

**SECTION 1: INTRODUCTION**

Noise has become a key factor in our perception of the quality of our environment. Noise affects both the home and work environment, and the enjoyment of recreational activity. For these reasons, noise is an important issue in the community planning process.

The State of California has mandated that each county and city prepare a noise element as part of its general plan. California Government Code, Division 1, Planning and Zoning, Chapter 3, Local Planning, Article 5, Section 65302(f) requires a plan including:

"A noise element which shall identify and appraise noise problems in the community. The noise element shall recognize the guidelines established by the Office of Noise Control in the State Department of Health Service and shall analyze and quantify, to the extent practicable, current and projected noise levels for all of the following sources:

1. Highways and freeways.
2. Primary arterials and major local streets.
3. Passenger and freight on-line railroad operations and ground rapid transit systems.
4. Commercial, general aviation, heliport, helistop, and military airport operations, aircraft overflights, jet engine test stands, and all other ground facilities and maintenance functions related to airport operation.
5. Local industrial plants, including, but not limited to, railroad classification yards.
6. Other ground stationary noise sources identified by local agencies as contributing to the community noise environment.

The noise contours shall be used as a guide for establishing a pattern of land uses in the Land Use Element that minimizes the exposure of community residents to excessive noise. The Noise Element shall include implementation measures of possible solutions that address existing and foreseeable noise problems, if any. The adopted Noise Element shall serve as a guideline for compliance with the state's Noise Insulation Standards."

The purpose of this document is to comply with the state mandate, to provide an easily understood discussion of noise and its impacts, and to set guidelines to prevent noise

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and land use conflicts. A further discussion of the means by which this mandate is to be met by the City of Palmdale, and a discussion of the goals and guidelines implemented to achieve the relevant planning goals and objectives is contained in the following sections.

## SECTION 2: GOALS, OBJECTIVES, AND POLICIES

**GOAL N1: Minimize the exposure of residents to excessive noise to the extent possible, through the land planning and the development review process.**

**Objective N1.1:** Utilize appropriate land use planning as the primary method of achieving noise compatibility among adjacent land uses.

**Policy N1.1.1:** Locate noise compatible land uses near existing and future air, rail and highway transportation noise sources.

**Policy N1.1.2:** Restrict noise sensitive land uses near existing or future air, rail or highway transportation noise sources unless mitigation measures have been incorporated into the design of the project to reduce the noise levels at the noise sensitive land use to less than 65 dBA CNEL at all exterior living spaces including but not limited to, single-family yards and multi-family patios, balconies, pool areas, cook-out areas and related private recreation areas.

**Policy N1.1.3:** When proposed stationary noise sources could exceed an exterior noise level of 65 dBA CNEL at present, or could impact future noise sensitive land uses, require preparation of an acoustical analysis and mitigation measures to reduce noise levels to no more than 65 dBA CNEL exterior and 45 dBA CNEL interior; if the noise level cannot be reduced to these thresholds through mitigation, the new noise source should not be permitted.

**Policy N1.1.4:** Consider the noise environment when making land use decisions with respect to the guidelines contained in Table N-1, and require noise standards consistent with the criteria listed on Table N-3. The State Recommended Acceptable Noise Guidelines, listed in Table N-1, are provided as guidelines only, and are not represented as standards.

**Objective N1.2:** Protect and maintain those areas having acceptable noise environments.

**Policy N1.2.1:** Locate new major noise sources in areas containing existing noise sources, and avoid their location adjacent to noise sensitive land uses unless a finding can be made, based on evidence in the record, that the placement of the new noise source will not result in adverse impacts to the existing noise sensitive land use.

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**TABLE N-1**

State Recommended Noise  
Level Guidelines

**Policy N1.2.2:** Restrict construction hours during the evening, early morning and Sundays.

**Policy N1.2.3:** Utilize any or all of the following measures in order to maintain acceptable noise environments throughout the City:

1. Control of noise at its source, including noise barriers and other muffling devices built into the noise source.
2. The provision of buffer areas and/or wide setbacks between the noise source and other development.
3. The reduction of densities, where practical, adjacent to the noise source (freeway, airport, railroad).
4. The use of sound insulation, blank walls, double paned windows and other design or architectural techniques to reduce interior noise levels.
5. Designation of appropriate land uses adjacent to known noise sources.

**Policy N1.2.4:** Where deemed appropriate based upon available information, acoustical analysis and appropriate mitigation for noise-sensitive land uses should be required in areas which may be adversely impacted by significant intermittent noise sources. Such noise sources may include but not be limited to railroads, racetracks, stadiums, aircraft overflights and similar uses.

**GOAL N2: Promote noise compatible land uses within the 65 CNEL contour and the Frequent Overflight Area of Air Force Plant 42.**

**Objective N2.1:** Ensure that land uses planned in the vicinity of Plant 42 will not be adversely affected by present and future noise levels expected to be generated by Plant 42.

**Policy N2.1.1:** Designate and permit land uses within the 65 CNEL contour and the Frequent Overflight Area which are primarily industrial, business park, commercial and recreational uses which are not noise sensitive; permit other uses only when it is found that no adverse noise impacts will result.

**Policy N2.1.2:** Restrict noise sensitive land uses (such as residential uses, churches, schools, rest homes, or similar uses) within areas designated as within both the 65 CNEL contour and the Frequent Overflight Area.

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**Policy N2.1.3:** In areas which are outside of the 65 dBA CNEL contour but which are within the Frequent Overflight Area, encourage establishment of compatible uses to the extent feasible.

**Policy N2.1.4:** Through the development review process, require that all new projects within the Accident Potential Zone (APZ) of Air Force Plant 42 provide an avigation easement. A disclosure statement indicating that the property is subject to frequent overflight and aircraft noise should be required upon sale of property within the APZ.

**Policy N2.1.5:** Through conditions of approval, require that any owner of developed or undeveloped property within the 65 CNEL noise contour or the low altitude overflight area which is seeking a land use action from the City, provide an avigation easement to the Los Angeles Department of Airports, the U.S. Air Force, and the City.

**Policy N2.1.6:** Investigate various means of obtaining avigation easements from all properties within the 65 CNEL noise contour and the low altitude overflight area, and obtain those easements to the extent feasible.

### **SECTION 3: IMPLEMENTATION**

Noise control programs involve federal, state, county and city agencies. Table N-2 highlights noise control responsibilities by agency. Other agencies are also involved with noise control; however, those identified in Table N-2 cover the major noise issues found in the City. Through these programs, the City will limit and regulate intrusive noises that accompany development and population growth.

#### **A. Land Use Compatibility**

##### **Introduction**

The City of Palmdale can achieve a noise compatible environment through comprehensive land use planning. Proposed developments are evaluated in terms of the projected impact from future noise sources and the application of the City's objectives and policies. The City's noise compatibility criteria by land use are summarized in Table N-4 and are consistent with both federal and state standards and guidelines. Proposed residential and other noise-sensitive projects impacted by a 65 dBA CNEL or greater would require additional acoustical analysis to achieve acceptable exterior noise levels. Acceptable interior noise levels of 45 dBA CNEL or less must also be achieved.

##### **Noise-Sensitive Land Uses Defined**

"Noise-sensitive land uses" include residential (single and multi-family dwellings, mobile home parks, dormitories, and similar uses); transient lodging (including hotels, motels, and similar uses); hospitals, nursing homes, convalescent hospitals, and other facilities for long-term medical care; public or private educational facilities, libraries, churches, and places of public assembly. Each of these land uses is particularly susceptible to noise intrusions because of the nature of the use being made of the land, the expectation of the occupants regarding an appropriate noise environment, and because of the fact that, in most cases, these uses involve long-term exposure to the noise environment affecting the property. In other words, residential uses (both single-family and multi-family) involve situations where the residents have an expectation that their daily lives will not be exposed to excessive noise levels which interfere with normal residential activities, such as family conversations, entertaining, telephone use, watching television, and the ability to sleep uninterrupted by outside noise sources. Residential uses also are affected by long-term exposure to a localized noise environment, which can cause a cumulative level of "annoyance" among the residents because their continued exposure to the noise source(s) interferes with their normal expectations regarding an appropriate residential environment. These considerations

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also apply to such uses as nursing homes, convalescent hospitals or other long-term medical care facilities.

Similarly, schools (public and private) are typically categorized as "noise sensitive uses" both because the students at a noise affected facility are exposed to continuing noise environment and because the noise is particularly inconsistent with the expected activity of the school - study and instructional conversation.

Some "noise sensitive uses" do not necessarily involve long-term exposure to a noise environment but are sensitive uses nevertheless because of the intended use of the facility and the expectation (or need) of the users for a quiet environment. Libraries and churches, for example, do not involve long-term exposure, since they are typically used only on a periodic basis by any given individual. Still, people using both libraries and places of worship have a reasonable expectation that they will be able to engage in the contemplative activities normally associated with these facilities free from excessive interruptions by external noise sources.

## **Other Land Uses**

Other land uses are not "noise sensitive," or are substantially less sensitive to noise events than residential or other similar uses. This designation does not mean that some protection against noise intrusions is unnecessary or inappropriate for these uses; but these land uses differ from sensitive uses in many respects, and consequently in how they are affected by noise impact. In large part, there are differences in public expectations regarding the urban noise environment. For example, in commercial settings where noise is a factor, the public is present only for limited periods of time, and they have a choice as to whether to patronize any particular establishment. In industrial settings, interior noise levels from industrial or manufacturing operations are often high enough that exterior noise sources are not intrusive. Certain types of recreational uses are also substantially less "noise sensitive" (e.g., golf courses) because of the relative infrequency of use and the voluntary nature of public use of such facilities.



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**TABLE N-2**

**NOISE CONTROL RESPONSIBILITY BY ACTIVITY AND AGENCY<sup>a</sup>**

<u>Agency</u>	<u>Highway Noise</u>	<u>Aviation Noise</u>	<u>Occupational Noise</u>	<u>Construction Noise</u>	<u>Land Use Compatibility</u>	<u>Building Siting</u>	<u>Complaints</u>	<u>Research</u>	<u>Product Noise</u>
<u>Federal</u>									
Department of Housing and Urban Development						X			
Department of Labor			X	X	X				
Environmental Protection Agency	X	X	X			X			X
Federal Aviation Administration	X								
Federal Highway Administration	X								
<u>State</u>									
Department of Health	X		X	X		X			X
Department of Transportation	X	X				X			
<u>County of Los Angeles</u>									
<u>City of Palmdale</u>									
City Council	X	X		X	X				
Building Department			X	X	X	X	X	X	
Planning Department	X	X	X					X	
Police Department			X						

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In certain cases, there are potential land uses which are directly supportive of the activities of the facility which is the principal source of noise affecting the property. For example, there are many potential industrial, commercial, service and direct aviation support uses which could support not only the continued mission of Air Force Plant 42, but which would support and enhance the further development of that facility as a scheduled commercial air carrier facility. By directing these uses toward areas most seriously affected by noise from Air Force Plant 42, the City can allow reasonable economic use of property in the vicinity of the facility while simultaneously providing a buffer against noise intrusions into more noise sensitive areas and land uses. Encouraging development of these types of land uses in areas affected by significant and continuing noise sources, such as major arterial roadways, Air Force Plant 42, and rail yards, therefore offers the City significant planning opportunities and advantages.

For the City to achieve noise and land use compatibility, mitigation measures and/or restrictions should be imposed on future noise sensitive developments proposed within 65 dBA CNEL contours from transportation sources. The 45 dBA CNEL or less interior criteria for noise sensitive land uses must also be achieved. In addition, noise sensitive developments, proposed near existing stationary noise sources generating noise levels exceeding 65 dBA CNEL, should be discouraged.

These goals are also served by encouraging the development of compatible land uses in areas subject to continuing noise exposure from stationary or transportation sources. It is not the goal of the City to render the development of any private property economically infeasible, but to ensure that land uses are located appropriately in terms of noise sensitivity and the surrounding noise environment. Therefore, appropriate levels of protection for normally compatible uses have been established in consideration of the health and well-being of employees and the general public, as well as the need for the City to promote development uses on noise-affected properties which support the economic health and infrastructure of the entire community.

### **B. Acoustical Analysis Reports**

The City will require acoustical analysis reports for those projects located within existing or future 60 dBA CNEL impact areas, areas subject to single-event noise episodes or as deemed necessary by the City. All acoustical analysis reports shall consider existing and future ambient and project related noise levels and shall be prepared by a qualified acoustical engineer with experience in environmental noise assessment and noise control design. Specifically, acoustical analysis reports shall include:

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- Existing ambient and roadway noise levels recorded by a calibrated noise monitor.
- Roadway traffic noise level analysis models determining existing and future noise levels anticipated from proposed projects and related cumulative noise sources.
- Noise contour maps.
- Surrounding land uses with identification of sensitive noise receptors and noise sources.
- Impacts of the project to the existing ambient noise environment.
- Noise control measures where needed.
- Cumulative impacts due to related projects.
- Unavoidable adverse impacts to the project area.
- Assessment of Impacts from Single-Event Noise Episodes.

Acoustical analysis reports shall evaluate the impacts of the existing noise levels on the proposed project as well as the impact of the project on the existing noise environment. The Planning Department will evaluate projects to ensure that noise sensitive land uses, such as schools, hospitals, and residential developments, will not be located adjacent to sources of noise, when exceeding acceptable levels.

Where appropriate, the City will require acoustical analysis reports to include acoustical design for residential development adjacent to freeways or major arterials to achieve the appropriate interior and exterior noise levels through sound insulation, or other means, as indicated in Table N-3.

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**TABLE N-3**

Land Use	Maximum Acceptable Levels		
	Exterior	Interior	Scale
Residential SFR MFR MHP	65 65 65	45 45 45	dBA CNEL dBA CNEL dBA CNEL
Commercial including, but not limited to: Retail Services Office	A noise level which does not jeopardize health, safety, and welfare of visitors.	55 55 55	Leq(h) Leq(h) Leq(h)
Institutional including, but not limited to: Schools Hospitals Nursing Homes	A noise level which does not jeopardize health, safety, and welfare of visitors.	45 45 45	Leq(h) Leq(h) Leq(h)
Industrial including, but not limited to: Industrial Park Business Park  Quarry	A noise level which does not interfere with normal business activity.  Maximum 65 Leq(h) at the interface with residentially designated land.	65 65  N/A	Leq(h) Leq(h)

Leq(h) The A-weighted equivalent sound level averaged over a period of "h" hours. An example would be Leq(12) where the equivalent sound level is the average over a specified 12-hour period (such as 7 a.m. to 7 p.m.). Typically, time period "h" is defined to match the hours of operation of a given type of use.

The Planning Department may require developments which will generate large congregations of people or maintain late nighttime hours to provide special mitigation measures, as indicated by the acoustical analysis.

### C. Noise Ordinance

The City Municipal Code, Chapter 8.28 Building Construction Hours and Operation and Noise Control contains provisions that restrict construction between the hours of 8:00 p.m. and 6:30 a.m. and regulates the impact of offensive noise from sources such as loud parties. The City may elect to adopt a noise ordinance if deemed necessary in order to reduce potential health hazards associated with other high noise levels. Any such ordinance would establish noise impact thresholds for noise abatement and attenuation and would be compatible with state and federal standards. Noise ordinances are typically directed at controlling noise from stationary sources and its

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intrusion onto adjacent properties. Enforcement of the noise ordinance would be an effective tool in controlling non-transportation noise sources. Federal and state laws regulate noise from transportation sources. (*General Plan Amendment 04-04, adopted by City Council July 26, 2004.*)

The Department of Building and Safety, the Planning Department, and the Sheriff's Department will work cooperatively to enforce the noise ordinance. The noise ordinance may include policies addressing the following issues:

- Land use compatibility.
- Restriction of hours of operation for construction equipment, power mowers, garbage collection, street sweeping, truck deliveries, leaf blowers, and other noise activities within the hours of 6:30 a.m. and 8:00 p.m., unless the work is made in response to an emergency or special purpose.
- Periodic investigation of noise sources throughout the City, with citations issued for offender, in addition to investigations conducted due to such complaints.

The Noise Ordinance shall set standards and penalties for violating the provisions contained therein. Penalties may range from warnings and monetary penalties to revocation of operating licenses for businesses.

### **D. General Plan Elements**

The City will review other General Plan Elements for policies and programs relating to noise. Other General Plan Elements may provide important policy guidance to assist in decisions to ensure noise and land use compatibility. While all of the elements of the General Plan are related and interdependent to some degree, the Noise Element is most closely related to the Land Use, Housing, Circulation, and Environmental Resources Elements as shown in Exhibit N-1.

The objective of the Noise Element is to provide guidelines to achieve compatible land uses. The Land Use and Noise Elements are, therefore, closely related. The Noise Element, by identifying noise-sensitive land uses and establishing compatibility guidelines for land use and noise, will influence the general distribution, location, and intensity of future land use. Effective land use planning can alleviate noise problems.

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Residential areas are one of the most noise-sensitive land uses. Therefore, the Housing Element is directly affected by the Noise Element. Enforcement of land use and noise compatibility guidelines can reduce noise impacts in residential locations. In addition, effective noise insulation in housing construction can mitigate exterior to interior noise intrusion.

The circulation system within a city is one of the major sources of noise. Therefore, the existing and future circulation system identified in the Circulation Element will greatly influence the noise environment. The circulation routes such as the freeway, highways, truck routes and the railroad should be located to minimize noise impacts upon noise-sensitive land use. The location and design of new transportation facilities and mitigation of noise from existing and planned facilities should be assessed in order to minimize noise impacts to the extent feasible.

Since noise can adversely affect the enjoyment of quiet outdoor activities, the Noise Element is also closely related to the Environmental Resources Element. Conversely, open space, or appropriate recreational uses, can be used as a noise buffer between incompatible land uses. Generally, the identification of development which is compatible with the local noise environment, and which allows property owners to realize beneficial use of their properties, is a preferred solution in the development of noise buffers between noise sources and land uses which are incompatible with the noise source. These techniques can reduce community noise impacts and also provide usable open space for recreation, or otherwise provide useful economic infrastructure and development without the need to acquire the property from the private land owner.

### **E. Joint Land Use Committee Policy Review**

The City will review all new development applications for conformance with the Joint Land Use Committee (JLUC) policies relating to noise, as adopted by the Palmdale City Council on March 6, 1991. The JLUC policies were developed through the joint efforts of the City of Palmdale, the City of Lancaster and the United States (U. S.) Air Force to address basic air installation land use compatibility issues. These policies relate to both noise and safety issues; the safety related policies appear in the Safety Element of the General Plan. The General Plan Overlay Map shall identify the location of the 65 CNEL Contour and the Frequent Overflight Area for U. S. Air Force Plant 42.

**1. Policies to govern land use within the 65 CNEL contour are as follows:**

- a. Land which currently has an industrial or commercial general plan designation shall not be changed to a residential or other incompatible use.
- b. Applications (zone change, General Plan Amendment, etc.) for land use changes which increase residential density shall not be approved.
- c. Existing residential land use designations shall be examined for potential redesignation to airport compatible designations. It should also be noted that this policy does not require that we re-designate any area, only that we look at the potential.
- d. Any developed or undeveloped property which is seeking a land use action from the City shall be conditioned to provide an avigation easement to the Los Angeles Department of Airports, the U. S. Air Force, and the City.
- e. Research and develop a means of obtaining avigation easements from all properties.
- f. A Joint Air Force Plant 42/City of Los Angeles Department of Airports/City of Palmdale/City of Lancaster Part 150 Study shall be conducted to determine the need for soundproofing of existing residential development, to make Plant 42 and the surrounding communities mutually more compatible through use of FAA funding.
- g. Currently existing residential areas shall be examined to determine the potential of the redevelopment process to convert those land uses to airport compatible uses.
- h. Noise sensitive receptors shall be excluded (examples of noise sensitive receptors are hospitals and schools).
- i. The development and zoning of residentially designated property shall be at the minimum density of the General Plan designation.

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Exhibit N-1



2. **Policies to govern the land use for areas which are outside of the 65 CNEL contour but are frequently overflown by aircraft at low altitudes for take-off, landing, and closed pattern flight activity. Typically, this line would extend as far north as Avenue K-4 and as far south as Avenue Q-4. The easterly boundary of the area would extend to 85<sup>th</sup> Street East and westerly boundary would be Sierra Highway as shown on Exhibit S-17 of the Safety Element. These recommendations recognize that existing land uses within overflight areas may be inconsistent with the guidelines; however, the recommendations reflect long-range goals of the City and the Air Force for that area. The recommendations are as follows:** *(General Plan Amendment 04-04, adopted by City Council July 26, 2004.)*
- a. Higher density residential uses shall be discouraged and that - in order of priority - industrial, commercial, and low density residential land use designations (i.e., 1 du/ac or larger lots) shall be encouraged.
  - b. Noise sensitive receptors shall be excluded (i.e. hospitals and schools).
  - c. Currently existing areas which are occupied by incompatible uses shall be examined to determine the potential of the redevelopment process to convert those land uses to airport compatible uses.
  - d. The General Plan shall designate this low altitude overflight area on the General Plan Overlay Map.
  - e. Land which currently has an industrial or commercial general plan designation shall not be changed to a residential or other airport incompatible use.
  - f. Any developed or undeveloped property which is seeking a land use action from the City shall be conditioned to provide an avigation easement to the Los Angeles City Department of Airports, the U.S. Air Force, and the City.
  - g. Research and develop a means of obtaining avigation easements from all properties within this area.

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### **JLUC Examples**

**Customer Intensive Uses** - Customer intensive retail operations would include grocery stores, drug stores, convenience stores, theaters, shopping centers, department stores, and similar uses.

**Low Customer Intensive Uses** - Low customer intensive uses would include nurseries, lumber yards, contractor yards, warehousing, mini storage and similar uses.

### **F. Airport Land Use Commission**

The City shall support the Airport Land Use Commission of Los Angeles County in planning for appropriate land uses around USAF Plant 42 through consistency of the City's General Plan with the County's Comprehensive Airport Land Use Plan. This implementation measure is further discussed in Section 3 of the Safety Element.

### **G. Noise Sensitive Land Uses**

The City shall coordinate with appropriate agencies and developers to reduce unnecessary noise in the vicinity of noise-sensitive locations through the following actions:

- Maintain liaison with transportation agencies, such as Caltrans, regarding the reduction of noise from existing facilities and roadways. The design and location of facilities and roadways shall also be considered.
- Maintain liaison with Los Angeles County Health Department to update information on the effects and impacts of noise pollution on humans.
- Consider noise as a priority factor in evaluating residential or other noise-sensitive projects. Building orientation and configuration should be utilized to minimize or eliminate noise problems for a sites adjacent to the freeway, arterials, or rail lines. Additional effective noise reduction tools include the use of earthen berms, sound reducing walls, and generous setbacks.
- Maintain a liaison with the Southern Pacific rail line to reduce the level of noise produced by train movement within the City, through the regular maintenance of the tracks and trains. Monitor the existing operations on the rail line, as well as any plans for future development so as to predict future noise levels.

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- Enforce regulations, such as the State Vehicle Code noise standards, for City owned and City operated vehicles.

### **H. Noise Sources and Receptors**

The City will maintain a map of receptors and sources in the Planning Area for new development in order to anticipate and/or avoid incompatible land uses. Acoustical analysis reports will be required to incorporate the receptor and source map in the report on a smaller scale.

### **I. Acoustical Design**

The City will require developments to implement noise control measures during construction. Acoustical design shall include measures to control noise at the source, along the transmission path or at the receptor.

## **SECTION 4: ISSUES AND OPPORTUNITIES**

### **A. Noise Measurement**

Community noise is generally not a steady state and varies with time. Under conditions of non-steady state noise, some type of statistical scale of measurement is necessary in order to quantify noise exposure over a long period of time. Several rating scales have been developed for describing the effects of noise on people. They are designed to account for the known effects of noise on people.

A variety of different noise measurement scales or "metrics" are used for measuring noise sources with differing characteristics. The metrics typically employed for measuring community stationary and mobile noise sources are the Equivalent Noise Level (LEQ), the Day/Night Noise Level (LDN) and the Community Noise Equivalent Level (CNEL). These metrics are defined as follows:

LEQ is the "energy" average noise level during the time period of the sample. It is a number that represents a decibel sound level. This constant sound level would contain an equal amount of energy as a fluctuating sound level over a given period of time. LEQ can be measured for any time period, but is typically measured for 15 minutes, 1 hour or 24 hours.

LDN is a 24 hour, time-weighted annual average noise level. Time-weighted refers to the fact that noise which occurs during certain sensitive time periods is penalized for occurring at these times. In the LDN scale, those events that take place during the night (10 pm to 7 am) are penalized by 10 dBA. This penalty was selected to attempt to account for increased human sensitivity to noise during the quieter period of a day, where sleep is the most probable activity.

CNEL is similar to the LDN scale except that it includes an additional 5 dBA penalty for events that occur during the evening (7 pm to 10 pm) time period. Either LDN or CNEL may be used to identify community noise impacts within the Noise Element.

Intermittent or occasional noise such as that associated with stationary noise sources is not of sufficient volume to exceed community noise standards that are based on a time averaged scale such as the CNEL scale. To account for intermittent noise, another method to characterize noise is the Percent Noise Level (L%). The Percent Noise Level is the level exceeded X% of the time during the measurement period. Percent Noise Levels are another method of characterizing ambient noise where, for example, L90 is the noise level exceeded 90 percent of the time, L50 is the level exceeded 50 percent of the time, and L10 is the level exceeded 10 percent of the time. L90

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represents the background or minimum noise level, L50 represents the average noise level, and L10 the peak or intrusive noise level.

### **B. Existing Noise Environment**

The existing noise environment in the Planning Area was documented through both a community noise survey and computer generated noise contours. The noise survey identified existing noise levels at specific locations within the City while the computer analysis predicted existing and future roadway noise levels.

#### **Community Noise Survey**

A community noise survey was conducted on November 2, 1987 to document the existing noise environment within the City of Palmdale. Noise measurements were conducted at 12 sites between the hours of 7:30 a.m. and 4:10 p.m. The noise monitoring locations are identified in Exhibit N-2 and were selected with the assistance of the Planning Department. The locations were representative of residential, commercial, industrial, public use areas, and undeveloped property.

The noise measurements indicated that the City of Palmdale has noise levels typical of urban residential communities. However, unlike other urban communities, the City of Palmdale has two unique noise sources: military aircraft and major freight rail operations. Noise from military aircraft operations was recorded at 6 of the 12 measurement locations, with the maximum aircraft departure noise levels reaching 92 to 95 dBA at Site 4. Site 4 is located within the 70 dBA CNEL noise contour from USAF Plant 42. Approaching aircraft noise levels at Site 3, which is located approximately on the 65 dBA CNEL noise contour from USAF Plant 42, were somewhat lower at 85 to 92 dBA. Aircraft noise varied throughout flyovers, with high frequencies predominating while an aircraft approached and low frequencies predominating after the aircraft had passed overhead.

Freight rail movements were measured at Sites 2 and 9. Rail noise was characterized as being of extremely long duration (several minutes) with 100 rail cars plus freight movements. The maximum locomotive noise level recorded was 99 dBA with rail cars generating noise levels of 64 to 73 dBA.

The noise measurement results are summarized in Table N-4 and should be used as a guide or indication of noise levels throughout the community. Maximum noise levels ranged from 53.5 to 99.0 dBA with the highest level generated by a locomotive. The second and third highest noise levels were military aircraft operations at 95 and 92 dBA. Site 12 was at a new residential development on the western boundary of the City. This

site, because of its remote location and light traffic, had substantially lower noise levels than any other site.

Table N-4 also provides the sound level exceeded 10 percent (L10), 33 percent (L33), 50 percent (L50) and 90 percent (L90) of the measurement duration. While the Lmax provides the highest level measured, the L10 provides a better indication of peak noise levels that would typically be expected at the specific location. Disregarding the quiet environment, L10 of 53.0 dBA at Site 12 and the substantial number of aircraft approaches at Site 3 resulting in an L10 of 85.5 dBA, the L10 values only ranged from 63.0 to 75.5 dBA for the remaining 10 locations. The L50 values also were relatively consistent and only varied from 51.0 to 68.5 dBA. These values indicate a typical urban environment with a variety of noise sources, including roadway traffic, rail operations, aircraft and other non-transportation related activities.

L90 values are commonly termed the background noise level. Background noise levels throughout the City ranged from 45.5 dBA to 62.0 dBA. The background noise levels were less than 60 dBA for all locations except Sites 3 and 4 near Air Force Plant 42. The lowest background noise level was at Site 7, a quiet residential neighborhood. The L33 sound level is provided in Table N-5 since it is used by various federal agencies to evaluate transportation noise impacts.

The 12 sites fall into four general land use categories: residential, commercial, public use, and undeveloped property. Each of these categories is discussed below.

Residential: Sites 1, 5, 7, and 12 can all be considered residential locations. Measurements at all four residential locations included roadway traffic at slower speeds. Site 12 was a new residential development on the far west end of the City and away from major noise sources. It, therefore, had the lowest noise levels of any of the 12 sites. The four residential sites had L50 values ranging from 51.0 to 63.0 dBA. Both Sites 1 and 5 had higher noise values for two reasons: measurements included State Route 14 truck traffic noise and military aircraft flyover noise.

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**TABLE N-4**

**NOISE MEASUREMENT RESULTS BY SITE**

<u>Site No.</u>	<u>Land Use</u>	<u>Lmax<sup>a</sup></u>	<u>L10<sup>b</sup></u>	<u>L33<sup>c</sup></u>	<u>L50<sup>d</sup></u>	<u>L90<sup>e</sup></u>
1	Residential	72.0	64.5	62.0	58.5	55.5
2	Commercial	99.0	73.0	66.5	63.5	55.0
3	Undeveloped	92.0	85.5	73.5	68.0	61.5
4	Undeveloped	95.0	75.5	70.5	68.5	62.0
5	Residential	78.0	69.0	65.0	63.0	59.5
6	Park	72.0	63.0	59.0	57.5	53.5
7	Residential	74.5	64.5	58.5	55.5	45.5
8	School	75.5	66.5	63.5	61.5	57.5
9	Undeveloped	79.0	68.5	63.5	61.5	55.5
10	Commercial	79.5	66.0	61.5	59.5	55.0
11	Undeveloped	73.5	68.0	63.5	60.5	53.5
12	Residential	53.5	53.0	52.5	51.0	49.0
Range		53.5-99.0	53.0-85.5	52.2-73.5	51.0-68.5	45.5-62.0

a Lmax is the maximum sound level recorded during the noise measurement duration.

b Inferior L10 is the sound level exceeded 10 percent of the noise measurement duration.

c L33 is the sound level exceeded 33 percent of the noise measurement duration.

d L50 is the sound level exceeded 50 percent of the noise measurement duration.

e L90 is the sound level exceeded 90 percent of the noise measurement duration. It is also considered the background noise level.

Commercial: Noise measurements at commercial locations included Sites 2 and 10. Commercial locations generally have slightly higher noise levels than residential locations because of the greater volumes of traffic and higher percentage of truck traffic. The L50 for these two sites ranged from 59.5 to 63.5 dBA.

Public Use: Site 6, McAdam Park, and Site 8, Sage Intermediate School, are public use facilities. McAdam Park was a quiet location as demonstrated by an L50 of 57.5 dBA. Noise levels were somewhat higher at Sage Intermediate School due to substantial traffic on Avenue R and 20th Street. The L50 at this site was 61.5 dBA.

Undeveloped Property: Sites 3, 4, 9 and 11 were representative of undeveloped locations within the City. The L50 values were as follows: Site 3, 68.0 dBA; Site 4, 68.5 dBA; Site 9, 61.5 dBA; and Site 11, 60.5 dBA. Sites 3 and 4 were on the arrival and departure ends of the primary runway at Air Force Plant 42. At Site 3, aircraft approach noise levels ranged from 68 to 92 dBA. Site 4 was approximately 4,000 feet from the primary runway at Air Force Plant 42 and aircraft departure noise ranged from 85 to 94 dBA. For comparison, traffic noise on Sierra Highway was 68 to 74 dBA at 150 feet. Sites 9 and 11 were at undeveloped locations to the southeast of the City. While Site 9 was near a residential community, a train pass-by during noise measurements resulted in higher noise levels. The L50 of 61.5 dBA was a combination of train (72 to 78 dBA) and truck (64 to 68 dBA) noise levels. Site 11, along Avenue T, had an L50 of 60.5 dBA with heavy trucks serving sand and gravel operations dominating the noise environment. Truck traffic noise levels at 150 feet ranged from 68 to 72 dBA.

### Noise Contours

The Noise Element identifies both 60 and 65 dBA CNEL contours for transportation noise sources including the Antelope Valley Freeway (SR-14), Pearblossom Highway, two Southern Pacific Railroad lines (The Valley Mainline and the Colton/Palmdale Cutoff), U.S. Air Force Plant 42, and major roadways on Exhibits N-4 and N-5.

A 65 dBA CNEL level describes an area as having a time-average constant sound level of roughly 65 dBA even though the area would experience individual sound events higher and lower than 65 dBA. CNEL provides a common measure for a variety of differing noise environments. Thus, the same CNEL can describe both an area with very few high noise events and an area with many low level events.

CNEL values can be useful in comparing noise environments and indicating the potential degree of adverse noise impacts. However, the CNEL scale has limitations in its usefulness through averaging the sound event levels over a 24-hour period and possibly obscuring the periodic high noise levels of individual events and their possible adverse effects. In recognition of this limitation, the Environmental Protection Agency (EPA) has adopted maximum single event noise impacts levels for sources such as buses, garbage trucks, and railroad equipment.

Note that CNEL is not a measure but a computation of measured sound levels. People do not "hear" CNEL, but respond to the sound levels of individual events or noise sources. People may integrate their response to noise over long-term intervals (daily, weekly, etc.) and make subjective judgments about the "quality" of the noise environment. This is one reason why CNEL may not be the most appropriate noise



## **Noise**

descriptor for land uses which do not involve continuous "long-term" exposure to the noise source occurring regularly over a 24 hour period.

The noise contours represent lines of equal noise exposure (see Exhibit N-3), just as the lines on a weather map indicate equal temperature or atmospheric pressure. The contours provide a visualization of estimates of sound level. Land forms and man-made structures have very complex effects on sound transmission and on noise contours. Generally, barriers between a source and receiver absorb and/or reflect noise resulting in a quieter environment. Where barriers or land forms do not interrupt the noise transmission path from source to receiver, the contours prove to be good estimates of the average noise level. In areas where barriers or land forms interrupt the sound transmission, the noise contours overestimate the extent to which a source intrudes into the community. Unfortunately, it is virtually impossible for the Noise Element to analyze each roadway segment of the City for barrier noise attenuation. Therefore, where specific projects are proposed within noise impacted areas, an acoustical analysis should be completed to evaluate the noise reduction provided by any barriers to the noise path.

CNEL values have been shown to be closely related to, and often within, 1dB of LDN values, a noise metric commonly used by federal agencies.

The noise contour analysis focused on transportation noise generators, which typically cause a constant increase in ambient noise levels. Specific findings of these studies are as follows:

Aircraft Noise: The U. S. Air Force Plant 42 is located in the City of Palmdale, east of the Sierra Highway and north of Avenue P. Aircraft noise contours (65, 70 and 80 dBA CNEL contours) for the U. S. Air Force Plant 42 were provided by the Department of the Air Force (AFSC Master Plan Air Installation Compatible Use Zone Map, August 1990). The noise contours reflect both aircraft operations and engine run-ups.

Railroad Noise: The Southern Pacific Railroad Company operates two rail lines through the City of Palmdale. The Valley Mainline runs north/south and operates adjacent to Sierra Highway. The Colton/Palmdale Cutoff branches from the Valley Mainland south of Avenue R and runs east. Railroad noise levels were calculated using the U. S. Department of Housing and Urban Development Noise Assessment guidelines. The following assumptions (based on information provided by S.P.R.R.) were made in the analysis of the Valley Mainline operations: 20 diesel trains per 24-hour period, 15 percent of the operations occurring at night; 4 diesel locomotives per train; 120 rail cars per train; average speed of 55 mph; welded tracks; and whistles required for grade crossings. The above assumptions also hold for the Colton/Palmdale Cutoff, with the

exception that 10 trains operate on the line in a 24-hour period. The 60 and 65 dBA CNEL contours for the two rail lines were generated from this analysis.

Roadway Noise: The City of Palmdale roadway noise contours were generated with the Federal Highway Administration's Highway (FHWA) Traffic Noise Prediction model, U.S. Department of Transportation (1978). This model was modified to generate CNEL values. Model input data included existing and projected average daily traffic volumes (provided by DKS Associates, 1989); day/evening/night percentages of autos, and medium and heavy trucks; vehicle speeds; ground attenuation factors (soft sight conditions were assumed); and roadway widths.

The results of the FHWA model analysis are summarized in Table N-5 which gives the distance from the roadway center line at the 60, 65 and 70 dBA CNEL contours, and the CNEL level at 50 feet away from the roadway centerline.

A graphic display of the noise contours for the existing major transportation noise sources is provided in Exhibit N-4. The 60, 65, 70 and 80 dBA CNEL contours are provided, showing the integrated effect from all transportation noise sources (aircraft, railway, and roadways where the CNEL contour is greater than 200 feet from the roadway centerline). The noise contours represent unmitigated conditions. Therefore, on roadways where walls, berms, or structures block the noise path, the contours overestimate the noise impact.

The population within each CNEL zone has been estimated in order to identify the number of persons that are impacted by transportation noise. There are approximately 10,000 residents within the City that are exposed to noise levels exceeding 65 dBA CNEL, and approximately 20,000 residents that are exposed to noise levels between 60 and 65 dBA CNEL.

### **Interpretation of Transportation Noise Contours**

Exhibit N-4 displays the 80, 70, 65 and 60 dBA CNEL noise contours that were generated using the FHWA noise model for existing transportation noise sources in the City of Palmdale. The contours portray areas of equal noise level within that contour.

The dominant feature on this exhibit is the 65 dBA CNEL contour generated by the U. S. Air Force Plant 42. The contour is roughly oval in shape and covers an area from Avenue L-8 on the north to Avenue P on the south, and from 20th Street West to 130th Street East. The existing land uses in the area encompassed by the 65 dBA CNEL contour are the U.S. Air Force Plant 42, open space, industrial, and a few rural residential homes to the north of the plant.

**Noise**

Exhibit N-3

**TABLE N-5**

page 1 of table

**Noise**

**TABLE N-5**  
(Continued)

page 2 of table

**TABLE N-5**  
(Continued)

page 3 of table

**Noise**

**TABLE N-5**  
(Continued)

page 4 of table

## **Noise**

State Route 14 transects the City from north to south and generates a 60 dBA CNEL contour that extends approximately 1,500 feet from the roadway centerline. A substantial number of both single- and multiple-family residential dwellings are located within this 60 dBA CNEL contour.

The Sierra Highway and the Valley Mainline Railroad run north/south and parallel to one another approximately 6,000 feet to the east of State Route 14. The combined noise levels of the Sierra Highway and the Valley Mainline generate a 60 dBA CNEL contour that extends approximately 1,800 feet from their centerpoints. The majority of the land uses in the area impacted by the 60 dBA CNEL contour are commercial and industrial. However, single and multiple-family residential dwellings are located within the 60 dBA CNEL contour, as well.

The Colton/Palmdale Cutoff railroad line, which branches off from the Valley Mainline Railroad at Avenue R and extends to the east, generates a 60 dBA CNEL contour that extends 1,000 feet from the railway centerline and affects single-family residential dwellings.

From 30th Street East to 60th Street East, Pearblossom Highway/Avenue T and the Colton Cutoff railroad line run parallel from east to west. Their noise levels combine to generate a 60 dBA CNEL that extends approximately 2,000 feet from their centerpoint. Rural residential dwellings lie within this 60 dBA CNEL contour.

The section of Palmdale Boulevard from the Antelope Valley Freeway to 47th Street East generates a 60 dBA CNEL contour that extends approximately 1,000 feet from the roadway centerline. Land use types within this contour are mostly commercial, but also impacted are single-family residential dwellings.

### **C. Future Noise Environment**

Future average daily traffic volumes (provided by DKS Associates, 1989) were used in the FHWA Traffic Noise Prediction Model to generate future CNEL noise contours. The results of the analysis for future conditions are summarized in Table N-6, which gives the distance from the roadway centerline to the 60, 65 and 70 dBA CNEL contours, and the CNEL level at 50 feet from the roadway centerline. Airport noise contours taken from AFSC Master Plan, Air Installation Compatible Use Zones (AICUZ), August 1990, were incorporated into this report.

Future noise contours from the railroad and Plant 42 are depicted in Exhibit N-5 (Exhibit N-5 is provided as a separate large blue-line map). The 60, 65, 70 and 80 dBA CNEL contours are provided, showing the integrated effect from all transportation noise sources (railway, airport and roadways where the 60 dBA CNEL contour is greater than



## **Noise**

200 feet from the roadway centerline). The roadway noise contours represent unmitigated conditions. Therefore, on roadways where walls, berms, or structures block the noise path, the contours overestimate the noise impacts. Exhibit N-5 shows the air installation compatible use zone noise contours developed by Force Plant 42 in 1990. The City of Los Angeles and the U. S. Air Force have reached a joint-use agreement allowing up to 400 commercial operations (take-offs or landings) per day on the northeast/southwest runway of the plant. Exhibit N-5 includes the addition of commercial flights which increased the size of the noise contours.

The population within each CNEL zone has been estimated in order to identify the number of persons that will be impacted by transportation noise. At the time of General Plan build-out, approximately 21,000 residents within the City will be exposed to noise levels exceeding 65 dBA CNEL, and approximately 28,000 residents will be exposed to noise levels between 60 and 65 dBA CNEL.

A comparison of Exhibit N-4 (existing noise contours) with Exhibit N-5 (future noise contours) shows that the transportation noise levels are expected to increase in the future. The discussion of land uses impacted within specified noise levels holds for the future also, with the exception that the noise contours are pushed outward from the roadways to encompass a larger area due to increased noise levels and, thus, will impact a greater area. A summary of noise impacts by source is provided in Table N-7.

### **Noise Impacts**

The effects of 60 and 65 dBA CNEL on residents is summarized in Table N-8. The existing and future noise contours identify areas where outdoor speech interference can occur and a small percentage of the population will be highly annoyed. However, noise mitigation measures, such as berms and walls located between a noise source and receiver would reduce noise impacts.

**TABLE N-6**

page 1

**Noise**

**TABLE N-6**  
(Continued)

page 2

**TABLE N-6**  
(Continued)

page 3

**Noise**

**TABLE N-6**  
(Continued)

page 4

**TABLE N-6**  
**(Continued)**

page 5

**Noise**

**TABLE N-6**  
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page 6

**TABLE N-6**  
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page 7



**Noise**

**TABLE N-6**  
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page 8

**TABLE N-6**  
(Continued)

page 9

**Noise**

**TABLE N-6**  
(Continued)

page 10

**TABLE N-6**  
(Continued)

page 11

## Noise

**TABLE N-7**

**NOISE IMPACTS BY SOURCE**

U.S. Air Force Plant 42	CNEL noise contours extend substantial distances into the community. The 70 dBA CNEL extends beyond SR-14 on the west.
Antelope Valley Freeway	CNEL noise levels are significant and the 60 dBA CNEL demonstrates that freeway noise extends a substantial distance off the right-of-way.
Sierra Highway/Southern Pacific Railroad Line	These transportation noise sources have overlapping noise contours resulting in substantial noise impacts. Major rail freight movements result in single events of long duration.
Pearblossom Highway	The 60 and 65 dBA CNEL contours extend substantial distances into the community.
Major Roadways	Noise-sensitive land uses along major roadways are impacted by traffic noise.
Commercial/Industrial	In general, commercial/industrial operations and activities are not considered a City-wide noise problem. Isolated noise problems occur where commercial/industrial uses are located near a noise-sensitive land use. Sand and gravel operations are presently far removed from noise sensitive land uses. However, sensitive residential uses are being developed closer to those operations and traffic along Avenue T will impact more residential uses as development spreads outward from the existing developed areas.
Construction	Construction noise can be annoying to adjacent noise-sensitive land uses.

**TABLE N-8**

**EFFECTS OF NOISE ON PEOPLE (RESIDENTIAL LAND USES)**

Effects <sup>a</sup>	dBA CNEL	
	60	65
Hearing Loss	Will not occur	Will not occur
Speech Interference		
Outdoor (distance for 95% sentence intelligibility)	2.0 meters (6.6 ft.)	1.5 meters (4.9 ft.)
Indoor (sentence intelligibility)	100%	100%
Highly Annoyed <sup>b</sup>	9%	15%
Average Community Recreation <sup>c</sup>	Moderate	Significant
General Community Attitude Towards Area	No more important than various other environmental factors	Adverse aspect on the community environment

a "Speech Interference" data are drawn from the following tables in EPA's "Levels Document": Table 3, Fig. D-1, Fig. D-2, Fig. D-3. All other data from National Academy of Science 1977 report "Guidelines for Preparing Environmental Impact Statements on Noise, Report of Working Group 69 on Evaluation of Environmental Impact of Noise."

b Depends on attitudes and other factors. An unknown small percentage of people will report being "highly annoyed" even in the quietest surroundings. One reason is the difficulty all people have in integrating annoyance over a very long time.

c Attitudes or other non-acoustic factors can modify this. Noise at low levels can still be an important problem, particularly when it intrudes into a quiet environment.

Note: Research implicates noise as a factor producing stress-related health effects such as heart disease, high-blood pressure and stroke, and ulcers and other digestive disorders. The relationships between noise and these effects, however, have not as yet been quantified.

Source: U. S. Department of Transportation, Federal Interagency Committee on Urban Noise, Guidelines for Considering Noise in Land Use Planning Control, page D-2, June 1980.