NOISE

This report addresses noise in Tiburon and the Planning Area. The primary noise sources in Tiburon are traffic (vehicle noise) and stationary noise sources. This report identifies key terms related to the discussion of noise, basic concepts associated with noise and acoustics, and the federal, state, and local regulatory framework that establishes policies and requirements associated with noise. Noise levels associated with traffic in Tiburon are discussed, as well as noise levels associated with typical stationary noise sources. The community noise environment is also described.

Topics:

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1 BACKGROUND AND REGULATORY FRAMEWORK

KEY TERMS

Acoustics The science of sound.

Ambient Noise The distinctive acoustical characteristics of a given area consisting of all noise sources audible at that location. In many cases, the term ambient is used to describe an existing or pre-project condition such as the setting in an environmental noise study.

Attenuation The reduction of noise.

A-Weighting A frequency-response adjustment of a sound level meter that conditions the output signal to approximate human response.

CNEL Community Noise Equivalent Level. Defined as the 24-hour average noise level with noise occurring during evening hours (7 p.m. - 10 p.m.) weighted by a factor of three and nighttime hours weighted by a factor of 10 prior to averaging.

Decibel or dB Fundamental unit of sound, defined as ten times the logarithm of the ratio of the sound pressure squared over the reference pressure squared.

Frequency The measure of the rapidity of alterations of a periodic acoustic signal, expressed in cycles per second or Hertz.

Impulsive Sound of short duration, usually less than one second, with an abrupt onset and rapid decay.

L_{DN} Day/Night Average Sound Level. Similar to CNEL but with no evening weighting.

L_{EQ} Equivalent or energy-averaged sound level.

L_{MAX} The highest root-mean-square (RMS) sound level measured over a given period of time.

$L_{(N)}$ The sound level exceeded as a described percentile over a measurement period. For instance, an hourly L_{50} is the sound level exceeded 50 percent of the time during the one-hour period.

Loudness A subjective term for the sensation of the magnitude of sound.

Noise Unwanted sound.

SEL A rating, in decibels, of a discrete event, such as an aircraft flyover or train passby, that compresses the total sound energy into a one-second event.

Sensitive Receptor Any residence; including single family, multifamily, and accessory dwelling units, any educational resource for minors including, but not limited to, schools or preschools for kindergarten through twelfth grade (K-12) or early childhood education; and any facility licensed under Health and Safety Code Section 1200 et al, for health care or community care including, but not limited to, hospitals, clinics, skilled nursing, long-term care, adult day care, foster and small family homes, child care centers, and family day care homes.

FUNDAMENTALS OF ACOUSTICS

Acoustics is the science of sound. Sound may be thought of as mechanical energy of a vibrating object transmitted by pressure waves through a medium to human (or animal) ears. If the pressure variations occur frequently enough (at least

20 times per second), then they can be heard and are called sound. The number of pressure variations per second is called the frequency of sound and is expressed as cycles per second or Hertz (Hz).

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

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

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

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

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

The day/night average level (L_{dn}) is based upon the average noise level over a 24-hour day, with a +10-decibel weighing applied to noise occurring during nighttime (10:00 p.m. to 7:00 a.m.) hours. The nighttime penalty is based upon the assumption that people react to nighttime noise exposures as though they were twice as loud as daytime exposures. Because L_{dn} represents a 24-hour average, it tends to disguise short-term variations in the noise environment. CNEL is similar to L_{dn} but includes a +3 dB penalty for evening noise. Table 1 lists several examples of the noise levels associated with common situations.

TABLE 1: TYPICAL NOISE LEVELS

COMMON OUTDOOR ACTIVITIES	NOISE LEVEL (DBA)	COMMON INDOOR ACTIVITIES
	--110--	Rock Band
Jet Fly-over at 300 m (1,000 ft)	--100--	
Gas Lawn Mower at 1 m (3 ft)	--90--	
Diesel Truck at 15 m (50 ft), at 80 km/hr (50 mph)	--80--	Food Blender at 1 m (3 ft) Garbage Disposal at 1 m (3 ft)
Noisy Urban Area, Daytime Gas Lawn Mower, 30 m (100 ft)	--70--	Vacuum Cleaner at 3 m (10 ft)
Commercial Area Heavy Traffic at 90 m (300 ft)	--60--	Normal Speech at 1 m (3 ft)

Common Outdoor Activities	Noise Level (dBA)	Common Indoor Activities
Quiet Urban Daytime	--50--	Large Business Office Dishwasher in Next Room
Quiet Urban Nighttime	--40--	Theater, Large Conference Room (Background)
Quiet Suburban Nighttime	--30--	Library
Quiet Rural Nighttime	--20--	Bedroom at Night, Concert Hall (Background)
	--10--	Broadcast/Recording Studio
Lowest Threshold of Human Hearing	--0--	Lowest Threshold of Human Hearing

Source: Caltrans, Technical Noise Supplement, Traffic Noise Analysis Protocol. November 2009.

Effects of Noise on People

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

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

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

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

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

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

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

Regulatory Framework

Federal

Federal Highway Administration (FHWA)

The FHWA has developed noise abatement criteria that are used for Federally funded roadway projects or projects that require Federal review. These criteria are discussed in detail in Title 23 Part 772 of the Federal Code of Regulations (23CFR772).

Environmental Protection Agency (EPA)

The EPA has identified the relationship between noise levels and human response. The EPA has determined that over a 24-hour period, an L_{eq} of 70 dBA will result in some hearing loss. Interference with activity and annoyance will not occur if exterior levels are maintained at an L_{eq} of 55 dBA and interior levels at or below 45 dBA. Although these levels are relevant for planning and design and useful for informational purposes, they are not land use planning criteria because they do not consider economic cost, technical feasibility, or the needs of the community.

The EPA has set 55 dBA L_{dn} as the basic goal for residential environments. However, other Federal agencies, in consideration of their own program requirements and goals, as well as difficulty of actually achieving a goal of 55 dBA L_{dn}, have generally agreed on the 65 dBA L_{dn} level as being appropriate for residential uses. At 65 dBA L_{dn} activity interference is kept to a minimum, and annoyance levels are still low. It is also a level that can realistically be achieved.

The U.S. Department of Housing and Urban Development (HUD) was established in response to the Urban Development Act of 1965 (Public Law 90-448). HUD was tasked by the Act (Public Law 89-117) "to determine feasible methods of reducing the economic loss and hardships suffered by homeowners as a result of the depreciation in the value of their properties following the construction of airports in the vicinity of their homes."

HUD first issued formal requirements related specifically to noise in 1971 (HUD Circular 1390.2). These requirements contained standards for exterior noise levels along with policies for approving HUD-supported or assisted housing projects in high noise areas. In general, these requirements established the following three zones:

- 65 dBA L_{dn} or less - an acceptable zone where all projects could be approved.
- Exceeding 65 dBA L_{dn} but not exceeding 75 dBA L_{dn} - a normally unacceptable zone where mitigation measures would be required and each project would have to be individually evaluated for approval or denial. These measures must provide 5 dBA of attenuation above the attenuation provided by standard construction required in a 65 to 70 dBA L_{dn} area and 10 dBA of attenuation in a 70 to 75 dBA L_{dn} area.
- Exceeding 75 dBA L_{dn} - an unacceptable zone in which projects would not, as a rule, be approved.

HUD's regulations do not include interior noise standards. Rather a goal of 45 dBA L_{dn} is set forth and attenuation requirements are geared towards achieving that goal. HUD assumes that using standard construction techniques, any building will provide sufficient attenuation so that if the exterior level is 65 dBA L_{dn} or less, the interior level will be 45 dBA L_{dn} or less. Thus, structural attenuation is assumed at 20 dBA. However, HUD regulations were promulgated solely for residential development requiring government funding and are not related to the operation of schools or churches.

The Federal government regulates occupational noise exposure common in the workplace through the Occupational Health and Safety Administration (OSHA) under the EPA. Noise exposure of this type is dependent on work conditions and is addressed through a facility's or construction contractor's health and safety plan. With the exception of construction workers involved in facility construction, occupational noise is irrelevant to this study and is not addressed further in this document.

STATE

California Department of Transportation (Caltrans)

Caltrans has adopted policy and guidelines relating to traffic noise as outlined in the Traffic Noise Analysis Protocol (Caltrans 1998b). The noise abatement criteria specified in the protocol are the same as those specified by FHWA.

Governor's Office of Planning and Research (OPR)

OPR has developed guidelines for the preparation of general plans (Office of Planning and Research, 1998). The guidelines include land use compatibility guidelines for noise exposure.

Existing Town Noise Thresholds

The Town of Tiburon General Plan Noise Element establishes goals and policies, as well as criteria for evaluating the compatibility of individual land uses with respect to noise exposure.

Town of Tiburon Noise Element:

Goals

N-A: To ensure that residential areas are quiet and that noise levels in public and commercial areas remain within acceptable limits.

N-B: To eliminate or reduce unnecessary, excessive and offensive noises from all sources.

N-C: To minimize the exposure of community residents to noise through the careful placement of land uses that may cause noise impacts.

N-D: To minimize current noise impacts from Tiburon Boulevard and other high-volume roads on adjacent land uses that are sensitive to noise.

Policies

N-1: The Town shall use the Noise and Land Use Compatibility Guidelines contained herein to determine where noise levels in the community are acceptable or unacceptable.

N-2: The Town should use the Noise and Land Use Compatibility Guidelines to determine acceptable uses, and to require noise attenuation methods in noise-impacted areas.

N-3: Environmental reviews (environmental impact reports, initial studies/negative declarations) of projects within the Tiburon Planning Area will be required to, where appropriate, include an acoustical analysis of the project's potential to cause a noise impact.

N-4: If the projected noise environment for a project exceeds the standards identified in the Noise and Land Use Guidelines, the Town shall require an acoustical analysis so that noise mitigation measures can be incorporated into the project design.

N-5: Motorized recreational vehicles (including trail motorcycles) shall be prohibited in off-road areas in the Tiburon Planning Area.

N-6: Hours of use of recreation and commercial facilities should be regulated to minimize offensive noise to ensure compatibility between such facilities and nearby residential areas.

N-7: Noise walls, sound walls or any form of solid barrier shall be aesthetically compatible with the surrounding neighborhood.

N-8: The Town, in conjunction with the County of Marin and other cities and towns, shall attempt to reduce aircraft noise over the Tiburon Planning Area by working with the appropriate regulatory agencies.

N-9: New projects in Downtown shall, through site and building design and the use of the best available building technology, minimize the potential noise conflicts between commercial and residential uses, on mixed-use and adjacent residential properties.

N-10: Standard quiet construction methods shall be used where feasible and when construction activities take place within 500 feet of noise sensitive areas.

Implementation Measures

N-a: The Town should periodically assess the noise environment to identify noise sources that should be regulated to reduce excessive or offensive noise.

N-b: The Town should contact the appropriate regulatory agencies to ensure that they are aware of the Town's policy discouraging aircraft flyovers of the Tiburon Planning Area.

	Community Noise Exposure, Ldn or CNEL, in dB						
Land Use Category	**55**	**60**	**65**	**70**	**75**	**80**	**85**
Residential (interior noise levels not to exceed 45 dBA Ldn)							
Transient Lodging, Motels, Hotels							
Schools, Libraries, Churches, Hospitals, Nursing Homes							
Auditoriums, Concert Halls, Amphitheaters							
Sports Arenas, Outdoor Spectator Sports							
Playgrounds, Neighborhood Parks, Tennis Courts, Outdoor Recreation							
Water Recreation, Riding Stables, Golf Courses, Cemeteries							
Office Buildings, Business, Commercial & Professional							
Industrial, Manufacturing, Utilities, Agriculture							

Normally Acceptable: Specified land use is satisfactory, based upon the assumption that any buildings involved are of normal conventional construction, without any special noise insulation requirements.

Conditionally Acceptable: New construction or development should be undertaken only after a detailed analysis of the noise reduction requirements is made and needed noise insulation features included in the design.

Normally Unacceptable: New construction or development should be discouraged. If new construction or development does proceed, a detailed analysis of the noise reduction requirements must be made and needed noise insulation features included in the design.

Cleary Unacceptable: New construction or development clearly should not be undertaken.

Town of Tiburon General Plan Noise and Land Use Compatibility Guidelines

2 EXISTING NOISE CONDITIONS

Traffic Noise Levels

The FHWA Highway Traffic Noise Prediction Model (FHWA-RD 77-108) was used to develop L_{dn} (24-hour average) noise contours for all highways and major roadways in the Planning Area. The model is based upon the CALVENO noise emission factors for automobiles, medium trucks, and heavy trucks, with consideration given to vehicle volume, speed, roadway configuration, distance to the receiver and the acoustical characteristics of the site. The FHWA Model predicts hourly L_{eq} values for free-flowing traffic conditions, and is generally considered to be accurate within 1.5 dB. To predict L_{dn} values, it is necessary to determine the hourly distribution of traffic for a typical 24-hour period.

Existing traffic volumes were obtained from the traffic modeling performed for the Planning Area. Day/night traffic distributions were based upon continuous hourly noise measurement data and Saxelby Acoustics file data for similar roadways. Caltrans vehicle truck counts were obtained for SRT-4. Using these data sources and the FHWA traffic noise prediction methodology, traffic noise levels were calculated for existing conditions. Table 2 shows the results of this analysis. Figure 1 shows the town wide traffic noise contours.

Table 2: Predicted Existing Traffic Noise Levels

Roadway	Segment	Noise Level at Closest Receptors (dB, Ldn)[1]	Distances to Traffic Noise Contours, Ldn (feet)		
			70 dB	65 dB	60 dB
Tiburon Blvd	East of US 101	67.2	211	98	45
Tiburon Blvd	West of Blackfield Drive	65.4	240	111	52
Tiburon Blvd	East of Reed Ranch Road	68.2	176	82	38
Tiburon Blvd	South of Trestle Glen Blvd	68.4	146	68	31
Tiburon Blvd	North of Avenida Miraflores	66.3	132	61	29
Tiburon Blvd	North of Rock Hill Drive	67.2	150	70	32
Tiburon Blvd	North of Lyford Drive	64.8	105	49	23
Tiburon Blvd	South of Beach Road	61.9	67	31	14
Tiburon Blvd	North of Main Street	61.8	46	22	10
Trestle Glen Blvd	East of Tiburon Blvd	61.4	56	26	12
Paradise Drive	East of Trestle Glen Blvd	52.7	15	7	3

Notes: Distances to traffic noise contours are measured in feet from the centerlines of the roadways.
1 Traffic noise levels are predicted at the closest sensitive receptors or at a distance of 100 feet in commercial/retail areas.
Source: TJKM, Caltrans, Saxelby Acoustics., 2020.

Traffic noise levels are predicted at the sensitive receptors located at the closest typical setback distance along each Planning Area roadway segment. In some locations, sensitive receptors may be located at distances which vary from the assumed calculation distance and may experience shielding from intervening barriers or sound walls. However, the traffic noise analysis is believed to be representative of the majority of sensitive receptors located closest to the Planning Area roadway segments analyzed in this report.

The actual distances to noise level contours may vary from the distances predicted by the FHWA model due to roadway curvature, grade, shielding from local topography or structures, elevated roadways, or elevated receivers. The distances reported in Table 2 are generally considered to be conservative estimates of noise exposure along roadways in the Town of Tiburon.

Fixed Noise Sources

The production of noise is a result of many industrial processes, even when the best available noise control technology is applied. Noise exposures within industrial facilities are controlled by Federal and State employee health and safety regulations (OSHA and Cal-OSHA), but exterior noise levels may exceed locally acceptable standards. Commercial, recreational, and public service facility activities can also produce noise which affects adjacent sensitive land uses. These noise sources can be continuous and may contain tonal components which have a potential to annoy individuals who live nearby. In addition, noise generation from fixed noise sources may vary based upon climatic conditions, time of day, and existing ambient noise levels.

In Tiburon, fixed noise sources typically include parking lots, loading docks, parks, schools, and other commercial/retail use noise sources (HVAC, exhaust fans, etc.)

From a land use planning perspective, fixed-source noise control issues focus upon two goals:

1. To prevent the introduction of new noise-producing uses in noise-sensitive areas, and
2. To prevent encroachment of noise sensitive uses upon existing noise-producing facilities.

The first goal can be achieved by applying noise level performance standards to proposed new noise-producing uses. The second goal can be met by requiring that new noise-sensitive uses in near proximity to noise-producing facilities include mitigation measures that would ensure compliance with noise performance standards.

Fixed noise sources which are typically of concern include but are not limited to the following:

- HVAC Systems
- Pump Stations
- Steam Valves
- Generators
- Air Compressors
- Conveyor Systems
- Pile Drivers
- Drill Rigs
- Welders
- Outdoor Speakers
- Chippers
- Loading Docks
- Cooling Towers/Evaporative Condensers
- Lift Stations
- Steam Turbines
- Fans
- Heavy Equipment
- Transformers
- Grinders
- Gas or Diesel Motors
- Cutting Equipment
- Blowers
- Cutting Equipment
- Amplified Music and Voice

The types of uses which may typically produce the noise sources described above include, but are not limited to: wood processing facilities, pump stations, industrial/agricultural facilities, trucking operations, tire shops, auto maintenance shops, metal fabricating shops, shopping centers, drive-up windows, car washes, loading docks, public works projects, batch plants, bottling and canning plants, recycling centers, electric generating stations, race tracks, landfills, sand and gravel operations, and special events such as concerts and athletic fields. Typical noise levels associated with various types of stationary noise sources are shown in Table 3.

Table 3: Typical Stationary Source Noise Levels

Use	Noise Level at 100 feet, Leq [1]	Distance to Noise Contours, feet			
		50 dB Leq (No Shielding)	45 dB Leq (No Shielding)	50 dB Leq (With 5 dB Shielding)	45 dB Leq (With 5 dB Shielding)
Auto Body Shop	56 dB	200	355	112	200
Auto Repair (Light)	53 dB	141	251	79	141
Busy Parking Lot	54 dB	158	281	89	158
Cabinet Shop	62 dB	398	708	224	398
Car Wash	63 dB	446	792	251	446
Cooling Tower	69 dB	889	1,581	500	889
Loading Dock	66 dB	596	1,059	335	596
Lumber Yard	68 dB	794	1,413	447	794
Maintenance Yard	68 dB	794	1,413	447	794
Outdoor Music Venue	90 dB	10,000	17,783	5,623	10,000
Paint Booth Exhaust	61 dB	355	631	200	355
School Playground / Neighborhood Park	54 dB	158	281	89	158
Skate Park	60 dB	316	562	178	316
Truck Circulation	48 dB	84	149	47	84
Vendor Deliveries	58 dB	251	446	141	251

1 Analysis assumes a source-receiver distance of approximately 100 feet, no shielding, and flat topography. Actual noise levels will vary depending on site conditions and intensity of the use. This information is intended as a general rule only, and is not suitable for final site-specific noise studies.
Source: j.c. brennan & associates, Inc. 2017.

Community Noise Survey

A community noise survey was conducted to document ambient noise levels at various locations throughout the town. Short-term noise measurements were conducted at nine locations throughout the town on December 9th, 2020. In addition, five continuous 24-hour noise monitoring sites were also conducted to record day-night statistical noise level trends from December 9th to 10th, 2020. The data collected included the hourly average (L_{eq}), median (L_{50}), and the maximum level (L_{max}) during the measurement period.

Community noise monitoring equipment included Larson Davis Laboratories (LDL) Model 812, 820, and 831 precision integrating sound level meters equipped with LDL ½" microphones. The measurement systems were calibrated using a LDL Model CAL200 acoustical calibrator before and after testing. The measurement equipment meets all of the pertinent requirements of the American National Standards Institute (ANSI) for Type 1 (precision) sound level meters.

Noise monitoring sites and the measured noise levels at each site are summarized in Table 4 and Table 5. Figure 2 shows the locations of the noise monitoring sites. The results of the community noise survey shown in Tables 4 and 5 indicate that existing transportation noise sources were the major contributor of noise observed during daytime hours, especially during vehicle passbys.

Table 4: Existing Continuous 24-Hour Ambient Noise Monitoring Results

Site	Location	Ldn (dBA)	Measured Hourly Noise Levels, dBA Low-High (Average)					
			Daytime (7:00 am - 10:00 pm)			Nighttime (10:00 pm – 7:00 am)		
			Leq	L50	Lmax	Leq	L50	Lmax
LT-1	Highway 131 at Lyford Drive	69	69	62	84	59	37	78
LT-2	Water Treatment Center East	64	63	61	77	55	48	75
LT-3	Water Treatment Center West – by Generator	54	53	52	63	46	43	60
LT-4	Trestle Glen Boulevard	59	59	51	77	48	31	65
LT-5	Highway at Nugget Market	68	68	66	79	59	47	74

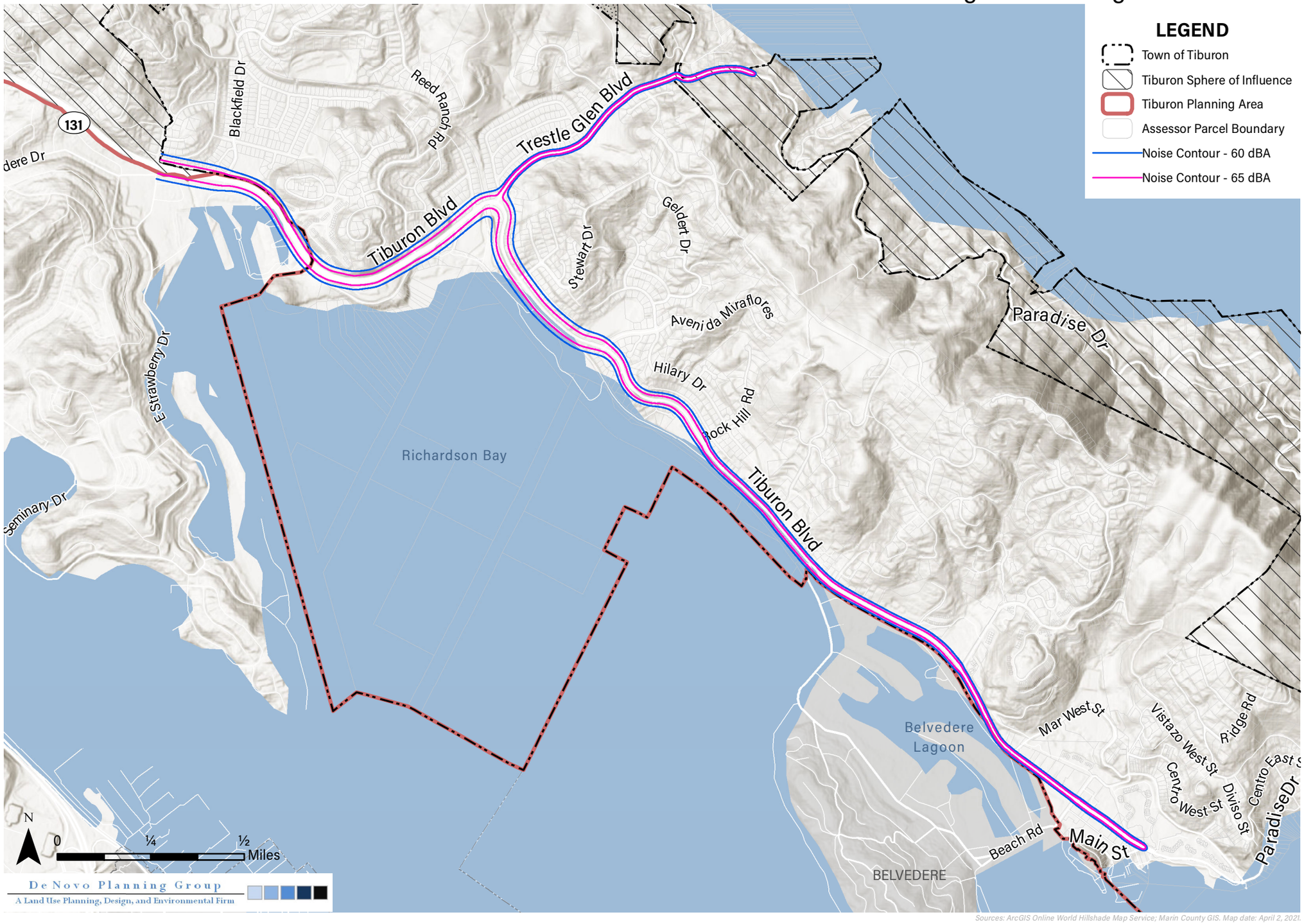
Source: Saxelby Acoustics, 2020.

TABLE 5: EXISTING SHORT-TERM COMMUNITY NOISE MONITORING RESULTS

SITE	LOCATION	TIME[1]	MEASURED SOUND LEVEL, DB			NOTES
			LEQ	L50	LMAX	
ST-1	Vistazo Street West	11:50 a.m..	43	43	50	Secondary noise sources from ambient nature, vehicle traffic and neighborhood construction sounds.
ST-2	Intersection at Beach Road and Tiburon Blvd	12:18 p.m.	63	60	76	Primary noise source is traffic on Tiburon Blvd and secondary noise source is traffic on Beach Rd and some construction noises.
ST-3	Mar West Street	12:41 p.m.	58	47	74	Primary noise source is vehicle traffic on Mar W St. Secondary noise source is light construction noises.
ST-4	Lyford Drive at Reed Elementary School	1:02 p.m.	62	54	78	Primary noise source is vehicle traffic on Lyford Dr. Secondary noise source is from Reed Elementary School.
ST-5	Rock Hill Drive	2:24 p.m.	56	51	69	Primary noise source is Highway 131/Tiburon Blvd. Secondary noise source is from traffic on Rock Hill Drive.
ST-6	Avenida Miraflores at Del Mar Middle School	2:43 p.m.	52	48	66	Primary noise source is traffic on Avenida Miraflores. Secondary noise source is from Del Mar Middle School.
ST-7	Trestle Glen Boulevard	3:15 p.m..	65	60	79	Primary noise source is traffic on Trestle Glan Blvd. Secondary noise source is from traffic on Turtle Rocks Court.
ST-8	Reed Ranch Road	3:25 p.m.	61	48	75	Primary noise source is traffic on Reed Ranch Road. Secondary noise source is traffic on Highway 131/Tiburon Blvd.
ST-9	Blackfield Drive	3:51 p.m.	61	55	72	Primary noise source is traffic on Blackfield Drive. Secondary noise source is from traffic on Cecelia Way.

1 - All Community Noise Measurement Sites have test durations of 10:00 minutes.
Source: Saxelby Acoustics, 2020.

Figure 1: Existing Noise Contours



Sources: ArcGIS Online World Hillshade Map Service; Marin County GIS. Map date: April 2, 2021.

Figure 2: Noise Monitoring Locations