 68.1                                              | 0.1    | +1.5 dB                   | No           |

As shown in the above tables, increases due to project traffic do not exceed the FICON criteria at the analyzed roadway segments. Therefore, impacts resulting from increased traffic noise would be considered **less-than-significant**.

### ***Operational Noise at Existing Sensitive Receptors***

#### ***Compliance with City of Davis Noise Level Standards***

As shown in **Figure 3**, the total combined project non-transportation noise sources are predicted to expose nearby residences to noise levels up to 66 dBA L<sub>max</sub> and a day/night average level of 55 dBA L<sub>dn</sub>. The City of Davis Municipal Code establishes maximum noise level standards of 75 dBA L<sub>max</sub> during daytime (7:00 a.m. to 9:00 p.m.) hours, 70 dBA L<sub>max</sub> during nighttime (9:00 p.m. to 7:00 a.m.) hours, and a day/night average noise level threshold of 60 dBA L<sub>dn</sub>, per the City's General Plan Noise Element. Therefore, stationary noise sources associated with the proposed project will comply with the City's noise level standards. This is a **less-than-significant** impact, and no mitigation is required.

#### ***Analysis of Significance of Long-Term Project-Related Noise Increases***

The City of Davis General Plan does not establish a significance threshold for increases in stationary noise sources. In the absence of a specific threshold, Saxelby Acoustics utilizes the FICON criteria to assess increases in ambient noise environment.

At the residences to the south of the proposed project, the average daytime ambient noise level was measured to be 63 dBA L<sub>dn</sub> (LT-1) based upon the ambient noise level survey. It was assumed that the existing sound wall

along East Covell Boulevard reduces existing traffic noise levels by an average of -5 dBA. Therefore, the existing noise levels in the nearest backyards are assumed to be 58 dBA  $L_{dn}$ .

Based upon the FICON criteria, an increase of +5.0 dBA or greater would constitute a significant increase where existing noise levels are less than 60 dBA. The resulting sum of ambient noise (58 dBA  $L_{dn}$ ) plus project generated noise (55 dBA  $L_{dn}$ ) would be 59.8 dBA  $L_{dn}$ . This would represent an increase of +1.8 dBA over ambient, which is less than the +5 dBA increase criterion. It should be noted that  $L_{dn}$  is used here for comparison per the City's use of  $L_{dn}$  in the General Plan Noise Element standards. Therefore, this would be considered a ***less-than-significant*** impact.

### ***Construction Noise***

During the construction phases of the project, noise from construction activities would add to the noise environment in the immediate project vicinity. As indicated in **Table 5**, activities involved in construction would generate average noise levels of up to 88 dBA  $L_{eq}$  at 50 feet and maximum noise levels ranging from 76 to 90 dBA  $L_{max}$  at a distance of 50 feet. Construction activities would also be temporary in nature and are anticipated to occur during normal daytime working hours.

### ***City of Davis Municipal Code Limits***

The City of Davis Municipal Code makes exemptions for certain typical activities which may occur within the City. The exemptions which apply to construction are listed in Article 24.02.040, Special Provisions, and are summarized below:

- a) Construction or landscape operations would be exempt during the hours of 7 AM to 7 PM Mondays through Fridays and between the hours of 8 AM to 8 PM Saturdays and Sundays assuming that the operations are authorized by valid city permit or business license, or carried out by employees or contractors of the city and one of the following conditions apply:
  - (1) No individual piece of equipment shall produce a noise level exceeding eighty-three dBA at a distance of twenty-five feet. If the device is housed within a structure on the property, the measurement shall be made outside the structure at a distance as close to twenty feet from the equipment as possible.
  - (2) The noise level at any point outside of the property plane of the project shall not exceed eighty-six dBA.
  - (3) The provisions of subdivisions (1) and (2) of this subsection shall not be applicable to impact tools and equipment; provided, that such impact tools and equipment shall have intake and exhaust mufflers recommended by manufacturers thereof and approved by the director of public works as best accomplishing maximum noise attenuation, and that pavement breakers and jackhammers shall also be equipped with acoustically attenuating shields or shrouds recommended by the manufacturers thereof and approved by the director of public works as best accomplishing maximum noise attenuation. In the absence of manufacturer's recommendations, the director of public works may prescribe such means of accomplishing maximum noise attenuation as he or she may determine to be in the public interest.

Construction projects located more than two hundred feet from existing homes may request a special use permit to begin work at 6:00 AM on weekdays from June 15th until September 1st. No percussion type tools (such as ramsets or jackhammers) can be used before 7:00 AM. The permit shall be revoked if any noise complaint is received by the police department.

- (4) No individual powered blower shall produce a noise level exceeding seventy dBA measured at a distance of fifty feet.
- (5) No powered blower shall be operated within one hundred feet radius of another powered blower simultaneously.
- (6) On single-family residential property, the seventy dBA at fifty feet restriction shall not apply if operated for less than ten minutes per occurrence.

The most restrictive standard would be the requirement that construction equipment does not exceed 83 dBA at a distance of 25-feet or 86 dBA at the property plane. Construction noise levels can comply with the City of Davis Municipal Code through the implementation of the strategies contained in the Noise Ordinance.

Specifically, as a means of complying with the requirement of 83 dBA at a distance of 25-feet, the project should employ sound control devices on equipment, muffled exhausts on equipment, and installation of acoustic barriers around stationary equipment which block line-of-sight to the equipment.

A list of potential noise reduction strategies is as follows:

- Use of electric construction equipment as an alternative to diesel-powered equipment;
- Sound control devices on equipment;
- Muffled exhaust on construction equipment;
- Staging of construction equipment from nearby residences;
- Limits on idling time for construction equipment and vehicles;
- Installation of acoustic barriers around stationary construction noise sources;
- Installation of temporary barriers between the project site and adjacent sensitive receptors.

#### Assessment of Significance of Noise Level Increases

The City of Davis does not provide specific criteria for determination of a significant impact due to construction noise. Saxelby Acoustics used a criterion of a +5.0 dBA increase over existing ambient to determine significance. As shown in **Table 5**, construction equipment is predicted to generate noise levels of up to 88 dBA  $L_{eq}$  at 50 feet from the acoustical center of activity. For this project, the acoustical center is assumed to occur at a distance of 50 feet inside the boundary of each construction area. **Table 13** provides the predicted noise levels at the nearest sensitive receptor to each project area, based on the construction of each of the large lot parcels of the project, as shown on **Figure 5**.

# Proposed General Plan Land Use Plan



## Willowgrove EIR

City of Davis, California

Figure 5

Temporary Construction Noise Barrier

Project Location



**TABLE 13: CONSTRUCTION NOISE AT EXISTING SENSITIVE RECEPTORS**

| Area | Distance to Sensitive Receptor (feet) | Representative Noise Receptor | Existing Ambient (Leq dBA) | Construction Noise Level (Leq dBA) | Existing + Construction (Leq dBA) | Increase Over Ambient | Exceeds 5 dB? |
|------|---------------------------------------|-------------------------------|----------------------------|------------------------------------|-----------------------------------|-----------------------|---------------|
| S-1  | 2,100                                 | LT-2 (West)                   | 48.1                       | 55.8                               | 56.5                              | 8.4                   | Yes           |
| S-2  | 1,500                                 | LT-2 (West)                   | 48.1                       | 58.7                               | 59.1                              | 11.0                  | Yes           |
| S-3  | 850                                   | LT-2 (West)                   | 48.1                       | 63.6                               | 63.7                              | 15.6                  | Yes           |
| S-4  | 225                                   | LT-2 (West)                   | 48.1                       | 75.2                               | 75.2                              | 27.1                  | Yes           |
| S-5  | 225                                   | LT-2 (West)                   | 48.1                       | 75.2                               | 75.2                              | 27.1                  | Yes           |
| S-6  | 830                                   | LT-2 (West)                   | 48.1                       | 63.8                               | 63.9                              | 15.8                  | Yes           |
| S-7  | 1,500                                 | LT-2 (West)                   | 48.1                       | 58.7                               | 59.1                              | 11.0                  | Yes           |
| S-8  | 2,100                                 | LT-2 (West)                   | 48.1                       | 55.8                               | 56.5                              | 8.4                   | Yes           |
| S-9  | 200                                   | LT-2 (West)                   | 48.1                       | 76.2                               | 76.2                              | 28.1                  | Yes           |
| S-10 | 830                                   | LT-2 (West)                   | 48.1                       | 63.8                               | 63.9                              | 15.8                  | Yes           |
| S-11 | 1,500                                 | LT-2 (West)                   | 48.1                       | 58.7                               | 59.1                              | 11.0                  | Yes           |
| S-12 | 1,250                                 | LT-1 (South)                  | 57.3                       | 55.3                               | 59.4                              | 2.1                   | No            |
| S-13 | 650                                   | LT-1 (South)                  | 57.3                       | 61.0                               | 62.5                              | 5.2                   | Yes           |
| S-14 | 750                                   | LT-1 (South)                  | 57.3                       | 59.7                               | 61.7                              | 4.4                   | No            |
| S-15 | 120                                   | LT-1 (South)                  | 57.3                       | 75.6                               | 75.7                              | 18.4                  | Yes           |
| S-16 | 120                                   | LT-1 (South)                  | 57.3                       | 75.6                               | 75.7                              | 18.4                  | Yes           |
| S-17 | 120                                   | LT-1 (South)                  | 57.3                       | 75.6                               | 75.7                              | 18.4                  | Yes           |
| S-18 | 120                                   | LT-1 (South)                  | 57.3                       | 75.6                               | 75.7                              | 18.4                  | Yes           |
| S-19 | 290                                   | LT-1 (South)                  | 57.3                       | 68.0                               | 68.3                              | 11.0                  | Yes           |
| S-20 | 1,300                                 | LT-2 (West)                   | 48.1                       | 59.9                               | 60.2                              | 12.1                  | Yes           |

As shown in the table, construction of the project is predicted to generate noise levels which exceed the existing average ambient noise level by greater than the +5.0 dBA threshold. To reduce these increases, Saxelby Acoustics recommends Mitigation Measure 1(a) which specifies the use of 8-foot-tall temporary noise barriers at the boundary of the construction area adjacent to the residential uses to the west. It should be noted that the residential uses to the south will not benefit from use of temporary noise barriers as they are already shielded by existing sound walls.

Noise would also be generated during the construction phase by increased truck traffic on area roadways. A project-generated noise source would be truck traffic associated with transport of heavy materials and equipment to and from the construction site. This noise increase would be of short duration and would occur during daytime hours.

Although construction activities are temporary in nature and would occur during normal daytime working hours, construction-related noise could result in sleep interference at existing noise-sensitive land uses in the vicinity of the construction if construction activities were to occur outside the normal daytime hours.

Therefore, impacts resulting from noise levels temporarily exceeding the threshold of significance due to construction would be considered **potentially significant**. Mitigation measure 1(a) would reduce construction noise levels at the existing sensitive receptors.

### ***Mitigation Measures***

- 1(a) The City shall establish the following as conditions of approval for any permit that results in the use of construction equipment:
- The proposed project shall incorporate 8-foot-tall temporary sound barriers between the existing sensitive receptors to the west and construction activities, as shown on **Figure 5**. The sound barrier fencing should consist of ½" plywood or minimum STC 27 sound curtains placed to shield nearby sensitive receptors. The barrier would be placed along the west boundary of large lot Parcels S-4, S-5, and 600 feet along the west side of S-9, as measured from the northwest corner of S-9. The plywood barrier should be free from gaps, openings, or penetrations to ensure maximum performance. The noise barrier should stay in place through the construction of buildings on large lot parcels S-4, S-5, and S-9 after which time they may be removed as buildings on those parcels will provide equivalent shielding.
  - Construction shall be limited to 7:00 a.m. to 7:00 p.m. Monday through Friday and 8:00 a.m. to 8:00 p.m. on Saturday.
  - All construction equipment powered by internal combustion engines shall be properly muffled and maintained.
  - Quiet construction equipment, particularly air compressors, are to be selected whenever possible.
  - All stationary noise-generating construction equipment such as generators or air compressors are to be located as far as is practical from existing residences. In addition, the project contractor shall place such stationary construction equipment so that emitted noise is directed away from sensitive receptors nearest the project site.
  - Unnecessary idling of internal combustion engines is prohibited.
  - The construction contractor shall, to the maximum extent practical, locate on-site equipment staging areas to maximize the distance between construction-related noise sources and noise-sensitive receptors nearest the project site during all project construction.

*Timing/Implementation:* Implemented prior to approval of grading and/or building permits

*Enforcement/Monitoring:* City of Davis Planning Department

### ***Significance After Mitigation***

The recommended temporary construction noise barriers detailed in Mitigation Measures 1(a) are expected to achieve a noise level reduction of -5 dBA. The resulting noise levels are listed in **Table 14** below:

**TABLE 14: CONSTRUCTION NOISE AT EXISTING SENSITIVE RECEPTORS WITH TEMPORARY BARRIERS**

| Area | Distance to Sensitive Receptor (feet) | Representative Noise Receptor | Existing Ambient (Leq dBA) | Construction Noise Level (Leq dBA) | Existing + Construction (Leq dBA) | Increase Over Ambient | Exceeds 5 dB? |
|------|---------------------------------------|-------------------------------|----------------------------|------------------------------------|-----------------------------------|-----------------------|---------------|
| S-1  | 2,100                                 | LT-2                          | 48.1                       | 50.8                               | 52.6                              | 4.5                   | No            |
| S-2  | 1,500                                 | LT-2                          | 48.1                       | 53.7                               | 54.7                              | 6.6                   | Yes           |
| S-3  | 850                                   | LT-2                          | 48.1                       | 58.6                               | 59.0                              | 10.9                  | Yes           |
| S-4  | 225                                   | LT-2                          | 48.1                       | 70.2                               | 70.2                              | 22.1                  | Yes           |
| S-5  | 225                                   | LT-2                          | 48.1                       | 70.2                               | 70.2                              | 22.1                  | Yes           |
| S-6  | 830                                   | LT-2                          | 48.1                       | 58.8                               | 59.2                              | 11.1                  | Yes           |
| S-7  | 1,500                                 | LT-2                          | 48.1                       | 53.7                               | 54.7                              | 6.6                   | Yes           |
| S-8  | 2,100                                 | LT-2                          | 48.1                       | 50.8                               | 52.6                              | 4.5                   | No            |
| S-9  | 200                                   | LT-2                          | 48.1                       | 71.2                               | 71.2                              | 23.1                  | Yes           |
| S-10 | 830                                   | LT-2                          | 48.1                       | 58.8                               | 59.2                              | 11.1                  | Yes           |
| S-11 | 1,500                                 | LT-2                          | 48.1                       | 53.7                               | 54.7                              | 6.6                   | Yes           |
| S-12 | 1,250                                 | LT-1                          | 57.3                       | 55.3                               | 59.4                              | 2.1                   | No            |
| S-13 | 650                                   | LT-1                          | 57.3                       | 61.0                               | 62.5                              | 5.2                   | Yes           |
| S-14 | 750                                   | LT-1                          | 57.3                       | 59.7                               | 61.7                              | 4.4                   | No            |
| S-15 | 120                                   | LT-1                          | 57.3                       | 75.6                               | 75.7                              | 18.4                  | Yes           |
| S-16 | 120                                   | LT-1                          | 57.3                       | 75.6                               | 75.7                              | 18.4                  | Yes           |
| S-17 | 120                                   | LT-1                          | 57.3                       | 75.6                               | 75.7                              | 18.4                  | Yes           |
| S-18 | 120                                   | LT-1                          | 57.3                       | 75.6                               | 75.7                              | 18.4                  | Yes           |
| S-19 | 290                                   | LT-1                          | 57.3                       | 68.0                               | 68.3                              | 11.0                  | Yes           |
| S-20 | 1,300                                 | LT-2                          | 48.1                       | 54.9                               | 55.8                              | 7.7                   | Yes           |

As shown in table, the temporary barriers would reduce several of the impacts to less-than-significant, although many areas remain significant. The resulting increase over ambient of up to 23.1 dBA is greater than the 5 dBA test of significance. Therefore, this would be considered a **significant and unavoidable** impact.

**Impact 2: Would the project generate excessive groundborne vibration or groundborne noise levels?**

Construction vibration impacts include human annoyance and building structural damage. Human annoyance occurs when construction vibration rises significantly above the threshold of perception. Building damage can take the form of cosmetic or structural.

The **Table 6** data indicate that construction vibration levels anticipated for the project are less than the 0.2 in/sec threshold at distances of 26 feet. Sensitive receptors which could be impacted by construction related vibrations, especially vibratory compactors/rollers, are located further than 26 feet from typical construction activities. At distances greater than 26 feet construction vibrations are not predicted to exceed acceptable

levels. Additionally, construction activities would be temporary in nature and would likely occur during normal daytime working hours.

This is a **less-than-significant** impact and no mitigation is required.

**Impact 3:** *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?*

There are no airports within two miles of the project vicinity. Therefore, this impact is not applicable to the proposed project.

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## Appendix A: Acoustical Terminology

|                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|-----------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Acoustics</b>            | The science of sound.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>Ambient Noise</b>        | The distinctive acoustical characteristics of a given space consisting of all noise sources audible at that location. In many cases, the term ambient is used to describe an existing or pre-project condition such as the setting in an environmental noise study.                                                                                                                                                                                                                                                            |
| <b>ASTC</b>                 | Apparent Sound Transmission Class. Similar to STC but includes sound from flanking paths and correct for room reverberation. A larger number means more attenuation. The scale, like the decibel scale for sound, is logarithmic.                                                                                                                                                                                                                                                                                              |
| <b>Attenuation</b>          | The reduction of an acoustic signal.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>A-Weighting</b>          | A frequency-response adjustment of a sound level meter that conditions the output signal to approximate human response.                                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>Decibel or dB</b>        | Fundamental unit of sound, A Bell is defined as the logarithm of the ratio of the sound pressure squared over the reference pressure squared. A Decibel is one-tenth of a Bell.                                                                                                                                                                                                                                                                                                                                                |
| <b>CNEL</b>                 | Community Noise Equivalent Level. Defined as the 24-hour average noise level with noise occurring during evening hours (7 - 10 p.m.) weighted by +5 dBA and nighttime hours weighted by +10 dBA.                                                                                                                                                                                                                                                                                                                               |
| <b>DNL</b>                  | See definition of Ldn.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>IIC</b>                  | Impact Insulation Class. An integer-number rating of how well a building floor attenuates impact sounds, such as footsteps. A larger number means more attenuation. The scale, like the decibel scale for sound, is logarithmic.                                                                                                                                                                                                                                                                                               |
| <b>Frequency</b>            | The measure of the rapidity of alterations of a periodic signal, expressed in cycles per second or hertz (Hz).                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>Ldn</b>                  | Day/Night Average Sound Level. Similar to CNEL but with no evening weighting.                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>Leq</b>                  | Equivalent or energy-averaged sound level.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>Lmax</b>                 | The highest root-mean-square (RMS) sound level measured over a given period of time.                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>L(n)</b>                 | The sound level exceeded a described percentile over a measurement period. For instance, an hourly L50 is the sound level exceeded 50% of the time during the one-hour period.                                                                                                                                                                                                                                                                                                                                                 |
| <b>Loudness</b>             | A subjective term for the sensation of the magnitude of sound.                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>NIC</b>                  | Noise Isolation Class. A rating of the noise reduction between two spaces. Similar to STC but includes sound from flanking paths and no correction for room reverberation.                                                                                                                                                                                                                                                                                                                                                     |
| <b>NNIC</b>                 | Normalized Noise Isolation Class. Similar to NIC but includes a correction for room reverberation.                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>Noise</b>                | Unwanted sound.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>NRC</b>                  | Noise Reduction Coefficient. NRC is a single-number rating of the sound-absorption of a material equal to the arithmetic mean of the sound-absorption coefficients in the 250, 500, 1000, and 2,000 Hz octave frequency bands rounded to the nearest multiple of 0.05. It is a representation of the amount of sound energy absorbed upon striking a particular surface. An NRC of 0 indicates perfect reflection; an NRC of 1 indicates perfect absorption.                                                                   |
| <b>RT60</b>                 | The time it takes reverberant sound to decay by 60 dB once the source has been removed.                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>Sabin</b>                | The unit of sound absorption. One square foot of material absorbing 100% of incident sound has an absorption of 1 Sabin.                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>SEL</b>                  | Sound Exposure Level. SEL is a rating, in decibels, of a discrete event, such as an aircraft flyover or train pass by, that compresses the total sound energy into a one-second event.                                                                                                                                                                                                                                                                                                                                         |
| <b>SPC</b>                  | Speech Privacy Class. SPC is a method of rating speech privacy in buildings. It is designed to measure the degree of speech privacy provided by a closed room, indicating the degree to which conversations occurring within are kept private from listeners outside the room.                                                                                                                                                                                                                                                 |
| <b>STC</b>                  | Sound Transmission Class. STC is an integer rating of how well a building partition attenuates airborne sound. It is widely used to rate interior partitions, ceilings/floors, doors, windows and exterior wall configurations. The STC rating is typically used to rate the sound transmission of a specific building element when tested in laboratory conditions where flanking paths around the assembly don't exist. A larger number means more attenuation. The scale, like the decibel scale for sound, is logarithmic. |
| <b>Threshold of Hearing</b> | The lowest sound that can be perceived by the human auditory system, generally considered to be 0 dB for persons with perfect hearing.                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>Threshold of Pain</b>    | Approximately 120 dB above the threshold of hearing.                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>Impulsive</b>            | Sound of short duration, usually less than one second, with an abrupt onset and rapid decay.                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>Simple Tone</b>          | Any sound which can be judged as audible as a single pitch or set of single pitches.                                                                                                                                                                                                                                                                                                                                                                                                                                           |

## **Appendix B: Continuous Long-Term Ambient Noise Measurement Results**



# Appendix B1a: Continuous Noise Monitoring Results

| Date                    | Time  | Measured Level, dBA |                  |                 |                 |
|-------------------------|-------|---------------------|------------------|-----------------|-----------------|
|                         |       | L <sub>eq</sub>     | L <sub>max</sub> | L <sub>50</sub> | L <sub>90</sub> |
| Saturday, April 5, 2025 | 0:00  | 54                  | 73               | 43              | 35              |
| Saturday, April 5, 2025 | 1:00  | 53                  | 77               | 39              | 33              |
| Saturday, April 5, 2025 | 2:00  | 51                  | 72               | 39              | 34              |
| Saturday, April 5, 2025 | 3:00  | 49                  | 69               | 39              | 35              |
| Saturday, April 5, 2025 | 4:00  | 49                  | 68               | 40              | 36              |
| Saturday, April 5, 2025 | 5:00  | 53                  | 75               | 43              | 40              |
| Saturday, April 5, 2025 | 6:00  | 57                  | 75               | 50              | 42              |
| Saturday, April 5, 2025 | 7:00  | 59                  | 75               | 55              | 44              |
| Saturday, April 5, 2025 | 8:00  | 61                  | 73               | 58              | 46              |
| Saturday, April 5, 2025 | 9:00  | 61                  | 79               | 58              | 47              |
| Saturday, April 5, 2025 | 10:00 | 62                  | 74               | 60              | 48              |
| Saturday, April 5, 2025 | 11:00 | 62                  | 80               | 59              | 48              |
| Saturday, April 5, 2025 | 12:00 | 62                  | 81               | 59              | 48              |
| Saturday, April 5, 2025 | 13:00 | 61                  | 78               | 59              | 47              |
| Saturday, April 5, 2025 | 14:00 | 61                  | 83               | 59              | 47              |
| Saturday, April 5, 2025 | 15:00 | 61                  | 75               | 59              | 48              |
| Saturday, April 5, 2025 | 16:00 | 62                  | 80               | 60              | 49              |
| Saturday, April 5, 2025 | 17:00 | 62                  | 80               | 59              | 49              |
| Saturday, April 5, 2025 | 18:00 | 61                  | 73               | 58              | 49              |
| Saturday, April 5, 2025 | 19:00 | 60                  | 82               | 58              | 49              |
| Saturday, April 5, 2025 | 20:00 | 59                  | 70               | 56              | 47              |
| Saturday, April 5, 2025 | 21:00 | 59                  | 75               | 56              | 47              |
| Saturday, April 5, 2025 | 22:00 | 57                  | 74               | 51              | 40              |
| Saturday, April 5, 2025 | 23:00 | 56                  | 68               | 48              | 40              |

| Statistics    | Leq | Lmax    | L50 | L90 |
|---------------|-----|---------|-----|-----|
| Day Average   | 61  | 77      | 58  | 47  |
| Night Average | 54  | 72      | 43  | 37  |
| Day Low       | 59  | 70      | 55  | 44  |
| Day High      | 62  | 83      | 60  | 49  |
| Night Low     | 49  | 68      | 39  | 33  |
| Night High    | 57  | 77      | 51  | 42  |
| Ldn           | 62  | Day %   |     | 89  |
| CNEL          | 63  | Night % |     | 11  |

Site: LT-1

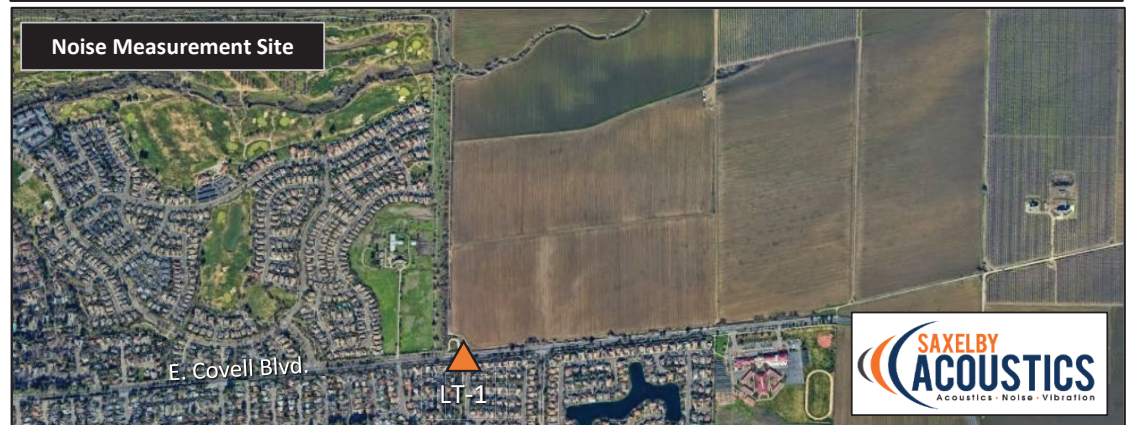
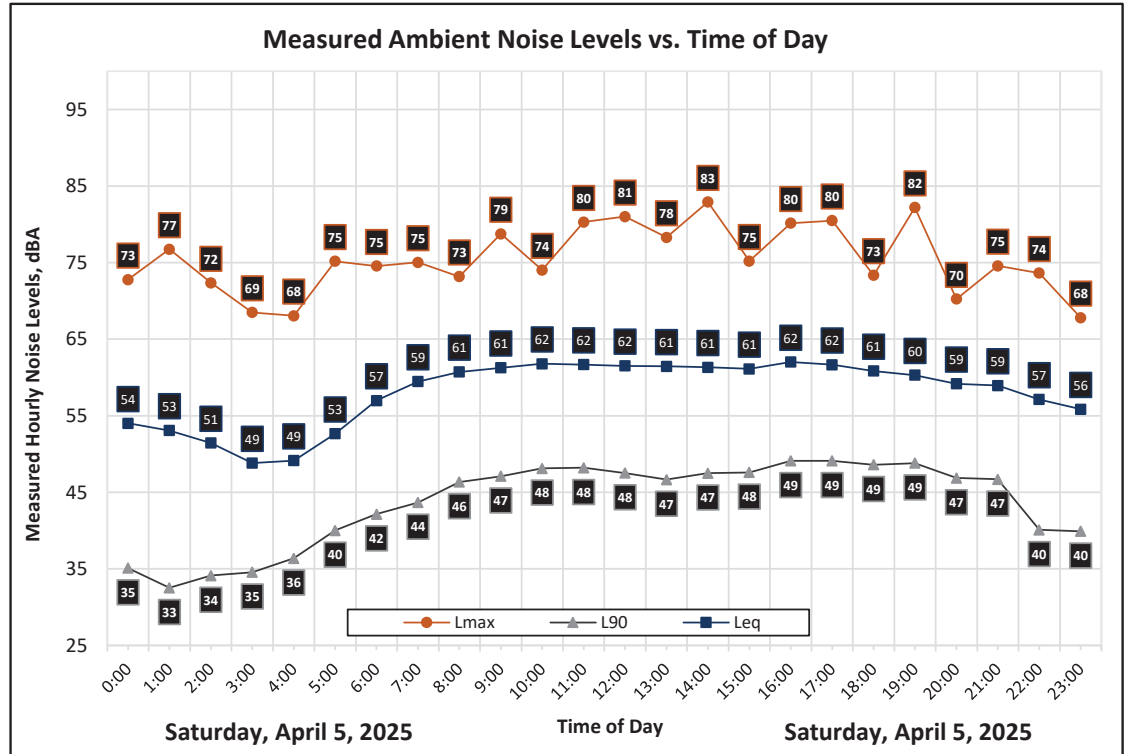
Project: Willowgrove EIR

Location: Southern Project Boundary

Coordinates: (38.5641477, -121.7122048)

Meter: LDL 820-3

Calibrator: CAL200



## Appendix B1b: Continuous Noise Monitoring Results

| Date                  | Time  | Measured Level, dBA |                  |                 |                 |
|-----------------------|-------|---------------------|------------------|-----------------|-----------------|
|                       |       | L <sub>eq</sub>     | L <sub>max</sub> | L <sub>50</sub> | L <sub>90</sub> |
| Sunday, April 6, 2025 | 0:00  | 55                  | 77               | 46              | 40              |
| Sunday, April 6, 2025 | 1:00  | 53                  | 72               | 44              | 40              |
| Sunday, April 6, 2025 | 2:00  | 52                  | 69               | 41              | 36              |
| Sunday, April 6, 2025 | 3:00  | 52                  | 75               | 41              | 35              |
| Sunday, April 6, 2025 | 4:00  | 50                  | 78               | 39              | 35              |
| Sunday, April 6, 2025 | 5:00  | 52                  | 71               | 45              | 38              |
| Sunday, April 6, 2025 | 6:00  | 56                  | 70               | 52              | 48              |
| Sunday, April 6, 2025 | 7:00  | 58                  | 73               | 53              | 47              |
| Sunday, April 6, 2025 | 8:00  | 60                  | 74               | 55              | 45              |
| Sunday, April 6, 2025 | 9:00  | 61                  | 74               | 58              | 46              |
| Sunday, April 6, 2025 | 10:00 | 61                  | 85               | 58              | 45              |
| Sunday, April 6, 2025 | 11:00 | 61                  | 79               | 58              | 47              |
| Sunday, April 6, 2025 | 12:00 | 62                  | 80               | 59              | 49              |
| Sunday, April 6, 2025 | 13:00 | 62                  | 75               | 60              | 49              |
| Sunday, April 6, 2025 | 14:00 | 62                  | 79               | 59              | 48              |
| Sunday, April 6, 2025 | 15:00 | 62                  | 76               | 59              | 48              |
| Sunday, April 6, 2025 | 16:00 | 63                  | 89               | 59              | 49              |
| Sunday, April 6, 2025 | 17:00 | 61                  | 77               | 59              | 49              |
| Sunday, April 6, 2025 | 18:00 | 61                  | 78               | 59              | 49              |
| Sunday, April 6, 2025 | 19:00 | 64                  | 93               | 57              | 48              |
| Sunday, April 6, 2025 | 20:00 | 59                  | 76               | 55              | 47              |
| Sunday, April 6, 2025 | 21:00 | 58                  | 72               | 53              | 45              |
| Sunday, April 6, 2025 | 22:00 | 55                  | 76               | 48              | 42              |
| Sunday, April 6, 2025 | 23:00 | 54                  | 73               | 46              | 42              |

| Statistics    | L <sub>eq</sub> | L <sub>max</sub> | L <sub>50</sub> | L <sub>90</sub> |
|---------------|-----------------|------------------|-----------------|-----------------|
| Day Average   | 61              | 79               | 57              | 48              |
| Night Average | 54              | 73               | 45              | 40              |
| Day Low       | 58              | 72               | 53              | 45              |
| Day High      | 64              | 93               | 60              | 49              |
| Night Low     | 50              | 69               | 39              | 35              |
| Night High    | 56              | 78               | 52              | 48              |
| Ldn           | 62              | Day %            | 90              |                 |
| CNEL          | 63              | Night %          | 10              |                 |

Site: LT-1

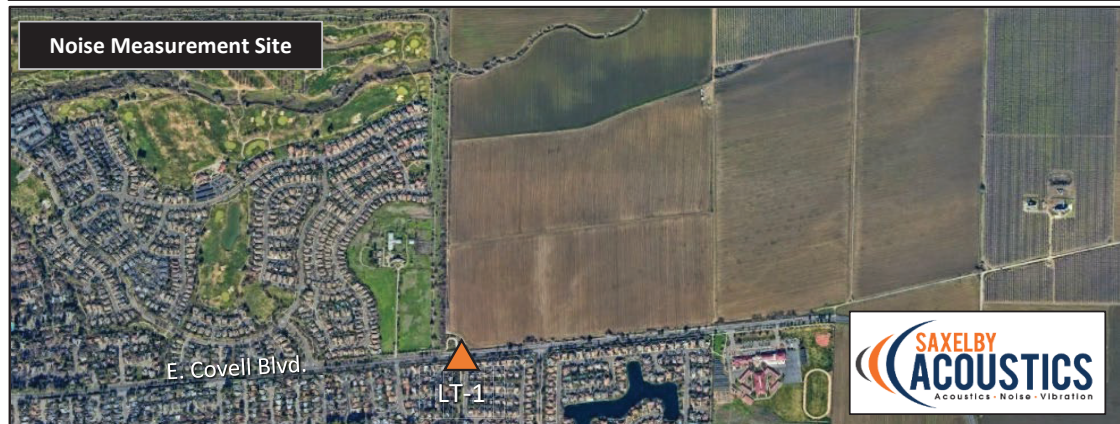
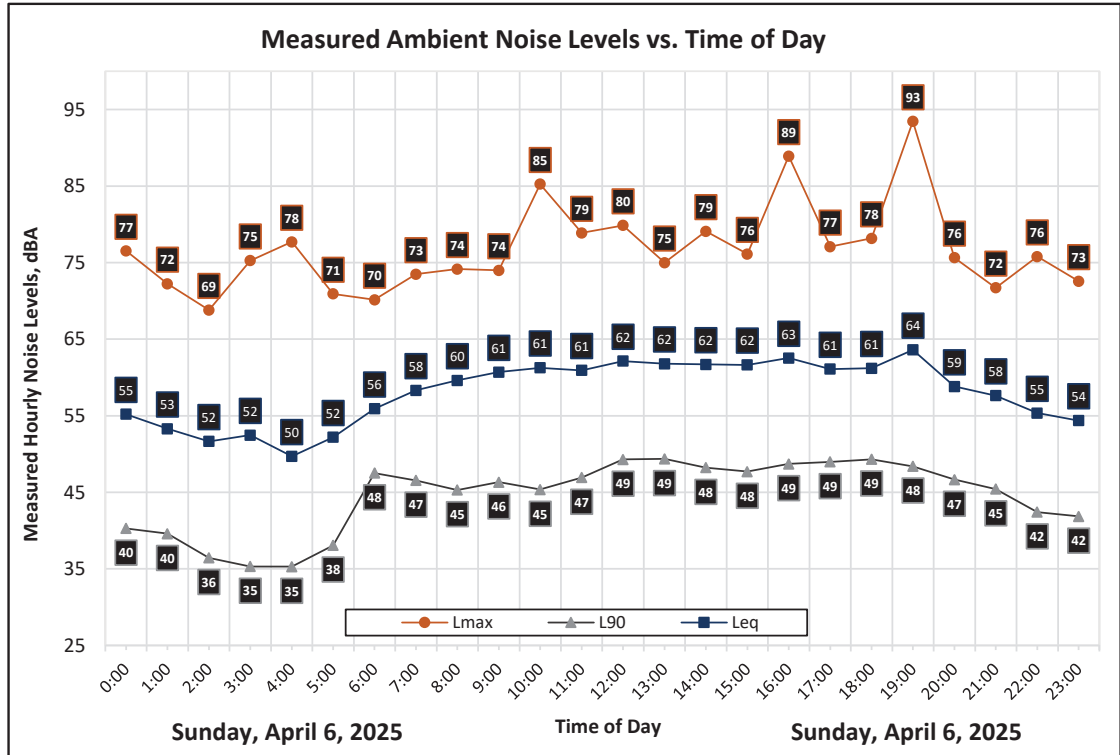
Project: Willowgrove EIR

Location: Southern Project Boundary

Coordinates: (38.5641477, -121.7122048)

Meter: LDL 820-3

Calibrator: CAL200



# Appendix B1c: Continuous Noise Monitoring Results

Site: LT-1

Project: Willowgrove EIR

Location: Southern Project Boundary

Coordinates: (38.5641477, -121.7122048)

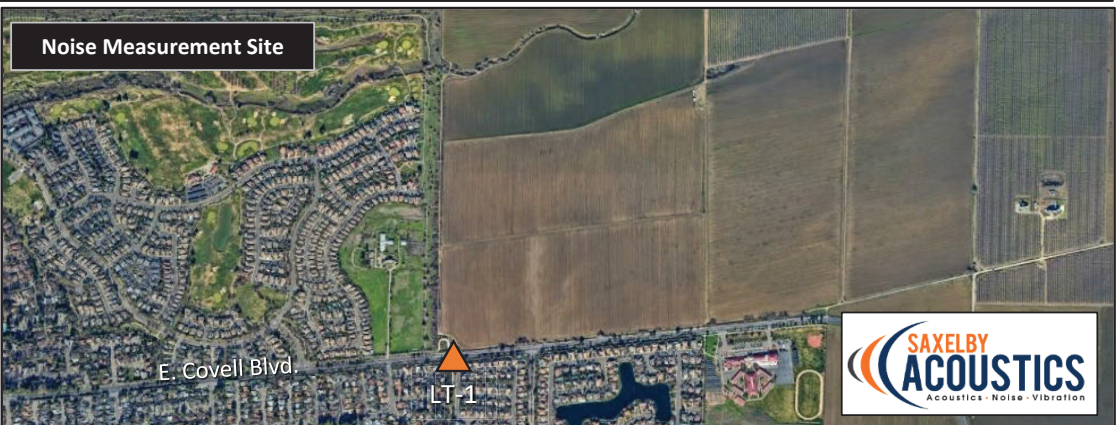
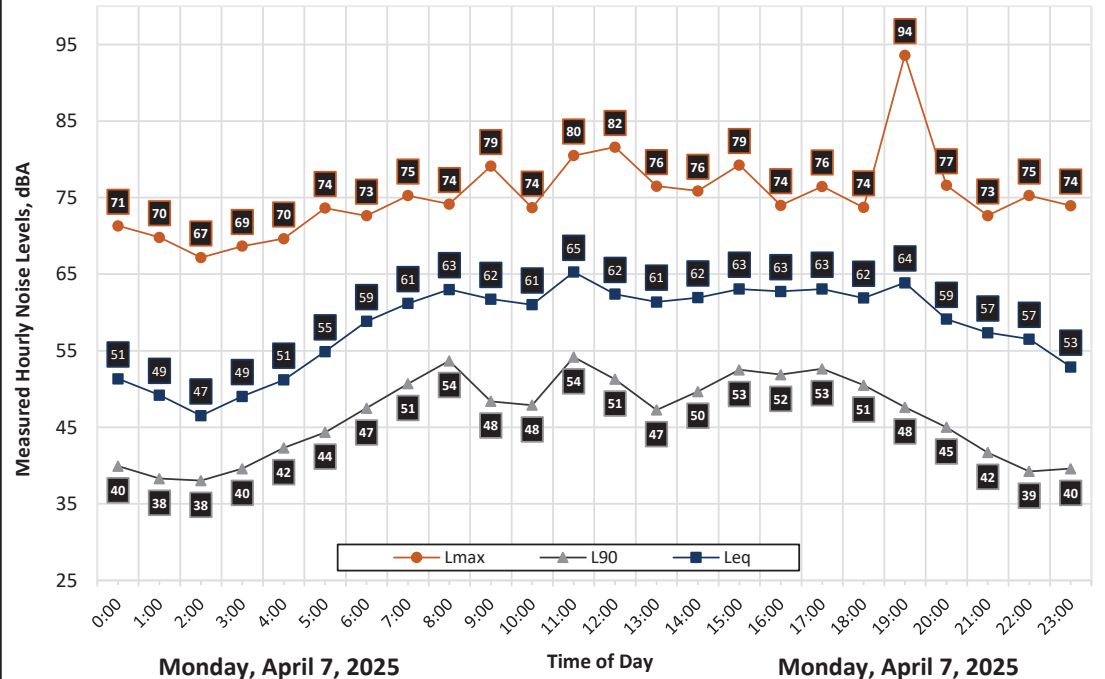
Meter: LDL 820-3

Calibrator: CAL200

| Date                  | Time  | Measured Level, dBA |                  |                 |                 |
|-----------------------|-------|---------------------|------------------|-----------------|-----------------|
|                       |       | L <sub>eq</sub>     | L <sub>max</sub> | L <sub>50</sub> | L <sub>90</sub> |
| Monday, April 7, 2025 | 0:00  | 51                  | 71               | 42              | 40              |
| Monday, April 7, 2025 | 1:00  | 49                  | 70               | 41              | 38              |
| Monday, April 7, 2025 | 2:00  | 47                  | 67               | 40              | 38              |
| Monday, April 7, 2025 | 3:00  | 49                  | 69               | 42              | 40              |
| Monday, April 7, 2025 | 4:00  | 51                  | 70               | 45              | 42              |
| Monday, April 7, 2025 | 5:00  | 55                  | 74               | 48              | 44              |
| Monday, April 7, 2025 | 6:00  | 59                  | 73               | 55              | 47              |
| Monday, April 7, 2025 | 7:00  | 61                  | 75               | 59              | 51              |
| Monday, April 7, 2025 | 8:00  | 63                  | 74               | 62              | 54              |
| Monday, April 7, 2025 | 9:00  | 62                  | 79               | 59              | 48              |
| Monday, April 7, 2025 | 10:00 | 61                  | 74               | 58              | 48              |
| Monday, April 7, 2025 | 11:00 | 65                  | 80               | 62              | 54              |
| Monday, April 7, 2025 | 12:00 | 62                  | 82               | 60              | 51              |
| Monday, April 7, 2025 | 13:00 | 61                  | 76               | 58              | 47              |
| Monday, April 7, 2025 | 14:00 | 62                  | 76               | 60              | 50              |
| Monday, April 7, 2025 | 15:00 | 63                  | 79               | 62              | 53              |
| Monday, April 7, 2025 | 16:00 | 63                  | 74               | 61              | 52              |
| Monday, April 7, 2025 | 17:00 | 63                  | 76               | 62              | 53              |
| Monday, April 7, 2025 | 18:00 | 62                  | 74               | 60              | 51              |
| Monday, April 7, 2025 | 19:00 | 64                  | 94               | 58              | 48              |
| Monday, April 7, 2025 | 20:00 | 59                  | 77               | 56              | 45              |
| Monday, April 7, 2025 | 21:00 | 57                  | 73               | 51              | 42              |
| Monday, April 7, 2025 | 22:00 | 57                  | 75               | 47              | 39              |
| Monday, April 7, 2025 | 23:00 | 53                  | 74               | 43              | 40              |

| Statistics    | L <sub>eq</sub> | L <sub>max</sub> | L <sub>50</sub> | L <sub>90</sub> |
|---------------|-----------------|------------------|-----------------|-----------------|
| Day Average   | 62              | 78               | 59              | 50              |
| Night Average | 54              | 71               | 45              | 41              |
| Day Low       | 57              | 73               | 51              | 42              |
| Day High      | 65              | 94               | 62              | 54              |
| Night Low     | 47              | 67               | 40              | 38              |
| Night High    | 59              | 75               | 55              | 47              |
| Ldn           | 63              | Day %            |                 | 92              |
| CNEL          | 64              | Night %          |                 | 8               |

Measured Ambient Noise Levels vs. Time of Day



## Appendix B2a: Continuous Noise Monitoring Results

| Date                    | Time  | Measured Level, dBA |                  |                 |                 |
|-------------------------|-------|---------------------|------------------|-----------------|-----------------|
|                         |       | L <sub>eq</sub>     | L <sub>max</sub> | L <sub>50</sub> | L <sub>90</sub> |
| Saturday, April 5, 2025 | 0:00  | 36                  | 47               | 35              | 33              |
| Saturday, April 5, 2025 | 1:00  | 34                  | 48               | 34              | 33              |
| Saturday, April 5, 2025 | 2:00  | 37                  | 51               | 35              | 33              |
| Saturday, April 5, 2025 | 3:00  | 40                  | 71               | 37              | 35              |
| Saturday, April 5, 2025 | 4:00  | 40                  | 57               | 38              | 36              |
| Saturday, April 5, 2025 | 5:00  | 41                  | 54               | 40              | 39              |
| Saturday, April 5, 2025 | 6:00  | 42                  | 57               | 39              | 37              |
| Saturday, April 5, 2025 | 7:00  | 45                  | 65               | 41              | 37              |
| Saturday, April 5, 2025 | 8:00  | 47                  | 72               | 41              | 38              |
| Saturday, April 5, 2025 | 9:00  | 43                  | 56               | 41              | 38              |
| Saturday, April 5, 2025 | 10:00 | 43                  | 63               | 39              | 36              |
| Saturday, April 5, 2025 | 11:00 | 44                  | 62               | 38              | 34              |
| Saturday, April 5, 2025 | 12:00 | 41                  | 61               | 36              | 34              |
| Saturday, April 5, 2025 | 13:00 | 39                  | 64               | 35              | 33              |
| Saturday, April 5, 2025 | 14:00 | 38                  | 55               | 35              | 33              |
| Saturday, April 5, 2025 | 15:00 | 41                  | 65               | 36              | 33              |
| Saturday, April 5, 2025 | 16:00 | 41                  | 61               | 36              | 34              |
| Saturday, April 5, 2025 | 17:00 | 41                  | 56               | 36              | 34              |
| Saturday, April 5, 2025 | 18:00 | 41                  | 62               | 40              | 37              |
| Saturday, April 5, 2025 | 19:00 | 43                  | 56               | 42              | 40              |
| Saturday, April 5, 2025 | 20:00 | 42                  | 54               | 41              | 40              |
| Saturday, April 5, 2025 | 21:00 | 41                  | 52               | 41              | 38              |
| Saturday, April 5, 2025 | 22:00 | 38                  | 47               | 38              | 36              |
| Saturday, April 5, 2025 | 23:00 | 39                  | 54               | 38              | 36              |

| Statistics      | L <sub>eq</sub> | L <sub>max</sub> | L <sub>50</sub> | L <sub>90</sub> |
|-----------------|-----------------|------------------|-----------------|-----------------|
| Day Average     | 42              | 60               | 38              | 36              |
| Night Average   | 39              | 54               | 37              | 35              |
| Day Low         | 38              | 52               | 35              | 33              |
| Day High        | 47              | 72               | 42              | 40              |
| Night Low       | 34              | 47               | 34              | 33              |
| Night High      | 42              | 71               | 40              | 39              |
| L <sub>dn</sub> | 46              | Day %            |                 | 78              |
| CNEL            | 47              | Night %          |                 | 22              |

Site: LT-2

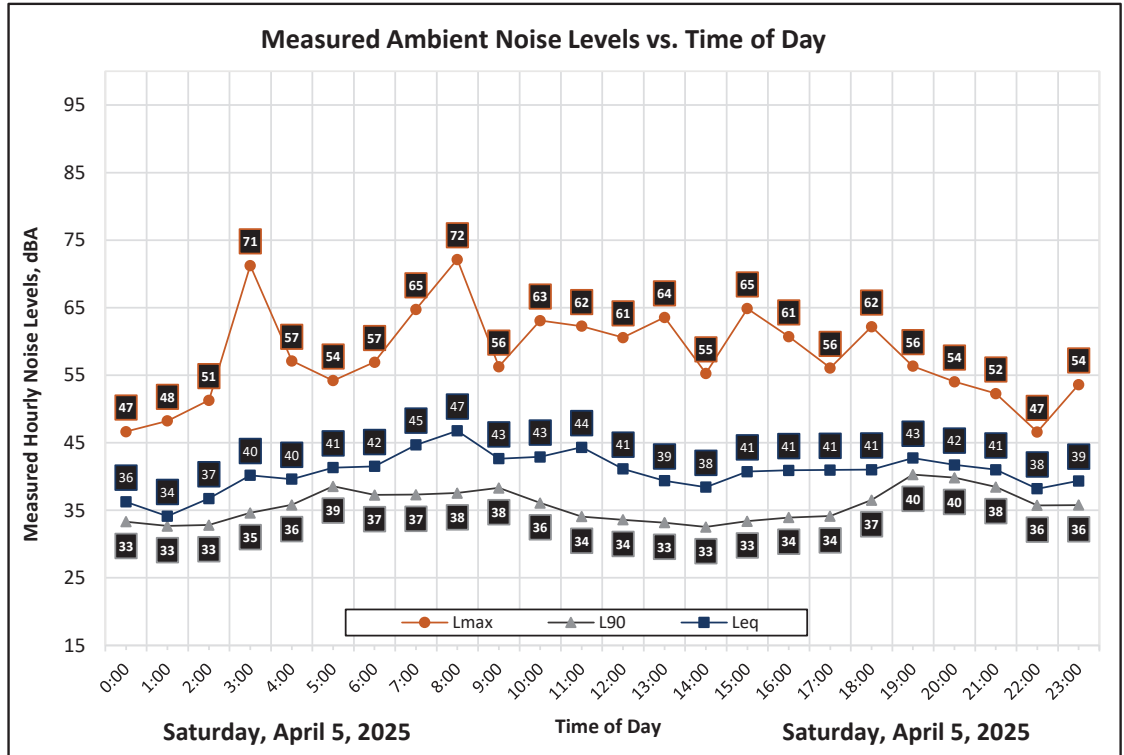
Project: Willowgrove EIR

Location: Northwestern Project Boundary

Coordinates: (38.5697110, -121.7131523)

Meter: LDL 820-5

Calibrator: CAL200



## Appendix B2b: Continuous Noise Monitoring Results

| Date                  | Time  | Measured Level, dBA |                  |                 |                 |
|-----------------------|-------|---------------------|------------------|-----------------|-----------------|
|                       |       | L <sub>eq</sub>     | L <sub>max</sub> | L <sub>50</sub> | L <sub>90</sub> |
| Sunday, April 6, 2025 | 0:00  | 39                  | 50               | 38              | 36              |
| Sunday, April 6, 2025 | 1:00  | 39                  | 54               | 38              | 36              |
| Sunday, April 6, 2025 | 2:00  | 38                  | 60               | 36              | 34              |
| Sunday, April 6, 2025 | 3:00  | 39                  | 55               | 37              | 34              |
| Sunday, April 6, 2025 | 4:00  | 37                  | 50               | 36              | 34              |
| Sunday, April 6, 2025 | 5:00  | 40                  | 56               | 39              | 37              |
| Sunday, April 6, 2025 | 6:00  | 45                  | 58               | 44              | 42              |
| Sunday, April 6, 2025 | 7:00  | 47                  | 66               | 46              | 44              |
| Sunday, April 6, 2025 | 8:00  | 46                  | 66               | 43              | 41              |
| Sunday, April 6, 2025 | 9:00  | 48                  | 65               | 40              | 37              |
| Sunday, April 6, 2025 | 10:00 | 46                  | 73               | 40              | 36              |
| Sunday, April 6, 2025 | 11:00 | 39                  | 56               | 37              | 35              |
| Sunday, April 6, 2025 | 12:00 | 44                  | 63               | 39              | 36              |
| Sunday, April 6, 2025 | 13:00 | 41                  | 57               | 39              | 37              |
| Sunday, April 6, 2025 | 14:00 | 42                  | 57               | 39              | 38              |
| Sunday, April 6, 2025 | 15:00 | 43                  | 60               | 40              | 38              |
| Sunday, April 6, 2025 | 16:00 | 46                  | 64               | 42              | 39              |
| Sunday, April 6, 2025 | 17:00 | 47                  | 68               | 43              | 41              |
| Sunday, April 6, 2025 | 18:00 | 45                  | 62               | 43              | 41              |
| Sunday, April 6, 2025 | 19:00 | 44                  | 60               | 43              | 41              |
| Sunday, April 6, 2025 | 20:00 | 42                  | 53               | 42              | 40              |
| Sunday, April 6, 2025 | 21:00 | 42                  | 53               | 42              | 40              |
| Sunday, April 6, 2025 | 22:00 | 39                  | 46               | 39              | 37              |
| Sunday, April 6, 2025 | 23:00 | 41                  | 53               | 40              | 38              |

| Statistics    | L <sub>eq</sub> | L <sub>max</sub> | L <sub>50</sub> | L <sub>90</sub> |
|---------------|-----------------|------------------|-----------------|-----------------|
| Day Average   | 45              | 62               | 41              | 39              |
| Night Average | 40              | 53               | 39              | 37              |
| Day Low       | 39              | 53               | 37              | 35              |
| Day High      | 48              | 73               | 46              | 44              |
| Night Low     | 37              | 46               | 36              | 34              |
| Night High    | 45              | 60               | 44              | 42              |
| Ldn           | 48              | Day %            |                 | 83              |
| CNEL          | 48              | Night %          |                 | 17              |

Site: LT-2

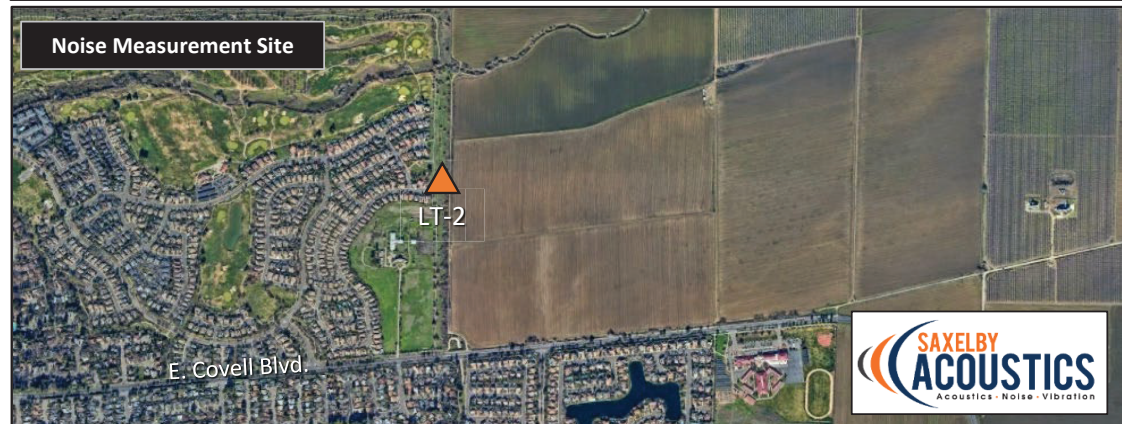
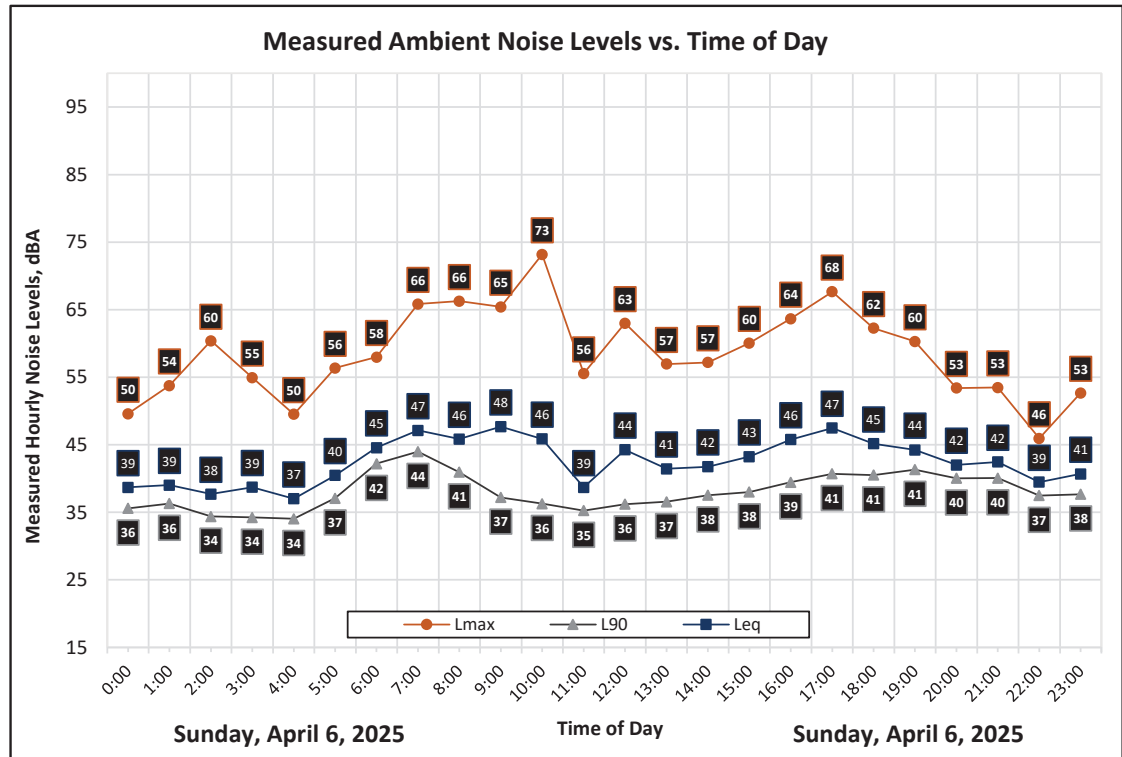
Project: Willowgrove EIR

Location: Northwestern Project Boundary

Coordinates: (38.5697110, -121.7131523)

Meter: LDL 820-5

Calibrator: CAL200



## Appendix B2c: Continuous Noise Monitoring Results

| Date                  | Time  | Measured Level, dBA |                  |                 |                 |
|-----------------------|-------|---------------------|------------------|-----------------|-----------------|
|                       |       | L <sub>eq</sub>     | L <sub>max</sub> | L <sub>50</sub> | L <sub>90</sub> |
| Monday, April 7, 2025 | 0:00  | 39                  | 57               | 38              | 36              |
| Monday, April 7, 2025 | 1:00  | 40                  | 54               | 38              | 36              |
| Monday, April 7, 2025 | 2:00  | 39                  | 61               | 37              | 35              |
| Monday, April 7, 2025 | 3:00  | 43                  | 60               | 40              | 38              |
| Monday, April 7, 2025 | 4:00  | 43                  | 56               | 42              | 40              |
| Monday, April 7, 2025 | 5:00  | 44                  | 55               | 44              | 42              |
| Monday, April 7, 2025 | 6:00  | 45                  | 56               | 45              | 44              |
| Monday, April 7, 2025 | 7:00  | 46                  | 62               | 46              | 44              |
| Monday, April 7, 2025 | 8:00  | 50                  | 62               | 49              | 44              |
| Monday, April 7, 2025 | 9:00  | 47                  | 64               | 44              | 41              |
| Monday, April 7, 2025 | 10:00 | 52                  | 69               | 44              | 40              |
| Monday, April 7, 2025 | 11:00 | 55                  | 71               | 44              | 40              |
| Monday, April 7, 2025 | 12:00 | 46                  | 70               | 39              | 37              |
| Monday, April 7, 2025 | 13:00 | 45                  | 60               | 39              | 36              |
| Monday, April 7, 2025 | 14:00 | 49                  | 68               | 38              | 35              |
| Monday, April 7, 2025 | 15:00 | 41                  | 55               | 39              | 37              |
| Monday, April 7, 2025 | 16:00 | 41                  | 61               | 40              | 38              |
| Monday, April 7, 2025 | 17:00 | 44                  | 64               | 42              | 38              |
| Monday, April 7, 2025 | 18:00 | 45                  | 62               | 43              | 41              |
| Monday, April 7, 2025 | 19:00 | 43                  | 65               | 42              | 40              |
| Monday, April 7, 2025 | 20:00 | 41                  | 52               | 40              | 39              |
| Monday, April 7, 2025 | 21:00 | 39                  | 56               | 38              | 36              |
| Monday, April 7, 2025 | 22:00 | 37                  | 53               | 36              | 34              |
| Monday, April 7, 2025 | 23:00 | 37                  | 52               | 36              | 35              |

| Statistics    | Leq | Lmax    | L50 | L90 |
|---------------|-----|---------|-----|-----|
| Day Average   | 48  | 63      | 42  | 39  |
| Night Average | 42  | 56      | 40  | 38  |
| Day Low       | 39  | 52      | 38  | 35  |
| Day High      | 55  | 71      | 49  | 44  |
| Night Low     | 37  | 52      | 36  | 34  |
| Night High    | 45  | 61      | 45  | 44  |
| Ldn           | 50  | Day %   |     | 88  |
| CNEL          | 50  | Night % |     | 12  |

Site: LT-2

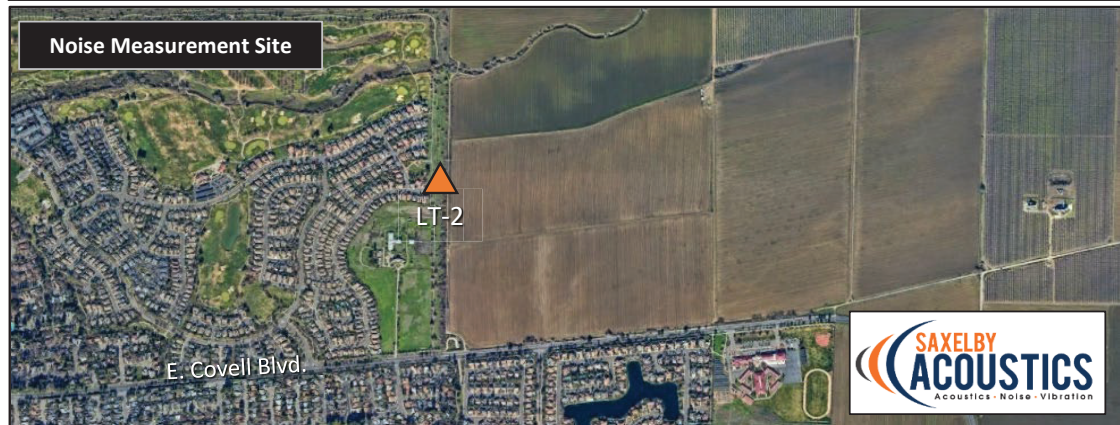
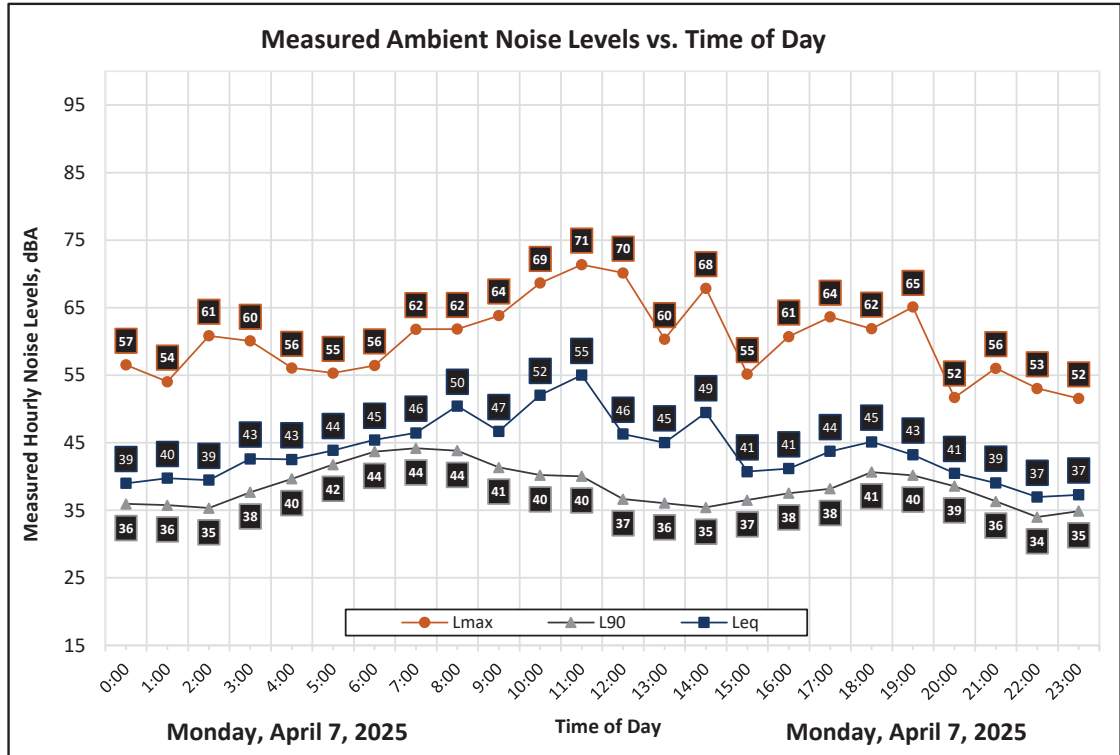
Project: Willowgrove EIR

Location: Northwestern Project Boundary

Coordinates: (38.5697110, -121.7131523)

Meter: LDL 820-5

Calibrator: CAL200



## Appendix C: Traffic Noise Calculation Inputs and Results



## Appendix C-1

### FHWA-RD-77-108 Highway Traffic Noise Prediction Model

Project #: 240201 Willowgrove EIR

Description: Existing Traffic

Ldn/CNEL: Ldn

Hard/Soft: Soft

| Segment | Roadway       | Segment                | ADT    | Day<br>% | Eve<br>% | Night<br>% | % Med.<br>Trucks | % Hvy.<br>Trucks | Speed | Distance | Offset<br>(dB) | Contours (ft.) - No<br>Offset |           |           | Level,<br>dBA |
|---------|---------------|------------------------|--------|----------|----------|------------|------------------|------------------|-------|----------|----------------|-------------------------------|-----------|-----------|---------------|
|         |               |                        |        |          |          |            |                  |                  |       |          |                | 60<br>dBA                     | 65<br>dBA | 70<br>dBA |               |
| 1       | Alhambra Dr   | South of E Covell Blvd | 2,740  | 92       | 0        | 8          | 1.0%             | 1.0%             | 30    | 75       | -5             | 29                            | 13        | 6         | 48.7          |
| 2       | Alhambra Dr   | West of Mace Blvd      | 3,980  | 92       | 0        | 8          | 1.0%             | 1.0%             | 30    | 55       | 0              | 37                            | 17        | 8         | 57.3          |
| 3       | E Covell Blvd | West of Market Ave     | 21,250 | 88       | 0        | 12         | 1.0%             | 1.0%             | 35    | 60       | 0              | 149                           | 69        | 32        | 65.9          |
| 4       | E Covell Blvd | East of Cannery Ave    | 20,570 | 88       | 0        | 12         | 1.0%             | 1.0%             | 35    | 140      | 0              | 146                           | 68        | 31        | 60.3          |
| 5       | E Covell Blvd | East of Pole Line Road | 14,580 | 88       | 0        | 12         | 1.0%             | 1.0%             | 35    | 80       | 0              | 116                           | 54        | 25        | 62.4          |
| 6       | E Covell Blvd | West of Baywood Ln     | 14,550 | 92       | 0        | 8          | 1.0%             | 1.0%             | 35    | 90       | 0              | 102                           | 47        | 22        | 60.8          |
| 7       | E Covell Blvd | West of Manzanita Ln   | 14,200 | 92       | 0        | 8          | 1.0%             | 1.0%             | 35    | 90       | 0              | 101                           | 47        | 22        | 60.7          |
| 8       | E Covell Blvd | West of Wright Blvd    | 13,990 | 92       | 0        | 8          | 1.0%             | 1.0%             | 35    | 75       | 0              | 100                           | 46        | 21        | 61.8          |
| 9       | E Covell Blvd | West of Monarch Ln     | 14,630 | 92       | 0        | 8          | 1.0%             | 1.0%             | 40    | 75       | 0              | 127                           | 59        | 27        | 63.4          |
| 10      | E Covell Blvd | East of Alhambra Dr    | 12,210 | 92       | 0        | 8          | 1.0%             | 1.0%             | 40    | 85       | -5             | 113                           | 52        | 24        | 56.8          |
| 11      | E Covell Blvd | West of Alhambra Dr    | 14,510 | 92       | 0        | 8          | 1.0%             | 1.0%             | 40    | 75       | -5             | 126                           | 59        | 27        | 58.4          |
| 12      | Pole Line Rd  | South of E Covell Blvd | 10,850 | 88       | 0        | 12         | 1.0%             | 1.0%             | 25    | 60       | 0              | 63                            | 29        | 14        | 60.3          |
| 13      | Pole Line Rd  | North of Picasso Ave   | 13,090 | 88       | 0        | 12         | 1.0%             | 1.0%             | 40    | 80       | 0              | 134                           | 62        | 29        | 63.4          |
| 14      | Pole Line Rd  | North of Donner Ave    | 12,330 | 88       | 0        | 12         | 1.0%             | 1.0%             | 40    | 65       | 0              | 129                           | 60        | 28        | 64.4          |
| 15      | Pole Line Rd  | North of Moore Blvd    | 11,010 | 88       | 0        | 12         | 1.0%             | 1.0%             | 45    | 50       | 0              | 145                           | 67        | 31        | 66.9          |

## Appendix C-2

### FHWA-RD-77-108 Highway Traffic Noise Prediction Model

**Project #:** 240201 Willowgrove EIR

**Description:** Existing Plus Project Traffic

**Ldn/CNEL:** Ldn

**Hard/Soft:** Soft

| Segment | Roadway       | Segment                | ADT    | Day<br>% | Eve<br>% | Night<br>% | % Med.<br>Trucks | % Hvy.<br>Trucks | Speed | Distance | Offset<br>(dB) | Contours (ft.) - No<br>Offset |           |           | Level,<br>dBA |
|---------|---------------|------------------------|--------|----------|----------|------------|------------------|------------------|-------|----------|----------------|-------------------------------|-----------|-----------|---------------|
|         |               |                        |        |          |          |            |                  |                  |       |          |                | 60<br>dBA                     | 65<br>dBA | 70<br>dBA |               |
| 1       | Alhambra Dr   | South of E Covell Blvd | 3,900  | 92       | 0        | 8          | 1.0%             | 1.0%             | 30    | 75       | -5             | 36                            | 17        | 8         | 50.2          |
| 2       | Alhambra Dr   | West of Mace Blvd      | 4,080  | 92       | 0        | 8          | 1.0%             | 1.0%             | 30    | 55       | 0              | 37                            | 17        | 8         | 57.4          |
| 3       | E Covell Blvd | West of Market Ave     | 23,910 | 88       | 0        | 12         | 1.0%             | 1.0%             | 35    | 60       | 0              | 162                           | 75        | 35        | 66.5          |
| 4       | E Covell Blvd | East of Cannery Ave    | 23,310 | 88       | 0        | 12         | 1.0%             | 1.0%             | 35    | 140      | 0              | 159                           | 74        | 34        | 60.8          |
| 5       | E Covell Blvd | East of Pole Line Road | 19,480 | 88       | 0        | 12         | 1.0%             | 1.0%             | 35    | 80       | 0              | 141                           | 65        | 30        | 63.7          |
| 6       | E Covell Blvd | West of Baywood Ln     | 19,590 | 92       | 0        | 8          | 1.0%             | 1.0%             | 35    | 90       | 0              | 125                           | 58        | 27        | 62.1          |
| 7       | E Covell Blvd | West of Manzanita Ln   | 19,300 | 92       | 0        | 8          | 1.0%             | 1.0%             | 35    | 90       | 0              | 123                           | 57        | 27        | 62.1          |
| 8       | E Covell Blvd | West of Wright Blvd    | 19,090 | 92       | 0        | 8          | 1.0%             | 1.0%             | 35    | 75       | 0              | 123                           | 57        | 26        | 63.2          |
| 9       | E Covell Blvd | West of Monarch Ln     | 19,790 | 92       | 0        | 8          | 1.0%             | 1.0%             | 40    | 75       | 0              | 155                           | 72        | 33        | 64.7          |
| 10      | E Covell Blvd | East of Alhambra Dr    | 15,740 | 92       | 0        | 8          | 1.0%             | 1.0%             | 40    | 85       | -5             | 133                           | 62        | 29        | 57.9          |
| 11      | E Covell Blvd | West of Alhambra Dr    | 19,730 | 92       | 0        | 8          | 1.0%             | 1.0%             | 40    | 75       | -5             | 155                           | 72        | 33        | 59.7          |
| 12      | Pole Line Rd  | South of E Covell Blvd | 11,980 | 88       | 0        | 12         | 1.0%             | 1.0%             | 25    | 60       | 0              | 68                            | 31        | 15        | 60.8          |
| 13      | Pole Line Rd  | North of Picasso Ave   | 13,400 | 88       | 0        | 12         | 1.0%             | 1.0%             | 40    | 80       | 0              | 136                           | 63        | 29        | 63.5          |
| 14      | Pole Line Rd  | North of Donner Ave    | 12,640 | 88       | 0        | 12         | 1.0%             | 1.0%             | 40    | 65       | 0              | 131                           | 61        | 28        | 64.6          |
| 15      | Pole Line Rd  | North of Moore Blvd    | 11,320 | 88       | 0        | 12         | 1.0%             | 1.0%             | 45    | 50       | 0              | 148                           | 69        | 32        | 67.1          |

## Appendix C-3

### FHWA-RD-77-108 Highway Traffic Noise Prediction Model

Project #: 240201 Willowgrove EIR

Description: Cumulative Traffic

Ldn/CNEL: Ldn

Hard/Soft: Soft

| Segment | Roadway       | Segment                | ADT    | Day<br>% | Eve<br>% | Night<br>% | % Med.<br>Trucks | % Hvy.<br>Trucks | Speed | Distance | Offset<br>(dB) | Contours (ft.) - No<br>Offset |           |           | Level,<br>dBA |
|---------|---------------|------------------------|--------|----------|----------|------------|------------------|------------------|-------|----------|----------------|-------------------------------|-----------|-----------|---------------|
|         |               |                        |        |          |          |            |                  |                  |       |          |                | 60<br>dBA                     | 65<br>dBA | 70<br>dBA |               |
| 1       | Alhambra Dr   | South of E Covell Blvd | 5,390  | 92       | 0        | 8          | 1.0%             | 1.0%             | 30    | 75       | -5             | 45                            | 21        | 10        | 51.6          |
| 2       | Alhambra Dr   | West of Mace Blvd      | 8,700  | 92       | 0        | 8          | 1.0%             | 1.0%             | 30    | 55       | 0              | 62                            | 29        | 13        | 60.7          |
| 3       | E Covell Blvd | West of Market Ave     | 29,000 | 88       | 0        | 12         | 1.0%             | 1.0%             | 35    | 60       | 0              | 184                           | 85        | 40        | 67.3          |
| 4       | E Covell Blvd | East of Cannery Ave    | 27,000 | 88       | 0        | 12         | 1.0%             | 1.0%             | 35    | 140      | 0              | 175                           | 81        | 38        | 61.5          |
| 5       | E Covell Blvd | East of Pole Line Road | 24,600 | 88       | 0        | 12         | 1.0%             | 1.0%             | 35    | 80       | 0              | 165                           | 76        | 35        | 64.7          |
| 6       | E Covell Blvd | West of Baywood Ln     | 25,380 | 92       | 0        | 8          | 1.0%             | 1.0%             | 35    | 90       | 0              | 148                           | 69        | 32        | 63.2          |
| 7       | E Covell Blvd | West of Manzanita Ln   | 25,230 | 92       | 0        | 8          | 1.0%             | 1.0%             | 35    | 90       | 0              | 148                           | 68        | 32        | 63.2          |
| 8       | E Covell Blvd | West of Wright Blvd    | 24,630 | 92       | 0        | 8          | 1.0%             | 1.0%             | 35    | 75       | 0              | 145                           | 67        | 31        | 64.3          |
| 9       | E Covell Blvd | West of Monarch Ln     | 26,830 | 92       | 0        | 8          | 1.0%             | 1.0%             | 40    | 75       | 0              | 190                           | 88        | 41        | 66.1          |
| 10      | E Covell Blvd | East of Alhambra Dr    | 20,420 | 92       | 0        | 8          | 1.0%             | 1.0%             | 40    | 85       | -5             | 159                           | 74        | 34        | 59.1          |
| 11      | E Covell Blvd | West of Alhambra Dr    | 25,980 | 92       | 0        | 8          | 1.0%             | 1.0%             | 40    | 75       | -5             | 186                           | 86        | 40        | 60.9          |
| 12      | Pole Line Rd  | South of E Covell Blvd | 15,850 | 88       | 0        | 12         | 1.0%             | 1.0%             | 25    | 60       | 0              | 82                            | 38        | 18        | 62.0          |
| 13      | Pole Line Rd  | North of Picasso Ave   | 18,500 | 88       | 0        | 12         | 1.0%             | 1.0%             | 40    | 80       | 0              | 169                           | 78        | 36        | 64.9          |
| 14      | Pole Line Rd  | North of Donner Ave    | 16,150 | 88       | 0        | 12         | 1.0%             | 1.0%             | 40    | 65       | 0              | 154                           | 71        | 33        | 65.6          |
| 15      | Pole Line Rd  | North of Moore Blvd    | 14,000 | 88       | 0        | 12         | 1.0%             | 1.0%             | 45    | 50       | 0              | 170                           | 79        | 37        | 68.0          |

## Appendix C-4

### FHWA-RD-77-108 Highway Traffic Noise Prediction Model

**Project #:** 240201 Willowgrove EIR

**Description:** Cumulative Plus Project Traffic

**Ldn/CNEL:** Ldn

**Hard/Soft:** Soft

| Segment | Roadway       | Segment                | ADT    | Day<br>% | Eve<br>% | Night<br>% | % Med.<br>Trucks | % Hvy.<br>Trucks | Speed | Distance | Offset<br>(dB) | Contours (ft.) - No<br>Offset |     |     | Level,<br>dBA |
|---------|---------------|------------------------|--------|----------|----------|------------|------------------|------------------|-------|----------|----------------|-------------------------------|-----|-----|---------------|
|         |               |                        |        |          |          |            |                  |                  |       |          |                | 60                            | 65  | 70  |               |
|         |               |                        |        |          |          |            |                  |                  |       |          |                | dBA                           | dBA | dBA |               |
| 1       | Alhambra Dr   | South of E Covell Blvd | 6,550  | 92       | 0        | 8          | 1.0%             | 1.0%             | 30    | 75       | -5             | 51                            | 24  | 11  | 52.5          |
| 2       | Alhambra Dr   | West of Mace Blvd      | 8,800  | 92       | 0        | 8          | 1.0%             | 1.0%             | 30    | 55       | 0              | 62                            | 29  | 13  | 60.8          |
| 3       | E Covell Blvd | West of Market Ave     | 31,660 | 88       | 0        | 12         | 1.0%             | 1.0%             | 35    | 60       | 0              | 195                           | 90  | 42  | 67.7          |
| 4       | E Covell Blvd | East of Cannery Ave    | 29,740 | 88       | 0        | 12         | 1.0%             | 1.0%             | 35    | 140      | 0              | 187                           | 87  | 40  | 61.9          |
| 5       | E Covell Blvd | East of Pole Line Road | 29,500 | 88       | 0        | 12         | 1.0%             | 1.0%             | 35    | 80       | 0              | 186                           | 86  | 40  | 65.5          |
| 6       | E Covell Blvd | West of Baywood Ln     | 30,420 | 92       | 0        | 8          | 1.0%             | 1.0%             | 35    | 90       | 0              | 167                           | 78  | 36  | 64.0          |
| 7       | E Covell Blvd | West of Manzanita Ln   | 30,330 | 92       | 0        | 8          | 1.0%             | 1.0%             | 35    | 90       | 0              | 167                           | 77  | 36  | 64.0          |
| 8       | E Covell Blvd | West of Wright Blvd    | 29,730 | 92       | 0        | 8          | 1.0%             | 1.0%             | 35    | 75       | 0              | 165                           | 76  | 35  | 65.1          |
| 9       | E Covell Blvd | West of Monarch Ln     | 31,990 | 92       | 0        | 8          | 1.0%             | 1.0%             | 40    | 75       | 0              | 214                           | 99  | 46  | 66.8          |
| 10      | E Covell Blvd | East of Alhambra Dr    | 23,950 | 92       | 0        | 8          | 1.0%             | 1.0%             | 40    | 85       | -5             | 176                           | 82  | 38  | 59.8          |
| 11      | E Covell Blvd | West of Alhambra Dr    | 31,200 | 92       | 0        | 8          | 1.0%             | 1.0%             | 40    | 75       | -5             | 210                           | 98  | 45  | 61.7          |
| 12      | Pole Line Rd  | South of E Covell Blvd | 16,980 | 88       | 0        | 12         | 1.0%             | 1.0%             | 25    | 60       | 0              | 85                            | 40  | 18  | 62.3          |
| 13      | Pole Line Rd  | North of Picasso Ave   | 18,810 | 88       | 0        | 12         | 1.0%             | 1.0%             | 40    | 80       | 0              | 171                           | 79  | 37  | 64.9          |
| 14      | Pole Line Rd  | North of Donner Ave    | 16,460 | 88       | 0        | 12         | 1.0%             | 1.0%             | 40    | 65       | 0              | 156                           | 72  | 34  | 65.7          |
| 15      | Pole Line Rd  | North of Moore Blvd    | 14,310 | 88       | 0        | 12         | 1.0%             | 1.0%             | 45    | 50       | 0              | 173                           | 80  | 37  | 68.1          |