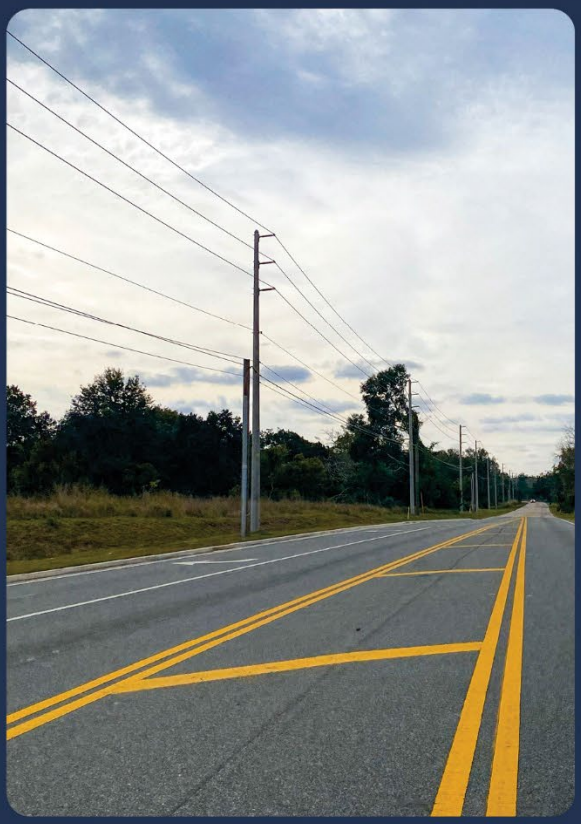
Prepared for

ORANGE COUNTY FLORIDA



CR 545 (Avalon Road) South
US 192 to Hartzog Road
Project Development and Environment (PD&E) Study
NOISE STUDY REPORT

April 2026

Submitted by

DRMP

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EXECUTIVE SUMMARY

This report summarizes the findings of a noise analysis performed by DRMP, Inc. for the proposed Avalon Road widening project in Orange County, Florida. The proposed project includes widening the existing two-lane roadway to four 12-foot travel lanes with curb and gutter, a 22-foot raised median, a six-foot-wide sidewalk on the east side of the roadway, and a 10-foot-wide multi-use path on the west side to accommodate pedestrians and bicyclists.

This Noise Study Report (NSR) presents the methodology and results of the highway traffic noise evaluation for the Avalon Road widening project. The purpose of this noise study is to identify noise sensitive sites that would be impacted by the preferred alternative, evaluate abatement measures at impacted noise sensitive sites, and determine where noise abatement (i.e., noise barriers) is considered feasible and reasonable.

The Federal Highway Administration (FHWA) Traffic Noise Model (TNM), version 2.5, was utilized to predict noise levels at 212 receptor points representing 210 residences and two special land uses (SLUs). For the year 2048 Build condition, noise levels are predicted to approach, meet, or exceed the Noise Abatement Criteria (NAC) at 38 residences within the project limits. A substantial increase of 15 dB(A) is not predicted to occur at any residence or SLU. Noise abatement for impacted noise sensitive sites were considered and evaluated to determine for feasibility and reasonableness of providing barriers to reduce traffic noise.

The noise barrier evaluation process identified that noise barriers are a feasible and reasonable form of abatement and could potentially provide at least a 5 dB(A) reduction at 13 of the 38 impacted residences (The Palisades Condominiums) at a cost below the reasonable limit. Additionally, the noise barrier achieves the Noise Reduction Design Goal (NRDG). Noise barriers were found to be potentially feasible and reasonable at the following Noise Sensitive Areas (NSA):

- NSA 4 – The Palisades Condominiums

The minimum barrier is 12 feet tall, 1,415 feet long and could provide a benefit to a total of 29 residences at the Palisades Condominiums, including 13 of the 34 impacted receptors. This barrier meets the noise reduction design goal of achieving a 7 dB(A) reduction at one or more benefited sites and costs $23,417 per benefited receptors, which is below the $64,000 per benefited receptor cost criteria.

INTRODUCTION

Project Description

Avalon Road (CR 545) is a critical link in Orange County's transportation network, as it provides primary north/south access for many residents and businesses in west Orange County. In addition, it provides continuity and access between Orange County and neighboring Osceola County, as well as offering a parallel, alternative route to SR 429 and to US 27 in nearby Lake County.

The project corridor is located along approximately 1.6 miles of Avalon Road in southwest Orange County, from US 192 to Hartzog Road. Avalon Road currently operates as a two-lane collector roadway with annual average daily traffic (AADT) volumes ranging from approximately 15,700 to 16,200 annual average daily traffic (AADT). Due to substantial growth in the surrounding area, traffic volumes along the corridor are predicted to increase to 34,000 AADT in 2048, exceeding the capacity of a two-lane roadway. Furthermore, most segments of Avalon Road currently operate at Level of Service (LOS) F, and traffic operations are expected to worsen. The County's vision for the corridor not only includes addressing capacity issues but also providing a complete multi-modal facility to serve motorists, pedestrians, and bicyclists.

The project includes capacity and multimodal improvements to address current and future transportation demands. Improvements will include the addition of multimodal facilities, roadway lighting, and landscape enhancements to improve mobility, safety, and corridor aesthetics.

The proposed project includes widening the existing two-lane roadway to four 12-foot travel lanes with curb and gutter, a 22-foot raised median, a six-foot-wide sidewalk on the east side of the roadway, and a 10-foot-wide multi-use path on the west side to accommodate pedestrians and bicyclists. These facilities will be separated from the roadway by a grass utility strip and will connect to planned regional pedestrian and bicycle facilities north of Hartzog Road. Pedestrian features, including crosswalks and pedestrian signals, will be provided at US 192, which is the only signalized intersection within the project limits. All facilities will comply with the Americans with Disabilities Act (ADA).

The project is being designed to minimize, to the extent possible, right-of-way impacts to adjacent existing and planned developments. The Preferred Alternative accommodates projected future traffic demands, improves roadway operations and safety, and incorporates stormwater management features designed to meet South Florida Water Management District and Orange County requirements. Three stormwater management ponds and a floodplain compensation site are planned to provide water quality treatment and runoff attenuation while avoiding impacts to nearby wetlands and floodplain areas, where feasible.

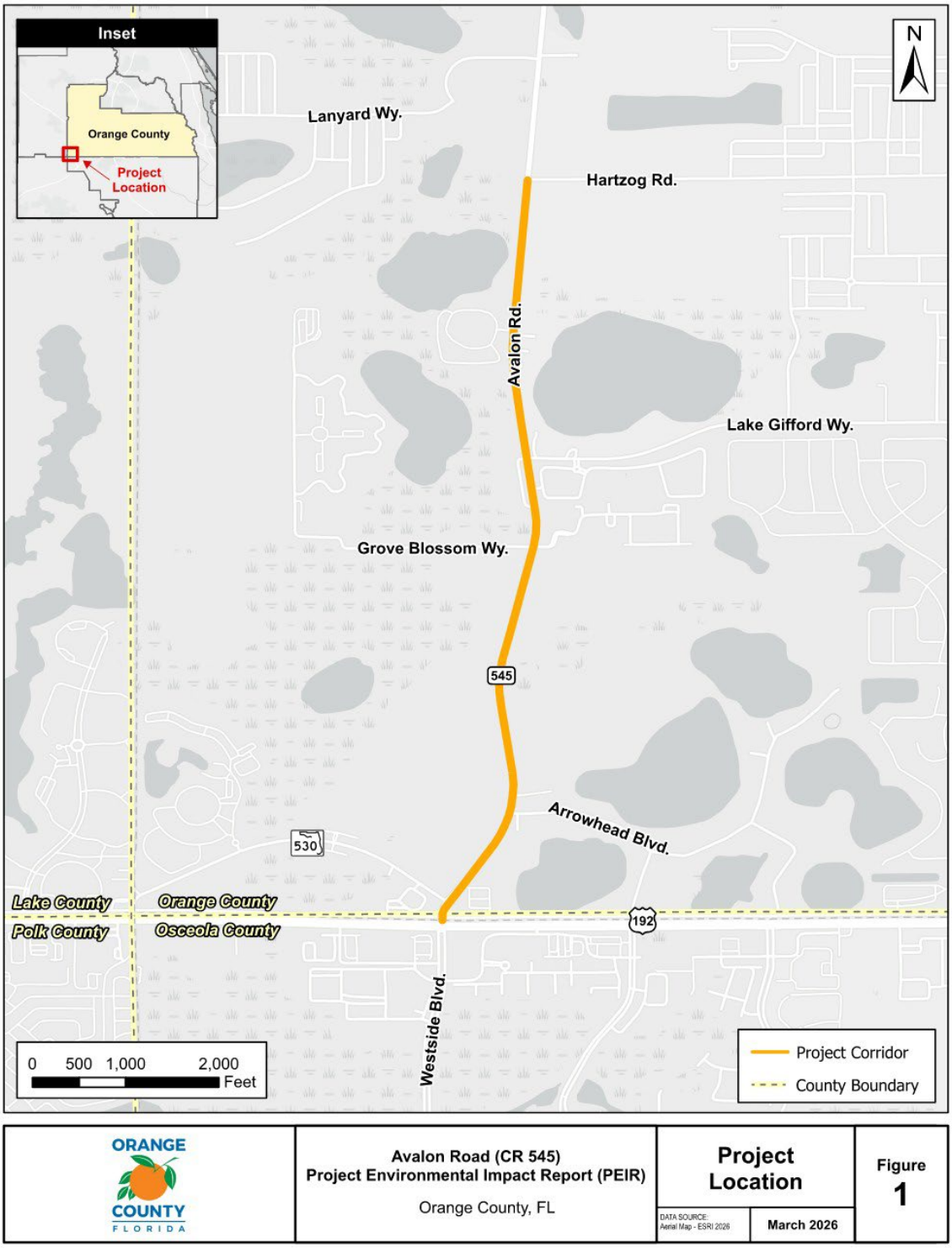


Figure 1 Project Location Map

METHODOLOGY

This highway traffic noise study was completed in accordance with Title 23, Code of Federal Regulations, Part 772 (23 CFR 772), *Procedures for Abatement of Highway Traffic Noise and Construction Noise* following methodology and procedures established by the FDOT in the PD&E Manual, Part 2, Chapter 18, *Highway Traffic Noise,* and the FDOT *Traffic Noise Modeling and Analysis Practitioners Handbook* .

The FHWA's Traffic Noise Model (TNM), version 2.5, was used to predict existing and future traffic noise levels and to analyze the effectiveness of noise barriers, where warranted. This model estimates the acoustic intensity at noise sensitive receptor sites from a series of roadway segments (the source). Model-predicted noise levels are influenced by several factors, such as vehicle speed and distribution of vehicle types. Noise levels are also affected by characteristics of the source-to-receptor site path, including the effects of intervening barriers, structures (houses, trees, etc.), ground surface type (hard or soft), and topography.

Representative receptor sites were used as inputs to the TNM to estimate noise levels associated with existing and future conditions within the project limits. These sites were chosen based on noise sensitivity, roadway proximity, anticipated impacts from the proposed project, and homogeneity (i.e., the site is representative of other nearby sites). For single-family residences, traffic noise levels were predicted at the edge of the dwelling unit closest to the nearest primary roadway. For other noise sensitive sites that may be impacted, traffic noise levels were predicted where the exterior activity occurs. For the prediction of interior noise levels, receptor sites were placed ten feet outside the building at the edge closest to the roadway. Building noise reduction factors identified in Figure 18-3 in Part 2, Chapter 18 of the PD&E Manual and window conditions were used to estimate noise reduction due to the physical structure.

Noise Metrics

Noise levels developed for this analysis are expressed in decibels (dB) using an "A"-scale [dB(A)] weighting. This scale most closely approximates the response characteristics of the human ear to typical traffic noise levels. All reported noise levels are hourly equivalent noise levels [Leq(h)]. The Leq(h) is defined as the equivalent steady-state sound level that, in an hourly period, contains the same acoustic energy as the time-varying sound level for the same hourly period. Use of these metrics is consistent with the requirements of 23 CFR 772.

The commonly accepted limitation of human hearing to detect sound frequencies is between 20 Hz and 20,000 Hz, and human hearing is most sensitive to the frequencies between 1,000 Hz and 6,000 Hz. Although people are generally not as sensitive to lower-frequency sounds as they are to higher frequencies, most people lose the ability to hear high-frequency sounds as they age. To accommodate varying receptor sensitivities, frequency sound levels are commonly adjusted, or filtered, before being logarithmically added and reported as a single sound level magnitude of that filtering scale. The A-weighted decibel filtering scale applies numerical adjustments to sound frequencies to emphasize the frequencies at which human hearing is sensitive, and to minimize the frequencies to which human hearing is not as sensitive.

Common indoor and outdoor noise levels are presented in Table 1. As shown by the example noise levels, most individuals are exposed to fairly high noise levels from many sources on a regular basis.

Table 1: Typical Noise Levels

Common Outdoor Noise Levels	Noise Level (dB(A))	Common Indoor Noise Levels
	110	Rock band
Jet Flyover at 1,000 feet	100	Inside Subway Train (NY)
Gas Lawn Mower at 3 feet	95	
Diesel Truck at 50 feet	90	Food Blender at 3 feet
Noisy Urban Daytime	80	Garage Disposal at 3 feet
Gas Lawn Mower at 100 feet	70	Vacuum Cleaner at 10 feet
Commercial Area	65	Normal Speech at 3 feet
	55	Large Business Office
Quiet Urban Daytime	50	Dishwasher Next Room
Quiet Urban Nighttime	40	Small Theater, Large Conference Room (Background)
Quiet Suburban Nighttime	35	Library
	30	
Quiet Rural Nighttime	25	Bedroom at Night, Concert Hall (Background)
	15	Broadcast and Recording Studio
	0	Threshold of Hearing

Adapted from Guide on Evaluation and Attenuation of Traffic Noise, American Association of State Highway and Transportation Officials (AASHTO). 1974 (revised 1993).

Traffic Data

Among other factors, traffic noise is heavily dependent on both traffic speed and traffic volume with the amount of noise generated by traffic increasing as the vehicle speed and number of vehicles increases. The traffic conditions that result in the highest noise levels for roadways are the hourly traffic volumes that represent Level of Service (LOS) C traffic conditions because these are the maximum traffic volumes that continue to travel at free flow speed.

Traffic data was reviewed to determine maximum traffic volumes that would allow traffic to flow at speeds consistent with established speed limits. The traffic data used in the TNM modeling is from a report entitled *Draft Design Traffic Technical Report* prepared for the project in 2022. The FDOT traffic noise data sheets, along with the traffic data used in the prediction of traffic noise levels by vehicle type (cars, medium trucks, heavy trucks, buses, and motorcycles) for the 2021 Existing, the 2048 No Build Alternative, and the 2048 Build Alternative conditions are included in **Appendix A**. For roadway segments where the predicted hourly design year traffic volumes equaled or exceeded LOS C, LOS C hourly traffic was utilized. For roadway segments where the predicted hourly traffic demand was less than LOS C traffic volumes, the predicted hourly demand volumes were utilized.

Noise Abatement Criteria

Noise sensitive land uses are areas where there is frequent human use that may be impacted by traffic noise levels that approach, meet, or exceed the Noise Abatement Criteria (NAC) – levels established by the Federal Highway Administration (FHWA) at which abatement must be considered. Typical noise sensitive land uses include residences, schools, places of worship, commercial properties with outdoor areas of use, and recreational areas. As shown in Table 2, the NAC vary by activity category.

The FDOT criteria are defined as being within one dB(A) of the FHWA's NAC to reflect values that "approach" the FHWA criteria. For perspective on the decibel values listed in Table 2. Table 1 provides typical noise levels of common indoor and outdoor activities.

Noise abatement measures must also be considered when a substantial increase in traffic noise is predicted to occur as a direct result of a transportation project. FDOT defines a substantial increase as 15 dB(A) or more above existing conditions. A substantial increase typically occurs in areas where traffic noise is a minor component of the existing noise environment but would become a major component after the project is constructed (e.g., new alignment project).

Table 2: Noise Abatement Criteria Hourly "A-weighted" Sound Level – Decibels (dBA)

Activity Category	Activity Leq(h)		Evaluation Location	Description of Land Use Activity Category
	FHWA	FDOT		
A	57	56	Exterior	Lands on which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose.
B	67	66	Exterior	Residential.
C	67	66	Exterior	Active sports areas, amphitheaters, auditoriums, campgrounds, cemeteries, day care centers, hospitals, libraries, medical facilities, parks, picnic areas, places of worship, playgrounds, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, recreation area, Section 4(f) sites, schools, television studios, trails, and trail crossings.
D	52	51	Interior	Auditoriums, day care centers, hospitals, libraries, medical facilities, places of worship, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, schools, and television studios.
E	72	71	Exterior	Hotels, motels, offices, restaurants/bars, and other developed lands, properties or activities not included in A – D or F.
F	------	------	------	Agriculture, airports, bus yards, emergency services, industrial, logging, maintenance facilities, manufacturing, mining, rail yards, retail facilities, shipyards, utilities (water resources, water treatment, electrical), and warehousing.
G	------	------	------	Undeveloped lands that are not permitted.

Source: 23 CFR Part 772, Procedures for Abatement of Highway Traffic Noise and Construction Noise, FHWA, 2010.

Noise Sensitive Receptors

A noise sensitive receptor is defined as a discrete or representative location of a noise sensitive area for any of the land use categories listed in Table 2. In determining traffic noise impacts for properties with Activity Category A, B, C or E land uses, areas of frequent exterior human use should be identified.

Unless the area of exterior frequent human use is identified elsewhere, residential receptor sites should be placed at the edge of the dwelling unit closest to the major traffic noise source. Receptor heights for first (ground) floor receptors are always assumed to be five feet above ground elevation. Receptors located on the second and subsequent floors of a building should be modeled 10 feet above the "height above ground" for each additional floor evaluated above the ground floor.

The term "Special Land Use" applies to land uses that are not residential as defined by Title 23 CFR Part 772. Activity Category NAC C would only be evaluated if exterior land uses are present. Some examples of special land uses include places of worship, schools, parks, and amphitheaters. If noise impacts occur at Special land uses, FDOT's research publication, Methodology to Evaluate Highway Traffic Noise at Special Land Uses, dated July 2025, should be used to determine if a noise barrier could be feasible and reasonable.

Noise Abatement Measures

Noise abatement is considered at all noise sensitive sites predicted to approach, meet, or exceed the NAC as stipulated by 23 CFR 772. Abatement measures considered included traffic management, alignment modifications, noise buffer zones through application of land use controls, and noise barriers. However, noise barriers were determined to be the only viable noise abatement measure. Therefore, noise barriers were considered at all noise sensitive sites predicted to approach, meet, or exceed the NAC for the year 2048 Build condition.

Traffic Management

Traffic management techniques can be used to abate traffic noise. For example, the timing of traffic lights could be altered to eliminate frequent stopping, heavy trucks could be limited to certain hours of the day on specific roads, and speed limits could be reduced. Avalon Road does not have a high truck volume, therefore, prohibiting or limiting heavy truck traffic on Avalon Road is not considered a reasonable abatement measure for this project. A substantial speed reduction on Avalon Road would lower traffic noise levels. However, the capacity of the roadway to service traffic would also be reduced with a reduction of speed. Therefore, speed reduction is not a reasonable abatement measure for this project.

Alignment Modifications

Modifying the horizontal alignment and/or vertical profile of a roadway can influence highway traffic noise levels and can therefore be an effective abatement measure. However, the existing alignment of Avalon Road has already established the proposed horizontal and vertical alignment. Project costs and detrimental effects on land use are minimized by making use of the existing corridor. The cost of acquiring additional

property for the sole purpose of abating highway traffic noise may exceed the cost reasonable limit of $64,000 per benefited receptor (a benefited receptor is defined as a noise sensitive site receiving at least a 5 dB(A) noise reduction from the abatement measure). Therefore, an alignment modification that could provide a substantial noise reduction is not a feasible or reasonable abatement measure

Buffer Zones

Providing a buffer space (i.e., an area of undeveloped land) between a highway and future noise sensitive development can minimize or eliminate noise impacts.

Buffer zones can be implemented through local land use planning. The distances from the proposed highway at which predicted traffic noise levels approach, meet or exceed the NAC for Activity Categories A, B, C and E are determined to facilitate future land use planning that is compatible with the traffic noise environment. For the proposed conceptual Design, the distance between the nearest edge of pavement of Avalon Road and the location where traffic noise levels would approach a particular NAC is provided in the Community Coordination section. Local officials can use the information in Table 6 to establish buffer zones for future projects, thereby minimizing or avoiding noise impacts at sensitive land uses. The distances do not account for any reduction in noise levels that may be provided by berms, privacy walls or intervening structures in the noise propagation path. These buffer zone contours also do not account for any increase in noise resulting from increased highway elevation (e.g., overpasses) or elevated noise sensitive sites (e.g., second floor patios).

Noise Barriers

Noise barriers reduce noise levels by interrupting the sound path between a highway and noise sensitive site. Barriers can cause sound waves to bend around and over the barrier (diffraction) which produces a "shadow zone" behind the barrier itself. To effectively reduce traffic noise, a barrier must be relatively long, continuous (with no intermittent gaps), and of sufficient height. A noise barrier must be considered both a feasible and reasonable noise abatement measure. Feasibility factors are related to the acoustical and engineering properties of an abatement measure. Reasonableness factors are related to the economic, environmental, and social properties. For a noise barrier to be considered feasible and cost reasonable, the following minimum conditions should be met.

Table 3: Feasible and Reasonable Requirements for a Noise Barrier

Feasible	Reasonable
At least two impacted receptors must be provided a noise reduction of 5 dB(A).	A noise barrier must also attain the Noise Reduction Design Goal (NRDG), which states that a minimum noise reduction of 7 dB(A) for at least one benefited receptor must be achieved. This receptor may also have been previously identified as meeting the feasibility requirement of receiving a 5 dB(A) reduction.
Engineering factors (design/construction, safety, access, ROW, maintenance, drainage, and utility) must be considered, and all conflicts must be resolved.	The cost of the noise barriers should not exceed $64,000 per benefited receptor. This is the upper cost limit established by FDOT. A benefited receptor is defined as a recipient of an abatement measure that experiences at least a 5 dB(A) reduction as a result of providing a noise barrier. The current unit cost used to evaluate cost reasonableness is $40 per square foot (sq. ft.).
	The viewpoint of benefited receptors must be considered.

Within the project limits, noise barrier locations are evaluated as follows:

- Right-of-way (ROW) noise barriers located outside the clear zone, which is defined in the FDOT Design Manual as 'the amount of recoverable area beyond the traveled way' but within the ROW, are initially considered at heights ranging from 8 ft. to 22 ft. in 2 ft. increments. According to the FDOT Design Manual, noise barriers outside the clear zone shall not exceed a maximum height of 22 ft.
- If a ROW barrier cannot provide at least a 5 dB(A) reduction to an impacted receptor or the barrier is not feasible due to construction limitations, then a shoulder barrier is evaluated. According to the FDOT Design Manual, shoulder barriers shall not exceed 14 ft. in height when on embankment and 8 ft. in height when on structure or Mechanically Stabilized Earth (MSE).

The length and height of the noise barriers are optimized based on the benefit provided to noise sensitive sites with predicted noise levels that approach, meet, or exceed the NAC.

TRAFFIC NOISE ANALYSIS

Existing Land Use and Noise Sensitive Receptor Sites

Existing land uses were initially identified in GIS and then subsequently verified in the field. The project area consists primarily of single-family and multi-family residential (Activity Category B) land uses. There are two pool areas associated with the Prose Horizons Apartments within the project study area. See the Project Aerials in **Appendix B** for the locations of the noise receptors.

Model Validation

TNM model validation is the process by which the accuracy of the existing conditions TNM 2.5 model is refined and confirmed by comparing noise levels at field measurement locations to the TNM-predicted noise levels at those same locations under the same traffic conditions. The validation process is the basis upon which the traffic noise models for predicting existing year and design year noise levels were built. Since TNM can only predict traffic noise levels, TNM models can only be validated for locations for which traffic was the dominant noise source. TNM model validation was performed for all short-term measurement locations for which traffic was the dominant noise source. A TNM model is considered validated if it is a reasonable representation of the existing noise study area and/or project area, and the TNM-predicted traffic noise levels are within ±3.0 decibels (±3.0 dB(A)) of the measured equivalent sound levels.

At each measurement location, two monitors were placed. The purpose of this is to ensure that noise sensitive receptors in the second or third row are properly accounted for in the model. A summary of the validation results is shown on Table 4 and the field data sheets are shown in **Appendix C**.

Table 4: Noise Measurement Data and TNM Verification Results

Measurement Location		Measurement Period	Measured L_{eq} (dB(A))	Predicted L_{eq} (dB(A))	Difference (predicted - measured) (dB(A))
M1	M1.1a	11:40-11:50 am	60.3	61.1	0.8
	M1.2a		55.7	58.4	2.7
	M1.1b	11:50 am-12:00 pm	61.5	61.6	0.1
	M1.2b		56.2	58.9	2.7
	M1.1c	12:00-12:10 pm	60.5	60.6	0.1
	M1.2c		55.1	57.9	2.8
M2	M2.1a	12:45-12:55 pm	61.5	62.9	1.4
	M2.2a		55.5	56.3	0.8
	M2.1b	12:55-1:05 pm	60.8	62.9	2.1
	M2.2b		55.4	56.4	1.0
	M2.1c	1:05-1:15 pm	61.5	63.1	1.6
	M2.2c		55.9	56.5	0.6

Predicted Noise Levels and Abatement Analysis

Two hundred twelve noise sensitive sites representing 196 balconies and patios associated with the Registry on Grass Lake Apartments and Palisades Condominiums, 14 single family residences, and two outdoor pools associated with the Prose Horizons Apartments were identified along Avalon Road. The predominant noise source for these receptors is traffic noise from Avalon Road.

The location of the receptor points representing the noise sensitive sites are in accordance with the FDOT PD&E Manual, Part 2, Chapter 18 Highway Traffic Noise. Residential receptor points are located at the edge of the building closest to the proposed Avalon Road.

The project corridor was divided into six noise sensitive areas (NSAs). NSA land use descriptions are discussed below. Predicted noise levels are shown in **Appendix D.**

NSA 1 – NSA 1 is located east of Avalon Road, north of US 192 and south and north of Arrowhead Boulevard. Seven receptors were modeled representing seven residences (R1-R7). Existing (2021) noise levels range from 52.2 dB(A) to 62.1 dB(A), No Build (2048) noise levels range from 52.4 dB(A) to 62.2 dB(A), and predicted future (2048) Build noise levels range from 56.5 dB(A) to 66.8 dB(A). Under the Build (2048) condition, two receptors are predicted to be impacted due to traffic noise. Due to driveway access for the receptors, a noise barrier is not feasible at this location.

NSA 2 – NSA 2 is located west of Avalon Road and south of Grove Blossom Boulevard and consists of 145 receptors representing the balconies associated with the Registry on Grass Lake Apartments (R8.1-R36.5), and one receptor representing a single-family residence (R37). The Registry on Grass Lake Apartments is a five-story multifamily complex. Each floor is designated with the floor number in the receptor name. For example, R8.1 represents the ground floor apartment, while receptor R8.5 is the fifth-floor apartment. Existing (2021) noise levels range from 43.9 dB(A) to 62 dB(A), No Build (2048) levels range from 43.9 dB(A) to 62 dB(A), and predicted future (2048) Build noise levels range from 48.8 dB(A) to 65 dB(A). No noise impacts are predicted for this NSA under the Build (2048) condition.

NSA 3 – NSA 3 is located east of Avalon Road and south of Lake Gifford Way and consists of two receptors representing the pool areas associated with the Prose Horizons Apartments (R38 and R56). The Prose Apartments do not have any balconies. If a residential parcel does not have an obvious area of exterior frequent human use (e.g., yard, balcony), the residential parcel is not eligible for evaluation, following guidance provided by FHWA. Therefore, only the pools were considered noise sensitive within this community. Existing (2021) noise levels range from 50.9 dB(A) to 55.1 dB(A), No Build (2048) noise levels range from 50.9 dB(A) to 55.1 dB(A), and predicted future (2048) Build noise levels range from 54.5 dB(A) to 56.4 dB(A). No noise impacts are predicted for this NSA under the Build (2048) condition.

NSA 4 – NSA 4 is located west of Avalon Road and north of Grove Blossom Boulevard and consists of fifty-one receptors representing the balconies associated with the Palisades Condominiums (R39.1-R55.3) and one receptor representing a residence (R62). The Palisades Condominiums are three floor buildings with balconies on each floor. Each floor is designated with the floor number in the receptor name. For example, R39.1 represents the ground floor condo, while receptor R39.3 is the third-floor condo. Existing (2021) noise levels range from 61.1 dB(A) to 64.9 dB(A), No Build (2048) noise levels range from 61.1 dB(A) to 64.9 dB(A), and predicted future (2048) Build noise levels range from 64.3 dB(A) to 67.1 dB(A). Thirty-four receptors representing 34 balconies were impacted due to traffic noise under the Build (2048) condition. A noise barrier was evaluated for these sites and is discussed in the Noise Barrier Analysis section.

NSA 5 – NSA 5 is located east of Avalon Road between Lake Gifford Way and Hartzog Road and consists of five receptors representing five single-family residences (R57-R61). Existing (2021) noise levels range from 53.7 dB(A) to 63.2 dB(A), No Build (2048) noise levels range from 53.7 dB(A) to 63.2 dB(A), and predicted future (2048) build noise levels range from 56.7 dB(A) to 67.3 dB(A). Two receptors representing two residences are predicted to experience a noise impact under the Build (2048) condition. Due to driveway access for the receptors, a noise barrier is not feasible at this location.

Noise Impact Analysis

The analysis concluded that the traffic noise levels under the design year 2048 Build Alternative condition will meet or exceed the NAC at 38 receptor sites and will have no substantial increases of 15 dBA or more. The locations of the modeled receptors and the location of the impacted receptors are shown in the figures included in **Appendix B**. Abatement was considered for all noise impacted sites under the Build (2048) condition. No noise impacts are predicted under the Existing (2021) and No Build (2048) conditions.

Noise Barrier Analysis

As previously stated, noise levels are predicted to meet or exceed the NAC at 38 receptor sites under the Build Alternative condition. Noise barriers were not evaluated at four of the impacted receptor sites (R2, R3, R57, and R59) as noise barriers at these locations would block driveway access to these residences. The following presents the results of the noise barrier analyses performed to determine if noise barriers would be feasible and reasonable for the remaining impacted sites.

Noise Barrier 1: The Palisades Condominiums

Thirty-four noise receptor sites within the multi-family community Palisades Condominiums were evaluated for noise abatement measures. A noise barrier was placed on the west side of Avalon Road within the proposed right-of-way. Due to breaks in the noise barrier required to provide access to the Palisades community, a barrier system consisting of three segments was analyzed. Segment 1 is located south of the entrance and is 363 feet long. Segment 2 is located between the two driveways and is 479 feet long. Segment 3 is located north of the northern driveway and is 573 feet long. All three segments together total a length of 1,415 feet. The height of the barrier was evaluated in two-foot increments from eight to 22 feet. The results of the barrier analysis are shown in Table 5. Results of this analysis indicated that the barrier could provide a five-dB(A) noise level reduction for at least two impacted receptors with heights between 10 and 22 feet. Additionally, barriers with heights of 12 to 22 feet are able to meet the FDOT reasonableness noise reduction design goal of achieving a seven-dB(A) reduction at one benefited receptor. All but one of the barrier heights (eight feet) were able to achieve the FDOT cost reasonableness criteria of $64,000 per benefitted receptor. Therefore, a 12-foot-tall ROW barrier 1,415 feet in length meets the minimum criteria, as shown on **Appendix B, Sheet 3**. This barrier will provide benefit for 13 impacted residences and an additional 16 residences, for a total of 29 benefited residences. The total cost for the barrier is $679,120 or $23,417.93 per benefited residence. A comparison of the barriers is shown in Table 5.

Table 5: Barrier Analysis– Noise Barrier 1 (The Palisades Condominiums)

Height (ft)	Total Length (ft)	Impacted Receivers	Impacted & Benefited	Noise Reduction at Benefited Residences		Total Benefited	Average Noise Reduction	Maximum Noise Reduction	Total Cost*	Cost/BR
				5-6.9 dB(A)	>7.0 dB(A)					
8	1,415	34	0	0	0	6	5.1	5.3	$ 452,720.00	$ 75,453.33
10	1,415	34	5	16	0	16	5.3	5.9	$ 565,920.00	$ 35,370.00
12	1415	34	13	22	7	29	6.4	7.9	$ 679,120.00	$ 23,417.93
14	1,415	34	17	14	19	33	7.1	8.6	$ 792,280.00	$ 24,008.48
16	1,415	34	30	21	26	47	7.5	9.5	$ 905,480.00	$ 19,265.53
18	1,415	34	34	16	35	51	7.9	10.2	$ 1,018,680.00	$ 19,974.12
20	1,415	34	34	12	39	51	8.4	10.8	$ 1,131,840.00	$ 22,192.94
22	1,415	34	34	12	39	51	8.4	10.8	$ 1,245,080.00	$ 24,413.33

*Cost is based on the cost provided in FDOT's PD&E Manual Part 2, Chapter 18, Section 18.2.3.3.2 Cost Effectiveness. The current cost is $40 per square foot. This cost was updated in 2024.

CONCLUSIONS

This NSR was prepared for the proposed project in accordance with FHWA's Title 23 CFR 772 using methodologies established by FDOT in the PD&E Manual, Part 2, Chapter 18 (July 31, 2024). Noise levels were predicted at 212 receptor points representing 196 balconies and patios associated with the Registry on Grass Lake Apartments and Palisades Condominiums, 14 single family residences, and two outdoor pools associated with the Prose Horizons Apartments.

The results of the NSR indicate that the predicted noise levels ranged from 43.9 dBA to 64.9 dBA for the existing (2021) condition and from 43.9 dBA to 64.9 dBA for the 2048 No Build Alternative. The predicted noise levels for the 2048 Build Alternative ranged from 48.8 dBA to 67.3 dBA. Under the design year 2048 Build Alternative, noise levels will meet or exceed the NAC at 38 receptor sites representing 38 residential units. No receptors will have a substantial increase of 15 dBA or more (see **Appendix D**). The impacted noise sensitive sites were evaluated to determine the feasibility and cost reasonableness of providing barriers to reduce traffic noise.

A noise barrier was not evaluated at four of the impacted receptor sites (R2, R3, R57 and R59) as noise barriers at these locations would block driveway access to these residences.

One noise barrier system was evaluated for the remaining 34 impacted receptor sites. Due to breaks in the noise barrier required to provide access to the Palisades Condominiums, a barrier system consisting of three segments was analyzed. The first segment is located south of the southern entrance and is 363 feet long. The second segment is located between the driveways and is 479 feet long. The third segment is located north of the northern driveway and is 573 feet long, for a total length of 1,415 feet. Based on the abatement analysis, a 12-foot barrier is the minimum feasible and reasonable barrier that meets the noise reduction design goal.

The barrier could benefit a total of 29 receptors, including 13 impacted receptors. The total cost of the barrier is $679,120.00, or $23,417.93 per benefited receptor. As shown in Table 5, this 1,415-foot long ROW noise barrier is reasonable and feasible.

CONSTRUCTION NOISE AND VIBRATION

Construction noise may result in temporary noise level increases for residences and businesses in the immediate vicinity of the alignment. The primary construction noise generators would be any heavy equipment used in constructing the roadway. The following construction noise abatement measures are recommended for incorporation into the contract plans and specifications to reduce construction noise in the vicinity of the proposed project:

- The contractor shall comply with all state and local sound control and noise level rules, regulations and ordinances which apply to any work performed pursuant to the contract.

- Each internal combustion engine used for any purpose on work related to the project shall be equipped with a muffler of a type recommended by the manufacturer. No internal combustion engine shall be operated on the project without such a muffler.
- Construction equipment motor panels shall be shut while equipment is in operation.
- Construction of temporary noise barriers may be required around a localized point source of noise or in a location such as to deflect noise from a sensitive area.
- In order to minimize the potential for impacts of construction noise on local residents during hours of darkness, nighttime work is only allowed to address emergencies beyond the control of the contractor.

COMMUNITY COORDINATION

Local agencies and local and community officials will have the opportunity to comment on the proposed project at a public meeting. This section will be updated after the public meeting is held.

To aid in promoting land use compatibility, a copy of the NSR, which provides information that can be used to protect future land development from becoming incompatible with anticipated traffic noise levels, will be provided to local officials with land use planning/zoning responsibility. In addition, generalized future traffic noise impact contours for the properties in the immediate vicinity of the project have been developed for NAC A, B, C, and E. These noise contours represent the approximate distances from the proposed edge-of-pavement to the limits of the area predicted to approach or exceed the NAC for the design year 2048 Build Alternative condition. The distances between the proposed edge-of-pavement and each contour level are shown in Table 6. To minimize the potential for incompatible land use, future noise sensitive land uses should be located beyond these distances.

Table 6: Design Year 2048 Build Alternative Noise Impact Contour Distances

Roadway Segment	56 dB(A) Contour Distance from Edge-of-Pavement (feet) – Activity Category A	66 dB(A) Contour Distance from Edge-of-Pavement (feet) – Activity Category B and C	71 dB(A) Contour Distance from Edge-of-Pavement (feet) – Activity Category E
Avalon Road	200	50	25

REFERENCES

23 CFR Part 772, "*Procedures for Abatement of Highway Traffic Noise and Construction Noise*", Federal Register, Vol. 75, No. 133, Tuesday, July 13, 2010; pages 39834-39839.

Florida Department of Transportation, "*A Method to Determine Reasonableness and Feasibility of Noise Abatement at Special Use Locations*", July 2009. 64 pages.

Florida Department of Transportation. "*Highway Traffic Noise*", Part 2, Chapter 18. Project Development and Environment Manual, Florida Department of Transportation, Tallahassee, July 31, 2024.

Florida Department of Transportation Design Manual Volume 1, Chapter 264, "*Noise Walls and Perimeter Walls*", January 2023.

Florida Department of Transportation, "*2020 FDOT Quality/Level of Service Handbook*"; Tallahassee, Florida; January 2020.

Florida Department of Transportation, "*FDOT Design Manual*", Tallahassee, Florida; January 2023.

Federal Highway Administration Report FHWA-HEP-10-025, "*Highway Traffic Noise: Analysis and Abatement Guidance*", June 2010 (revised December 2010); 76 pages.

Federal Highway Administration Report FHWA-PD-96-009, "*FHWA Traffic Noise Model, Version 1.0 User's Guide*", January 1998; 192 pages + supplements.

Federal Highway Administration Report Number FHWA-PD-96-046, "*Measurement of Highway-Related Noise*", Cynthia S.Y. Lee and Gregg Fleming; May 1996; 206 pages.

Federal Highway Administration Report FHWA-HEP-06-015, "*FHWA Highway Construction Noise Handbook: Final Report*". August 2006; 185 pages.

Federal Highway Administration. "Consideration of Existing Noise Barrier in a Type I Noise Analysis FHWA-HEP-12-051." https://www.fhwa.dot.gov/ENVIRONMENT/noise/noise_barriers/abatement/existing.cfm.

APPENDIX A

Traffic Data

Highway Traffic Noise: Traffic Data

Project/Data Information

Project Name	Avalon Road Widening
Project Number	
Condition	Existing
Year	2021
Source	Table 3 and Table 4 from Draft Design Traffic Tehcnical Report
Preparer [Traffic Engineer]	
Prepared Date	3/10/2026
Notes	No break down of medium, heavy trucks, etc so assume all are heavy trucks for a conservative noise estimate.

	Roadway Details					Traffic Details									Raw Traffic Data Selection & Off-Peak Calculation		
Traffic Segment Number	**Roadway Name**	**From**	**To**	**Roadway Type**	**Number of Lanes** *In 1 direction	**LOS C Peak Hour Peak Direction (PHPD)**	**Demand Hourly Volumes (DHV) Peak Hour Peak Direction (PHPD)**	**% Autos**	**% Medium Trucks**	**% Heavy Trucks**	**% Buses**	**% Motorcycles**	**Standard K-factor**	**D-factor**	**Posted Speed (mph)**	**LOS C vs. DHV Comparison**	**Peak Direction Volume*** *Used on both sides for LOS C	**Off-Peak Direction Volume*** *DHV only
1	Avalon Rd	US 192	Arrowhead Blvd	Arterial	1	830	908	98%	0%	2.3%	0%	0%	9.00%	64.24%	40	LOS C	830	N/A
2	Avalon Rd	Arrowhead Blvd	Grove Blossom Way	Arterial	1	830	931	98%	0%	2.3%	0%	0%	9.00%	64.24%	40	LOS C	830	N/A
3	Avalon Rd	Grove Blossom Way	Lake Gifford Way	Arterial	1	830	937	98%	0%	2.3%	0%	0%	9.00%	64.24%	40	LOS C	830	N/A
4	Avalon Rd	Lake Gifford Way	Hartzog Rd	Arterial	1	830	937	98%	0%	2.3%	0%	0%	9.00%	64.24%	40	LOS C	830	N/A
5	US192	West of Avalon		Arterial	3	2,940	2,740	98%	0%	2.3%	0%	0%	9.00%	53.55%	55	DHV	2740	2377
6	US192	East of Avalon		Arterial	3	2,940	2,567	98%	0%	2.3%	0%	0%	9.00%	53.55%	55	DHV	2567	2227
7	Arrowhead Blvd	East of Avalon		Other	1	710	35	98%	0%	2.3%	0%	0%	9.00%	58.46%	35	DHV	35	25
8	Grove Blossom Way	West of Avalon		Other	1	710	92	98%	0%	2.3%	0%	0%	9.00%	55.95%	35	DHV	92	72

Highway Traffic Noise: Traffic Data

Project/Data Information

Project Name	Avalon Road Widening
Project Number	
Condition	No-Build
Year	2048
Source	Figure 15 (No-Build AADT Volumes); Table 3 (Recommended Roadway Design Characteristics) and Table 4 from Draft Design Traffic Tehcnical Report
Preparer [Traffic Engineer]	Robyn Hartz
Prepared Date	3/10/2026
Notes	No break down of medium, heavy trucks, etc so assume all are heavy trucks for a conservative noise estimate

	Roadway Details					Traffic Details										Raw Traffic Data Selection & Off-Peak Calculation		
Traffic Segment Number	**Roadway Name**	**From**	**To**	**Roadway Type**	**Number of Lanes** *In 1 direction	**Two-Way LOS C AADT**	**LOS C Peak Hour Peak Direction (PHPD)**	**Demand Hourly Volumes (DHV) Peak Hour Peak Direction (PHPD)**	**% Autos**	**% Medium Trucks**	**% Heavy Trucks**	**% Buses**	**% Motorcycles**	**Standard K-factor**	**D-factor**	**Posted Speed (mph)**	**LOS C vs. DHV Comparison**	**Peak Direction Volume*** *Used on both sides for LOS C	**Off-Peak Direction Volume*** *DHV only
1	Avalon Rd	US 192	Arrowhead Blvd	Arterial	1	23,600	830	1,364	98%	0%	2.3%	0%	0%	9.00%	64.24%	40	LOS C	830	N/A
2	Avalon Rd	Arrowhead Blvd	Grove Blossom Way	Arterial	1	24,200	830	1,399	98%	0%	2.3%	0%	0%	9.00%	64.24%	40	LOS C	830	N/A
3	Avalon Rd	Grove Blossom Way	Lake Gifford Way	Arterial	1	24,200	830	1,399	98%	0%	2.3%	0%	0%	9.00%	64.24%	40	LOS C	830	N/A
4	Avalon Rd	Lake Gifford Way	Hartzog Rd	Arterial	1	24,300	830	1,405	98%	0%	2.3%	0%	0%	9.00%	64.24%	40	LOS C	830	N/A
5	US192	West of Avalon		Arterial	3	67,100	2,940	3,234	98%	0%	2.3%	0%	0%	9.00%	53.55%	55	LOS C	2940	N/A
6	US192	East of Avalon		Arterial	3	62,800	2,940	3,027	98%	0%	2.3%	0%	0%	9.00%	53.55%	55	LOS C	2940	N/A
7	Arrowhead Blvd	East of Avalon		Other	1	880	710	46	98%	0%	2.3%	0%	0%	9.00%	58.46%	35	DHV	46	33
8	Grove Blossom Way	West of Avalon		Other	1	2,400	710	121	98%	0%	2.3%	0%	0%	9.00%	55.95%	35	DHV	121	95

Highway Traffic Noise: Traffic Data

Project/Data Information

Project Name	Avalon Road Widening
Project Number	
Condition	Build
Year	2048
Source	Figure 17 (Build AADT Volumes); Table 3 (Recommended Roadway Design Characteristics) and Table 4 from Draft Design Traffic Tehcnical Report
Preparer [Traffic Engineer]	Robyn Hartz
Prepared Date	3/10/2026
Notes	No break down of medium, heavy trucks, etc so assume all are heavy trucks for a conservative noise estimate

	Roadway Details					Traffic Details										Raw Traffic Data Selection & Off-Peak Calculation		
Traffic Segment Number	**Roadway Name**	**From**	**To**	**Roadway Type**	**Number of Lanes** *In 1 direction	**Two-Way LOS C AADT**	**LOS C Peak Hour Peak Direction (PHPD)**	**Demand Hourly Volumes (DHV) Peak Hour Peak Direction (PHPD)**	**% Autos**	**% Medium Trucks**	**% Heavy Trucks**	**% Buses**	**% Motorcycles**	**Standard K-factor**	**D-factor**	**Posted Speed (mph)**	**LOS C vs. DHV Comparison**	**Peak Direction Volume*** *Used on both sides for LOS C	**Off-Peak Direction Volume*** *DHV only
1	Avalon Rd	US 192	Arrowhead Blvd	Arterial	2	33,100	1,660	1,914	98%	0%	2.3%	0%	0%	9.00%	64.24%	40	LOS C	1660	N/A
2	Avalon Rd	Arrowhead Blvd	Grove Blossom Way	Arterial	2	33,900	1,660	1,960	98%	0%	2.3%	0%	0%	9.00%	64.24%	40	LOS C	1660	N/A
3	Avalon Rd	Grove Blossom Way	Lake Gifford Way	Arterial	2	33,900	1,660	1,960	98%	0%	2.3%	0%	0%	9.00%	64.24%	40	LOS C	1660	N/A
4	Avalon Rd	Lake Gifford Way	Hartzog Rd	Arterial	2	34,100	1,660	1,972	98%	0%	2.3%	0%	0%	9.00%	64.24%	40	LOS C	1660	N/A
5	US192	West of Avalon		Arterial	3	80,900	2,940	3,899	98%	0%	2.3%	0%	0%	9.00%	53.55%	55	LOS C	2940	N/A
6	US192	East of Avalon		Arterial	3	75,700	2,940	3,648	98%	0%	2.3%	0%	0%	9.00%	53.55%	55	LOS C	2940	N/A
7	Arrowhead Blvd	East of Avalon		Other	1	1,240	710	65	98%	0%	2.3%	0%	0%	9.00%	58.46%	35	DHV	65	46
8	Grove Blossom Way	West of Avalon		Other	1	3,300	710	166	98%	0%	2.3%	0%	0%	9.00%	55.95%	35	DHV	166	131

APPENDIX B

Project Aerials

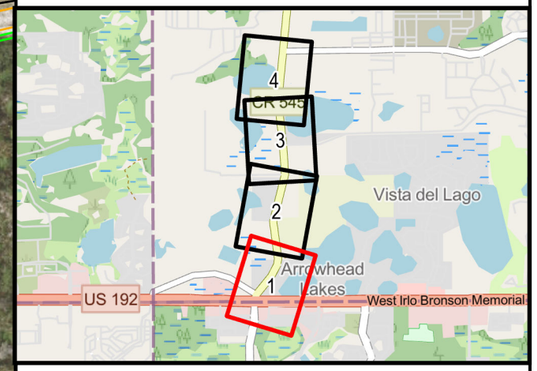
ORANGE COUNTY
PUBLIC WORKS,
ENGINEERING DIVISION

Legend

- IMPACTED AND BENEFITED
- NOT IMPACTED, BUT BENEFITED
- IMPACTED BUT NOT BENEFITED
- NOT IMPACTED, NOT BENEFITED
- MONITORING LOCATION
- NOISE SENSITIVE AREA (NSA)
- PARCELS
- PROPOSED EDGE OF TRAVEL LANE
- PROPOSED SIDEWALK
- RECOMMENDED 12-FOOT TALL NOISE BARRIER

N

0 100 200 400 Feet



AVALON ROAD WIDENING
FROM US 192 TO HARTZOG ROAD
ORANGE COUNTY,
FLORIDA

DETAILED STUDY AREA MAP

MARCH 2026 FIGURE 2.2 SHEET 1

ORANGE COUNTY
PUBLIC WORKS,
ENGINEERING DIVISION

NSA 2

Registry on
Grass Lake
Apartments

R15.1-R15.5
R14.1-R14.5
R20.1-R21.5
R19.1-R19.5
R31.1-R31.5
R30.1-R30.5
R36.1-R36.5
R35.1-R35.5
R18.1-R18.5
R13.1-R13.5
R17.1-R17.5
R29.1-R29.5
R28.1-R28.5
R34.1-R34.5
R33.1-R33.5
R12.1-R12.5
R11.1-R11.5
R27.1-R27.5
R32.1-R32.5
R16.1-R16.5
R8.1-R8.5
R9.1-R9.5
R10.1-R10.5
R21.1-R21.5
R22.1-R22.5
R23.1-R23.5
R24.1-R24.5
R25.1-R25.5
R26.1-R26.5
R37
R38

AVALON RD

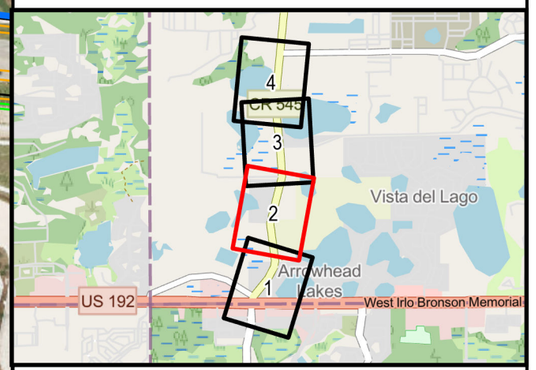
GROVE BLOSSOM BLVD

Legend

- IMPACTED AND BENEFITED
- NOT IMPACTED, BUT BENEFITED
- IMPACTED BUT NOT BENEFITED
- NOT IMPACTED, NOT BENEFITED
- MONITORING LOCATION
- NOISE SENSITIVE AREA (NSA)
- PARCELS
- PROPOSED EDGE OF TRAVEL LANE
- PROPOSED SIDEWALK
- RECOMMENDED 12-FOOT TALL NOISE BARRIER

N

0 100 200 400 Feet



AVALON ROAD WIDENING
FROM US 192 TO HARTZOG ROAD
ORANGE COUNTY,
FLORIDA

DETAILED STUDY AREA MAP

MARCH 2026 FIGURE 2.2 SHEET 2

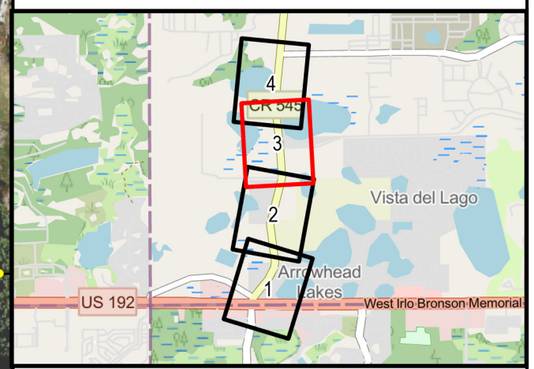
ORANGE COUNTY
PUBLIC WORKS,
ENGINEERING DIVISION

Legend

- IMPACTED AND BENEFITED
- NOT IMPACTED, BUT BENEFITED
- IMPACTED BUT NOT BENEFITED
- NOT IMPACTED, NOT BENEFITED
- MONITORING LOCATION
- NOISE SENSITIVE AREA (NSA)
- PARCELS
- PROPOSED EDGE OF TRAVEL LANE
- PROPOSED SIDEWALK
- RECOMMENDED 12-FOOT TALL NOISE BARRIER

N

Feet
0 100 200 400



AVALON ROAD WIDENING
FROM US 192 TO HARTZOG ROAD
ORANGE COUNTY,
FLORIDA

DETAILED STUDY AREA MAP

MARCH 2026 FIGURE 2.2 SHEET 3

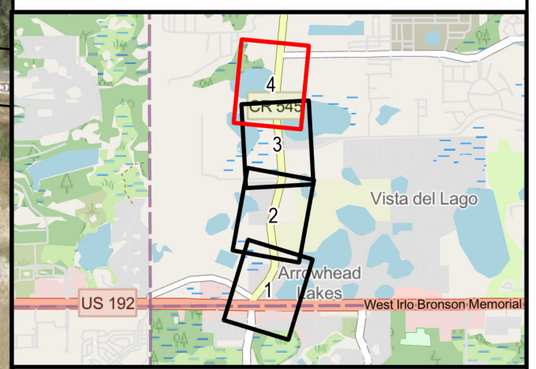
ORANGE COUNTY
PUBLIC WORKS,
ENGINEERING DIVISION

Legend

- IMPACTED AND BENEFITED
- NOT IMPACTED, BUT BENEFITED
- IMPACTED BUT NOT BENEFITED
- NOT IMPACTED, NOT BENEFITED
- MONITORING LOCATION
- NOISE SENSITIVE AREA (NSA)
- PARCELS
- PROPOSED EDGE OF TRAVEL LANE
- PROPOSED SIDEWALK
- RECOMMENDED 12-FOOT TALL NOISE BARRIER

N

0 100 200 400 Feet



AVALON ROAD WIDENING
FROM US 192 TO HARTZOG ROAD
ORANGE COUNTY,
FLORIDA

DETAILED STUDY AREA MAP

MARCH 2026 FIGURE 2.2 SHEET 4

APPENDIX C

Model Validation Field Sheets

NOISE MEASUREMENT FIELD DATA SHEET

GENERAL INFORMATION

PROJECT NAME	Avalon Road Widening			OBSERVER(S)	JL/RK
STIP #		DATE	3/5/2026	TIME PERIOD	11:40-11:50 AM
SITE ID	M1	DURATION	10 minutes	LAND USE(S)	Residential

TRAFFIC DATA

ROAD NAME	Avalon Road		Insert Name		Insert Name		Insert Name		Insert Name	
ROAD DIRECTION	EB/NB	WB/SB	EB/NB	WB/SB	EB/NB	WB/SB	EB/NB	WB/SB	EB/NB	WB/SB
AUTOS	84	92								
MEDIUM TRUCKS	1	6								
HEAVY TRUCKS	0	2								
BUSES	0	1								
MOTORCYCLES	1	0								
OBS. SPEED (MPH)	35	35								

WEATHER DATA

TEMPERATURE (°F)	79.3
CLOUD COVER	Partly Cloudy
WIND SPEED (MPH)	0.46
WIND DIRECTION	NW
REL. HUMIDITY (%)	61.8

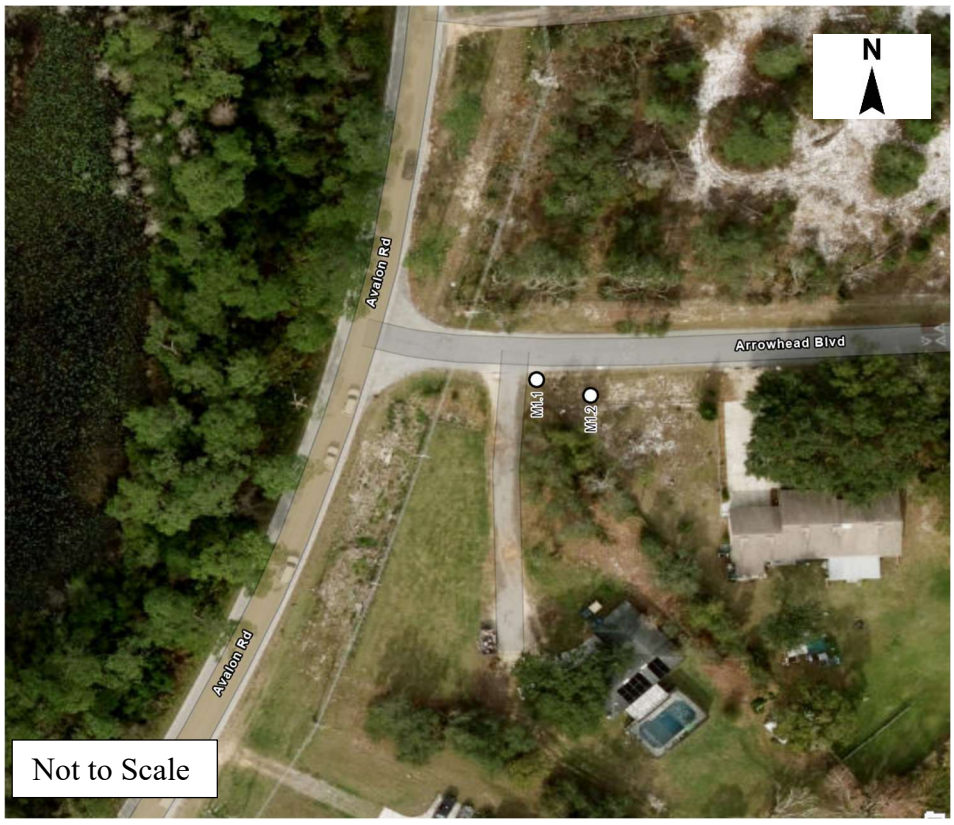
NOISE SOURCE DATA

MAJOR	Avalon Road
BACKGROUND	

SLM DATA

CALIBRATION LEVEL	114.3

SITE SKETCH (INDICATE NORTH)



NOISE MEASUREMENT FIELD DATA SHEET

GENERAL INFORMATION

PROJECT NAME	Avalon Road Widening			OBSERVER(S)	JL/RK
STIP #		DATE	3/5/2026	TIME PERIOD	11:50 AM-12:00 PM
SITE ID	M1	DURATION	10 minutes	LAND USE(S)	Residential

TRAFFIC DATA

ROAD NAME	Avalon Road		Insert Name		Insert Name		Insert Name		Insert Name	
ROAD DIRECTION	EB/NB	WB/SB	EB/NB	WB/SB	EB/NB	WB/SB	EB/NB	WB/SB	EB/NB	WB/SB
AUTOS	81	72								
MEDIUM TRUCKS	4	3								
HEAVY TRUCKS	3	2								
BUSES	0	0								
MOTORCYCLES	0	1								
OBS. SPEED (MPH)	35	35								

WEATHER DATA

TEMPERATURE (°F)	79.3
CLOUD COVER	Partly Cloudy
WIND SPEED (MPH)	0.46
WIND DIRECTION	NW
REL. HUMIDITY (%)	61.8

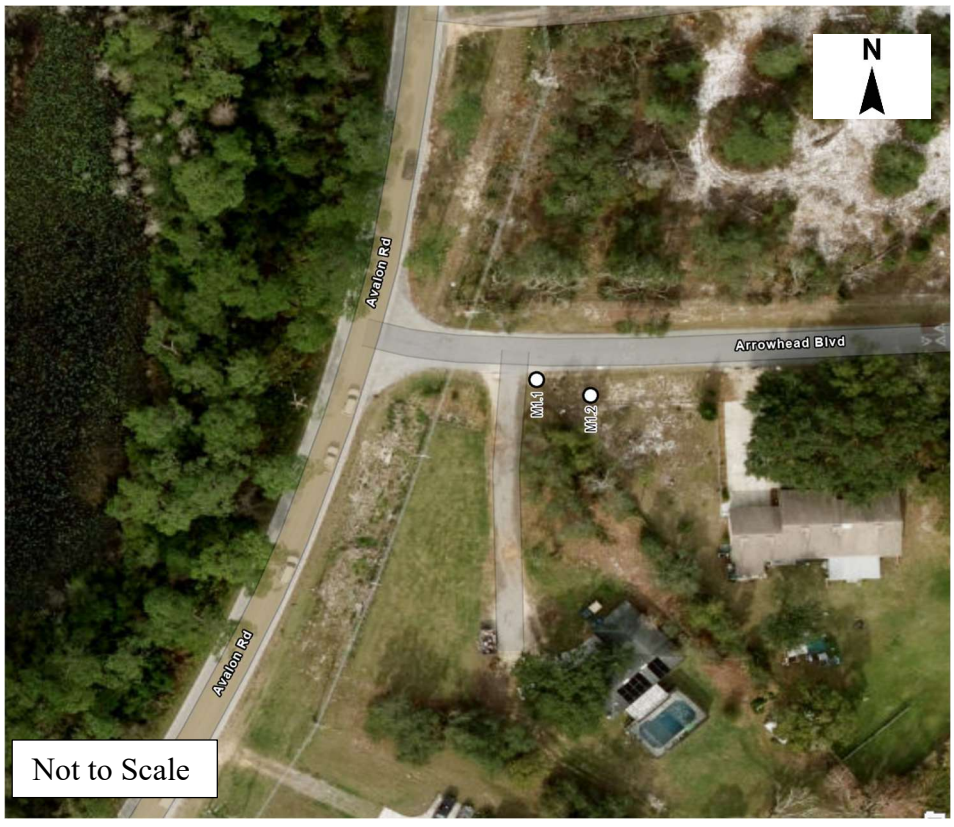
NOISE SOURCE DATA

MAJOR	Avalon Road
BACKGROUND	

SLM DATA

CALIBRATION LEVEL	114.3

SITE SKETCH (INDICATE NORTH)



NOISE MEASUREMENT FIELD DATA SHEET

GENERAL INFORMATION

PROJECT NAME	Avalon Road Widening			OBSERVER(S)	JL/RK
STIP #		DATE	3/5/2026	TIME PERIOD	12:00 PM-12:10 PM
SITE ID	M1	DURATION	10 minutes	LAND USE(S)	Residential

TRAFFIC DATA

ROAD NAME	Avalon Road		Insert Name		Insert Name		Insert Name		Insert Name	
ROAD DIRECTION	EB/NB	WB/SB	EB/NB	WB/SB	EB/NB	WB/SB	EB/NB	WB/SB	EB/NB	WB/SB
AUTOS	97	59								
MEDIUM TRUCKS	2	3								
HEAVY TRUCKS	0	2								
BUSES	0	0								
MOTORCYCLES	2	0								
OBS. SPEED (MPH)	35	35								

WEATHER DATA

TEMPERATURE (°F)	79.3
CLOUD COVER	Partly Cloudy
WIND SPEED (MPH)	0.46
WIND DIRECTION	NW
REL. HUMIDITY (%)	61.8

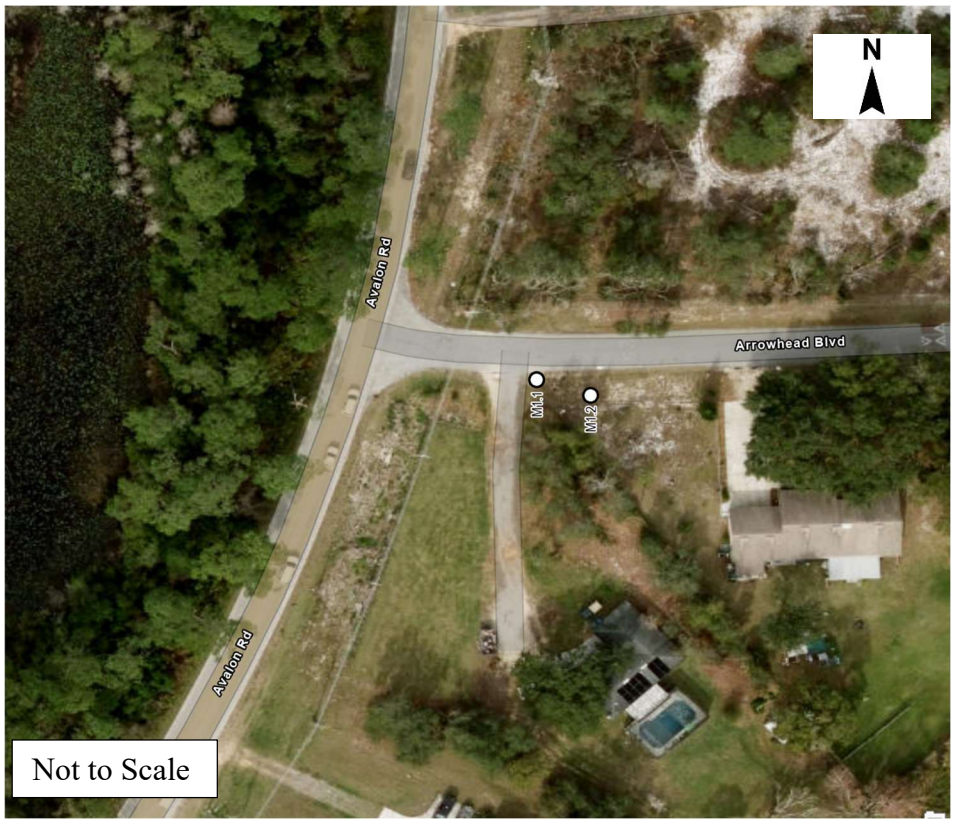
NOISE SOURCE DATA

MAJOR	Avalon Road
BACKGROUND	

SLM DATA

CALIBRATION LEVEL	114.3

SITE SKETCH (INDICATE NORTH)



Noise Measurement Site [M1.1]
[East of Avalon Road and south of Arrowhead Boulevard)]

Sound Level Meter 40341 (looking North)

Sound Level Meter 40341 (looking South)

Sound Level Meter 40341 (looking East)

Sound Level Meter 40341 (looking West)

Noise Measurement Site [M1.2]
[East of Avalon Road and south of Arrowhead Boulevard)]

Sound Level Meter 40342 (looking North)

Sound Level Meter 40342 (looking South)

Sound Level Meter 40342 (looking East)

Sound Level Meter 40342 (looking West)

Calibration Certificate

Certificate Number 2025011058
Customer:
DRMP

,

Model Number	SoundExpert 821	***Procedure Number***	D0001.8466
Serial Number	40341	***Technician***	Jacob Cannon
Test Results	**Pass**	***Calibration Date***	2025-08-11
Initial Condition	AS RECEIVED same as shipped	***Calibration Due***	2026-08-11
Description	SoundExpert 821 Class 1 Sound Level Meter Firmware Revision: 1.502R12	***Temperature***	23.47 °C ± 0.25 °C
		Humidity	49 %RH ± 2.0 %RH
		Static Pressure	86.61 kPa ± 0.13 kPa

Evaluation Method ***Tested with:*** ***Data reported in dB re 20 µPa.***

Larson Davis CAL200. S/N 9079
TMS 9917C. S/N 219
Larson Davis PRM821. S/N 001744
PCB 377B02. S/N 356724

Compliance Standards Compliant to Manufacturer Specifications and the following standards when combined with Calibration Certificate from procedure D0001.8467:

IEC 60651:2001 Type 1	ANSI S1.4-2014 Class 1
IEC 60804:2000 Type 1	ANSI S1.4 (R2006) Type 1
IEC 61260:2014 Class 1	ANSI S1.11-2014 Class 1
IEC 61672:2013 Class 1	ANSI S1.43 (R2007) Type 1

Issuing lab certifies that the instrument described above meets or exceeds all specifications as stated in the referenced procedure (unless otherwise noted). The results documented in this certificate relate only to the item(s) calibrated or tested. It has been calibrated using measurement standards traceable to the International System of Units (SI) through the National Institute of Standards and Technology (NIST), or other national measurement institutes, and meets the requirements of ISO/IEC 17025:2017.
Test points marked with a ‡ in the uncertainties column do not fall within this laboratory's scope of accreditation.

The quality system is registered to ISO 9001:2015.

This calibration is a direct comparison of the unit under test to the listed reference standards and did not involve any sampling plans to complete. No allowance has been made for the instability of the test device due to use, time, etc. Such allowances would be made by the customer as needed.

The uncertainties were computed in accordance with the ISO Guide to the Expression of Uncertainty in Measurement (GUM). A coverage factor of approximately 2 sigma (k=2) has been applied to the standard uncertainty to express the expanded uncertainty at approximately 95% confidence level.

Correction data from Larson Davis SoundExpert 721/821 Manual, I821.01 Rev B

For 1/4" microphones, the Larson Davis ADP024 1/4" to 1/2" adaptor is used with the calibrators and the Larson Davis ADP043 1/4" to 1/2" adaptor is used with the preamplifier.

Calibration Certificate

Certificate Number 2025011059
Customer:
DRMP

,

Model Number	SoundExpert 821	***Procedure Number***	D0001.8466
Serial Number	40342	***Technician***	Jacob Cannon
Test Results	**Pass**	***Calibration Date***	2025-08-11
Initial Condition	AS RECEIVED same as shipped	***Calibration Due***	2026-08-11
Description	SoundExpert 821 Class 1 Sound Level Meter Firmware Revision: 1.502R12	***Temperature***	23.57 °C ± 0.25 °C
		Humidity	49.4 %RH ± 2.0 %RH
		Static Pressure	86.6 kPa ± 0.13 kPa

Evaluation Method ***Tested with:*** ***Data reported in dB re 20 µPa.***

Larson Davis CAL200. S/N 9079
TMS 9917C. S/N 219
Larson Davis PRM821. S/N 001745
PCB 377B02. S/N 356725

Compliance Standards Compliant to Manufacturer Specifications and the following standards when combined with Calibration Certificate from procedure D0001.8467:

IEC 60651:2001 Type 1	ANSI S1.4-2014 Class 1
IEC 60804:2000 Type 1	ANSI S1.4 (R2006) Type 1
IEC 61260:2014 Class 1	ANSI S1.11-2014 Class 1
IEC 61672:2013 Class 1	ANSI S1.43 (R2007) Type 1

Issuing lab certifies that the instrument described above meets or exceeds all specifications as stated in the referenced procedure (unless otherwise noted). The results documented in this certificate relate only to the item(s) calibrated or tested. It has been calibrated using measurement standards traceable to the International System of Units (SI) through the National Institute of Standards and Technology (NIST), or other national measurement institutes, and meets the requirements of ISO/IEC 17025:2017.
Test points marked with a ‡ in the uncertainties column do not fall within this laboratory's scope of accreditation.

The quality system is registered to ISO 9001:2015.

This calibration is a direct comparison of the unit under test to the listed reference standards and did not involve any sampling plans to complete. No allowance has been made for the instability of the test device due to use, time, etc. Such allowances would be made by the customer as needed.

The uncertainties were computed in accordance with the ISO Guide to the Expression of Uncertainty in Measurement (GUM). A coverage factor of approximately 2 sigma (k=2) has been applied to the standard uncertainty to express the expanded uncertainty at approximately 95% confidence level.

Correction data from Larson Davis SoundExpert 721/821 Manual, I821.01 Rev B

For 1/4" microphones, the Larson Davis ADP024 1/4" to 1/2" adaptor is used with the calibrators and the Larson Davis ADP043 1/4" to 1/2" adaptor is used with the preamplifier.

NOISE MEASUREMENT FIELD DATA SHEET

GENERAL INFORMATION

PROJECT NAME	Avalon Road Widening			OBSERVER(S)	JL/RK
STIP #		DATE	3/5/2026	TIME PERIOD	12:45-12:55 PM
SITE ID	M2	DURATION	10 minutes	LAND USE(S)	Residential

TRAFFIC DATA

ROAD NAME	Avalon Road		Insert Name		Insert Name		Insert Name		Insert Name	
ROAD DIRECTION	EB/NB	WB/SB	EB/NB	WB/SB	EB/NB	WB/SB	EB/NB	WB/SB	EB/NB	WB/SB
AUTOS	92	75								
MEDIUM TRUCKS	4	2								
HEAVY TRUCKS	0	1								
BUSES	0	0								
MOTORCYCLES	0	2								
OBS. SPEED (MPH)	40	40								

WEATHER DATA

TEMPERATURE (°F)	89.4
CLOUD COVER	Partly Cloudy
WIND SPEED (MPH)	0.46
WIND DIRECTION	NW
REL. HUMIDITY (%)	61.8

NOISE SOURCE DATA

MAJOR	Avalon Road
BACKGROUND	

SLM DATA

CALIBRATION LEVEL	114.3

SITE SKETCH (INDICATE NORTH)

NOISE MEASUREMENT FIELD DATA SHEET

GENERAL INFORMATION

PROJECT NAME	Avalon Road Widening			OBSERVER(S)	JL/RK
STIP #		DATE	3/5/2026	TIME PERIOD	12:55-1:05 PM
SITE ID	M2	DURATION	10 minutes	LAND USE(S)	Residential

TRAFFIC DATA

ROAD NAME	Avalon Road		Insert Name		Insert Name		Insert Name		Insert Name	
ROAD DIRECTION	EB/NB	WB/SB	EB/NB	WB/SB	EB/NB	WB/SB	EB/NB	WB/SB	EB/NB	WB/SB
AUTOS	78	80								
MEDIUM TRUCKS	1	1								
HEAVY TRUCKS	1	3								
BUSES	1	0								
MOTORCYCLES	0	0								
OBS. SPEED (MPH)	40	40								

WEATHER DATA

TEMPERATURE (°F)	89.4
CLOUD COVER	Partly Cloudy
WIND SPEED (MPH)	0.3
WIND DIRECTION	NW
REL. HUMIDITY (%)	47

NOISE SOURCE DATA

MAJOR	Avalon Road
BACKGROUND	

SLM DATA

CALIBRATION LEVEL	114.3

SITE SKETCH (INDICATE NORTH)

NOISE MEASUREMENT FIELD DATA SHEET

GENERAL INFORMATION

PROJECT NAME	Avalon Road Widening			OBSERVER(S)	JL/RK
STIP #		DATE	3/5/2026	TIME PERIOD	1:05-1:15 PM
SITE ID	M2	DURATION	10 minutes	LAND USE(S)	Residential

TRAFFIC DATA

ROAD NAME	Avalon Road		Insert Name		Insert Name		Insert Name		Insert Name	
ROAD DIRECTION	EB/NB	WB/SB	EB/NB	WB/SB	EB/NB	WB/SB	EB/NB	WB/SB	EB/NB	WB/SB
AUTOS	93	83								
MEDIUM TRUCKS	2	1								
HEAVY TRUCKS	0	2								
BUSES	0	0								
MOTORCYCLES	0	1								
OBS. SPEED (MPH)	40	40								

WEATHER DATA

TEMPERATURE (°F)	89.4
CLOUD COVER	Partly Cloudy
WIND SPEED (MPH)	0.3
WIND DIRECTION	NW
REL. HUMIDITY (%)	47

NOISE SOURCE DATA

MAJOR	Avalon Road
BACKGROUND	

SLM DATA

CALIBRATION LEVEL	114.3

SITE SKETCH (INDICATE NORTH)

Noise Measurement Site [M2.1]
[West of Avalon Road and north of Grove Blossom Boulevard)]

Sound Level Meter 40341 (looking North)

Sound Level Meter 40341 (looking South)

Sound Level Meter 40341 (looking East)

Sound Level Meter 40341 (looking West)

Calibration Certificate

Certificate Number 2025011058
Customer:
DRMP

,

Model Number	SoundExpert 821	***Procedure Number***	D0001.8466
Serial Number	40341	***Technician***	Jacob Cannon
Test Results	**Pass**	***Calibration Date***	2025-08-11
Initial Condition	AS RECEIVED same as shipped	***Calibration Due***	2026-08-11
Description	SoundExpert 821 Class 1 Sound Level Meter Firmware Revision: 1.502R12	***Temperature***	23.47 °C ± 0.25 °C
		Humidity	49 %RH ± 2.0 %RH
		Static Pressure	86.61 kPa ± 0.13 kPa

Evaluation Method ***Tested with:*** ***Data reported in dB re 20 µPa.***

Larson Davis CAL200. S/N 9079
TMS 9917C. S/N 219
Larson Davis PRM821. S/N 001744
PCB 377B02. S/N 356724

Compliance Standards Compliant to Manufacturer Specifications and the following standards when combined with Calibration Certificate from procedure D0001.8467:

IEC 60651:2001 Type 1	ANSI S1.4-2014 Class 1
IEC 60804:2000 Type 1	ANSI S1.4 (R2006) Type 1
IEC 61260:2014 Class 1	ANSI S1.11-2014 Class 1
IEC 61672:2013 Class 1	ANSI S1.43 (R2007) Type 1

Issuing lab certifies that the instrument described above meets or exceeds all specifications as stated in the referenced procedure (unless otherwise noted). The results documented in this certificate relate only to the item(s) calibrated or tested. It has been calibrated using measurement standards traceable to the International System of Units (SI) through the National Institute of Standards and Technology (NIST), or other national measurement institutes, and meets the requirements of ISO/IEC 17025:2017.
Test points marked with a ‡ in the uncertainties column do not fall within this laboratory's scope of accreditation.

The quality system is registered to ISO 9001:2015.

This calibration is a direct comparison of the unit under test to the listed reference standards and did not involve any sampling plans to complete. No allowance has been made for the instability of the test device due to use, time, etc. Such allowances would be made by the customer as needed.

The uncertainties were computed in accordance with the ISO Guide to the Expression of Uncertainty in Measurement (GUM). A coverage factor of approximately 2 sigma (k=2) has been applied to the standard uncertainty to express the expanded uncertainty at approximately 95% confidence level.

Correction data from Larson Davis SoundExpert 721/821 Manual, I821.01 Rev B

For 1/4" microphones, the Larson Davis ADP024 1/4" to 1/2" adaptor is used with the calibrators and the Larson Davis ADP043 1/4" to 1/2" adaptor is used with the preamplifier.

Calibration Certificate

Certificate Number 2025011059
Customer:
DRMP

,

Model Number	SoundExpert 821	***Procedure Number***	D0001.8466
Serial Number	40342	***Technician***	Jacob Cannon
Test Results	**Pass**	***Calibration Date***	2025-08-11
Initial Condition	AS RECEIVED same as shipped	***Calibration Due***	2026-08-11
Description	SoundExpert 821 Class 1 Sound Level Meter Firmware Revision: 1.502R12	***Temperature***	23.57 °C ± 0.25 °C
		Humidity	49.4 %RH ± 2.0 %RH
		Static Pressure	86.6 kPa ± 0.13 kPa

Evaluation Method ***Tested with:*** ***Data reported in dB re 20 µPa.***

Larson Davis CAL200. S/N 9079
TMS 9917C. S/N 219
Larson Davis PRM821. S/N 001745
PCB 377B02. S/N 356725

Compliance Standards Compliant to Manufacturer Specifications and the following standards when combined with Calibration Certificate from procedure D0001.8467:

IEC 60651:2001 Type 1	ANSI S1.4-2014 Class 1
IEC 60804:2000 Type 1	ANSI S1.4 (R2006) Type 1
IEC 61260:2014 Class 1	ANSI S1.11-2014 Class 1
IEC 61672:2013 Class 1	ANSI S1.43 (R2007) Type 1

Issuing lab certifies that the instrument described above meets or exceeds all specifications as stated in the referenced procedure (unless otherwise noted). The results documented in this certificate relate only to the item(s) calibrated or tested. It has been calibrated using measurement standards traceable to the International System of Units (SI) through the National Institute of Standards and Technology (NIST), or other national measurement institutes, and meets the requirements of ISO/IEC 17025:2017.
Test points marked with a ‡ in the uncertainties column do not fall within this laboratory's scope of accreditation.

The quality system is registered to ISO 9001:2015.

This calibration is a direct comparison of the unit under test to the listed reference standards and did not involve any sampling plans to complete. No allowance has been made for the instability of the test device due to use, time, etc. Such allowances would be made by the customer as needed.

The uncertainties were computed in accordance with the ISO Guide to the Expression of Uncertainty in Measurement (GUM). A coverage factor of approximately 2 sigma (k=2) has been applied to the standard uncertainty to express the expanded uncertainty at approximately 95% confidence level.

Correction data from Larson Davis SoundExpert 721/821 Manual, I821.01 Rev B

For 1/4" microphones, the Larson Davis ADP024 1/4" to 1/2" adaptor is used with the calibrators and the Larson Davis ADP043 1/4" to 1/2" adaptor is used with the preamplifier.

APPENDIX D

Predicted Noise Levels

Noise Sensitive Area Name	Receptor ID	Activity Category	Property Type	Number of Residents Represented	Existing (2021)	No Build (2048)	Build (2048)	Difference Between Existing and Build dB(A)	Impacted	
									NAC	Substantial Increase
NSA 1 - Residences located east of Avalon Road, north of US 192 and south and north of Arrowhead Boulevard	R1	B (66 dB(A))	Residence	1	61.4	61.5	65.1	3.7	No	No
	R2	B (66 dB(A))	Residence	1	62.1	62.2	66.8	4.7	Yes	No
	R3	B (66 dB(A))	Residence	1	60.8	60.9	66.7	5.9	Yes	No
	R4	B (66 dB(A))	Residence	1	58.4	58.7	64.7	6.3	No	No
	R5	B (66 dB(A))	Residence	1	56.8	57.6	59.7	2.9	No	No
	R6	B (66 dB(A))	Residence	1	53.4	54.4	57.6	4.2	No	No
	R7	B (66 dB(A))	Residence	1	52.2	52.4	56.5	4.3	No	No
	R8.1	B (66 dB(A))	Residence	1	55.7	55.8	59.7	4	No	No
	R8.2	B (66 dB(A))	Residence	1	59.2	59.2	62.1	2.9	No	No
	R8.3	B (66 dB(A))	Residence	1	60.9	60.9	63.5	2.6	No	No
	R8.4	B (66 dB(A))	Residence	1	61.1	61.2	63.7	2.6	No	No
	R8.5	B (66 dB(A))	Residence	1	61.2	61.2	63.8	2.6	No	No
	R9.1	B (66 dB(A))	Residence	1	56	56	60.1	4.1	No	No
	R9.2	B (66 dB(A))	Residence	1	59.6	59.6	62.8	3.2	No	No
	R9.3	B (66 dB(A))	Residence	1	61.2	61.2	63.9	2.7	No	No
	R9.4	B (66 dB(A))	Residence	1	61.3	61.4	64.1	2.8	No	No
	R9.5	B (66 dB(A))	Residence	1	61.4	61.4	64.1	2.7	No	No
	R10.1	B (66 dB(A))	Residence	1	55.4	55.4	59.9	4.5	No	No
	R10.2	B (66 dB(A))	Residence	1	59.3	59.3	62.6	3.3	No	No
	R10.3	B (66 dB(A))	Residence	1	61	61	63.8	2.8	No	No
	R10.4	B (66 dB(A))	Residence	1	61.1	61.1	63.9	2.8	No	No
	R10.5	B (66 dB(A))	Residence	1	61.1	61.2	64	2.9	No	No
	R11.1	B (66 dB(A))	Residence	1	52.6	52.7	55.9	3.3	No	No
	R11.2	B (66 dB(A))	Residence	1	55.5	55.6	58.2	2.7	No	No
	R11.3	B (66 dB(A))	Residence	1	57.3	57.4	59.9	2.6	No	No
	R11.4	B (66 dB(A))	Residence	1	58.1	58.2	60.5	2.4	No	No
	R11.5	B (66 dB(A))	Residence	1	58.3	58.4	60.7	2.4	No	No
	R12.1	B (66 dB(A))	Residence	1	52.1	52.2	55.2	3.1	No	No
	R12.2	B (66 dB(A))	Residence	1	54.9	55	57.5	2.6	No	No
	R12.3	B (66 dB(A))	Residence	1	56.6	56.7	59.1	2.5	No	No
	R12.4	B (66 dB(A))	Residence	1	57.6	57.7	59.8	2.2	No	No
	R12.5	B (66 dB(A))	Residence	1	57.8	57.9	60.1	2.3	No	No
	R13.1	B (66 dB(A))	Residence	1	51.3	51.5	53.7	2.4	No	No
	R13.2	B (66 dB(A))	Residence	1	53.7	53.9	56.2	2.5	No	No
	R13.3	B (66 dB(A))	Residence	1	55.2	55.3	57.5	2.3	No	No
	R13.4	B (66 dB(A))	Residence	1	56.2	56.4	58.5	2.3	No	No
	R13.5	B (66 dB(A))	Residence	1	56.7	56.9	58.9	2.2	No	No
	R14.1	B (66 dB(A))	Residence	1	50.7	51	52.7	2	No	No

Noise Sensitive Area Name	Receptor ID	Activity Category	Property Type	Number of Residents Represented	Existing (2021)	No Build (2048)	Build (2048)	Difference Between Existing and Build dB(A)	Impacted	
									NAC	Substantial Increase
	R14.2	B (66 dB(A))	Residence	1	52.9	53.1	55.3	2.4	No	No
	R14.3	B (66 dB(A))	Residence	1	54.3	54.5	56.4	2.1	No	No
	R14.4	B (66 dB(A))	Residence	1	55.2	55.4	57.4	2.2	No	No
	R14.5	B (66 dB(A))	Residence	1	55.9	56.1	58	2.1	No	No
	R15.1	B (66 dB(A))	Residence	1	50.6	50.9	52.4	1.8	No	No
	R15.2	B (66 dB(A))	Residence	1	52.7	52.9	55	2.3	No	No
	R15.3	B (66 dB(A))	Residence	1	54	54.2	56.1	2.1	No	No
	R15.4	B (66 dB(A))	Residence	1	54.9	55.1	57.1	2.2	No	No
	R15.5	B (66 dB(A))	Residence	1	55.6	55.8	57.7	2.1	No	No
	R16.1	B (66 dB(A))	Residence	1	51.4	51.4	56.5	5.1	No	No
	R16.2	B (66 dB(A))	Residence	1	55.6	55.6	58.9	3.3	No	No
	R16.3	B (66 dB(A))	Residence	1	57.5	57.5	60.7	3.2	No	No
	R16.4	B (66 dB(A))	Residence	1	58	58	60.9	2.9	No	No
	R16.5	B (66 dB(A))	Residence	1	58	58	61	3	No	No
	R17.1	B (66 dB(A))	Residence	1	49.8	49.8	55	5.2	No	No
	R17.2	B (66 dB(A))	Residence	1	53.6	53.6	57.1	3.5	No	No
	R17.3	B (66 dB(A))	Residence	1	55.8	55.8	59.1	3.3	No	No
	R17.4	B (66 dB(A))	Residence	1	56.6	56.6	59.5	2.9	No	No
	R17.5	B (66 dB(A))	Residence	1	56.7	56.7	59.7	3	No	No
	R18.1	B (66 dB(A))	Residence	1	46.5	46.5	51.6	5.1	No	No
	R18.2	B (66 dB(A))	Residence	1	50.1	50.1	53.6	3.5	No	No
	R18.3	B (66 dB(A))	Residence	1	52.1	52.1	55.5	3.4	No	No
	R18.4	B (66 dB(A))	Residence	1	53.5	53.5	56.6	3.1	No	No
	R18.5	B (66 dB(A))	Residence	1	53.9	53.9	56.8	2.9	No	No
	R19.1	B (66 dB(A))	Residence	1	44.7	44.7	49.5	4.8	No	No
	R19.2	B (66 dB(A))	Residence	1	48	48	51.7	3.7	No	No
	R19.3	B (66 dB(A))	Residence	1	49.9	49.9	53.3	3.4	No	No
	R19.4	B (66 dB(A))	Residence	1	51.3	51.3	54.7	3.4	No	No
	R19.5	B (66 dB(A))	Residence	1	52.3	52.3	55.1	2.8	No	No
	R20.1	B (66 dB(A))	Residence	1	43.9	43.9	48.8	4.9	No	No
	R20.2	B (66 dB(A))	Residence	1	47.2	47.2	50.9	3.7	No	No
	R20.3	B (66 dB(A))	Residence	1	49.1	49.1	52.4	3.3	No	No
	R20.4	B (66 dB(A))	Residence	1	50.4	50.4	53.8	3.4	No	No
	R20.5	B (66 dB(A))	Residence	1	51.6	51.6	54.4	2.8	No	No
	R21.1	B (66 dB(A))	Residence	1	56.3	56.3	60.7	4.4	No	No
	R21.2	B (66 dB(A))	Residence	1	60.3	60.3	63.8	3.5	No	No
	R21.3	B (66 dB(A))	Residence	1	61.5	61.5	64.5	3	No	No
	R21.4	B (66 dB(A))	Residence	1	61.6	61.7	64.6	3	No	No

Noise Sensitive Area Name	Receptor ID	Activity Category	Property Type	Number of Residents Represented	Existing (2021)	No Build (2048)	Build (2048)	Difference Between Existing and Build dB(A)	Impacted	
									NAC	Substantial Increase
NSA 2 - Registry on Grass Lake Apartments and single family residence located west of Avalon Road and south of Grove Blossom Boulevard	R21.5	B (66 dB(A))	Residence	1	61.6	61.6	64.6	3	No	No
	R22.1	B (66 dB(A))	Residence	1	56.5	56.5	60.8	4.3	No	No
	R22.2	B (66 dB(A))	Residence	1	60.6	60.6	64	3.4	No	No
	R22.3	B (66 dB(A))	Residence	1	61.7	61.7	64.6	2.9	No	No
	R22.4	B (66 dB(A))	Residence	1	61.8	61.8	64.7	2.9	No	No
	R22.5	B (66 dB(A))	Residence	1	61.7	61.7	64.7	3	No	No
	R23.1	B (66 dB(A))	Residence	1	56.5	56.5	60.7	4.2	No	No
	R23.2	B (66 dB(A))	Residence	1	60.6	60.7	64	3.4	No	No
	R23.3	B (66 dB(A))	Residence	1	61.7	61.7	64.6	2.9	No	No
	R23.4	B (66 dB(A))	Residence	1	61.8	61.8	64.8	3	No	No
	R23.5	B (66 dB(A))	Residence	1	61.7	61.7	64.7	3	No	No
	R24.1	B (66 dB(A))	Residence	1	56.9	56.9	61.1	4.2	No	No
	R24.2	B (66 dB(A))	Residence	1	61.1	61.1	64.4	3.3	No	No
	R24.3	B (66 dB(A))	Residence	1	61.9	61.9	64.9	3	No	No
	R24.4	B (66 dB(A))	Residence	1	62	62	65	3	No	No
	R24.5	B (66 dB(A))	Residence	1	61.9	61.9	64.9	3	No	No
	R25.1	B (66 dB(A))	Residence	1	56.9	56.9	61.1	4.2	No	No
	R25.2	B (66 dB(A))	Residence	1	61.2	61.2	64.4	3.2	No	No
	R25.3	B (66 dB(A))	Residence	1	62	62	64.9	2.9	No	No
	R25.4	B (66 dB(A))	Residence	1	62	62	65	3	No	No
	R25.5	B (66 dB(A))	Residence	1	61.9	61.9	64.9	3	No	No
	R26.1	B (66 dB(A))	Residence	1	57	57	61.1	4.1	No	No
	R26.2	B (66 dB(A))	Residence	1	61.2	61.2	64.5	3.3	No	No
	R26.3	B (66 dB(A))	Residence	1	62	62	64.9	2.9	No	No
	R26.4	B (66 dB(A))	Residence	1	62	62	65	3	No	No
	R26.5	B (66 dB(A))	Residence	1	61.9	61.9	64.9	3	No	No
	R27.1	B (66 dB(A))	Residence	1	52.8	52.8	57.7	4.9	No	No
	R27.2	B (66 dB(A))	Residence	1	56.9	56.9	60.5	3.6	No	No
	R27.3	B (66 dB(A))	Residence	1	59	59	61.9	2.9	No	No
	R27.4	B (66 dB(A))	Residence	1	59.1	59.1	62.1	3	No	No
	R27.5	B (66 dB(A))	Residence	1	59.2	59.2	62.2	3	No	No
	R28.1	B (66 dB(A))	Residence	1	48.8	48.8	54	5.2	No	No
	R28.2	B (66 dB(A))	Residence	1	52.6	52.6	56.1	3.5	No	No
	R28.3	B (66 dB(A))	Residence	1	54.8	54.8	58.3	3.5	No	No
	R28.4	B (66 dB(A))	Residence	1	55.8	55.8	58.7	2.9	No	No
	R28.5	B (66 dB(A))	Residence	1	55.9	55.9	58.9	3	No	No
	R29.1	B (66 dB(A))	Residence	1	47.9	47.9	53	5.1	No	No
	R29.2	B (66 dB(A))	Residence	1	51.6	51.6	55.1	3.5	No	No

Noise Sensitive Area Name	Receptor ID	Activity Category	Property Type	Number of Residents Represented	Existing (2021)	No Build (2048)	Build (2048)	Difference Between Existing and Build dB(A)	Impacted	
									NAC	Substantial Increase
	R29.3	B (66 dB(A))	Residence	1	53.7	53.7	57.3	3.6	No	No
	R29.4	B (66 dB(A))	Residence	1	55	55	57.9	2.9	No	No
	R29.5	B (66 dB(A))	Residence	1	55.1	55.1	58	2.9	No	No
	R30.1	B (66 dB(A))	Residence	1	47.3	47.4	49.8	2.5	No	No
	R30.2	B (66 dB(A))	Residence	1	49.3	49.4	52	2.7	No	No
	R30.3	B (66 dB(A))	Residence	1	50.7	50.8	53.3	2.6	No	No
	R30.4	B (66 dB(A))	Residence	1	51.7	51.8	54.5	2.8	No	No
	R30.5	B (66 dB(A))	Residence	1	52.6	52.7	55	2.4	No	No
	R31.1	B (66 dB(A))	Residence	1	48.5	48.8	49.8	1.3	No	No
	R31.2	B (66 dB(A))	Residence	1	50	50.2	51.9	1.9	No	No
	R31.3	B (66 dB(A))	Residence	1	51.1	51.3	53.1	2	No	No
	R31.4	B (66 dB(A))	Residence	1	52	52.1	54.3	2.3	No	No
	R31.5	B (66 dB(A))	Residence	1	52.8	52.9	54.9	2.1	No	No
	R32.1	B (66 dB(A))	Residence	1	55.8	55.8	60	4.2	No	No
	R32.2	B (66 dB(A))	Residence	1	59.8	59.8	63.2	3.4	No	No
	R32.3	B (66 dB(A))	Residence	1	61.1	61.1	64	2.9	No	No
	R32.4	B (66 dB(A))	Residence	1	61.2	61.2	64.1	2.9	No	No
	R32.5	B (66 dB(A))	Residence	1	61.1	61.1	64.2	3.1	No	No
	R33.1	B (66 dB(A))	Residence	1	52.3	52.3	56.3	4	No	No
	R33.2	B (66 dB(A))	Residence	1	55.6	55.6	58.7	3.1	No	No
	R33.3	B (66 dB(A))	Residence	1	57.6	57.6	60.5	2.9	No	No
	R33.4	B (66 dB(A))	Residence	1	57.9	57.9	60.7	2.8	No	No
	R33.5	B (66 dB(A))	Residence	1	57.9	57.9	60.8	2.9	No	No
	R34.1	B (66 dB(A))	Residence	1	51.5	51.5	55.4	3.9	No	No
	R34.2	B (66 dB(A))	Residence	1	54.7	54.7	57.7	3	No	No
	R34.3	B (66 dB(A))	Residence	1	56.6	56.6	59.7	3.1	No	No
	R34.4	B (66 dB(A))	Residence	1	57.2	57.2	60	2.8	No	No
	R34.5	B (66 dB(A))	Residence	1	57.2	57.3	60.1	2.9	No	No
	R35.1	B (66 dB(A))	Residence	1	49	49	52.2	3.2	No	No
	R35.2	B (66 dB(A))	Residence	1	51.7	51.7	54.6	2.9	No	No
	R35.3	B (66 dB(A))	Residence	1	53.3	53.3	56.2	2.9	No	No
	R35.4	B (66 dB(A))	Residence	1	54.5	54.5	57.5	3	No	No
	R35.5	B (66 dB(A))	Residence	1	55	55	57.8	2.8	No	No
	R36.1	B (66 dB(A))	Residence	1	48.6	48.6	51.7	3.1	No	No
	R36.2	B (66 dB(A))	Residence	1	51.2	51.2	54.1	2.9	No	No
	R36.3	B (66 dB(A))	Residence	1	52.8	52.8	55.7	2.9	No	No
	R36.4	B (66 dB(A))	Residence	1	53.9	53.9	57	3.1	No	No
	R36.5	B (66 dB(A))	Residence	1	54.6	54.6	57.4	2.8	No	No

Noise Sensitive Area Name	Receptor ID	Activity Category	Property Type	Number of Residents Represented	Existing (2021)	No Build (2048)	Build (2048)	Difference Between Existing and Build dB(A)	Impacted	
									NAC	Substantial Increase
	R37	B (66 dB(A))	Residence	1	58.3	58.3	60	1.7	No	No
NSA 3 - Pools associated with the Prose Horizons Apartments located east of Avalon Road and south of Lake Gifford Way	R38 - Pool	C (66 dB(A))	Recreational - Pool	N/A	50.9	50.9	54.5	3.6	No	No
	R56 - Pool	C (66 dB(A))	Recreational - Pool	N/A	55.1	55.1	56.4	1.3	No	No
NSA 4 - Palisades Condominiums and single family residence located west of Avalon Road and north of Grove Blossom Boulevard	R39.1	B (66 dB(A))	Residence	1	64.9	64.9	65.1	0.2	No	No
	R39.2	B (66 dB(A))	Residence	1	64.7	64.7	67.1	2.4	Yes	No
	R39.3	B (66 dB(A))	Residence	1	64.8	64.8	67.1	2.3	Yes	No
	R40.1	B (66 dB(A))	Residence	1	64.5	64.6	64.7	0.2	No	No
	R40.2	B (66 dB(A))	Residence	1	64.4	64.4	66.8	2.4	Yes	No
	R40.3	B (66 dB(A))	Residence	1	64.6	64.6	66.9	2.3	Yes	No
	R41.1	B (66 dB(A))	Residence	1	64.2	64.2	64.4	0.2	No	No
	R41.2	B (66 dB(A))	Residence	1	64.1	64.1	66.5	2.4	Yes	No
	R41.3	B (66 dB(A))	Residence	1	64.3	64.3	66.7	2.4	Yes	No
	R42.1	B (66 dB(A))	Residence	1	63.8	63.8	64.3	0.5	No	No
	R42.2	B (66 dB(A))	Residence	1	63.9	64	66.3	2.4	Yes	No
	R42.3	B (66 dB(A))	Residence	1	64.1	64.1	66.5	2.4	Yes	No
	R43.1	B (66 dB(A))	Residence	1	63.8	63.8	64.5	0.7	No	No
	R43.2	B (66 dB(A))	Residence	1	64	64	66.4	2.4	Yes	No
	R43.3	B (66 dB(A))	Residence	1	64.2	64.2	66.6	2.4	Yes	No
	R44.1	B (66 dB(A))	Residence	1	63.4	63.4	64.6	1.2	No	No
	R44.2	B (66 dB(A))	Residence	1	63.9	63.9	66.3	2.4	Yes	No
	R44.3	B (66 dB(A))	Residence	1	64	64	66.5	2.5	Yes	No
	R45.1	B (66 dB(A))	Residence	1	63.2	63.2	64.8	1.6	No	No
	R45.2	B (66 dB(A))	Residence	1	63.8	63.8	66.3	2.5	Yes	No
	R45.3	B (66 dB(A))	Residence	1	63.9	63.9	66.5	2.6	Yes	No
	R46.1	B (66 dB(A))	Residence	1	63.1	63.1	65	1.9	No	No
	R46.2	B (66 dB(A))	Residence	1	63.8	63.8	66.3	2.5	Yes	No
	R46.3	B (66 dB(A))	Residence	1	63.9	63.9	66.5	2.6	Yes	No
	R47.1	B (66 dB(A))	Residence	1	63.2	63.2	65.3	2.1	No	No
	R47.2	B (66 dB(A))	Residence	1	64	64	66.5	2.5	Yes	No
	R47.3	B (66 dB(A))	Residence	1	64	64.1	66.7	2.7	Yes	No
	R48.1	B (66 dB(A))	Residence	1	63.2	63.2	65.4	2.2	No	No
	R48.2	B (66 dB(A))	Residence	1	63.9	63.9	66.4	2.5	Yes	No
	R48.3	B (66 dB(A))	Residence	1	64	64	66.6	2.6	Yes	No
	R49.1	B (66 dB(A))	Residence	1	63.2	63.2	65.3	2.1	No	No
	R49.2	B (66 dB(A))	Residence	1	63.8	63.8	66.3	2.5	Yes	No
	R49.3	B (66 dB(A))	Residence	1	64	64	66.5	2.5	Yes	No
	R50.1	B (66 dB(A))	Residence	1	63	63	65.1	2.1	No	No
	R50.2	B (66 dB(A))	Residence	1	63.6	63.6	66	2.4	Yes	No

Noise Sensitive Area Name	Receptor ID	Activity Category	Property Type	Number of Residents Represented	Existing (2021)	No Build (2048)	Build (2048)	Difference Between Existing and Build dB(A)	Impacted	
									NAC	Substantial Increase
	R50.3	B (66 dB(A))	Residence	1	63.8	63.8	66.3	2.5	Yes	No
	R51.1	B (66 dB(A))	Residence	1	63.3	63.3	65.5	2.2	No	No
	R51.2	B (66 dB(A))	Residence	1	63.9	63.9	66.3	2.4	Yes	No
	R51.3	B (66 dB(A))	Residence	1	64	64	66.6	2.6	Yes	No
	R52.1	B (66 dB(A))	Residence	1	62.9	62.9	65.2	2.3	No	No
	R52.2	B (66 dB(A))	Residence	1	63.6	63.6	66.1	2.5	Yes	No
	R52.3	B (66 dB(A))	Residence	1	63.8	63.8	66.4	2.6	Yes	No
	R53.1	B (66 dB(A))	Residence	1	62.9	62.9	65.4	2.5	No	No
	R53.2	B (66 dB(A))	Residence	1	63.8	63.8	66.3	2.5	Yes	No
	R53.3	B (66 dB(A))	Residence	1	63.9	63.9	66.6	2.7	Yes	No
	R54.1	B (66 dB(A))	Residence	1	62.9	62.9	65.6	2.7	No	No
	R54.2	B (66 dB(A))	Residence	1	63.9	63.9	66.4	2.5	Yes	No
	R54.3	B (66 dB(A))	Residence	1	64	64	66.7	2.7	Yes	No
	R55.1	B (66 dB(A))	Residence	1	62.6	62.6	65.4	2.8	No	No
	R55.2	B (66 dB(A))	Residence	1	63.8	63.8	66.3	2.5	Yes	No
	R55.3	B (66 dB(A))	Residence	1	63.9	63.9	66.5	2.6	Yes	No
	R62	B (66 dB(A))	Residence	1	61.1	61.1	64.9	3.8	No	No
NSA 5 - Residences located east of Avalon Road between Lake Gifford Way and Hartzog Road	R57	B (66 dB(A))	Residence	1	60.4	60.4	66.1	5.7	Yes	No
	R58	B (66 dB(A))	Residence	1	53.7	53.7	56.7	3	No	No
	R59	B (66 dB(A))	Residence	1	63.2	63.2	67.3	4.1	Yes	No
	R60	B (66 dB(A))	Residence	1	57.5	57.5	60.2	2.7	No	No
	R61	B (66 dB(A))	Residence	1	54.7	54.7	58.1	3.4	No	No