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CITY OF GLENDALE
NOISE ELEMENT OF THE GENERAL PLAN
TECHNICAL APPENDIX

Prepared for the
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GLENDALE NOISE ELEMENT
TECHNICAL APPENDIX

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1.0 INTRODUCTION

The Noise Element of a General Plan is a comprehensive program for including noise management in the planning process. It is a tool for local planners to use in achieving and maintaining land uses that are compatible with environmental noise levels. The Noise Element identifies noise sensitive land uses and noise sources, and defines areas of noise impact for the purpose of developing programs to ensure that Glendale residents will be protected from excessive noise intrusion. The current Noise Element of the General Plan for the City of Glendale was adopted in July 1978. It identifies roadways as the most significant source of noise in the City. While traffic noise is still the major noise source in the City, other sources have become a concern. Additionally, the method for controlling noise and incorporating noise concerns into planning decisions has become more sophisticated over the years since the first Element was adopted. Thus, the decision was made by the City to update their Noise Element to more effectively protect and plan for the residents of the City.

This document constitutes the Technical Appendix of the Noise Element and provides the technical background for the Noise Element. Topics covered in the Technical Appendix include background information on noise, health effects related to noise pollution, methodologies used to monitor and model noise levels throughout the City, the results of the noise monitoring program, and the noise contours for the City.

The Noise Element, including the Technical Appendix, follows the revised State guidelines ("General Plan Guidelines," Governors Office of Planning and Research, October 2003) and State Government Code Section 65302(f). The Element quantifies the community noise environment in terms of noise exposure contours for both near and long-term levels of growth and traffic activity. The information will become a guideline for the development of land use policies to achieve compatible land uses and provide baseline levels and noise source identification for local noise ordinance enforcement.

2.0 BACKGROUND INFORMATION ON NOISE

This section presents background information on the characteristics of noise and summarizes the methodologies used to study the noise environment. This section will give the reader an understanding of the metrics and methodologies used to assess noise impacts. The section is divided as follows:

- *Properties of sound that are important for technically describing sound*
- *Acoustic factors influencing human subjective response to sound.*
- *Potential disturbances to humans and health effects due to sound.*
- *Sound rating scales used in this study*
- *Summary of noise assessment criteria*

2.1 Characteristics of Sound

Sound Level and Frequency. Sound can be technically described in terms of the sound pressure (amplitude) and frequency (similar to pitch). Sound pressure is a direct measure of the magnitude of a sound without consideration for other factors that may influence its perception.

The range of sound pressures that occur in the environment is so large that it is convenient to express these pressures as sound pressure levels on a logarithmic scale which compresses the wide range of sound pressures to a more usable range of numbers. The standard unit of measurement of sound is the decibel (dB), which describes the pressure of a sound relative to a reference pressure.

The frequency (pitch) of a sound is expressed as Hertz (Hz) or cycles per second. The normal audible frequency for young adults is 20 Hz to 20,000 Hz. Community noise, including aircraft and motor vehicles, typically ranges between 50 Hz and 5,000 Hz. The human ear is not equally sensitive to all frequencies, with some frequencies judged to be louder for a given signal than others. As a result of this, various methods of frequency weighting have been developed. The most common weighting is the A-weighted noise curve (dBA). The A-weighted decibel scale (dBA) performs this compensation by discriminating against frequencies in a manner approximating the sensitivity of the human ear. In the A-weighted decibel, everyday sounds normally range from 30 dBA (very quiet) to 100 dBA (very loud). Most community noise analyses are based upon the A-weighted decibel scale. Examples of various sound environments, expressed in dBA, are presented in Exhibit 1.

Propagation of Noise. Outdoor sound levels decrease as the distance from the source increases, and as a result of wave divergence, atmospheric absorption and ground attenuation. Sound radiating from a source in a homogeneous and undisturbed manner travels in spherical waves. As the sound wave travels away from the source, the sound energy is dispersed over a greater area decreasing the sound power of the wave. Spherical spreading of the sound wave reduces the noise level at a rate of 6 dB per doubling of the distance.

Atmospheric absorption also influences the levels received by the observer. The greater the distance traveled, the greater the influence of the atmosphere and the resultant fluctuations. Atmospheric absorption becomes important at distances of greater than 1,000 feet. The degree of absorption varies depending on the frequency of the sound as well as the humidity and temperature of the air. For example, atmospheric absorption is lowest (i.e., sound carries farther) at high humidity and high temperatures. A schematic diagram of how weather including temperature gradients and wind can affect sound propagation is shown in Exhibit 2. Turbulence and gradients of wind, temperature and humidity also play a significant role in determining the degree of attenuation. Certain conditions, such as inversions, can channel or focus the sound waves resulting in higher noise levels than would result from simple spherical spreading. Absorption effects in the atmosphere vary with frequency. The higher frequencies are more readily absorbed than the lower frequencies. Over large distances, the lower frequencies become the dominant sound as the higher frequencies are attenuated.

Duration of Sound. Annoyance from a noise event increases with increased duration of the noise event, i.e., the longer the noise event, the more annoying it is. The "*effective duration*" of a sound is the time between when a sound rises above the background sound level until it drops back below the background level. Psycho-acoustic studies have determined the relationship between duration and annoyance and the amount a sound must be reduced to be judged equally annoying for increased duration. Duration is an important factor in describing sound in a community setting.

The relationship between duration and noise level is the basis of the equivalent energy principal of sound exposure. Reducing the acoustic energy of a sound by one half results in a 3 dB reduction. Doubling the duration of the sound increases the total energy of the event by

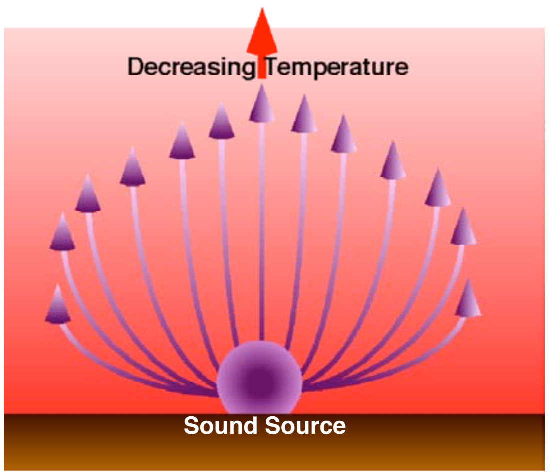
dBA	Outdoor	Indoor
0–20	threshold of hearing (0 dBA)	
20–40	rustling of leaves (20 dBA)	whispering at 5 feet (20 dBA)
40–60	quiet residential area (40 dBA)	refrigerator (50 dBA)
60–80	air-conditioner at 100 feet (60 dBA) car at 25 feet at 65 mph (77 dBA)	sewing machine (60 dBA) normal conversation (60 to 65 dBA) dishwasher (55-70 dBA) living room music or TV (70 -75 dBA)
80–100	diesel truck at 50 feet at 40 mph (84 dBA) propeller airplane flyover at 1000 feet (88 dBA) motorcycle at 25 feet (90 dBA) lawnmower (96 dBA) backhoe at 50 feet (75-95 dBA)	garbage disposal (80 dBA) ringing telephone (80 dBA) vacuum cleaner (60-85 dBA) shouted conversation (90 dBA)
100–120	snowmobile (100 dBA) pile driver at 50 feet (90-105 dBA) car horn (110 dBA) rock concert (110 dBA) leaf blower (110 dBA)	baby crying on shoulder (110 dBA)
120–140	ambulance siren (120 dBA) stock car races (130 dBA) jackhammer (130 dBA)	

Sources: League For The Hard Of Hearing, www.lhh.org
Handbook of Noise Control, McGraw Hill, Edited byCyril Harris, 1979
Measurements by Mestre Greve Associates

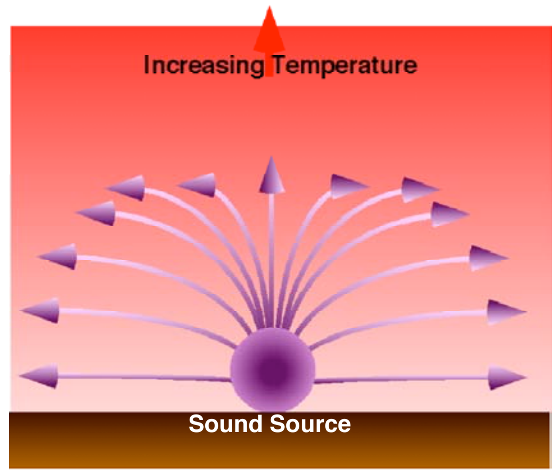
Exhibit 1
Typical Sounds Levels in A-Weighted Decibels (dBA)

Exhibit 2
THE EFFECTS OF WEATHER ON SOUND PROPAGATION

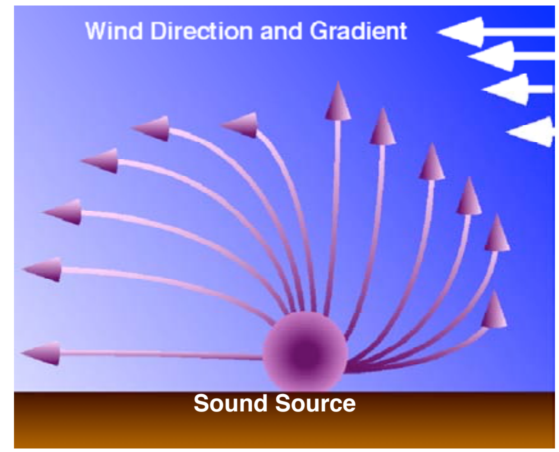
Refraction of sound in an atmosphere with a normal lapse rate. Sound rays are bent upwards.



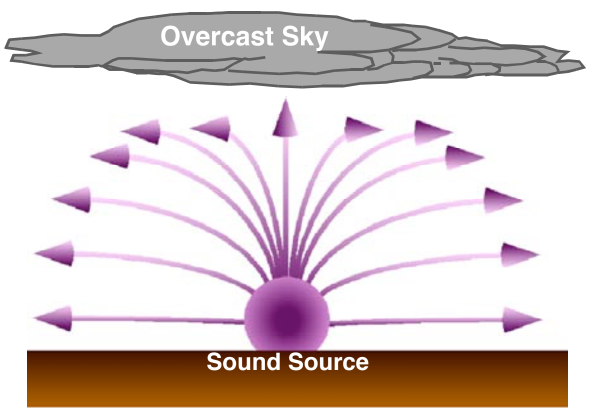
Refraction of sound in an atmosphere with an inverted lapse rate. Sound rays are bent downward.



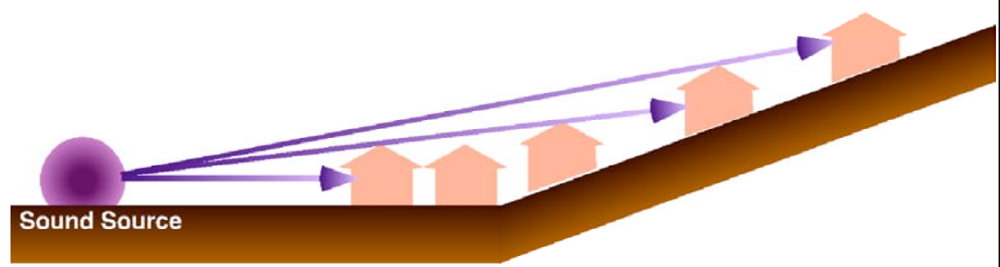
Refraction of sound in an atmosphere with a wind present. Sound rays are bent in the direction of the wind.



Refraction of sound in an atmosphere with overcast sky conditions. Sound rays are bent downward.



Propagation of sound over terrain. Ground absorption and shielding may be present for buildings at the same elevation as the source. No shielding is present for buildings which can 'see' the source.



Source: Adapted from Vancouver International Airport, Noise Management Report.

3 dB. This equivalent energy principal is based upon the premise that the potential for a noise to impact a person is dependent on the total acoustical energy content of the noise. Defined in subsequent sections of this study, noise metrics such as CNEL, DNL, LEQ and SENEL are all based upon the equal energy principle.

Change in Noise. The concept of change in ambient sound levels can be understood with an explanation of the hearing mechanism's reaction to sound. The human ear is a far better detector of relative differences in sound levels than absolute values of levels. Under controlled laboratory conditions, listening to a steady unwavering pure tone sound that can be changed to slightly different sound levels, a person can just barely detect a sound level change of approximately one decibel for sounds in the mid-frequency region. When ordinary noises are heard, a young healthy ear can detect changes of two to three decibels. A five decibel change is readily noticeable while a 10 decibel change is judged by most people as a doubling or a halving of the loudness of the sound. It is typical in environmental documents to consider a 3 dB change as potentially discernable.

Masking Effect. The ability of one sound to limit a listener from hearing another sound is known as the masking effect. The presence of one sound effectively raises the threshold of audibility for the hearing of a second sound. For a signal to be heard, it must exceed the threshold of hearing for that particular individual and exceed the masking threshold for the background noise.

The masking characteristics of sound depend on many factors including the spectral (frequency) characteristics of the two sounds, the sound pressure levels, and the relative start time of the sounds. Masking effect is greatest when the frequencies of the two sounds are similar or when low frequency sounds mask higher frequency sounds. High frequency sounds do not easily mask low frequency sounds.

2.2 Factors Influencing Human Response to Sound

Many factors influence sound perception and annoyance. This includes not only physical characteristics of the sound but also secondary influences such as sociological and external factors. Molino, in the *Handbook of Noise Control* describes human response to sound in terms of both acoustic and non-acoustic factors. These factors are summarized in Table 1.

Sound rating scales are developed in reaction to the factors affecting human response to sound. Nearly all of these factors are relevant in describing how sounds are perceived in the community. Many non-acoustic parameters play a prominent role in affecting individual response to noise. Background sound, an additional acoustic factor not specifically listed, is also important in describing sound in rural settings. Researchers have identified the effects of personal and situational variables on noise annoyance, and have identified a clear association of reported annoyance and various other individual perceptions or beliefs.

Thus, it is important to recognize that non-acoustic factors as well as acoustic factors contribute to human response to noise.

Table 1
Factors that Affect Individual Annoyance to Noise

Primary Acoustic Factors

- Sound Level
- Frequency
- Duration

Secondary Acoustic Factors

- Spectral Complexity
- Fluctuations in Sound Level
- Fluctuations in Frequency
- Rise-time of the Noise
- Localization of Noise Source

Non-acoustic Factors

- Physiology
- Adaptation and Past Experience
- How the Listener's Activity Affects Annoyance
- Predictability of When a Noise will Occur
- Is the Noise Necessary?
- Individual Differences and Personality

Source: C. Harris, 1979

2.3 Sound Rating Scales

The description, analysis, and reporting of community sound levels is made difficult by the complexity of human response to sound and myriad sound-rating scales and metrics developed to describe acoustic effects. Various rating scales approximate the human subjective assessment to the "loudness" or "noisiness" of a sound. Noise metrics have been developed to account for additional parameters such as duration and cumulative effect of multiple events.

Noise metrics are categorized as single event metrics and cumulative metrics. Single event metrics describe the noise from individual events, such as one aircraft flyover. Cumulative metrics describe the noise in terms of the total noise exposure throughout the day. Noise metrics used in this study are summarized below. First single event metrics are discussed followed by discussions of the cumulative metrics.

Single Event Metrics

Frequency Weighted Metrics (dBA). In order to simplify the measurement and computation of sound loudness levels, frequency weighted networks have obtained wide acceptance. The A-weighting (dBA) scale has become the most prominent of these scales and is widely used in community noise analysis. Its advantages are that it has shown good correlation with community response and is easily measured. The metrics used in this study are all based upon the dBA scale.

Maximum Noise Level or Lmax is the highest noise level reached during a noise event. For example, as an aircraft approaches, the sound of the aircraft begins to rise above ambient noise levels. The closer the aircraft gets the louder it is until the aircraft is at its closest point directly overhead. Then as the aircraft passes, the noise level decreases until the sound level again settles to ambient levels. Such a history of a flyover is plotted at the top of Exhibit 3. It is this metric to which people generally instantaneously respond when an aircraft flyover or a loud vehicle like a truck or motorcycle passes by.

Single Event Noise Exposure Level (SENEL) or Sound Exposure Level (SEL) is computed from dBA sound levels, and is used to quantify the total noise associated with an event such as an aircraft overflight or a train pass-by. Referring again to the top of Exhibit 3, the shaded area, or the area within 10 dB of the maximum noise level, is the area from which

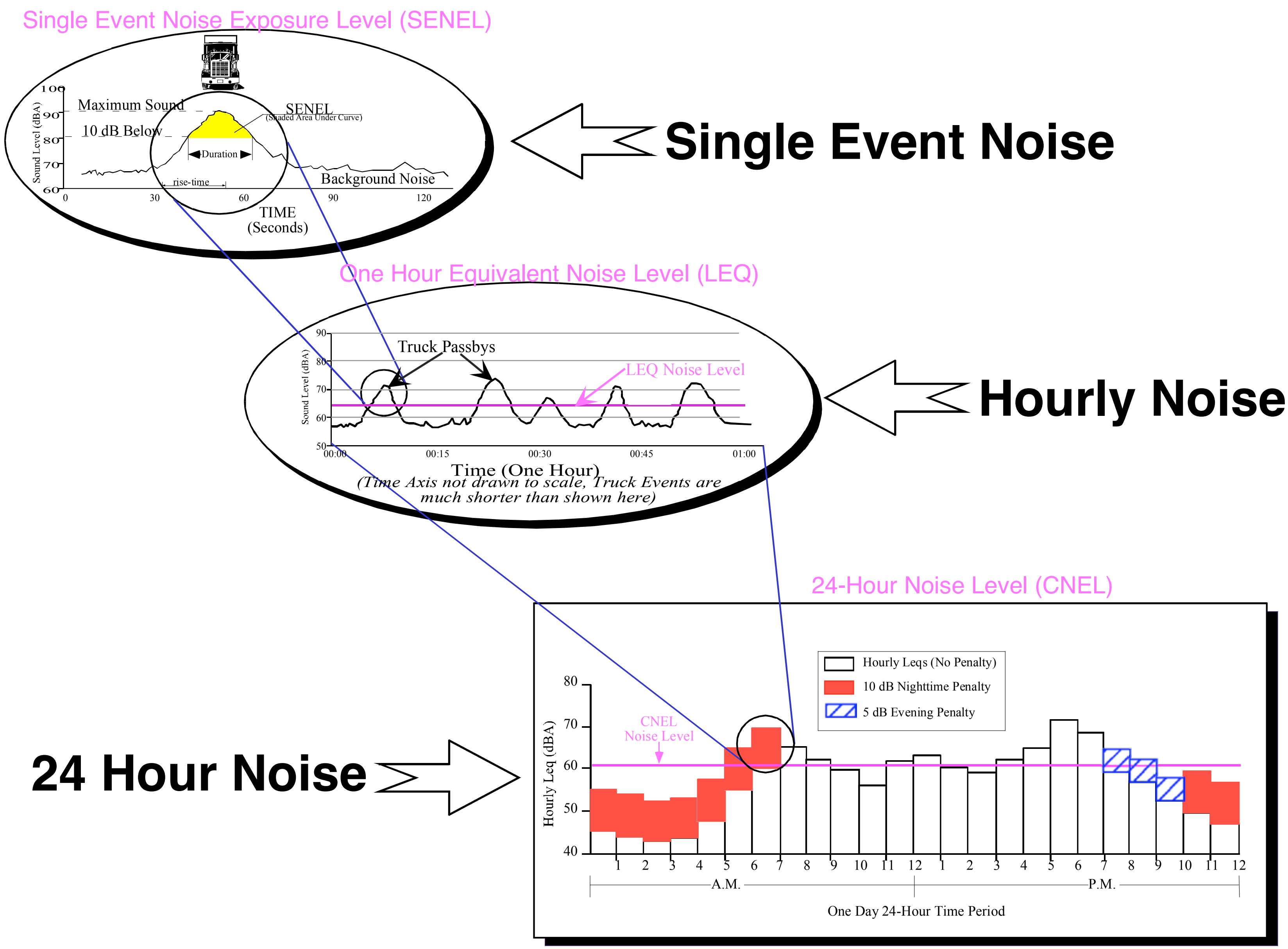


Exhibit 3

Single and Cumulative Noise Metric Definitions

Source: Mestre Greve Associates 1998

Glendale General Plan Noise Element

the SENEL is computed. The SENEL value is the integration of all the acoustic energy contained within the event. Speech and sleep interference research can be assessed relative to Single Event Noise Exposure Level data.

The SENEL metric takes into account the maximum noise level of the event and the duration of the event. Single event metrics are a convenient method for describing noise from individual aircraft events. This metric is useful in that airport noise models contain aircraft noise curve data based upon the SENEL metric. In addition, cumulative noise metrics such as LEQ, CNEL and DNL can be computed from SENEL data.

Cumulative Metrics

Cumulative noise metrics assess community response to noise by including the loudness of the noise, the duration of the noise, the total number of noise events and the time of day these events occur into one single number rating scale.

Equivalent Noise Level (Leq) is the sound level corresponding to a steady-state A-weighted sound level containing the same total energy as several SEL events during a given sample period. Leq is the "energy" average noise level during the time period of the sample. It is based on the observation that the potential for noise annoyance is dependent on the total acoustical energy content of the noise. This is graphically illustrated in the middle graph of Exhibit 3. Leq can be measured for any time period, but is typically measured for 15 minutes, 1 hour or 24-hours. Leq for a one hour period is used by the Federal Highway Administration for assessing highway noise impacts. Leq for one hour is called Hourly Noise Level (HNL) in the California Airport Noise Regulations and is used to develop Community Noise Equivalent Level (CNEL) values for aircraft operations.

Community Noise Equivalent Level, or CNEL is a 24-hour, time-weighted energy average noise level based on the A-weighted decibel. It is a measure of the overall noise experienced during an entire day. The term "time-weighted" refers to the penalties attached to noise events occurring during certain sensitive time periods. In the CNEL scale, noise occurring between the hours of 7 p.m. and 10 p.m. is penalized by approximately 5 dB. This penalty accounts for the greater potential for noise to cause communication interference during these hours, as well as typically lower ambient noise levels during these hours. Noise that takes place during the night (10 p.m. to 7 a.m.) is penalized by 10 dB. This penalty was selected to attempt to account for the higher sensitivity to noise in the nighttime and the expected further decrease in background noise levels that typically occur in the nighttime.

CNEL is graphically illustrated in the bottom of Exhibit 3. Examples of various noise environments in terms of CNEL are presented in Exhibit 4. CNEL is specified for use in California by local planning agencies in their General Plan Noise Element for land use compatibility planning.

The DNL index is very similar to CNEL, but does not include the evening (7 p.m. to 10 p.m.) penalty that is included in CNEL. It does include the nighttime (10 p.m. to 7 a.m.) penalty. Typically, DNL is about 1 dB lower than CNEL, although the difference may be greater if there is an abnormal concentration of noise events in the 7 to 10 p.m. time period. DNL is specified for use in all States except California

L(%), Lmax and Lmin are statistical methods of describing noise which accounts for variance in noise levels throughout a given measurement period. L(%) is a way of expressing the noise level exceeded for a percentage of time in a given measurement period. For example since 5 minutes is 25% of 20 minutes, L(25) is the noise level that is equal to or exceeded for five minutes in a twenty minute measurement period. It is L(%) that is used for most Noise Ordinance standards. Lmax represents the loudest noise level that is measured. The Lmax only occurs for a fraction of a second with all the other noise less than the Lmax level. Lmin represents the quietest noise level during a noise measurement. All other noise during the measurement period is louder than the Lmin.

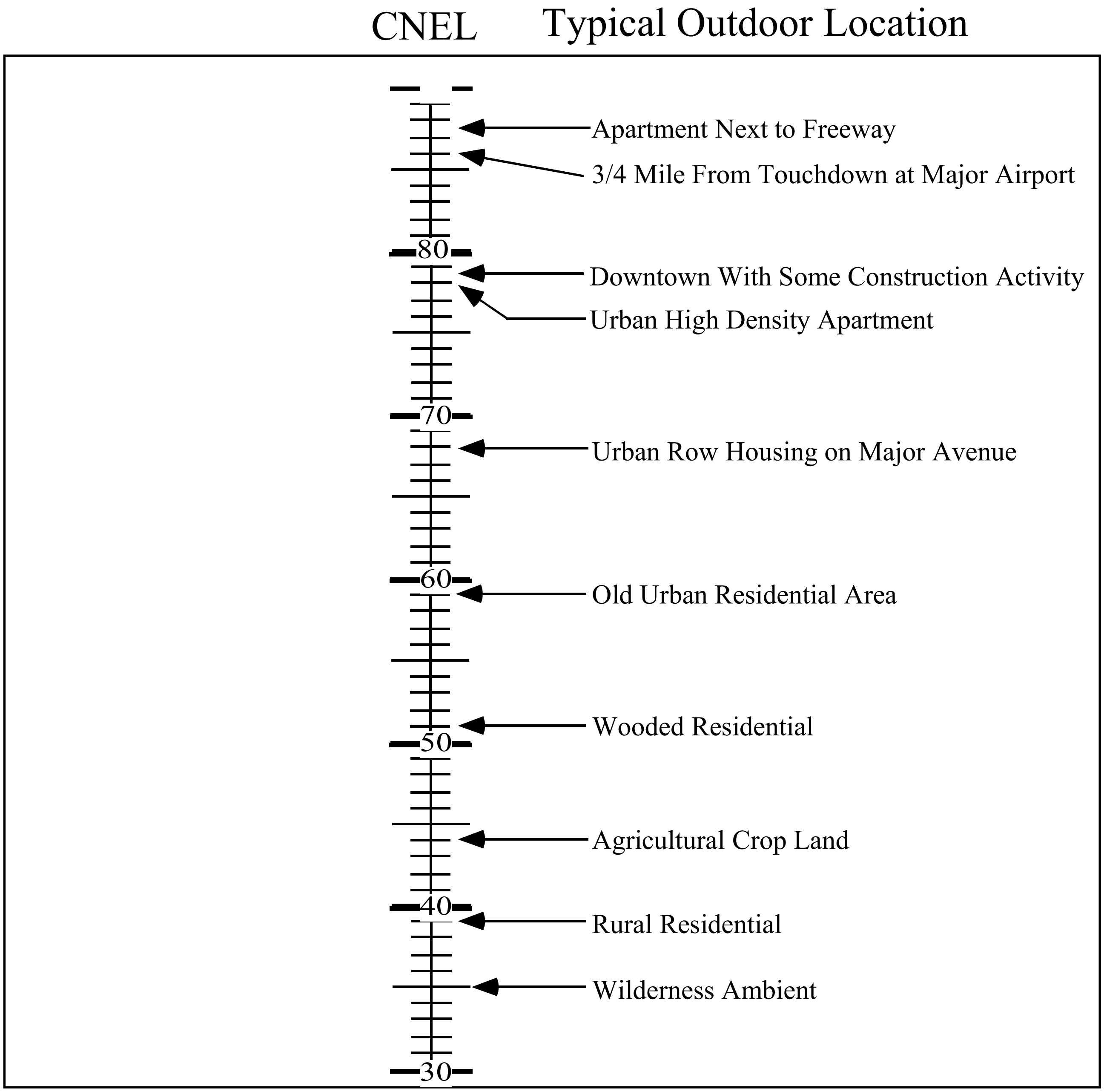


Exhibit 4

Examples of Typical Outdoor CNEL Levels

Source: Adapted from "Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare With an Adequate Margin of Safety", EPA, 1974

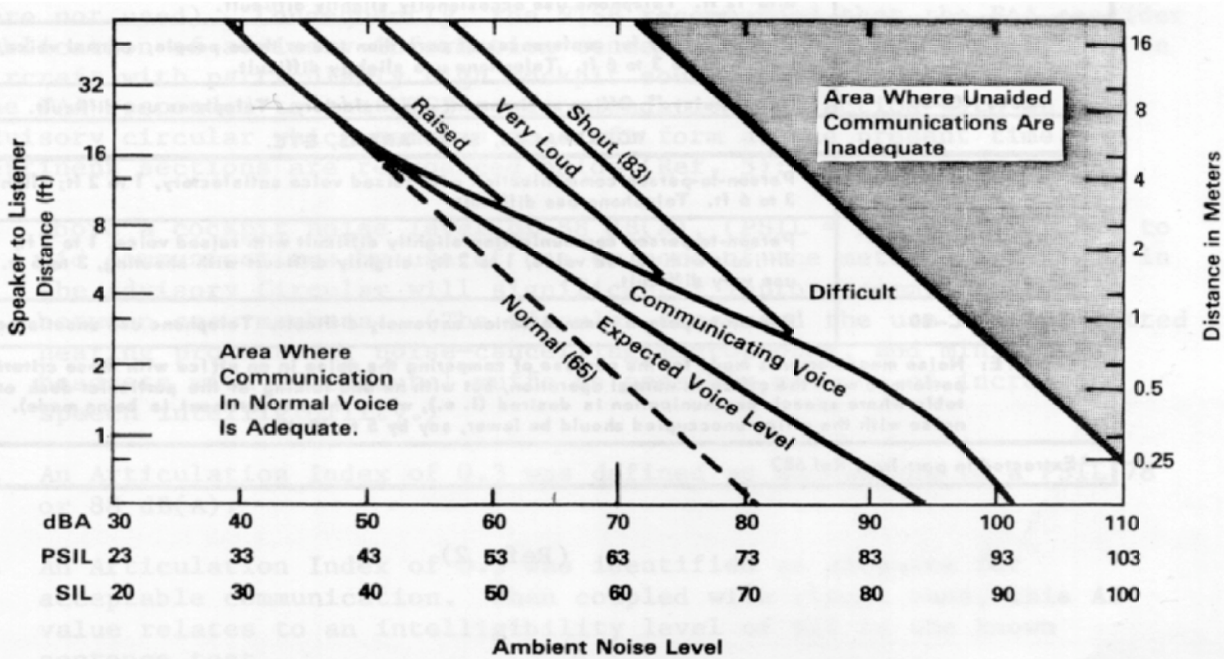
3.0 HEALTH EFFECTS

Noise, often described as unwanted sound, is known to have several adverse effects on humans. From these known adverse effects of noise, criteria have been established to help protect the public health and safety and prevent disruption of certain human activities. These criteria are based on effects of noise on people such as hearing loss (not a factor with typical community noise), communication interference, sleep interference, physiological responses, and annoyance. Each of these potential noise impacts on people are briefly discussed in the following narrative:

Hearing Loss is generally not a concern in community noise problems, even very near a major airport or a major freeway. The potential for noise induced hearing loss is more commonly associated with occupational noise exposures in heavy industry, very noisy work environments with long term exposure, or certain very loud recreational activities such as target shooting, motorcycle or car racing, etc. The Occupational Safety and Health Administration (OSHA) identifies a noise exposure limit of 90 dBA for 8 hours per day to protect from hearing loss (higher limits are allowed for shorter duration exposures). Noise levels in neighborhoods, even in very noisy neighborhoods, are not sufficiently loud to cause hearing loss.

Communication Interference is one of the primary concerns in environmental noise problems. Communication interference includes speech interference and interference with activities such as watching television. Normal conversational speech is in the range of 60 to 65 dBA and any noise in this range or louder may interfere with speech. There are specific methods of describing speech interference as a function of distance between speaker and listener and voice level. Exhibit 5 shows the relation of quality of speech communication with respect to various noise levels.

Sleep Interference is a major noise concern in noise assessment and, of course, is most critical during nighttime hours. Sleep disturbance is one of the major causes of annoyance due to community noise. Noise can make it difficult to fall asleep, create momentary disturbances of natural sleep patterns by causing shifts from deep to lighter stages and cause awakening. Noise may even cause awakening that a person may or may not be able to recall.



Permissible Distance Between a Speaker and Listeners for Specified Voice Levels and Ambient Noise Levels

(The Levels in Parantheses Refer to Voice Levels Measured One Meter From the Mouth.)

Exhibit 5

Speech Interference and Noise Levels

Extensive research has been conducted on the effect of noise on sleep disturbance with varying results. Recommended values for desired sound levels in residential bedroom space range from 25 to 45 dBA with 35 to 40 dBA being the norm. In 1981, the National Association of Noise Control Officials published data on the probability of sleep disturbance with various single event noise levels. Based on laboratory experiments conducted in the 1970's, this data indicated noise exposure, at 75 dBA interior noise level event will cause noise induced awakening in 30 percent of the cases. Recent research from England, however showed that the probability for sleep disturbance is less than what had been earlier reported. Field studies conducted during the 1990's, using new sophisticated techniques, indicated that awakenings can be expected at a much lower rate than had been expected based on earlier laboratory studies. This research showed that once a person was asleep, it is much more unlikely that they will be awakened by a noise. The significant difference in the recent English study is the use of actual in-home sleep disturbance patterns as opposed to laboratory data that had been the historic basis for predicting sleep disturbance. Some of this research has been criticized because it was conducted in areas where subjects had become habituated to aircraft noise. On the other hand, some of the earlier laboratory sleep studies had been criticized because of the extremely small sample sizes of most laboratory studies, and because the laboratory was not necessarily a representative sleep environment. The 1994 British sleep study compared the various causes of sleep disturbance using in home sleep studies. This field study assessed the effects of nighttime aircraft noise on sleep in 400 people (211 women and 189 men; 20-70 years of age; one per household) habitually living at eight sites adjacent to four U.K. airports, with different levels of night flying. The main finding was that only a minority of aircraft noise events affected sleep, and, for most subjects, that domestic and other non-aircraft factors had much greater effects. As shown in the Exhibit 6, aircraft noise was a minor contributor among a host of other factors that lead to awakening response.

The Federal Interagency Committee on Noise (FICON) in 1992 in a document entitled *Federal Interagency Review of Selected Airport Noise Analysis Issues* recommended an interim dose-response curve for sleep disturbance based on laboratory studies of sleep disturbance. In June of 1997, the Federal Interagency Committee on Aviation Noise (FICAN) updated the FICON recommendation with an updated curve based on the more recent in-home sleep disturbance studies which show lower rates of awakening compared to the laboratory studies. FICAN recommended a curve based on the upper limit of the data presented and therefore considers the curve to represent the "maximum percent of the exposed population expected to be behaviorally awakened," or the "maximum awakened."

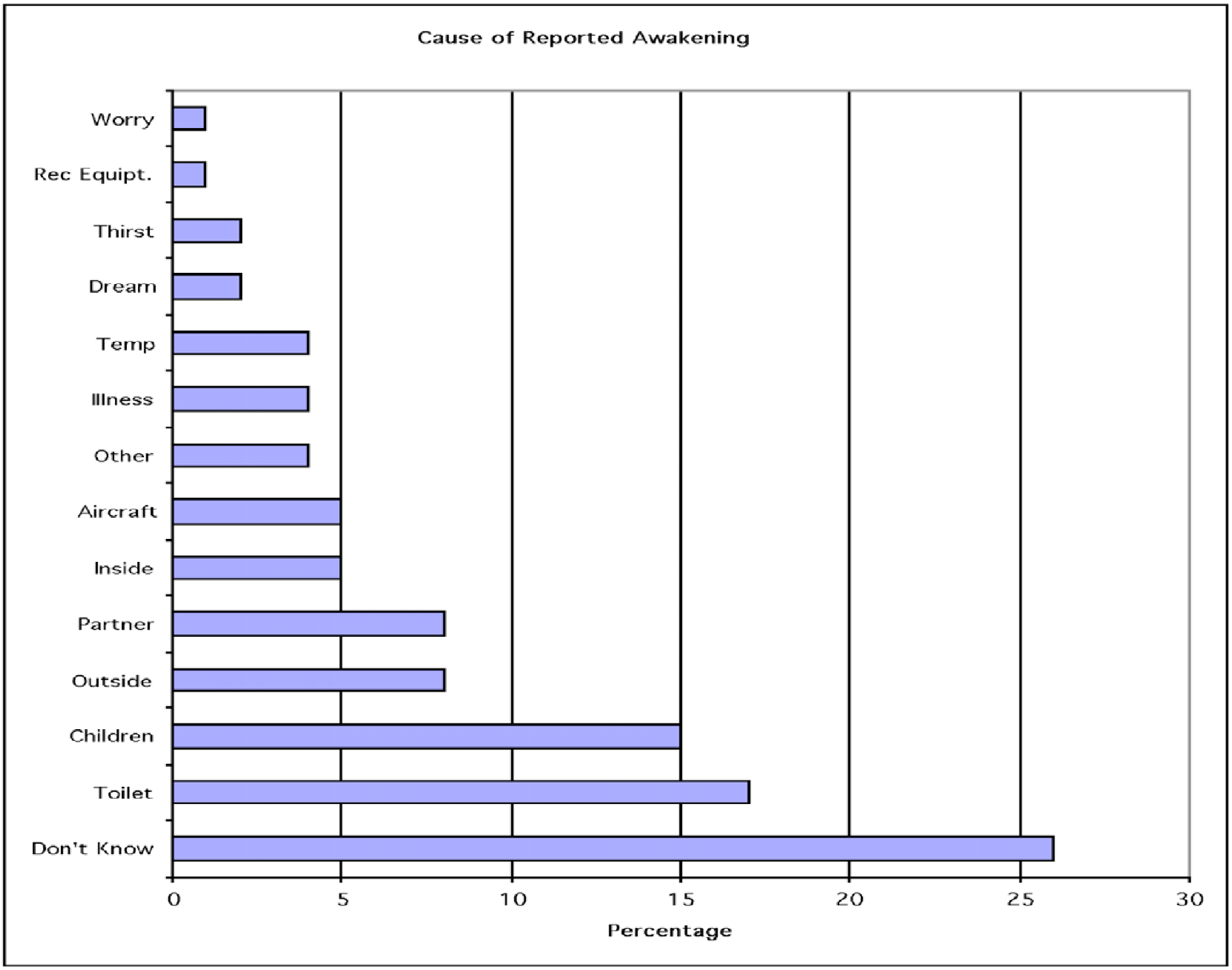


Exhibit 6
Causes and Prevalence of All Awakenings

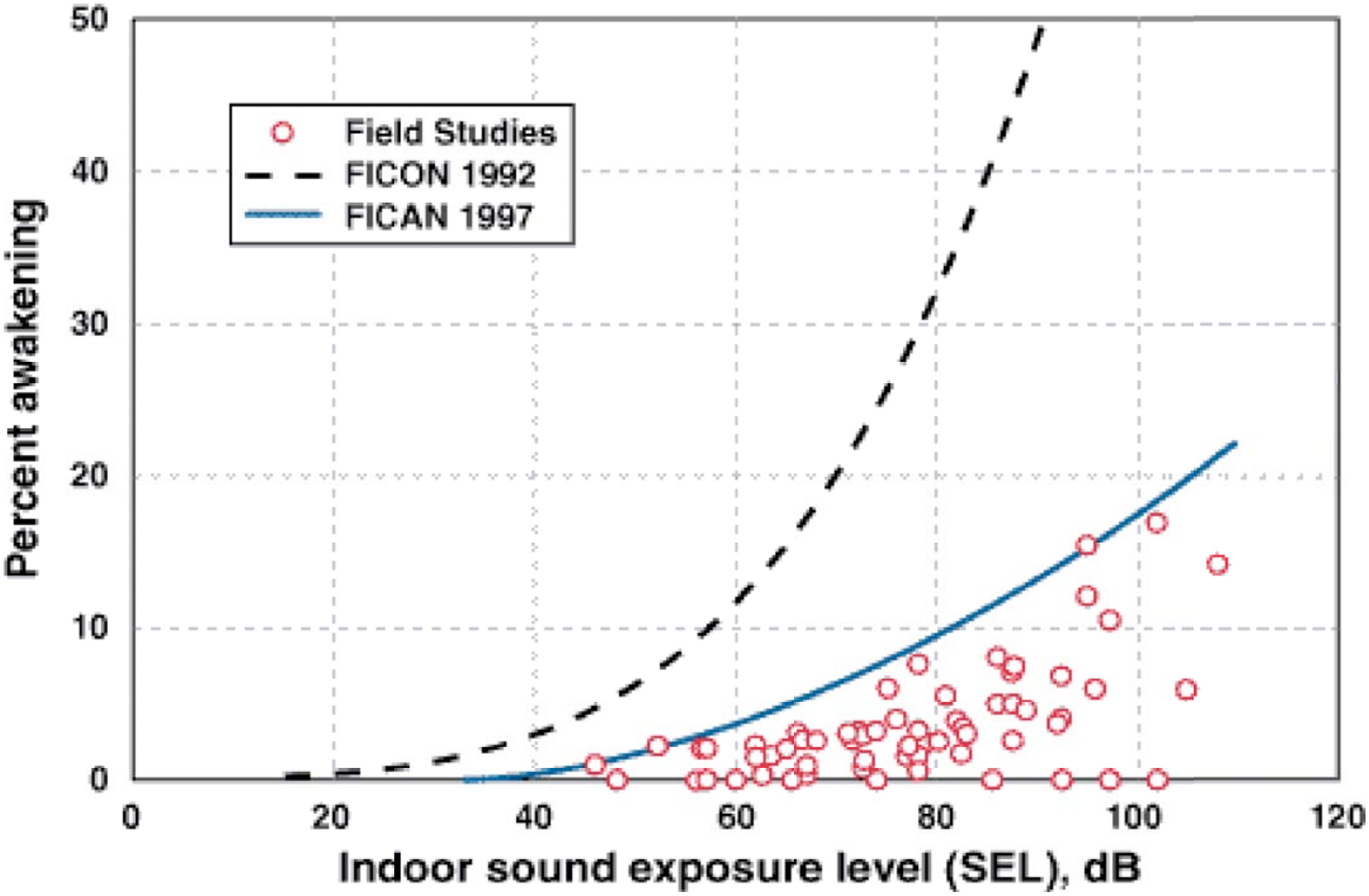
The FICAN recommendation is shown on Exhibit 7. This is a very conservative approach. A more common statistical curve for the data points reflected in Exhibit 7, for example, would indicate a 10% awakening rate at a level of approximately 100 dB SENEL, while the "maximum awakened" curve reflected in Exhibit 7 shows the 10% awakening rate being reached at 80 dB SENEL. (The full FICAN report can be found on the internet at www.fican.org.)

Physiological Responses are those measurable effects of noise on people that are realized as changes in pulse rate, blood pressure, etc. While such effects can be induced and observed, the extent is not known to which these physiological responses cause harm or are a sign of harm. Generally, physiological responses are a reaction to a loud short term noise such as a rifle shot or a very loud jet over flight.

Health effects from noise have been studied around the world for nearly thirty years. Scientists have attempted to determine whether high noise levels can adversely affect human health-apart from auditory damage-which is amply understood. These research efforts have covered a broad range of potential impacts from cardiovascular response to fetal weight and mortality. While a relationship between noise and health effects seems plausible, it has yet to be convincingly demonstrated--that is, shown in a manner that can be repeated by other researchers while yielding similar results.

While annoyance and sleep/speech interference have been acknowledged, health effects, if they exist, are associated with a wide variety of other environmental stressors. Isolating the effects of aircraft noise alone as a source of long term physiological change has proved to be almost impossible. In a review of 30 studies conducted worldwide between 1993 and 1998, a team of international researchers concluded that, while some findings suggest that noise can affect health, improved research concepts and methods are needed to verify or discredit such a relationship. They called for more study of the numerous environmental and behavioral factors than can confound, mediate or moderate survey findings. Until science refines the research process, a direct link between aircraft noise exposure and non-auditory health effects remains to be demonstrated.

Annoyance is the most difficult of all noise responses to describe. Annoyance is a very individual characteristic and can vary widely from person to person. What one person considers tolerable can be quite unbearable to another of equal hearing capability. The level of annoyance, of course, depends on the characteristics of the noise (i.e.; loudness,



Indoor Single Event Noise Exposure Level (SENEL)

Exhibit 7

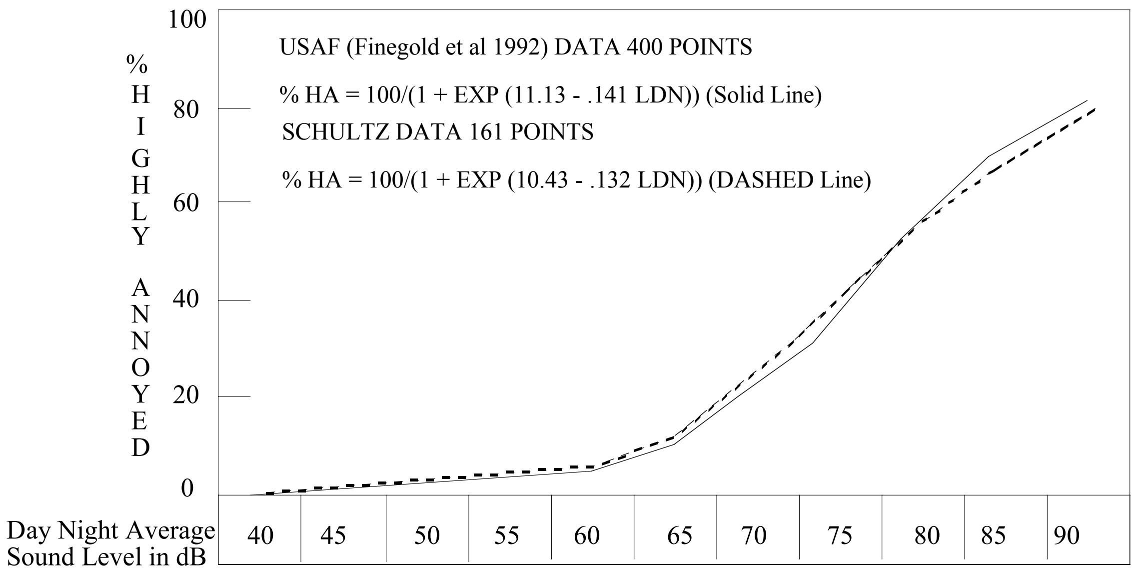
Sleep Interference and Noise Level

frequency, time, and duration), and how much activity interference (e.g. speech interference and sleep interference) results from the noise. However, the level of annoyance is also a function of the attitude of the receiver. Personal sensitivity to noise varies widely. It has been estimated that 2 to 10 percent of the population is highly susceptible to annoyance from any noise not of their own making, while approximately 20 percent are unaffected by noise. Attitudes are affected by the relationship between the person and the noise source (Is it our dog barking or the neighbor's dog?). Whether we believe that someone is trying to abate the noise will also affect our level of annoyance.

Annoyance levels have been correlated to CNEL levels. Exhibit 8 relates DNL noise levels to community response from two of these surveys. One of the survey curves presented in Exhibit 8 is the well-known Schultz curve, developed by Theodore Schultz. It displays the percent of a populace that can be expected to be annoyed by various DNL (CNEL in California) values for residential land use with outdoor activity areas. At 65 dB DNL the Schultz curve predicts approximately 14% of the exposed population reporting themselves to be "highly annoyed." At 60 dB DNL this decreases to approximately 8% of the population.

However, the Schultz curve and recent updates include data having a very wide range of scatter with communities reporting much higher percentages of population highly annoyed at these noise exposure levels. For example, under contract to the FAA, Bolt Beranek & Newman conducted community attitude surveys in the residential areas south of John Wayne Airport in Orange County in 1981 as part of a study of possible "power cutback" departure procedures. That study concluded that the surveyed population (principally in Santa Ana Heights and various Newport Beach neighborhoods) had more highly annoyed individuals at various CNEL levels than would be predicted by the Schultz curve. When plotted similar to the Schultz curve, this survey indicated the populations in Santa Ana Heights and Newport Beach were approximately 5 dB CNEL more sensitive to noise than the average population predicted by the Schultz curve. While the precise reasons for this increased noise sensitivity were not identified, it is possible that non-acoustic factors, including political or the socio-economic status of the surveyed population may have played an important role in increasing the sensitivity of this community during the period of the survey. Annoyance levels have never been correlated statistically to single event noise exposure levels in airport related studies.

School Room Effects. Interference with classroom activities and learning from aircraft noise is an important consideration and the subject of much recent research. Studies from



Calculated % HA Points		40	45	50	55	60	65	70	75	80	85	90
	USAF	0.41	0.831	1.66	3.31	6.48	12.29	22.1	36.47	53.74	70.16	82.64
	SCHULTZ	0.576	1.11	2.12	4.03	7.52	13.59	23.32	37.05	53.25	68.78	81.0

Exhibit 8

Comparison of logistic fits to original 161 data points of Schultz (1978) and USAF analysis with 400 points (data provided by USAF Armstrong Laboratory).

Source: Ficon 1992

around the world indicate that vehicle traffic, railroad and aircraft noise can have adverse effects on reading ability, concentration, motivation, and long term learning retention. A complicating factor in this research is the extent of background noise from within the classroom itself. The studies indicating the most adverse effects examine cumulative noise levels equivalent to 65 CNEL or higher and single event maximum noise levels ranging from 85 to 95 dBA. In other studies the level of noise is unstated or ambiguous. According to these studies, a variety of adverse school room effects can be expected from *interior* noise levels equal to or exceeding 65 CNEL and or 85 dBA SEL.

Some interference with classroom activities can be expected with noise events that interfere with speech. As discussed in other sections of this report, speech interference begins at 65 dBA that is the level of normal conversation. Typical construction attenuates outdoor noise by 20 dBA with windows closed and 12 dBA with windows open. Thus some interference of classroom activities can be expected at outdoor levels of 77 to 85 dBA.

4.0 Noise Measurements

4.1 Methodology

Twenty-two (22) sites were selected for measurement of the noise environment in Glendale. A review of noise complaints, discussions with City staff, input received at a community meeting and identification of major noise sources in the community provided the initial base for development of the community noise survey. The measurement locations were selected on the basis of proximity to major noise sources and noise sensitivity of the land use. The measurement locations are depicted in Exhibit 9.

Noise measurements were made of the short term Leq values. These measurements provide a short 'snapshot' view of the noise environment. The noise measurements were made at a normal receptor height of about 5 feet above the ground. Measurements were made on August 16 and 17, 2005. The measurements were made with a Bruel & Kjaer Type 2236 Sound Level Meter, and calibrated every few hours. These noise measurement systems meet the American National Standards Institute "Type 1" specifications, which is the most accurate for community noise measurements. The meter and calibrator have current certification traceable to the National Institute of Standards and Technology (NIST).

4.2 Results

The results of the noise measurements are shown in Exhibit 10. These figures also depict the date and time of the measurement. The cause of the loudest event is identified and the most predominant noise source(s) are identified. The quantities measured were the Equivalent Noise Level (Leq), the maximum noise level (Lmax) and the minimum noise levels (Lmin).

When examining the noise data shown in Exhibit 10 it is important to note that most of these sites were at the front yards of homes. These data are intended to identify noise levels over a broad range of the City and are not an assessment of impacts at these sites. In all cases the major sources of noise are motor vehicles. The noise levels measured cover a wide range of noise exposure throughout the City. The quietest environment was in a residential area where noise levels were often below 40 dBA. The loudest events were buses and trucks and these events would push the noise levels into the mid 80 dBA range. In general, aircraft noise, industrial noise, and commercial noise sources did not appear to contribute significantly to the noise levels measured. A discussion of the noise measurements is presented below on a site by site basis.

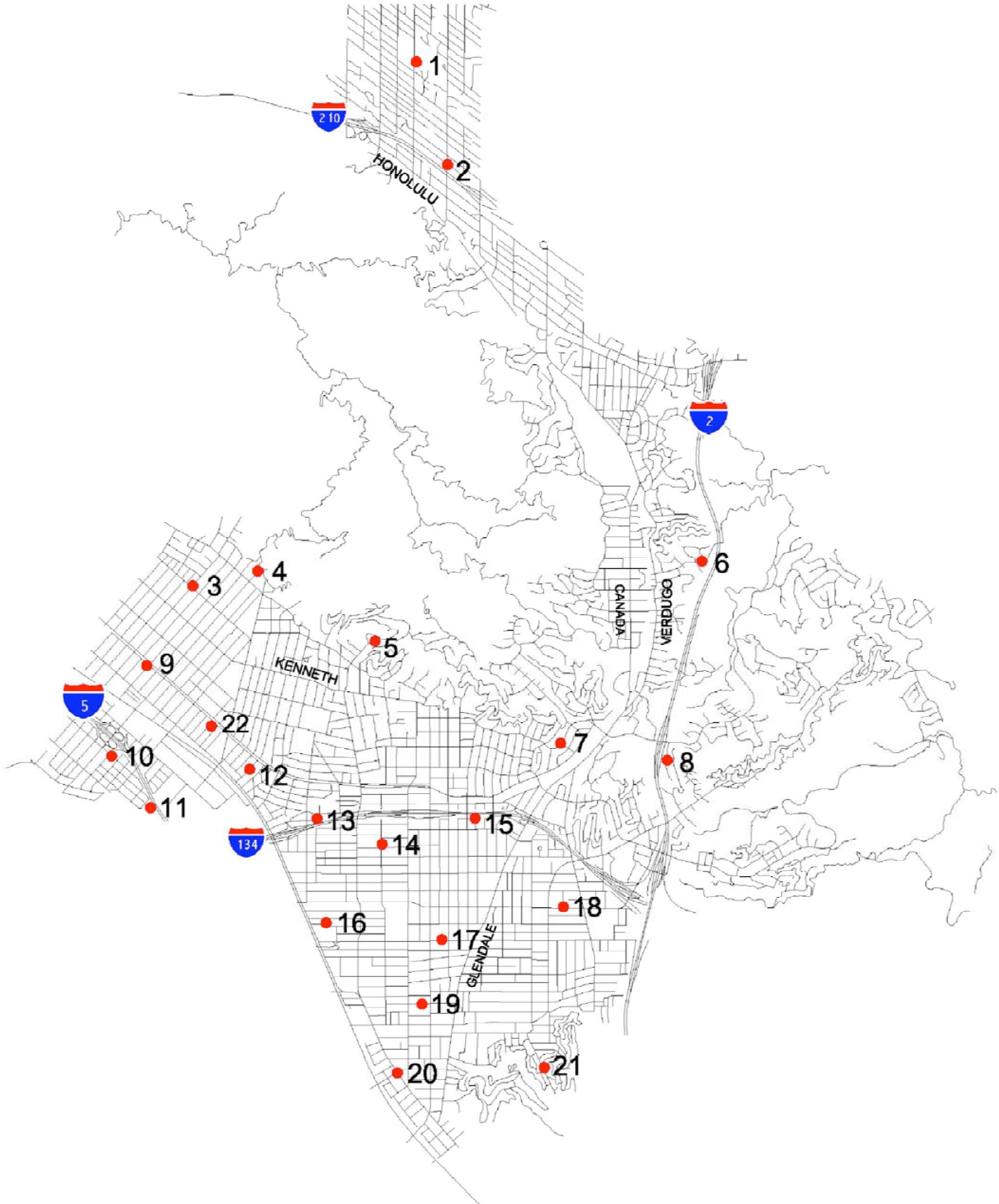
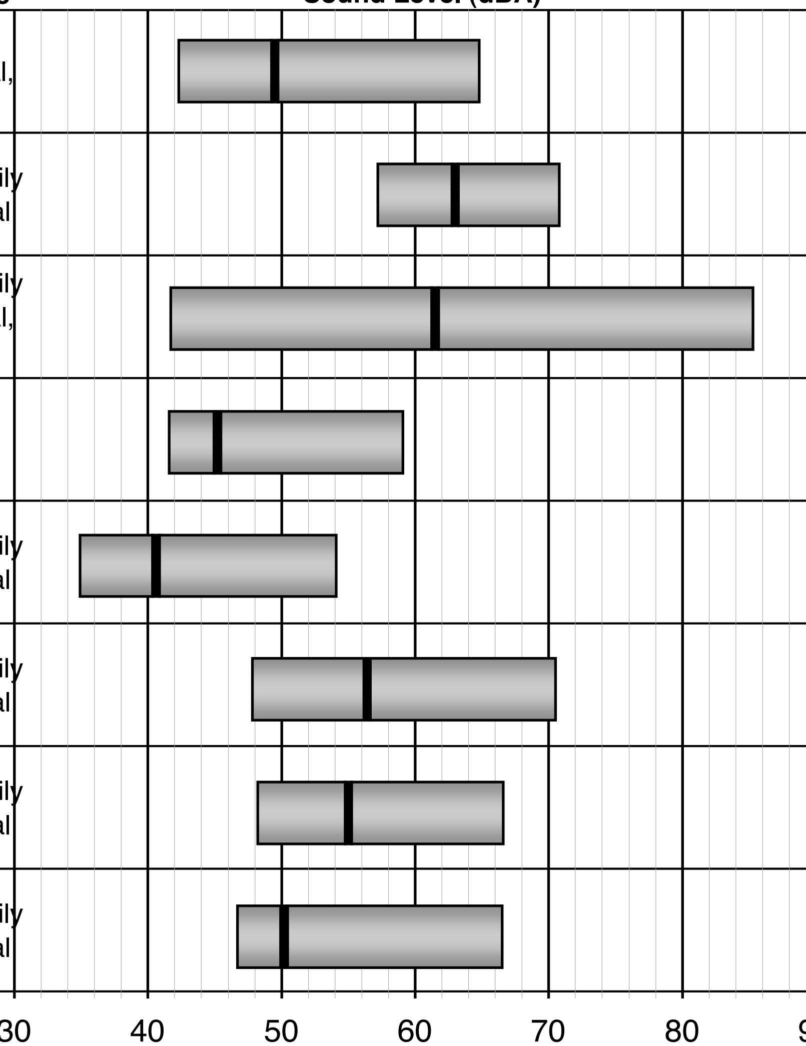


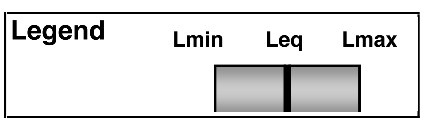
Exhibit 9
Measurement Locations

Exhibit 10
Graphic Summary of Short-Term Ambeint Noise Measurment Results

Site	Location	Date	Time	Land Use	Noise Sources
1	At interface between Dunsmore Park and residential area	8/17	10:00 a.m.	park, s.f. residential, school	dog bark was loudest event; ballfield, tennis court, soccer
2	SE Corner of Encinal and New York Avenue	8/17	8:40 a.m.	single family residential	traffic from Foothill Freeway
3	NW Corner of Allen Ave and Bel Aire Drive	8/17	12:58 p.m.	single family residential, school	loudest event was delivery truck; cars on road
4	Brand Park near Friendship Garden	8/17	4:10 p.m.	park	trash truck was loudest; waterfall, cars and street
5	1750 North Pacific Avenue	8/17	11:27 a.m.	single family residential	car door slam was loudest; distant const, birds
6	1981 Fern Lane	8/17	9:27 p.m.	single family residential	truck was loudest; cars, distant freeway
6	1981 Fern Lane	8/17	9:44 p.m.	single family residential	truck was loudest; cars, distant freeway
6	1981 Fern Lane	8/17	10:00 p.m.	single family residential	police car leaving was loudest; distant freeway

Sound Level (dBA)

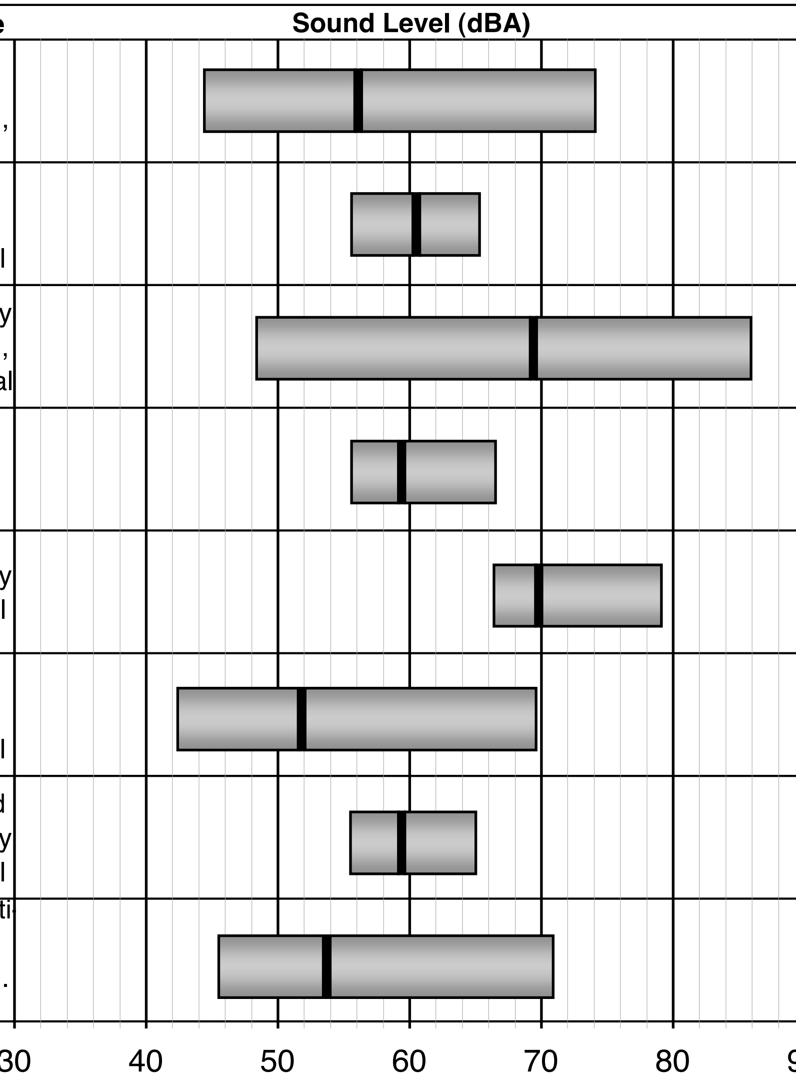


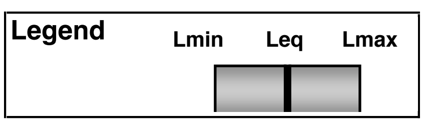


City of Glendale Noise Element
Mestre Greve Associates

Exhibit 10 (cont'd)
Graphic Summary of Short-Term Ambeint Noise Measurment Results

Site	Location	Date	Time	Land Use	Sound Level (dBA)	Noise Sources
7	Nibley Park on Mountain Road	8/16	8:17 p.m.	single family residential, park		Student car exhaust was loudest; cars
8	818 Foxkirk	8/16	4:20 p.m.	single family residential		motorcycle and truck were loudest; Glendale Frwy.
9	Glenoaks Ave. near Thompson Ave.	8/17	1:42 p.m.	multi-family residential, commercial		Beeline bus was loudest; other traffic on Glenoaks
10	Franklin Elementary School	8/16	6:58 p.m.	school		traffic on local road and distant freeway
11	Apartments near I-5 and SR-134	8/17	7:51 a.m.	multi-family residential		traffic from freeway
12	854 Norton Avenue	8/17	7:16 a.m.	single family residential		car on Norton was loudest, traffic on Glenoaks
13	669 Fairmont Avenue	8/16	5:45 p.m.	single and multi-family residential		freeway traffic
14	502 Columbus Avenue	8/17	10:50 p.m.	single/multi-family residential. school		car was loudest; cars and talking neighbors



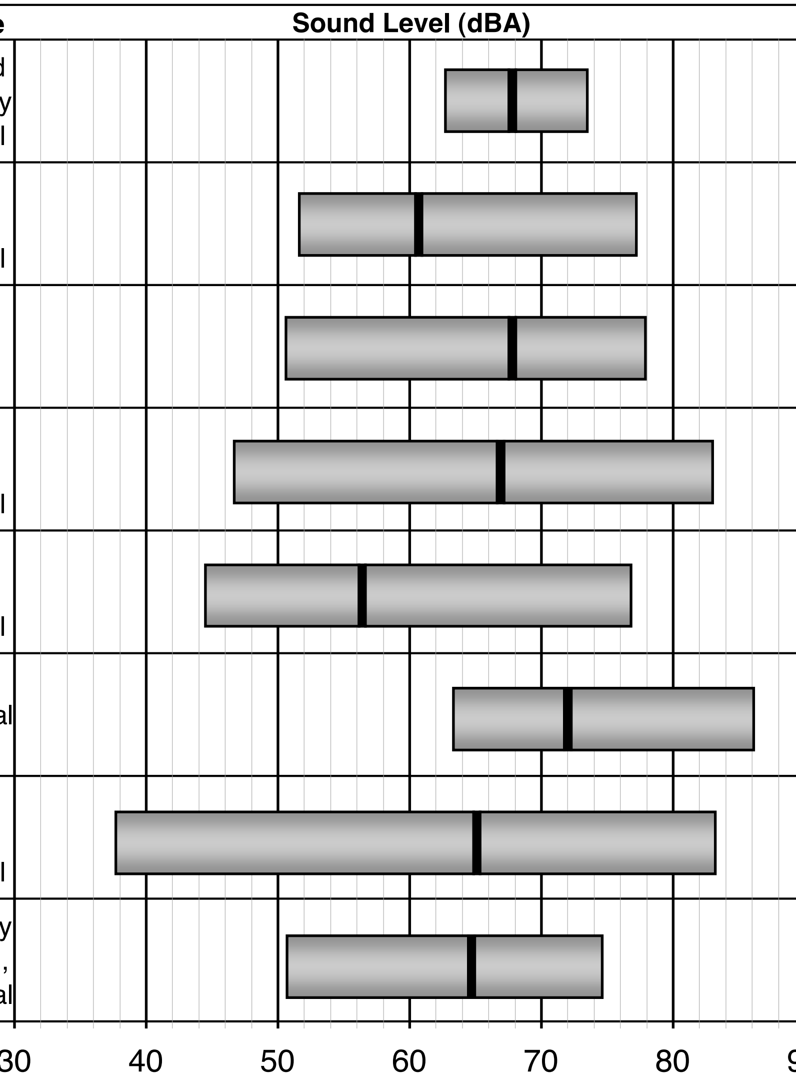


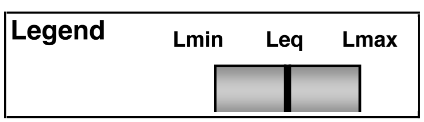
City of Glendale Noise Element
Mestre Greve Associates

Exhibit 10 (cont'd)

Graphic Summary of Short-Term Ambeint Noise Measurment Results

Site	Location	Date	Time	Land Use	Noise Sources
15	630 Isabel Street	8/16	5:00 p.m.	single and multi-family residential	traffic
16	633 Harvard	8/17	2:34 p.m.	single family residential	delivery truck was loudest; traffic into commercial
17	201 East Colorado Boulevard	8/16	3:30 p.m.	park	buses and trucks loudest; other traffic
18	1301 E. Broadway	8/16	2:41 p.m.	single family residential	buses were loudest; other traffic
19	124 Garfield Avenue	8/16	1:26 p.m.	single family residential	truck was loudest; other traffic
20	SW Corner of Los Feliz and San Fernando Road	8/16	12:15 p.m.	commercial	heavy truck was loudest; other traffic
21	1426 Adams Street	8/16	2:10 p.m.	single family residential	truck was loudest; other traffic
22	SW Corner of Davis and Glenoaks Boulevard	8/17	8:30 p.m.	multi-family residential, commercial	bus was loudest; other traffic





City of Glendale Noise Element
Mestre Greve Associates

4.3 Detailed Discussion of Noise Measurements

Twenty-two (22) sites were monitored as part of the measurement program. Each site is discussed below. Exhibit 10, previously presented, includes the time of day, exact location, general land use around the site, and more detail on the measurement results. It may be useful for the reader to refer back to this exhibit during the following discussions.

Site 1 – The noise measurement was taken at the interface between Dunsmore Park and the adjacent residential area. This site is in the Montrose area of the City. This site was selected to check on the compatibility of an active park area with residential uses. While the measurements were conducted, the ball field, soccer field and tennis courts were all active. There is a parking lot between the homes and the active fields that acts as a buffer zone. The noise levels measured at the residents ranged from 42 to 64 dBA with the average noise level (Leq) being just under 50 dBA. Most of the noise measured was due to the playfields, however, the loudest sound recorded came from a barking neighborhood dog. The daytime Leq is often indicative of the CNEL noise level. The CNEL in this area would be expected to be around 50 dBA. Thus, this area represents a quiet residential area, and shows that residential and active park uses can be compatible when in close proximity if properly planned.

Site 2 – This site is located near the Foothill Freeway, at the southeast corner of Encinal and New York Avenues, and was selected to test the effectiveness of the soundwall located along the freeway. The noise measurements, taken during the morning peak rush period, revealed an Leq noise level of 63 dBA. The California Department of Transportation (Caltrans) noise criteria is essentially an Leq of 67 dBA. Therefore, the soundwall at this site is working as planned, and the noise level should be considered acceptable.

Site 3 – Site 3 is at the northwest corner of Allen Avenue and Bel Aire Drive. This is a residential area with a school nearby. The noise levels varied widely for this street. When no cars or trucks driving on the street, the noise levels would drop into the 40 to 50 dBA range. However, when a loud delivery truck passed along the street the noise level increased substantially to 85 dBA. The average (Leq) noise level for the site was 61.5 dBA, which is typical for urban residential areas.

Site 4 – This noise measurement of Brand Park is representative of a quiet park. The experience of being in this park would be degraded if the noise level was loud. The average noise level in the park was 45 dBA, which is a very low noise level and reflects the peace and quiet that is associated with the park. A waterfall and distant traffic noise could be heard much of the time. The loudest noise levels were just below 60 dBA and were due to a trash truck. The noise levels experienced in this park are an excellent goal for development of future parks where peace and quiet are a major goal.

Site 5 – This site was selected to be representative of a very quiet residential area. The site is at 1750 North Pacific Avenue. Average noise levels were just above 40 dBA. The site was at the end of a cul-de-sac.

Site 6 – Site 6 is along Fern Lane, specifically measurements were made at 1981 Fern Lane. The Glendale Sports Complex was constructed at the east end of Fern Lane. Residents continue to complain about the traffic noise associated with the Sports Complex. Three 15-minute measurements were made at this site. During the first two measurements, which lasted from 9:27 p.m. to 9:59 p.m. cars were regularly traveling in a westbound direction from the Sports Complex. From 10:00 p.m. to 10:15 p.m. only one car passed the measurement site. Two factors may have effected the noise measurements. First, the police were present on the street and this may have caused people to drive slower than if the police had not been present. Second, one resident told us that about half of the playfields were not being used because it was not soccer season. We were unable to independently confirm this. The measurements during the first two periods averaged 56 and 55 dBA. The noise level during the third period was 50 dBA (Leq). The traffic on the distant freeway kept the noise levels in the 48 to 52 dBA range. Based on our limited measurements, the Sports Complex traffic does appear to increase average noise levels by about 5 dBA during the 30-minute period when the cars are leaving the Sports Complex. (A similar increase might be expected when the cars are arriving at the complex.) This increase in noise would be noticeable to the local residents. However, the noise levels remain low during this time that the time that the cars are leaving. With noise levels in the mid-50 dBA range, this neighborhood is very typical of many neighborhoods that were measured. The residents also have complained about the maximum sound levels due to cars passing by with loud exhausts. In the first measurement period, the loudest event was a pickup truck and the noise was generated by the vehicle's tires. In the second period, the loudest event was caused by the exhaust system on a pickup truck and reached a noise level of 66.6 dBA. Even though this level may be annoying to residents, it is at a legal level (i.e., California Motor Vehicle Code Sections

27204 and 27150) and is consistent with what was measured in other neighborhoods. (A summary of findings and recommendations is provided in the main body of the Noise Element.)

Site 7 – Site 7 is along Mountain Road at Nibley Park. At the community meeting some residents complained about the exhaust noise from student vehicles during the evening hours. Because there are speed bumps on this road, travel speeds are generally low. This measurement was intended as a check on the situation. Measurements were initiated 8:17 p.m. and lasted for 30 minutes. It is impossible to positively identify student traffic as opposed to residents, but it was clear that a significant portion of the traffic was associated with the college based spotting college parking tags and the general age of the driver. During the measurement period about 15 cars passed by whose noise level was between 65 and 70 dBA. Only one car exceeded 70 dBA, and that car was responsible for the maximum sound level measured during the period (i.e., 74.1 dBA). The exhaust on the car was the loudest source of noise. The exhaust on this car, while perhaps annoying to residents, is not illegal and is consistent with noise levels typical measured on other small streets throughout the City. The Leq noise level for the measurement was 56 dBA, which is representative of a quiet urban area. When no cars were present the area was very quiet, with the Lmin noise level measured at 44 dBA.

Site 8 - This site is located at 818 Foxkirk near the Glendale Freeway (SR-2). The site was selected to test the effectiveness of the soundwall located along the freeway. The noise measurements, taken during the morning peak rush period, revealed an Leq noise level of 60.5 dBA. The California Department of Transportation (Caltrans) noise criteria is essentially an Leq of 67 dBA. Therefore, the soundwall at this site is working as planned, and the noise level should be considered acceptable.

Site 9 – The area around this site is a mix of residential and commercial uses. Specifically, the site was at apartments along Glenoaks Avenue near Thompson Avenue. The site was selected as an example to determine if commercial noise was an issue for the nearby residents. Noise from the commercial uses was insignificant and the site was dominated by the noise from Glenoaks Avenue. The average noise level (Leq) was 69.4 dBA, and is a strong indicator that the CNEL noise level would also be in the upper 60s. This noise level is very loud for residential uses, and is generally considered unacceptable. Most communities consider noise levels in excess of 65 CNEL to be unacceptable for private spaces (e.g., yards and patios) around residential developments. Additionally, when noise levels exceed 65 CNEL additional construction upgrades (e.g., upgraded windows) are needed to insure that the State standard of 45 CNEL is achieved in indoor areas. A Beeline bus was the loudest noise recorded during the measurements with the noise reaching nearly 86 dBA.

Site 10 – Noise measurements were made in front of Franklin Elementary School. This site is a school site in a primarily residential neighborhood. The loudest noise levels were caused by the occasional vehicle on the local roadway. The Golden State Freeway (I-5) was a constant source of noise. This site was measured as part of the work for the original Noise Element. We measured it at about the same time of day as the measurements in 1978. In 1978, the Leq noise level was 57.9 dBA during the evening. We measured the noise at 59.4 dBA, or about 1.5 dBA higher than was measured 27 years ago. In other words, based on our noise measurements the noise levels in this area are about the same as they were in the 1970s.

Site 11 – Measurements were made at the apartment complex near the Golden State Freeway (I-5) and Ventura Freeway (SR-134). These apartments are located just west of Paula Avenue. It appears that a soundwall was constructed by Caltrans along the I-5 north of the apartment complex, but no soundwall runs along the apartment complex. The Leq noise levels at the site were 70 dBA, which is above the Caltrans standard of 67 dBA (Leq) and is generally considered unacceptable for residential development. The measurement also indicates that the CNEL noise level is in the upper 60s or low 70s, which is higher than the 65 CNEL level generally considered acceptable for residential development.

Site 12 – Noise measurements were made early in the morning at 854 Norton Avenue. At the community meeting, residents had complained that trucks in the early morning cut through on this street and cause unacceptable noise levels. We counted trucks while we conducted our noise measurements and did not see a single truck (including 2 axle delivery trucks). Noise levels were fairly low during the measurement with the Leq at 52 dBA. The loudest event was a car on Norton Avenue, which was nearly 70 dBA.

Site 13 – Site 13 is located at 669 Fairmont Avenue and is exposed to noise from the Ventura Freeway (SR-134). Caltrans recently constructed a soundwall along this area. The Leq noise level was measured at 59 dBA, which should be considered as very acceptable.

Site 14 – This site represents a residential area and school that are on the future edge of the Downtown Corridor. Currently the noise levels are low at this site (502 Columbus Avenue) with the Leq measured at 54 dBA. The loudest noises were due to cars driving on this street and reached 70 dBA.

Site 15 – The site at 630 Isabel is a residential area of multi-family dwellings along the Ventura Freeway (SR-134). The freeway is depressed through this area and there are no soundwalls present. The majority of the noise at this site was due to the freeway traffic. The noise level (Leq) was measured at 67.8 dBA, which is slightly above the Caltrans criteria of 67 dBA (Leq). Peak noise levels from traffic on the freeway were almost 74 dBA. This would be considered a loud residential area.

Site 16 – This site is in a residential area just off of San Fernando Road. A Home Depot store uses this road for customer and delivery access. The measurements were made in front of 633 Harvard. The loudest noise measured was 77 dBA and was due to a delivery truck. Traffic on Harvard was the primary source of noise at this location, and most of the traffic appeared to be associated with Home Depot. The Leq noise level was 60.7 dBA, and this noise level is generally acceptable for residential areas.

Site 17 – Site 17 was measured because it is representative of a downtown urban park. The park is located at 201 East Colorado Boulevard. Buses and trucks were the cause of the loudest noise levels, while traffic on Colorado Boulevard was a constant source of noise. The noise level was fairly high for a park use at 67.8 dBA. People tended to accumulate a little farther from the roadway than where we made our measurement, and appeared to be able to communicate and enjoy the park.

Site 18 – This area is representative of an urban residential area. The area along Broadway is a mix of commercial and residential uses. The loudest events measured were due to the buses on Broadway with the maximum sound level being 83 dBA. The average sound level (Leq) was 67 dBA. This noise level is slightly above what is typically considered acceptable for residential development.

Site 19 – This site, 124 Garfield Avenue, is directly adjacent to an automotive service center. This site is of interest because it represents many locations in this area where residents are located directly adjacent to automotive uses. At this site the noise both in terms of peak noise levels and predominate noise sources were due to the traffic on Garfield Avenue. The service center intercom was heard and was about 47 dBA; near the low end of the noise range. At this site there appears to be no noise incompatibility between the automotive use and the residential area.

Site 20 – Site 20 is at one of the busiest intersections in Glendale and is located in a commercial area. The measurement was near the corner of Los Feliz and San Fernando Roads. The noise at this site was cause by the traffic on these two roadways. This was the loudest site measured with an Leq of 72 dBA.

Site 21 – This site is representative of the Adams Hill residential area. The cars on Adams Street were responsible for the noise at this site. The Lmax was due to a very loud delivery truck that reached a noise of 83 dBA. When no traffic was present, the noise levels dropped very low to the low 40 dBA and lower range. The average noise level was 65 dBA (Leq).

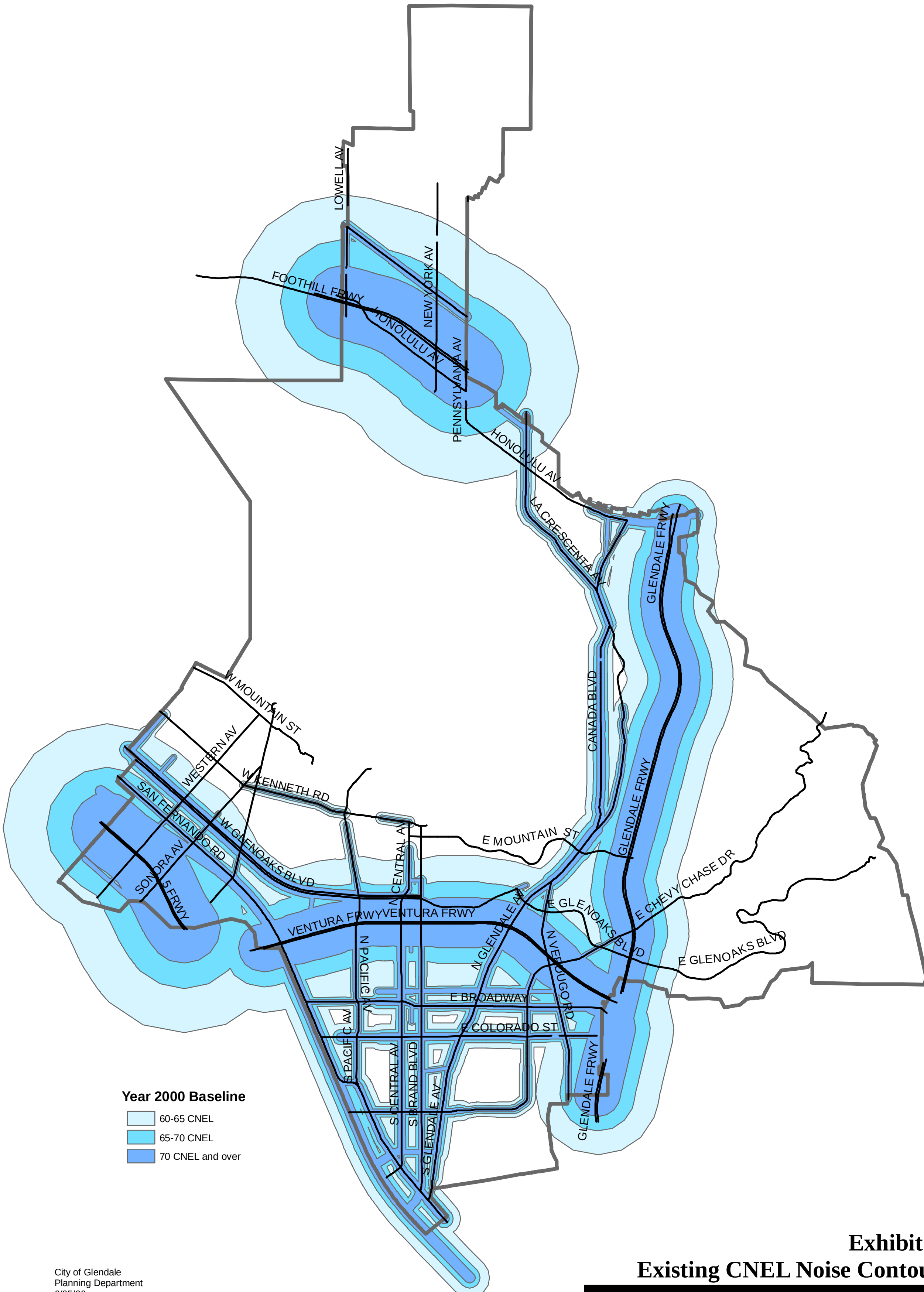
Site 22 – Site 22 is a senior housing complex across the street from a banquet facility. This was our fourth time trying to measure noise, if any, generated by a banquet facility. Unfortunately, the banquet facility was not operating during any of the four attempted monitoring times. The loudest event was due to a bus on Glenoaks Boulevard. Traffic on Glenoaks was the predominant noise source. The Leq noise level at this site was 65 dBA, which is at the upper end of what is normally considered acceptable for residential development.

5.0 NOISE CONTOURS

The noise environment in Glendale is attributable primarily to roadways, which include both surface roadways and freeways. Along the southwest border of the City, the Union Pacific Railroad is also a significant noise source. There are no airplane or helicopter operations that are loud enough and consistent enough to be significant.

The noise contours for the City of Glendale are presented in Exhibits 11 and 12 for existing and future conditions respectively. The existing contours are based on the existing conditions of traffic volumes and other sources of noise in the community. Both sets of traffic data were provided by the Glendale Traffic Department. The future contours represent a year 2030 scenario. (The traffic noise contours, including the average daily traffic, are also presented in a tabular form at the end of this report.)

The noise contours were generated using a mathematical model developed by the Federal Highway Administration ("Traffic Noise Model," FHWA-EP-02-031, April 2004). The Traffic Noise Model (TNM) model uses traffic volume, vehicle mix, average vehicle speed, roadway geometry, and sound propagation path characteristics to predict hourly A-weighted Leq values adjacent to a road. Vehicle mix is reported in terms of the number of automobiles, medium trucks, and heavy trucks. The truck categories are defined in the TNM model by number of axles and weight. In order to compute a CNEL value for roadways the hourly data for a 24 hour period are used according to the CNEL formula. Vehicle distribution over the 24 hour day must be known, i.e., the percent of vehicles in the daytime period (7 a.m. to 7 p.m.), evening period (7 p.m. to 10 p.m.) and night period (10 p.m. to 7 a.m.). The mix of automobiles, medium trucks and heavy trucks has an effect on noise levels. The assumption used to model noise is based on known traffic mix data. For arterial roadways the vehicle mix data are obtained from mix data collected by the County of Orange during extensive surveys of 53 intersections within the County. This survey is the most comprehensive conducted in Southern California and is considered representative for the vast majority of arterial highways in this area. The arterial roadway mix data are provided in Table 2.



City of Glendale
Planning Department
6/05/06

Exhibit 11
Existing CNEL Noise Contours

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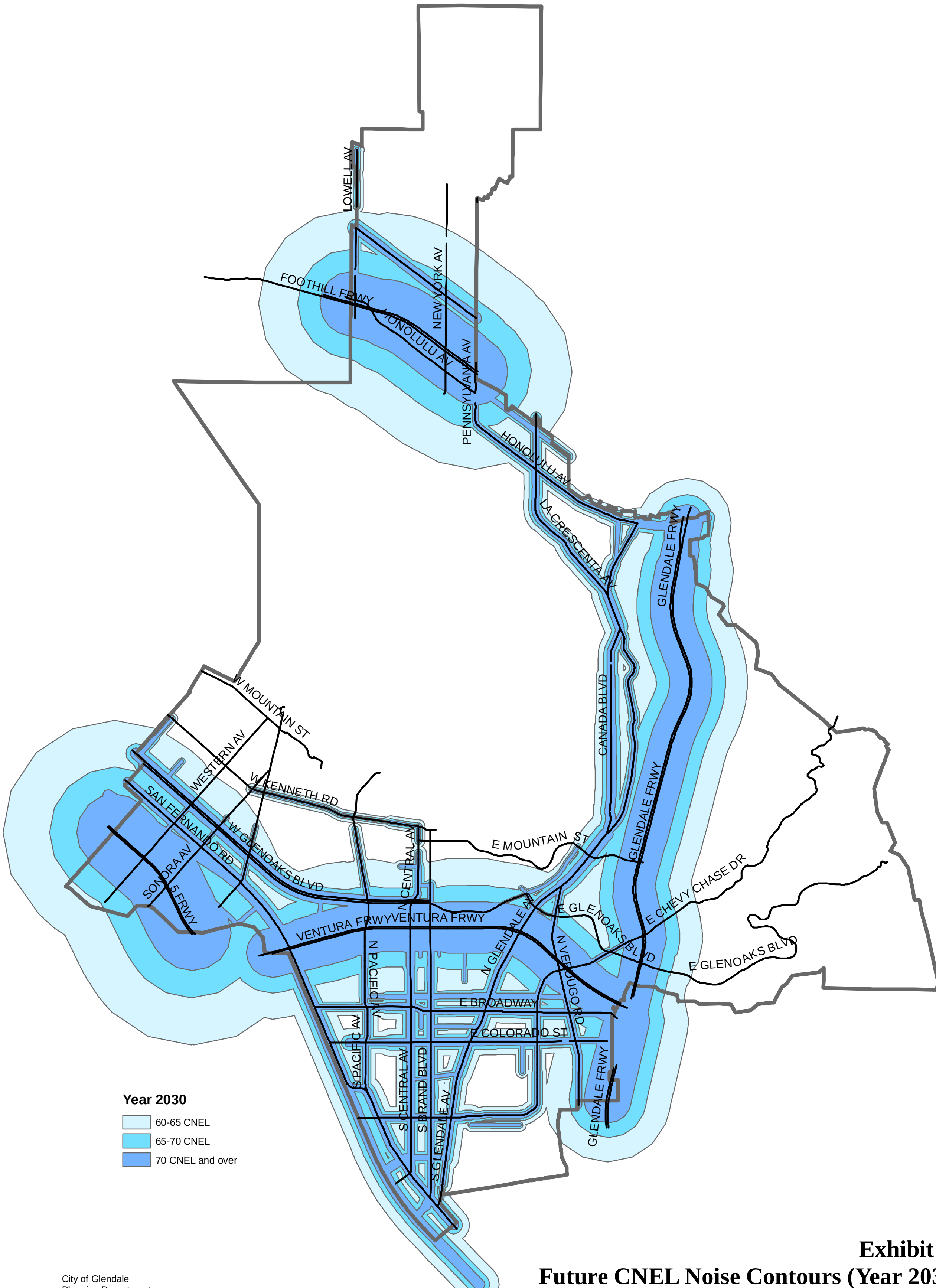

City of Glendale
Planning Department
6/05/06

Exhibit 12
Future CNEL Noise Contours (Year 2030)

Table 2
Arterial Roadway Vehicle Mix Data
(Traffic distribution per time of day in percent of Average Daily Traffic – ADT)

VEHICLE TYPE	DAY (7 a.m. to 7 p.m.)	EVENING (7 p.m. to 10 p.m.)	NIGHT (10 p.m. to 7 a.m.)	TOTAL
Automobile	75.51	12.57	9.34	97.42
Medium Truck	1.56	0.09	0.19	1.84
Heavy Truck	0.64	0.02	0.08	0.74

Caltrans conducts periodic traffic counts on freeways and publishes them on the internet (www.dot.ca.gov/hq/traffops/saferesr/trafdata/). The various truck percentages reported by Caltrans were used for the projections.

The Union Pacific Railroad line handles three types of train in the Glendale area; Metrolink, Amtrak, and freight. In terms of noise Metrolink is the dominant noise source. Published train schedules were consulted and it was determined that 64 Metrolink trains run through Glendale each day. Two Amtrak trains are currently scheduled each day. Representatives from Union Pacific Railroad were contacted and no precise numbers of daily freight train operations could be provided, however on those discussions and our observations, we estimated that 10 freight trains pass through each day. According to Metrolink representatives, by the year 2030 ninety-six (96) Metrolink trains are anticipated each day. There are no plans to increase Amtrak trains at this time. Freight train usage was increased to 15 trains per day. These data were used to generate the train noise contours included in Exhibit 11 and 12.

Noise contours represent lines of equal noise exposure, just as the contour lines on a topographic map are lines of equal elevation. The contours shown on the map are the 60, 65 and 70 dB CNEL noise level. The noise contours presented can be used as a guide for land use planning. The 60 CNEL contour defines the Noise Referral Zone. This is the noise level for which noise considerations should be included when making land use policy decisions.

The contours presented in this report are a graphic representation of the noise environment. These distances to contour values are also shown in tabulated format in the appendix. Topography and intervening buildings or barriers have a very complex effect on the propagation of noise. To present a worst case estimate, the topographic affect is not included in these contours to present a worst case projection. Exhibit 11 presents the CNEL noise contours for existing conditions and Exhibit 12 presents estimated contours for 25 years in the future (2030).

Exhibits 11 and 12 also show the land uses in the City of Glendale. Residential land uses are considered noise sensitive and can be identified by the key on the exhibit. Residential land use identifiers all begin with the letter "R" (e.g., R-1250).

APPENDIX

Traffic Noise Contours

Glendale Noise Element
Existing Traffic Noise Contours

Road	ADT	SPEED	CNEL 50' From CL	Distance to Contour From CL (ft) 70	65	60
ALAMEDA AVE.						
South of W. Kenneth Rd.	10000	25	73.10	75	143	273
South of Glenwood Rd.	16000	25	75.20	97	186	355
ALLEN AVE.						
North of W. Glenaoks Blvd.	10000	25	73.10	75	143	273
CANADA BLVD.						
South of N.Verdugo Rd.	17000	35	78.90	144	261	475
South of Santa Maria Ave.	22000	35	80.00	165	299	543
South of Glorietta Ave.	23000	35	80.20	168	306	555
South of Capistrano Ave.	25000	35	80.50	176	319	580
South of Opechee Ave.	29000	35	81.20	190	345	626
South of Colina Dr.	29000	35	81.20	190	345	626
CONCORD ST.						
South of W. Glenoaks Blvd.	10000	30	74.80	91	169	314
South of Fairmont Ave.	11000	30	75.20	96	178	331
E. BROADWAY						
East Of Brand Blvd.	11000	35	77.00	115	209	379
East of Maryland Ave.	13000	35	77.70	125	228	413
East of Louise St.	15000	35	78.30	135	245	445
East of Kenwood St.	13000	35	77.70	125	228	413
East of Isabel St.	14000	35	78.00	130	236	429
East of Glendale Ave.	16000	35	78.60	140	253	460
East of Chevy Chase Dr.	22000	35	80.00	165	299	543
East of Verdugo Rd.	24000	35	80.40	172	313	568
E. CHEVY CHASE DR.						
East of S. Brand Blvd.	13000	35	77.70	125	228	413
East of S. Glendale Ave.	15000	35	78.30	135	245	445
East of Boynton St.	8000	35	75.60	97	177	321
East of La Boice Dr.	9000	35	76.10	104	188	341
East of S. Adams St.	10000	35	76.60	109	199	361
East of N. Verdugo Rd.	14000	35	78.00	130	236	429
East of Sinclair Ave.	10000	35	76.60	109	199	361
East of E. Glenoaks Blvd.	7000	35	75.00	91	165	300
East of Harvey Dr.	14000	35	78.00	130	236	429
E. COLORADO ST.						
West of Brand Blvd.	26000	35	80.70	179	326	592
West of N. Glendale Blvd.	21000	35	79.80	161	292	530
East S. Everett St.	21000	35	79.80	161	292	530
East of S. Adams St.	23000	35	80.20	168	306	555
East of Chevy Chase Dr.	17000	35	78.90	144	261	475
East of N. Verdugo Rd.	16000	35	78.60	140	253	460
West of Glendale Freeway	20000	35	79.60	157	284	516
E. DORAN ST.						
East of N. Brand Blvd.	12000	25	73.90	83	158	302
East of N. Maryland Ave.	9000	25	72.70	71	135	257
East of N. Louise St.	12000	25	73.90	83	158	302
East of N. Isabel St.	10000	25	73.10	75	143	273

Road	ADT	SPEED	CNEL 50' From CL	Distance to Contour From CL (ft) 70	65	60
E. GLENOAKS BLVD.						
East of N. Brand Blvd.	17000	25	75.40	101	193	368
East of N. Louise St.	14000	25	74.60	90	173	330
South of E. Glenoaks Blvd.	11000	25	73.50	79	151	288
E. LOS FELIZ RD.						
East of S. Central Ave.	13000	35	77.70	125	228	413
E. MAPLE ST.						
East of S. Brand Blvd.	11000	25	73.50	79	151	288
East of S. Louise St.	12000	25	73.90	83	158	302
E. WILSON AVE.						
East of N. Brand Blvd.	10000	35	76.60	109	199	361
East of N. Louise St.	11000	35	77.00	115	209	379
East of N. Isabel St.	15000	35	78.30	135	245	445
East of N. Everett Ave.	14000	35	78.00	130	236	429
East of N. Adams St.	16000	35	78.60	140	253	460
East of N. Chevy Chase Dr.	7000	35	75.00	91	165	300
East of Olive St.	8000	35	75.60	97	177	321
East of N. Verdugo Rd.	11000	35	77.00	115	209	379
East of Sinclair Ave.	11000	35	77.00	115	209	379
ETHEL ST.						
West of Viscano Dr.	9000	25	72.70	71	135	257
FAIRMONT AVE.						
East of San Fernando Rd.	9000	30	74.40	86	160	297
FOOTHILL BLVD.						
East of Lowell Ave.	16000	40	80.30	163	290	515
East of Boston Ave.	16000	40	80.30	163	290	515
East of Lauderdale Ave.	20000	40	81.20	182	324	576
East of Dunsmore Ave.	23000	40	81.80	195	348	618
East of Maryland Ave.	26000	40	82.40	208	369	657
FOOTHILL FREEWAY						
East of Lowell Ave.	282000	65	101.00	1561	2700	4673
East of Boston Ave.	282000	65	101.00	1561	2700	4673
West of Pennsylvania Ave.	318000	65	101.00	1652	2860	4948
GLENDALE BLVD.						
South of San Fernando Rd.	30000	35	81.30	193	351	637
North of Union Pacific Railroad	28000	35	81.00	186	339	615
GLENDALE FREEWAY						
South of Verdugo Blvd.	85000	65	94.80	609	1007	1665
North of Stancrest Dr.	101000	65	95.50	656	1085	1795
South of Stancrest Dr.	129000	65	96.60	730	1208	1997
South of Oak Valley Rd.	176000	65	98.00	837	1383	2288
North of Solway St.	166000	65	97.70	815	1349	2230
North of E. Chevy Chase Dr.	193000	65	98.40	871	1440	2382
South of E. Chevy Chase Dr.	151000	65	97.30	782	1294	2140
South of E. Glenoaks Blvd.	138000	65	96.90	752	1244	2057
South of W. Broadway	246000	65	99.40	968	1601	2648
GOLDEN STATE FREEWAY						
South of Lenden Ct.	271000	65	101.00	1516	2622	4533
North of Thompson Ave.	243000	65	100.00	1440	2489	4304
South of Justin Ave.	279000	65	101.00	1537	2658	4596

Road	ADT	SPEED	CNEL 50' From CL	Distance to Contour From CL (ft) 70	65	60
GRANDVIEW AVE.						
South of W. Glenoaks Blvd.	13000	25	74.30	87	166	316
North of San Fernando Rd.	14000	25	74.60	90	173	330
HARVEY DR.						
South of E. Chevy Chase Dr.	8000	35	75.60	97	177	321
South of E. Glenoaks Blvd.	14000	35	78.00	130	236	429
South of Holly Dr.	19000	35	79.40	153	277	503
South of 134 Freeway	19000	35	79.40	153	277	503
North of E. Wilson Ave.	28000	35	81.00	186	339	615
South of E. Wilson Ave.	27000	35	80.90	183	332	603
HONOLULU AVE.						
West of Boston Ave.	6000	35	74.30	84	152	277
East of Boston Ave.	7000	35	75.00	91	165	300
East of Dunsmore Ave.	10000	35	76.60	109	199	361
East of New York Ave.	9000	35	76.10	104	188	341
West of Pennsylvania Ave.	5000	35	73.60	76	139	252
West of Ocean View Blvd.	10000	35	76.60	109	199	361
East of Ocean View Blvd.	8000	35	75.60	97	177	321
LA CRESCENTA AVE.						
North of Montrose Ave.	18000	40	80.80	173	307	547
South of Montrose Ave.	11000	40	78.60	135	240	427
South of Honolulu Ave.	10000	40	78.20	129	229	407
West of Roselawn Ave.	7000	40	76.70	108	192	341
East of Roselawn Ave.	9000	40	77.80	122	217	387
LOWELL AVE.						
North of 210 Freeway	14000	30	76.30	109	203	377
South of 210 Freeway	26000	30	79.00	152	283	526
MONTEREY RD.						
East of N. Brand Blvd.	12000	30	75.60	100	186	347
East of Geneva St.	12000	30	75.60	100	186	347
South of Coronado Dr.	11000	30	75.20	96	178	331
South of Cordova Ave.	25000	30	78.80	149	277	515
East of N. Glendale Ave.	10000	30	74.80	91	169	314
MONTROSE AVE.						
East of Ramsdell Ave.	9000	35	76.10	104	188	341
N. BRAND BLVD.						
South of Dryden St.	18000	30	77.40	125	232	431
South of Glenoaks Blvd.	22000	30	78.30	139	258	480
South of Monterey Rd.	30000	30	79.60	164	305	568
North of Doran St.	41000	30	81.00	194	361	672
South of Doran St.	19000	30	77.60	128	239	444
South of Milford St.	21000	30	78.00	136	252	468
South of Lexington Dr.	22000	30	78.30	139	258	480
South of California Ave.	19000	30	77.60	128	239	444
South of Wilson Ave.	20000	30	77.80	132	245	456

Road	ADT	SPEED	CNEL 50' From CL	Distance to Contour From CL (ft) 70	65	60
N. CENTRAL AVE.						
South of W. Mountain St.	12000	30	75.60	100	186	347
South of W. Stocker St.	19000	30	77.60	128	239	444
South of W. Dryden St.	16000	30	76.90	117	218	405
South of W. Fairview Ave.	18000	35	79.10	148	269	489
South of W. Glenoaks Blvd.	18000	35	79.10	148	269	489
South of Burchett St.	27000	35	80.90	183	332	603
Under 134 Freeway	34000	35	81.90	206	374	680
South of 134 Freeway	31000	35	81.50	197	357	648
South of W. Doran St.	31000	35	81.50	197	357	648
South of W. Lexington Dr.	26000	35	80.70	179	326	592
South of W. Wilson Ave.	31000	35	81.50	197	357	648
N. CHEVY CHASE DR.						
North of E. Broadway	8000	35	75.60	97	177	321
North of E. Wilson Ave.	16000	35	78.60	140	253	460
N. GLENDALE AVE.						
North of E. Glenoaks Blvd.	31000	30	79.70	167	311	578
South of E. Glenoaks Blvd.	36000	30	80.40	181	337	626
South of Monterey Rd.	44000	30	81.30	202	375	698
South of 134 Freeway	46000	30	81.50	207	384	715
North of E. Doran St.	43000	30	81.20	199	371	689
South of E. Doran St.	40000	30	80.80	192	357	663
South of E. Lexington Dr.	34000	30	80.10	176	327	607
South of E. California Ave.	33000	30	80.00	173	321	598
South of E. Wilson Ave.	29000	30	79.50	161	300	557
N. LOUISE ST.						
South of E. Glenoaks Blvd.	1000	25	63.10	21	39	75
N. ORANGE ST.						
South of W. Doran St.	9000	30	74.40	86	160	297
N. PACIFIC AVE.						
South of W. Kenneth Rd.	10000	25	73.10	75	143	273
South of Monte Vista Ave.	10000	25	73.10	75	143	273
South of Glenwood Rd.	12000	25	73.90	83	158	302
South of W. Stocker St.	14000	25	74.60	90	173	330
South of Palm Dr.	19000	25	75.90	107	205	391
South of W. Dryden St.	23000	25	76.70	120	228	436
South of W. Glenoaks Blvd.	33000	30	80.00	173	321	598
South of Burchett St.	38000	30	80.60	187	347	645
South of 134 Freeway	25000	30	78.80	149	277	515
South of W. Lexington Dr.	18000	30	77.40	125	232	431
South of W. Wilson Ave.	15000	30	76.60	113	210	391

Road	ADT	SPEED	CNEL 50' From CL	Distance to Contour From CL (ft) 70	65	60
N. VERDUGO RD.						
South of Fern Ln.	10000	35	76.60	109	199	361
South of Verdugo Knolls Dr.	14000	35	78.00	130	236	429
South of Sherer Ln.	15000	35	78.30	135	245	445
South of Towne Ave.	14000	35	78.00	130	236	429
North of E. Mountain St.	52000	35	83.70	257	467	847
South of E. Mountain St.	39000	35	82.50	221	402	730
North of E. Glenoaks Blvd.	9000	35	76.10	104	188	341
South of E. Glenoaks Blvd.	10000	35	76.60	109	199	361
South of Monterey Rd.	17000	35	78.90	144	261	475
South of Chevy Chase Dr.	1100	35	67.00	35	63	115
South of Stanley Ave.	13000	35	77.70	125	228	413
South of E. Wilson Ave.	9000	35	76.10	104	188	341
OCEAN VIEW BLVD.						
North of Honolulu Ave.	11000	30	75.20	96	178	331
South of Honolulu Ave.	9000	30	74.40	86	160	297
South of Sunview Dr.	6000	30	72.60	69	128	239
PENNSYLVANIA AVE.						
North of Montrose Ave.	23000	35	80.20	168	306	555
S. BRAND BLVD.						
South of Broadway	22000	30	78.30	139	258	480
South of Harvard St.	23000	30	78.40	142	265	492
South of Colorado St.	26000	30	79.00	152	283	526
South of Maple St.	30000	30	79.60	164	305	568
South of Garfield Ave.	28000	30	79.30	158	294	547
South of Chevy Chase Dr.	22000	30	78.30	139	258	480
South of Cerritos Ave.	28000	30	79.30	158	294	547
S. CENTRAL AVE.						
South of W. Broadway	14000	35	78.00	130	236	429
South of W. Harvard St.	16000	35	78.60	140	253	460
South of W. Colorado St.	20000	35	79.60	157	284	516
South of W. Chevy Chase Dr.	24000	35	80.40	172	313	568
South of Los Feliz Rd.	9000	35	76.10	104	188	341
S. CHEVY CHASE DR.						
South of E. Maple St.	10000	35	76.60	109	199	361
North of E. Maple St.	7000	35	75.00	91	165	300
North of E. Colorado St.	14000	35	78.00	130	236	429
S. GLENDALE AVE.						
South of E. Broadway	31000	30	79.70	167	311	578
South of E. Harvard St.	27000	30	79.10	155	289	536
South of E. Colorado St.	28000	30	79.30	158	294	547
South of E. Lomita Ave.	27000	30	79.10	155	289	536
South of E. Chestnut St.	26000	30	79.00	152	283	526
South of E. Maple St.	20000	30	77.80	132	245	456
South of E. Chevy Chase Dr.	28000	30	79.30	158	294	547
South of E. Palmer Ave.	27000	30	79.10	155	289	536
South of E. Cypress St.	27000	30	79.10	155	289	536
South of E. Los Feliz Rd.	16000	30	76.90	117	218	405
South of E. Cerritos Ave.	9000	30	74.40	86	160	297

Road	ADT	SPEED	CNEL 50' From CL	Distance to Contour From CL (ft) 70	65	60
S. ORANGE ST.						
South of W. Broadway	9000	30	74.40	86	160	297
S. PACIFIC AVE.						
South of W. Broadway	17000	30	77.10	121	225	418
South of W. Colorado St.	16000	30	76.90	117	218	405
S. VERDUGO RD.						
South of E. Broadway	13000	35	77.70	125	228	413
South of E. Colorado St.	16000	35	78.60	140	253	460
South of Dixon St.	14000	35	78.00	130	236	429
South of E. Maple St.	13000	35	77.70	125	228	413
SAN FERNANDO RD.						
North of Western Ave.	16000	35	78.60	140	253	460
South of Western Ave.	16000	35	78.60	140	253	460
South of Sonora Ave.	18000	35	79.10	148	269	489
South of Grandview Ave.	40000	35	82.60	224	407	740
South of Highland Ave.	42000	35	82.80	230	418	759
South of Fairmont Ave.	38000	35	82.40	218	397	720
South of W. Doran St.	32000	35	81.60	200	363	659
South of W. California Ave.	29000	35	81.20	190	345	626
South of W. Broadway	28000	35	81.00	186	339	615
South of Colorado St.	20000	35	79.60	157	284	516
South of Riverdale Dr.	20000	35	79.60	157	284	516
West of S. Pacific Ave.	17000	35	78.90	144	261	475
South of S. Pacific Ave.	26000	35	80.70	179	326	592
South of W. Chevy Chase Dr.	27000	35	80.90	183	332	603
South of W. Los Feliz Rd.	19000	35	79.40	153	277	503
South of S. Central Ave.	28000	35	81.00	186	339	615
South of Forest Ave.	28000	35	81.00	186	339	615
South of S. Glendale Ave.	38000	35	82.40	218	397	720
SONORA AVE.						
North of Glenoaks Blvd.	8000	25	72.20	66	126	241
South of Glenoaks Blvd.	14000	25	74.60	90	173	330
South of San Fernando Rd.	19000	35	79.40	153	277	503
South of Flower St.	19000	35	79.40	153	277	503
South of Lake St.	16000	35	78.60	140	253	460
UNION PACIFIC RAILROAD						
Parallel to San Fernando Rd.	0	0	0.00	240	455	870

Road	ADT	SPEED	CNEL 50' From CL	Distance to Contour From CL (ft) 70	65	60
VENTURA FREEWAY						
West of Union Pacific Railroad	282000	65	100.00	1028	1700	2811
East of Union Pacific Railroad	282000	65	100.00	1028	1700	2811
West of Concord St.	318000	65	100.00	1083	1792	2963
East of Concord St.	329000	65	100.00	1100	1818	3007
West of N. Pacific Ave.	297000	65	100.00	1052	1739	2876
East of N. Pacific Ave.	256000	65	99.60	985	1630	2695
East of N. Central Ave.	268000	65	99.80	1005	1663	2749
East of N. Louise St.	306000	65	100.00	1065	1762	2913
East of Geneva St.	275000	65	99.90	1017	1681	2781
South of N. Glendale Ave.	298000	65	100.00	1053	1741	2880
South of E. Chevy Chase Dr.	250000	65	99.50	975	1613	2667
East of Sinclair Ave.	228000	65	99.10	937	1549	2562
East of Harvey Dr.	218000	65	98.90	919	1519	2512
VERDUGO BLVD.						
East of Verdugo Rd.	26000	35	80.70	179	326	592
East of Valihi Way	29000	35	81.20	190	345	626
East of Hilldale Dr.	22000	35	80.00	165	299	543
East of 2 Freeway	17000	35	78.90	144	261	475
VERDUGO RD.						
North of Broadview Dr.	12000	35	77.40	120	218	396
South of Broadview Dr.	5000	35	73.60	76	139	252
South of Castera Ave.	13000	35	77.70	125	228	413
North of Bagdad Pl.	23000	35	80.20	168	306	555
VICTORY BLVD.						
East of Allen Ave.	9000	35	76.10	104	188	341
W. BROADWAY						
West of San Fernando Rd.	10000	35	76.60	109	199	361
East of Concord St.	10000	35	76.60	109	199	361
East of N. Kenilworth Ave.	8000	35	75.60	97	177	321
East of Pacific Ave.	13000	35	77.70	125	228	413
East of Columbus Ave.	27000	35	80.90	183	332	603
East of Central Ave.	15000	35	78.30	135	245	445
East of Orange St.	12000	35	77.40	120	218	396
W. CHEVY CHASE DR.						
East of San Fernando Rd.	13000	35	77.70	125	228	413
East of S. Central Ave.	15000	35	78.30	135	245	445
W. COLORADO ST.						
West of S. Pacific Ave.	28000	35	81.00	186	339	615
East of S. Pacific Ave.	17000	35	78.90	144	261	475
East of S. Columbus Ave.	25000	35	80.50	176	319	580
East of S. Central Ave.	20000	35	79.60	157	284	516
W. DORAN ST.						
East of San Fernando Rd.	14000	25	74.60	90	173	330
East of N. Central Ave.	11000	25	73.50	79	151	288
East of N. Orange St.	10000	25	73.10	75	143	273
East of N. Brand Blvd.	10000	25	73.10	75	143	273

Road	ADT	SPEED	CNEL 50' From CL	Distance to Contour From CL (ft) 70	65	60
W. GLENOAKS BLVD.						
South of Alameda Ave.	28000	40	82.70	216	383	682
South of Sonora Ave.	33000	40	83.40	234	416	740
South of Grandview Ave.	27000	40	82.50	212	377	670
South of Cleveland Rd.	26000	40	82.40	208	369	657
South of Graynold Ave.	27000	40	82.50	212	377	670
South of Alma St.	29000	40	82.90	219	390	694
East of Highland Ave.	26000	40	82.40	208	369	657
East of Concord St.	22000	40	81.70	191	340	604
East of N. Kenilworth Ave.	26000	40	82.40	208	369	657
East of N. Pacific Ave.	23000	40	81.80	195	348	618
East of N. Central Ave.	21000	25	76.30	114	217	414
W. KENNETH RD.						
West of Grandview Ave.	9000	25	72.70	71	135	257
East of Grandview Ave.	10000	25	73.10	75	143	273
East of Highland Ave.	9000	25	72.70	71	135	257
East of N. Pacific Ave.	5000	25	70.10	51	97	185
East of Valley View Rd.	9000	25	72.70	71	135	257
W. LOS FELIZ RD.						
North of Union Pacific Railroad	29000	35	81.20	190	345	626
North of San Fernando Rd.	26000	35	80.70	179	326	592
W. WILSON AVE.						
East of N. Columbus Ave.	10000	35	76.60	109	199	361
East of N. Central Ave.	13000	35	77.70	125	228	413
East of N. Orange St.	8000	35	75.60	97	177	321
WESTERN AVE.						
South of W. Glenoaks Blvd.	13000	25	74.30	87	166	316
South of San Fernando Rd.	24000	25	76.90	122	234	446
South of Lake St.	18000	25	75.70	104	199	380

Glendale Noise Element 2030 Traffic Noise Contours						
			CNEL 50'	Distance to Contour from CL (ft)		
Road	**ADT**	**SPEED**	**From CL**	**70**	**65**	**60**
ALAMEDA AVE.						
South of W. Kenneth Rd.	9000	25	72.60	71	135	257
South of Glenwood Rd.	18000	25	75.60	104	199	380
ALLEN AVE.						
North of W. Glenoaks Blvd.	11000	25	73.50	79	151	288
North of Lake St.	9000	25	72.60	71	135	257
South of Lake St.	11000	25	73.50	79	151	288
CANADA BLVD.						
South of N. Verdugo Rd.	23000	35	80.10	168	306	555
South of Santa Maria Ave.	23000	35	80.10	168	306	555
South of Glorietta Ave.	31000	35	81.40	197	357	648
South of Capistrano Ave.	33000	35	81.70	203	369	669
Opechee Way	38000	35	82.30	218	397	720
South of Colina Dr.	37000	35	82.20	215	391	710
CONCORD ST.						
South of W. Glenoaks Blvd.	10000	30	74.80	91	169	314
South of Fairmont Ave.	17000	30	77.10	121	225	418
E. BROADWAY						
East of Brand Blvd.	13000	35	77.70	125	228	413
East of Maryland Ave.	15000	35	78.30	135	245	445
East of Louise St.	16000	35	78.60	140	253	460
East of Kenwood St.	15000	35	78.30	135	245	445
East of Isabel St.	15000	35	78.30	135	245	445
East of Glendale Ave.	19000	35	79.30	153	277	503
East of Chevy Chase Dr.	25000	35	80.50	176	319	580
East of Verdugo Rd.	26000	35	80.70	179	326	592
E. CHEVY CHASE DR.						
East of S. Brand Blvd.	17000	35	78.80	144	261	475
East of S. Glendale Ave.	19000	35	79.30	153	277	503
East of Boynton St.	11000	35	76.90	115	209	379
East of La Boice Dr.	11000	35	76.90	115	209	379
East of S. Adams St.	14000	35	78.00	130	236	429
East of N. Verdugo Rd.	18000	35	79.10	148	269	489
West of E. Glenoaks Blvd.	13000	35	77.70	125	228	413
East of E. Glenoaks Blvd.	9000	35	76.10	104	188	341
East of Harvey Dr.	18000	35	79.10	148	269	489
E. COLORADO ST.						
East of S. Brand Blvd.	28000	35	81.00	186	339	615
East of S. Glendale Ave.	26000	35	80.70	179	326	592
East of S. Everett St.	24000	35	80.30	172	313	568
East of S. Adams St.	26000	35	80.70	179	326	592
East of S. Chevy Chase Dr.	19000	35	79.30	153	277	503
East of S. Verdugo Rd.	15000	35	78.30	135	245	445
East of Lincoln Ave.	19000	35	79.30	153	277	503

Road	ADT	SPEED	CNEL 50' From CL	Distance to Contour from CL (ft)		
				70	65	60
E. DORAN ST.						
East of N. Brand Blvd.	15000	25	74.80	94	179	343
East of N. Maryland Ave.	11000	25	73.50	79	151	288
East of N. Louise St.	13000	25	74.20	87	166	316
East of N. Isabel St.	12000	25	73.90	83	158	302
East of Geneva St.	7000	25	71.50	61	117	223
East of N. Glendale Ave.	8000	25	72.10	66	126	241
E. GLENOAKS BLVD.						
East of N. Brand Blvd.	21000	25	76.30	114	217	414
East of N. Louise St.	18000	25	75.60	104	199	380
East of N. Jackson St.	12000	25	73.90	83	158	302
East of N. Isabel St.	10000	25	73.10	75	143	273
East of Geneva St.	8000	25	72.10	66	126	241
South of Rossmoyne Ave.	14000	25	74.50	90	173	330
South of N. Glendale Ave.	9000	25	72.60	71	135	257
East of N. Adams St.	7000	25	71.50	61	117	223
E. HARVARD ST.						
East of S. Brand Blvd.	8000	30	73.80	81	150	279
East of S. Louise St.	7000	30	73.20	75	139	259
East of S. Jackson St.	8000	30	73.80	81	150	279
E. LOS FELIZ RD.						
East of S. Central Ave.	16000	35	78.60	140	253	460
E. MAPLE ST.						
East of S. Brand Blvd.	14000	25	74.50	90	173	330
East of S. Louise St.	14000	25	74.50	90	173	330
E. PALMER AVE.						
West of S. Adams St.	11000	25	73.50	79	151	288
E. WILSON AVE.						
East of N. Brand Blvd.	13000	35	77.70	125	228	413
East of N. Louise St.	13000	35	77.70	125	228	413
East of N. Isabel St.	17000	35	78.80	144	261	475
East of N. Everett St.	16000	35	78.60	140	253	460
East of N. Adams St.	18000	35	79.10	148	269	489
East of N. Chevy Chase Dr.	9000	35	76.10	104	188	341
East of Olive St.	9000	35	76.10	104	188	341
East of N. Verdugo Rd.	11000	35	76.90	115	209	379
East of Sinclair Ave.	12000	35	77.30	120	218	396
ETHEL ST.						
East of Rossmoyne Ave.	11000	25	73.50	79	151	288
East of Viscano Dr.	9000	25	72.60	71	135	257
FAIRMONT AVE.						
East of San Fernando Rd.	15000	30	76.50	113	210	391
East of Faircourt Ln.	11000	30	75.20	96	178	331

Road	ADT	SPEED	CNEL 50' From CL	Distance to Contour from CL (ft) 70	65	60
FLOWER ST.						
South of Sonora Ave.	19000	30	77.60	128	239	444
South of Grandview Ave.	12000	30	75.60	100	186	347
West of Air Way	11000	30	75.20	96	178	331
FOOTHILL BLVD.						
East of Lowell Ave.	27000	40	82.50	212	377	670
East of Boston Ave.	25000	40	82.20	204	362	644
East of Lauderdale Ave.	28000	40	82.60	216	383	682
East of Dunsmore Ave.	32000	40	83.20	231	410	729
East of Maryland Ave.	35000	40	83.60	241	429	762
FOOTHILL FREEWAY						
East of Lowell Ave.	207000	0	100.00	1347	2331	4033
East of Boston Ave.	243000	0	100.00	1454	2516	4353
West of Pennsylvania Ave.	227000	0	100.00	1407	2435	4214
GLENDALE BLVD.						
South of San Fernando Rd.	34000	35	81.80	206	374	680
South of Vassar Ave.	20000	35	79.50	157	284	516
GLENDALE FREEWAY						
South of Verdugo Blvd.	104000	0	95.70	665	1100	1818
North of Stancrest Dr.	121000	0	96.30	710	1175	1943
South of Stancrest Dr.	150000	0	97.30	780	1290	2134
South of Oak Valley Rd.	202000	0	98.60	889	1470	2430
North of Solway St.	192000	0	98.30	869	1437	2377
South of Solway St.	216000	0	98.90	915	1513	2502
South of E. Chevy Chase Dr.	170000	0	97.80	824	1363	2254
South of Glenoaks Blvd.	155000	0	97.40	792	1309	2165
South of W. Broadway	257000	0	99.60	987	1633	2700
GOLDEN STATE FREEWAY						
South of Allen Ave.	312000	0	101.00	1621	2803	4847
North of Justin Ave.	287000	0	101.00	1558	2694	4658
South of Justin Ave.	319000	0	101.00	1639	2833	4898
GRANDVIEW AVE.						
South of Glenwood Rd.	9000	25	72.60	71	135	257
North of W. Glenoaks Blvd.	10000	25	73.10	75	143	273
South of W. Glenoaks Blvd.	16000	25	75.10	97	186	355
South of Zook Dr.	17000	25	75.40	101	193	368
HARVEY DR.						
South of E. Chevy Chase Dr.	9000	35	76.10	104	188	341
South of E. Glenoaks Blvd.	15000	35	78.30	135	245	445
South of Holly Dr.	22000	35	79.90	165	299	543
South of 134 Freeway	25000	35	80.50	176	319	580
North of E. Wilson Ave.	28000	35	81.00	186	339	615
South of E. Wilson Ave.	27000	35	80.80	183	332	603

Road	ADT	SPEED	CNEL 50' From CL	Distance to Contour from CL (ft) 70	65	60
HONOLULU AVE.						
East of Lowell Ave.	9000	35	76.10	104	188	341
East of Boston Ave.	13000	35	77.70	125	228	413
East of Dunsmore Ave.	16000	35	78.60	140	253	460
East of New York Ave.	17000	35	78.80	144	261	475
South of Honolulu Pl.	10000	35	76.50	109	199	361
East of Pennsylvania Ave.	16000	35	78.60	140	253	460
East of Ramsdell	18000	35	79.10	148	269	489
East of La Crescenta Ave.	13000	35	77.70	125	228	413
East of Rosemont Ave.	12000	35	77.30	120	218	396
East of Wickham Way	14000	35	78.00	130	236	429
East of Ocean View Blvd.	9000	35	76.10	104	188	341
LA CRESCENTA AVE.						
South of Mayfield Ave.	11000	40	78.60	135	240	427
South of Montrose Ave.	11000	40	78.60	135	240	427
South of Honolulu Ave.	16000	40	80.20	163	290	515
South of Urquidez Ave.	13000	40	79.30	147	261	465
South of Roselawn Ave.	16000	40	80.20	163	290	515
LOWELL AVE.						
North of Santa Carlotta St.	10000	30	74.80	91	169	314
South of Santa Carlotta St.	8000	30	73.80	81	150	279
South of Foothill Blvd.	17000	30	77.10	121	225	418
South of Honolulu Ave.	15000	30	76.50	113	210	391
MONTEREY RD.						
East of N. Brand Blvd.	14000	30	76.20	109	203	377
East of Geneva St.	13000	30	75.90	105	195	362
South of Coronado Dr.	11000	30	75.20	96	178	331
East of Cordova Ave.	26000	30	78.90	152	283	526
East of N. Glendale Ave.	12000	30	75.60	100	186	347
MONTROSE AVE.						
East of Pennsylvania Ave.	10000	35	76.50	109	199	361
East of Ramsdell	12000	35	77.30	120	218	396
East of La Crescenta Ave.	8000	35	75.50	97	177	321
N. BRAND BLVD.						
South of W. Dryden St.	19000	30	77.60	128	239	444
South of Glenoaks Blvd.	26000	30	78.90	152	283	526
South of Monterey Rd.	33000	30	80.00	173	321	598
South of 134 Freeway	46000	30	81.40	207	384	715
South of Doran St.	24000	30	78.60	146	271	503
South of Milford St.	25000	30	78.80	149	277	515
South of Lexington Dr.	27000	30	79.10	155	289	536
South of California Ave.	23000	30	78.40	142	265	492
South of Wilson Ave.	25000	30	78.80	149	277	515

Road	ADT	SPEED	CNEL 50' From CL	Distance to Contour from CL (ft) 70	65	60
N. CENTRAL AVE.						
South of W. Kenneth Rd.	9000	30	74.30	86	160	297
South of W. Mountain St.	13000	30	75.90	105	195	362
South of W. Randolph St.	13000	30	75.90	105	195	362
South of W. Stocker St.	22000	30	78.20	139	258	480
South of W. Dryden St.	18000	30	77.30	125	232	431
South of W. Fairview Ave.	20000	35	79.50	157	284	516
South of W. Glenoaks Blvd.	18000	35	79.10	148	269	489
South of Burchett St.	29000	35	81.10	190	345	626
Under the 134 Freeway	38000	35	82.30	218	397	720
South of Sanchez Dr.	36000	35	82.10	212	386	700
South of W. Doran St.	31000	35	81.40	197	357	648
South of W. Lexington Dr.	20000	35	79.50	157	284	516
South of W. Wilson Ave.	35000	35	82.00	209	380	690
N. CHEVY CHASE DR.						
South of E. Wilson Ave.	12000	35	77.30	120	218	396
South of E. Broadway	18000	35	79.10	148	269	489
N. GLENDALE AVE.						
South of N. Verdugo Rd.	35000	30	80.20	178	332	617
South of E. Glenoaks Blvd.	39000	30	80.70	189	352	654
South of Monterey Rd.	48000	30	81.60	212	393	731
South of State Highway 134	51000	30	81.90	219	406	755
North of E. Doran St.	47000	30	81.50	209	389	723
South of E. Doran St.	45000	30	81.30	204	380	706
South of E. Lexington Dr.	39000	30	80.70	189	352	654
South of E. California Ave.	38000	30	80.60	187	347	645
South of E. Wilson Ave.	35000	30	80.20	178	332	617
N. JACKSON ST.						
South of E. Glenoaks Blvd.	8000	25	72.10	66	126	241
South of Monterey Rd.	11000	25	73.50	79	151	288
South of E. Doran St.	10000	25	73.10	75	143	273
South of E. Lexington Dr.	8000	25	72.10	66	126	241
N. LOUISE ST.						
South of E. Glenoaks Blvd.	13000	25	74.20	87	166	316
South of Monterey Rd.	10000	25	73.10	75	143	273
N. MARYLAND AVE.						
South of E. Doran St.	9000	25	72.60	71	135	257

Road	ADT	SPEED	CNEL 50' From CL	Distance to Contour from CL (ft) 70	65	60
N. ORANGE ST.						
South of W. Doran St.	10000	30	74.80	91	169	314
N. PACIFIC AVE.						
South of W. Kenneth Rd.	10000	25	73.10	75	143	273
South of Monte Vista Ave.	10000	25	73.10	75	143	273
South of Glenwood Rd.	13000	25	74.20	87	166	316
South of W. Stocker St.	15000	25	74.80	94	179	343
South of Palm Dr.	20000	25	76.10	110	211	403
South of W. Dryden St.	24000	25	76.90	122	234	446
South of W. Glenoaks Blvd.	33000	30	80.00	173	321	598
South of Burchett St.	37000	30	80.50	184	342	635
South of 134 Freeway	26000	30	78.90	152	283	526
South of W. Lexington Dr.	20000	30	77.80	132	245	456
South of W. Wilson Ave.	18000	30	77.30	125	232	431
N. VERDUGO RD.						
South of Canada Blvd.	11000	35	76.90	115	209	379
South of Fern Ln.	15000	35	78.30	135	245	445
South of Verdugo Knolls Dr.	18000	35	79.10	148	269	489
South of Sherer Ln.	19000	35	79.30	153	277	503
South of Towne St.	17000	35	78.80	144	261	475
South of Canada Blvd.	63000	35	84.50	284	515	936
South of E. Mountain St.	48000	35	83.30	247	448	813
North of E. Glenoaks Blvd.	14000	35	78.00	130	236	429
South of E. Glenoaks Blvd.	15000	35	78.30	135	245	445
South of Monterey Rd.	25000	35	80.50	176	319	580
South of Chevy Chase Dr.	17000	35	78.80	144	261	475
South of Stanley Ave.	18000	35	79.10	148	269	489
South of E. Wilson Ave.	12000	35	77.30	120	218	396
OCEAN VIEW BLVD.						
North of Honolulu Ave.	12000	30	75.60	100	186	347
South of Honolulu Ave.	11000	30	75.20	96	178	331
South of Sunview Dr.	8000	30	73.80	81	150	279
PENNSYLVANIA AVE.						
North of Montrose Ave.	28000	35	81.00	186	339	615
South of Montrose Ave.	14000	35	78.00	130	236	429
ROSSMOYNE AVE.						
North of E. Glenoaks Blvd.	9000	25	72.60	71	135	257
S. ADAMS ST.						
South of E. Colorado St.	10000	25	73.10	75	143	273

Road	ADT	SPEED	CNEL 50' From CL	Distance to Contour from CL (ft) 70	65	60
S. BRAND BLVD.						
South of Broadway	31000	30	79.70	167	311	578
South of Harvard St.	29000	30	79.40	161	300	557
South of Colorado St.	29000	30	79.40	161	300	557
South of Maple St.	33000	30	80.00	173	321	598
South of Garfield Ave.	30000	30	79.50	164	305	568
South of Chevy Chase Dr.	23000	30	78.40	142	265	492
South of Cerritos Ave.	29000	30	79.40	161	300	557
S. CENTRAL AVE.						
South of W. Broadway	31000	35	81.40	197	357	648
South of W. Harvard St.	29000	35	81.10	190	345	626
South of W. Colorado St.	30000	35	81.30	193	351	637
South of W. Chevy Chase Dr.	22000	35	79.90	165	299	543
South of Los Feliz Rd.	29000	35	81.10	190	345	626
S. CHEVY CHASE DR.						
South of E. Maple St.	13000	35	77.70	125	228	413
North of E. Maple St.	11000	35	76.90	115	209	379
North of E. Colorado St.	18000	35	79.10	148	269	489
S. GLENDALE AVE.						
South of E. Broadway	38000	30	80.60	187	347	645
South of E. Harvard St.	33000	30	80.00	173	321	598
South of E. Colorado St.	34000	30	80.10	176	327	607
South of E. Lomita Ave.	33000	30	80.00	173	321	598
South of E. Chestnut St.	32000	30	79.80	170	316	588
South of E. Maple St.	24000	30	78.60	146	271	503
South of E. Chevy Chase Dr.	32000	30	79.80	170	316	588
South of E. Palmer Ave.	32000	30	79.80	170	316	588
South of E. Cypress St.	30000	30	79.50	164	305	568
South of E. Los Feliz Rd.	16000	30	76.80	117	218	405
South of E. Cerritos Ave.	8000	30	73.80	81	150	279
S. ORANGE ST.						
South of W. Broadway	13000	30	75.90	105	195	362
S. PACIFIC AVE.						
South of W. Broadway	19000	30	77.60	128	239	444
South of W. Colorado St.	18000	30	77.30	125	232	431
S. VERDUGO RD.						
South of E. Broadway	19000	35	79.30	153	277	503
South of E. Colorado St.	22000	35	79.90	165	299	543
South of Dixon St.	19000	35	79.30	153	277	503
South of E. Maple St.	18000	35	79.10	148	269	489

Road	ADT	SPEED	CNEL 50' From CL	Distance to Contour from CL (ft) 70	65	60
SAN FERNANDO RD.						
North of Western Ave.	36000	35	82.10	212	386	700
South of Western Ave.	36000	35	82.10	212	386	700
South of Sonora Ave.	39000	35	82.40	221	402	730
South of Grandview Ave.	45000	35	83.00	238	433	786
South of Highland Ave.	47000	35	83.20	244	443	804
South of Fairmont Ave.	44000	35	83.00	236	428	777
South of W. Doran St.	41000	35	82.60	227	413	749
South of W. California Ave.	37000	35	82.20	215	391	710
South of W. Broadway	33000	35	81.70	203	369	669
South of W. Elk Ave.	27000	35	80.80	183	332	603
South of Riverdale Dr.	25000	35	80.50	176	319	580
East of Goodwin Ave.	22000	35	79.90	165	299	543
South of S. Pacific Ave.	32000	35	81.60	200	363	659
South of W. Chevy Chase Dr.	32000	35	81.60	200	363	659
South of W. Los Feliz Rd.	22000	35	79.90	165	299	543
South of S. Central Ave.	31000	35	81.40	197	357	648
South of S. Brand Blvd.	28000	35	81.00	186	339	615
South of S. Glendale Ave.	36000	35	82.10	212	386	700
SONORA AVE.						
North of Glenoaks Blvd.	9000	25	72.60	71	135	257
South of Glenoaks Blvd.	15000	25	74.80	94	179	343
South of San Fernando Rd.	20000	35	79.50	157	284	516
South of Flower St.	30000	35	81.30	193	351	637
South of Lake St.	26000	35	80.70	179	326	592
UNION PACIFIC RAILROAD						
Parallel to San Fernando Rd.	0	0	0.00	300	570	1090
VENTURA FREEWAY						
West of Union Pacific Railroad	296000	0	100.00	1050	1736	2871
East of Union Pacific Railroad	283000	0	100.00	1030	1703	2816
West of Concord St.	335000	0	100.00	1108	1833	3031
East of Concord St.	350000	0	100.00	1130	1868	3089
East of N. Kenilworth Ave.	317000	0	100.00	1082	1789	2959
East of N. Pacific Ave.	274000	0	99.90	1015	1679	2776
East of N. Central Ave.	284000	0	100.00	1031	1705	2820
East of N. Louise St.	319000	0	100.00	1085	1794	2967
East of Geneva St.	286000	0	100.00	1034	1710	2829
North of E. Chevy Chase Dr.	308000	0	100.00	1068	1767	2922
South of E. Chevy Chase Dr.	255000	0	99.60	984	1627	2690
East of Sinclair Ave.	232000	0	99.20	944	1561	2581
East of Harvey Dr.	222000	0	99.00	926	1531	2532

Road	ADT	SPEED	CNEL 50' From CL	Distance to Contour from CL (ft) 70	65	60
VERDUGO BLVD.						
East of Verdugo Rd.	33000	35	81.70	203	369	669
East of Valihi Way	37000	35	82.20	215	391	710
East of Hilldale Dr.	27000	35	80.80	183	332	603
East of 2 Freeway	21000	35	79.70	161	292	530
VERDUGO RD.						
North of Broadview Dr.	15000	35	78.30	135	245	445
South of Broadview Dr.	9000	35	76.10	104	188	341
South of Castera Ave.	18000	35	79.10	148	269	489
South of La Crescenta Ave.	35000	35	82.00	209	380	690
VICTORY BLVD.						
South of Allen Ave.	12000	30	75.60	100	186	347
W. BROADWAY						
East of San Fernando Rd.	10000	35	76.50	109	199	361
East of Concord St.	11000	35	76.90	115	209	379
East of N. Kenilworth Ave.	9000	35	76.10	104	188	341
East of Pacific Ave.	15000	35	78.30	135	245	445
East of Columbus Ave.	24000	35	80.30	172	313	568
East of Central Ave.	17000	35	78.80	144	261	475
East of Orange St.	18000	35	79.10	148	269	489
W. CHEVY CHASE DR.						
East of San Fernando Rd.	17000	35	78.80	144	261	475
East of S. Central Ave.	19000	35	79.30	153	277	503
W. COLORADO ST.						
West of S. Pacific Ave.	29000	35	81.10	190	345	626
East of S. Pacific Ave.	19000	35	79.30	153	277	503
East of S. Columbus Ave.	28000	35	81.00	186	339	615
East of S. Central Ave.	25000	35	80.50	176	319	580
W. DORAN ST.						
East of San Fernando Rd.	15000	25	74.80	94	179	343
East of N. Central Ave.	12000	25	73.90	83	158	302
East of N. Orange St.	10000	25	73.10	75	143	273
W. DRYDEN ST.						
East of N. Central Ave.	12000	25	73.90	83	158	302
W. GLENOAKS BLVD.						
South of Alameda Ave.	36000	40	83.70	244	435	773
South of Sonora Ave.	39000	40	84.10	254	453	805
South of Grandview Ave.	33000	40	83.40	234	416	740
East of Cleveland Rd.	31000	40	83.10	227	403	718
East of Graynold Ave.	32000	40	83.20	231	410	729
East of Alma St.	34000	40	83.50	238	423	751
East of Highland Ave.	32000	40	83.20	231	410	729
East of Concord St.	27000	40	82.50	212	377	670
East of N. Kenilworth Ave.	31000	40	83.10	227	403	718
East of N. Pacific Ave.	29000	40	82.80	219	390	694
East of N. Central Ave.	28000	25	77.50	133	255	486

Road	ADT	SPEED	CNEL 50' From CL	Distance to Contour from CL (ft) 70	65	60
W. KENNETH RD.						
West of Grandview Ave.	9000	25	72.60	71	135	257
East of Grandview Ave.	10000	25	73.10	75	143	273
East of Highland Ave.	9000	25	72.60	71	135	257
East of N. Pacific Ave.	6000	25	70.90	56	107	205
East of Valley View Rd.	11000	25	73.50	79	151	288
W. LOS FELIZ RD.						
North of Union Pacific Railroad	32000	35	81.60	200	363	659
W. MAPLE ST.						
East of S. Central Ave.	8000	25	72.10	66	126	241
W. STOCKER ST.						
West of N. Central Ave.	9000	25	72.60	71	135	257
W. WILSON AVE.						
East of N. Pacific Ave.	6000	35	74.30	84	152	277
East of N. Columbus Ave.	12000	35	77.30	120	218	396
East of N. Central Ave.	17000	35	78.80	144	261	475
East of N. Orange St.	18000	35	79.10	148	269	489
WESTERN AVE.						
South of W. Glenoaks Blvd.	18000	25	75.60	104	199	380
South of San Fernando Rd.	29000	25	77.70	136	260	496
South of Lake St.	20000	25	76.10	110	211	403