Appendix F

Noise Technical Memorandum

Michael Baker INTERNATIONAL

We Make a Difference

MEMORANDUM

To: City of Temecula Public Works Department

From: Ryan Chiene
Achilles Malisos

Date: May 3, 2017

Subject: Temecula Parkway Park and Ride Project – Noise Technical Memorandum

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PURPOSE

The purpose of this technical memorandum is to provide an acoustical analysis of operational noise to surrounding sensitive receptors as a result of the proposed Temecula Park and Ride Project, located in the City of Temecula, California. This memorandum has been prepared to support an exemption from the California Environmental Quality Act (CEQA) in accordance with Section 15332 (In-Fill Development Projects) of the State CEQA Guidelines. Specifically, this analysis addresses the noise impacts referenced in State CEQA Guidelines Section 15332(d).

PROJECT LOCATION

The project site is located on the southeast corner of La Paz Street and Temecula Parkway, approximately 0.22-mile east of Interstate 15 (I-15) in the southern portion of the City of Temecula, California. The project site (Assessor's Parcel Number 231-062-14 [APN]) encompasses approximately 2.37 acres and is disturbed from previous construction activities. The site is bounded by residential uses and Vallejo Avenue to the north/northeast, vacant land to the southeast, residential and institutional (church) uses, and Temecula Parkway (State Route 79 [SR-79]) to the transportation uses (Temecula Parkway [State Route 79]) to the southwest, and Temecula Parkway, residential, and vacant land uses to the northwest. The parcel is also adjacent to the "Gateway to Temecula" project, which is under construction northwest of the project site. The future "Gateway to Temecula" project proposes the development of a number of commercial uses.

PROJECT DESCRIPTION

The proposed project includes the development of 157 parking spaces, including six handicap spaces, motorcycle parking and bike lockers. The proposed improvements to the site would include landscaping, raised curb planted islands, Americans with Disabilities Act (ADA)-accessible ramps, paved driveways, water quality basins, and sound/light attenuation features (walls and berms) to lessen impacts to nearby residents. The site would be accessed via a driveway along Vallejo Avenue.

Along the northern boundary of the project site adjacent to Vallejo Avenue, the project proposes the development of a six-foot sound wall (three-foot berm with three-foot soundwall on top of berm). These

features have been designed to provide buffering between potential lighting and noise sources and the existing residences along Vallejo Avenue.

Along La Paz Street and Vallejo Avenue, the project also proposes the development of pedestrian access features along the extent of the project site for both roadways.

DESCRIPTION OF NOISE METRICS

Sound is mechanical energy transmitted by pressure waves in a compressible medium such as air, and is characterized by both its amplitude and frequency (or pitch). The human ear does not hear all frequencies equally. In particular, the ear de-emphasizes low and very high frequencies. To better approximate the sensitivity of human hearing, the A-weighted decibel scale (dBA) has been developed. On this scale, the human range of hearing extends from approximately three dBA to around 140 dBA. Examples of various sound levels in different environments are illustrated on Table 1, *Sound Levels and Human Response*.

Table 1
Sound Levels and Human Response

Noise Source	dBA Noise Level	Response
	150	
Carrier Jet Operation	**140**	Harmfully Loud
	130	Pain Threshold
Jet Takeoff *(200 ft.)* Discotheque	**120**	
Unmuffled Motorcycle Auto Horn *(3 ft.)* Rock'n Roll Band Riveting Machine	**110**	Maximum Vocal Effort Physical Discomfort
Loud Power Mower Jet Takeoff *(2000 ft.)* Garbage Truck	**100**	Very Annoying Hearing Damage (Steady 8-Hour Exposure)
Heavy Truck *(50 ft.)* Pneumatic Drill *(50 ft.)*	**90**	
Alarm Clock Freight Train *(50 ft.)* Vacuum Cleaner *(10 ft.)*	**80**	Annoying
Freeway Traffic *(50 ft.)*	**70**	Telephone Use Difficult
Dishwashers Air Conditioning Unit *(20 ft.)*	**60**	Intrusive
Light Auto Traffic *(100 ft.)*	**50**	Quiet
Living Room Bedroom	**40**	
Library Soft Whisper *(15 ft.)*	**30**	Very Quiet
Broadcasting Studio	**20**	Just Audible
	10	Threshold of Hearing

Source: Environmental Protection Agency, *Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety (EPA/ONAC 550/9-74-004),* March 1974 and Melville C. Branch and R. Dale Beland, *Outdoor Noise in the Metropolitan Environment*, page 2, 1970.

Noise is generally defined as unwanted or excessive sound, which can vary in intensity by over one million times within the range of human hearing; therefore, a logarithmic scale, known as the decibel scale (dB), is used to quantify sound intensity. Noise can be generated by a number of sources, including mobile sources such as automobiles, trucks, and airplanes, and stationary sources such as construction sites, machinery, and industrial operations. Noise generated by mobile sources typically attenuates (is reduced) at a rate between three dBA and 4.5 dBA per doubling of distance. The rate depends on the ground surface and the number or type of objects between the noise source and the receiver. Hard and flat surfaces, such as concrete or asphalt, have an attenuation rate of three dBA per doubling of distance. Soft surfaces, such as uneven or vegetated terrain, have an attenuation rate of about 4.5 dBA per doubling of distance. Noise generated by stationary sources typically attenuates at a rate between 6 dBA and about 7.5 dBA per doubling of distance.

There are a number of metrics used to characterize community noise exposure, which fluctuate constantly over time. One such metric, the equivalent sound level (L_{eq}), represents a constant sound that, over the specified period, has the same sound energy as the time-varying sound. Noise exposure over a longer period of time is often evaluated based on the Day-Night Sound Level (L_{dn} or DNL). This is a measure of 24-hour noise levels that incorporates a 10-dBA penalty for sounds occurring between 10:00 p.m. and 7:00 a.m. The penalty is intended to reflect the increased human sensitivity to noises occurring during nighttime hours, particularly at times when people are sleeping and there are lower ambient noise conditions. Typical L_{dn} noise levels for light and medium density residential areas range from 55 dBA to 65 dBA. Table 2, *Noise Descriptors*, provides a listing of methods to measure sound over a period of time.

Table 2
Noise Descriptors

Term	Definition
Decibel (dB)	The unit for measuring the volume of sound equal to 10 times the logarithm (base 10) of the ratio of the pressure of a measured sound to a reference pressure (20 micropascals).
A-Weighted Decibel (dBA)	A sound measurement scale that adjusts the pressure of individual frequencies according to human sensitivities. The scale accounts for the fact that the region of highest sensitivity for the human ear is between 2,000 and 4,000 cycles per second (hertz).
Equivalent Sound Level (L_{eq})	The sound level containing the same total energy as a time varying signal over a given time period. The L_{eq} is the value that expresses the time averaged total energy of a fluctuating sound level.
Maximum Sound Level (L_{max})	The highest individual sound level (dBA) occurring over a given time period.
Minimum Sound Level (L_{min})	The lowest individual sound level (dBA) occurring over a given time period.
Community Noise Equivalent Level (CNEL)	A rating of community noise exposure to all sources of sound that differentiates between daytime, evening, and nighttime noise exposure. These adjustments are +5 dBA for the evening, 7:00 PM to 10:00 PM, and +10 dBA for the night, 10:00 PM to 7:00 AM.
Day/Night Average (L_{dn})	The L_{dn} is a measure of the 24-hour average noise level at a given location. It was adopted by the U.S. Environmental Protection Agency for developing criteria for the evaluation of community noise exposure. It is based on a measure of the average noise level over a given time period called the L_{eq}. The L_{dn} is calculated by averaging the L_{eq}'s for each hour of the day at a given location after penalizing the "sleeping hours" (defined as 10:00 PM to 7:00 AM) by 10 dBA to account for the increased sensitivity of people to noises that occur at night.
Exceedance Level (L_n)	The A-weighted noise levels that are exceeded 1%, 10%, 50%, and 90% (L_{01}, L_{10}, L_{50}, L_{90}, respectively) of the time during the measurement period.
Source: Cyril M. Harris, *Handbook of Noise Control*, 1979.	

REGULATORY SETTING

State of California

The State Office of Planning and Research Noise Element Guidelines include recommended exterior and interior noise level standards for local jurisdictions to identify and prevent the creation of incompatible land uses due to noise. The Noise Element Guidelines contain a land use compatibility table that describes the compatibility of various land uses with a range of environmental noise levels in terms of the Community Noise Equivalent Level (CNEL). The guidelines also present adjustment factors that may be used to arrive at noise acceptability standards that reflect the noise control goals of the community, the particular community's sensitivity to noise, and the community's assessment of the relative importance of noise pollution.

City of Temecula General Plan

The California Government Code requires that a noise element be included in the general plan of each county and City in the state. The City of Temecula General Plan Noise Element (Noise Element) evaluates the existing noise environment, future noise environment projections as well as identifies noise-sensitive land uses and major noise sources in the City. The Noise Element provides goals, policies, and implementation programs designed to minimize noise problems and to protect public health. The Noise Element includes the following goals, policies, and implementation programs applicable to the proposed project:

Goal 1: Separate significant noise generators from sensitive receptors.
Promote a pattern of land uses compatible with current and future noise levels.

Policy 1.1: Discourage noise sensitive land uses in noisy exterior environments unless measures can be implemented to reduce exterior and interior noise to acceptable levels. Alternatively, encourage less sensitive uses in areas adjacent to major noise generators but require sound-appropriate interior working environments.

Policy 1.3: Use information from the noise contour map in the General Plan in the development review process to prevent the location of sensitive land uses near major stationary noise sources.

Goal 2: Minimize transfer of noise impacts between adjacent land uses.

Policy 2.1: Limit the maximum permitted noise levels crossing property lines and impacting adjacent land uses.

Goal 3: Minimize the impact of noise levels throughout the community through land use planning.

Policy 3.1: Enforce and maintain acceptable noise limit standards.

Policy 3.2: Work with the County of Riverside and the City of Murrieta to minimize or avoid land use/noise conflicts prior to project approvals.

Policy 3.4: Evaluate potential noise conflicts for individual sites and projects, and require mitigation of all significant noise impacts as a condition of project approval.

Goal 4: Minimize impacts from transportation noise sources.

Policy 4.1: Minimize noise conflicts between land uses and the circulation network, and mitigate sound levels where necessary or feasible to ensure the peace and quiet of the community.

Policy 4.2: Ensure the effective enforcement of City, State and federal noise standards by all City Divisions.

Implementation Program N-4: During review of development applications, consider the noise and vibration impacts of the proposed land use on the current or planned adjacent uses. Establish and enforce standards for noise transfer between non-residential and residential components of mixed use development projects.

Implementation Program N-5: During review of development applications, consider the noise and vibration impacts of the proposed land use on the current or planned adjacent uses. Establish and enforce standards for noise transfer between non-residential and residential components of mixed use development projects.

Implementation Program N-6:

- Designate the Planning Director as the noise control coordinator for new development, charged with the responsibility to enforce City noise policy.

- Work with the noise control coordinators for the County of Riverside and City of Murrieta to ensure mitigation of potential land use / noise conflicts near the City's edge.

Implementation Program N-7: Consider site design techniques as the primary means to minimize noise impacts. Require developers to consider alternative site layouts and architectural features as a means of meeting City noise reduction requirements. Discourage projects that are incapable of successfully mitigating excessive noise. Site design and architectural features recommended to reduce noise include (but are not limited to) the following:

- Promote the placement of noise tolerant land uses such as parking lots, maintenance facilities, and utility areas between the noise source and receptor.

Implementation Program N-8: Employ the following measures to mitigate transportation activity noise impacts to acceptable levels:

- Incorporate noise control measures, such as sound walls and berms, into roadway improvement projects to mitigate impacts to adjacent development. Measures will emphasize the establishment of buffers between roadways and adjacent noise sensitive areas.

In addition, the Noise Element provides the City's noise standards and land use compatibility standards for normally acceptable conditions, based on state recommendations and City land use designations. The City's noise standards are presented in Table 3, *Noise/Land Use Compatibility Matrix*, and the City's Land Use Compatibility standards are presented in Table 4, *Temecula Land Use/Noise Standards*. These standards, which use the CNEL noise descriptor, are intended to be applicable for land use designations exposed to noise levels generated by transportation related sources.

Table 3
Noise/Land Use Compatibility Matrix

Land Use	Community Noise Exposure (L_{dn} or CNEL)			
	Normally Acceptable	Conditionally Acceptable	Normally Unacceptable	Clearly Unacceptable
Residential[1]	50 - 60	60 - 70	70-75	75-85
Transient Lodging - Motel, Hotels	50 - 60	60 - 70	70 - 80	80 – 85
Schools, Libraries, Churches, Hospitals, Nursing Homes	50 - 60	60 - 70	70 - 80	80 – 85
Auditoriums, Concert Halls, Amphitheaters[2]	NA	50 - 70	NA	70 – 85
Sports Arenas, Outdoor Spectator Sports[2]	NA	50 - 75	NA	75 – 85
Playgrounds, Neighborhood Parks	50 - 70	NA	67.5 - 75	72.5 – 85
Golf Courses, Riding Stables, Water Recreation, Cemeteries	50 - 70	NA	70 - 80	80 – 85
Office Buildings, Business Commercial and Professional	50 - 65	65 - 75	75 - 85	NA
Industrial, Manufacturing, Utilities, Agriculture	50 - 70	70 - 80	80 - 85	NA

NA: Not Applicable

Notes:
1. Regarding aircraft-related noise, the maximum acceptable exposure for new residential development is 60dB CNEL.
2. No normally acceptable condition is defined for these uses. Noise studies are required prior to approval.

Normally Acceptable – Specified land use is satisfactory, based upon the assumption that any buildings involved meet conventional Title 24 construction standards. No special noise insulation requirements.

Conditionally Acceptable – New construction or development shall be undertaken only after a detailed noise analysis is made and noise reduction measures are identified and included in the project design.

Normally Unacceptable – New construction or development is discouraged. If new construction is proposed, a detailed analysis is required, noise reduction measures must be identified, and noise insulation features included in the design.

Clearly Unacceptable – New construction or development clearly should not be undertaken.

Source: City of Temecula, *Temecula General Plan Noise Element*, 2005.

Table 4
Temecula Land Use/Noise Standards

Property Receiving Noise		CNEL (dBA)	
Type of Use	**Land Use Designation**	**Interior**	**Exterior[1]**
Residential	Hillside	45	65
	Rural		
	Very Low		
	Low		
	Low Medium		
	Medium	45	65/70[2]
	High	45	70[2]
Commercial and Office	Neighborhood Community Highway Transit Service	-	70
	Professional Office	50	70
Light Industrial	Industrial Park	55	75
Public/Institutional	Schools	50	65
	All others	50	70
Open Space	Vineyards/Agriculture	-	70
	Open Space	-	70/65[3]

Notes:
1. Regarding aircraft-related noise, the maximum acceptable exposure for new residential development is 60 dB CNEL.
2. Maximum exterior noise levels up to 70 dB CNEL are allowed for Multiple-Family Housing.
3. Where quiet is a basis required for the land use.

Source: City of Temecula, *Temecula General Plan Noise Element*, 2005.

BASELINE CONDITIONS

Noise Measurements

In order to quantify existing ambient noise levels in the project area, noise measurements were conducted at three locations in the vicinity of the project site on April 25, 2017; refer to Table 5, *Noise Measurements*. The noise measurements were taken adjacent to the project site and represent typical existing noise exposure within and immediately adjacent to the project site. Measurements were taken during off-peak traffic hours to characterize baseline noise levels with without exposure to heavy traffic or noise-generating activities. The measured noise levels range between 60.7 dBA L_{eq} and 73.4 dBA L_{eq}. Meteorological conditions were partly cloudy skies, cool temperatures, with light wind speeds (approximately 0 to 5 miles per hour), and low humidity. Noise monitoring equipment used for the ambient noise survey consisted of a Larson-Davis Model 820 Type 1 sound level meter. The results of the field measurements are included in Appendix A, *Noise Data*.

Table 5
Noise Measurements

Site No.	Location	L_{eq} (dBA)	L_{min} (dBA)	L_{max} (dBA)	Peak (dBA)	Time	Date
1	Vacant parcel to the north of the project site, along Vallejo Avenue (just east of residence).	63.4	58.2	70.5	94.6	10:00 a.m.	4/25/17
2	North of the project site, south of residence located along Vallejo Avenue.	60.7	56.1	75.1	104.3	10:13 a.m.	
3	South of the project site along Temecula Parkway (SR-79).	73.4	55.9	83.3	105.4	10:27 a.m.	
dBA = A-weighted decibel; L_{eq} = equivalent sound level; L_{max} = maximum sound level; L_{min} = minimum sound level.							
Source: Michael Baker International, Inc., April 25, 2017.							

Mobile Traffic Noise

The project area's noise environment is dominated by vehicular traffic along Temecula Parkway, and other local roadways (e.g., La Paz Street, Vallejo Avenue). During peak travel hours, heavy traffic on these roadways causes higher noise levels compared to noise levels during non-peak hours. These roadways have been designed to specifically carry large volumes, although long-established land use patterns have placed residential uses along some portions of these roadways.

In order to assess the potential for mobile source noise impacts, it is necessary to determine the noise currently generated by vehicles traveling through the project planning area. The existing roadway noise levels in the vicinity of the project site were projected. Noise models were run using the Federal Highway Administration's Highway Noise Prediction Model (FHWA RD-77-108) together with several roadway and site parameters. These parameters determine the projected impact of vehicular traffic noise and include the roadway cross-section (such as the number of lanes), roadway width, average daily traffic (ADT), vehicle travel speed, percentages of auto and truck traffic, roadway grade, angle-of-view, and site conditions ("hard" or "soft"). The model does not account for ambient noise levels (i.e., noise from adjacent land uses) or topographical differences between the roadway and adjacent land uses. A 25- to 50-mile per hour (mph) average vehicle speed was assumed for existing conditions based on empirical observations and posted maximum speeds along the adjacent roadways. Noise projections are based on modeled vehicular traffic volumes as derived from the *Temecula Park & Ride Focused Traffic Impact Analysis*, prepared by Michael Baker International, Inc., May 3, 2017 (Traffic Impact Analysis).

Existing noise contours were calculated for major arterial and minor arterial roadways in the vicinity of the project site; refer to Table 6, *Existing Traffic Noise Levels*. Noise generation for each roadway link was calculated and the distance to the 60 dBA L_{dn}, 65 dBA L_{dn}, and 70 dBA L_{dn} contours was determined. As shown in Table 6, the existing traffic noise levels range from a low of 46.7 L_{dn} along Vallejo Avenue (east of La Paz), to a high of 73.5 L_{dn} along Temecula Parkway (from Bedford Court to La Paz). It should be noted that the FHWA RD-77-108 models do not account for variations in topography, intervening structures, or soundwalls. Additionally, Table 6 depicts modeled daily traffic noise levels, which are not based upon actual site measurements during a specific event or time of day.

Table 6
Existing Traffic Noise Levels

Roadway Segment	ADT	dBA @ 100 Feet from Roadway Centerline	Distance from Roadway Centerline to: (Feet) [1]		
			60 L_{dn} Noise Contour	65 L_{dn} Noise Contour	70 L_{dn} Noise Contour
Temecula Parkway, Bedford Court to La Paz	64,800	73.2	2,617	828	262
Temecula Parkway, La Paz to Pechanga Parkway	68,300	73.5	2,759	873	276
La Paz, Temecula Parkway to Vallejo Avenue	13,300	59.9	114	36	11
Vallejo Avenue, east of La Paz	600	46.7	5	2	1

Source: Noise modeling is based upon traffic data within the *Temecula Park & Ride Focused Traffic Impact Analysis,* prepared by Michael Baker International, Inc., May 3, 2017.

Sensitive Receptors

Certain land uses are particularly sensitive to noise, including schools, hospitals, rest homes, long-term medical and mental care facilities, and parks and recreation areas. Residential areas are also considered noise sensitive, especially during the nighttime hours. Existing sensitive receptors located in the project vicinity include residential uses adjoin the project site to the north, northeast, south, and southwest, as well as a church to the south. Sensitive receptors are listed in Table 7*, Sensitive Receptors*.

Table 7
Sensitive Receptors

Type	Name	Distance from Project Site (feet)[1]	Direction from Project Site	Location
Residential	Single-family residential	Adjoining	North Northeast Southeast South Southwest	Multiple addresses.
Institutional	The Church of Jesus Christ of Latter-day Saints	Adjoining	South	44650 La Paz Road, Temecula, CA 92592
	Hope Lutheran Church	1,240 feet	Northwest	32819 Temecula Parkway B, Temecula, CA 92592

Note:
1. Distances are measured from the exterior project boundary only and not from individual activity areas within the interior of the project site.

Source: Google Earth 2017.

Existing Noise Sources

The predominant noise source in the area is traffic noise along Temecula Parkway to the south of the project site.

ACOUSTICAL ANALYSIS

Long-Term Mobile Traffic Noise

As discussed above, the project includes the development of 155 parking spaces, including six handicap spaces, motorcycle parking and bike lockers. The site would be accessed via a driveway along Vallejo Avenue. A six-foot sound wall (i.e., a three-foot berm with a three-foot soundwall on top of the berm) would be positioned along Vallejo Avenue at the northern project site boundary.

The proposed parking facilities would generate increased mobile noise impacts in the project area and surrounding roadways due to daily trips to and from the project site. Table 8, *Future Traffic Noise Levels*, outlines the roadway noise levels in the project area as a result of the proposed project.

Table 8
Future Traffic Noise Levels

Roadway Segment	Future Without Project					Future With Project					Difference in dBA @ 100 feet from Roadway
	ADT	dBA @ 100 Feet from Roadway Centerline	Distance from Roadway Centerline to: (Feet)			ADT	dBA @ 100 Feet from Roadway Centerline	Distance from Roadway Centerline to: (Feet)			
			60 CNEL Noise Contour	65 CNEL Noise Contour	70 CNEL Noise Contour			60 CNEL Noise Contour	65 CNEL Noise Contour	70 CNEL Noise Contour	
Tustin Avenue											
Temecula Parkway, Bedford Court to La Paz	79,118	74.1	3,190	1,009	319	79,259	74.1	3,197	1,011	320	0.0
Temecula Parkway, La Paz to Pechanga Parkway	81,370	74.2	3,287	1,039	329	81,384	74.2	3,287	1,039	329	0.0
La Paz, Temecula Parkway to Vallejo Avenue	16,274	60.8	140	44	14	16,811	61.0	144	46	14	0.2
Vallejo Avenue, east of La Paz	612	46.7	5	2	1	1,298	50.0	11	4	1	3.3

Source: Noise modeling is based upon traffic data within the *Temecula Park & Ride Focused Traffic Impact Analysis,* prepared by Michael Baker International, Inc., May 3, 2017.

As shown in Table 8, under the "Future Without Project" scenario, noise levels would range from approximately 46.7 dBA to 74.2 dBA at 100 feet from the roadway centerline, with the highest noise levels occurring along Temecula Parkway (between La Paz and Pechanga Parkway). The "Future With Project" scenario noise levels would range from approximately 50.0 dBA to 74.2 dBA at 100 feet from the roadway centerline, with the highest noise levels also occurring along Temecula Parkway (between La Paz and Pechanga Parkway). The traffic noise levels associated with the project would likely exceed the "normally acceptable" land use compatibility thresholds (60 dB CNEL) at the residential uses to the north and northwest of the project site, and the residential and church uses to the south of Temecula Parkway. However, as shown in Table 6, traffic noise levels along Temecula Parkway currently exceed the City's 60 dB CNEL land use compatibility threshold under existing conditions. Noise levels would not change along Temecula Parkway as a result of the project, and a nominal increase in traffic noise levels (0.2 dBA) would

occur along La Paz. It is noted that although a 3.3 dBA increase would occur along Vallejo Avenue under "Future With Project" conditions (compared to "Future Without Project" conditions), traffic noise levels at the nearest residential uses would be below the City's noise standards; refer to Table 8. Further, the project would include a six-foot barrier along the northern boundary of the site to attenuate noise at nearby sensitive receptors to the north and northwest. According to the FHWA's *Roadway Construction Noise Model User's Guide* (January 2006), a noise source is reduced by 8 dBA with shielding from a solid noise barrier. As such, traffic noise levels would be below the City's noise standards at the residential uses to the north of the project site. Thus, off-site traffic noise impacts would be less than significant.

Parking Lot Noise

Traffic associated with parking lots is typically not of sufficient volume to exceed community noise standards, which are based on a time-averaged scale such as the CNEL scale. However, the instantaneous maximum sound levels generated by a car door slamming, engine starting up and car pass-bys may be an annoyance to adjacent noise-sensitive receptors. Estimates of the maximum noise levels associated with some parking lot activities are presented in Table 9, *Typical Noise Levels Generated by Parking Lots*. Conversations in parking areas may also be an annoyance to adjacent sensitive receptors. Sound levels of speech typically range from 33 dBA at 48 feet for normal speech to 50 dBA at 50 feet for very loud speech.

Table 9
Typical Noise Levels Generated by Parking Lots

Noise Source	Maximum Noise Levels at 50 Feet from Source
Car door slamming	63 dBA Leq
Car starting	60 dBA Leq
Car idling	61 dBA Leq

As shown in Table 9, during operation of the proposed project, noise levels from parking activities would range from approximately 60.0 to 63.0 dBA at a distance of 50 feet (assuming no reductions from barriers). The closest sensitive receptors are single-family residential uses located approximately 50 feet to the north of the project site, which would experience maximum noise levels of 63 dBA at this distance. However, as noted above, the project would include a six-foot barrier along the northern boundary of the project site along Vallejo Avenue that would reduce parking lot noise sources by 8 dBA.[1] As such, noise associated with parking activities would not exceed the City's exterior (65 dBA CNEL), interior (45 dBA CNEL), or "Normally Acceptable" (60 dBA CNEL) Land Use Compatibility noise standards for residential uses. In addition, parking lot noise at the residential uses to the north and south, and the church to the south is anticipated to be lower than the levels presented in Table 9, as the noise would be partially masked by background traffic noise along Temecula Parkway (see noise measurement results for location 3 in Table 5). Therefore, the sensitive receptors to the north would not be exposed to excessive noise from parking areas, and a less than significant impact would occur in this regard.

Mitigation Measures: No mitigation is required.

[1] Federal Highway Administration, *Construction Noise Model User's Guide*, January 2006.

CONCLUSION

Project implementation would result in less than significant long-term noise impacts. No mitigation measures would be required. Therefore, the proposed project would not result in significant effects related to Section 15332(d) of the State CEQA Guidelines.

REFERENCES

City of Temecula, *Temecula General Plan*, 2005.

City of Temecula, *Temecula Municipal Code*, current through Ordinance 16-09 and the November 2016 code supplement.

Cyril M. Harris, *Handbook of Noise Control*, 1979.

Environmental Protection Agency, *Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety (EPA/ONAC 550/9-74-004),* March 1974

Federal Highway Administration, *Construction Noise Model User's Guide*, January 2006.

Federal Transit Administration, *Transit Noise and Vibration Impact Assessment Guidelines*, May 2006. Table 12-2.

Google Earth, 2017.

Melville C. Branch and R. Dale Beland, *Outdoor Noise in the Metropolitan Environment*, 1970.

Michael Baker International, *Temecula Park & Ride Focused Traffic Impact Analysis*, May 3, 2017.

Michael Baker International, *Temecula Park & Ride Vallejo Avenue Profile Exhibit*, September 29, 2016.

Appendix A
Noise Data

Site Number: 1			
Recorded By: Ryan Chiene			
Job Number: 159472			
Date: 4/25/17			
Time: 10:00 a.m.			
Location: Vacant parcel to the north of the project site, along Vallejo Avenue (just east of residence).			
Source of Peak Noise: Traffic on Temecula Parkway (SR-79).			
Noise Data			
Leq (dB)	Lmin (dB)	Lmax (dB)	Peak (dB)
63.4	58.2	70.5	94.6

Equipment						
Category	Type	Vendor	Model	Serial No.	Cert. Date	Note
Sound	Sound Level Meter	Brüel & Kjær	2250	3011133	3/27/2017	
	Microphone	Brüel & Kjær	4189	3086765	3/27/2017	
	Preamp	Brüel & Kjær	ZC 0032	25380	3/27/2017	
	Calibrator	Brüel & Kjær	4231	2545667	3/27/2017	

Weather Data			
Est.	Duration: 10 minutes		Sky: Partly Cloudy
	Note: dBA Offset = -0.01		Sensor Height (ft): 5 ft
	Wind Ave Speed (mph / m/s)	Temperature (degrees Fahrenheit)	Barometer Pressure (inches)
	< 5.0	68.0	29.89

Photo of Measurement Location

2250

Instrument:		2250
Application:		BZ7225 Version 4.7.2
Start Time:		04/25/2017 10:00:18
End Time:		04/25/2017 10:10:18
Elapsed Time:		00:10:00
Bandwidth:		1/3-octave
Max Input Level:		141.92

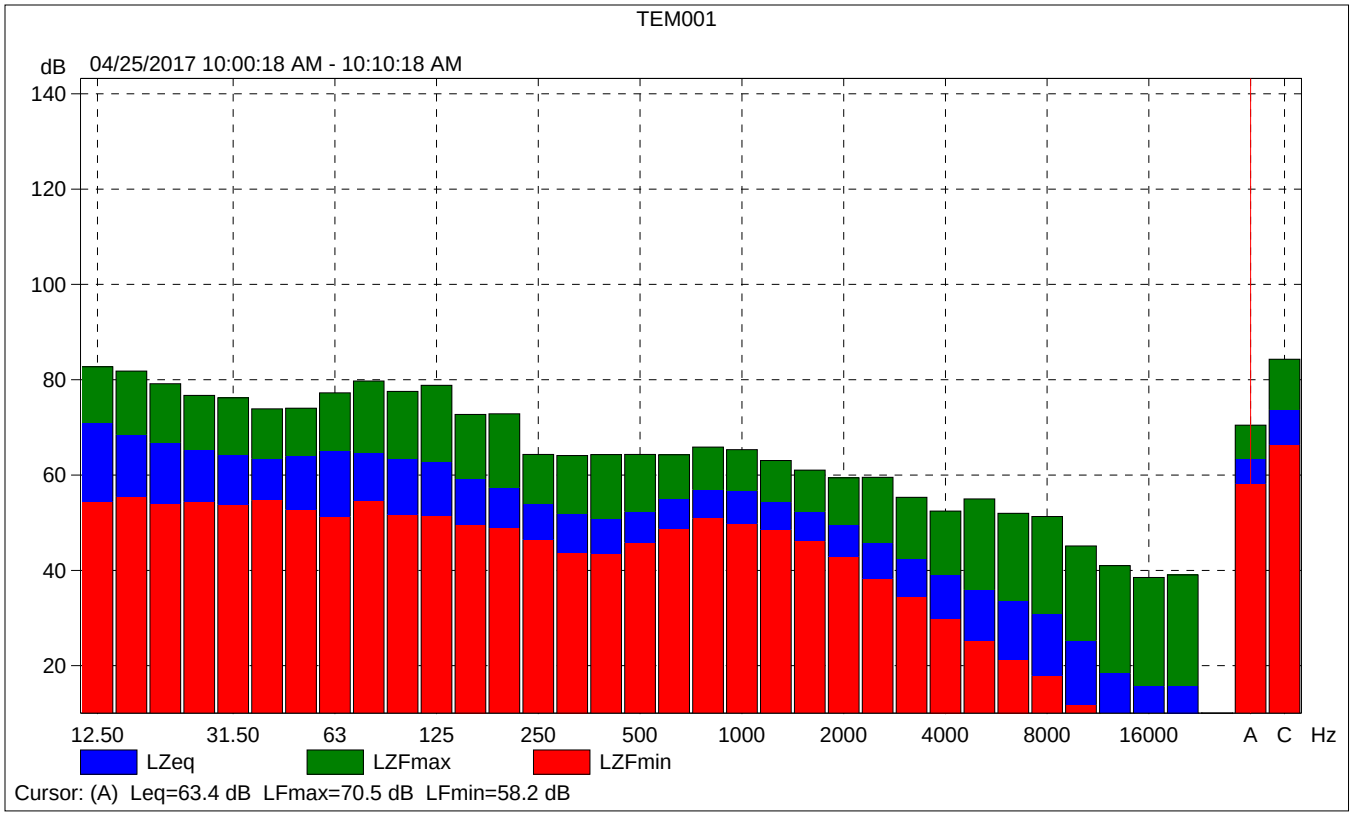
	Time	Frequency
Broadband (excl. Peak):	FSI	AC
Broadband Peak:		C
Spectrum:	FS	Z

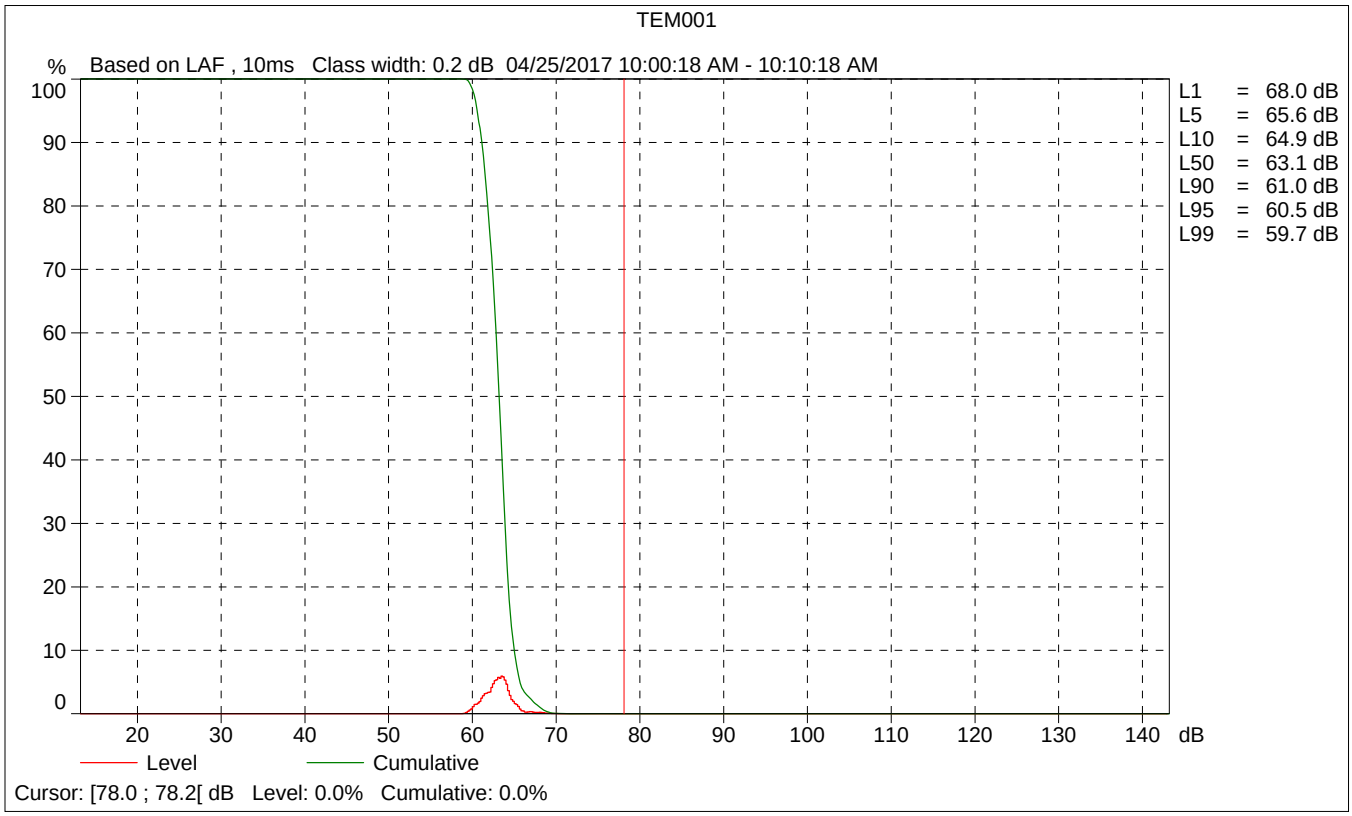
Instrument Serial Number:		3011133
Microphone Serial Number:		3086765
Input:		Top Socket
Windscreen Correction:		None
Sound Field Correction:		Free-field

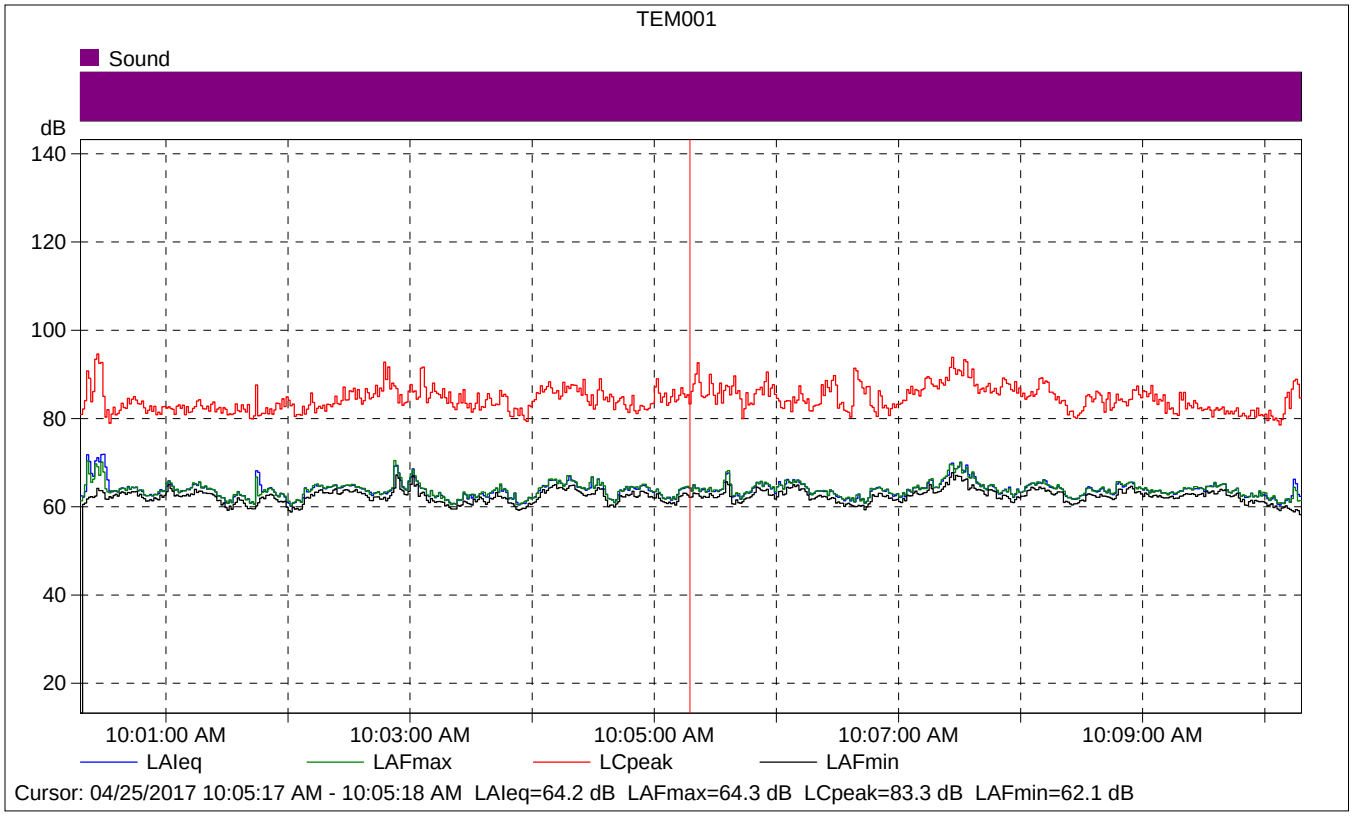
Calibration Time:		04/24/2017 14:43:42
Calibration Type:		External reference
Sensitivity:		44.6215867996216 mV/Pa

TEM001

	Start time	End time	Elapsed time	Overload [%]	LAeq [dB]	LAFmax [dB]	LAFmin [dB]
Value				0.00	63.4	70.5	58.2
Time	10:00:18 AM	10:10:18 AM	0:10:00				
Date	04/25/2017	04/25/2017					

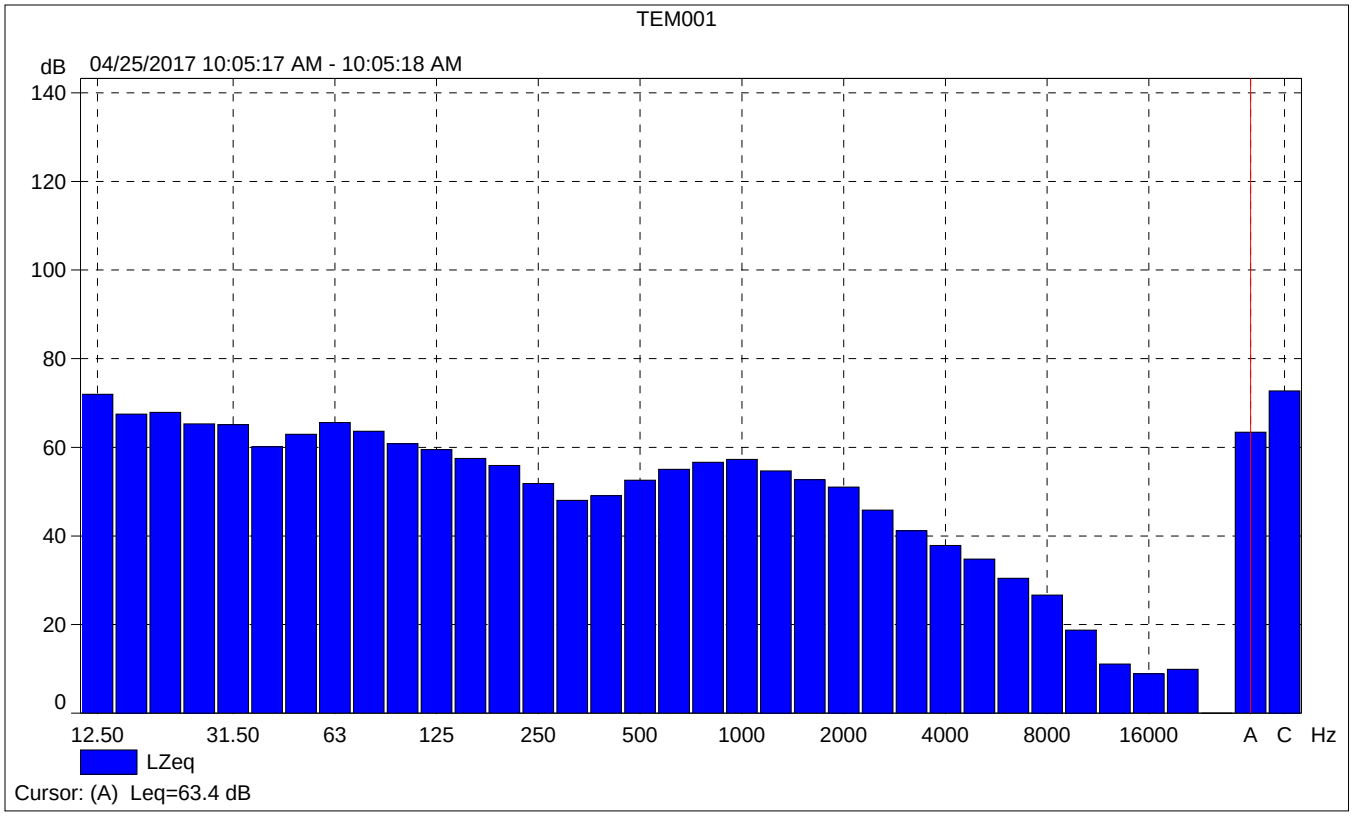

TEM001
dB
04/25/2017 10:00:18 AM - 10:10:18 AM
140
120
100
80
60
40
20
12.50
31.50
63
125
250
500
1000
2000
4000
8000
16000
A
C
Hz
LZeq
LZFmax
LZFmin
Cursor: (A) Leq=63.4 dB LFmax=70.5 dB LFmin=58.2 dB

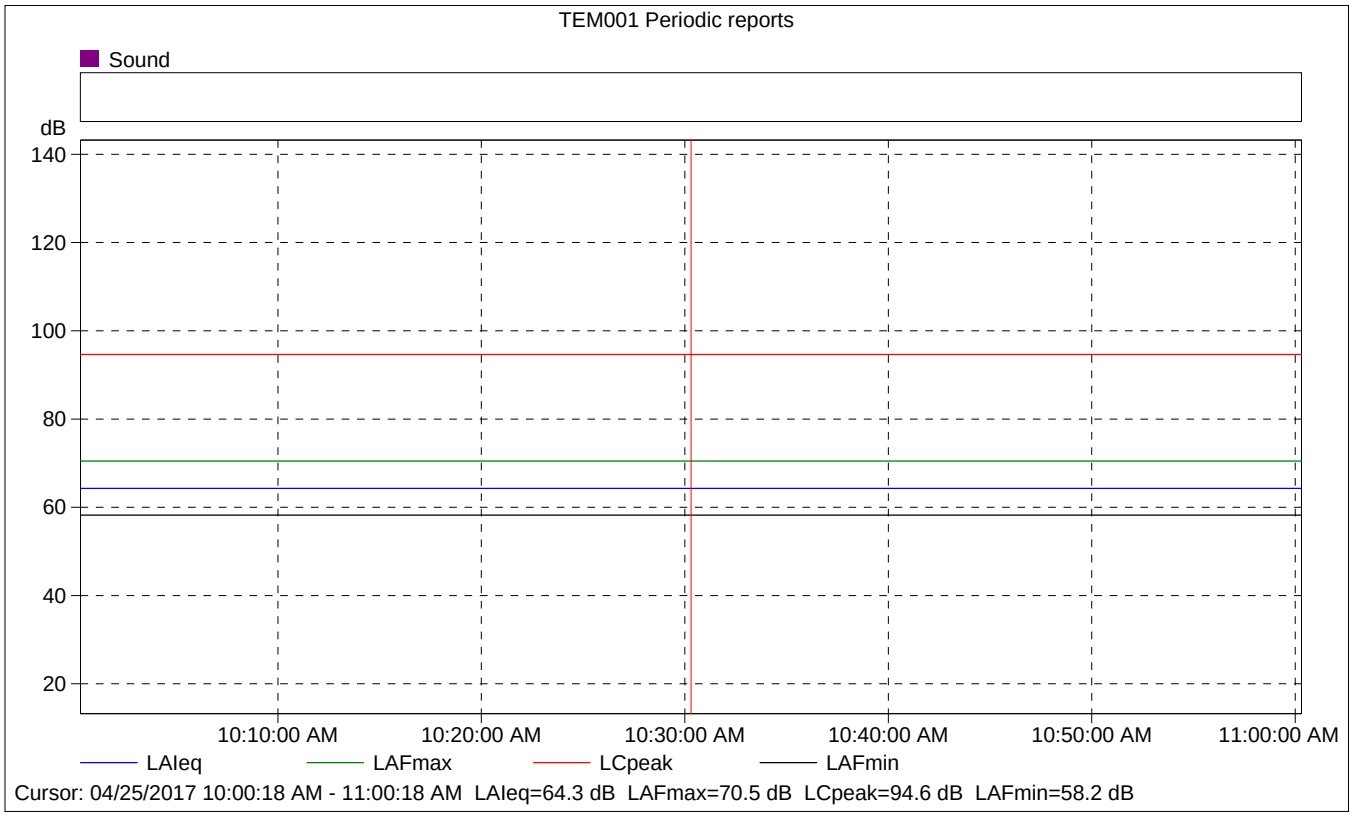

TEM001
%
Based on LAF , 10ms Class width: 0.2 dB 04/25/2017 10:00:18 AM - 10:10:18 AM
100
90
80
70
60
50
40
30
20
10
0
20
30
40
50
60
70
80
90
100
110
120
130
140
dB
L1 = 68.0 dB
L5 = 65.6 dB
L10 = 64.9 dB
L50 = 63.1 dB
L90 = 61.0 dB
L95 = 60.5 dB
L99 = 59.7 dB
Level
Cumulative
Cursor: [78.0 ; 78.2[dB Level: 0.0% Cumulative: 0.0%



TEM001

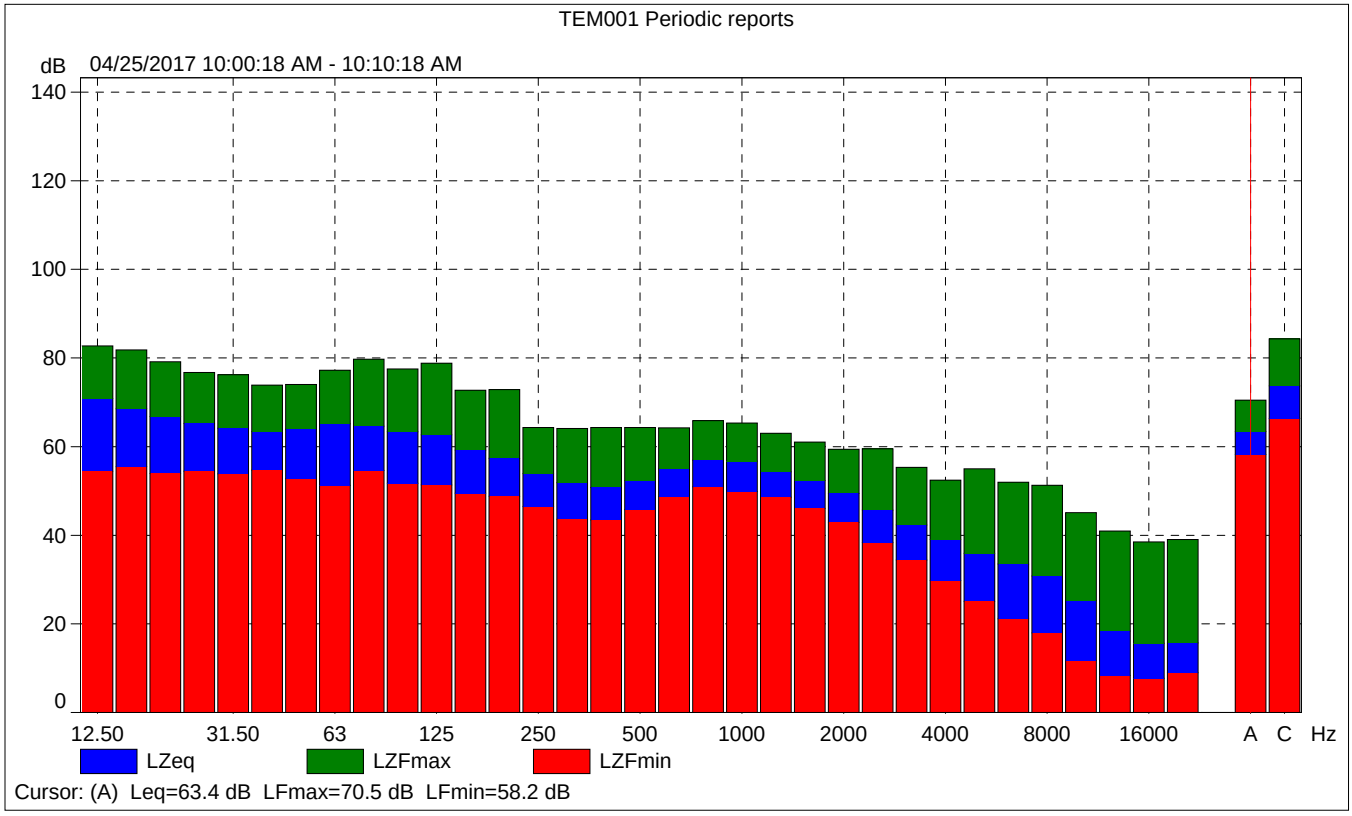
	Start time	Elapsed time	LAIeq [dB]	LAFmax [dB]	LAFmin [dB]
Value			64.2	64.3	62.1
Time	10:05:17 AM	0:00:01			
Date	04/25/2017				

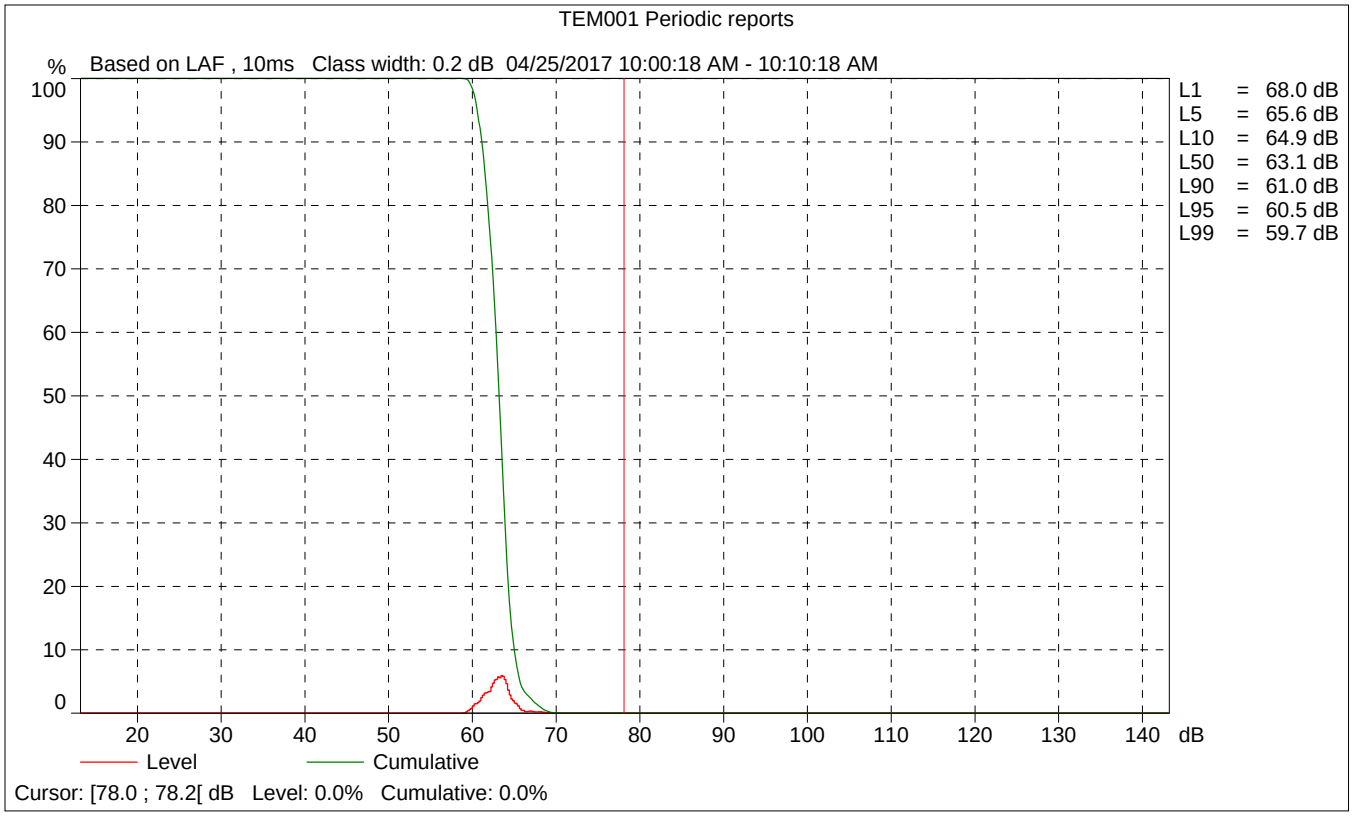

TEM001
dB
04/25/2017 10:05:17 AM - 10:05:18 AM
140
120
100
80
60
40
20
0
12.50
31.50
63
125
250
500
1000
2000
4000
8000
16000
A
C
Hz
LZeq
Cursor: (A) Leq=63.4 dB


TEM001 Periodic reports
Sound
dB
140
120
100
80
60
40
20
10:10:00 AM
10:20:00 AM
10:30:00 AM
10:40:00 AM
10:50:00 AM
11:00:00 AM
LAIeq
LAFmax
LCpeak
LAFmin
Cursor: 04/25/2017 10:00:18 AM - 11:00:18 AM LAIeq=64.3 dB LAFmax=70.5 dB LCpeak=94.6 dB LAFmin=58.2 dB

TEM001 Periodic reports

	Start time	Elapsed time	Overload [%]	LAIeq [dB]	LAFmax [dB]	LAFmin [dB]
Value			0.00	64.3	70.5	58.2
Time	10:00:18 AM	0:10:00				
Date	04/25/2017					




TEM001 Periodic reports
% Based on LAF , 10ms Class width: 0.2 dB 04/25/2017 10:00:18 AM - 10:10:18 AM
100
90
80
70
60
50
40
30
20
10
0
20 30 40 50 60 70 80 90 100 110 120 130 140 dB
L1 = 68.0 dB
L5 = 65.6 dB
L10 = 64.9 dB
L50 = 63.1 dB
L90 = 61.0 dB
L95 = 60.5 dB
L99 = 59.7 dB
Level
Cumulative
Cursor: [78.0 ; 78.2[dB Level: 0.0% Cumulative: 0.0%

Site Number: 2	
Recorded By: Ryan Chiene	
Job Number: 159472	
Date: 4/25/17	
Time: 10:13 a.m.	
Location: North of the project site, south of residence located along Vallejo Avenue.	
Source of Peak Noise: Traffic on Temecula Parkway (SR-79), construction at adjacent property, cars driving on Vallejo Avenue.	

Noise Data			
Leq (dB)	Lmin (dB)	Lmax (dB)	Peak (dB)
60.7	56.1	75.1	104.3

Equipment						
Category	Type	Vendor	Model	Serial No.	Cert. Date	Note
Sound	Sound Level Meter	Brüel & Kjær	2250	3011133	3/27/2017	
	Microphone	Brüel & Kjær	4189	3086765	3/27/2017	
	Preamp	Brüel & Kjær	ZC 0032	25380	3/27/2017	
	Calibrator	Brüel & Kjær	4231	2545667	3/27/2017	

Weather Data			
Est.	Duration: 10 minutes		Sky: Partly Cloudy
	Note: dBA Offset = -0.01		Sensor Height (ft): 5 ft
	Wind Ave Speed (mph / m/s)	Temperature (degrees Fahrenheit)	Barometer Pressure (inches)
	< 5.0	69.0	29.89

Photo of Measurement Location

2250

Instrument:		2250
Application:		BZ7225 Version 4.7.2
Start Time:		04/25/2017 10:13:32
End Time:		04/25/2017 10:23:32
Elapsed Time:		00:10:00
Bandwidth:		1/3-octave
Max Input Level:		141.92

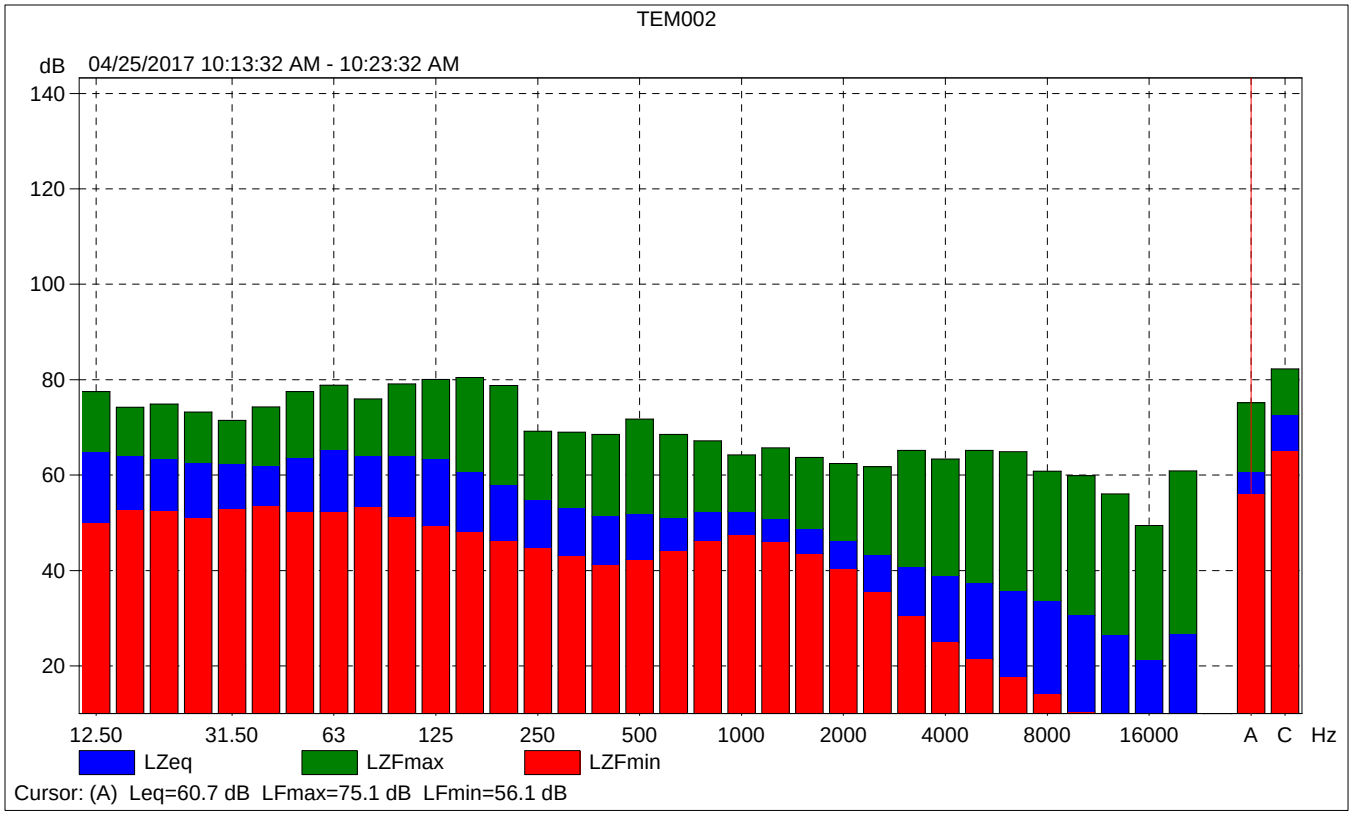
	Time	Frequency
Broadband (excl. Peak):	FSI	AC
Broadband Peak:		C
Spectrum:	FS	Z

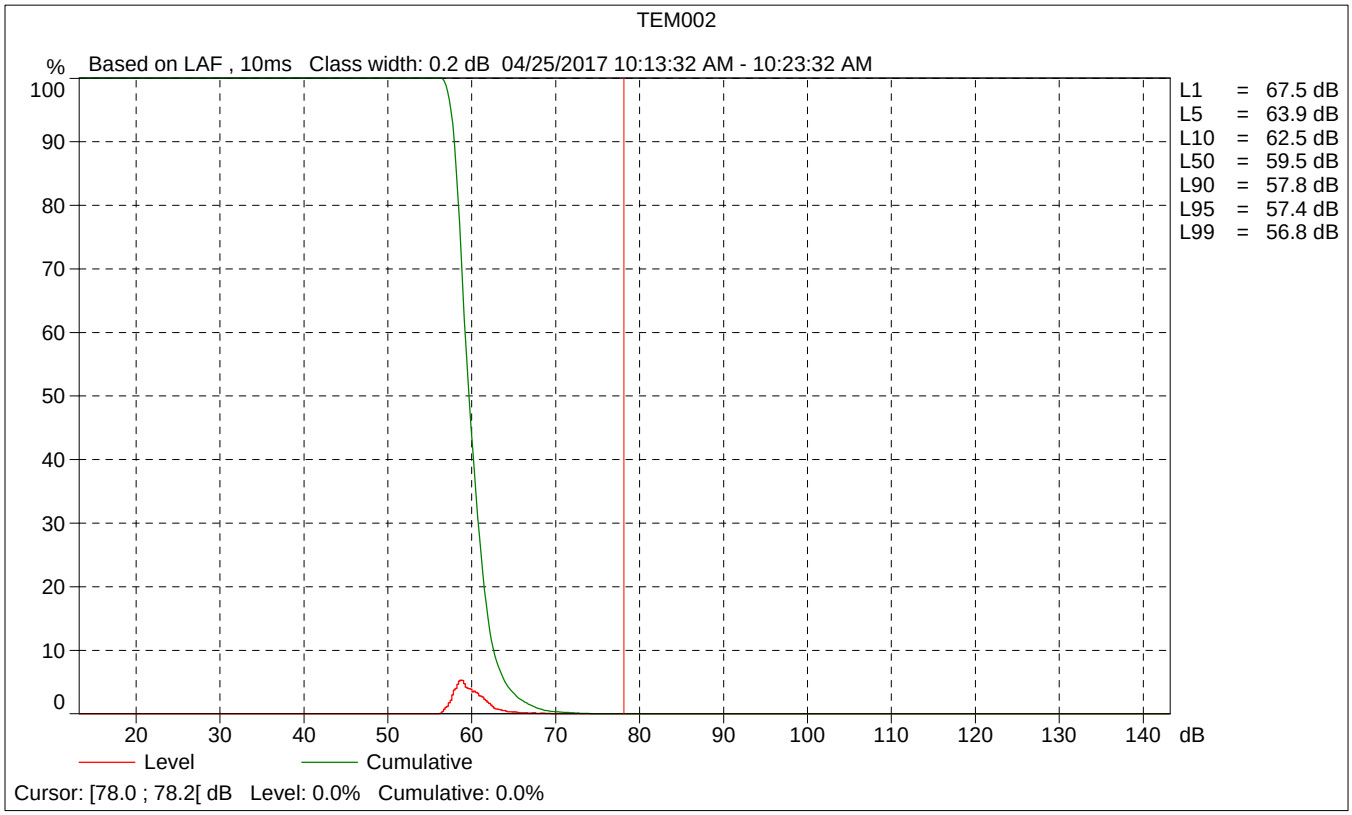
Instrument Serial Number:		3011133
Microphone Serial Number:		3086765
Input:		Top Socket
Windscreen Correction:		None
Sound Field Correction:		Free-field

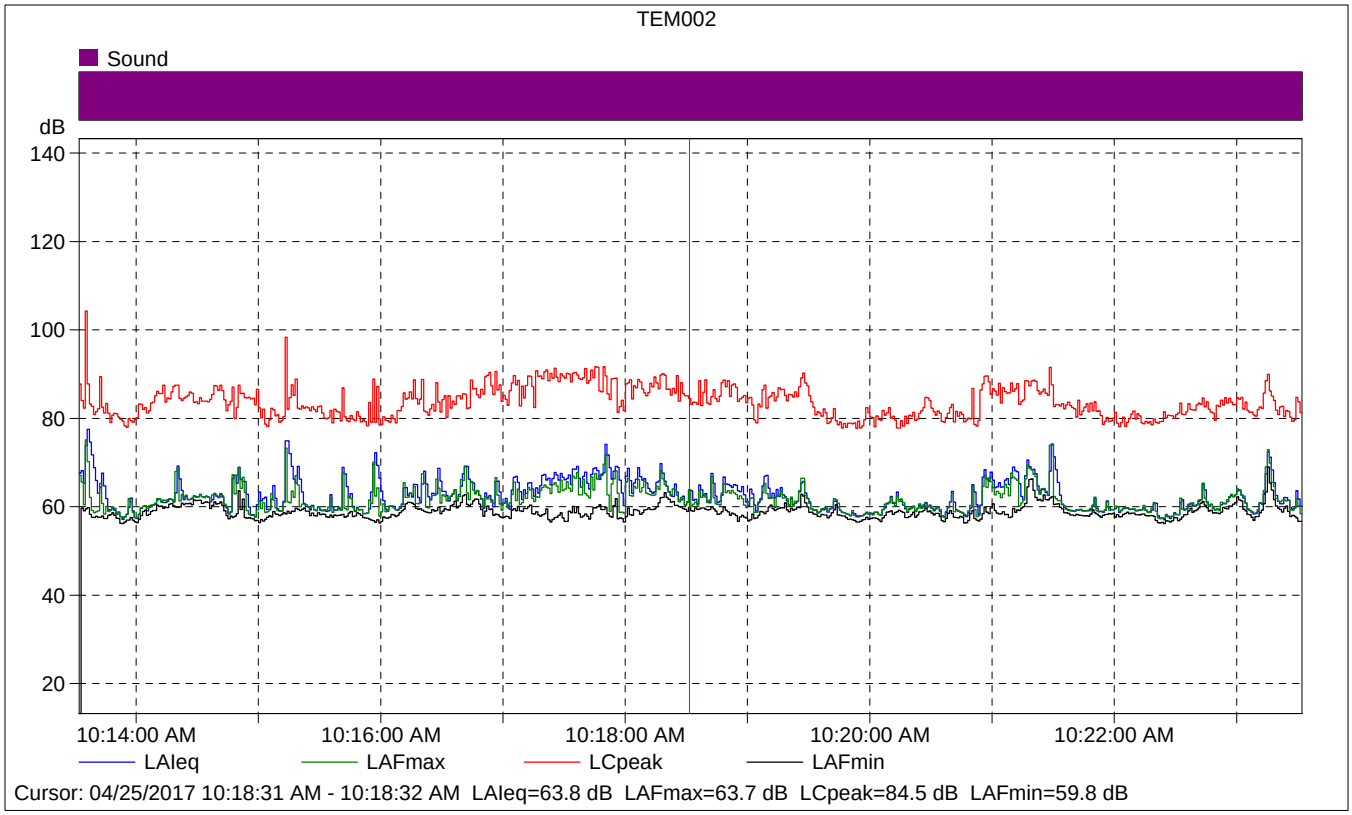
Calibration Time:		04/24/2017 14:43:42
Calibration Type:		External reference
Sensitivity:		44.6215867996216 mV/Pa

TEM002

	Start time	End time	Elapsed time	Overload [%]	LAeq [dB]	LAFmax [dB]	LAFmin [dB]
Value				0.00	60.7	75.1	56.1
Time	10:13:32 AM	10:23:32 AM	0:10:00				
Date	04/25/2017	04/25/2017					

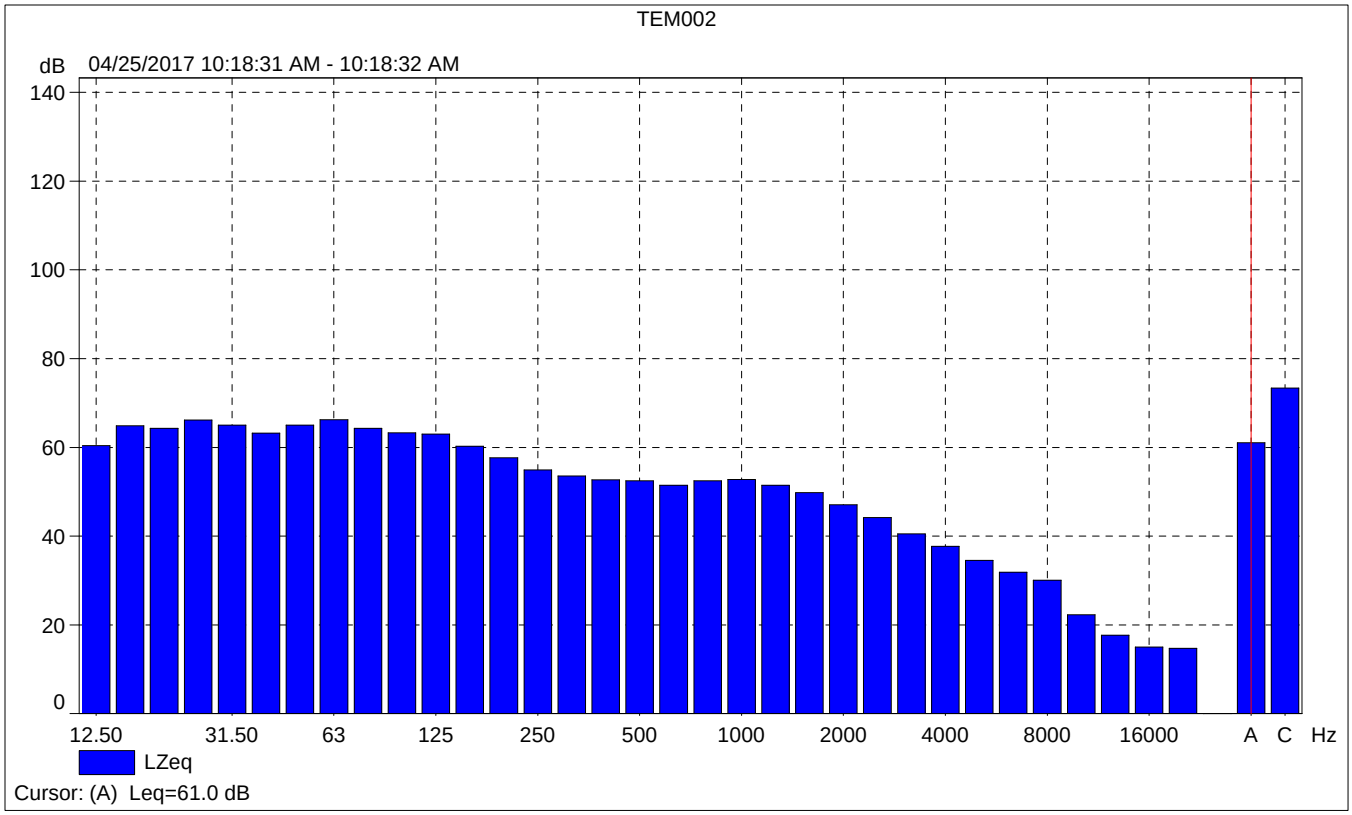

TEM002
dB
04/25/2017 10:13:32 AM - 10:23:32 AM
140
120
100
80
60
40
20
12.50
31.50
63
125
250
500
1000
2000
4000
8000
16000
A
C
Hz
LZeq
LZFmax
LZFmin
Cursor: (A) Leq=60.7 dB LFmax=75.1 dB LFmin=56.1 dB

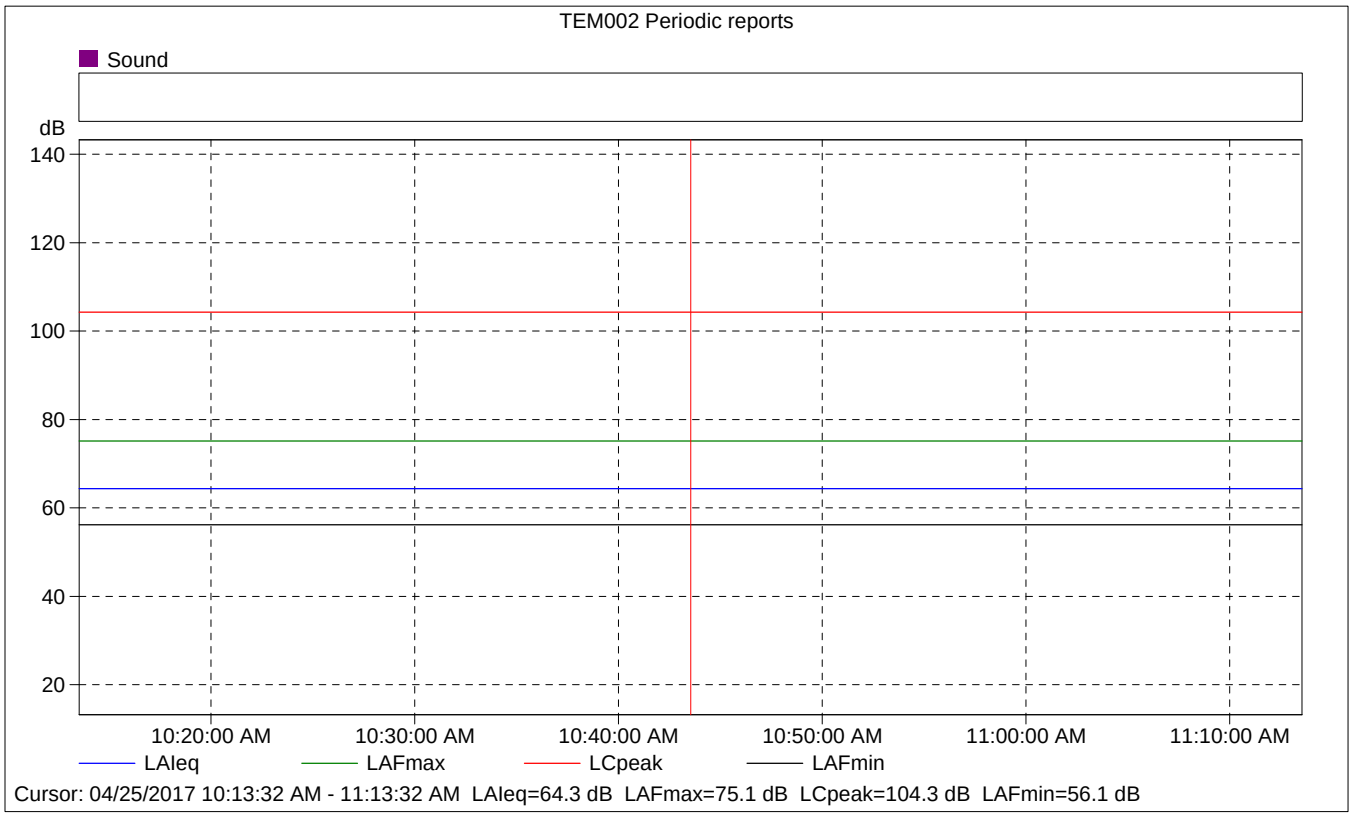

TEM002
%
Based on LAF , 10ms Class width: 0.2 dB 04/25/2017 10:13:32 AM - 10:23:32 AM
100
90
80
70
60
50
40
30
20
10
0
20
30
40
50
60
70
80
90
100
110
120
130
140
dB
L1 = 67.5 dB
L5 = 63.9 dB
L10 = 62.5 dB
L50 = 59.5 dB
L90 = 57.8 dB
L95 = 57.4 dB
L99 = 56.8 dB
Level
Cumulative
Cursor: [78.0 ; 78.2[dB Level: 0.0% Cumulative: 0.0%



TEM002

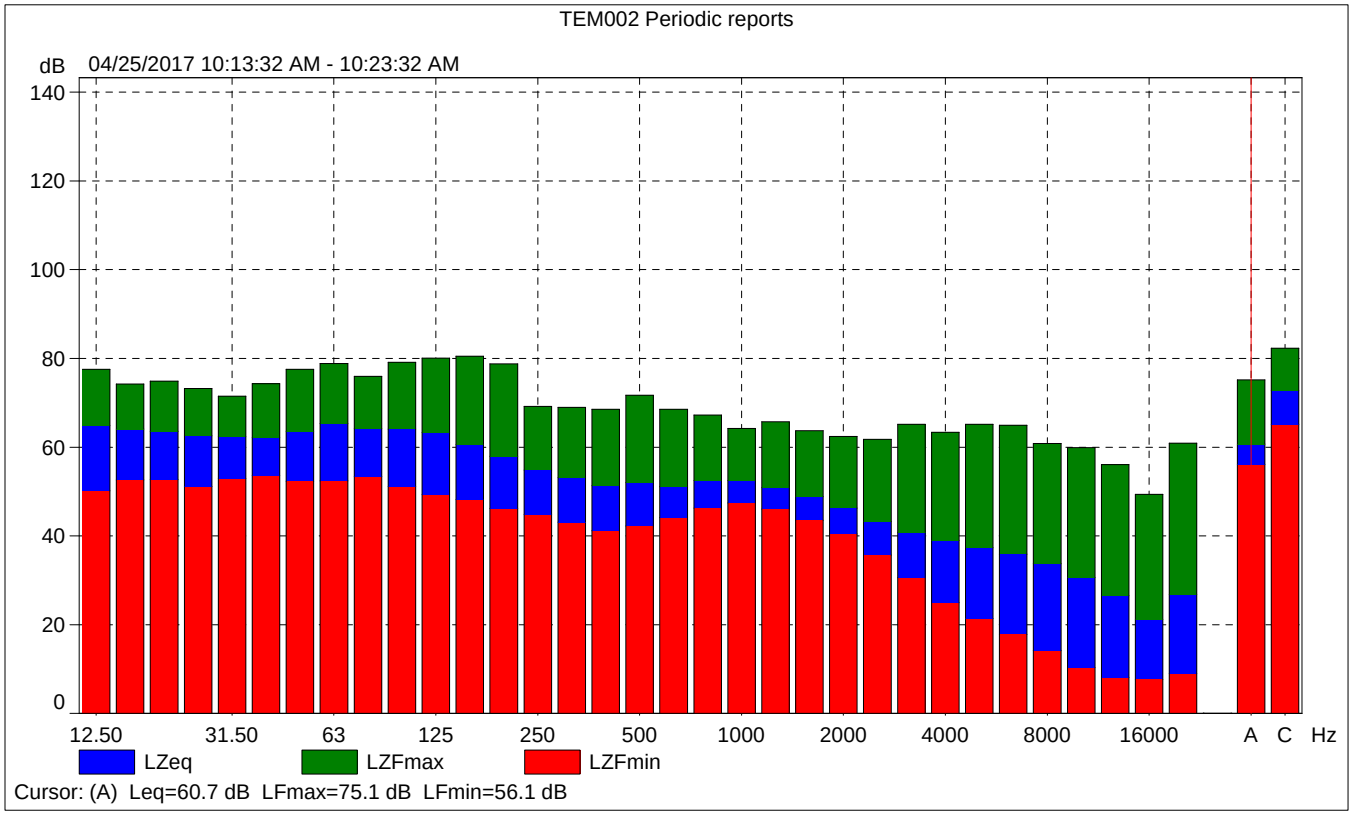
	Start time	Elapsed time	LAIeq [dB]	LAFmax [dB]	LAFmin [dB]
Value			63.8	63.7	59.8
Time	10:18:31 AM	0:00:01			
Date	04/25/2017				

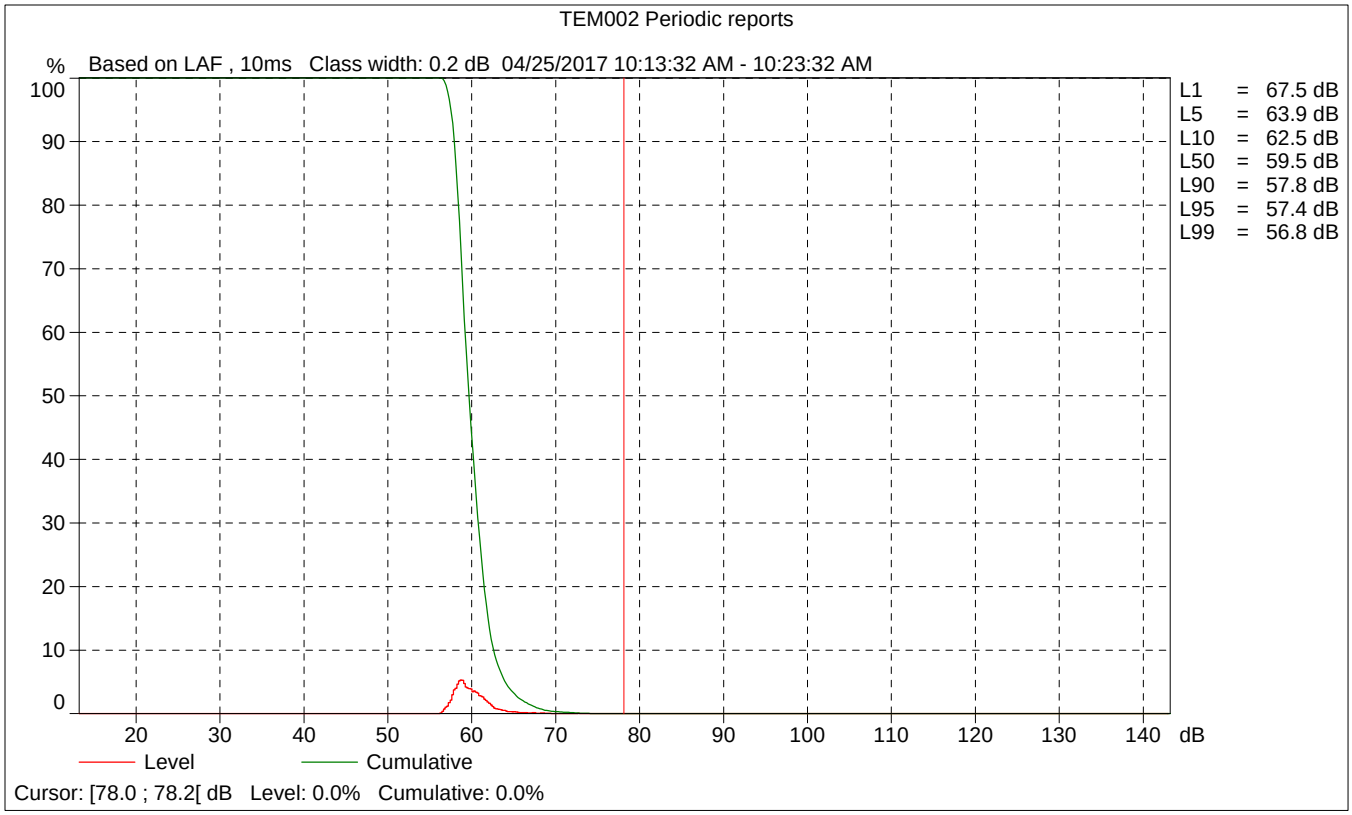

TEM002
dB
04/25/2017 10:18:31 AM - 10:18:32 AM
140
120
100
80
60
40
20
0
12.50
31.50
63
125
250
500
1000
2000
4000
8000
16000
A
C
Hz
LZeq
Cursor: (A) Leq=61.0 dB


TEM002 Periodic reports
Sound
dB
140
120
100
80
60
40
20
10:20:00 AM
10:30:00 AM
10:40:00 AM
10:50:00 AM
11:00:00 AM
11:10:00 AM
LAIeq
LAFmax
LCpeak
LAFmin
Cursor: 04/25/2017 10:13:32 AM - 11:13:32 AM LAIeq=64.3 dB LAFmax=75.1 dB LCpeak=104.3 dB LAFmin=56.1 dB

TEM002 Periodic reports

	Start time	Elapsed time	Overload [%]	LAleq [dB]	LAFmax [dB]	LAFmin [dB]
Value			0.00	64.3	75.1	56.1
Time	10:13:32 AM	0:10:00				
Date	04/25/2017					




TEM002 Periodic reports
% Based on LAF , 10ms Class width: 0.2 dB 04/25/2017 10:13:32 AM - 10:23:32 AM
100
90
80
70
60
50
40
30
20
10
0
20 30 40 50 60 70 80 90 100 110 120 130 140 dB
L1 = 67.5 dB
L5 = 63.9 dB
L10 = 62.5 dB
L50 = 59.5 dB
L90 = 57.8 dB
L95 = 57.4 dB
L99 = 56.8 dB
Level
Cumulative
Cursor: [78.0 ; 78.2[dB Level: 0.0% Cumulative: 0.0%

Site Number: 3			
Recorded By: Ryan Chiene			
Job Number: 159472			
Date: 4/25/17			
Time: 10:27 a.m.			
Location: South of the project site along Temecula Parkway (SR-79).			
Source of Peak Noise: Traffic on Temecula Parkway (SR-79).			
Noise Data			
Leq (dB)	Lmin (dB)	Lmax (dB)	Peak (dB)
73.4	55.9	83.3	105.4

Equipment						
Category	Type	Vendor	Model	Serial No.	Cert. Date	Note
Sound	Sound Level Meter	Brüel & Kjær	2250	3011133	3/27/2017	
	Microphone	Brüel & Kjær	4189	3086765	3/27/2017	
	Preamp	Brüel & Kjær	ZC 0032	25380	3/27/2017	
	Calibrator	Brüel & Kjær	4231	2545667	3/27/2017	

Weather Data			
Est.	Duration: 10 minutes		Sky: Partly Cloudy
	Note: dBA Offset = -0.01		Sensor Height (ft): 5 ft
	Wind Ave Speed (mph / m/s)	Temperature (degrees Fahrenheit)	Barometer Pressure (inches)
	< 5.0	69.0	29.89

Photo of Measurement Location

2250

Instrument:		2250
Application:		BZ7225 Version 4.7.2
Start Time:		04/25/2017 10:27:34
End Time:		04/25/2017 10:37:34
Elapsed Time:		00:10:00
Bandwidth:		1/3-octave
Max Input Level:		141.92

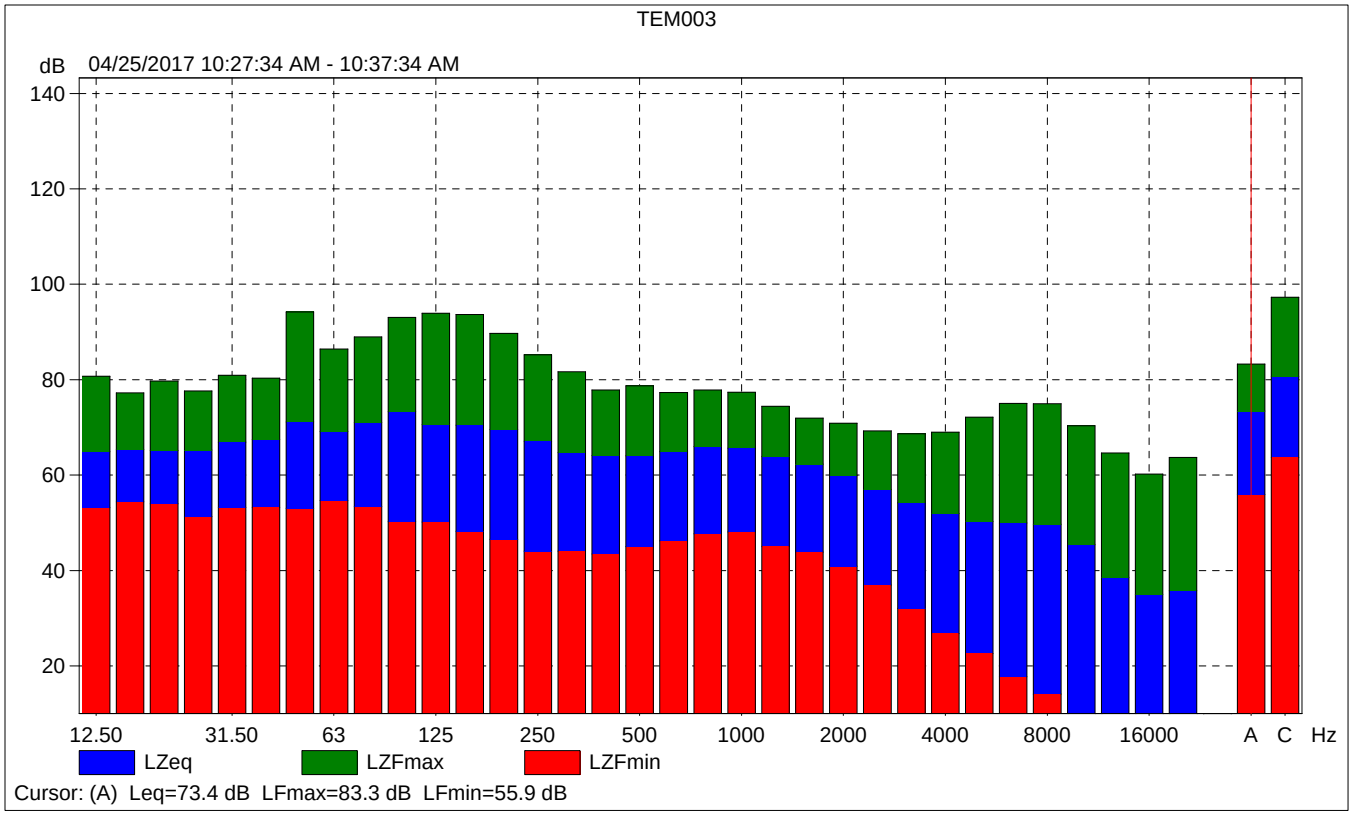
	Time	Frequency
Broadband (excl. Peak):	FSI	AC
Broadband Peak:		C
Spectrum:	FS	Z

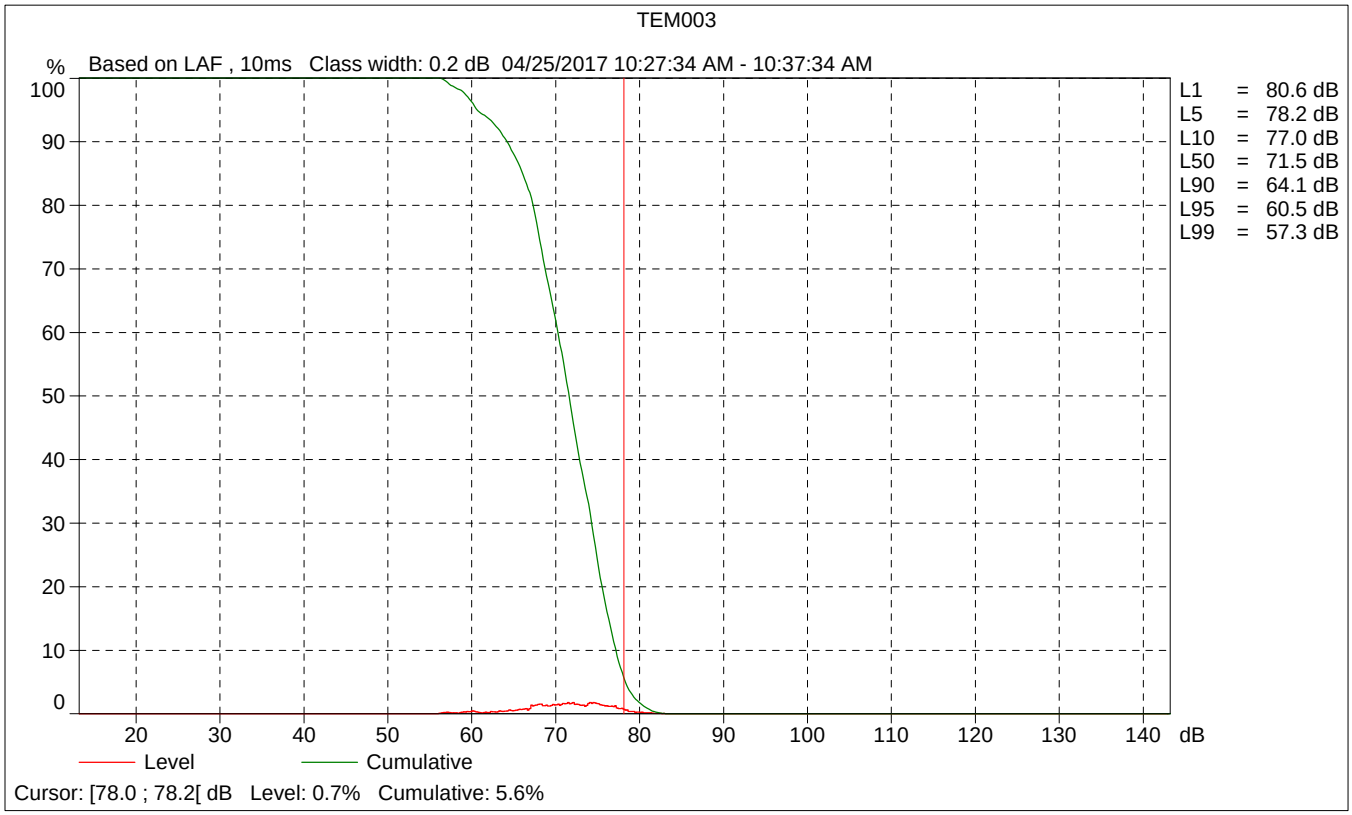
Instrument Serial Number:		3011133
Microphone Serial Number:		3086765
Input:		Top Socket
Windscreen Correction:		None
Sound Field Correction:		Free-field

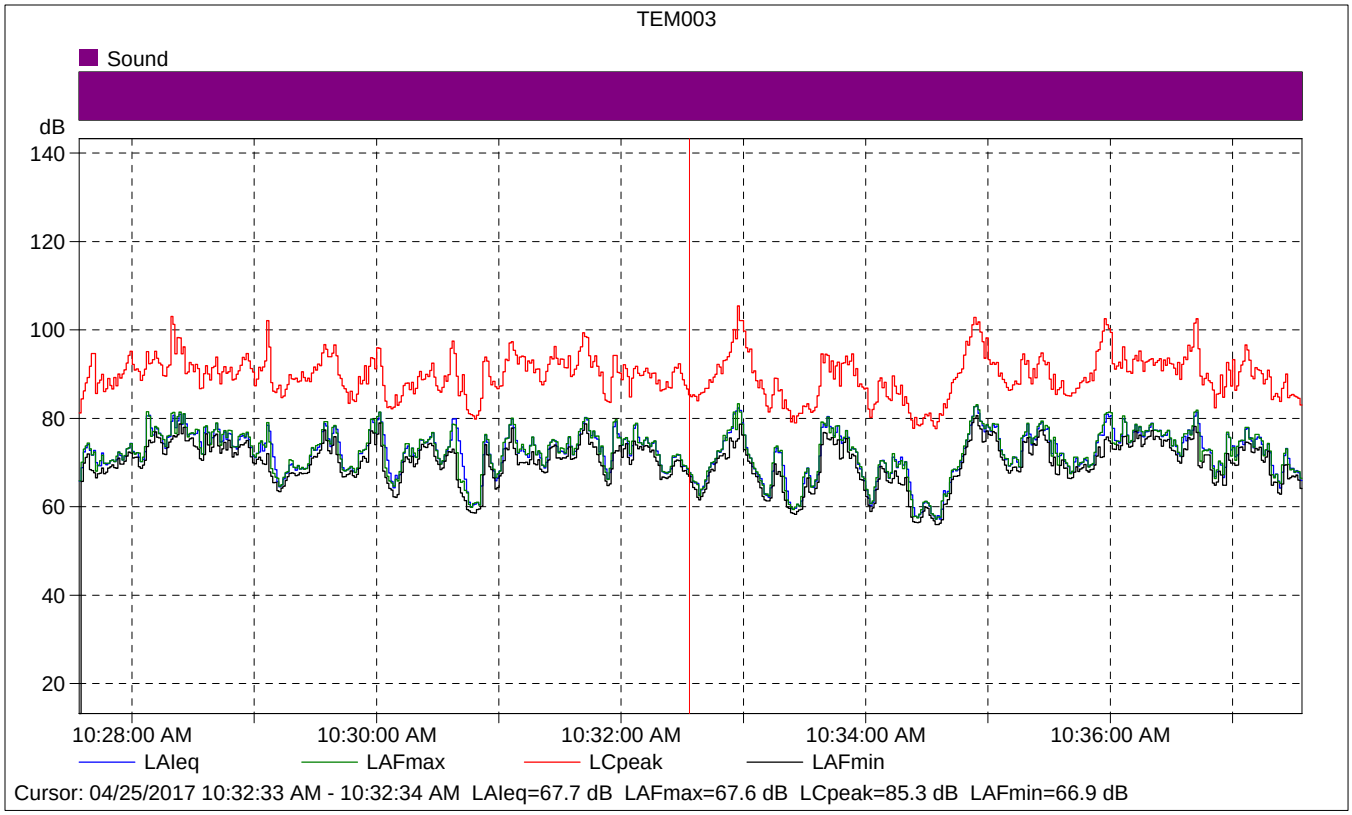
Calibration Time:		04/24/2017 14:43:42
Calibration Type:		External reference
Sensitivity:		44.6215867996216 mV/Pa

TEM003

	Start time	End time	Elapsed time	Overload [%]	LAeq [dB]	LAFmax [dB]	LAFmin [dB]
Value				0.00	73.4	83.3	55.9
Time	10:27:34 AM	10:37:34 AM	0:10:00				
Date	04/25/2017	04/25/2017					

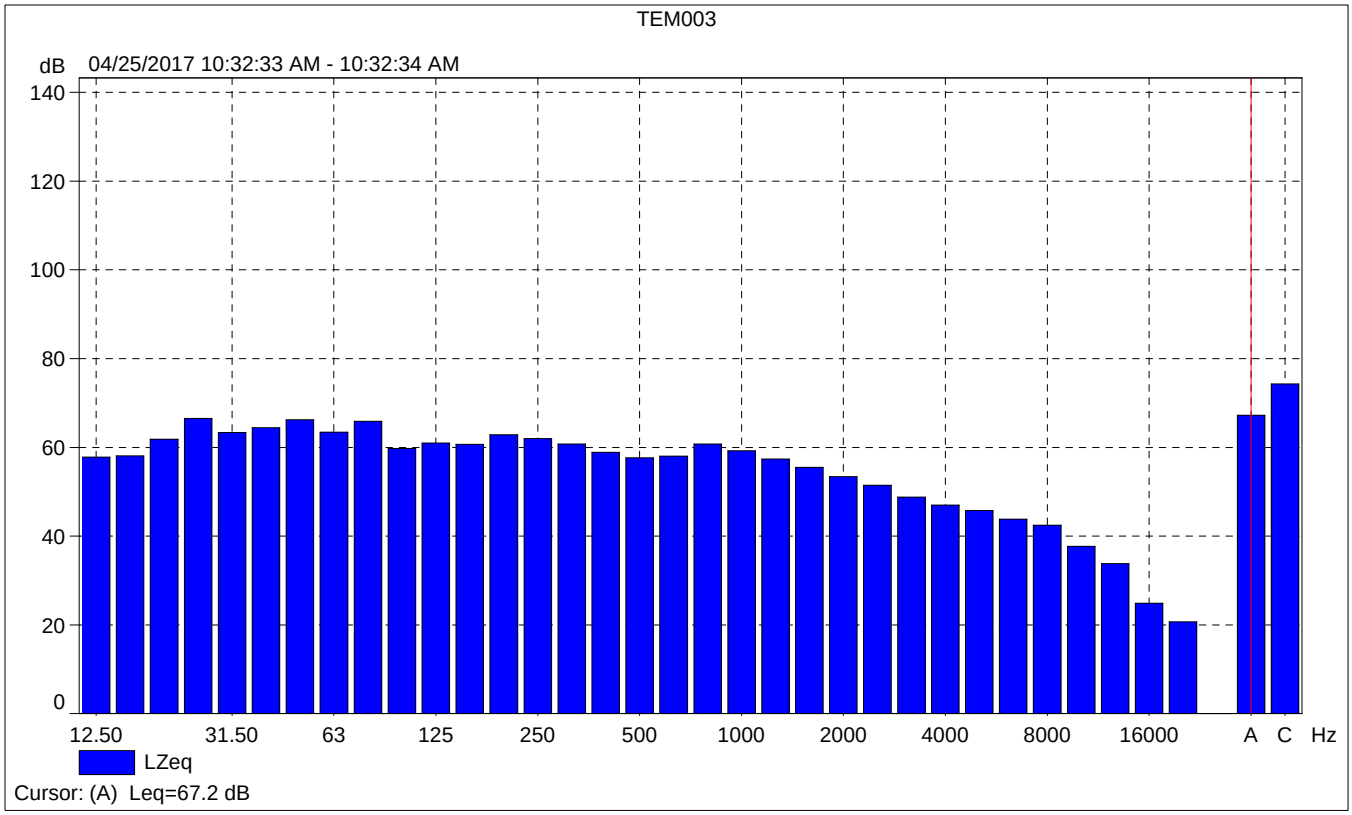

TEM003
dB
04/25/2017 10:27:34 AM - 10:37:34 AM
140
120
100
80
60
40
20
12.50
31.50
63
125
250
500
1000
2000
4000
8000
16000
A
C
Hz
LZeq
LZFmax
LZFmin
Cursor: (A) Leq=73.4 dB LFmax=83.3 dB LFmin=55.9 dB

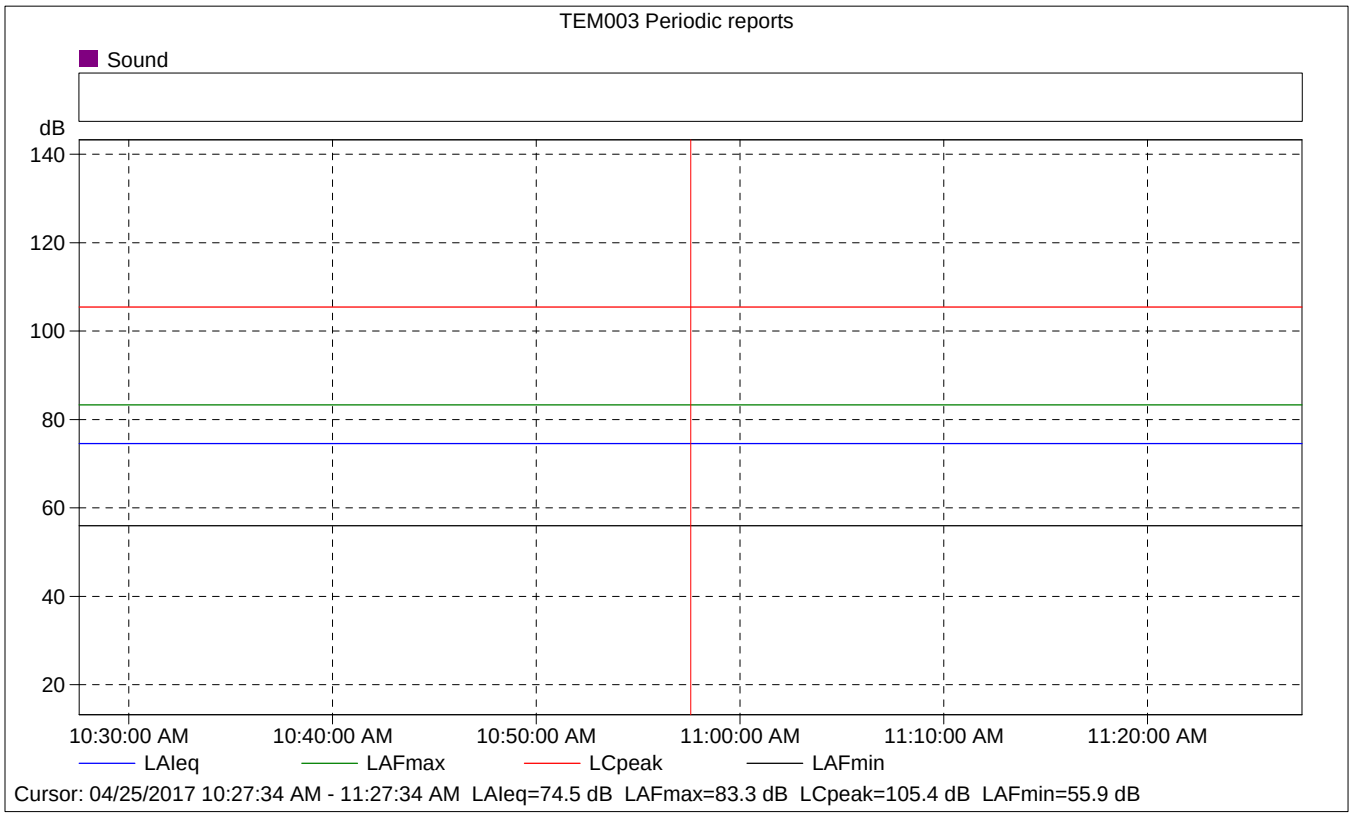

TEM003
%
Based on LAF , 10ms Class width: 0.2 dB 04/25/2017 10:27:34 AM - 10:37:34 AM
100
90
80
70
60
50
40
30
20
10
0
20
30
40
50
60
70
80
90
100
110
120
130
140
dB
L1 = 80.6 dB
L5 = 78.2 dB
L10 = 77.0 dB
L50 = 71.5 dB
L90 = 64.1 dB
L95 = 60.5 dB
L99 = 57.3 dB
Level
Cumulative
Cursor: [78.0 ; 78.2[dB Level: 0.7% Cumulative: 5.6%



TEM003

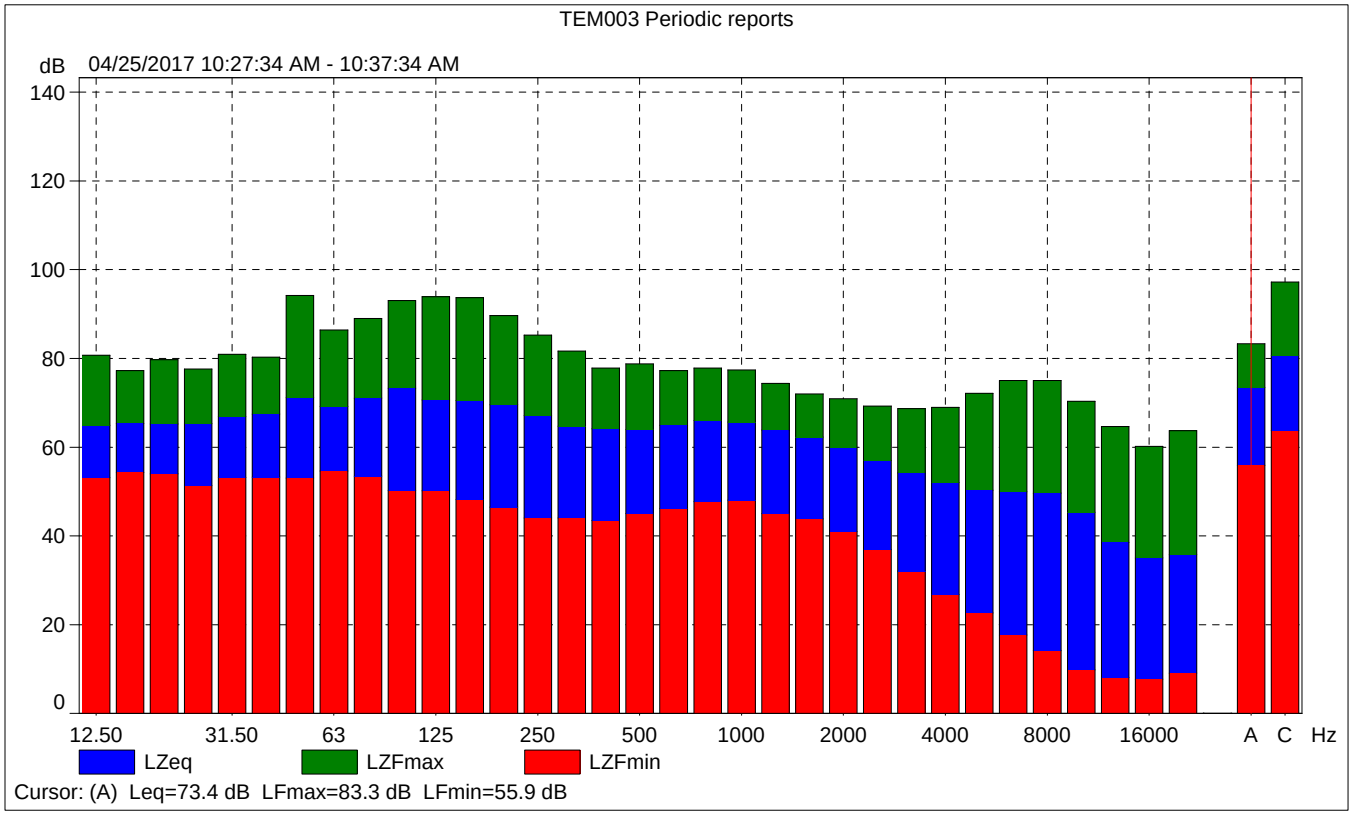
	Start time	Elapsed time	LAIeq [dB]	LAFmax [dB]	LAFmin [dB]
Value			67.7	67.6	66.9
Time	10:32:33 AM	0:00:01			
Date	04/25/2017				

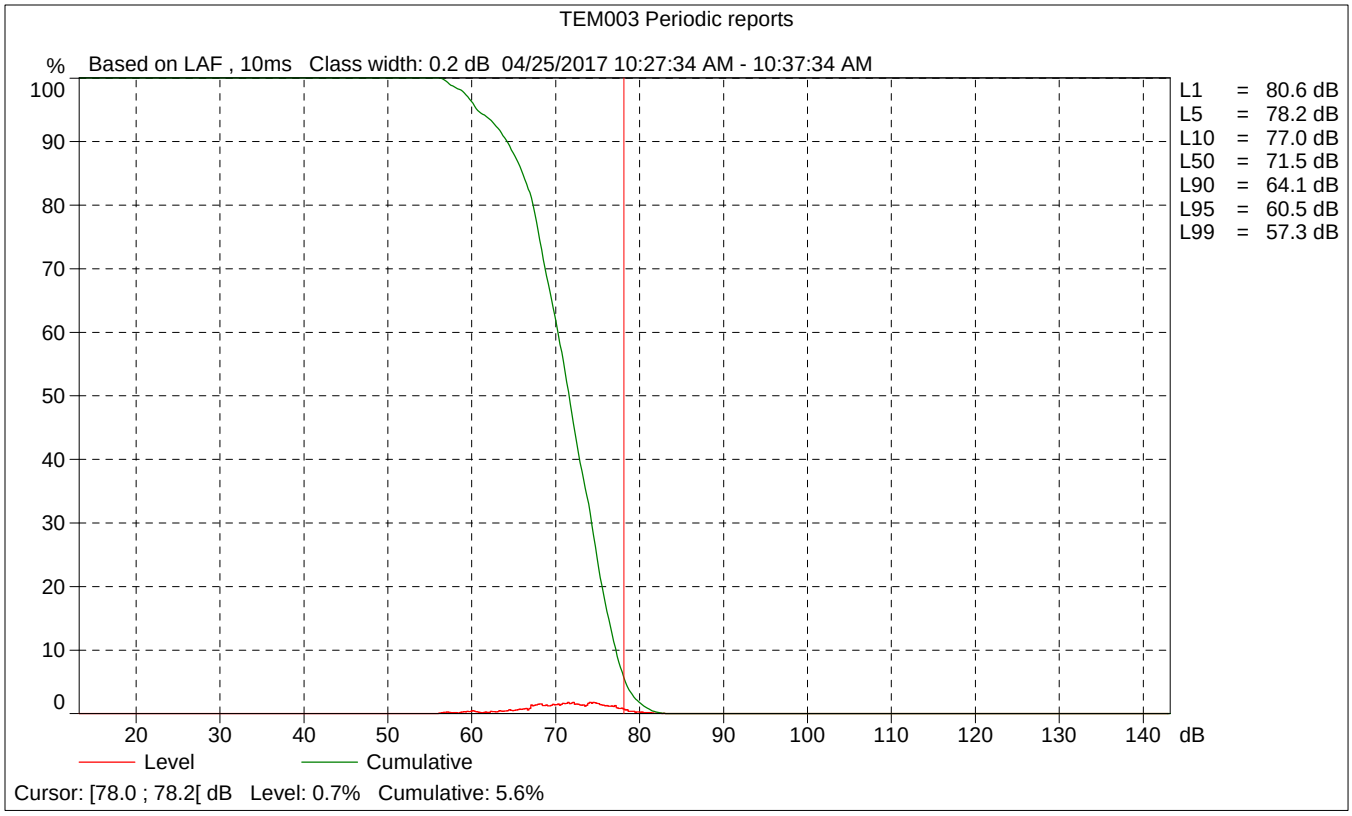

TEM003
dB
04/25/2017 10:32:33 AM - 10:32:34 AM
140
120
100
80
60
40
20
0
12.50
31.50
63
125
250
500
1000
2000
4000
8000
16000
A
C
Hz
LZeq
Cursor: (A) Leq=67.2 dB


TEM003 Periodic reports
Sound
dB
140
120
100
80
60
40
20
10:30:00 AM
10:40:00 AM
10:50:00 AM
11:00:00 AM
11:10:00 AM
11:20:00 AM
LAIeq
LAFmax
LCpeak
LAFmin
Cursor: 04/25/2017 10:27:34 AM - 11:27:34 AM LAIeq=74.5 dB LAFmax=83.3 dB LCpeak=105.4 dB LAFmin=55.9 dB

TEM003 Periodic reports

	Start time	Elapsed time	Overload [%]	LAleq [dB]	LAFmax [dB]	LAFmin [dB]
Value			0.00	74.5	83.3	55.9
Time	10:27:34 AM	0:10:00				
Date	04/25/2017					




TEM003 Periodic reports
% Based on LAF , 10ms Class width: 0.2 dB 04/25/2017 10:27:34 AM - 10:37:34 AM
100
90
80
70
60
50
40
30
20
10
0
20 30 40 50 60 70 80 90 100 110 120 130 140 dB
L1 = 80.6 dB
L5 = 78.2 dB
L10 = 77.0 dB
L50 = 71.5 dB
L90 = 64.1 dB
L95 = 60.5 dB
L99 = 57.3 dB
Level
Cumulative
Cursor: [78.0 ; 78.2[dB Level: 0.7% Cumulative: 5.6%

Federal Highway Administration RD-77-108
Traffic Noise Prediction Model (CALVENO)

Project Name:	Temecula Park and Ride	Scenario:	Existing
Analyst:	Ryan Chiene	Job #:	159472
Roadway:	Temecula Parkway		
Road Segment:	Bedford Court to La Paz		

PROJECT DATA

Centerline Dist to Barrier	**0**
Barrier (0=wall, 1= berm):	**0**
Receiver Barrier Dist:	**0**
Centerline Dist. To Observer:	**100**
Barrier Near Lane CL Dist:	**0**
Barrier Far lane CL Dist:	**0**
Pad Elevation:	**0.5**
Road Elevation:	**0**
Observer Height (above grade):	**0**
Barrier Height:	**0**

Rt View: **90** Lft View: **-90**

NOISE SOURCE ELEVATIONS (Feet)

Autos:	**0**
Medium Trucks:	**2.3**
Heavy Trucks:	**8**

SITE DATA

Road Grade:	0
Average Daily Traffic:	64800
Peak Hour Traffic:	**6480**
Vehicle Speed:	50
Centerline Separation:	54

NOISE INPUTS

Site conditions **HARD SITE**

FLEET MIX

Type	Day	Evening	Night	Daily
Auto	0.775	0.129	0.096	0.9742
Med. Truck	0.848	0.049	0.103	0.0184
Heavy Truck	0.865	0.027	0.108	0.0074

UNMITIGATED NOISE LEVELS (No topographic or barrier attenuation)

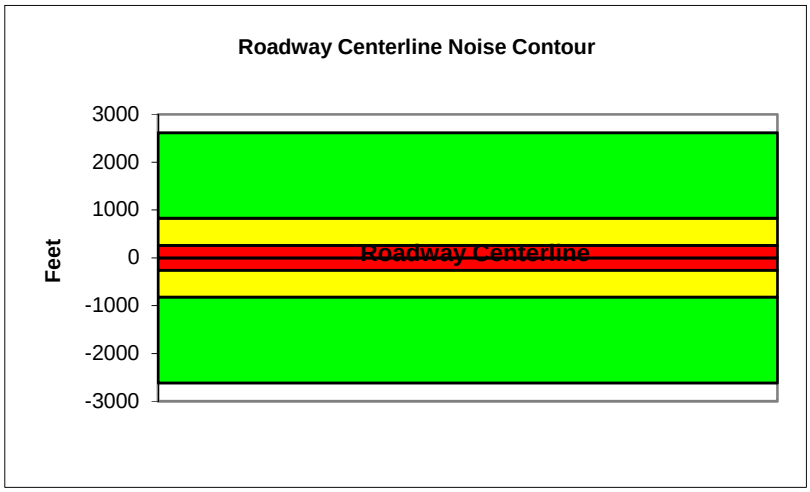
Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	62.1	70.9	69.1	63.0	71.7	72.3
Medium Trucks:	69.8	61.7	55.3	53.8	62.3	62.5
Heavy Trucks:	74.0	62.1	53.0	54.3	63.6	63.8
Vehicle Noise:	**76.3**	**72.0**	**69.4**	**64.1**	**72.7**	**73.2**

MITIGATED NOISE LEVELS (With topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:						
Medium Trucks:						
Heavy Trucks:						
Vehicle Noise:						

CENTERLINE NOISE CONTOUR

Unmitigated	
60 dBA	2617
65 dBA	828
70 dBA	262
Mitigated	
60 dBA	
65 dBA	
70 dBA	



Federal Highway Administration RD-77-108
Traffic Noise Prediction Model (CALVENO)

Project Name:	Temecula Park and Ride	Scenario:	Existing
Analyst:	Ryan Chiene	Job #:	159472
Roadway:	Temecula Parkway		
Road Segment:	La Paz to Pechanga Parkway		

PROJECT DATA

Centerline Dist to Barrier	**0**
Barrier (0=wall, 1= berm):	**0**
Receiver Barrier Dist:	**0**
Centerline Dist. To Observer:	**100**
Barrier Near Lane CL Dist:	**0**
Barrier Far lane CL Dist:	**0**
Pad Elevation:	**0.5**
Road Elevation:	**0**
Observer Height (above grade):	**0**
Barrier Height:	**0**
Rt View: **90**	Lft View: **-90**

NOISE SOURCE ELEVATIONS (Feet)

Autos:	**0**
Medium Trucks:	**2.3**
Heavy Trucks:	**8**

SITE DATA

Road Grade:	0
Average Daily Traffic:	68300
Peak Hour Traffic:	**6830**
Vehicle Speed:	50
Centerline Separation:	54

NOISE INPUTS

Site conditions **HARD SITE**

FLEET MIX

Type	Day	Evening	Night	Daily
Auto	0.775	0.129	0.096	0.9742
Med. Truck	0.848	0.049	0.103	0.0184
Heavy Truck	0.865	0.027	0.108	0.0074

UNMITIGATED NOISE LEVELS (No topographic or barrier attenuation)

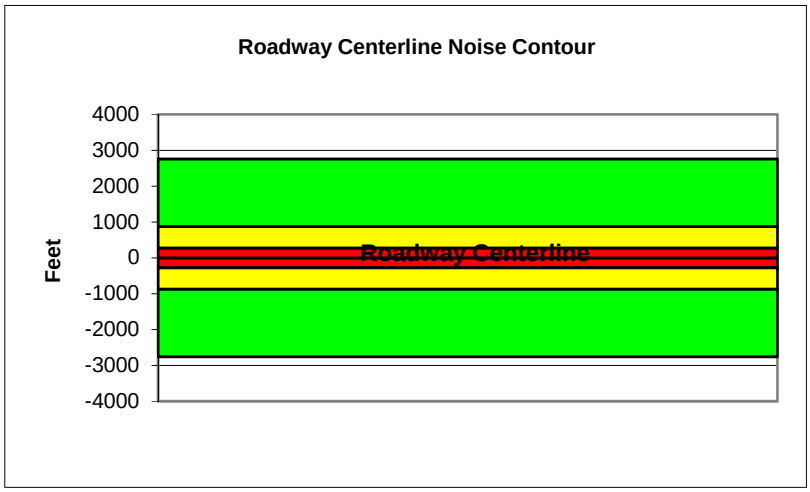
Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	62.4	71.1	69.3	63.3	71.9	72.5
Medium Trucks:	70.0	62.0	55.6	54.0	62.5	62.7
Heavy Trucks:	74.3	62.3	53.3	54.5	63.9	64.0
Vehicle Noise:	**76.6**	**72.2**	**69.7**	**64.4**	**73.0**	**73.5**

MITIGATED NOISE LEVELS (With topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:						
Medium Trucks:						
Heavy Trucks:						
Vehicle Noise:						

CENTERLINE NOISE CONTOUR

Unmitigated	
60 dBA	2759
65 dBA	873
70 dBA	276
Mitigated	
60 dBA	
65 dBA	
70 dBA	



Federal Highway Administration RD-77-108
Traffic Noise Prediction Model (CALVENO)

Project Name:	Temecula Park and Ride	Scenario:	Existing
Analyst:	Ryan Chiene	Job #:	159472
Roadway:	La Paz		
Road Segment:	Temecula Parkway to Vallejo Avenue		

PROJECT DATA

Centerline Dist to Barrier	**0**
Barrier (0=wall, 1= berm):	**0**
Receiver Barrier Dist:	**0**
Centerline Dist. To Observer:	**100**
Barrier Near Lane CL Dist:	**0**
Barrier Far lane CL Dist:	**0**
Pad Elevation:	**0.5**
Road Elevation:	**0**
Observer Height (above grade):	**0**
Barrier Height:	**0**
Rt View: **90**	Lft View: **-90**

NOISE SOURCE ELEVATIONS (Feet)

Autos:	**0**
Medium Trucks:	**2.3**
Heavy Trucks:	**8**

SITE DATA

Road Grade:	0
Average Daily Traffic:	13300
Peak Hour Traffic:	**1330**
Vehicle Speed:	25
Centerline Separation:	34

NOISE INPUTS

Site conditions **HARD SITE**

FLEET MIX

Type	Day	Evening	Night	Daily
Auto	0.775	0.129	0.096	0.9742
Med. Truck	0.848	0.049	0.103	0.0184
Heavy Truck	0.865	0.027	0.108	0.0074

UNMITIGATED NOISE LEVELS (No topographic or barrier attenuation)

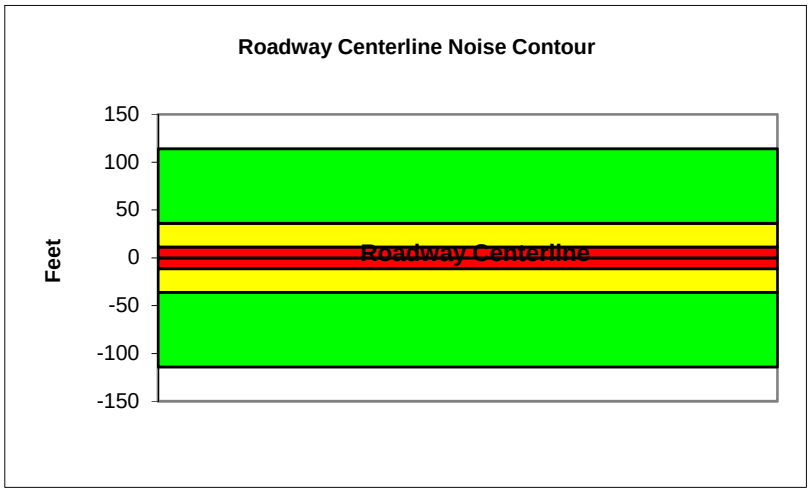
Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	46.9	55.7	53.9	47.8	56.4	57.0
Medium Trucks:	58.5	50.5	44.1	42.5	51.0	51.2
Heavy Trucks:	64.7	52.7	43.7	44.9	55.3	55.4
Vehicle Noise:	**67.3**	**58.9**	**54.9**	**51.0**	**59.6**	**59.9**

MITIGATED NOISE LEVELS (With topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:						
Medium Trucks:						
Heavy Trucks:						
Vehicle Noise:						

CENTERLINE NOISE CONTOUR

Unmitigated	
60 dBA	114
65 dBA	36
70 dBA	11
Mitigated	
60 dBA	
65 dBA	
70 dBA	



Federal Highway Administration RD-77-108
Traffic Noise Prediction Model (CALVENO)

Project Name:	Temecula Park and Ride	Scenario:	Existing
Analyst:	Ryan Chiene	Job #:	159472
Roadway:	Vallejo Avenue		
Road Segment:	East of La Paz		

PROJECT DATA

Centerline Dist to Barrier	**0**
Barrier (0=wall, 1= berm):	**0**
Receiver Barrier Dist:	**0**
Centerline Dist. To Observer:	**100**
Barrier Near Lane CL Dist:	**0**
Barrier Far lane CL Dist:	**0**
Pad Elevation:	**0.5**
Road Elevation:	**0**
Observer Height (above grade):	**0**
Barrier Height:	**0**

Rt View: **90** Lft View: **-90**

NOISE SOURCE ELEVATIONS (Feet)

Autos:	**0**
Medium Trucks:	**2.3**
Heavy Trucks:	**8**

SITE DATA

Road Grade:	0
Average Daily Traffic:	600
Peak Hour Traffic:	**60**
Vehicle Speed:	25
Centerline Separation:	24

NOISE INPUTS

Site conditions **HARD SITE**

FLEET MIX

Type	Day	Evening	Night	Daily
Auto	0.775	0.129	0.096	0.9742
Med. Truck	0.848	0.049	0.103	0.0184
Heavy Truck	0.865	0.027	0.108	0.0074

UNMITIGATED NOISE LEVELS (No topographic or barrier attenuation)

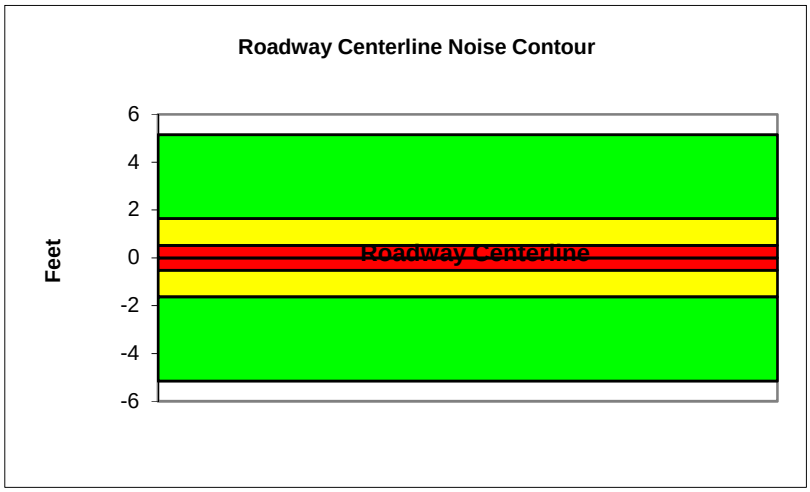
Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	33.6	42.4	40.6	34.5	43.1	43.8
Medium Trucks:	45.2	37.2	30.8	29.2	37.7	37.9
Heavy Trucks:	51.4	39.5	30.4	31.6	42.0	42.1
Vehicle Noise:	**54.1**	**45.6**	**41.6**	**37.7**	**46.3**	**46.7**

MITIGATED NOISE LEVELS (With topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:						
Medium Trucks:						
Heavy Trucks:						
Vehicle Noise:						

CENTERLINE NOISE CONTOUR

Unmitigated	
60 dBA	5
65 dBA	2
70 dBA	1
Mitigated	
60 dBA	
65 dBA	
70 dBA	



Federal Highway Administration RD-77-108
Traffic Noise Prediction Model (CALVENO)

Project Name:	Temecula Park and Ride	Scenario:	Future
Analyst:	Ryan Chiene	Job #:	159472
Roadway:	Temecula Parkway		
Road Segment:	Bedford Court to La Paz		

PROJECT DATA

Centerline Dist to Barrier	**0**
Barrier (0=wall, 1= berm):	**0**
Receiver Barrier Dist:	**0**
Centerline Dist. To Observer:	**100**
Barrier Near Lane CL Dist:	**0**
Barrier Far lane CL Dist:	**0**
Pad Elevation:	**0.5**
Road Elevation:	**0**
Observer Height (above grade):	**0**
Barrier Height:	**0**
Rt View: **90**	Lft View: **-90**

NOISE SOURCE ELEVATIONS (Feet)

Autos:	**0**
Medium Trucks:	**2.3**
Heavy Trucks:	**8**

SITE DATA

Road Grade:	0
Average Daily Traffic:	79118
Peak Hour Traffic:	**7911.8**
Vehicle Speed:	50
Centerline Separation:	54

NOISE INPUTS

Site conditions **HARD SITE**

FLEET MIX

Type	Day	Evening	Night	Daily
Auto	0.775	0.129	0.096	0.9742
Med. Truck	0.848	0.049	0.103	0.0184
Heavy Truck	0.865	0.027	0.108	0.0074

UNMITIGATED NOISE LEVELS (No topographic or barrier attenuation)

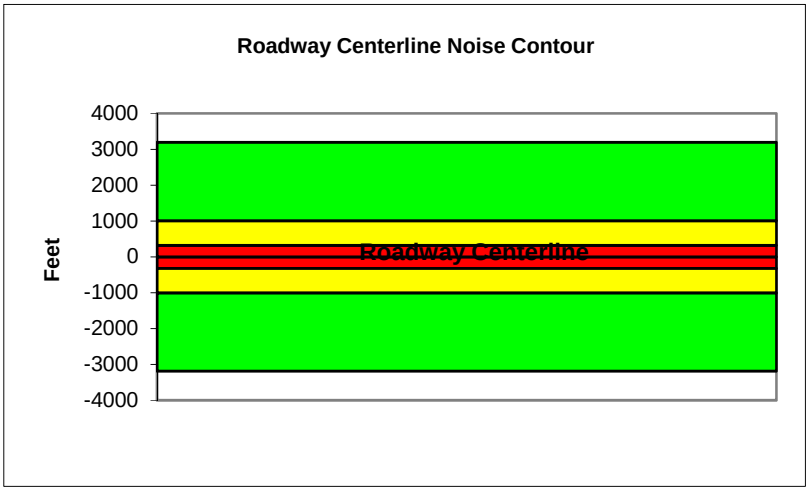
Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	63.0	71.8	70.0	63.9	72.5	73.2
Medium Trucks:	70.7	62.6	56.2	54.6	63.1	63.4
Heavy Trucks:	74.9	63.0	53.9	55.1	64.5	64.6
Vehicle Noise:	**77.2**	**72.9**	**70.3**	**65.0**	**73.6**	**74.1**

MITIGATED NOISE LEVELS (With topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:						
Medium Trucks:						
Heavy Trucks:						
Vehicle Noise:						

CENTERLINE NOISE CONTOUR

Unmitigated	
60 dBA	3190
65 dBA	1009
70 dBA	319
Mitigated	
60 dBA	
65 dBA	
70 dBA	



Federal Highway Administration RD-77-108
Traffic Noise Prediction Model (CALVENO)

Project Name:	Temecula Park and Ride	Scenario:	Future
Analyst:	Ryan Chiene	Job #:	159472
Roadway:	Temecula Parkway		
Road Segment:	La Paz to Pechanga Parkway		

PROJECT DATA

Centerline Dist to Barrier	**0**
Barrier (0=wall, 1= berm):	**0**
Receiver Barrier Dist:	**0**
Centerline Dist. To Observer:	**100**
Barrier Near Lane CL Dist:	**0**
Barrier Far lane CL Dist:	**0**
Pad Elevation:	**0.5**
Road Elevation:	**0**
Observer Height (above grade):	**0**
Barrier Height:	**0**
Rt View: **90**	Lft View: **-90**

NOISE SOURCE ELEVATIONS (Feet)

Autos:	**0**
Medium Trucks:	**2.3**
Heavy Trucks:	**8**

SITE DATA

Road Grade:	0
Average Daily Traffic:	81370
Peak Hour Traffic:	**8137**
Vehicle Speed:	50
Centerline Separation:	54

NOISE INPUTS

Site conditions **HARD SITE**

FLEET MIX

Type	Day	Evening	Night	Daily
Auto	0.775	0.129	0.096	0.9742
Med. Truck	0.848	0.049	0.103	0.0184
Heavy Truck	0.865	0.027	0.108	0.0074

UNMITIGATED NOISE LEVELS (No topographic or barrier attenuation)

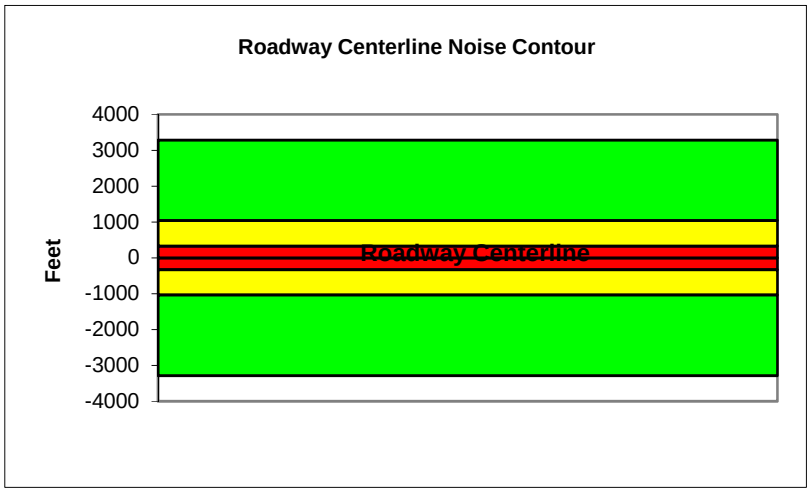
Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	63.1	71.9	70.1	64.0	72.7	73.3
Medium Trucks:	70.8	62.7	56.3	54.8	63.3	63.5
Heavy Trucks:	75.0	63.1	54.0	55.2	64.6	64.8
Vehicle Noise:	**77.3**	**73.0**	**70.4**	**65.1**	**73.7**	**74.2**

MITIGATED NOISE LEVELS (With topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:						
Medium Trucks:						
Heavy Trucks:						
Vehicle Noise:						

CENTERLINE NOISE CONTOUR

Unmitigated	
60 dBA	3287
65 dBA	1039
70 dBA	329
Mitigated	
60 dBA	
65 dBA	
70 dBA	



Federal Highway Administration RD-77-108
Traffic Noise Prediction Model (CALVENO)

Project Name:	Temecula Park and Ride	Scenario:	Future
Analyst:	Ryan Chiene	Job #:	159472
Roadway:	La Paz		
Road Segment:	Temecula Parkway to Vallejo Avenue		

PROJECT DATA

Centerline Dist to Barrier	**0**
Barrier (0=wall, 1= berm):	**0**
Receiver Barrier Dist:	**0**
Centerline Dist. To Observer:	**100**
Barrier Near Lane CL Dist:	**0**
Barrier Far lane CL Dist:	**0**
Pad Elevation:	**0.5**
Road Elevation:	**0**
Observer Height (above grade):	**0**
Barrier Height:	**0**
Rt View: **90**	Lft View: **-90**

NOISE SOURCE ELEVATIONS (Feet)

Autos:	**0**
Medium Trucks:	**2.3**
Heavy Trucks:	**8**

SITE DATA

Road Grade:	0
Average Daily Traffic:	16274
Peak Hour Traffic:	**1627.4**
Vehicle Speed:	25
Centerline Separation:	34

NOISE INPUTS

Site conditions **HARD SITE**

FLEET MIX

Type	Day	Evening	Night	Daily
Auto	0.775	0.129	0.096	0.9742
Med. Truck	0.848	0.049	0.103	0.0184
Heavy Truck	0.865	0.027	0.108	0.0074

UNMITIGATED NOISE LEVELS (No topographic or barrier attenuation)

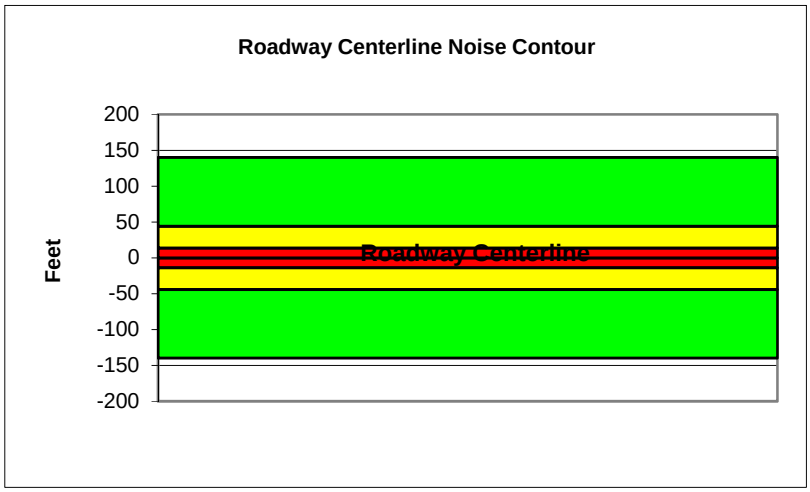
Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	47.8	56.5	54.7	48.7	57.3	57.9
Medium Trucks:	59.4	51.3	45.0	43.4	51.9	52.1
Heavy Trucks:	65.6	53.6	44.6	45.8	56.2	56.3
Vehicle Noise:	**68.2**	**59.8**	**55.7**	**51.9**	**60.4**	**60.8**

MITIGATED NOISE LEVELS (With topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:						
Medium Trucks:						
Heavy Trucks:						
Vehicle Noise:						

CENTERLINE NOISE CONTOUR

Unmitigated	
60 dBA	140
65 dBA	44
70 dBA	14
Mitigated	
60 dBA	
65 dBA	
70 dBA	



Federal Highway Administration RD-77-108
Traffic Noise Prediction Model (CALVENO)

Project Name:	Temecula Park and Ride	Scenario:	Future
Analyst:	Ryan Chiene	Job #:	159472
Roadway:	Vallejo Avenue		
Road Segment:	East of La Paz		

PROJECT DATA

Centerline Dist to Barrier	**0**
Barrier (0=wall, 1= berm):	**0**
Receiver Barrier Dist:	**0**
Centerline Dist. To Observer:	**100**
Barrier Near Lane CL Dist:	**0**
Barrier Far lane CL Dist:	**0**
Pad Elevation:	**0.5**
Road Elevation:	**0**
Observer Height (above grade):	**0**
Barrier Height:	**0**

Rt View: **90** Lft View: **-90**

NOISE SOURCE ELEVATIONS (Feet)

Autos:	**0**
Medium Trucks:	**2.3**
Heavy Trucks:	**8**

SITE DATA

Road Grade:	0
Average Daily Traffic:	612
Peak Hour Traffic:	**61.2**
Vehicle Speed:	25
Centerline Separation:	24

NOISE INPUTS

Site conditions **HARD SITE**

FLEET MIX

Type	Day	Evening	Night	Daily
Auto	0.775	0.129	0.096	0.9742
Med. Truck	0.848	0.049	0.103	0.0184
Heavy Truck	0.865	0.027	0.108	0.0074

UNMITIGATED NOISE LEVELS (No topographic or barrier attenuation)

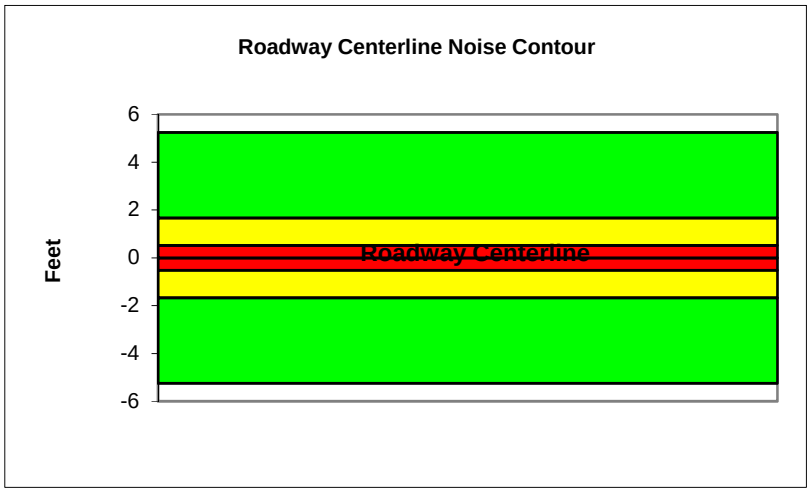
Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	33.7	42.5	40.7	34.6	43.2	43.8
Medium Trucks:	45.3	37.3	30.9	29.3	37.8	38.0
Heavy Trucks:	51.5	39.5	30.5	31.7	42.1	42.2
Vehicle Noise:	**54.1**	**45.7**	**41.7**	**37.8**	**46.4**	**46.7**

MITIGATED NOISE LEVELS (With topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:						
Medium Trucks:						
Heavy Trucks:						
Vehicle Noise:						

CENTERLINE NOISE CONTOUR

Unmitigated	
60 dBA	5
65 dBA	2
70 dBA	1
Mitigated	
60 dBA	
65 dBA	
70 dBA	



Federal Highway Administration RD-77-108
Traffic Noise Prediction Model (CALVENO)

Project Name:	Temecula Park and Ride	Scenario:	Future Plus Project
Analyst:	Ryan Chiene	Job #:	159472
Roadway:	Temecula Parkway		
Road Segment:	Bedford Court to La Paz		

PROJECT DATA

Centerline Dist to Barrier	**0**
Barrier (0=wall, 1= berm):	**0**
Receiver Barrier Dist:	**0**
Centerline Dist. To Observer:	**100**
Barrier Near Lane CL Dist:	**0**
Barrier Far lane CL Dist:	**0**
Pad Elevation:	**0.5**
Road Elevation:	**0**
Observer Height (above grade):	**0**
Barrier Height:	**0**

Rt View: **90** Lft View: **-90**

NOISE SOURCE ELEVATIONS (Feet)

Autos:	**0**
Medium Trucks:	**2.3**
Heavy Trucks:	**8**

SITE DATA

Road Grade:	0
Average Daily Traffic:	79259
Peak Hour Traffic:	**7925.9**
Vehicle Speed:	50
Centerline Separation:	54

NOISE INPUTS

Site conditions **HARD SITE**

FLEET MIX

Type	Day	Evening	Night	Daily
Auto	0.775	0.129	0.096	0.9742
Med. Truck	0.848	0.049	0.103	0.0184
Heavy Truck	0.865	0.027	0.108	0.0074

UNMITIGATED NOISE LEVELS (No topographic or barrier attenuation)

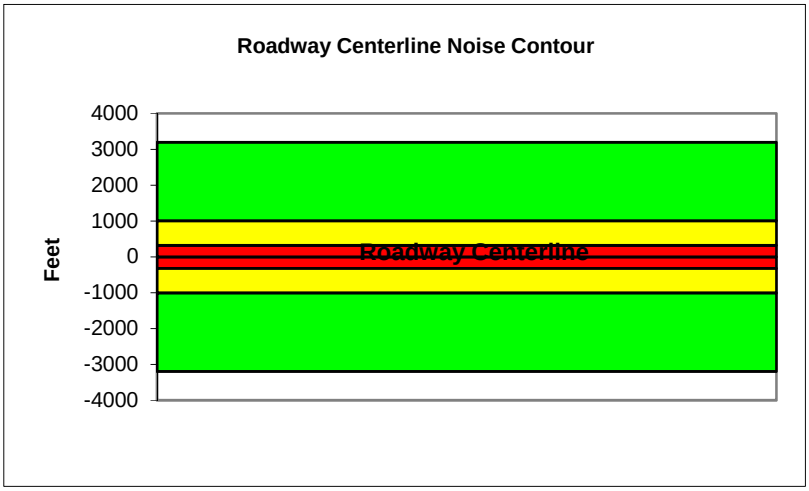
Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	63.0	71.8	70.0	63.9	72.6	73.2
Medium Trucks:	70.7	62.6	56.2	54.6	63.1	63.4
Heavy Trucks:	74.9	63.0	53.9	55.1	64.5	64.6
Vehicle Noise:	**77.2**	**72.9**	**70.3**	**65.0**	**73.6**	**74.1**

MITIGATED NOISE LEVELS (With topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:						
Medium Trucks:						
Heavy Trucks:						
Vehicle Noise:						

CENTERLINE NOISE CONTOUR

Unmitigated	
60 dBA	3197
65 dBA	1011
70 dBA	320
Mitigated	
60 dBA	
65 dBA	
70 dBA	



Federal Highway Administration RD-77-108
Traffic Noise Prediction Model (CALVENO)

Project Name:	Temecula Park and Ride	Scenario:	Future Plus Project
Analyst:	Ryan Chiene	Job #:	159472
Roadway:	Temecula Parkway		
Road Segment:	La Paz to Pechanga Parkway		

PROJECT DATA

Centerline Dist to Barrier	**0**
Barrier (0=wall, 1= berm):	**0**
Receiver Barrier Dist:	**0**
Centerline Dist. To Observer:	**100**
Barrier Near Lane CL Dist:	**0**
Barrier Far lane CL Dist:	**0**
Pad Elevation:	**0.5**
Road Elevation:	**0**
Observer Height (above grade):	**0**
Barrier Height:	**0**

Rt View: **90** Lft View: **-90**

NOISE SOURCE ELEVATIONS (Feet)

Autos:	**0**
Medium Trucks:	**2.3**
Heavy Trucks:	**8**

SITE DATA

Road Grade:	0
Average Daily Traffic:	81384
Peak Hour Traffic:	**8138.4**
Vehicle Speed:	50
Centerline Separation:	54

NOISE INPUTS

Site conditions **HARD SITE**

FLEET MIX

Type	Day	Evening	Night	Daily
Auto	0.775	0.129	0.096	0.9742
Med. Truck	0.848	0.049	0.103	0.0184
Heavy Truck	0.865	0.027	0.108	0.0074

UNMITIGATED NOISE LEVELS (No topographic or barrier attenuation)

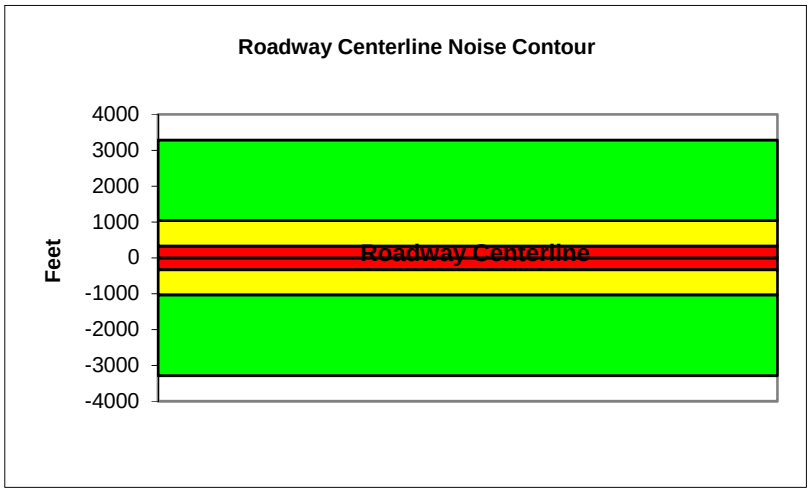
Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	63.1	71.9	70.1	64.0	72.7	73.3
Medium Trucks:	70.8	62.7	56.3	54.8	63.3	63.5
Heavy Trucks:	75.0	63.1	54.0	55.2	64.6	64.8
Vehicle Noise:	**77.3**	**73.0**	**70.4**	**65.1**	**73.7**	**74.2**

MITIGATED NOISE LEVELS (With topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:						
Medium Trucks:						
Heavy Trucks:						
Vehicle Noise:						

CENTERLINE NOISE CONTOUR

Unmitigated	
60 dBA	3287
65 dBA	1039
70 dBA	329
Mitigated	
60 dBA	
65 dBA	
70 dBA	



Federal Highway Administration RD-77-108
Traffic Noise Prediction Model (CALVENO)

Project Name:	Temecula Park and Ride	Scenario:	Future Plus Project
Analyst:	Ryan Chiene	Job #:	159472
Roadway:	La Paz		
Road Segment:	Temecula Parkway to Vallejo Avenue		

PROJECT DATA

Centerline Dist to Barrier	**0**
Barrier (0=wall, 1= berm):	**0**
Receiver Barrier Dist:	**0**
Centerline Dist. To Observer:	**100**
Barrier Near Lane CL Dist:	**0**
Barrier Far lane CL Dist:	**0**
Pad Elevation:	**0.5**
Road Elevation:	**0**
Observer Height (above grade):	**0**
Barrier Height:	**0**
Rt View: **90**	Lft View: **-90**

NOISE SOURCE ELEVATIONS (Feet)

Autos:	**0**
Medium Trucks:	**2.3**
Heavy Trucks:	**8**

SITE DATA

Road Grade:	0
Average Daily Traffic:	16811
Peak Hour Traffic:	**1681.1**
Vehicle Speed:	25
Centerline Separation:	34

NOISE INPUTS

Site conditions **HARD SITE**

FLEET MIX

Type	Day	Evening	Night	Daily
Auto	0.775	0.129	0.096	0.9742
Med. Truck	0.848	0.049	0.103	0.0184
Heavy Truck	0.865	0.027	0.108	0.0074

UNMITIGATED NOISE LEVELS (No topographic or barrier attenuation)

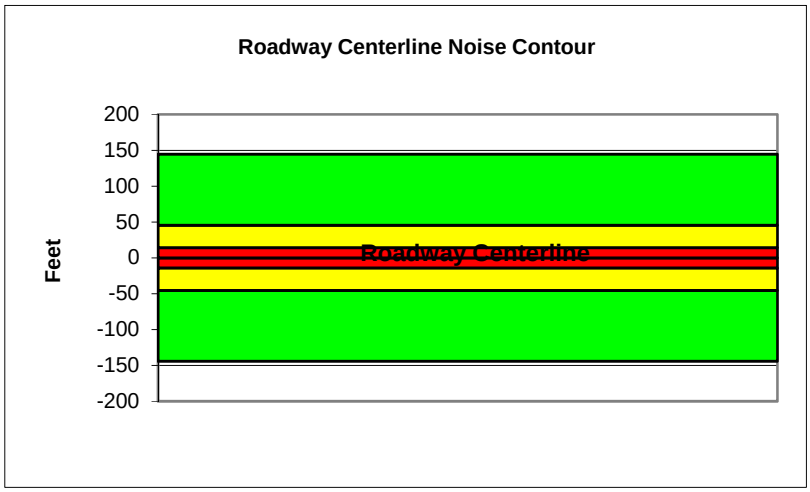
Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	47.9	56.7	54.9	48.8	57.5	58.1
Medium Trucks:	59.5	51.5	45.1	43.5	52.0	52.2
Heavy Trucks:	65.7	53.8	44.7	45.9	56.3	56.4
Vehicle Noise:	**68.4**	**59.9**	**55.9**	**52.1**	**60.6**	**61.0**

MITIGATED NOISE LEVELS (With topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:						
Medium Trucks:						
Heavy Trucks:						
Vehicle Noise:						

CENTERLINE NOISE CONTOUR

Unmitigated	
60 dBA	144
65 dBA	46
70 dBA	14
Mitigated	
60 dBA	
65 dBA	
70 dBA	



Federal Highway Administration RD-77-108
Traffic Noise Prediction Model (CALVENO)

Project Name:	Temecula Park and Ride	Scenario:	Future Plus Project
Analyst:	Ryan Chiene	Job #:	159472
Roadway:	Vallejo Avenue		
Road Segment:	East of La Paz		

PROJECT DATA

Centerline Dist to Barrier	**0**
Barrier (0=wall, 1= berm):	**0**
Receiver Barrier Dist:	**0**
Centerline Dist. To Observer:	**100**
Barrier Near Lane CL Dist:	**0**
Barrier Far lane CL Dist:	**0**
Pad Elevation:	**0.5**
Road Elevation:	**0**
Observer Height (above grade):	**0**
Barrier Height:	**0**

Rt View: **90** Lft View: **-90**

NOISE SOURCE ELEVATIONS (Feet)

Autos:	**0**
Medium Trucks:	**2.3**
Heavy Trucks:	**8**

SITE DATA

Road Grade:	0
Average Daily Traffic:	1298
Peak Hour Traffic:	**129.8**
Vehicle Speed:	25
Centerline Separation:	24

NOISE INPUTS

Site conditions **HARD SITE**

FLEET MIX

Type	Day	Evening	Night	Daily
Auto	0.775	0.129	0.096	0.9742
Med. Truck	0.848	0.049	0.103	0.0184
Heavy Truck	0.865	0.027	0.108	0.0074

UNMITIGATED NOISE LEVELS (No topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	36.9	45.7	43.9	37.9	46.5	47.1
Medium Trucks:	48.6	40.5	34.1	32.6	41.1	41.3
Heavy Trucks:	54.7	42.8	33.7	35.0	45.4	45.5
Vehicle Noise:	**57.4**	**49.0**	**44.9**	**41.1**	**49.6**	**50.0**

MITIGATED NOISE LEVELS (With topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:						
Medium Trucks:						
Heavy Trucks:						
Vehicle Noise:						

CENTERLINE NOISE CONTOUR

Unmitigated	
60 dBA	11
65 dBA	4
70 dBA	1
Mitigated	
60 dBA	
65 dBA	
70 dBA