CHAPTER 4
NOISE

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CHAPTER 4
NOISE ELEMENT

INTRODUCTION

The Noise Element of the General Plan provides 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. In addition, noise contours in the form of community noise equivalent level (CNEL) or day-night average level (Ldn) are provided for all referenced sources.

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 Duarte. The Noise Element also serves as a guideline for compliance with the State's Noise Insulation Standards.

The State of California requires every jurisdiction to include a Noise element in their General Plan. The Noise element for this General Plan presents several different aspects of noise evaluation. The City's goals, objectives, and policies for meeting noise standards are first identified, and then the method in which the noise levels are measured are described. The most general ways to quantify noise levels are by CNEL, Leq, and Ldn, which are measured in decibels using the A-weighted sound pressure level (dBA). Community Noise Exposure Level (CNEL) is a long-term noise measurement that is an average of noise levels gathered over 24 hours. Equivalent sound level (Leq) is more short-term noise measurement taken over a given period of time, which can vary from one hour to 24 hours. The 24-hour measurement period is how the CNEL is derived. The average day/night noise level (Ldn) is another way to analyze community noise exposure. The Ldn noise level is measured by taking noise measurements over a 24-hour period, similar to CNEL, meaning the two are generally equivalent.

Also presented in the Noise element are Federal, State, and Local noise standards, and related laws, standards, ordinances, and regulations, such as the U.S. Noise Control Act and California Office of Planning and Research Guidelines. The noise analysis follows and includes an evaluation of existing noise conditions, including sensitive receptors, noise generated by traffic and stationary sources, and ambient noise levels. Existing traffic noise levels are evaluated, as well as projected traffic noise levels for 2020. A description of the noise plan, including attenuation rates and other noise controls, and implementation measures suggesting how to go about meeting established goals concludes the Noise element of the General Plan.

CHAPTER 4
NOISE ELEMENT

Noise Element Statutory Requirements

The State of 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 overflights, 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."*

Relationship to Other General Plan Elements and Program EIR

California law requires that all elements of the General Plan be consistent. While each of the General Plan elements could be characterized as independent documents, they are also interrelated in the common goal of providing a long-range integrated plan for the ongoing development of the city. The Noise Element is most directly related to the Land Use, Circulation, and Air Quality section of the Open Space and Conservation Elements.

A Program Environmental Impact Report (EIR) will be prepared in conjunction with the Duarte General Plan. Policies and mitigation measures presented in the Noise Element will also be presented as mitigation measures in the Program EIR.

GOALS, OBJECTIVES AND POLICIES

This section presents the goals, objectives, and policies for the Noise Element of the Duarte General Plan.

Noise Goal 1: To reduce noise impacts from transportation sources.

Objective 1.1: Maintain and reduce where feasible background noise levels emanating from citywide transportation sources.

Policies:

Noise 1.1.1 Ensure noise mitigation measures are included in the design of new developments.

Noise 1.1.2 Encourage the State Department of Transportation (Caltrans) to continue Programs that lead to the reduction of the noise levels on I-210 and I-605.

Noise 1.1.3 Continue the City's beautification program along arterials to help reduce noise levels.

Noise 1.1.4 Encourage acoustical materials in all new residential and commercial developments where noise levels exceed the compatibility standards outlined in the Noise Element.

Noise 1.1.5 Limit construction, delivery, and through truck traffic to designated routes.

Noise 1.1.6 Ensure Community Noise Equivalent Levels (CNEL) for noise sensitive land uses meet or exceed normally acceptable levels, as defined by State of California standards.

Noise 1.1.7 The City should encourage, support, and enforce all State and Federal legislation designed to abate and control noise pollution.

Noise 1.1.8 The City should encourage the use of rubberized asphalt city streets.

Noise Goal 2: Develop measures to control non-transportation noise impacts.

Objective 1.2: Commercial and industrial uses, construction activity and other non-transportation related sources of noise can contribute negatively to the noise environment. Identifying and mitigating these potential noise sources will reduce negative impacts.

Policies:

Noise 2.2.1 Continuously review the Noise Ordinance to ensure noise-generating uses are adequately addressed.

Noise 2.1.2 Strive to resolve existing and potential conflicts between noise generating uses and human activities.

Noise 2.1.3 Reduce noise from rock quarrying operations.

Noise 2.1.4 Prohibit significant noise generating activities from locating adjacent to residential neighborhoods and near schools.

Noise 2.1.5 Evaluate the noise impacts from projects and existing uses in adjacent cities and work cooperatively with these cities to develop mitigation measures that will improve ambient noise conditions in Duarte.

Noise Goal 3: To establish land uses which are compatible with noise levels within the community.

Objective 1.3: Land use planning decisions directly relate to potential noise impacts. Therefore, careful consideration of noise impacts should be a part of all land use decisions.

Policies:

Noise 3.1.1 Establish a system of locating land uses according to the maximum noise levels they generate.

Noise 3.1.2 Enforce limits set by the State to control noise levels, particularly those governing motor vehicles.

Noise 3.1.3 Ensure that construction noise does not cause an adverse impact to the residents of the City.

Noise 3.1.4 Minimize noise and light spillage onto other residential properties.

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

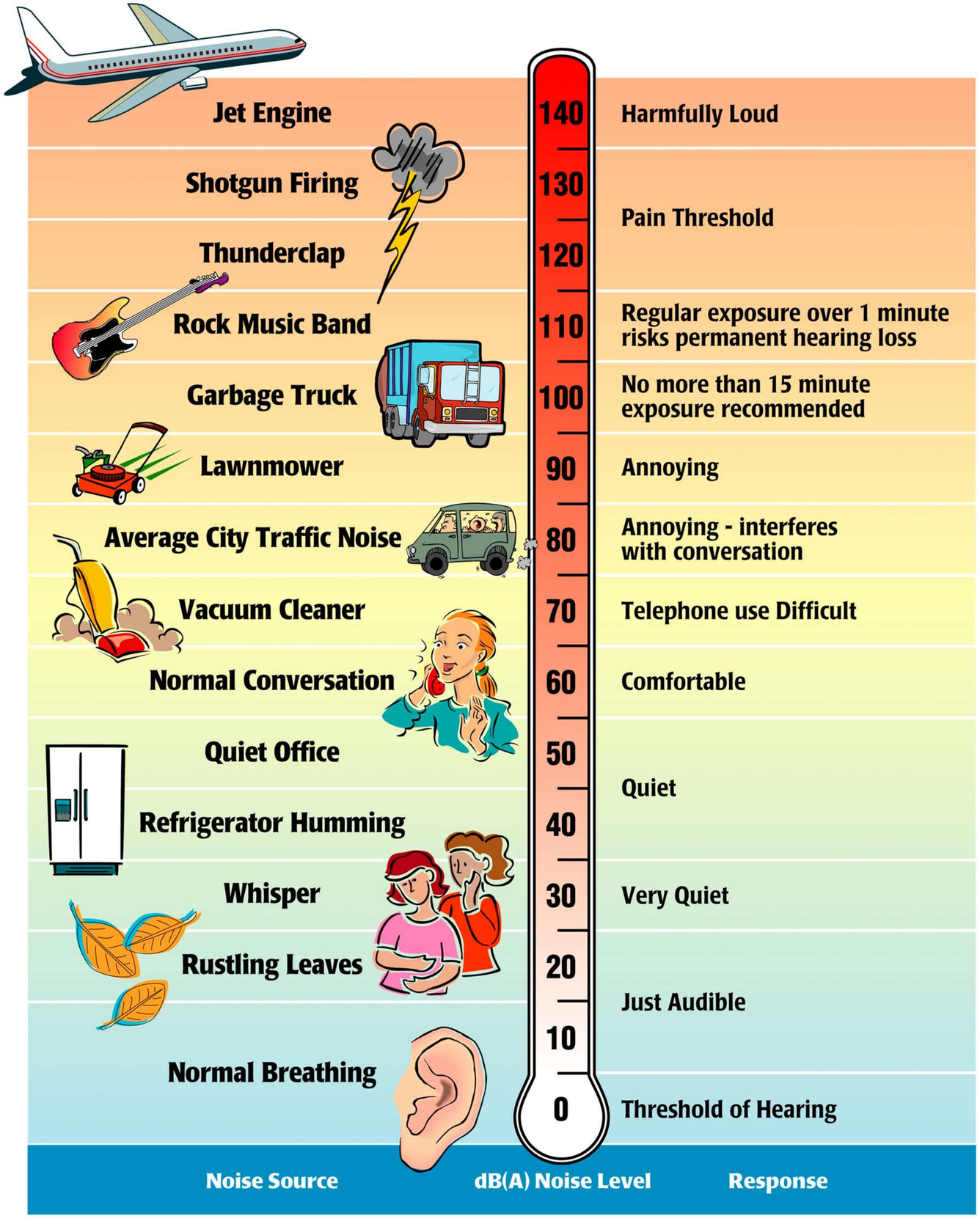
pressure levels are measured in decibels (dB). Decibels are logarithmic quantities, relating the sound pressure level of a noise source to the reference pressure level.
An important characteristic of sound is frequency. This is the rate of repetition of sound pressure oscillations (waves) as they reach 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.



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Common Environmental Noise Levels

Exhibit N - 1

LEGEND

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.

July 14, 2006

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 a.m. and 10:00 p.m. 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 p.m. to 7:00 a.m.) 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.

Equivalent Noise Level (L_{EQ})

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.

Day Night Average (Ldn)

Another commonly used noise metric is the day/night average noise level (L_{dn}). The Ldn is a measure of the 24-hour average noise level at a given location. It was adopted by the 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 p.m. to 7:00 a.m.) 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.

Other Noise Matrices

As previously mentioned, 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.

RELATED LAWS, ORDINANCES, REGULATIONS, AND STANDARDS

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.

U.S. Environmental Protection Agency

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.

State of California

The State Office of Planning and Research (OPR) *Noise Element Guidelines* include recommended exterior and interior noise level standards for local jurisdictions to identify and prevent the creation of incompatible land uses due to noise. The OPR Guidelines contain a land use compatibility table that describes the compatibility of various land uses with a range of environmental noise levels in terms of CNEL. A noise environment of 50 to 60 CNEL is considered to be "normally acceptable" for residential uses. The 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. Table N -1 (Land Use Compatibility Noise Guidelines – California) illustrates the State guidelines established by the State Department of Health Services for acceptable noise levels for each county and city.

Table N -1
Land Use Compatibility Noise Guidelines — 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 - Motels, and 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.

City Noise Standards

The City of Duarte maintains a comprehensive Noise Ordinance within the Municipal Code that sets standards for noise levels citywide and provides the means to enforce the reduction of obnoxious or offensive noises. Chapter 9.68 of the Duarte Municipal Code establishes noise standards and enforcement procedures.

City Noise Ordinance

The City of Duarte has adopted a number of policies that are directed at controlling or mitigating environmental noise effects. A Noise Ordinance establishes acceptable noise levels generated on private property in residential neighborhoods. It is designed to control unnecessary, excessive and annoying sounds generated from a stationary source impacting an adjacent property. It differentiates between environmental and nuisance noise. Environmental noise is measured under a time average period while nuisance noise cannot exceed the established Noise Ordinance levels at any time. Chapter 9.68 of the City of

Duarte Municipal Code controls unnecessary, excessive and annoying noise. The City's noise regulations have established in the Ambient Base Noise Levels that "It is unlawful for any person within the city of Duarte to make, cause or allow to be produced noise which is received on property occupied by another person with the designated zone, in excess of the following levels, except as expressly provided otherwise". Table N -2 (City of Duarte Noise Ordinance Standards) provides the City of Duarte's noise regulations.

TABLE N - 2
CITY OF DUARTE NOISE ORDINANCE STANDARDS

Zone	Noise Level (dBA)	
	Day: 7AM – 9PM	Night: 9PM – 7AM
R-1 and R-2	55	45
R-3 and R-4	55	50
Commercial	60	55
Industrial and Light Manufacturing	70	70
Source: City of Duarte Municipal Code, Chapter 9.68.050 (Ambient base noise levels)		

At the boundary line between a residential property and a commercial and manufacturing property, the noise level of the quieter zone shall be used. Table N -3 (Corrections to Noise Limits) illustrates how the numerical limits given in Table N -2 (City of Duarte Noise Ordinance Standards) shall be adjusted by the following corrections when appropriate.

TABLE N - 3
CORRECTION TO NOISE LIMITS

Noise Condition	Correction (in dB)
Repetitive impulsive noise, pure tones and sound with cyclically varying amplitude	– 5
Steady whine, screech or hum	– 5
Noise occurring more than 5 but less than 15 minutes per hour*	+ 5
Noise occurring more than 1 but less than 5 minutes per hour*	+ 10
Noise occurring less than 1 minute per hour*	+ 15
* The Following corrections apply to day only	
Source: City of Duarte Municipal Code, Chapter 9.68.050 (Ambient base noise levels)	

The major sources of noise in the City of Duarte are transportation related. These sources include I-210, local surface streets, railroads, and rapid transit. The major traffic noise sources include vehicles operating on the major arterials that serve the city, such as, Huntington Drive, Buena Vista Street, Highland

Avenue, and Duarte Road. Also, I-210 generates significant noise levels because the freeway is elevated at its closest point within the city. The noise generated by the traffic noise represent a constant noise; while railroads, on the average, generate a higher level of noise but only for a short duration of time. In the areas throughout the city where industrial operations are located in close proximity to homes, there is a potential for noise impacts from machinery, work activities, and truck traffic during certain periods of the day. Over the recent years, noise levels throughout the community have escalated as development and traffic have increased.

Residents are protected from excessive noise through established local and state laws and standards. The Duarte Noise Ordinance will also serve as a primary implementation measure or reducing excessive noise in the city. The California Department of Transportation (Caltrans) has established, according to Section 215.5 of the State Streets and Highway Code, a priority system for erecting sound walls along freeway routes. The state has also established noise insulation standards pursuant to Title 25, Section 1092 of the California Administrative Code. This code protects multiple-family residential dwelling units from excessive and unnecessary noise.

NOISE ANALYSIS

The following sections describe the existing noise conditions in the City of Duarte and present the projected noise for the future buildout year of 2020.

Existing 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 - 4 (Sensitive Receptors) and Exhibit N - 2 (Sensitive Uses) illustrate some of the sensitive receptors that are located within the City of Duarte and can be affected by excess noise levels.

Computer Modeling

Roadway noise levels throughout the City were projected using the Federal Highway Administration's Highway Noise Prediction Model (FHWA RD-77-108)

together with several roadway and site parameters. These parameters determine the projected impact of vehicular traffic noise and include the roadway cross-section (i.e., number of lanes), the roadway width, the average daily traffic (ADT), and the vehicle travel speed. The percentages of auto and truck traffic, the roadway grade, the angle-of-view, the site conditions ("hard" or "soft"), and the percent of total ADT that flows each hour throughout a 24-hour period. The model does not account for ambient noise levels (i.e., noise from adjacent land uses) or topographical differences between the roadways and adjacent land uses. Various vehicle speeds were assumed throughout the City based on empirical observations and posted maximum speeds. Noise projections are based on vehicular traffic as derived from the *Duarte General Plan Circulation Element*.

Traffic Noise

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 the City's primary and major arterials, as well as I-210 that traverse the City. In addition, a number of secondary and commuter streets were modeled as well. 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; the CNEL beyond the contour line - away from the street - is less than 60 dBA). Refer to Exhibit N - 3 (Existing Noise Contours), for the approximate location of existing noise contours based on average daily traffic (ADT).

TABLE N - 4
SENSITIVE RECEPTORS

Receptor:	Location:
Institutional:	
Berean Bible Church	2302 Mountain Avenue, Duarte, CA 91010
Church of Christ	1330 Highland Avenue, Duarte, CA 91010
Church of the Nazarene Duarte	2047 Mountain Avenue, Duarte, CA 91010
Covenant Life Ministries	1430 East Huntington Dr, Duarte, CA 91010
Duarte Christian Church	2632 Royal Oaks Drive, Duarte, CA 91010
Duarte Fellowship Church	1551 Huntington Drive, Duarte, CA 91010
First Baptist Church of Duarte	2200 East Huntington Dr, Duarte, CA 91010
God's Grace Christian Fellowship Church	2160 East Huntington Drive, Duarte, CA 91010
Joy Christian Center	822 Bradbourne Avenue, Duarte, CA 91010
New Life Assembly of God	822 Bradbourne Avenue, Duarte, CA 91010
The Church of Jesus Christ of Latter-Day Saints	1452 Royal Oaks Drive, Duarte, CA 91010
City of Hope - National Medical Center	1500 E. Duarte Road, Duarte, CA 91010
The Manor at Santa Teresita Hospital	819 Buena Vista Street, Duarte, CA 91010
Country Villa Monte Vista (Rehabilitation Center)	802 Buena Vista Street, Duarte, CA 91010
Monrovia Convalescent Hospital	1220 Huntington Drive, Duarte, CA 91010
Duarte Montessori School	1640 3rd Street, Duarte, CA 91010
Head Start-State Preschool	1433 Crestfield Drive, Duarte, CA 91010
Kidz Excel	1014 Highland Av, Duarte, CA 91010
YMCA of San Gabriel Valley	1014 Highland Avenue, Duarte, CA 91010
Andres Duarte Elementary School	1433 Crestfield Drive, Duarte, CA 91010
Beardslee Elementary School	1212 E. Kellwil Way, Duarte, CA 91010
Royal Oaks Elementary School	2499 Royal Oaks Drive, Duarte, CA 91010
Valley View Elementary School	237 Melcanyon Road, Duarte, CA 91010
Mount Olive Alternative Education (7-12)	1400 Mount Olive Drive, Duarte, CA 91010
Northview Intermediate School (7-8)	1401 Highland, Duarte, CA 91010
Duarte High School (9-12)	1565 East Central Avenue, Duarte, CA 91010
Duarte Public Library	1301 Buena Vista Street, Duarte, CA 91010
Westminster Gardens - Residential Facility	1420 Santo Domingo Avenue, Duarte, CA 91010
Community Care Center	2335 Mountain Avenue, Duarte, CA 91010
Huntington Oaks Village	1657 Huntington Drive, Duarte, CA 91010
Andres Duarte Terrace	1730 East Huntington Drive, Duarte, CA 91010
Parks:	
Beardslee Park (4.91 acres)	2000 Buena Vista Street, Duarte, CA 91010
Duarte Park (2.96 acres)	1344 Bloomdale Street, Duarte, CA 91010
Encanto Park (11.5 acres)	751 Encanto Parkway, Duarte, CA 91010
Hacienda Park (1.64 acres)	2695 Hacienda Drive, Duarte, CA 91010
Lena Valenzuela Park (0.78 acres)	2120 Mountain Avenue, Duarte, CA 91010
Moore Park (1.13 acres)	1100 Duarte Road, Duarte, CA 91010
Northview Park (2.02 acres)	1433 Highland Avenue, Duarte, CA 91010
Royal Oaks Park (7.40 acres)	2627 Royal Oaks Drive, Duarte, CA 91010
Royal Oaks Park Extension	2701 Royal Oaks Drive, Duarte, CA 91010

TABLE N - 4 [CONTINUED]
SENSITIVE RECEPTORS

Receptor:	Location:
Parks [continued]:	
Sports Park (12.25 acres)	1401 Central Avenue, Duarte, CA 91010
Third Street Park (0.36 acres)	1626 Third Street, Duarte, CA 91010
Glenn Miller Park (1.38 acres)	205 Melcanyon Drive, Duarte, CA 91010
Residential:	
	North of I-210/I-605 Intersection
	South of I-210 (Eastbound direction)
	Southwest "corner" of the city – stretching to the City boundaries
	East of I-605 and continuing north to the San Gabriel Mountains
	Northern area of Duarte
Source: Google Earth, 2005. Image 2006, NASA; 2006 TerraMetics.	

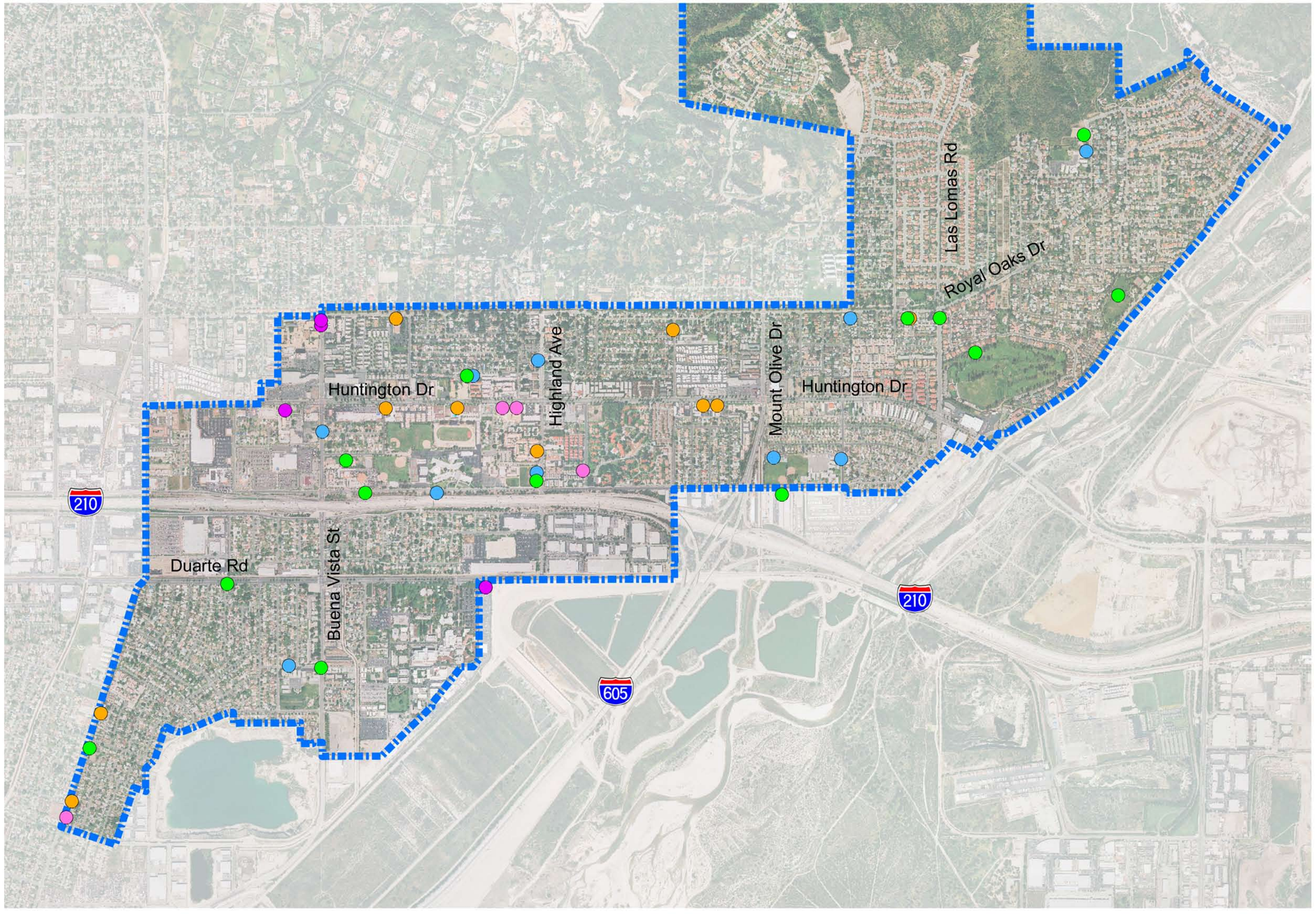
In an effort to reduce the effects of roadway noise generated from I-210 on the local population, the City of Duarte has constructed soundwalls adjacent to the I-210 freeway as well as provided landscaping along the soundwalls. Phase One of the 210 Freeway soundwall project was completed in December 2002 by Caltrans. Phase two timing has not been determined.

Existing Noise Contours

As indicated in Table N - 5 (Existing Traffic Noise Levels), none of the roadways measured generate noise levels at a distance of 100 feet from centerline that exceed 75 CNEL. Of the 35 roadway links modeled within the City planning area, eight roadway links generate noise levels at 65 CNEL or greater at 100 feet from centerline. Eleven of the roadway links modeled generate noise levels between 60 CNEL and 65 CNEL. These links include Huntington Drive East of Las Lomas, Duarte Road, segments along Buena Vista, Buena Vista Street between I-210 Freeway to the south of Duarte Road, segments along Royal Oaks Road and Mount Olive Drive. Twelve of the thirty-five roadway segments modeled generate noise levels between 55 CNEL and 60 CNEL. These segments are along Buena Vista Street, Highland Avenue, Royal Oaks Road, Bradbourne Avenue, and Las Lomas. Four modeled roadway links with noise levels below 55 CNEL at 100 feet from centerline are Mountain Avenue south of Duarte Road, Royal Oaks Road west of Encanto Parkway, and Los Lomas Road north of Royal Oaks Road. Exhibit N-3 displays the projected 60, 65, and 70 CNEL noise contours calculated from the roadway centerline.

City of Duarte General Plan Building a new vision. 20/20

Sensitive Uses
Exhibit N - 2



LEGEND

Sensitive Noise Receptors

- Churches
- Hospitals
- Parks
- Schools
- Senior Centers

Interstate Highways

- 210
- 605

City Limits

Note: The sensitive receptors correspond to Table N-4 (Sensitive Receptors).

NORTH

0 1,500 3,000

Feet

July 14, 2006

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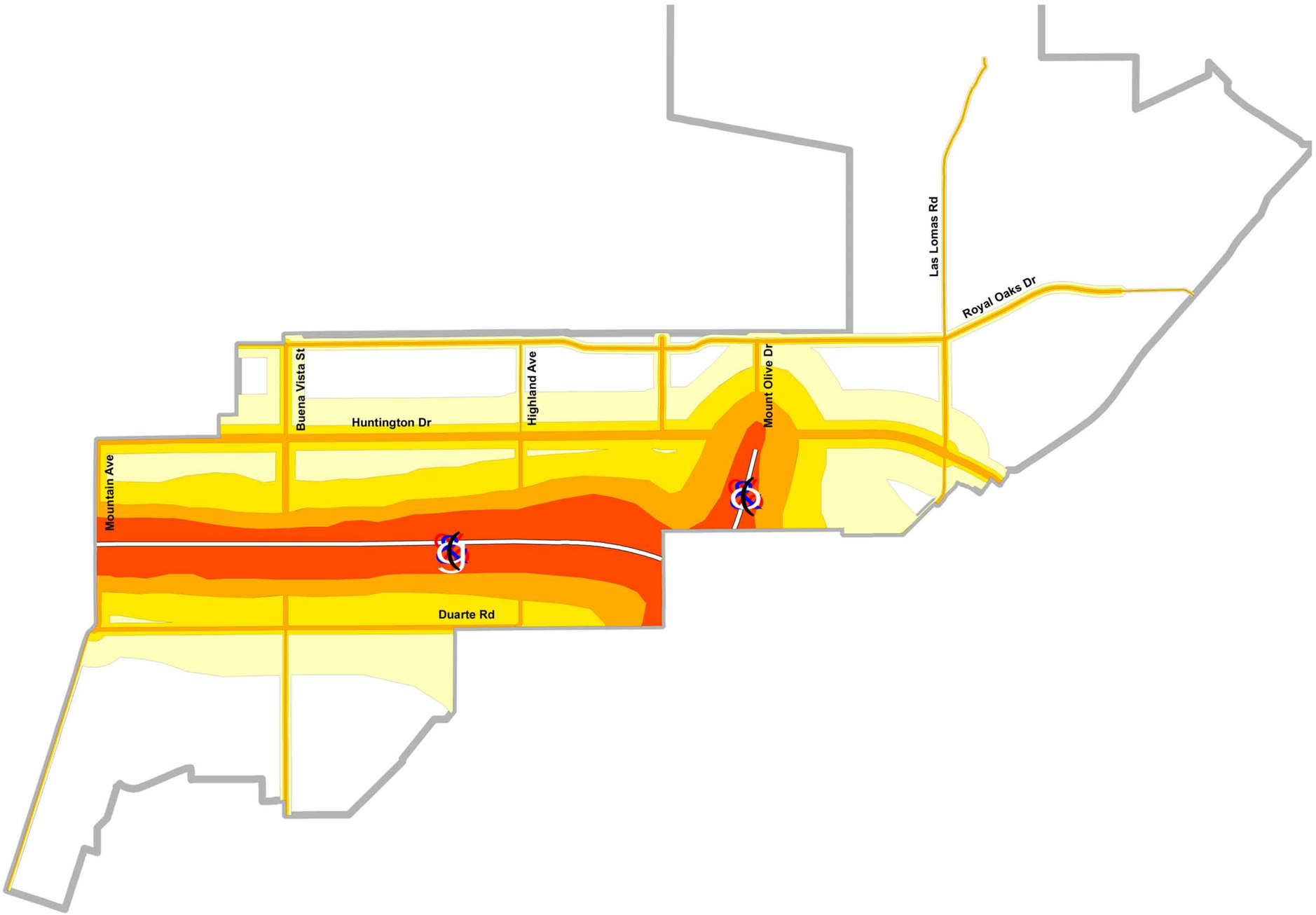
Existing Noise Contours
Diagram N - 1



LEGEND
Noise Levels - Existing
- 75 CNEL
- 70 CNEL
- 65 CNEL
- 60 CNEL

Interstates
- 210
- 605

City Limits

NORTH

0 1,500 3,000
Feet

July 14, 2006

Table N - 5
Existing Traffic Noise Levels

Roadway Segment	ADT	dBA @ 100 Feet from Roadway Centerline	Noise Contour (distance from centerline)		
			60 CNEL	65 CNEL	70 CNEL
Arterial Roadways:					
Huntington Drive:					
Between Mountain Ave. and Buena Vista St.	26,530	67.1	621	196	62
Between Buena Vista St. and Highland Ave.	23,810	66.6	557	176	56
Between Highland Ave. and Bradbourne Ave.	26,460	67.1	620	196	62
Between Bradbourne Ave. and Mount Olive Dr.	28,640	67.4	672	212	67
Between Mount Olive Dr. and Las Lomas Rd.	26,750	67.1	627	198	63
Huntington Dr. East of Las Lomas Rd.	26,170	64.0	221	103	48
Duarte Road:					
Between Mountain Ave. and Buena Vista St.	11,950	63.8	280	89	28
Buena Vista St. to Highland Ave.	12,740	64.0	299	94	30
Mountain Avenue:					
Between Huntington Drive and I-210 Freeway	24,500	65.6	423	134	42
Between I-210 Freeway and Duarte Road	31,040	66.7	535	169	54
Mountain Avenue South of Duarte Road	3,550	54.6	48	22	10
Buena Vista Street:					
Between Royal Oaks Dr. and Huntington Dr.	11,310	63.5	265	84	26
Between Huntington Drive and I-210 Freeway	18,860	65.7	442	140	44
Between I-210 Freeway and Duarte Road	15,170	61.8	154	71	33
Buena Vista Street South of Duarte Road	7,860	58.0	81	38	17
Highland Avenue:					
Between Royal Oaks Dr. and Huntington Drive	3,750	57.7	65	20	6
Between Huntington Drive and I-210 Freeway	11,480	63.8	269	85	27
Between I-210 Freeway and Duarte Road	9,650	60.1	114	53	25
Collector Streets:					
Royal Oaks Drive:					
Royal Oaks Dr. West of Buena Vista Street	10,650	62.2	184	58	18
Between Buena Vista St. to Highland Avenue	8,550	58.3	86	40	18
Between Highland Ave. and Bradbourne Ave.	7,610	57.9	79	37	17
Between Bradbourne Ave. and Mount Olive Dr.	7,870	58.0	81	38	17
Between Mount Olive Dr. and Las Lomas Road	10,380	59.2	97	45	21
Royal Oaks Dr. East of Las Lomas Road	8,000	58.1	82	38	18
Royal Oaks Dr. West of Encanto Parkway	1,400	50.5	26	12	6

Table N – 5 (Continued)
Existing Traffic Noise Levels

Roadway Segment	ADT	dBA @ 100 Feet from Roadway Centerline	Noise Contour (distance from centerline)		
			60 CNEL	65 CNEL	70 CNEL
Central Avenue:					
Central Avenue West of Buena Vista Street	3,880	56.5	48	15	5
Central Avenue East of Buena Vista Street	12,200	61.5	150	48	15
Central Avenue West of Highland Avenue	3,550	56.2	44	14	4
Between Highland Ave. and Bradbourne Ave.	7,100	59.2	88	28	9
Bradbourne Avenue:					
Between Royal Oaks Dr. and Huntington Drive	1,260	51.0	118	55	25
Mount Olive Drive:					
Between Royal Oaks Dr. to Huntington Drive	10,230	60.4	118	55	25
Mount Olive Drive South of Huntington Drive	23,870	63.6	208	97	45
Las Lomas Road:					
Las Lomas Road North of Royal Oaks Drive	3,200	52.6	36	17	8
Between Royal Oaks Dr. and Huntington Drive	9,440	58.4	91	42	20
Las Lomas Road South of Huntington Drive	4,080	55.1	52	24	11

Source: Chapter 4, Circulation Element, prepared by RBF Consulting, April 2006.

Stationary Noise Sources

Commercial and industrial 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 noise from stationary sources including commercial and industrial centers. These impacts are best controlled through effective land use planning and application of the City Noise Ordinance.

Irwindale Rock Quarry

Irwindale is in close proximity, southwest of Duarte and is home to seventeen rock quarries; however, currently, eight of the seventeen quarries are dormant. According to police records, no noise complaints have been made regarding these facilities, however, residents, at public meeting indicate they can hear the quarry operations.

Azusa Rock Company

The Azusa Rock Company, which is now a part of Vulcan Materials Company, is a 350-acre Rock Pit on the border of Duarte and it's easterly neighboring community, Azusa. Despite the large mining activities, truck traffic is typically not a major noise source since the material coming out of the Azusa Rock pit is placed on a conveyor belt, transported to the Reliance Plant and crushed into sand and gravel. However, residents at public meeting have indicated that when in full operation, the Azusa Rock Quarry is loud.

San Gabriel Valley Gun Club

The San Gabriel Valley Gun Club, which was closed in late 2006, was located in the City of Azusa, at the northeast corner of the City of Duarte. The Gun Club provided civilians, security agencies, police, government agencies, and the military a safe and secure location to practice marksmanship. The Gun Club was open for entry at 6:30 a.m. Tuesday through Sunday. The outdoor rifle and pistol ranges were open from 8:00 a.m. to 4:00 p.m. Tuesday through Friday and 8:00 a.m. to 4:45 p.m. Saturday and Sunday and offers eighty-six (86) covered shooting positions. The air rifle and air pistol range was open the same hours of operation as the rifle and pistol range and has 20 positions available. In addition to the rifle and pistol ranges, the Club also offered four shotgun fields that operated from the hours of 10:00 a.m. to 3:30 p.m. Tuesday, Wednesday and Friday and from 8:30 a.m. to 4:15 p.m. on Saturday and Sunday. The San Gabriel Valley Gun Club was a non-conforming use in the City of Azusa. It was reported that residents in both Azusa and Duarte complained about noise generated by the facility. The gun club is no longer a noise generator.

Duarte Gold Line Metro Station

The Duarte Gold Line Metro Station is proposed along Duarte Road, approximately 500 feet west of Highland Avenue. The proposed station will be a center platform station with entrances on both ends. The surrounding uses include commercial and industrial buildings to the northeast and the San Gabriel Flood Control area to the south. In a baseline study, RBF Consulting conducted an overnight noise measurement on March 22, 2006. The overnight measurement read 67 L_{eq}; refer to Table N - 6 (Field Noise Measurements). In addition to the proposed Gold Line Metro Station, the City is anticipating that ten out of the twenty acres east of the residential areas and west of Highland Avenue will become mixed use. The development of the Gold Line Station will slightly increase noise within the vicinity of the station; however, noises would be a result

of the increase in passengers waiting for the train in the morning as well as departing the train in the evening. The station is located in an industrial area and thus, the slight increase in noise will not create a disturbance or become a nuisance to the surrounding uses.

Irwindale Speedway

The Irwindale Speedway is a new, state-of-the-art motorsports and entertainment event facility that features 6,000 seats, 12 exclusive Corporate "Sky Box" Suites, twin paved oval race tracks that are banked at 1/2 and 1/3 mile, sound and lighting systems, and paved parking for over 3,000 cars. The Irwindale Speedway is located adjacent to the 605 Freeway and to the southeast of Duarte. The Speedway accommodates stock cars, sprint cars, midgets, supermodifieds, legends, and trucks. The venue is home to National Association for Stock Car Auto Racing (NASCAR) competition on selected Friday and Saturday evenings with gates opening to the public at 4:00 p.m. and the race starting at 10:00 p.m and ending at 10:00 p.m. During the week, NASCAR drivers can be found training around the oval tracks. Drag Racing is held at the venue every Sunday from 8:00 a.m. to 5:00 p.m. and Thursday from 4:00 p.m. to 10 p.m. According to Duarte Sheriff records, there are no noise complaints filed in regards to the Speedway, however, at General Plan public meetings, residents stated they can clearly hear the speedway.

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 specific area 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.

The thirteen ambient noise measurement points were selected based on their proximity to sensitive receptors within the City. They were taken in areas that had several sensitive uses within one area. The four roadway measurements were chosen based on the traffic volume on the roadways. Three roadway measurements were taken along Huntington Drive, the main traffic artery within the City and the other was along Duarte Road, a local street that runs parallel to the eastbound lane of Interstate 210. To quantify the ambient noise levels in the City of Duarte, RBF Consulting conducted noise measurements on March 22 through 23, 2006; refer to Table N - 6 (Field Noise Measurements). The noise measurement sites were representative of typical existing noise exposure within and immediately adjacent to sensitive uses within the City; refer to Exhibits N-4a through N-4c (Noise Measurement Sites). Fifteen-minute measurements were taken at each site, between 10:00 a.m. and 4:30 p.m. Meteorological conditions were typical, with light wind speeds, low humidity, and clear skies.

Table N - 6
Field Noise Measurements

Site	Location	Leq	Time[1]
1	Duarte High School	63.9	10:40 a.m.
2	Huntington Drive and Buena Vista Street	68.7	11:17 a.m.
3	Second Street between Cotter and Oak Avenues	52.7	11:42 a.m.
4	Broadland Avenue between Maynard Drive and Bloomdale Street	56.8	12:07 p.m.
5	Aloysia Moore Park	53.1	1:20 p.m.
6	Duarte Road and Earlington Avenue	65.6	1:45 p.m.
7	City of Hope Hospital – National Medical Center	59.6	3:00 p.m.
8	Sandefur Street and Eastford Avenue	50.0	3:30 p.m.
9[2]	East Duarte Road between Hope Drive and Highland Avenue	67.1	4:10 p.m.
10	Crestfield Drive and Bashor Street	48.5	11:25 a.m.
11	Fairwood Street between Bernwood and Conata Streets	48.4	11:45 a.m.
12	Huntington Drive near Calle Linares	70.6	12:10 p.m.
13	Huntington Drive and Windsor Circle	71.1	12:43 p.m.
14	Westminster Gardens – A Retirement Oasis	58.2	2:00 p.m.
15	Maynard Street between Crestfield and Femley Drives	57.4	2:29 p.m.
16	Bettyhill Avenue between Conata and Elda Streets	48.8	2:54 p.m.
17	Eastern side of Hacienda Park on Hacienda Drive	54.2	3:23 p.m.

1 Unless otherwise noted, noise measurements were recorded over a period of 15 minutes.
2 Overnight measurement for the duration of 18 hours, 21 minutes, 9.8 seconds.

L_{eq} = equivalent sound level; dBA = A-weighted decibel.

Source: Noise Monitoring Survey conducted by RBF Consulting, March 22 and 23, 2006.

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Field Noise Measurement Sites

Exhibit N - 3a