

CHAPTER 9: NOISE ELEMENT

This Element of the General Plan addresses Noise in its many forms, and provides policies and actions to help ensure that uses sensitive to noise maintain the desired level of “quiet” that is needed for a healthy and desirable community.

NOISE

“Noise” is sometimes defined as “unwanted sound.” Sound which is desirable in some situations—for instance, a music concert—can become “noise” in other situations. Some types of sound—from trains, vehicle traffic, and mechanical equipment—are generally considered undesirable in residential areas, but are accepted in other areas (such as industrial areas).

Noise has been cited as being a health problem, not only in terms of actual physiological damages such as hearing impairment, but in terms of inhibiting general well-being and contributing to stress and annoyance.

In some cases (including, in some cases, the neighbor whose stereo or party creates a nuisance), noise is an annoyance. This



type of noise is generally addressed as a “nuisance” and enforced by law enforcement. The policies and standards in this Noise Element address ongoing and significant noise sources (roadways, railroads, mechanical equipment, etc.); issues with “noisy neighbors” are not addressed specifically in this Element.

Long or repeated exposure to sounds at or above 85 decibels can cause hearing loss. The louder the sound, the shorter the time period before noise-induced hearing loss can occur. Sounds of less than 75 decibels, even after long exposure, are unlikely to cause hearing loss.¹

Noise can come from two types of sources: mobile and stationary.

- **Mobile source** noises are generally associated with transportation, such as cars, trains, and aircraft. The most significant mobile sources of noise in Madera are the Madera Airport (noise created by aircraft takeoffs and landings), the two railroad lines that pass through the Planning Area, and Hwy 99 and other major roadways.
- **Stationary sounds** can be pin-pointed and do not move. Examples of stationary sources include outdoor machinery (such as heating/air conditioning systems, which may be found in both residential and commercial areas), the Madera Raceway, the high school football stadium, and the industrial areas near the Madera Airport and in the southwest portion of the Planning Area. Noise generated at construction sites also falls within the category of stationary sound.

Noise can be measured in a number of ways, ranging from the momentary noise caused by a single event (such as a passing train) to a day-long average. Most of the measures in this Noise Element use the latter measurement, which provides a weighted average of the noise in a given location over a 24-hour period. Two different 24-hour measures are used: **Ldn** (Day/Night

¹ Source: National Institute on Deafness and Other Hearing Disorders



Noise at stock car races at the Madera Speedway has been measured at 110-115 decibels.

How Loud Is It? Sound Levels for Common Noise Sources

Activity	Noise Level in Decibels
Limit of Hearing	0 dB
Normal Breathing	10 dB
Soft Whisper	30 dB
Library	40 dB
Refrigerator	50 dB
Rainfall	50 dB
Washing Machine	50-75 dB
Normal Conversation	60 dB
Hair Dryer	60-95 dB
Alarm Clock	65-80 dB
Power Mower	65-95 dB
Dumpster Pickup (@ 50')	80 dB
Garbage Disposal	80-95 dB
Noisy Restaurant	85 dB
Train Approaching (Engines)	85-90 dB
Tractor	90 dB
Shouting in Ear	110 dB
Loud Rock Concert	120 dB
Jet Engine at Takeoff	150 dB

These are typical noise levels. Distance from the source will reduce the noise level. A 10 dB increase doubles perceived loudness. Continued exposure to noise above 85 dB can cause hearing loss; the maximum exposure to 85 dB noise in the workplace is eight hours. A single exposure to 140 dB noise can cause some hearing loss. Source: National Institute for Occupational Safety and Health.

Level) and **CNEL** (Community Noise Equivalent Level). While they differ in some details, both “weight” noise produced during nighttime and early morning hours to reflect the fact that noise during these normally quiet periods is more intrusive and more likely to disrupt sleep.

Generally speaking, land uses considered noise-sensitive are those in which noise can adversely affect what people are doing on the land. For example, a residential land use, where people live, sleep, and study, is generally considered sensitive to noise because noise can disrupt these activities (the passing train, for instance, whose engine noise or warning horn can disrupt sleep).

Most communities handle noise issues through taking care to put compatible uses near each other and avoid placing noisy uses next to homes and noise-sensitive uses.

The table and maps on the following pages illustrate future noise conditions that will need to be addressed as the City makes land use decisions.

Table N-A provides information on projected noise levels along major roadways in the Planning Area—specifically, what the future noise level will be at a distance of 100 feet from the edge of the roadway. This information is useful to residents seeking information on neighborhoods and to planners who want to ensure that noise impacts are properly addressed when new development proposals are reviewed.

TABLE N-A: PROJECTED (2030) NOISE CONTOURS FOR MAJOR ROADWAYS IN MADERA

Roadway Segment	ADT	CNEL at 100 Feet from Near Travel-lane Centerline	Distance (feet) From Roadway Centerline to CNEL Contour		
			70	65	60
4 th Street, East of Gateway Drive	17,090	58.84	--	60.2	120.7
Almond Avenue, East of SR 145	15,730	60.09	--	70.9	145.2
Almond Avenue, West of SR 145	11,340	58.67	--	58.9	117.7
Avenue 12, Between Granada Street and Pine Street	23,090	66.02	60.6	130.0	279.7
Avenue 12, Between Road 23 and Road 241/2	13,010	63.53	--	88.8	190.9
Avenue 12, Between SR 99 and Road 30	40,310	68.44	87.6	188.3	405.5
Avenue 13, Between Pine Street and SR 145	13,370	63.65	--	90.4	194.4
Avenue 13, Between Road 23 and Granada Street	6,970	60.82	--	58.7	126.0
Avenue 13, Between SR 145 and SR 99	16,390	64.53	--	103.5	222.7
Avenue 13, Between SR 99 and Road 29	12,970	63.51	--	88.6	190.5
Avenue 15, West of Road 29	11,050	68.51	88.6	190.5	410.3
Avenue 17 at Airport Drive	47,460	68.57	98.1	210.1	451.9
Avenue 17, Between Country Club Drive and Lake Street	24,640	72.00	151.0	325.1	700.2
Avenue 17, Between SR 99 and Country Club Drive	37,390	73.81	199.4	429.3	924.6
Cleveland Avenue, Between Granada Drive and Schnoor Street	18,220	60.73	--	77.4	159.7
Cleveland Avenue, Between Schnoor Street and SR 99	32,360	63.22	--	110.2	232.6
Cleveland Avenue, Between Sharon Road and D Street	15,070	68.91	94.1	202.4	435.9
Country Club Drive, Between Avenue 17 and Avenue 171/2	27,680	72.50	163.2	351.3	756.6

Roadway Segment	ADT	CNEL at 100 Feet from Near Travel-lane Centerline	Distance (feet) From Roadway Centerline to CNEL Contour		
			70	65	60
Country Club Drive, Between Cleveland Avenue and Ellis Avenue	29,660	63.83	--	102.2	218.9
Country Club Drive, North of Avenue 18 ½	6,790	60.70	--	57.7	123.8
Country Club Drive, South of Avenue 17	25,080	66.38	64.0	137.3	295.6
D Street, North of 4 th Street	8,570	53.99	--	--	61.3
D Street, North of Cleveland Avenue	6,790	53.47	--	--	--
Ellis Avenue, Between Country Club Drive and Lake Street	3,490	63.51	--	88.5	190.4
Gateway Drive (SR 145), Between Madera Avenue and Yosemite Avenue	29,630	63.83	--	102.1	218.7
Gateway Drive, North of 4 th Street	12,550	55.64	--	--	76.4
Gateway Drive, North of Cleveland Avenue	10,550	54.89	--	--	69.0
Granada Drive, Between Howard Avenue and Pecan Avenue	8,350	59.75	--	55.5	117.3
Granada Drive, South of Cleveland Avenue	10,150	58.19	--	--	109.7
Granada Drive, South of Olive Avenue	8,320	60.02	--	70.2	143.6
Granada Drive, South of Sunset Avenue	6,260	56.09	--	--	81.3
Howard Road, Between Granada Drive and Schnoor Street	22,540	61.65	--	88.0	183.5
Madera Avenue (SR 145), Between Avenue 13 and SR 99	35,090	63.57	58.2	116.0	245.4
Olive Avenue, Between Yosemite Avenue and Madera Avenue (SR 145)	19,240	60.97	--	79.9	165.4
Pine Street, Between Olive Avenue and Pecan Avenue	22,520	64.06	--	105.7	226.5
Raymond Road, Between Avenue 16 and Arizona Avenue	4,220	64.33	--	100.4	216.1

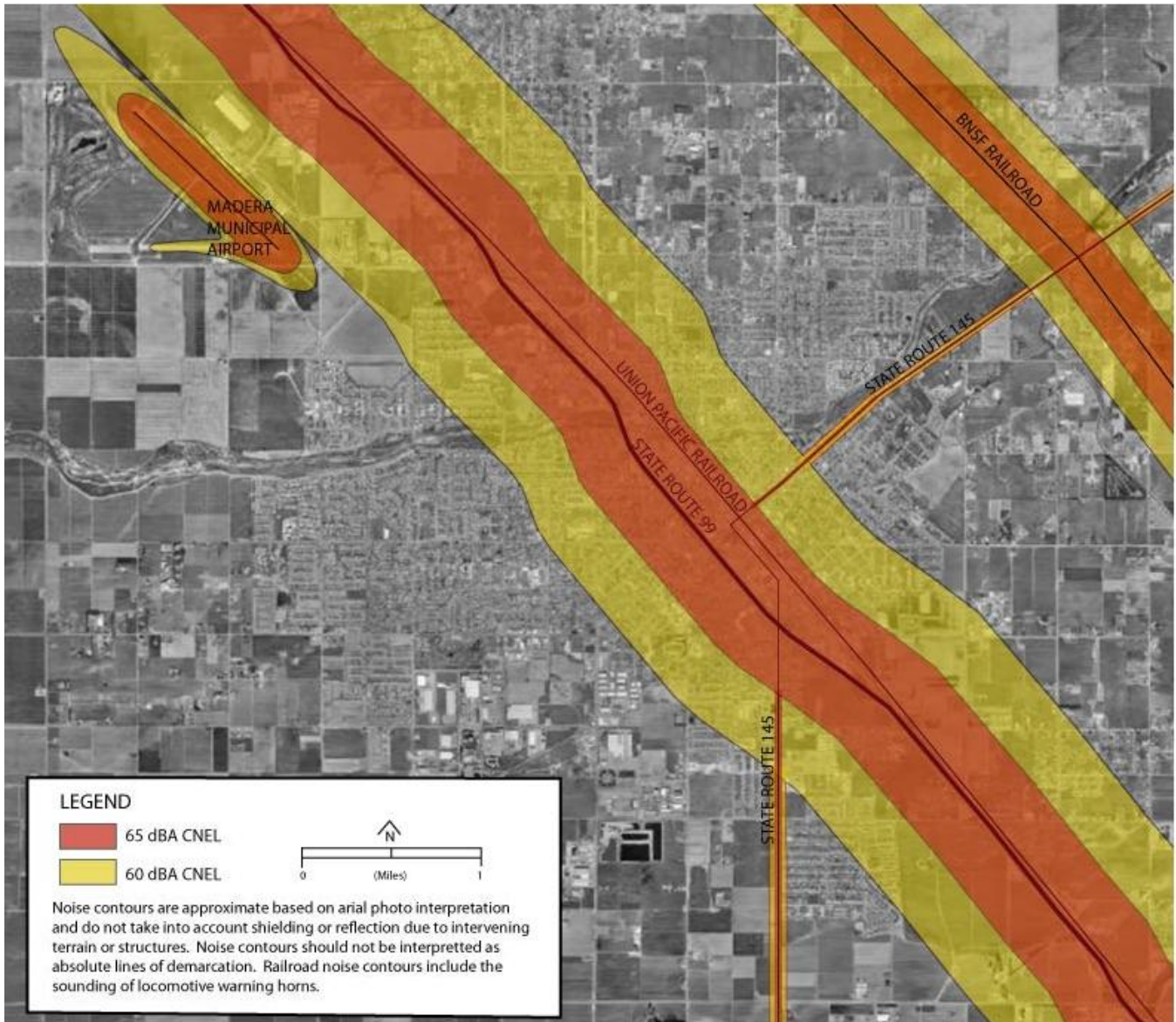
Roadway Segment	ADT	CNEL at 100 Feet from Near Travel-lane Centerline	Distance (feet) From Roadway Centerline to CNEL Contour		
			70	65	60
Road 23, Between Avenue 16 and Cleveland Avenue	29,170	72.73	169.0	363.8	783.5
Road 23, North of Avenue 12	9,770	62.28	--	73.4	157.8
Road 29, Between Olive Avenue and Avenue 13	14,590	69.72	106.6	229.3	493.7
Road 29, Between SR 145 and Avenue 15	11,910	68.84	93.1	200.3	431.3
SR 99, Between Avenue 12 and Avenue 9	135,510	79.51	816.9	1,755.3	3,778.9
SR 99, Between Avenue 16 and Cleveland Avenue	135,040	79.49	815.1	1,751.3	3,770.2
SR 99, Between Avenue 20 and Avenue 18 1/2	144,350	79.78	851.9	1,830.8	3,941.5
SR 99, Between Second Street and 4 th Street	136,410	79.54	820.5	1,763.1	3,795.7
SR 99, Between SR 145 and Gateway Drive	125,330	79.17	775.8	1,666.4	3,587.3
Sunset Avenue, Between Granada Drive and Schnoor Street	8,790	57.56	--	--	100.2
Tozer Avenue, Between Avenue 15 and Sunrise Avenue	8,400	67.32	73.9	158.7	341.7
Tozer Avenue, Between Olive Avenue and Almond Avenue	8,420	67.33	74.0	159.0	342.3
Westberry Boulevard, Between Sunset Avenue and Howard Avenue	10,410	59.29	--	51.9	109.4
Yosemite Avenue (SR 149), Between Cleveland Avenue /Tozer Street and Road 29	11,480	58.72	--	59.3	118.6
Yosemite Avenue (SR 149), Between Gateway Drive and Cleveland Ave/Tozer Street	22,130	61.57	--	87.0	181.3

Source: Ambient Consulting. Projected traffic volumes provided by Fehr and Peers.

Noise levels/contours were calculated using the FHWA roadway noise model based on Calven vehicle reference noise levels and traffic data obtained from the traffic analysis prepared for this project.

--" Indicates that noise contours are within roadway right-of-way and do not affect properties adjacent to the roadway.

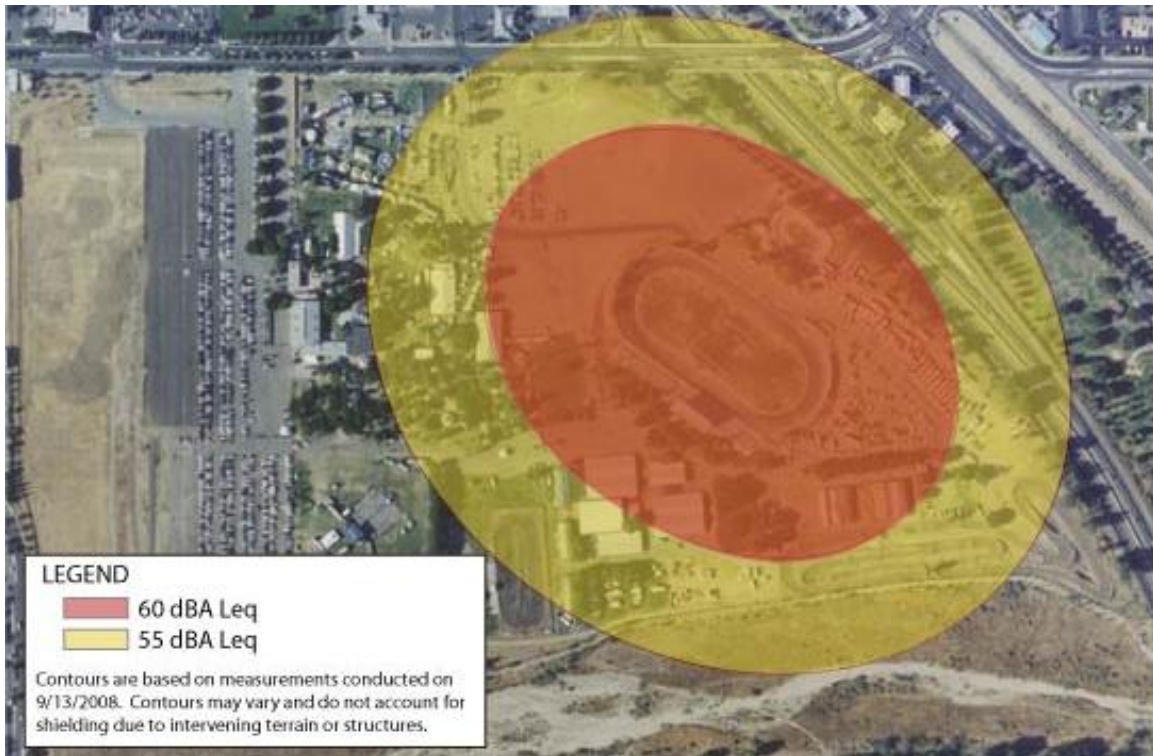
FIGURE N-1: MADERA TRANSPORTATION NOISE CONTOURS, 2010



Source: Ambient Consulting. Contours are based on projected roadway and rail traffic and airport operations per the Madera Airport master plan.

For detailed information on the location of noise contours along major roadways not shown in this Figure, please see **Table N-A**.

FIGURE N-2: MADERA RACEWAY NOISE CONTOURS



Source: Ambient Consulting, 2008

NOISE GOALS

GOAL N-1

NOISE

To protect residents from the harmful effects of exposure to excessive noise, and to protect the economic base of the City by preventing the encroachment of incompatible land uses near roadways, industries, railroads, and other sources of noise.

NOISE POLICIES

Policy N-1 ▶

The City will protect residential areas and other noise-sensitive uses from excessive noise by doing the following:

- 1) Requiring that land uses, roadways, and other sources do not create incompatible noise levels on adjacent parcels.
- 2) Allowing homes or noise-sensitive uses to be developed only in places where existing and projected noise levels will meet the exterior noise guidelines and standards shown in Policies N-5 and N-6.
- 3) Requiring that City decisions which would cause or allow an increase in noise created by stationary or mobile sources (such as development of noise-generating land uses or the construction of new or wider roadways) be informed by a noise analysis and accompanied by noise reduction measures to keep noise at acceptable levels.

Policy N-2▶

To implement Policy N-1, the following shall apply:

- 1) No use regulated by the City shall be permitted to generate noise that would cause the ambient noise on any adjacent parcel to exceed the “completely compatible” 24-hour guidelines shown in Policy N-5 or the 30-minute noise standards in Policy N-6.
- 2) The City shall ensure that noise mitigation to achieve a “completely compatible” 24-hour exterior noise level and conformance with the 30-minute exterior noise standard is provided in conjunction with any decision² it makes that would cause a violation of item 1) above.
- 3) Developers of new residential or other noise-sensitive uses which are placed in environments subject to existing or projected noise that exceeds the “completely compatible” guidelines in Policy N-5 shall be responsible for ensuring that acceptable exterior and interior noise levels will be achieved.
- 4) The City shall ensure that transportation projects such as new or widened roadways include mitigation measures to maintain at least “tentatively compatible” noise levels as shown in Policy N-5. Mitigation for roadway noise need not be provided where “tentatively compatible” noise guidelines would be exceeded on vacant lands, but shall be installed as part of the transportation project where the noise would affect existing homes. In those instances where noise mitigation is not initially triggered, it shall be the responsibility of the project which places residential units on the vacant lands.

² Examples of decisions include: Roadway construction projects, public park construction, General Plan amendments, changes of zone, conditional use permits, and site plan review approval.

Action Item N-2.1

Apply the State Noise Insulation Standards,³ zoning and building controls, buffers, sound barriers, traffic controls, and other effective measures to reduce exposure to noise that exceeds the standards contained in this General Plan.

Action Item N-2.2

Require acoustical studies⁴ for:

- 1) Significant new noise generators, or
- 2) New uses which are proposed to be developed in areas which do not meet the “completely compatible” exterior noise guidelines contained in Policy N-5 or Policy N-6.

If information on the noise environment at a project site is not available, a measurement of the noise environment by a qualified acoustical engineer may be needed to make a determination whether a proposed project complies with the guidelines and standards in Policy N-5 or N-6.

Action Item N-2.3

Seek to obtain noise mitigation from other agencies (including the State of California) required to address the noise impacts of decisions made by those agencies (including, but not limited to, roadway widenings and railroad operations).

³The State's noise insulation standards are contained in Title 24 of the California Code of Regulations.

⁴ See Policy N-12 for the City's requirements for the preparation of acoustical analyses.

Policy N-3▶

The following definitions shall be used to interpret and implement the policies in this Noise Element.

- “Noise-Sensitive Use” is any use other than residential or commercial for which an acceptable interior or exterior noise level is defined in this General Plan or other uses as determined by the City. Generally, noise-sensitive uses will be those which require a reasonable level of quiet as part of their ordinary functioning.
- Noise standards in residential areas shall be applied to outdoor activity areas. Where the outdoor activity areas are not known, the exterior noise standard shall be applied to all areas within 50 feet of the residential dwelling.
- “Outdoor Activity Areas” for residential uses include rear yard areas, including patios located in a rear yard; private ground-floor patios; and community play areas, pools, etc.
- “Projected Noise Levels” shall be those projected to exist at a time 20 (twenty) years in the future, based on projected future development, traffic, and other factors.
- “Residential Area” is any area designated for residential uses on the Land Use Map of this General Plan.
- “Transportation Noise” consists of noise generated by motor vehicles, trains, and aircraft takeoffs and landings.

Policy N-4▶

The following compatibility standards shall be used to determine whether a proposed use is appropriate for its location, given the projected ambient noise level.

- “Completely Compatible” means that the specified land use is satisfactory and both the indoor and outdoor environments are pleasant.
- “Tentatively Compatible” means that noise exposure may be of concern, but common building construction practices will make the indoor living environment acceptable, even for sleeping quarters, and outdoor activities will not be unduly disturbed by noise.
- “Normally Incompatible” means that noise exposure warrants special attention, and new construction or development should generally be undertaken only after a detailed analysis of noise reduction requirements is made and needed noise insulation features are included in the design. Careful site planning or exterior barriers may be needed to make the outdoor environment tolerable.
- “Completely Incompatible” means that the noise exposure is so severe that new construction or development should generally not be undertaken.

Policy N-5▶

The following are the maximum 24-hour exterior noise levels for land designated by this General Plan for residential, commercial/retail, and public parks.⁵

- See Policy N-2 for the definitions of these levels of compatibility.
- These guidelines apply to land designated by this General Plan for these uses. Residential, retail, or public parks which have been

⁵ See Policy N-6 for maximum 30-minute exterior noise standards. Interior noise standards are shown in Policy N-7.

developed on land designated for other uses shall be subject to the exterior noise guidelines for the land on which they are located.

- Non-residential uses located on residentially designated land shall be subject to the exterior noise guidelines for residential lands.
- All uses on Commercial lands, including non-commercial uses, shall be subject to the standards for Commercial land.
- Land use designations not listed above do not have exterior noise compatibility standards. Land use designations with no exterior noise compatibility standard include office and industrial.
- Standards for public schools are set and enforced by the State of California and are not regulated by the City of Madera. Therefore, no standards for public schools are shown in **Table N-B**.

TABLE N-B: EXTERIOR NOISE COMPATIBILITY GUIDELINES FOR NOISE FROM ALL SOURCES, INCLUDING TRANSPORTATION NOISE (24-HOUR DAY-NIGHT AVERAGE [CNEL/Ldn])

Land Use Designations	Completely Compatible	Tentatively Compatible	Normally Incompatible	Completely Incompatible
All Residential (Single- and Multi-Family)	Less than 60 dBA	60-70 dBA	70-75 dBA	Greater than 75 dBA
All Commercial	Less than 70 dBA	70-75 dBA	Greater than 75 dBA	(1)
Public Parks (Lands designated as Open Space on which public parks are located or planned)	Less than 65 dBA	65-70 dBA	70-75 dBA	Greater than 75 dBA

(1) No "Completely Incompatible" category is shown for commercial uses because not all commercial uses are incompatible with noisy environments. The City may determine as part of the review of individual development proposals that some types of commercial uses are incompatible with noise environments in excess of 75 dBA CNEL.

Policy N-6 ▶

The following are the City's standards for maximum exterior non-transportation noise levels to which land designated for residential land uses may be exposed for any 30-minute period on any day.⁶

- Where existing ambient noise levels exceed these standards, the ambient noise level shall be highest allowable noise level as measured in dBA Leq (30 minutes).
- The noise levels specified above shall be lowered by 5 dB for simple tonal noises (such as humming sounds), noises consisting primarily of speech or music, or for recurring impulsive noises (such as pile drivers, punch presses, and similar machinery). Example: the Single Family/Duplex standard from 10 p.m. to 7 a.m. for these types of noises is 45 dBA.
- The City may impose exterior noise standards which are less restrictive than those specified above, provided that:
 - 1) The noise impact on the residential or other noise-sensitive use is addressed in an environmental analysis,
 - 2) A finding is made by the approving body stating the reasons for accepting a higher exterior noise standard, and
 - 3) Interior noise standards will comply with those identified in Policy N-7.

⁶ Please see Policy N-7 for 24-hour exterior noise guidelines.

**TABLE N-C: EXTERIOR NOISE LEVEL STANDARDS
FOR NON-TRANSPORTATION NOISE, MEASURED AS dBA Leq (30 MINUTES)⁷**

Land Use Type	Time Period	Maximum Noise Level (dBA)
Single-Family Homes and Duplexes	10 p.m. to 7 a.m.	50
	7 a.m. to 10 p.m.	60
Multiple Residential 3 or More Units Per Building (Triplex +)	10 p.m. to 7 a.m.	55
	7 a.m. to 10 p.m.	60

Policy N-7▶

The following are the City's standards for acceptable indoor noise levels for various types of land uses. These standards should receive special attention when projects are considered in "Tentatively Compatible" or "Normally Incompatible" areas.

- Noise created inside a use listed above shall not count toward the acceptable noise levels to be maintained in accordance with this policy.

**TABLE N-D: MAXIMUM ACCEPTABLE
INTERIOR NOISE LEVELS CREATED BY EXTERIOR NOISE SOURCES**

Land Use Type	Acceptable Noise Level (dBA Ldn or CNEL)
Residential Living and Sleeping Areas	45 dBA
Residential Living and Sleeping Areas where the dwelling unit is subject to noise from railroad tracks, aircraft overflights, or similar sources which produce clearly identifiable, discrete noise events (such as the passing of a train as opposed to relatively steady or constant noise sources such as roadways)	40 dBA

⁷ Leq (Equivalent Sound Level) is the average noise level during the time period of the sample.

Land Use Type	Acceptable Noise Level (dBA Ldn or CNEL)
Private & Semi Private School Classrooms ⁸	55 dBA
All Places of Work Other than School Classrooms	Conform with applicable state and federal workplace safety standards

Policy N-8 ▶

Multi-Family residential uses constructed in a mixed-use setting with commercial or office uses may be exempted from exterior noise standards at the City’s discretion but must meet interior noise standards as defined in Policy N-7.

Policy N-9 ▶

The City’s preferences for providing noise mitigation are, in order (#1 is the most preferred, #5 the least):

- 1) Reduce noise at the source.
- 2) If #1 is not practical, seek to designate land uses which are compatible with projected noise levels.
- 3) If #1 or #2 are not practical, use distance from the source to reduce noise to acceptable levels.
- 4) If #1, #2, or #3 are not practical, use buildings, berms, or landscaping or a combination of these to reduce exterior noise to acceptable levels. Use construction techniques (sound-reducing windows, etc.) to reduce interior noise to acceptable levels.
- 5) The last measure which should be considered is the use of a sound wall to reduce noise to acceptable levels.

⁸ Standards for public schools are set and enforced by the State of California and are not regulated by the City of Madera.

Policy N-10▶

Where they are constructed, sound walls should be:

- 1) Considered only if proven effective by accompanying noise studies.
- 2) Be visually attractive, complement the surroundings, and require a minimum of maintenance. (See Community Design Element references to sound wall designs).
- 3) As small/low as possible consistent with the need to reduce noise to acceptable levels.

Policy N-11▶

The City shall generally not require the installation of sound walls in front yard areas to reduce noise to acceptable levels in residential areas which were originally constructed without sound walls. The City shall emphasize other methods to reduce noise levels in these situations, and may accept exterior noise levels higher than those shown in Policy N-5 in order to minimize the construction of sound walls. Examples of “other methods” include:

- Installation of double- or triple-paned windows
- Installation of weather stripping or seals to keep noise out
- Replacing wooden fencing with walls or other materials with better sound reducing properties.
- Use of rubberized asphalt to reduce roadway noise

Note to the Reader: Please see also the Community Design Element for policies related to the creation of attractive streetscapes and neighborhoods.

Policy N-12▶

All acoustical analysis prepared pursuant to this Noise Element shall:

- 1) Be the financial responsibility of the applicant.
- 2) Be prepared by a qualified person experienced in the fields of environmental noise assessment and architectural acoustics.
- 3) Include representative noise level measurements with sufficient sampling periods and locations to adequately describe local conditions and the predominant noise sources.
- 4) Estimate existing and projected cumulative (20 years) noise levels in terms of Ldn or CNEL and/or the standards in this Noise Element, and compare those levels to the policies in this Noise Element.
- 5) Recommend appropriate mitigation to achieve compliance with the adopted policies and standards of this Noise Element, giving preference to proper site planning and design over mitigation measures which require the construction of noise barriers or structural modifications to buildings which contain noise-sensitive land uses.
- 6) In cases where a sound wall is proposed, the potential impacts associated with noise reflecting off the wall and toward other properties or sensitive uses shall be evaluated.
- 7) Estimate noise exposure after the prescribed mitigation measures have been implemented.
- 8) Describe a post-project assessment program which could be used to evaluate the effectiveness of the proposed mitigation measures.

Policy N-13▶

For the purposes of CEQA analysis, a 5 db increase in CNEL or Ldn noise levels shall be normally considered to be a significant increase in noise.

Policy N-14▶

New equipment and vehicles purchased by the City shall comply with noise level performance standards consistent with the best available noise reduction technology.

Policy N-15▶

The City will require that aviation easements be recorded in conjunction with the approval of development projects on properties affected by airport noise as identified in the Airport Land Use Compatibility Plan.