CHAPTER 4
NOISE ELEMENT

1.0 INTRODUCTION

The purpose of the Noise Element is to provide a framework to limit noise exposure within the City. Existing and future noise environments and the compatibility of land uses are considered in the Element, as well as sensitive receptors and generators of stationary noise. Projected noise levels are included to help guide future land use policy and prevent high noise levels in sensitive areas at buildout.

Various measures are described in order to mitigate potential noise conflicts. These measures are designed to lessen impacts from unavoidable noise conflicts within the City of Glendora. The Noise Element also serves as a guideline for compliance with the State's Noise Insulation Standards.

2.0 AUTHORITY FOR ELEMENT

California Government Code Section 65302(f) requires that a General Plan include:

"…a noise element which shall identify and appraise noise problems in the community. The Noise Element shall recognize the guidelines established by the Office of Noise Control in the State Department of Health Services and shall analyze and quantify…current and projected noise levels for all of the following sources: (1) highways and freeways; (2) primary arterials and major local streets; (3) passenger and freight on-line railroad operations and ground rapid transit systems; (4) commercial, general aviation, heliport, and military airport operations, aircraft over flights, jet engine test stands, and all other ground facilities and maintenance functions related to airport operation; (5) local industrial plants, including but not limited to, railroad classification yards; (6) other ground stationary noise sources identified by local agencies as contributing to the community noise environment."

3.0 SUMMARY OF EXISTING CONDITIONS

The following section outlines existing noise resources within the City of Glendora.

3.1 NOISE SCALES AND DEFINITIONS

Sound pressure level is a measure of the sound pressure of a given noise source relative to a standard reference value. The reference pressure is typical of the quietest sound that a young person with good hearing is able to detect. Sound pressure levels are measured in decibels (dB). Decibels are logarithmic quantities, relating the sound pressure level of a noise source to the reference pressure level.

An important characteristic of sound is frequency. This is the rate of repetition of sound pressure oscillations (waves) as they reach our ears; frequency is expressed in hertz (Hz). When analyzing the total noise of any source, the frequency components are sometimes analyzed to determine the relative amounts of low-frequency, middle-frequency, and high-frequency noise. This breakdown is important for two reasons:

- Our ear is better equipped to hear mid- and high-range frequencies than lower frequencies. Thus, we find mid- and high-frequency noise to be more annoying. High-frequency noise is also more capable of producing hearing loss.

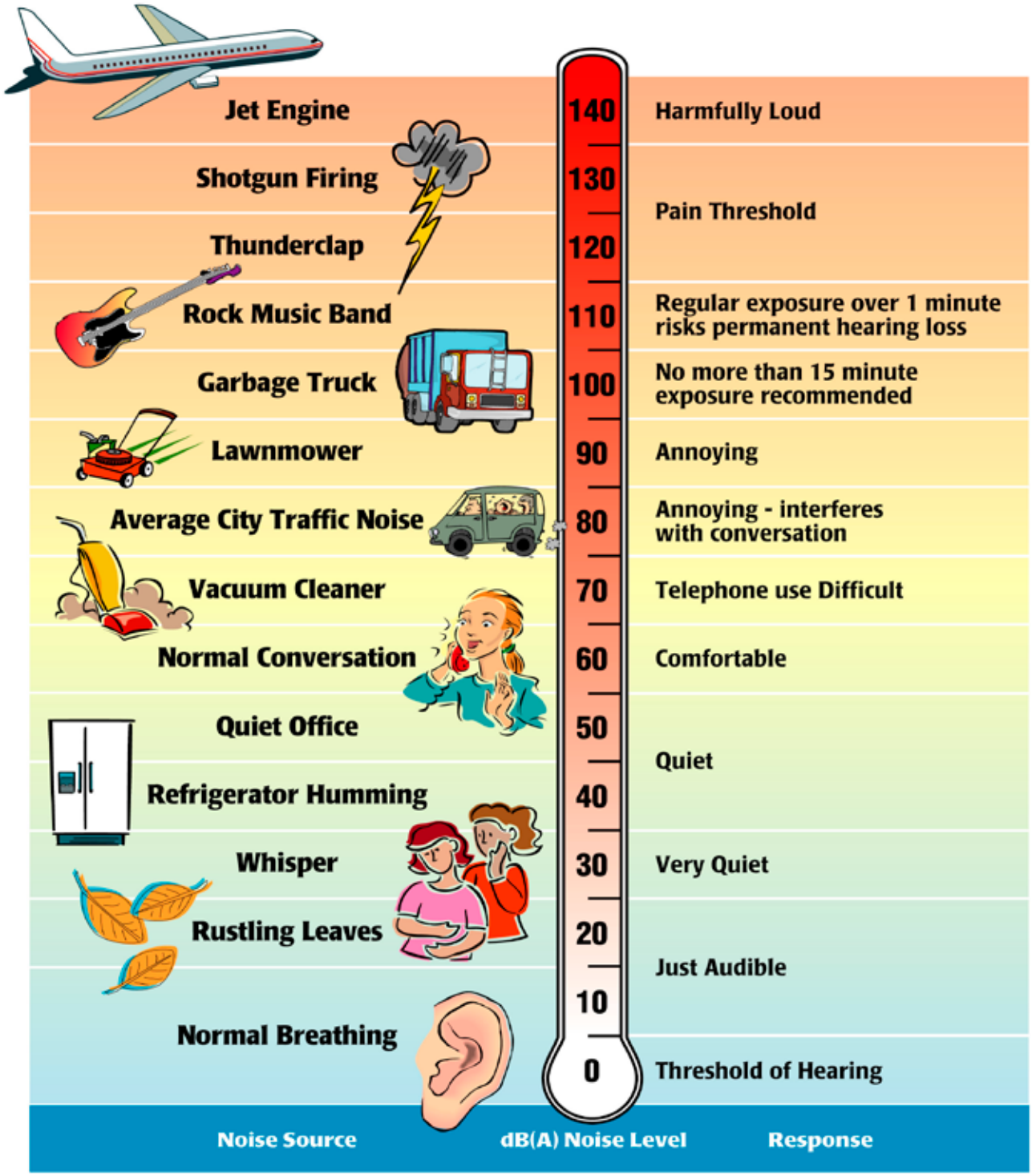
- Engineering solutions to a noise problem are different for different frequency ranges. Low-frequency noise is generally harder to control.

The normal frequency range of hearing for most people extends from a low frequency of about 20 Hz to a high frequency of about 10,000 to 15,000 Hz. People respond to sound most readily when the predominant frequency is in the range of normal conversation, typically around 1,000 to 2,000 Hz. Several filters have been developed that match the sensitivity of our ear and thus help us to judge the relative loudness of various sounds made up of many different frequencies. The so-called "A" filter is the best measure for most environmental noise sources. Sound pressure levels measured through this filter are referred to as A-weighted levels, and are measured in A-weighted decibels or (dBA). *Exhibit N–1*, *Common Environmental Noise Levels*, provides examples of common environmental noise levels.

The A-weighted filter significantly de-emphasizes those parts of the total noise that occur at lower frequencies (those below about 500 Hz) and also those at very high frequencies (above 10,000 Hz) the frequencies that we do not hear as well. The filter has very little effect, or is nearly "flat," in the middle range of frequencies (between 500 and 10,000 Hz), where our ears are most sensitive. Because this filter generally matches our ears' sensitivity, sounds having a higher A-weighted sound level are usually judged to be louder than those with lower A-weighted sound levels, a relationship that otherwise might not be true.

3.1.1 Community Noise Equivalent Level (CNEL)

Cumulative noise metrics were developed to assess community response to noise. They are useful because they attempt to take into account the loudness and duration of the noise, the total number of noise events, and the time of day these events occur in one single-number rating scale. They are designed to account for the known health effects of noise on people. The community noise equivalent level (CNEL) is a 24-hour, time-weighted energy-average noise level based on dBA that measures the overall noise during an entire day. Noise that occurs during certain sensitive time periods is penalized for occurring at these times (by adding decibels to its Leq measurement). On the CNEL scale, noise between 7:00 AM and 10:00 PM is penalized by approximately five dB, to account for the greater potential for noise to interfere during these hours, as well as the typically lower ambient (background) noise levels during these hours. Noise during the night (from 10:00 PM to 7:00 AM) is penalized by 10 dB to attempt to account for our higher sensitivity to noise in the nighttime and the expected further decrease in ambient noise levels that typically occur in the night.



Source:

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

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.

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06/07 • JN 10-102317

Common Environmental Noise Levels

Exhibit N-1

3.1.2 Equivalent Noise Level (Leq)

The equivalent sound level, abbreviated L_{eq}, is a measure of the exposure resulting from the accumulation of A-weighted sound levels over a particular time period (e.g., 1-hour, 8-hour, a school day, nighttime, or a full 24-hour day). However, because the length of the period can be different depending on the time frame of interest, the applicable period should always be identified or clearly understood when discussing the metric. Such durations are often identified through a subscript, for example, "L_{eq} (24)."

Conceptually, L_{EQ} may be thought of as a constant sound level over the period of interest that contains as much sound energy as the actual time-varying sound level with its normal peaks and valleys. It is important to realize, however, that the two signals (the constant one and the time-varying one) would sound very different from each other if compared in real life. Variations in the "average" sound level suggested by L_{eq} is not an arithmetic value, but a logarithmic ("energy-averaged") sound level. Thus, loud events clearly dominate any noise environment described by the metric.

3.1.3 Day Night Average (Ldn)

Another commonly used noise metric is the day/night average noise level (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 (EPA) for developing criteria to evaluate community noise exposure. L_{dn} is based on a measure of the average noise level over a given time period. The L_{dn} is calculated by averaging the L_{eq} for each hour of the day at a given location after penalizing the sleeping hours (from 10:00 PM to 7:00 AM) by 10 dBA to take into account the increased sensitivity of people to noises that occur at night. The sound level exceeded over a specified time frame can be expressed as L_n (i.e., L_{90}, L_{50}, L_{10}, etc.). L_{50} equals the level exceeded 50 percent of the time; L_{10}, 10 percent of the time; etc.

3.1.4 Other Noise Matrices

People tend to respond to changes in sound pressure in a logarithmic manner. In general, a 1 dBA change in the sound pressure levels of a given sound is detectable only under laboratory conditions. A 3 dBA change in sound pressure level is considered a detectable difference in most situations. A 5 dBA change is readily noticeable and a 10 dBA change is considered a doubling (or halving) of the subjective loudness. It should be noted that a 3 dBA increase or decrease in the average traffic noise level is realized by a doubling or halving of the traffic volume; or by about a 7 mile per hour (mph) increase or decrease in speed.

For each doubling of distance from a point noise source, the sound level will decrease by 6 dBA. In other words, if a person is 100 feet from a machine, and moves to 200 feet from that source, sound levels will drop approximately 6 dBA. For each doubling of distance from a line source, like a roadway, noise levels are reduced by 3 to 5 decibels, depending on the ground cover between the source and the receiver.

Noise barriers can provide approximately a 5 dBA CNEL noise reduction (additional reduction may be provided with a barrier of appropriate height, material, location and length). A row of buildings

provides up to 5 dBA CNEL noise reduction with a 1.5 dBA CNEL reduction for each additional row up to a maximum reduction of approximately 10 dBA. The exact degree of noise attenuation depends on the nature and orientation of the structure and intervening barriers.

3.2 NOISE STANDARDS

3.2.1 Federal Noise Standards

The United States Noise Control Act of 1972 (NCA) recognized the role of the Federal government in dealing with major commercial noise sources in order to provide for uniform treatment of such sources. As Congress has the authority to regulate interstate and foreign commerce, regulation of noise generated by such commerce also falls under congressional authority. The Federal government specifically preempts local control of noise emissions from aircraft, railroad and interstate highways.

The EPA offers guidelines for community noise exposure in the publication *Noise Effects Handbook – A Desk Reference to Health and Welfare Effects of Noise*. These guidelines consider occupational noise exposure, as well as noise exposure in homes. The EPA recognizes an exterior noise level of 55 dB Ldn as a general goal to protect the public from hearing loss, activity interference, sleep disturbance, and annoyance. The EPA and other Federal agencies have adopted suggested land use compatibility guidelines that indicate that residential noise exposures of 55 to 65 dB Ldn are acceptable. The EPA notes, however, that these levels are not regulatory goals, but are levels defined by a negotiated scientific consensus, without concern for economic and technological feasibility or the needs and desires of any particular community.

3.2.2 State Noise Standards

The Office of Noise Control in the State Department of Health Services has developed criteria and guidelines for local governments to use when setting standards for human exposure to noise and preparing noise elements for General Plans. A noise environment of 50 to 60 CNEL is considered to be "normally acceptable" for residential uses. The State indicates that locating residential units, parks, and institutions (such as churches, schools, libraries, and hospitals) in areas where exterior ambient noise levels exceed 65 CNEL is undesirable. The Office of Planning and Research (OPR) recommendations also note that, under certain conditions, more restrictive standards than the maximum levels cited may be appropriate. As an example, the standards for quiet suburban and rural communities may be reduced by 5 to 10 dB to reflect their lower existing outdoor noise levels in comparison with urban environments.

In addition, Title 25, Section 1092 of the *California Code of Regulations*, sets forth requirements for the insulation of multiple-family residential dwelling units from excessive and potentially harmful noise. Whenever such units are to be located in such areas, the developer must incorporate into building design construction features that reduce interior noise levels to 45 dBA CNEL.

Table N-1, *Noise and Land Use Compatibility Matrix-California*, illustrates the State guidelines established by the State Department of Health Services for acceptable noise levels for counties and cities. These standards and criteria will be incorporated into the land use planning process to reduce future noise and land use incompatibilities. This table is the primary tool that allows the City to ensure integrated planning for compatibility between land uses and outdoor noise.

3.2.3 CITY NOISE STANDARDS

The City of Glendora maintains a comprehensive Noise Ordinance within the *Glendora Municipal Code* that sets standards for noise levels citywide and provides the means to enforce the reduction of obnoxious or offensive noises.

City Noise Ordinance

Chapter 09.44.050 of the *Glendora Municipal Code* establishes noise standards and enforcement procedures. Section 09.44.050, establishes noise standards and enforcement procedures. *Table N-2*, *Glendora Noise Ordinance Standards*, summarizes noise standards established by the City.

The Ordinance is designed to control unnecessary, excessive and annoying sounds generated on one piece of property from impacting an adjacent property and to protect residential areas from noise sources, including noise generated by traffic. As shown in *Table N-2*, between the hours of 7:00 PM and 7:00 AM, the noise standards are more stringent than during the day hours of 7:00 AM to 7:00 PM.

The Noise environment in Glendora is dominated by vehicular traffic including vehicular generated noise along Interstate 210 (I-210) and primary and secondary arterials. In addition, a number of other sources contribute to the total noise environment. These noise sources include construction activities, power tools and gardening equipment, loudspeakers, auto repair, radios, children playing and dogs barking. In order to provide a description of the existing noise environment in Glendora, noise contours were quantified for highway and local street traffic.

3.3 EXISTING NOISE CONDITIONS

Human response to noise varies widely depending on the type of noise, time of day, and sensitivity of the receptor. The effects of noise on humans can range from temporary or permanent hearing loss to mild stress and annoyance due to such things as speech interference and sleep deprivation. Prolonged stress, regardless of the cause, is known to contribute to a variety of health disorders. Noise, or the lack of it, is a factor in the aesthetic perception of some settings, particularly those with religious or cultural significance.

Table N-1
Noise and Land Use Compatibility Matrix - California

Land Use Category	Community Noise Exposure (L_{dn} or CNEL, dBA)			
	Normally Acceptable	Conditionally Acceptable	Normally Unacceptable	Clearly Unacceptable
Residential - Low Density, Single-Family, Duplex, Mobile Homes	50 - 60	55 - 70	70-75	75-85
Residential - Multiple Family	50 - 65	60 - 70	70 - 75	70 - 85
Transient Lodging - Motel, Hotels	50 - 65	60 - 70	70 - 80	80 - 85
Schools, Libraries, Churches, Hospitals, Nursing Homes	50 - 70	60 - 70	70 - 80	80 - 85
Auditoriums, Concert Halls, Amphitheaters	NA	50 - 70	NA	65 - 85
Sports Arenas, Outdoor Spectator Sports	NA	50 - 75	NA	70 - 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 - 70	67.5 - 77.5	75 - 85	NA
Industrial, Manufacturing, Utilities, Agriculture	50 - 75	70 - 80	75 - 85	NA

NA: Not Applicable

Source: *General Plan Guidelines*, Office of Planning and Research, California, October 2003.

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. Conventional construction, but with closed windows and fresh air supply systems or air conditioning, will normally suffice.

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.

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

Table N-2
Glendora Noise Ordinance Standards

Zone	Noise Level (dBA)		
	Day: 7AM – 7PM	Evening: 7PM-10PM	Night: 10PM – 7AM
Single Family Residential (R-1)	55	50	45
Multiple Residential (R-3 and R-4)	55	55	50
Commercial	65	65	60
Industrial and Light Manufacturing	70	70	70
Special Zones (MS)	55	50	45

Source: *Glendora Municipal Code*, Chapter 9.44.040 (Ambient noise base levels)

Table N-3, *Sensitive Receptors* illustrate some of the sensitive receptors that are located within the City of Glendora and can be affected by excess noise levels.

Table N-3
Sensitive Receptors

RECEPTOR	LOCATION
Institutional:	
Hope Lutheran Church	1041 E. Foothill Blvd
Mar Thoma Church of Los Angeles	134 S. Vista Bonita Avenue
Grace Episcopal Church	555 E. Mountain View Avenue
Church of the Brethren	150 S. Vermont Avenue
Glendora Grace Lutheran Church	804 E. Foothill Blvd.
United Methodist Church	201 E. Bennett Avenue
Church of the Open Door	701 W. Sierra Madre Avenue
Reason to Believe	731 E. Arrow Highway
First Christian Church	300 N. Glendora Avenue
Cornerstone Bible Church	400 N. Glendora Avenue
Glendora Alliance Church	116 E. Carroll Avenue
The Church of Jesus Christ of Latter-Day Saints	955 W. Foothill Blvd.
Christian Science Church	151 N. Glendora Avenue
Grace Church of Glendora Preschool	1515 S. Glendora Avenue
Cullen Elementary School	440 N. Live Oak
La Fetra Elementary School	547 W. Bennett
Sellers Elementary School	500 N. Loraine Avenue
Stanton Elementary School	725 S. Vecino Avenue
Sutherland Elementary School	1330 N. Amelia
Williams Elementary School	301 S. Loraine Avenue
Goddard Middle School	859 E. Sierra Madre
Sandburg Middle School	819 W. Bennett
Glendora High School	1600 E. Foothill Blvd.
Whitcomb High School	350 W. Mauna Loa
Arrow High School	1505 S. Sunflower
Washington Elementary	325 W. Gladstone
Willow Elementary	1427 S. Willow
Citrus Community College	1000 West Foothill Boulevard
Glendora Public Library	140 S. Glendora Avenue
Foothill Presbyterian Hospital	250 S. Grand Avenue
Huntington East Valley Hospital	150 W. Route 66
Arbor Glen Care Center	1033 E. Arrow Highway
Emmanuel health Care & Rehabilitation Center	805 W. Arrow Highway
Foothill Nursing and Rehabilitation Center	401 W. Ada Avenue
YMCA: Glendora	505 N. Grand Avenue

Table N-3
Sensitive Receptors (Continued)

RECEPTOR	LOCATION
PARKS:	
Dawson Avenue Park (5.44 acres)	201 Dawson Avenue
Sandburg School Park (12.19 acres)	Leadora Avenue & Wildwood Avenue
Big Tree Park (0.34 acres)	665 S. Santa Fe Avenue
Gladstone Park (8.37 acres)	600 E. Gladstone Avenue
Ole Hammer Park (1.74 acres)	362 N. Live Oak Avenue
Finkbiner Park	160 N. Wabash Avenue
George Manooshian School Park	E. Palm Drive & N. Loraine Avenue
Willow Springs Park (1.21 acres)	515 N. Willow springs Lane
South Hills Park (3.00 acres)	701 E. Mauna Loa Avenue
Rainbird Park (4.66 acres)	
C.E. Equestrian Park (2.11 acres)	1000 N. Glendora Mountain Road
Centennial Park (0.90 acres)	725 E. Mauna Loa Avenue

3.3.1 Traffic Noise

Existing Roadway Conditions

Interstate 210 (I-210) traverses the southern portion of the City in an east/west direction. City roadways are generally comprised of major north/south arterial roadways (i.e., Grand Avenue and Lone Hill Avenue) and major east/west arterial roadways (i.e., Route 66, Arrow Highway, and Base Line Road). Posted speed limits range from 35 to 40 miles per hour (mph). Secondary roadways and collector roads are located throughout the City in a grid pattern. Posted speed limits range from 25 to 40 mph along these roadways.

Traffic Noise Levels

Traffic noise levels can be reliably predicted using formulas that take into account traffic volume, speed, and percentage of trucks. Existing noise contours were calculated for all of the City's primary and major arterials, as well as I-210 that traverse the City, roadways within residential and commercial uses. Noise generation for each roadway segment was calculated and the distance to the 60, 65, and 70 dBA CNEL contours was determined.

A noise contour is a line behind which the noise level does not exceed a certain value. For instance, the 60 dBA CNEL contour indicates that the CNEL between the street and the contour line is equal to, or greater than 60 dBA. This means that the CNEL beyond the contour line, away from the street, is less than 60 dBA.

Existing modeled traffic noise levels can be found in *Table N-4*, *Existing Traffic Noise Levels* for the approximate location of existing noise contours based on average daily traffic (ADT).

Table N-4
Existing Traffic Noise Levels

Roadway Segment	ADT	dBA @ 100 Feet from Roadway Centerline	Distance from Roadway Centerline to: (Feet)		
			60 CNEL	65 CNEL	70 CNEL
Sierra Madre Avenue					
Between Live Oak Avenue and Loraine Avenue	5,030	53.3	38	18	8
Between Loraine Avenue and Valley Center Avenue	4,450	52.8	35	16	7
Foothill Boulevard					
Barranca Avenue and Grand Avenue	12,790	59.9	110	35	11
Grand Avenue and Vermont Avenue	19,250	65.8	451	143	45
Elwood Avenue and Loraine Avenue	11,328	56.4	65	30	14
Loraine Avenue and Valley Center Avenue	12,590	56.8	70	32	15
Valley Center Avenue and Lone Hill Avenue	13,810	57.2	74	34	16
Route 66					
Barranca Avenue and Grand Avenue	19,145	64.5	330	104	33
Grand Avenue and Vermont Avenue	20,130	64.7	347	110	35
Vermont Avenue and Glendora Avenue	19,950	64.6	344	109	34
Glendora Avenue and Pasadena Avenue	24,380	65.5	421	133	42
Pasadena Avenue and Elwood Avenue	24,100	65.5	416	132	42
Elwood Avenue and Loraine Avenue	23,820	65.4	410	130	41
Loraine Avenue and Compromise Line Road	24,945	65.6	430	136	43
Base Line Road					
Barranca Avenue and Grand Avenue	6,310	59.6	109	34	11
Grand Avenue and Glendora Avenue	11,285	62.2	195	62	19
Gladstone Street					
Barranca Avenue and Grand Avenue	11,290	60.4	126	59	27
Grand Avenue and Glendora Avenue	11,395	60.5	127	59	27

Table N-4 (Continued)
Existing Traffic Noise Levels

Roadway Segment	ADT	dBA @ 100 Feet from Roadway Centerline	Distance from Roadway Centerline to: (Feet)		
			60 CNEL	65 CNEL	70 CNEL
Glendora Avenue and Bonnie Cove Avenue	14,530	61.5	150	69	32
Bonnie Cove Avenue and Sunflower Avenue	12,500	60.9	135	63	29
Sunflower Avenue and Valley Center Avenue	11,930	60.7	131	61	28
Valley Center Avenue and Lone Hill Avenue	14,410	61.5	149	69	32
Grand Avenue					
Leadora Avenue and Bennett Avenue	9,920	58.9	95	44	20
Bennett Avenue and Foothill Boulevard	12,500	59.5	110	51	24
Foothill Boulevard and Ada Avenue	18,870	64.4	325	103	33
Ada Avenue and Route 66	18,590	64.4	325	103	33
Route 66 and Mauna Loa Avenue	23,500	61.3	144	67	31
Mauna Loa Avenue and Base Line Road	24,310	65.5	419	132	42
Base Line Road and Gladstone Street	27,490	63.0	186	87	40
Gladstone Street and Juanita Avenue	26,420	62.8	182	84	39
Glendora Avenue					
Route 66 and Base Line Road	16,935	62.2	166	77	36
Base Line Road and Interstate 210	13,160	61.1	140	65	30
Interstate 210 and Gladstone Avenue	15,200	61.7	154	72	33
Gladstone Avenue and Juanita Avenue	11,760	60.6	130	60	28
Loraine Avenue					
North of Sierra Madre Avenue	2,110	53.2	41	19	9
Sierra Madre Avenue and Leadora Avenue	2,790	54.4	50	23	11
Leadora Avenue and Bennett Avenue	4,820	56.7	72	33	15
Bennett Avenue and Foothill Boulevard	6,850	58.3	91	42	20
Foothill Boulevard and Route 66	6,395	58.0	87	40	19
Sunflower Avenue					
Interstate 210 and Gladstone Street	10,250	60.0	119	55	26
Gladstone Street and Juanita Avenue	9,040	59.5	109	51	23
Valley Center Avenue					
Bennett Avenue and Foothill Boulevard	5,180	53.4	38	18	8
Foothill Boulevard and Compromise Line Road	4,890	56.8	72	34	16
Lone Hill Avenue					
Foothill Boulevard and Route 66	14,580	57.5	77	36	17
Route 66 and Interstate 210	27,870	63.0	188	87	41
Interstate 210 and Gladstone Street	26,720	65.9	460	146	46
Amelia Avenue					
Foothill Boulevard and Route 66	5,260	53.5	39	18	8
Route 66 and Interstate 210	7,740	58.8	98	46	21

1. Traffic modeling based upon data contained within the *Traffic Impact Study* prepared by Kimley-Horn and Associates Inc. in April 2007.

3.3.2 Stationary Noise

Commercial and industrials land uses located near residential areas currently generate occasional noise impacts. The primary noise sources associated with these facilities are caused by delivery trucks, air compressors, generators, outdoor loudspeakers, and gas venting. Other significant stationary noise sources in the City include noise from construction activity, street sweepers, and gas-powered leaf blowers. Residential land uses and areas identified as noise-sensitive, must be protected from excessive stationary noise. Stationary sources include, among others, commercial and industrial centers. These impacts are best controlled through effective land use planning and application of the City Noise Ordinance.

3.3.3 Other Stationary Noise Sources

Ambient Noise

In atmospheric sound transmission or noise pollution, the ambient noise level is the sound pressure level at a given location, normally specified as a reference level to study a new intrusive sound source. Ambient sound levels are often measured in order to map sound conditions over a spatial regime to understand their variation with locale. In this case the product of the investigation is a sound level contour diagram. Alternatively ambient noise levels may be measured to provide a reference point for analyzing an intrusive sound to a given environment. For example, aircraft noise is studied by measuring ambient sound without the presence of any overflights, and then studying the noise addition by measurement or computer simulation of overflight events.

Ambient noise level is measured with a sound level meter. It is usually measured in dB above a reference pressure level of 0.00002 Pascals (Pa), in the International System of Units (SI). Most frequently ambient noise levels are measured using a frequency-weighting filter, the most common being the A-weighting scale, such that resulting measurements are denoted dBA, or decibels on the A-weighting scale.

Noise Measurement Methodology

Locations for noise measurements were selected utilizing aerial photographs flown by Eagle Aerial in 2006, as well as a land use map provided by the City of Glendora. RBF utilized the aerial photograph to divide the City into a grid, which was then further grouped into similar land uses to determine specific areas to be measured. RBF determined nine areas that would provide sufficient data to establish an acoustical baseline for the City. RBF conducted one short-term noise measurement (10 minutes in length) in each designated area on May 3, 2007.

Noise monitoring equipment used for the ambient short-term noise survey consisted of a Brüel & Kjær Hand-held Analyzer Type 2250 equipped with a 4189 microphone. The monitoring equipment complies with applicable requirements of the American National Standards Institute (ANSI) for Type I (precision) sound level meters.

Noise Measurement Results

Noise measurements were conducted by RBF Consulting on May 3, 2007 and are shown in *Table N-5*, *Noise Measurements*. The noise measurement sites were representative of typical existing noise exposure adjacent to major roadways as well as within residential and commercial uses. Meteorological conditions were typical, with light wind speeds (0 to 5 miles per hour), low humidity and clear skies. Existing measured short-term noise levels ranged from 49.0 dBA to 66.3 dBA.

Table N-5
Noise Measurements

Site No.	Location	Leq (dBA)	Time
1	Located at the intersection of Gladstone Street and Grand Avenue, north of Oakdale Memorial Park.	66.3	10:26 AM
2	Located north along Foothill Boulevard and west along Barranca Avenue.	65.3	10:59 AM
3	Located along Route 66, near Huntington East Valley Hospital.	64.4	11:28 AM
4	Located in the southwest corner of Finkbiner Park.	46.6	11:51 AM
5	Located at the intersection of East Sierra Madre and Loraine Avenue within residential uses and nearby a middle school.	59.2	12:13 PM
6	Located within a residential area along Lemon Avenue (east of Loraine Avenue).	49.0	1:14 PM
7	Located within a residential area, north of Route 66 and east of Lone Hill Avenue.	49.1	1:39 PM
8	Located within a commercial general area to the west of Lone Hill Avenue and south of Interstate-210.	60.2	2:08 PM
9	Located within a residential area (north of Arrow Highway) that adjoin commercial uses.	57.4	2:33 PM

Source: Noise Monitoring Survey conducted by RBF Consulting, May 3, 2007.

4.0 NOISE CONTOURS

Projected general plan buildout noise levels can be found in *Table N-6*, *General Plan Buildout Traffic Noise Levels*.

Exhibit N-2, *Existing Noise Contours*, and *Exhibit N-3*, *General Plan Buildout Noise Contours*, provide existing and expected 2025 noise contours along many of the city's major and secondary arterials and the two freeways that traverse the City.

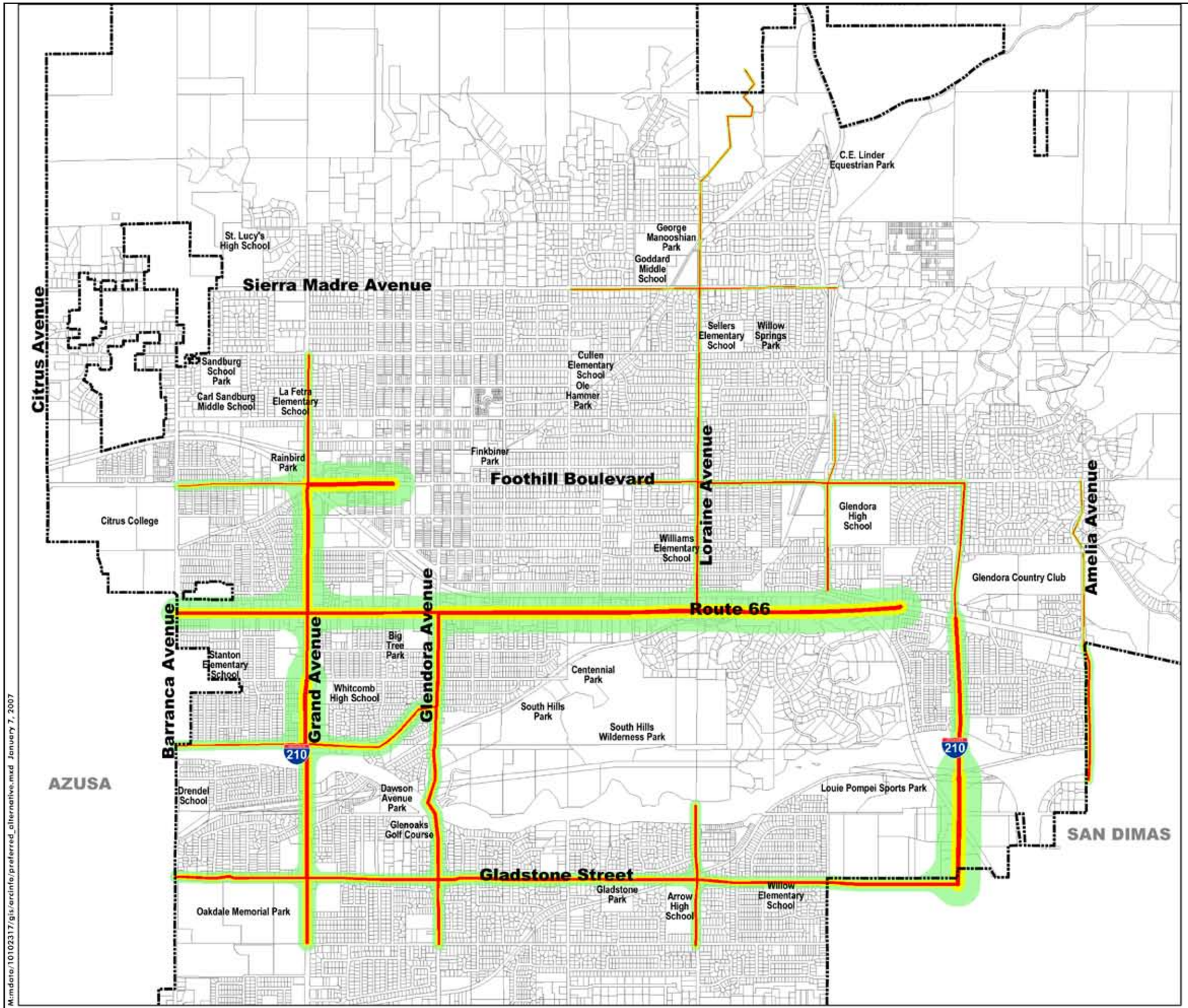
Table N-6
General Plan Buildout Traffic Noise Levels

Roadway Segment	ADT	dBA @ 100 Feet from Roadway Centerline	Distance from Roadway Centerline to: (Feet)		
			60 CNEL	65 CNEL	70 CNEL
Sierra Madre Avenue					
Between Live Oak Avenue and Loraine Avenue	6,290	54.3	44	20	9
Between Loraine Avenue and Valley Center Avenue	5,870	54.0	42	19	9
Foothill Boulevard					
Barranca Avenue and Grand Avenue	13,700	60.2	118	37	12
Grand Avenue and Vermont Avenue	20,100	66.0	471	149	47
Elwood Avenue and Loraine Avenue	12,210	56.7	68	32	15
Loraine Avenue and Valley Center Avenue	14,060	57.3	75	35	16
Valley Center Avenue and Lone Hill Avenue	15,610	57.8	80	37	17
Route 66					
Barranca Avenue and Grand Avenue	12,255	62.5	211	67	21
Grand Avenue and Vermont Avenue	23,990	65.4	414	131	41
Vermont Avenue and Glendora Avenue	22,270	65.1	384	121	38
Glendora Avenue and Pasadena Avenue	27,320	6.0	471	149	47
Pasadena Avenue and Elwood Avenue	27,450	6.0	473	150	47
Elwood Avenue and Loraine Avenue	27,580	66.0	475	150	48
Loraine Avenue and Compromise Line Road	28,830	66.2	497	157	50
Base Line Road					
Barranca Avenue and Grand Avenue	10,280	61.8	177	56	18
Grand Avenue and Glendora Avenue	12,115	62.5	209	66	21
Gladstone Street					
Barranca Avenue and Grand Avenue	12,200	60.8	133	62	29
Grand Avenue and Glendora Avenue	12,465	60.9	135	63	29
Glendora Avenue and Bonnie Cove Avenue	16,270	62.0	161	75	35
Bonnie Cove Avenue and Sunflower Avenue	19,390	62.8	181	84	39
Sunflower Avenue and Valley Center Avenue	18,730	62.6	177	82	38
Valley Center Avenue and Lone Hill Avenue	19,480	62.8	182	84	39
Grand Avenue					
Leadora Avenue and Bennett Avenue	12,440	59.5	110	51	24
Bennett Avenue and Foothill Boulevard	15,220	60.4	126	58	27
Foothill Boulevard and Ada Avenue	21,570	65.0	372	118	37
Ada Avenue and Route 66	23,990	62.4	170	79	37
Route 66 and Mauna Loa Avenue	30,250	66.4	521	165	52
Mauna Loa Avenue and Base Line Road	32,750	66.8	565	179	56
Base Line Road and Gladstone Street	32,730	63.7	209	97	45
Gladstone Street and Juanita Avenue	28,900	63.2	193	89	42

Table N-6 (Continued)
General Plan Buildout Traffic Noise Levels

Roadway Segment	ADT	dBA @ 100 Feet from Roadway Centerline	Distance from Roadway Centerline to: (Feet)		
			60 CNEL	65 CNEL	70 CNEL
Glendora Avenue					
Route 66 and Base Line Road	20,920	63.1	191	89	41
Base Line Road and Interstate 210	17,040	62.2	166	77	36
Interstate 210 and Gladstone Avenue	19,150	62.7	180	83	39
Gladstone Avenue and Juanita Avenue	15,140	61.7	154	71	33
Loraine Avenue					
North of Sierra Madre Avenue	2,980	54.7	52	24	11
Sierra Madre Avenue and Leadora Avenue	3,360	55.2	56	26	12
Leadora Avenue and Bennett Avenue	5,525	57.3	79	36	17
Bennett Avenue and Foothill Boulevard	7,690	58.8	98	45	21
Foothill Boulevard and Route 66	6,855	58.3	91	42	20
Sunflower Avenue					
Interstate 210 and Gladstone Street	10,470	60.1	120	56	26
Gladstone Street and Juanita Avenue	9,530	59.7	113	52	24
Valley Center Avenue					
Bennett Avenue and Foothill Boulevard	6,590	54.5	45	21	10
Foothill Boulevard and Compromise Line Road	6,770	58.2	90	42	19
Lone Hill Avenue					
Foothill Boulevard and Route 66	18,250	58.4	89	41	19
Route 66 and Interstate 210	36,740	64.2	226	105	49
Interstate 210 and Gladstone Street	33,438	66.9	577	182	58
Amelia Avenue					
Foothill Boulevard and Route 66	5,560	53.7	40	19	9
Route 66 and Interstate 210	8,070	59.0	101	47	22

1. Traffic modeling based upon data contained within the *Traffic Impact Study* prepared by Kimley-Horn and Associates Inc. in April 2007.



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EXISTING NOISE CONTOURS

EXHIBIT N-2

LEGEND

Noise Levels

- 70 CNEL
- 65 CNEL
- 60 CNEL
- CITY LIMITS

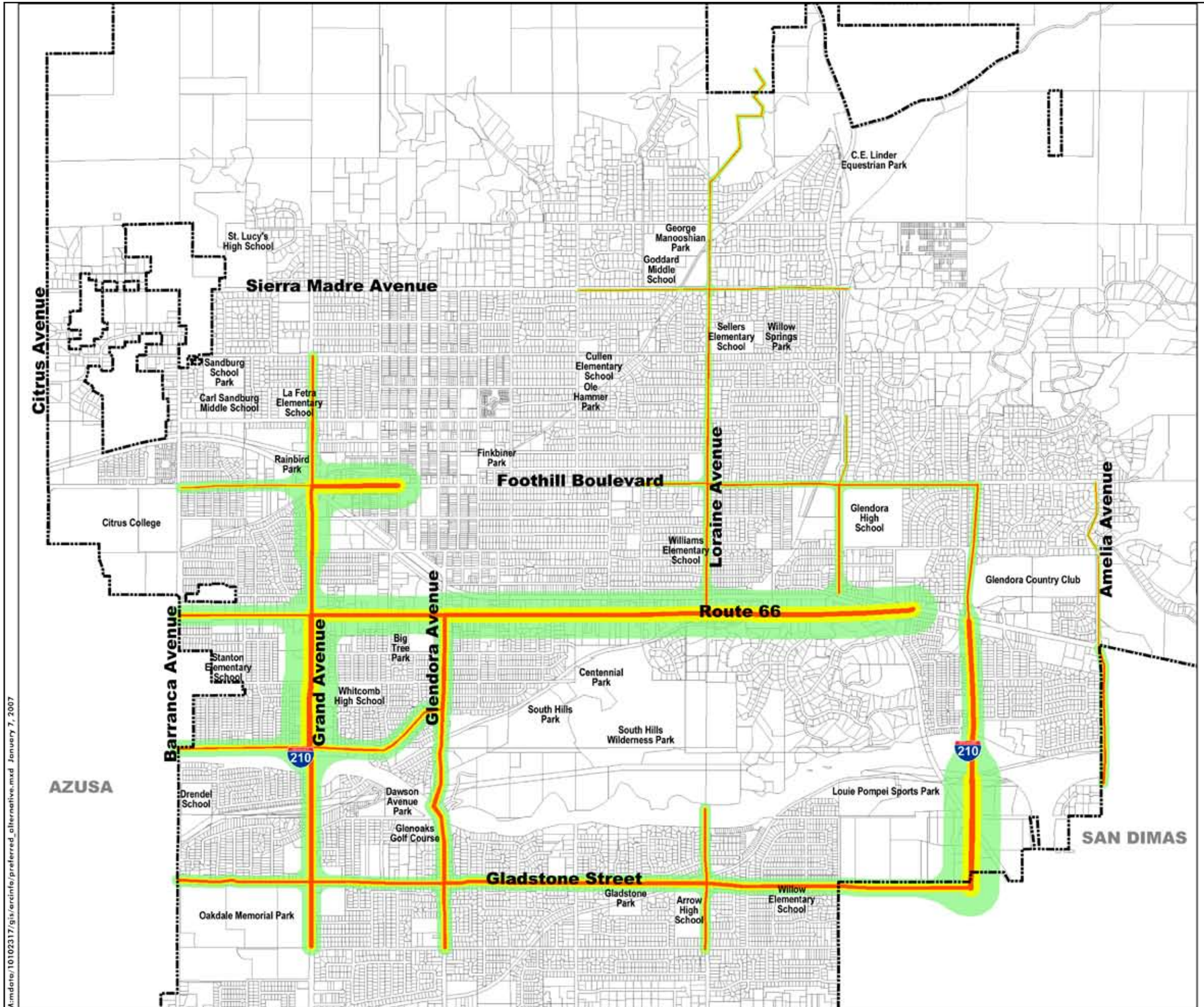
Source: GIS Data, City of Glendora

NORTH

0 2,000 Feet

GENERAL PLAN BUILDOUT NOISE CONTOURS

EXHIBIT N-3



LEGEND

Noise Levels

- 70 CNEL
- 65 CNEL
- 60 CNEL
- CITY LIMITS

Source: GIS Data, City of Glendora

NORTH

0 2,000 Feet

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Exhibits N-2 and *N-3* display the average daily traffic (ADT) volume noise levels at 100 feet from the roadway centerline and the distance from the roadway centerline to the 70, 65, and 60 dBA CNEL contours. None of the roadways measured generated currently general noise levels at a distance of 100 feet from centerline that exceed 70 CNEL. Of the 48 roadway links modeled within the City planning area, seven roadway links generate noise levels at 65 CNEL or greater at 100 feet from centerline.

Twenty-one of the roadway links modeled generate noise levels between 60 CNEL and 65 CNEL. These links include Route 66 between Barranca Avenue and Glendora Avenue, Base Line Road between Grand Avenue and Glendora Avenue, segments along Gladstone Street between Barranca Avenue and Lone Hill Avenue, segments along Grand Avenue from Foothill Boulevard and Gladstone Street and Juanita Avenue, Glendora Avenue between Route 66 and Juanita Avenue, a segment on Sunflower Avenue between Interstate 210 to Gladstone Street, and one on Lone Hill Avenue from Route 66 and Interstate 210.

Fourteen of the 48 roadway segments modeled generate noise levels between 55 CNEL and 60 CNEL. These segments are along Foothill Boulevard between Barranca and Grand Avenue and Elwood and Loraine Avenue, Base Line Road between Barranca and Grand Avenue, Grand Avenue between Leadora Avenue and Foothill, Loriane Avenue between Leadora Avenue and Route 66, a segment on Sunflower Avenue between Gladstone Street and Juanita Avenue, Valley Center Avenue at Foothill Boulevard and Compromise Line Road, Lone Hill Avenue between Foothill Boulevard and Route 66, and Amelia Avenue between Route 66 and Interstate 210.

Six modeled roadway links with nose levels below 55 CNEL at 100 feet from centerline are located along Sierra Madre Avenue between Live Oak Avenue and Valley Center Avenue, Loraine Avenue north of Sierra Madre and between Sierra Madre and Leadora Avenue, along Valley Center Avenue between Bennett Avenue and Foothill Boulevard, and Amelia Avenue between Foothill Boulevard and Route 66.

Tables in the Circulation Element indicated traffic volumes on designated street segments. Surface traffic noise has the greatest impact on the noise environment of Glendora's residential and sensitive-receptor properties. Contours between 55 and 60 dBA CNEL are common along City collector streets, 65 dBA CNEL or greater contours are common along major streets.

5.0 DESCRIPTION OF NOISE PLAN

Transportation noise is the most serious noise problem in Glendora. However, local government has little direct control of transpiration noise at the source. State and federal agencies have the responsibility to control vehicle noise admission levels. The noise effective method the City has to mitigate transportation noise by reducing noise impact on the community. Mitigation through site planning and the design and construction of a noise barrier are the most common ways of alleviating traffic noise impacts in existing urban environments.

5.1 TYPICAL NOISE ATTENUATION TECHNIQUES

Noise impacts can be mitigated in three basic ways: by reducing the sound level of the noise generator, by increasing the distance between the source and receiver, and by insulating the receiver.

Noise reduction can be accomplished by placement of walls, landscaped berms, or a combination of the two, between the noise source and the receiver. Generally, effective noise shielding requires a solid barrier with a mass of at lease four pounds per square-foot of surface area which is large enough to block the line of sight between source and receiver. Variations may be appropriate in individual cases based on distance, nature and orientation of buildings behind the barrier, and a number of other factors. Garages or other buildings may be used to shield dwelling units and outdoor living areas from traffic noise.

In addition to site design techniques, noise insulation can be accomplished through proper design of buildings. Nearby noise generators should be recognized in determining the location of doors, windows and vent openings. Sound-rated windows (extra thick or multi-paned) and wall insulation are also effective. None of these measures, however, can realize their full potential unless care is taken in actual construction: doors and windows fitted properly; openings sealed; joints caulked; plumbing adequately insulted from structural members. Sound-related doors and windows will have little effect if left open. This may require installation of air conditioning for adequate ventilation. This chain of design, construction and operation is only as effective as its weakest link.

Noise impacts can be reduced by insulating noise sensitive uses, such as residences, schools, libraries, hospitals, nursing and care homes and some types of commercial activities. But perhaps a more efficient approach involves limiting the level of noise generation at the source. State and Federal statutes have largely preempted local control over vehicular noise emissions but commercial and industrial operations and certain residential activities provide opportunities for local government to assist in noise abatement. Local ordinances may establish maximum levels for noise generated on-site. This usually takes the form of limiting the level of noise permitted to leave the property where it may impact other uses.

Although vehicular noise emissions standards are established at the State and Federal levels, local agencies can play a significant part in reducing traffic noise by controlling traffic volume and congestion. Traffic noise is greatest at intersections due to acceleration, deceleration and gear shifting. Measures such as sign synchronization can help to minimize this problem. Likewise, reduction of congestion aids in reduction of noise. This can be accomplished through the application of traffic engineering techniques such as channelization of turning movements, parking restrictions, separation of modes (bus, auto, bicycle, pedestrian) and restrictions on truck traffic.

Noise reduction through reduction of traffic volumes can also be accomplished with incentive programs for traffic volumes can also be accomplished with incentive programs for use of public transit facilities and high-occupancy vehicles, staggering of work hours and land use controls. Vehicle trips can be turned into pedestrian trips with integration of housing and employment into the same project or area, construction of high-density, affordable housing in proximity to employment, shopping and public transit facilities and other techniques.

5.2 NOISE AND LAND USE PLANNING INTEGRATION

Information relative to the existing and future noise environments within Glendora should be integrated into future land use planning decisions. The Element presents the existing and future noise environments so that the City will include noise impact considerations in development programs. Noise and land use compatibility guidelines are presented, as well as noise standards for new developments. Community noise considerations are to be incorporated into land use planning to the maximum extent feasible.

5.3 TRANSPORTATION NOISE CONTROL

The most efficient and effective means of controlling noise from transportation systems is to reduce noise at the source. However, since the City has little direct control over source noise levels because of State and federal preemption (for example, State motor vehicle noise standards and Federal air regulations), the City should focus on reducing the impact of the noise on the community.

5.4 NON-TRANSPORTATION NOISE CONTROL

People must be protected from excessive noise from non-transportation sources, including commercial and industrial centers. These impacts are most effectively controlled through the application of the City's Noise Ordinance.

6.0 PLANNING FACTORS, GOALS, AND POLICIES

TRANSPORTATION NOISE IMPACTS

Planning Consideration: The most significant contributors to noise impacts are generated from transportation sources. The City of Glendora seeks to minimize the noise impacts associated with transportation to the greatest extent feasible. Minimizing these impacts requires the evaluation of existing noise sources and coordination of appropriate mitigation through design and policy considerations.

Goal	N-1:	Reduced noise impacts from transportation sources.
Policies	N-1.1	Ensure traffic noise mitigation measures are included and implemented in the design of new development.
	N-1.2	Encourage the State Department of Transportation (Caltrans) to continue programs that lead to the reduction of the noise levels on I-210.

N-1.3 Limit construction, delivery, and through truck traffic to designated routes.

N-1.4 Mitigate transportation equipment impacts at construction sites.

NON-TRANSPORTATION NOISE IMPACTS

Planning Consideration: Non-transportation noise sources, including those generated from commercial/industrial activities, construction equipment and various community activities, have the potential of introducing undesirable impacts within the City. Development policy and regulatory standards should consider the reduction of these non-transportation noise impacts and mitigate them to a less than significant level.

Goal N-2: Reduced noise impacts from non-transportation sources.

Policies

N-2.1 Review and update the Noise Ordinance, on a regular basis, to ensure noise-generating uses are adequately addressed.

N-2.2 Strive to resolve existing and potential conflicts between noise generating uses and human activities.

N.2.3 Prohibit significant noise generating activities from locating adjacent to residential neighborhoods and near schools.

N-2.4 Ensure that construction noise does not cause an adverse impact to the residents of the City by requiring that noise mitigation techniques be incorporated into all construction-related activities.

N-2.5 Consider developing maximum noise standards for ventilation systems (i.e., air conditioning units) in residential areas.

COORDINATION WITH LAND USE PLANNING

Planning Consideration: Land use planning has a direct relationship with objectionable noise. The location and type of land uses should consider the potential noise impacts generated. Therefore, the evaluation of potential noise generation should be a consideration in all land use decisions.

Goal N-3: Coordinated land use planning and noise mitigation.

Policies

N-3.1 Ensure Community Noise Equivalent Levels (CNEL) levels for noise sensitive land uses meet or exceed normally acceptable levels, as defined by State of California standards.

N-3.2 Enforce all noise standards as outlined in the City's Noise Ordinance.

N-3.3 Enforce limits set by the State of California to control noise levels, particularly those governing motor vehicles.

N-3.4 Ensure that all new development is consistent with exterior and interior noise standards.

N-3.5 Incorporate noise reduction measures into all development proposals, as necessary.

N-3.6 Consider noise impacts associated with the development of non-residential uses in the vicinity of residential uses.

N-3.7 Require acoustical materials in all new residential and commercial developments where noise levels exceed the compatibility standards outlined in the Noise Element.

N-3.8 Encourage the use of double-paned windows for residential uses adjacent to the freeways and along major arterials.

N-3.9 Encourage programs to retrofit existing homes to reduce noise impacts in the homes.