NOISE ELEMENT

DEPARTMENT OF CITY PLANNING LOS ANGELES, CALIFORNIA

Noise Element
of the Los Angeles City General Plan

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Introduction

California State Government Code Section 65302g mandates that noise elements be included as a part of city general plans and that cities adopt comprehensive noise ordinances. The city's 1975 Noise Plan and ordinance achieved compliance with state law. This element revises and updates the 1975 plan and references the city's noise standards, which are contained in Los Angeles Municipal Code Section 111 et seq. In addition to addressing issues, such as airport related noise, which were addressed in the 1975 plan, the element addresses noise sources and noise mitigation strategies and regulations that came into existence after 1975, including new fixed rail systems.

The noise element applies to the city as a whole. It addresses noise mitigation regulations, strategies and programs and delineates federal, state and city jurisdiction relative to rail, automotive, aircraft and nuisance noise.

Regulation of noise relative to vehicles is largely outside the authority of municipal government. Primary municipal authority relates to regulation of land use, implementing federal and state regulations and enforcing nuisance noise. This element describes noise management programs of each jurisdictional entity, as they relate to the City of Los Angeles.

The exhibits contained herein include examples of noise commonly experienced by city dwellers, local airport noise contours, state environmental guidelines and a history of Los Angeles transportation and associated noise issues.

Chapters III and IV set forth noise management goals, objectives, policies and programs of the City of Los Angeles. Implementation programs include noise mitigation guidelines for community planners and permit processors, noise management activities in which the city is engaged and affirmation of the Alameda Corridor Project which will consolidate freight rail lines, thereby reducing noise impacts on local neighborhoods.

Chapter I — Background

Planning Area

The Noise Element relates to the entire City of Los Angeles. Within the city's boundaries are approximately 467 square miles of land area, including approximately 214 square miles of hills and mountains. The San Gabriel and Santa Susana Mountains bound the city on the north, the Santa Monica Mountains extend across the middle of the city and the Palos Verdes Hills and Pacific Ocean are on the south and west. Some noise impacts are generated by sources, such as rail, highway and freeway systems, which are within the purview of other governmental entities. Noise generated by aircraft associated with Los Angeles-based air facilities potentially impact people outside the city. Therefore, the element takes into account other jurisdictions and governmental entities.

Demographics

The 1990 federal census estimated that the city's population was 3,485,399 individuals. The 1996 Citywide General Plan Framework Element (aka Framework) of the city's general plan estimates that the population of the city would be increased by approximately 820,000 people to 4,306,564 by the year 2010 and that employment will be increased by an estimated 390,000 jobs. Circulation and transportation systems, a primary source of urban noise, continue to evolve in response to the city's changing needs and introduction of new technology.

California State Noise Element Requirements

Content

In 1971 the state of California required cities and counties to include noise elements in their general plans (Government Code Section 65302 et seq.). State law intended that noise elements guide policy makers in making land use determinations and in preparing noise ordinances that would limit exposure of their populations to excessive noise levels. The law required that local jurisdictions prepare noise ordinances that would help manage noise. In 1984, state noise element provisions were revised to shorten the list of noise element requirements, encourage local jurisdictions to design their own noise control approaches and to eliminate the requirement that general plan noise and circulation elements be consistent with each other.

Under the 1984 provisions, a noise element is required to "recognize" guidelines prepared by the Office of Noise Control of the California Department of Health Services and to analyze and quantify, "to the extent practicable, as determined by the legislative body," noise from the following sources: highways and freeways; primary arterials and major local streets; passenger and freight on-line railroad operations and ground rapid transit systems; commercial, general aviation, heliport, helistop and military airport operations, aircraft overflights, jet engine test stands, and other ground facilities and maintenance functions related to airport operation; local industrial plants, including, but not limited to, railroad classification yards; and other ground stationary noise sources identified by local agencies as contributing to the community noise environment.

The subject element complies with state law by describing airport related noise management programs and identifying and analyzing noise sources and noise management measures. It also provides guidelines for noise management within Los Angeles.

Noise Measurement and Standards

State law (Government Code Section 65302 et seq.) specifies that, as is practical, a community noise equiva-

lent level (CNEL) or day/night average level (Ldn) be used to measure noise exposure for the identified noise sources. Modeling is permitted as a tool for measuring noise. However, as will be noted in Chapter II, state and federal law has preempted local authority with reference to many of the above listed noise sources.

In response to the 1971 state requirements, the city simultaneously prepared a noise plan and a comprehensive noise ordinance. It utilized noise contours and modeling in order to establish ambient noise standards that were linked to zoning classifications. Identical standards were incorporated into the ordinance and plan to facilitate implementation and enforcement. The ordinance was adopted in 1973 (Los Angeles Municipal Code Section 111 et seq.). It has been amended several times. The city's first noise plan was adopted in 1975. The intent of state law was to prompt local jurisdictions to establish noise standards vis-a-vis the state's noise insulation standards and to enact plan implementation measures to address local noise problems. The city met these objectives with the adoption of the ordinance and plan. The noise standards contained in the ordinance guide the city's noise management and are consistent with state and federal standards.

The California Environmental Quality Act (CEQA) permit processing procedures and the ambient noise standards contained in the city's noise ordinance guide noise impact assessment and mitigation relative to new development that is subject to CEQA environmental assessment review. This element, combined with the city's noise ordinance, complies with the noise measurement and standards requirements of state law, to the greatest extent practicable, by providing sample noise exposure contours for local airports and by outlining airport and other noise management programs.

Insulation Standards

The California Department of Health Services noise office, which is cited in the 1984 general plan law, no longer exists. The most current guidelines prepared by the state noise officer were issued in 1987 and are contained in the "General Plan Guidelines" issued by the Governor's Office of Planning and Research in 1990. The standards contained in the city noise ordinance are consistent with the noise officer's 1987 guidelines.

General Plan Consistency

State general plan law requires that all elements and all parts of a general plan be integrated, internally consistent and compatible (Government Code Section 65300.5). The Framework element of the city's general plan provides broad policies and guidelines for preparation of the other elements of the general plan. It identifies the noise element as one of twelve general plan elements but contains no other noise element policies or guidelines. The subject noise element references and is consistent with general plan community plans that contain noise management issues or programs. In addition, it references and is consistent with local airport plans, as required by California Government Code Section 65302.3.

Implementation

General plan law requires that a general plan be meaningfully implemented (Government Code Section 65400). The noise element is implemented by a variety of city regulations. In addition, the airport plans and individual community plans contain implementation features that address noise related land use issues.

Element Scope

The subject element updates and replaces the city's 1975 noise plan. It identifies new significant potential noise sources, addresses the issue of vibration relative to rail and identifies historic and current significant noise management approaches.

Issues Not Addressed

Occupational noise is not addressed. State and federal governments, not cities, have jurisdiction over standards and enforcement relative to occupational health, including noise.

The goals, standards, objectives, policies and programs presented herein are within the jurisdiction of the City of Los Angeles. Programs outside the authority of the city are not listed. For example, rail, state highway and freeway and aspects of airports that are unrelated to land use generally are under federal and/or state, not municipal authority. The roles and relationship of various authorities are discussed in Chapter II, providing a context within which the element and can be better understood.

Chapter II — Existing Conditions, Noise Impact Issues and Noise Management History

Introduction

Noise is unwanted sound and, therefore, is an important factor in the quality of urban life. There are two main types of sound: ambient and intrusive. Ambient sound is the background sound that aggregates all sound emissions, far and near, as received within a particular locale. It is the "given" level of sound to which we are accustomed in our residential, work or other particular environments; the generally not unpleasant "hum" of sound about us. Intrusive sound is greater than the ambient sound level; it is perceived as "noise." It may be intermittent (siren, barking dog) or continuous (air conditioner equipment). Abatement of intrusive noise generally involves one or more of the following: reducing the noise at the source (turning down the volume), isolating the noise source by establishing buffer land uses (industrial uses around airports), blocking noise (walls, berms), or protecting the receiver (industrial ear protectors, home insulation).

The decibel (dB) is the standard unit used for measuring noise. To more closely approximate noise as it is received by the human ear at different frequencies, the decibel scale is 'A-weighted' (dBA). 'A' measures the level of sound the way sound is received by the human ear. The range of human hearing is approximately 3 to 140 dBA, with 110 dBA considered intolerable or painful to the human ear. Continuous levels of 70 dBA or higher can cause loss of hearing. A comparison of types of commonly experienced environmental noise is provided in Exhibit H. The goal of all noise mitigation is to reduce or manage intrusive noise so as to achieve or maintain healthful ambient sound levels.

Since the adoption of the city's noise plan in 1975, significant noise management has taken place, largely due to public demand for noise abatement. Watershed legislation was the National Environmental Policy Act of 1969 (NEPA) which required all significant potential environmental impacts to be evaluated and mitigation measures determined prior to issuance of land development permits. NEPA led to the establishment of state and local environmental laws, including the 1971 California Environmental Quality Act (CEQA) and requirements that general plans contain noise elements and that cities adopt local noise ordinances. Public concerns about noise led to establishment of national transportation policies and programs, including noise standards for aircraft. NEPA and CEQA require environmental assessment and imposition of noise mitigation measures for new development projects, including transportation projects. Millions of dollars in public funds have been expended to reduce impacts of noise from existing airports and freeways, as well as for research and development of new design, noise suppression technology and regulations for mitigating noise from transportation and other sources.

Transportation systems are a primary source of urban noise. Management of noise from the most significant of these sources (aircraft, trains and freeways) generally has been preempted by federal and state authority. Primary municipal authority is regulation of land use. The City of Los Angeles has established standards for ambient noise levels that are correlated with land use zoning classifications. The standards are contained in the city's noise ordinance, Los Angeles Municipal Code (LAMC) Section 111 et seq. Compliance is achieved by a variety of means, including barriers, buffers, separation of incompatible uses and reduction of sound at its source.

The first section of this chapter discusses ordinances and other measures for regulating noise sources and mitigating noise impacts within the city. The other sections discuss the evolution of noise impacts and

management measures associated with local transportation systems. The Appendix provides an historical perspective of the evolution of transportation systems and associated noise issues.

Building Sound Insulation and Nuisance Noise

Several city, state and federal regulations address sound insulation and nuisance noise. These range from use permit limitations and building construction provisions to nuisance abatement. This section summarizes the city's major noise management procedures and regulations.

California And Federal Legislation

CALIFORNIA NOISE INSULATION STANDARDS

The California Noise Insulation Standards of 1988 (California Building Code Title 24, Section 3501 et seq.) establishes inter-dwelling (between units in a building) and exterior sound transmission control measures. It requires that interior noise levels from the exterior source be reduced to 45 decibels (dB) or less in any habitable room of a multi-residential use facility, e.g., hotels, motels, dormitories, long-term care facilities, and apartment houses and other dwellings, except detached single-family dwellings. Measurements are based on a day/night average sound level (Ldn) or the community noise equivalent level (CNEL). Both Ldn and CNEL utilize averaging, not single event exposure. Therefore, the passing of a single train during a day would be averaged over the 24-hour period, resulting in negligible exposure.

The significant noise generation sources identified by the Noise Insulation Standards are: highways, country roads, city streets, railroads, rapid transit lines, airports and industrial areas. Noise-sensitive uses planned in proximity to such uses are required to be designed to prevent intrusion of significant exterior noise. The applicant must submit an acoustical analysis, prepared by or under the supervision of an acoustical engineer, indicating that a 45 dB or less interior noise level will be achieved within each proposed habitable room. Interior allowable noise levels can be achieved by reorienting the project on the site, providing setbacks, shielding (e.g., buffer walls or berms) the receptor from the noise source, incorporating sound insulation into the building construction, requiring that windows be unopenable or remain closed and air conditioning be provided, and any other methods.

To help permit processors assess whether special acoustical analysis and mitigation is needed, local jurisdictions are to identify areas of 60 dB or greater, averaged over a 24-hour period. The noise element of the general plan is to be used in helping to identify sites with noise levels of 60 dB or greater. In addition, the state general plan law (Government Code Section 65302 et seq.) calls for noise elements to "recognize" the state health department noise guidelines and to quantify, "to the extent practicable, as determined by the legislative body, current and projected noise levels" from transportation and other significant sources. This element identifies noise levels of 65 dB or greater with reference to airports.

NATIONAL ENVIRONMENTAL POLICY ACT (NEPA)

The National Environmental Policy Act of 1969 (NEPA) requires that an environmental impact statement (EIS) be prepared for federal or federally funded (including loans) projects. The EIS identifies potential impacts of the project and evaluates feasible alternatives for mitigating the impacts. The impacts and mitigation alternatives are taken into account by decision makers. However, mitigation of impacts is not required by NEPA.

FEDERAL NOISE CONTROL ACT

The Noise Control Act of 1972 (42 United States Code 4901 et seq.) gives the Environmental Protection Agency (EPA) authority to publish regulations and standards relative to transportation, construction and electrical equipment, motors, engines, etc. It reaffirms the Federal Aviation Administration and EPA preemption of state and local control over aircraft noise. It requires that the FAA to consult with the EPA prior to promulgating or amending noise regulations.

The California Environmental Quality Act of 1970 (CEQA) was patterned in part after NEPA. It mandates that mitigation measures be part of a discretionary land use development permit approval, including building permits, unless a project is deemed exempt from environmental assessment procedures. CEQA is intended to protect the natural environment from avoidable damage, including from noise impacts, by requiring that proposed land development projects mitigate identified significant potential impacts. Where an environmental impact report is required, the decision maker may issue a permit even if the potential impact cannot be reduced to a level of insignificance, providing the decision maker finds that project benefits outweigh the unavoidable impacts. Impacts on the environment (or known future environment) also are considered, including noise from exterior sources on project users or residents. Where federal agencies or funding is involved, both NEPA and CEQA apply.

Conservation of nonrenewable energy resources is a consideration under NEPA and CEQA. Mitigation measures typically include building insulation to reduce heat gain and loss so as to reduce the amount of energy needed to heat or cool buildings. Even without CEQA mitigation requirements, most new construction includes energy insulation features, combined with air conditioning and heating systems, to make projects more energy efficient. Insulation reduces exterior-to-interior noise impacts.

City Noise Ordinances

The City of Los Angeles has numerous ordinances and enforcement practices that apply to intrusive noise and that guide new construction. These are summarized in the following sections.

The city's comprehensive noise ordinance (LAMC Section 111 et seq.) establishes sound measurement and criteria, minimum ambient noise levels for different land use zoning classifications, sound emission levels for specific uses (radios, television sets, vehicle repairs and amplified equipment, etc.), hours of operation for certain uses (construction activity, rubbish collection, etc.), standards for determining noise deemed a disturbance of the peace, and legal remedies for violations. Its ambient noise standards are consistent with current state and federal noise standards. They are correlated with land use zoning classifications in order to guide the measurement of intrusive noise that results in intermittent (periodic) or extended impacts on a geographically specific site. The intent is to maintain identified ambient noise levels and to limit, mitigate, or eliminate intrusive noise that exceeds the ambient noise levels within the zones specified. The standards guide building construction and equipment installation, equipment maintenance and nuisance noise enforcement. The city council initially adopted the ordinance in 1973 and periodically amends it to reflect current issues and noise management approaches.

As a general rule, the city's building and safety department enforces noise ordinance provisions relative to equipment (air conditioning units, swimming pool pumps, car wash facilities and other machinery) and the police department enforces provisions relative to noise generated by people (parties, amplified sound, etc.). The police department also is authorized to enforce the mechanical equipment and other provisions of the noise ordinance, relative to nuisance noise complaints.

Zoning And Land Use

The city's planning and zoning code (LAMC Section 11 et seq.) contains a variety of provisions that directly or indirectly mitigate noise impacts on, or impacts that are associated with, different types of land uses. Permit processing is guided by the general plan, especially the community plans which together are the city's land use element. The plans designate appropriate land use (zoning) classifications. Noise element programs (Chapters III and IV) outline considerations that may be taken into account during community plan preparation and planning permit processing. The noise ordinance guides land use considerations by setting maximum ambient noise levels for specific zones.

Los Angeles was the first jurisdiction in the nation to establish zoning by land use category (1904 and 1908). Under the guidance of the city's first planning director, Gordon Whitnall, the zoning was changed (1930) to create the standardized classifications that are used today. These include regulation of height, area (including yards), density and parking. The combination of the various regulations contributes significantly to reduction of potential noise impacts throughout the city.

The most basic noise management measure is traditional zoning that separates agricultural, residential, commercial and industrial uses. Another is the front yard set back that not only adds attractiveness to a neighborhood but serves to distance homes from adjacent street noise. Side and rear yards also serve as noise buffers. Through zone change and subdivision processes, site or use specific conditions can be imposed to assure compatibility of land use and to protect users of a site from impacts from adjacent uses.

The commercial (C zones) and manufacturing (M zones) provisions of the code contain use specific requirements intended to reduce noise, odor and other impacts on adjacent uses. These include prohibiting of certain commercial and industrial uses within so many feet of residential or less restrictive uses or zones, requiring increased setbacks from residential uses, limiting hours of operation, containing uses wholly within an enclosed buildings, requiring sound walls, prohibiting openings that face residential uses and prohibiting audibility of noise outside a facility.

Conditional use and use variance permits (LAMC Sections 12.24, 12.27, 12.28 and 12.29) allow the planning commission, zoning administrators and, on appeal, board of zoning appeals and city council to assess potential use impacts and impose conditions to mitigate noise impacts. Conditional use or use variance permits are required in certain zones for schools, churches, homeless shelters, municipal facilities, correctional institutions, alcohol sales, golf courses, parks, rubbish disposal projects, mixed use development, stadia, automobile service and repair facilities, certain types of parking, joint living and work quarters, mini-malls, hotels and motels, drive-thru food establishments, nightclubs, keeping of certain types of animals and other unique, potentially noise intrusive uses. In most cases the uses are allowed by right in less restrictive zones. Some are prohibited entirely in residential zones. The permitting procedures include site investigations, notice to neighbors and hearings to assist decision makers in determining if the use should be permitted and, if permitted, allow imposition of appropriate conditions of approval. Typical conditions include specific site design, setbacks, use limitations on all or parts of the site, walls and hours of operation so as to minimize noise and other impacts. Violation of conditions can result in permit revocation.

Supplemental use districts or "overlay zones" (LAMC Section 13) for such uses as oil drilling, animal slaughter, surface mining and equine keeping typically contain construction, installation and operational provisions that are intended to minimize or eliminate noise impacts on adjacent uses. For example, the surface mining provisions prohibit establishment of a surface mining district closer than 100 feet from a residential zone, unless a landscaped buffer berm is provided, and limit mining activity hours. Oil drilling district noise mitigation provisions include drilling operation term limits, drilling equipment noise guidelines and a requirement that oil production activities be inaudible outside the enclosed operations structure. In some cases, the commission and city council are authorized to impose additional conditions to further mitigate potential impacts associated with a particular supplemental use.

Other code provisions allow a zoning administrator to conditionally permit, without public hearing, particular uses allowed in a zone, provided that the uses meet certain criteria, such as provision of additional parking or walls. The additional parking requirements for such uses as health clubs, restaurants, trade schools and auditoriums in part are to minimize noise impacts, especially in the evening and at night on residential neighborhoods. Poten-

tial impacts include door slamming and people talking as they walk to their cars.

The authority to revoke, discontinue a use or to impose nuisance abatement conditions on established uses has become a major tool for reducing nuisance noise. Use permits may be revoked by the commission, zoning administrator, or, on appeal, by the board of zoning appeals or city council for nuisance (including disturbance of the peace) or noncompliance with conditions of a conditional permit. In addition, a zoning administrator may discontinue or, on appeal, the board or council, may impose operational conditions on existing commercial or industrial uses that are deemed a nuisance, including for excessive noise or disturbance of the peace (LAMC Section 12.21-A.15). These two procedures have been increasingly utilized in recent years to encourage owners to operate activities on their properties in a manner that is compatible with adjacent uses, particularly residential uses.

Building Sound Insulation Regulations

With the development of inexpensive insulation materials, air conditioning and improved noise reduction techniques it became economically feasible to design buildings that provide effective insulation from outside noise as well as from weather conditions. It has been estimated that standard insulation, efficiently sealing windows and other energy conservation measures reduce exterior-to-interior noise by approximately 15 decibels. Such a reduction generally is adequate to reduce interior noise from outside sources, including street noise, to an acceptable level. Building setbacks and orientation also reduce noise impacts.

Sound transmission control requirements were added to the national Uniform Building Code (UBC) in 1992. The UBC standards were incorporated into the city's building code (LAMC Section 91) in 1994. They are consistent with state noise insulation standards (California Building Code Title 24, Section 3501 et seq.), requiring that intrusive noise not exceed 45 dB in any habitable room. As with state standards, the provisions do not apply to detached single-family residential uses. The city's airport noise abatement programs apply the standard to detached single-family dwellings.

The city's building code guides building construction. The insulation provisions are intended to mitigate interior noise from outside sources, as well as sound between structural units. The provisions vary according to the intended use of the building, e.g., residential, commercial, industrial. The regulations are intended to achieve a maximum interior sound level equal to or less than the ambient noise level standard for a particular zone, as set forth in the city's noise ordinance.

Nuisance Noise

Nuisance noise is intermittent noise that exceeds the city's ambient noise levels or is otherwise deemed a nuisance. It is addressed primarily through enforcement of municipal code provisions described in this section.

BUILDING MECHANICAL EQUIPMENT

In addition to standards and regulations contained in the noise ordinance, mechanical equipment noise (e.g., roof top air conditioners) is regulated by the building code (LAMC Section 91). The city's building and safety department administers and enforces the code as it applies to noise relative to both installation and maintenance of equipment.

DISTURBING THE PEACE

In addition to the noise ordinance, Los Angeles Municipal Code Section 41 contains several disturbance of the peace provisions that are enforced by the police department. These include regulation of noise from theaters, construction activities, devices used to emit music, miniature golf courses (including unduly loud talking) and "loud and raucous" noise. The latter probably is the most commonly requested noise enforcement provision because it relates to general public nuisance, e.g., loud parties. California Penal Code Section 415 also authorizes local police departments to enforce noise relative to public nuisances, including intentional noise making.

The street sales (vendor) ordinance (LAMC Section 42.00) is enforced by the police department. It prohibits "loud, boisterous, raucous, offensive or insulting" activity associated with the sale of goods or services, including solicitation for sight-seeing tours.

CITY PARK FACILITIES

Los Angeles Municipal Code Section 63.44 regulates use of recreation and parks department facilities. Park rangers and other recreation and parks department staff enforce regulations that include restrictions on use of sound amplification systems within parks and regulation of concert uses of park facilities. In addition, the recreation and parks department designs its facilities, locates activities within park sites, enforces park use hours and has operational policies for individual sites that are intended to minimize potential noise and activity impacts on surrounding neighborhoods.

BARKING DOGS

The animal regulation department administers the barking dog noise ordinance (LAMC Section 53.63). It investigates written complaints and issues warning notices to owners of properties on which barking dogs are located. If the problem continues, a hearing is set before an animal regulation department hearing officer who considers testimony and attempts to resolve the problem. Dog licenses can be revoked and the owner required to remove the animal from the site if the problem continues.

COMMERCIAL VEHICLES

Engines of large commercial vehicles (six tires, gross weight of 10,000 pounds or more when empty) are not permitted to be operated at night in any manner deemed disturbing to residents of dwelling units, including residential hotels (LAMC Section 80.36.3). The prohibition is enforced by the police department and applies to parked as well as moving vehicles.

EMERGENCY VEHICLES

It is operational policy of the city's fire and police departments to limit use of sirens and horns, as practical, when emergency vehicles travel past noise sensitive uses or through noise sensitive areas.

Automotive Vehicles

The noise most commonly experienced throughout the city is produced by automotive vehicles (cars, trucks, buses, motorcycles). Traffic moving along streets and freeways produces a sound level that remains relatively constant and is part of the city's minimum ambient noise level. Vehicular noise varies with the volume, speed and type of traffic. Slower traffic produces less noise than fast moving traffic. Trucks typically generate more noise than cars. Infrequent or intermittent noise also is associated with vehicles, including sirens, vehicle alarms, slamming of doors, garbage and construction vehicle activity and honking of horns. These noises add to urban noise and are regulated by a variety of agencies.

Management of automotive vehicle and associated noise is within the jurisdiction of federal, state and/or local authorities. This section reviews the jurisdictional authority of vehicle noise management relative to the City of Los Angeles.

Vehicle Emissions

Vehicle noise emission standards are promulgated by the federal Environmental Protection Agency (Title 49, Code of Federal Regulations Parts 190 et seq.). The Federal Highway Administration (FHA) of the Department of Transportation has authority to enforce noise standards pertaining to licensed interstate vehicles with a gross weight of over 10,000 pounds, providing the enforcement authority has been authorized "curbing" (i.e., police) authority. The FHA in the Los Angeles region (headquarters in Riverside County), does not have curbing authority. State and local jurisdictions may adopt the Environmental Protection Agency regulations without amendment in order to enforce the regulations. However many cities, including Los Angeles, have not done so because noise emissions, as described previously and below, can be enforced locally as nuisance noise under other authorities.

Street Noise

Occupants of buildings are protected from traffic noise and vehicle related noise by a number of lo-

cal land use, building construction and noise mitigation measures. Separation of land uses through general plan and zoning classifications traditionally has provided one of the best means of reducing noise impacts. Early land use practices and zoning designated commercial and industrial uses along highway corridors. This provided buffer uses between highways and residential areas. Construction of freeways that cut through existing communities, introduced traffic noise impacts into previously protected neighborhoods.

Modern building construction noise insulation and air filtration (air conditioning) standards contained in the city's building code generally are sufficient to mitigate noise impacts associated with city streets and ambient noise. The code also requires that outside factors, such as nearness to freeways or highways, be assessed in establishing noise insulation requirements for a particular building. The city's noise ordinance (Municipal Code Section 111 et seq.) and noise element provide minimum ambient noise levels that are correlated with land use zoning classifications. The ordinance regulates excessive noise generated by individual vehicles and incidents including noise from radios, horns, alarms, sound amplification equipment and other vehicle equipment. It also regulates hours of construction equipment operation and rubbish truck collection. These sections of the ordinance are enforced by the police department. Other noise regulations and noise mitigation procedures are contained in the municipal code and environmental review guidelines. The slower a vehicle travels, the less noise it generates. Therefore, speed limits, especially on local streets, reduce traffic noise impacts on adjacent uses. Together, the zoning and other statutes and provisions establish the city's standards and guidelines for vehicle related noise management.

The California Department of Motor Vehicles has jurisdiction over vehicle noise emissions within California. California Motor Vehicle Code Section 23130 establishes vehicle noise limits for moving vehicles, including interstate trucks that operate on streets, highways and freeways within the state, and regulates noise impacts on adjacent land uses. The provisions are enforced by the California Highway Patrol and local law enforcement agencies, such as city police.

Trucks tend to generate greater noise than cars. Certain types of trucks are prohibited by the state from traveling on certain state highways due to safety considerations. Freeways serve as the primary truck freight haul routes. Within the city, trucks are allowed to travel on streets except where prohibited by state regulations or by weight or height limits, such as on bridges, in tunnels and on some mountain or substandard streets. Because trucks can travel on most streets and highways in Los Angeles, truck noise can impact all areas of the city. Areas especially impacted tend to be those that are located adjacent to industrial and warehouse sites. Truck traffic impacts, including noise, are such a problem in the port community of Wilmington that the Wilmington-Harbor City community plan (adopted 1989) recommends that certain major highways within the community be designated as truck routes and that trucks be discouraged from using other streets.

Freeway Noise

By the late 1960s, freeways were a major source of noise throughout the state. Entire communities were impacted, especially at night, by the steady hum or roar generated by fast moving traffic. In 1973-74 state and federal agencies, in response to the 1969 National Environmental Policy Act, adopted formal policies and criteria for construction of noise barriers to mitigate impacts. In California, the responsibility for freeway and highway noise management was assumed by the California Department of Transportation (Caltrans). As a part of the nationwide highway noise abatement effort, Caltrans instituted a noise management program to reduce impacts from existing and new freeways on residential, school and other noise sensitive uses.

The program utilized noise barriers (sound walls) and/or building modification methods. The noise barrier program was the most publicly visible of the methods used. By 1996 over 150 miles of the nearly 210 miles of walls nationwide had been con-

structed in California, including more than 115 miles of walls in Los Angeles County. Sound walls typically are eight to fourteen feet in height and are installed between the freeway and adjacent homes or other impacted uses.

Where sound walls alone cannot reduce interior sound to acceptable levels, buildings sometimes are modified by adding or improving air conditioning, acoustical glass and/or other noise insulation features. Such abatement measures primarily are applied to schools. By 1996, the retrofitting program had been almost entirely completed for impacted schools located within the city's boundaries.

In addition, new freeways, such as the Glenn Anderson Interstate 105 Freeway (formerly called the Century Freeway), which opened in 1993, are constructed with noise mitigation features. These include walls and earth berms, freeway design (e.g., locating freeways in trenches) and conversion of some adjacent, potentially impacted properties to freeway compatible uses. The noise mitigation measures for both existing and new freeways has contributed significantly to reduction of ambient urban noise and has reduced direct noise impacts on adjacent uses and neighborhoods.

Rail Systems

Noise from rail systems is localized, impacting immediately adjacent communities. This section reviews noise and vibration management relative to rail systems within the city.

Railroads

JURISDICTIONAL AUTHORITY

The city cannot regulate transcontinental or intrastate trains operating within its borders. It has the authority to regulate land use as long as its determinations do not conflict with or infringe upon state or federal authority. Management of rail system related noise is within the jurisdiction of federal and/or state authorities. For example, the Federal Transit Administration (FTA) requires that all rail systems that receive federal funding must be constructed and operated in accordance with its specifications; the Federal Rail Administration (FRA) sets and enforces safety standards, including regulation of noise emissions within locomotive cabs, and requiring that train horns be a minimum of 96 dBA at 100 feet in front of a moving train; the National Environmental Policy Act (NEPA) requires federal agencies to incorporate environmental protection and enhancement measures into projects that are financed in whole or in part by federal funds (including loans). The FTA has promulgated noise and vibration impact assessment and mitigation guidelines for use by rail authorities for preparation of environmental impact reports for federally funded rail projects. Rail operations in Los Angeles are centered around Union Station and the east Los Angeles rail yards.

NOISE ISSUES

Union Station is located in the Central City North community of Los Angeles, adjacent to El Pueblo de Los Angeles Historic Monument. The train yard adjacent to the station bounds New Chinatown and extends to Taylor Yard, which is adjacent to the communities of Glassell Park and Cypress Park (Northeast community plan area). The station and yards serve both passenger and freight trains. Noise from Union Station and the adjacent yards largely is buffered from residential uses by manufacturing, commercial, office and park (Elysian Park) uses. In the early 1990s use of the yards by Metrolink trains generated public concern. An advisory committee was formed. The committee prepared a community compatibility study that recommended noise management measures.

Noise from freight train activities associated with industrial and warehouse uses and around the Los Angeles-Long Beach harbors generally is buffered from adjacent uses by surrounding industrial, warehouse and commercial uses. Overall improvement in train equipment and servicing methods has contributed significantly to reduction in noise impacts. However, some residential neighborhoods near active rail lines are impacted

by noise from intermittent passing trains and associated rail and truck activities.

ALAMEDA CORRIDOR PROJECT

Construction of the six-lane, 20-mile project began in 1997. The corridor extends from the ports of Los Angeles and Long Beach, though south and central Los Angeles to rail yards in the cities of Vernon and Commerce, interconnecting rail lines with regional truck systems. It is intended to increase the efficiency of movement of freight and expand rail capacity within the Southern California region. This is to accommodate the expected tripling of Pacific rim (Asia, North and South America and other Pacific nations) trade over the next quarter of a century. The project will consolidate some 90 miles of railroad tracks and eliminate approximately 200 at-grade street crossings. A 30-foot deep trench paralleling ten miles of Alameda Street is planned from the rail yards near downtown Los Angeles to the Artesia Freeway (Route 91) in the city of Compton. Consolidation of rail lines will reduce noise impacts by reducing the number of freight haul lines and by providing buffering of new lines, thereby eliminating or significantly reducing noise associated with freight trains.

New Rail Systems

TRAIN AND LIGHT RAIL NOISE

The Southern California Regional Rail Authority (SCRRA) is a quasi-state agency that operates the Metrolink commuter train system. Since it is regulated by federal interstate commerce laws, it is exempt from local regulations. If a train system utilizes existing rail rights-of-way, it is deemed categorically exempt under the California Environmental Quality Act (CEQA) environmental assessment and mitigation procedures. Metrolink trains utilize existing rail corridors, station areas and rail yards. Therefore its system generally have been deemed categorically exempt under CEQA. However, SCRRA voluntarily attempts to abide by local noise regulations and responds to noise complaints.

Other new rail systems are under the authority of the Los Angeles County Metropolitan Transportation Authority (MTA). The MTA serves commuter and short haul public transit passengers within the greater Los Angeles metropolitan area. As a quasi-state agency it is exempt from city noise laws. However, the MTA attempts to comply with the local noise regulations and to achieve the federal standard of 85 dBA within 50 feet of a habitable dwelling. The MTA uses comprehensive noise and vibration criteria that varies according to land use. This has enabled it, in some neighborhoods, to achieve even more restrictive sound emission levels than are set forth in the city ordinances and/or federal guidelines.

Before rail lines are constructed or new systems installed, significant potential noise and vibration must be identified and mitigation measures assured in accordance with federal and state environmental impact regulations (NEPA and CEQA). New rail systems and equipment are designed to comply with noise standards established by the FTA, the American Association of Railroads and the Public Utilities Commission relative to car, engine and track design, horns, auxiliary equipment, train operation, sound of wheels at curves, crossing signal bells and other system associated noise. Significant noise mitigation has been achieved by both MTA and SCRRA through replacement of existing rails and wood ties or construction of new tracks with continuous or seamless (not jointed) welded rails. Antilock braking systems prevent 'flat spots' on train wheels which, in the past, caused them to bump and clank whenever the flat spot and rail came into contact. New car and wheel system design and noise dampening devices also reduce external noise. These and other features have eliminated the vibration, noisy "click-clack" sound and other noises commonly associated with traditional railways.

The MTA Blue Line and Metrolink lines generally utilize existing rights-of-way that bound existing industrial, institutional, commercial, open space and other nonresidential areas, thus minimizing new noise impacts on residential uses. Securing of rail rights-of-way has enabled the MTA to, in some

cases, create open space, park and recreational buffers along rail lines, further reducing noise impacts on adjacent residential areas. Noise impacts are virtually nonexistent for the MTA's Green Line light rail system because it is located almost entirely within the Glenn Anderson Freeway.

New development on properties adjacent to rail lines must comply with the city's building code insulation provisions. Along with zoning setbacks, building insulation generally assures adequate noise mitigation relative to adjacent rail lines.

The MTA and SCRRA have attempted to be responsive to neighbors. After the Blue Line began to operate between downtown Los Angeles and Long Beach, residents in the Long Beach area complained to the MTA of the sound of wheels on rails at one section of the line. People also complained about the loudness of the train horns. These complaints prompted the MTA to hire a noise consultant to investigate. Based on the consultant's recommendation, the MTA installed quieter horns, retrofitted cars with additional dampening fixtures and materials, modified the car design, ground the rails and constructed a sound barrier at the noise complaint site, thereby achieving lower noise levels. The redesign of the cars and other modifications benefitted properties along the entire Blue Line route and are being applied to other MTA light rail systems. Similar complaints about the loudness of Metrolink horns resulted relocation of the horns from the roofs to the undercarriages of the trains, significantly reducing noise impacts.

Partially in response to community concerns, the planned Metrolink maintenance facility at Taylor Yard (Glassell Park and Cypress Park in northeast Los Angeles) was designed to reduce noise impacts. New technology and facility design enabled entire trains to be serviced without having to separate cars or locomotives. This virtually eliminated noise from separation of air hoses and coupling and uncoupling of cars.

Nevertheless, the community experienced noise impacts due to increased activity in the yards. This resulted in neighborhood demands for mitigation of rail yard noise and for development of more compatible uses along the eastern portion of the property. A study group was formed in the early 1990s. It was comprised of the representatives of the American Institute of Architects, community groups, property owners and operators, public agencies, elected officials and other entities who evaluated the potential use of parcels adjacent to and within the eastern portion of Taylor Yard. The team recommended community oriented commercial and other neighborhood compatible development of some parcels along the north side of Taylor Yard. The recommendations were used in conjunction with the revision of the Northeast community plan, which was underway in 1998.

SUBWAY NOISE AND VIBRATION

MTA's Metro Rail Red Line subway is partially completed. A single subway line operates between Union Station and Western Avenue (in the Wilshire community). Other lines are under construction, including a branch to the San Fernando Valley via Vermont Avenue and Hollywood Boulevard (Hollywood community). Because it is an enclosed underground system, noise impact concerns have been minimal, except relative to construction activities. Subway construction was granted a variance from the city's noise ordinance construction hours to enable tunneling 24 hours a day, in accordance with conditions of the variance. Any construction activities must otherwise comply with the noise ordinance.

In the Hollywood area the broadcast industry raised concerns about vibration and noise, especially during construction, relative to the proposed tunnels below television, radio and recording studios. This resulted in the hiring by the MTA of a consultant to evaluate potential noise and vibration impacts and to propose mitigation measures as a supplement to the environmental impact report for that segment of the system. The measures issued in 1989 included some subway realignment. Depth of the subway tunnels, track engineering and vibration dampening measures are expected to reduce or

eliminate impacts of vehicle generated vibration on uses located above the tunnels when the system becomes operational.

Tunneling under the community of North Hollywood began in 1996 and resulted unanticipated problems, including construction noise and vibration impacts on sensitive uses, e.g., recording studios. The MTA reanalyzed its planned train operations and environmental conditions. In response to its findings, the MTA adjusted its noise and vibration criteria, modified the track supports and offered to modify some buildings that contained sensitive uses. The measures are intended to eliminate any significant above ground noise and any vibration impacts, as measured relative to the high ambient noise levels associated with the area.

Aircraft and Airports

Airport and heliport noise is localized, affecting communities immediately adjacent to the facilities. However, the intensity and intrusiveness of jet aircraft noise has resulted in such noise becoming a major local concern. The primary issue raised during the hearings and public discussion relative to the city's first Noise Plan (1975) was the issue of aircraft noise, especially noise impacts on communities adjacent to the Los Angeles International Airport (LAX). Issues also were raised in 1975 about noise associated with heliports and the Hollywood-Burbank Airport (now called the Burbank-Glendale-Pasadena Airport). In the interim since the 1975 plan was adopted many changes have taken place that have enabled authorities to better address noise issues relating to airports. However airport noise remains the primary unresolved noise issue facing the city. This section reviews noise management of aircraft and airports (including heliports) within the city. It addresses this issue relative to the five airports that are located within or immediately adjacent to the City of Los Angeles: LAX, Van Nuys, Burbank, Santa Monica and Whiteman airports.

Jurisdictional Authority

Management of aircraft and airport related noise is within the jurisdiction of federal, state and/or local authorities.

FEDERAL

Under federal statutes, safety and national defense have primacy over noise abatement. The Federal Aviation Act of 1958 vested the Federal Aviation Administration (FAA) with exclusive authority over air safety, management and control of airspace and movement of aircraft through airspace. Local jurisdictions and local airport authorities have no direct control over airspace or air traffic control, which are safety issues under the authority of the FAA. The FAA determines landing and departure routes for public and private airports and heliports and sets construction and operational standards to assure safety. Federal authority preempts state and local authority over aircraft operations, including aircraft noise emissions, aircraft flight patterns and airport use.

STATE

Enforcement in California of federal airport regulations is delegated to the California Department of Transportation (Caltrans) and is administered by the Caltrans Aeronautics Program (CAP). CAP sets noise guidelines for local airports. In addition, the state is responsible for regulation of airport related land use and has established noise insulation standards. It has delegated authority over land use regulation largely to local governments.

LOCAL

Land use compatibility with airport uses is largely within the authority of local jurisdictions, as long as actions do not conflict with or infringe upon federal and state authority. Local governments cannot regulate flight hours, flight patterns or operational procedures. Where the local government is also the airport proprietor, it may adopt noise abatement measures affecting aircraft operations only with the express authorization of the FAA. The city has mapped airport hazard areas around the Van Nuys (VNY) and LAX airports and established procedures to regulate land development consistent

with federal safety regulations (LAMC Section 12.50). Land use within flight path hazard areas, both within and outside of airport boundaries, must comply with height, glare and other safety considerations established by the FAA.

AIRPORT LAND USE COMMISSION

State law (Public Utilities Code Section 21670 et seq.) requires creation of county airport land use commissions (ALUCs). The ALUCs advise local jurisdictions concerning coordination of airport and land use planning for adjacent geographic areas in order to achieve orderly expansion of airports, reduction of community exposure to excessive noise and elimination of safety hazards associated with airport operations. The ALUCs prepare and adopt comprehensive airport land use plans (CLUPs) that "provide for the orderly growth of each public airport and the area surrounding the airport" within the ALUC's jurisdiction and protect the welfare of the surrounding residents and general public. The plans are based upon airport layout plans, as accepted by the CAP, or locally adopted airport master plans. The ALUC plans anticipate airport growth for a period of 20 years.

An ALUC reviews those sections of a city's general plan (e.g. community plans and airport plans), as well as proposed plan amendments, specific plan ordinances and development permit requests that pertain to airport hazard and noise impact areas in order to determine consistency with the CLUP. Local authorities may overrule an ALUC's determination.

State law provides for the Los Angeles County Regional Planning Commission to act as the ALUC for Los Angeles County. The county's 1991 CLUP contains a CNEL of 65 or 70 dB noise exposure contours for each airport in the county. The CLUP "Land Use Compatibility Table" provides guidelines for establishment of particular uses in areas exposed to a CNEL of 60 or more dB noise impacts. The City of Los Angeles noise ordinance emission standards are consistent with the 1991 CLUP guidelines. Revision of the county's CLUP was initiated in 1997.

CITY OF LOS ANGELES

Pursuant to the city's planning and zoning code, aircraft landing fields are allowed by right in the M2 (light industrial) and M3 (heavy industrial) zones. In all other zones they are authorized by conditional use permit issued by the city planning commission (LAMC Section 12.24.B.1) or, on appeal, by the city council. Most heliports are not located in M2 or M3 zones. The three airports within the city boundaries (LAX, VNY and Whiteman) generally are zoned in the M2, M3 or PF (public facilities) zones.

In 1998 Los Angeles World Airports, the city's airport authority, was preparing master plans for LAX and VNY. The plans are limited by the FAA to land use considerations, including intensity of development. However, changes in airport land use must be approved by the FAA. The city is prohibited from closing an airport or reducing the intensity or type of aircraft activity without FAA approval.

Because Whiteman Airport is a county facility, it is legally exempt from municipal zoning laws. However, as a matter of policy, the county attempts to comply with city zoning laws and land use procedures.

SUMMARY

In general: federal authority is over airspace and safety, including aircraft noise standards; state authority is over airports, including airport noise standards, and enforcement of airport safety (except where preempted by federal authority); and local authority is over operations and land use (except where preempted by federal and state authority).

Regulations And Programs

A variety of regulations and programs guide and assist local airport authorities in achieving federal and state noise standards.

ENVIRONMENTAL ASSESSMENT

The 1969 National Environmental Policy Act (NEPA) and 1970 California Environmental Quality Act (CEQA) require that environmental impacts, including noise impacts, be evaluated. NEPA requires

that mitigation measures be considered in project implementation. CEQA requires that mitigation measures be incorporated into the project to avoid or minimize significant impacts to the maximum extent feasible. Proposed new airports, including heliports, are required to submit environmental statements as a part of their permit applications. Master plans, zone changes, reconfiguration of airport uses (including runways) or other significant projects are discretionary actions that trigger the environmental assessment and mitigation procedures. All official environmental review documents are subject to public review and comment.

FEDERAL AVIATION REGULATIONS PART 36 (FAR PART 36)

Congress in 1968 granted the FAA authority to implement and monitor airspace regulations, including regulation of aircraft noise. The FAA in 1969 promulgated "14 Code of Federal Aviation Regulations Part 36" (FAR Part 36) establishing maximum sound emission levels for new aircraft and phasing out of noisier aircraft. Subsequent amendments classified fixed-wing aircraft into three noise impact categories, with Stage 1 applying to the oldest and noisiest aircraft engines and Stage 3 to the newest and quietest engines. New fixed-wing aircraft built in the United States were required to comply with the Stage 3 standards. After January 1, 1986 commercial fixed-wing aircraft were to comply with the Stage 2 standards. Stage 1 aircraft were phased out of use at civilian airports by 1990.

To comply with FAR Part 36, all new commercial passenger airplanes are designed to reduce engine noise to a minimum feasible level. Lighter and stronger composite materials and more streamlined design have reduced needed engine power, thereby reducing engine noise emissions. New technological advances are anticipated to further reduce fixed-wing aircraft engine noise in the future.

CALIFORNIA AIRPORT NOISE STANDARDS

California Airport Noise Standards (California Code of Regulations Title 21, Section 5000 et seq.) were adopted in 1970. They are administered by the Caltrans Aeronautics Program (CAP). Under the standards, civilian airports, including heliports, that are deemed to be a "noise problem airports" are required to meet a community noise equivalent level (CNEL) of 65 dB at airport boundaries by January 1, 1986 (FAR Part 36) or to seek a variance from CAP. Noise problem airports that were unable to eliminate noise incompatibility within the established time frame were permitted to seek and renew variances. Variances provide extensions of time for development of plans for compliance within a reasonable period of time.

CNEL is a noise measurement scale applied over a 24-hour period to all noise events received at the measurement point. It is weighted more heavily for evening and night periods in order to account for the lower tolerance of individuals to noise during those periods. Noise is greater at the source (airport runway) and diminishes as the distance between source and the receptor widens. The CNEL measurement is expressed as a contour line around the noise source.

The California Noise Standards contain procedures for implementing noise and land use compatibility requirements. They establish systematic methods for measuring noise levels and addressing noise problems and define incompatible noise sensitive uses, e.g., residential dwellings (including mobile homes), schools, hospitals, convalescent homes and houses of worship. An interior noise level of a CNEL of 45 dB is the standard for all noise sensitive uses.

Counties are authorized under the noise standards to issue a resolution declaring that a civilian airport within its boundaries is a "noise problem" airport, based upon receipt of noise complaints and other noise impact data. Once so identified, the airport becomes subject to the California Airport Noise Standards, which are enforced by the county. The county is required to validate the noise contours. Airports identified by the county as noise problem airports are to reduce noise problems (i.e., incompatibility) through a variety of suggested strategies, including reconfiguration of airport land use, modification of airport flight paths, rezoning, land ac-

quisition and other abatement measures. The airport's comprehensive land use plan is submitted to the county for review and adoption. The county submits the plan and quarterly reports (documenting the contours and incompatible land uses within the contour areas) to the CAP. The CAP reviews the reports and approves the plans.

Five airports are within or adjoin the city (Exhibit A). The Los Angeles County Board of Supervisors has deemed three of the five, LAX, VNY and Burbank, to be noise problem airports. All three airports submit quarterly reports with contour maps depicting CNEL of 65 dB contours (Exhibits B-D) to the county and prepare noise abatement programs. They currently operate under noise compatibility compliance time extension variances. Santa Monica and Whiteman airports are not considered noise problem airports because significant airport related noise is contained within the airport or surrounding airport-compatible land use (Exhibits E and F).

AIRPORT NOISE AND CAPACITY ACT OF 1990 (FAR PARTS 91 AND 161)

The Airport Noise and Capacity Act of 1990 (14 Code of Federal Regulations [subsequently recodified as 49 U.S.C. 47521 et seq.]) established FAA authority over most airport noise management, preempting state and local authority. The Act sets procedural requirements that must be met before noise regulations can be enacted for an airport. It is implemented by "14 Code of Federal Aviation Regulations Part 161" (FAR Part 161), which establishes a program for reviewing airport noise and access restrictions on the operations of Stage 2 and Stage 3 aircraft. In addition, FAR Part 91 establishes procedures for phasing out of large (over 75,000 pounds) Stage 2 aircraft and for reducing noise emitted by Stage 2 aircraft. The goal is to phase out most Stage 2 commercial fixed-wing aircraft from airports by December 31, 1999. Any proposed new Stage 3 noise mitigation measures must be authorized by the FAA. Prior to 1990, airports could impose more stringent standards than were contained in federal regulations. The Act allows noise ordinances already in effect, such as the Van Nuys Noise Abatement and Curfew Ordinance, to remain in effect, i.e., to be "grandfathered".

FEDERAL AVIATION REGULATIONS PART 150 PROGRAM (FAR PART 150)

In 1979, passage of the Aviation Safety and Noise Abatement Act made matching funds available for noise abatement. "14 Code of Federal Aviation Regulations Part 150" specifies how abatement and prevention measures may become eligible for the funds. The program is popularly known as "FAR 150 program." The Burbank Airport Authority and LAWA are participating in the FAR Part 150 program relative to the LAX, VNY and Burbank airports.

To qualify impacted areas for noise abatement or prevention funds, an airport authority must submit noise exposure contour maps and prepare a noise compatibility program (NCP), as defined by FAR Part 150. The maps are to identify CNEL of 65 dB or greater noise exposure contours for current and projected exposures. The NCP is to include a description of how citizens, local jurisdictions and affected agencies will participate; an airport land use compatibility plan; measures to prevent introduction of additional incompatible uses within the noise exposure areas; and detailed proposals for achieving and maintaining compatibility, e.g., reduction of incompatible land uses, airport reconfiguration, modification of flight procedures, sound proofing or other noise management measures designed to reduce impacts on existing surrounding noise sensitive uses. To guide noise impact assessment and prioritization, FAR Part 150 provides a land use compatibility table. It is comparable to the state guidelines and the guidelines contained in this noise element (Exhibit I). The FAA may deny an NCP or approve eligibility for funding for all or part of a proposed NCP.

The FAR Part 150 program in 1998 began requiring evidence that local authorities are preventing the introduction of new noise sensitive uses within noise impact areas and stopped providing funds for noise abatement for incompatible uses introduced after January 1, 1998. The changes are intended to

encourage promulgation and enforcement of local land use compatibility measures.

CALIFORNIA NOISE INSULATION STANDARDS

The interior noise standard to be achieved by abatement programs is specified by the California Noise Insulation Standards (Building Code Title 24, Section 3501 et seq.). It sets interior noise levels of 45 dB in any habitable room, averaged over a 24-hour period. The standard is applied, per the California Airport Noise Standards, to all "sensitive uses" pursuant to the airport noise compatibility program.

LOCAL NOISE COMPATIBILITY PROGRAMS

In addition to federal noise abatement and prevention funding, local airport authorities may establish their own programs. LAWA has established an abatement program relative to LAX. It is independent of the Part 150 program. In addition, local airports and jurisdictions have sought to reduce through land use changes and other noise management approaches.

Helicopters

PLANNING COMMISSION AND FIRE DEPARTMENT PERMITS

Aircraft, helicopters and heliport noise and safety considerations are within the regulatory authority of the state and federal governments, as described previously. However, cities have authority over certain land use and specific safety considerations.

In the 1960s the Los Angeles City Planning Commission (CPC) was given the responsibility (LAMC Section 12.24) for authorizing heliports, including heliports[1] used only in emergency situations. The permits are conditioned, based on potential impacts identified during the permit review process, including environmental review and public hearings. The conditions define and regulate the use of a specific heliport. If noise or other potential land use related problems appear unsolvable, the CPC can deny the permit. Permits can be revoked if noise impacts prove greater than anticipated or conditions of approval are not observed. The county's airport land use commission is required by state law to confirm the local heliport permit before final authorization can be considered by the Caltrans Aeronautics Program. The FAA determination of conformity of a heliport and its flight paths to FAA guidelines occurs prior to CPC consideration. Therefore, the determination is part of the documentation provided by the applicant to the CPC. If the state, FAA or the city fire department determine that a proposed or existing heliport is unsafe, the CPC's permit becomes moot.

The fire department has the authority to deny or revoke use of a private or public heliport if it determines that a facility does not meet city safety requirements (e.g., failure to maintain a heliport in a safe condition, existence of trees or other obstructions in the landing or departure paths or improper maintenance of wind socks and lighting).

In 1974 all new buildings over 75 feet in height were required by the city to provide emergency helicopter landing facilities (LAMC Section 57.18.11). The authority to approve such uses was assigned to the fire department. The new law resulted in a substantial reduction in the number and type of permits considered by the CPC. Permits for banks and hospitals became the most common requests because banks needed to transfer paper records on a daily basis and hospitals needed heliports for transfer of patients and materials. Requests for commuter and passenger service operations generally were denied by the commission. However, such requests were rare because of the availability of helicopter operations at local airports.

In 1978 the fire department was authorized to approve "infrequent" helicopter landings in any zone (LAMC Section 12.22-A.6). Such landings may occur only twice a year at sites within specified single-family (RA, R1) and commercial (C1, CR) zones. Infrequent landing permits are to accommodate occasional events such as educational programs and movie filming.

Commission hearings for heliports typically generate community concern regarding noise impacts. To minimize noise impacts, the CPC generally limits the use (e.g., bank records transfer only), hours

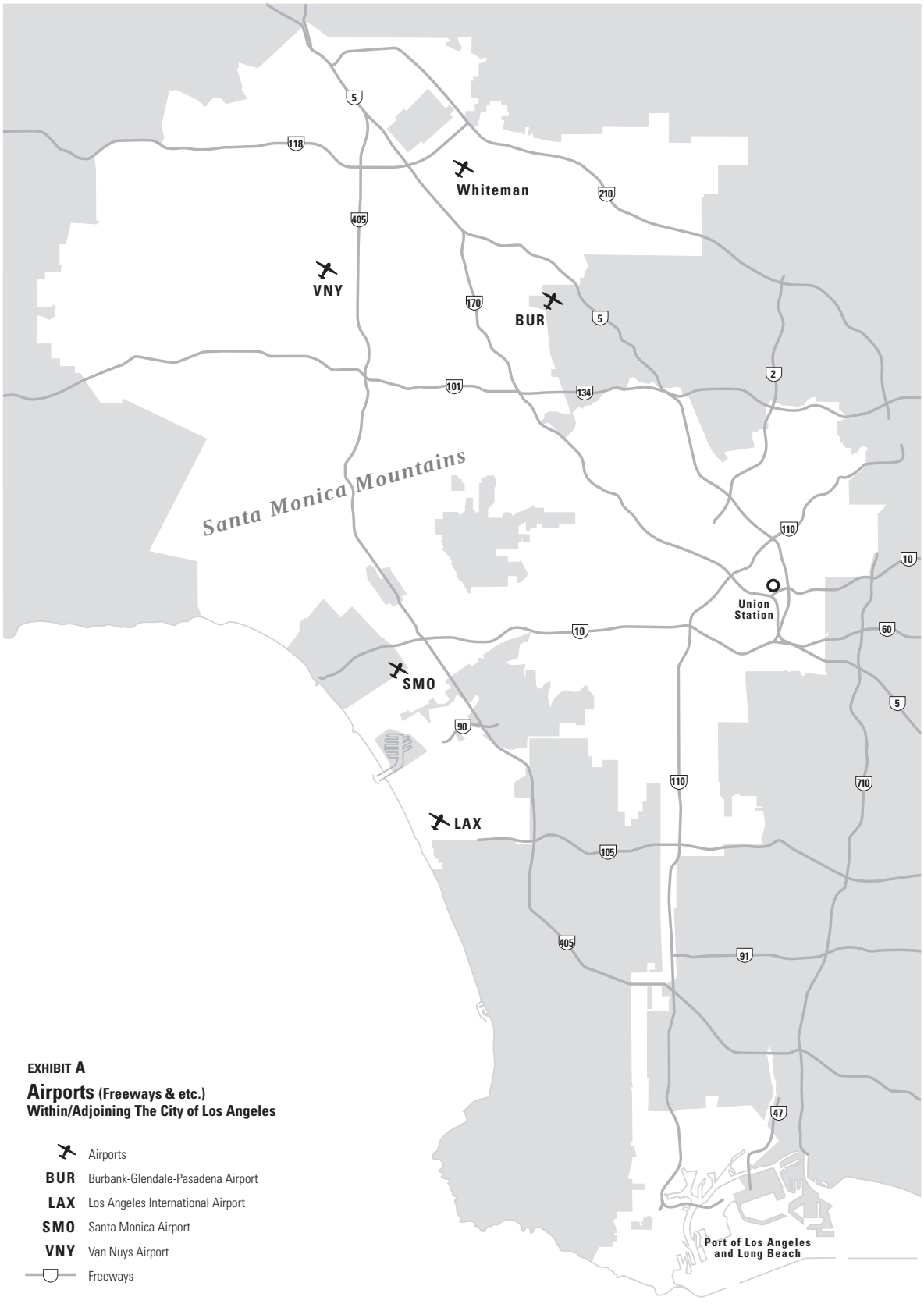

EXHIBIT A

Airports (Freeways & etc.)
Within/Adjoining The City of Los Angeles

- Airports
- **BUR** Burbank-Glendale-Pasadena Airport
- **LAX** Los Angeles International Airport
- **SMO** Santa Monica Airport
- **VNY** Van Nuys Airport
- Freeways

Source: Proposed Transportation Element of the General Plan, Los Angeles City Planning Department, 1997.
Prepared by the Transportation Unit • City of Los Angeles Planning Department • Citywide Graphics • January, 1998

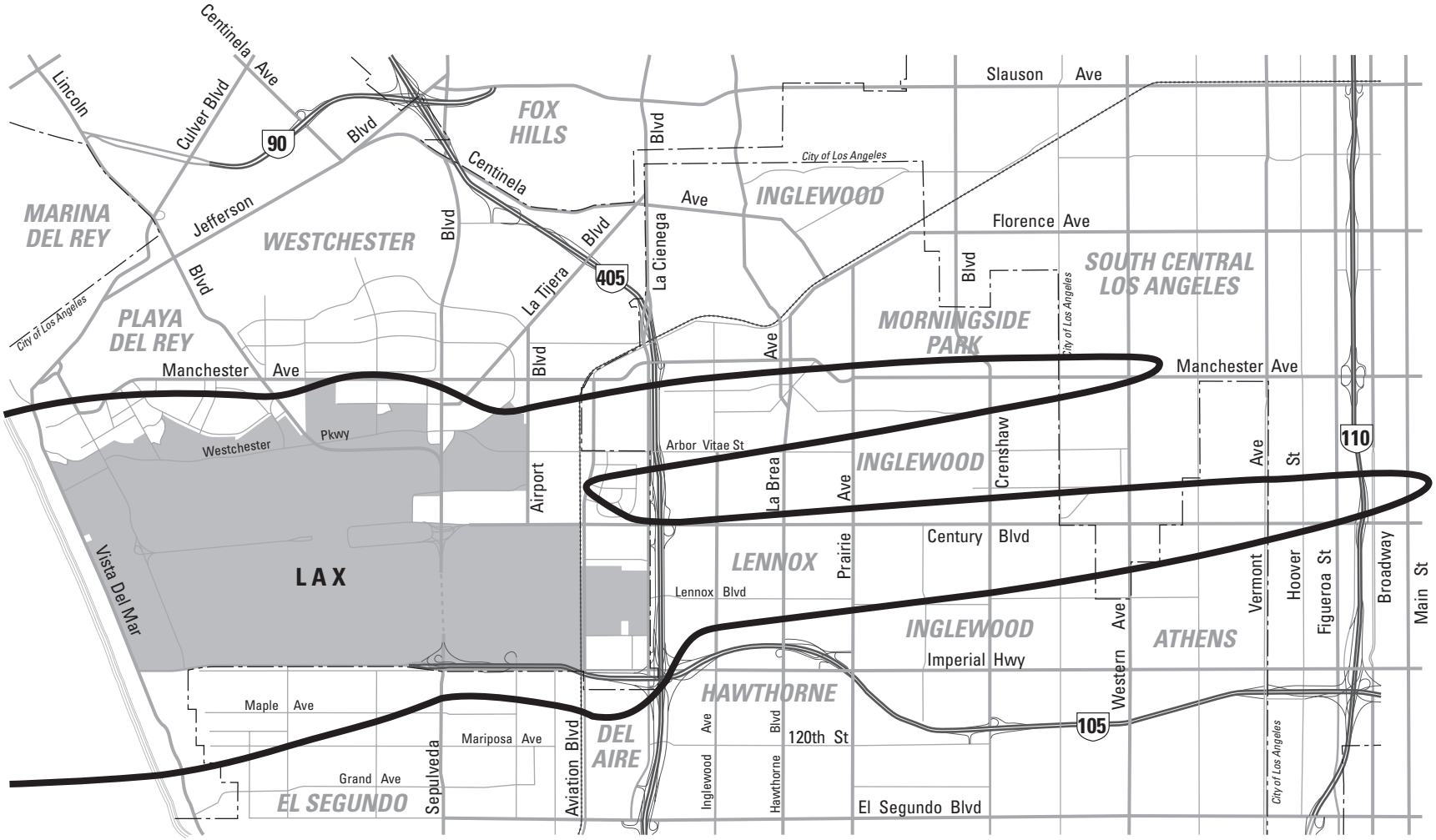

EXHIBIT B

Los Angeles International Airport

Noise Exposure Contour*

Noise Contour (a CNEL of 65 dB)

Airport Boundary

Note: Exhibit is illustrative and is not to scale.
For further information contact Los Angeles World Airports.

*Based on: (1) Fourth Quarter Monitoring Report, Los Angeles World Airports, August 13, 1997
Los Angeles World Airports, April 07, 1997
(2) City Planning Department community plan maps.

Prepared by the Graphics Section • City of Los Angeles Planning Department • Citywide Planning Division • January, 1998

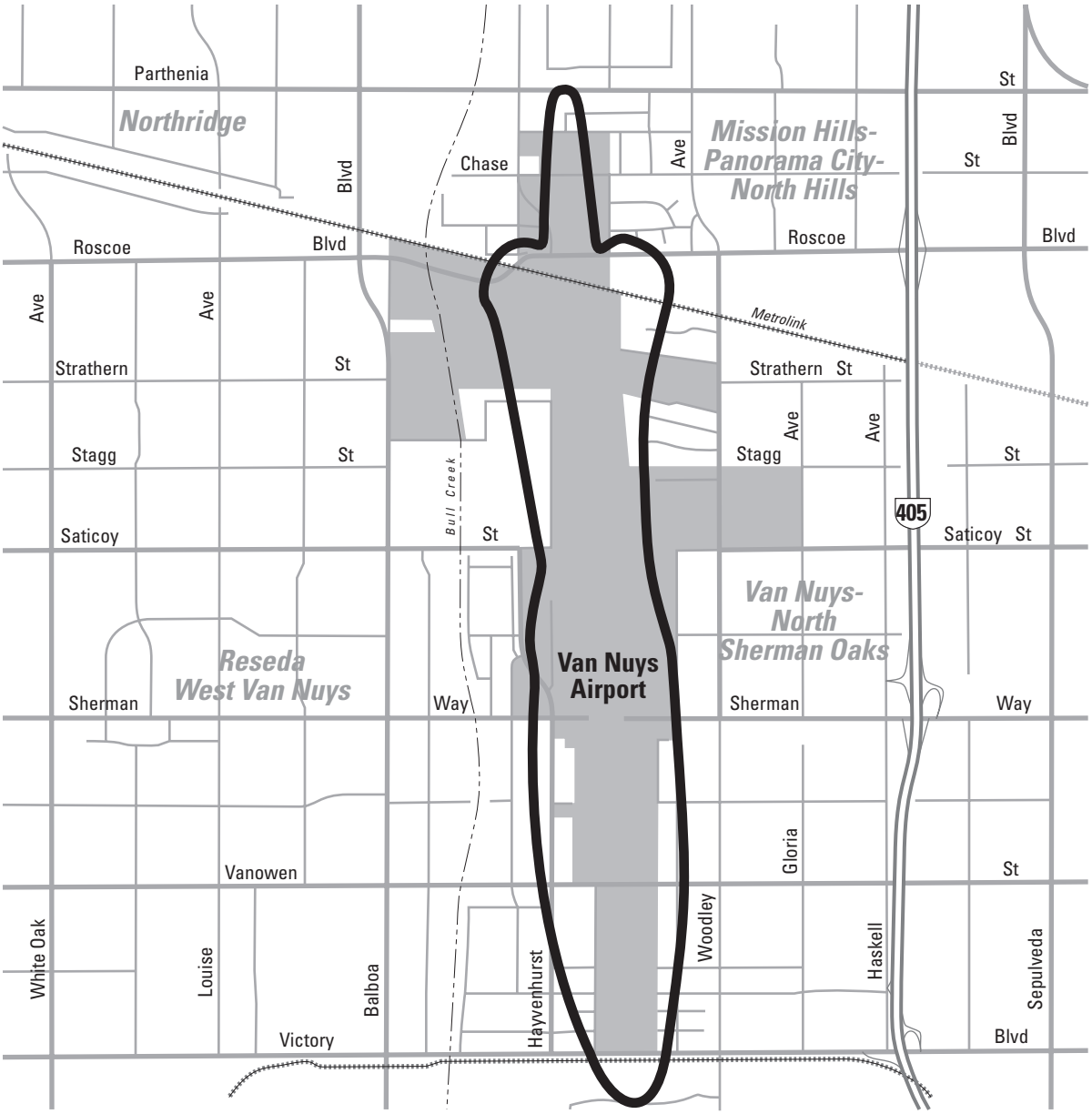

EXHIBIT C

Van Nuys Airport
Noise Exposure Contour*

Noise Contour (a CNEL of 65 dB)

Airport Boundary

Note: Exhibit is illustrative and is not to scale.
For current information contact Los Angeles World Airports.

*Based on : (1) Fourth Quarter Monitoring Report, Los Angeles World Airports, September 8, 1997
(2) City Planning Department community plan maps.

Prepared by the Graphics Section • City of Los Angeles Planning Department • Citywide Planning Division • January, 1998

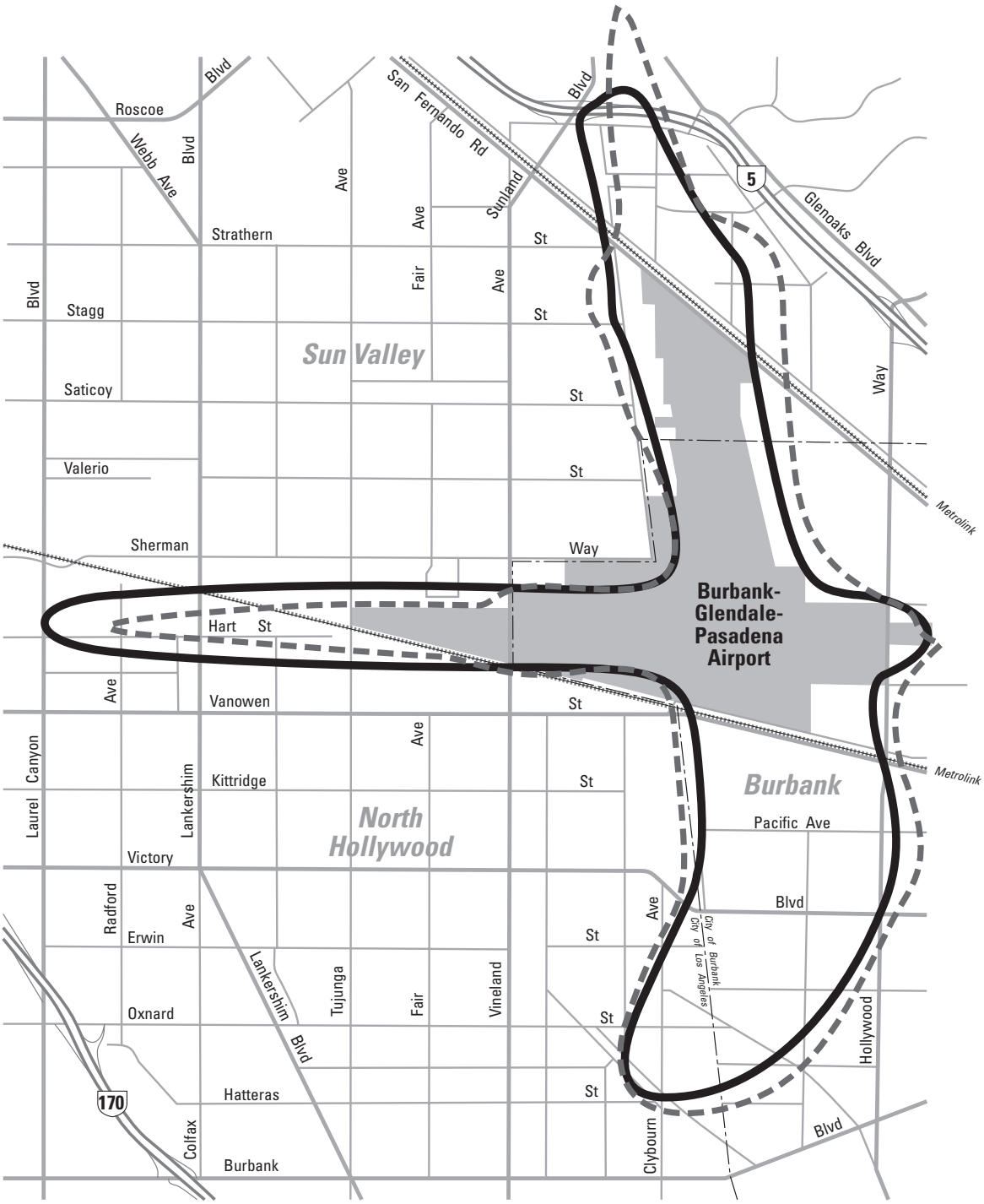

EXHIBIT D

Burbank-Glendale-Pasadena Airport
Noise Exposure Contours

1996 Noise Contour (a CNEL of 65 dB)*

2010 Projected Contour (a CNEL of 65 dB)**

Airport Boundary

*Based on : (1) "Quarterly Noise Monitoring Report, at Burbank Airport, Fourth Quarter 1996", Burbank-Glendale-Pasadena Airport Authority, July 1996.
(2) City Planning Department community plan maps.

**Based on : "Environmental Impact Statement for Land Acquisition and Replacement Terminal Project," Burbank-Glendale-Pasadena Airport Authority, August-1995.

Note: Exhibit is illustrative and is not to scale. For further information contact the Airport Authority

Prepared by the Graphics Section • City of Los Angeles Planning Department • Citywide Planning Division • January, 1998

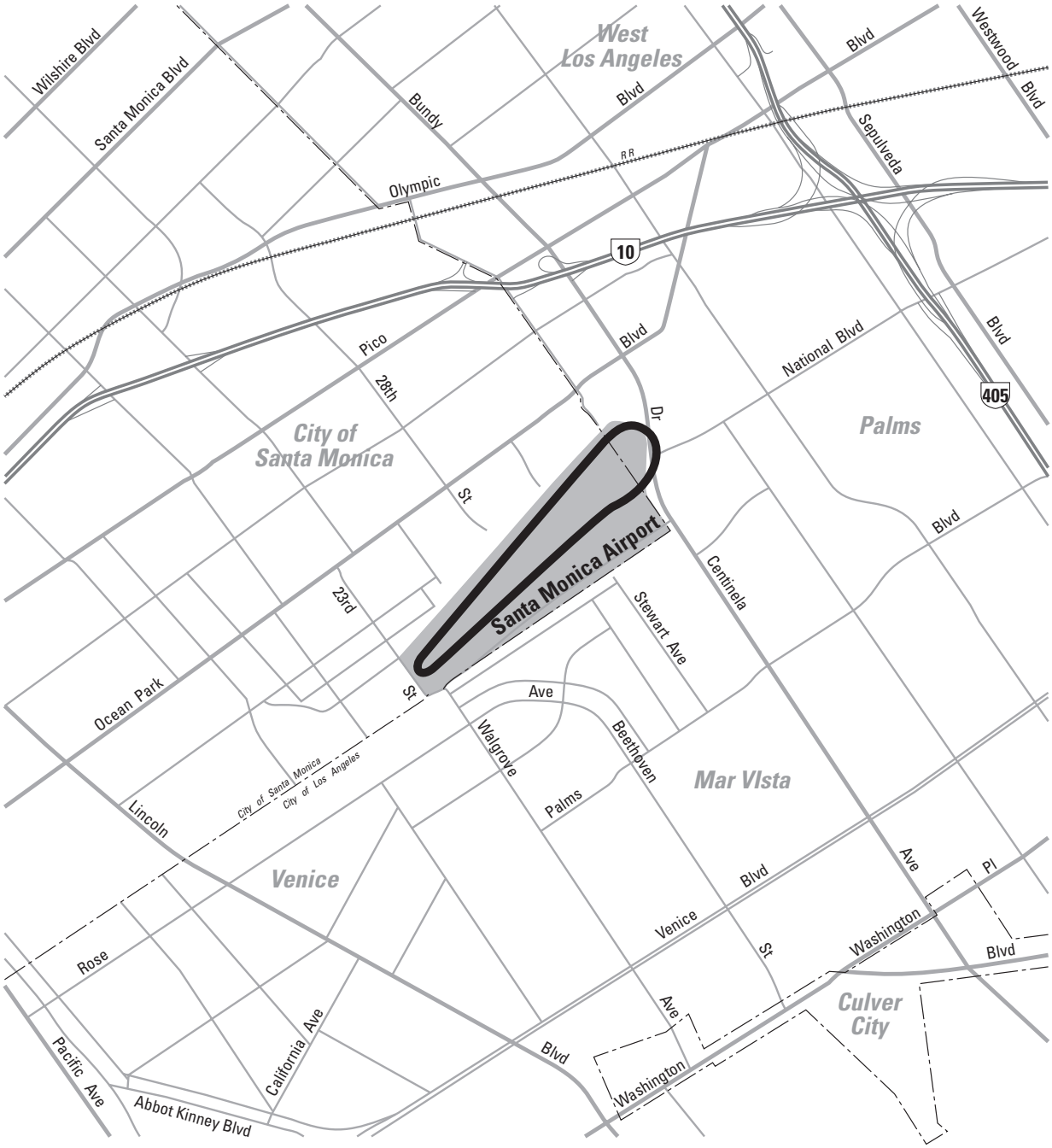

EXHIBIT E

Santa Monica Airport
Noise Exposure Contour*

Noise Contour (a CNEL of 65 dB)

Airport Boundary

Note: Exhibit is Illustrative and is not to scale.
For current information contact the Santa Monica Airport

*Based on : (1) Santa Monica Airport Noise Management Office, 1996.
(2) City Planning Department community plan maps.

Prepared by the Graphics Section • City of Los Angeles Planning Department • Citywide Planning Division • January, 1998

EXHIBIT F

Whiteman Airport
Noise Exposure Contour*

Noise Contour (a CNEL of 65 dB)

Airport Boundary

Note: Exhibit is illustrative and is not to scale.
For current information contact the County Regional Planning Department

* Based on: (1) "Los Angeles County Airport Land Use Plan", adopted 1991, Los Angeles County Airport Land Use Commission.
(2) City Planning Department community plan map.

Prepared by the Graphics Section • City of Los Angeles Planning Department • Citywide Planning Division • January, 1998

of operation and number of flights. It sometimes requires noise barrier walls and imposes landing or departure routes. However, because state and federal authority preempts that of municipalities regarding safety, flight path and noise barrier requirements sometimes have been deemed inoperative by the FAA or CAP if they interfered with flight safety. For many years the CPC imposed helicopter weight limitations because it was assumed that weight could be correlated with the amount of noise generated. It ceased imposing the condition in the early 1980s when it was advised that helicopter weight no longer had any bearing on noise emissions.

Helicopter noise, unlike that of fixed-wing aircraft, is associated with the sound generated by rotor blades slapping against wind currents, not by the aircraft engine. Improvements in rotor systems is the primary means of reducing noise generated by helicopters. By the mid-1980s requests for conditional permits for heliports dwindled to zero, largely due to the building construction recession, electronic transfer of documents, increased popularity of limousine service and increased helicopter use of airports. By then approximately 50 private heliports had been permitted within the city, apart from emergency heliports and at local airports (primarily at Van Nuys and Burbank airports).

In the 1980s noise reduction and concern about crime resulted in the support by many local communities for police surveillance helicopters, causing such use to increase substantially. In Los Angeles, police and fire department helicopters operate from existing heliports that often contain fueling, parking and helicopter maintenance facilities.

HELICOPTER NOISE

Even with noise suppression improvements, helicopter flight at 500 feet creates an audible sound that is especially noticeable at night. National "Fly Neighborly" guidelines are implemented voluntarily by most pilots, thereby reducing noise impacts, especially in the vicinity of residential neighborhoods and noise sensitive uses. For example, voluntary alternate flight routes have been requested by the FAA relative to the Hollywood Bowl and other open air theaters during summer concert seasons. In the 1980s, to reduce noise impacts on adjacent communities, local airport authorities established helicopter operational flight procedures, specific landing and departure routes, use restrictions (e.g., no flight training exercises) and restricted hours of operation. These measures, along with rotor system redesign, significantly reduced noise impacts on neighborhoods. The operational procedures were "grandfathered" as existing procedures when the Aircraft Noise and Capacity Act of 1990 was effectuated (October 1990).

Airports In The Los Angeles Area

Los Angeles International Airport is known by its FAA identifier "LAX." It is one of four airport facilities operated by the Los Angeles Department of Airports. The department adopted the business name of "Los Angeles World Airports" (LAWA) in 1997.[2] LAWA is an independent, fee supported, self-managing city agency governed by a board of airport commissioners who are appointed by the mayor and confirmed by the city council. LAWA establishes rules and regulations governing the operation its four airports.

In 1930 LAX became the city's first airport. LAWA subsequently acquired the Van Nuys (VNY), Ontario and Palmdale airport properties. LAX and VNY are located within the city's borders. Ontario Airport is located 30 miles east of Los Angeles, within the city of Ontario. The Palmdale Regional Airport is located 35 miles northeast of Los Angeles in the Antelope Valley within the Mojave Desert, near the city of Palmdale. A temporary airport terminal is located on U.S. Air Force property adjacent to the city's 17,750 acre future regional airport site. Pending development of that airport, portions of the site are used for agricultural purposes (pistachio nut and fruit orchards, grazing sheep). The Ontario and Palmdale airports are not discussed in this element.

Los Angeles International Airport (LAX)

LAX is located entirely within the City of Los Angeles. It is situated south of the Santa Monica Mountain range, within the Westchester-Playa del Rey community planning area. It bounds the cities of El Segundo and Inglewood, the county community of Lennox and the Pacific Ocean.

The airport was located in the middle of a bean field. It rapidly expanded until today it occupies an approximately 3,500 acre site. It has four lighted runways ranging from 8,925 feet to 12,090 feet in length, each of which can accommodate wide bodied passenger jet aircraft. A major contributor to the local economy, LAX is the fourth busiest airport in the United States and the world. In 1996 it served 763,866 flights and 58 million passengers and its 98 acre "cargo city" handled over 1.89 million tons of goods, 40 percent of which was international freight. Among the facilities located on LAX property are commercial and light manufacturing uses, the Centinela Hospital Airport Medical Clinic, a U.S. Coast Guard Air Station and a 200 acre El Segundo Blue Butterfly habitat preservation area.

LAX ZONING

The majority of the LAX site is classified in the M2 and M3 (manufacturing) zones, which allow airport uses by right. Commercial, light manufacturing and open space zoning around the perimeter of the site has encouraged development and retention of airport compatible uses, which serve as noise buffers between the airport and adjacent noise sensitive uses. A portion of the zoning within the airport is conditioned to limit types of use and intensity of development in order to reduce street traffic impacts and encourage compatibility with surrounding communities. Parcels along the north (Westchester) perimeter generally are required to secure planning commission or planning department site plan approval prior to issuance of building permits. This allows additional public review and ensures compliance with planning commission policy.

LAX NOISE MANAGEMENT

Following the opening of the airfield in 1928, agricultural lands surrounding the airport gradually were converted to urban uses. When jet aircraft were introduced in 1959, residents, merchants and school authorities began complaining about noise, especially noise associated with landings and takeoffs. A Sound Abatement Coordinating Committee comprised of representatives of the air transport industry, LAWA, FAA, the Airline Pilots Association and commercial carriers was formed in July 1959 to address the noise problem. Subsequently LAWA implemented the committee's recommendation that aircraft be required to maintain a straight departure course, not turning until they were over the Pacific Ocean. But noise complaints continued.

As a result of a legal action by Westchester property owners, LAWA, with the assistance of FAA funds, in 1965 began to acquire and remove more than 2,800 homes that were severely impacted by aircraft noise and to relocate approximately 7,000 residents of the homes. The program was completed in the 1980s with many of the homes relocated as a part of an affordable housing program. Twenty of the vacated homes were used for a sound insulation testing program. The program concluded that homes severely impacted by airport noise could not be adequately insulated at a reasonable cost using materials and techniques then available. The study is one of the most systematic investigations of different methods and materials applied to dwellings. It has been used by federal and other agencies for formulating insulation standards and programs.

To achieve compliance with FAA and state noise regulations, LAWA adopted (1972) a five-point program to reduce aircraft noise and diminish greater than CNEL of 65 dB aircraft noise impacts on surrounding communities. The measures included termination of airport use permits for operators who repeatedly violated LAWA's noise regulations. Nighttime noise impacts on residential areas was reduced in 1973 when LAWA instituted a preferential nighttime runway system and rerouted night landing and departures over the ocean. Fol-

lowing a test flight of the Concorde supersonic airplane to LAX in 1974 all supersonic aircraft were prohibited from using LAX until such time as they could meet LAWA noise standards. A 1,500 foot long concrete and landscaped earthen sound barrier was constructed in 1979 along the north side of LAX between Emerson Avenue and the Westchester Golf Course to mitigate noise impacts on the Westchester community. During the 1970s a lawsuit brought against LAWA by local school districts was settled when LAWA agreed to provide funds for insulation of schools impacted by LAX and the school districts agreed to aviation (overflight) easements.

LAX - FAR PART 150 AND LAWA NOISE COMPATIBILITY PROGRAMS[3]

The major program in the 1980s and 1990s to accomplish greater compatibility between airports and their neighbors was the FAR Part 150 noise compatibility program. In 1981, to qualify for FAR Part 150 funds, LAWA instituted a four-part study, "The LAX-Airport Noise Control Land Use Compatibility Study." The study reevaluated the feasibility of achieving acceptable indoor noise levels, the methods and materials to meet the levels and the costs involved. It established new noise identification and mitigation procedures that could be applied to homes within a CNEL of 65 dB contour. The new procedures included an aircraft noise monitoring system, which was installed to detect nighttime engine testing in maintenance areas, and a 24-hour complaint and information phone line to facilitate processing of and response to community complaints.

The study provided documentation that enables thousands of properties in the LAX noise impact area to quality for noise abatement funds. Representatives of the aviation industry, regulatory agencies and communities impacted by noise participated in the study. They assessed noise management techniques in relation to land use and recommended methods for achieving greater compatibility between LAX and its neighbors. Public hearings and workshops were conducted to help identify the scope of the study and to secure information and ideas. Committees explored different issues including helicopter noise, maintenance operations, nighttime impacts, operations of aircraft in flight and on the ground and community specific issues. Using advanced modeling techniques, airfield and aircraft operational strategies were evaluated for both noise reduction and safety. In addition, homeowners in noise impacted communities were invited to participate in a "validation" project to test noise insulation materials and methods. Of the 243 dwellings offer by owners for sound insulation testing, seven apartment buildings and 15 single-family dwellings were selected. Residents were interviewed to determine the effectiveness of insulation techniques and materials.

Data from the study resulted in establishment of geographic boundaries within which impacted jurisdictions and properties could qualify to participate in the FAR Part 150 program. The study provided the information needed to qualify and establish prioritization of properties and jurisdictions for FAR Part 150 funding and led LAWA, in 1987, to establish its own sound insulation funding program to supplement federal funding. Other noise monitoring and reduction benefits resulting from the study include: an ongoing dialogue between the community and airport authority; revision of flight and on-ground aircraft and maintenance operational procedures; acceleration of planning and redevelopment programs to reduce incompatible land uses in surrounding jurisdictions; enactment by LAWA of a requirement that aircraft using the Imperial Boulevard terminal (near the city of El Segundo) be towed between the airfield and the terminal; installation of auxiliary power units at all aircraft parking locations so that aircraft would not have to run their engines in order to maintain air conditioning levels within the aircraft between flights; proposals for redesign of runways, including a plan for maximizing use of interior runways so as to focus noise away from adjacent communities; reaffirmation of LAWA's prohibition of supersonic aircraft from use of LAX; establishment of procedures for improved pilot education concern-

ing flight noise management procedures and new helicopter noise abatement (including requiring a 2,000 foot flight altitude); construction of additional sound barriers in Westchester and El Segundo; and a determination that recent advances in acoustical and thermal insulation materials and techniques had made retrofitting a viable alternative for some noise impacted areas and uses.

LAWA sound insulation funds were made available in 1987 to impacted jurisdictions (Los Angeles city and county, Inglewood and El Segundo). To qualify for LAWA funds a local jurisdiction must be a participant in the FAR Part 150 program. Funding for both the FAR Part 150 and LAWA programs has been expanded to accelerate noise management efforts. An estimated 29,041 uninsulated dwelling units lie within the LAX CNEL of 65 dB noise exposure area (approximately 20,051 multifamily and 8,990 single-family residential units). It is estimated that, by the year 2010, LAWA will spend approximately $245 million to soundproof more than 21,000 dwelling units and $220 million for purchase (for conversion) of incompatible uses. As of 1996, the city of Inglewood had been allocated $8 million to convert noise impacted residential properties to airport compatible uses and school districts had been allocated $21 million for sound insulation.

Between 1981 and 1996 the LAX CNEL of 70 dB noise exposure contour area had shrunk from 2.6-square miles to one-square mile, while the CNEL of 65 dB contour remained at around three-square miles. Noise impacts on surrounding communities were significantly reduced by 1986, primarily due to the phasing out of all Stage 1 aircraft, the noisiest aircraft. Virtually all Stage 2 aircraft were phased out by 1996 and all will be phased out by the year 2000.

LAWA is preparing an exterior sound transmission control ordinance to codify noise exposure contours and establish uniform procedures and requirements for sound insulation of new and existing noise sensitive uses, as defined by the California Airport Noise Standards, based on the contours. LAWA also is continuing its efforts to work with the FAA and pilots to further reduce noise impacts through flight techniques and practices. For example, a LAWA-FAA instrument based procedure recently was developed that enables pilots to readily identify the Pacific shoreline. This enables them to maintain flight paths and turning patterns that are less likely to impact the El Segundo and Playa del Rey communities.

LAX - COMMUNITY PLAN NOISE ISSUES

In spite of all these efforts, airport related noise continues to impact surrounding communities, including the Los Angeles city communities of Westchester-Playa del Rey and South Central, the cities of Inglewood and El Segundo and unincorporated areas of Los Angeles County, especially the community of Lennox. Each jurisdiction is addressing the issue of airport noise compatibility through its general planning and noise management programs.

LAX is located within the community of Westchester. To facilitate preparation of plans for LAX, the airport property was removed from the Westchester-Playa del Rey community plan. In acknowledgment of this action, Objective 7 of the 1974 Westchester-Playa del Rey District Plan calls for coordination of airport and airport related land uses to "provide adequate buffers and transitional uses" between LAX and the community.

LAX PLAN

LAWA is preparing a airport master plan that addresses the first major expansion of LAX since 1984. It will become a part of the city's general plan and, therefore, will be considered for approval and/or adoption by the planning commission, mayor and city council, following public hearings. The primary goal of the plan is to reduce noise impacts on adjacent communities, especially residential neighborhoods, while enabling significant expansion of airport activity. The project also will address ground traffic impacts (both noise and circulation) on surrounding communities. Noise has been a major issue in the project discussions.

Van Nuys Airport (VNY)

Van Nuys Airport is owned and operated by LAWA. It is located wholly within the City of Los Angeles. It is known by its FAA identifier "VNY." VNY is situated in the center of the San Fernando Valley, north of the Santa Monica Mountain range, within the community of West Van Nuys and at the edges of the community plan areas of Mission Hills-Panorama City and Van Nuys-North Sherman Oaks. VNY is a 730-acre general aviation airport (no scheduled air carrier services). It has two lighted runways. The 8,000 foot long runway crosses Sherman Way boulevard via an overpass and can accommodate jet aircraft of up to 210,000 pounds. The 4,000 foot runway can accommodate aircraft of up to 14,000 pounds. In 1996 VNY was the busiest general aviation airport in the world and the seventh busiest civilian airport in the nation, handling over 526,433 annual flights and serving 750 based aircraft (those that lease space at the airport). In addition to airport related uses, VNY property contains a hotel, nine-hole golf course, restaurants, agricultural uses and an office supplies store.

VNY ZONING

The majority of the airport property is classified in the [Q]M2-1VL Zone. The [Q] 'Permanent Qualified' condition limits land use on specified sites to airport and airport related uses. The 1VL Height District designation limits structures to 45-feet in height. Less than 16 acres of the property is classified in the M1 and M2 (light manufacturing) zones. The remaining 59 acres lie within the airport overfly (hazard) area and are classified in the OS-1XL (open space) and A1-1XL (agricultural) zones with structures limited to 30 feet in height by the 1XL Height District classification.

Pending completion of the VNY master plan, the city council in 1993 imposed a two-year interim control ordinance to regulate airport land use changes. Subsequently the time period was extended. The ordinance requires planning department authorization for virtually all changes in use. This is to ensure that new uses will not significantly intensify airport activity, that they will be compatible with the surrounding neighborhood and that they will not preclude airport master plan actions.

VNY NOISE MANAGEMENT[4]

From 1949, when LAWA acquired the airport, to 1971, additional acquisitions led to airport expansion and enabled establishment of peripheral airport related uses to buffer airport noise from adjacent residential neighborhoods. However, continuing complaints from neighboring communities regarding noise, especially during the nighttime hours, prompted the city council in 1981 to adopt a noise abatement and curfew law (Ordinance 155,727). The ordinance prohibited airplanes that exceeded 74 dB from taking off from VNY between the hours of 11 p.m. and 7 a.m. (except as provided by the ordinance, e.g., military aircraft and in the event of an emergency); prohibited repetitive jet pattern flying and training operations; limited propeller driven aircraft activities, engine testing and use of certain runways during nighttime hours; and established penalties for ordinance violations. Fixed-wing aircraft operators subsequently were required to sign a "Quiet Jet Departure Program" agreement. The agreement required pilots to observe flight techniques and procedures designed to reduce noise impacts on surrounding communities, e.g., modification of hours and patterns for landings and departures. With the passage of the federal Airport Noise and Capacity Act of 1990, local governments and airports were prohibited from adopting new noise restrictions without obtaining authorization from the FAA. However the Act grandfathered existing local noise ordinances, including the VNY noise abatement ordinance.

In October 1982, LAWA prohibited scheduled commercial air carrier flights from using VNY. In 1985, in response to community concerns regarding potential airport acquisitions, expansion, safety and noise, LAWA established the VNY citizens advisory council to help assess community concerns and develop noise management strategies. In 1992 it prepared the VNY Part 150 program with the assistance of a steering

committee, which included community representatives. It was not accepted by the FAA because the FAA deemed that the airport noise exposure maps, upon which the program was based, were unacceptable.

Voluntary modified takeoff procedures were requested of jet aircraft by LAWA in 1993 to reduce noise and enable an assessment of the effects of such measures on noise impacts. In 1994 noise monitoring was improved to provide more accurate noise contours on which to base the FAR Part 150 noise compatibility program. By 1996, VNY and FAA noise management strategies, including acquisition of land for airport related uses and phasing out of Stage 1 (the noisiest aircraft), had reduced the CNEL of 65 dB contour to an area almost entirely within the airport boundaries and surrounding industrial properties (Exhibit C). A new FAR Part 150 Steering Committee was established in 1996 to advise LAWA concerning noise issues and to recommend abatement measures.

From 1995 to 1998, in response to continuing complaints from neighbors about noise, LAWA enacted a series of noise management policies, all of which required approval of the FAA before they could be incorporated into the VNY noise abatement ordinance. These included prohibiting issuance of additional leases for Stage 2 based aircraft (July 1995), extending the curfew from 11 p.m. to 10 p.m. (May 1996) and requesting permission to apply the curfew to helicopters (March 1997). The curfew limitations and the nonaddition rule for aircraft with a noise emission level of over 77 dBA (calculated using FAA Advisory Circular No. 36-3) were authorized by the FAA in August 1997. FAA ruled that any proposed new helicopter restrictions must comply with FAR Part 161, following environmental review processes and public hearings, consistent with federal procedures. The new curfew was incorporated into the VNY noise abatement ordinance and became effective in February 1998. The nonaddition rule was under consideration by city decision makers in 1998.

VNY - COMMUNITY PLAN NOISE ISSUES

Some noise from VNY impacts adjacent communities located within the general plan community planning areas of Reseda-West Van Nuys, Mission Hills-Panorama City-Sepulveda and Van Nuys-North Sherman Oaks. The majority of the VNY is located within the Reseda-West Van Nuys community plan area. The plan was adopted in 1986. Its policies call for all new development within VNY to be accomplished under conditional use permit. This enables the planning commission and city council, on appeal, to review use change requests and, if approved, to impose conditions, including noise impact mitigation measures. The community plan designates 650 acres of the plan area for industrial use, most of which is located within or around VNY. The industrial uses provide buffers between the airport and adjacent residential neighborhoods. Some residential uses still exist within the noise contour area. The community plan was being updated in 1998.

The Mission Hills-Panorama City-Sepulveda and Van Nuys-North Sherman Oaks community plans for several decades have designated land immediately adjacent to VNY for industrial uses. By the late 1980s incompatible uses generally had been phased out and an industrial buffer had been created adjacent to the southern and northwestern portions of VNY. Both community plans were being revised in 1998.

VNY PLAN

A master plan for VNY was being prepared by LAWA, in coordination with the VNY citizens' advisory council and other affected and interested parties, in 1998. The master plan will become a part of the city's general plan and, therefore, will be considered for approval and/or adoption by the planning commission, mayor and city council following public hearings. The FAA also must approve the plan. The primary goals of the planning effort are to reconfigure on-site airport land use and modify airport use to make VNY more economically viable while at the same time reducing im-

pacts on adjacent communities. Noise from current as well as potential future airport activities was a major issue in the master plan discussions which were taking place in 1997-98.

Burbank-Glendale-Pasadena Airport (BUR)

The Burbank-Glendale-Pasadena Airport, commonly known as the Burbank Airport and by its FAA identifier "BUR," is not within the jurisdiction of the City of Los Angeles, although a small portion of the airport is located within the city. It is owned and operated by the Burbank-Glendale-Pasadena Airport Authority, which is independent of the three cities for which it is named. Each of the cities appoints representatives to the Authority's board of directors.

BUR is located primarily within the City of Burbank, north of the Santa Monica Mountains. Small portions of BUR are located within the Los Angeles communities of Sun Valley and North Hollywood. The most westerly portion of BUR bounds the Los Angeles planning area of North Hollywood. In 1996, BUR occupied a 480-acre site and had two lighted runways in excess of 6,000 feet in length and capable of supporting 240,000 pound jets. It served over 59,000 passenger air carrier flights with nearly 5 million annual passengers, as well as over 125,000 flights by other types of aircraft (air taxi, cargo, business, private flights and a small number of military flights).

BUR NOISE MANAGEMENT[5]

When the Authority purchased BUR in 1978, incompatible uses within a CNEL of 70 dB noise impact contour totaled 385 acres. At that time, BUR was not a designated "noise problem" airport. However, the FAA and state encouraged civilian airports to reduce airport related noise impacts within their CNEL of 70 dB noise contour areas through such means as changes in land use, installation of sound insulation and changes in airport operations. To achieve this goal, the Authority in 1981 required commercial airlines to phase out their Stage 1 and Stage 2 aircraft and to operate only Stage 3 aircraft, the quietest jet air passenger carriers, by 1989. It also prohibited departures and landings of all general aviation Stage 1 and Stage 2 jet aircraft between the hours of 10 p.m. and 7 a.m. Scheduled air carriers were asked to comply voluntarily with the curfew. Most of the carriers voluntarily complied. Stage 3, freight and other private aircraft did not come under the mandatory or voluntary restrictions. The goal of only-Stage 3 passenger carriers operating at BUR was achieved ahead of schedule, in 1987.

Due to these measures, by 1986 only 83 acres of impacted land (residential and other noise sensitive uses) remained within a CNEL of 70 dB noise contour area. In 1986 the Division of Aeronautics (later called Caltrans Aeronautics Program) changed its noise impact measurement standard from a CNEL of 70 dB to a CNEL of 65 dB. This resulted in an increase in the impact area to 446 acres. By 1994, noise management measures had reduced the number of scheduled commercial airline flights to approximately a dozen during nighttime hours, with only three occurring after 6:30 p.m. In addition to the noise reduction measures, between 1985 and 1996 the total flights associated with BUR declined from 246,000 to 184,000, further reducing noise impacts. By 1996, the impacted area within a CNEL of 65 dB contour had been reduced to 373 acres.

In 1985 the Authority began preparation of its FAR Part 150 noise compatibility program. The FAA approved the program in 1989 and allocated funds that enabled soundproofing of four schools of which two were located within the City of Los Angeles. Within the CNEL of 65 dB noise contour area (Exhibit D) approximately 2,300 dwellings within Los Angeles and Burbank could be eligible for grant assistance, depending upon the availability of money from the Federal Aviation Trust Fund. In 1997 funding became available and was offered for soundproofing of 50 homes.

BUR - COMMUNITY PLAN NOISE ISSUES

In spite of all these efforts, noise from aircraft activity continued to impact Burbank and the Los Angeles community planning areas of Sun Valley,

North Hollywood and the Van Nuys-North Sherman Oaks. Plans for the three planning areas generally designate land immediately adjacent to BUR for industrial uses. By the mid-1980s most of those lands had been improved with industrial uses, thereby creating buffers adjacent to the airport. In addition, revisions to the community plans between 1979 and 1996 called for additional mitigation measures to reduce noise impacts.

BUR PLAN

A final environmental impact report (EIR) for land acquisition and a BUR replacement passenger terminal was approved by the Authority in 1993. The proposed project included acquisition by the Authority of 130 acres of land for construction of a new passenger terminal and conversion of the existing terminal site to airfield related uses. The new terminal site was selected in order to meet FAA terminal and runway separation requirements. The FAA, for safety reasons, requires that a terminal not be closer than 750 feet from the center line of an active air carrier runway. The current terminal is within the runway hazard zone.

In 1993 the City of Los Angeles challenged the adequacy of the EIR. The superior court found in favor of Los Angeles and requested that the Authority prepare a supplemental environmental impact report addressing noise impacts associated with BUR's projected increased aircraft activity. The report was prepared and, in 1995, the court found that the EIR met California Environmental Quality Act (CEQA) requirements. Los Angeles appealed the finding. In 1996 the FAA completed its review of the federally required environmental impact statement (EIS) for the project and deemed that it met the National Environmental Policy Act (NEPA) requirements. In 1996 Los Angeles challenged the adequacy of the EIS. It contended that the project was for the entire airport and would result in increased airport activity and increased impacts on noise sensitive uses within the City of Los Angeles, as indicated on the project's EIS 2010 projected noise contour map (Exhibit D). The Authority contended that the project was for the terminal only and that the increase in flight activity would occur whether or not a new terminal was constructed. Lawsuits also were filed between the Authority and City of Burbank over jurisdictional, noise and other matters. In March 1998 a federal court of appeals upheld the EIS. Other litigation was pending in 1998.

Santa Monica Airport (SMO)

Santa Monica Airport, known by its FAA identifier "SMO," was established in 1919. It is the oldest continuously operated airfield in Los Angeles County. SMO is a general aviation airport (no scheduled air carriers) that is owned and operated by the City of Santa Monica and is located entirely within that city. The site is south of the Santa Monica Mountains, east of the Pacific Ocean and a few miles north of LAX. It adjoins the Los Angeles community planning areas of Venice and Palms-Mar Vista-Del Rey. The 225 acre site has a single 5,000 foot lighted runway that is capable of handling aircraft of up to 105,000 pounds. In 1994 SMO served approximately 550 based aircraft and handled over 208,000 flights annually. It has a capacity for 750 based aircraft. In addition to airport related activities, the site contains conference and meeting facilities and a large aircraft museum that displays vintage, corporate and recreational aircraft.

SMO - COMMUNITY PLAN NOISE ISSUES

In the 1990s, noise from SMO activities was not identified as a significant planning issue by either the Venice or Palms-Mar Vista-Del Rey community plans. The Penmar Golf Course in Venice adjoins SMO at the northeast boundary of the plan area, providing a partial buffer at the west end of the SMO runway. The golf course significantly mitigates noise impacts on Venice. The 1997 revised Palms-Mar Vista-Del Rey plan designates an area between SMO and Centinela Avenue for low density residential use. Footnote No. 4 indicates that the land should not be developed with residential uses as long as the airport is in operation. A portion of the area is developed with residential uses, the remainder with developed with airport related uses.

Until the 1960s SMO primarily served as a testing field for the Douglas Aircraft Company. When the company moved its operations to Long Beach, SMO expanded its operations. By 1966 it rivaled VNY as the busiest general aviation airport in the nation, reaching a peak of 374,000 flights.

With the expansion of SMO and introduction of jet aircraft in the 1960s neighbors began to complain about noise. During the 1970s the volume of flights continued to increase, as did complaints from Santa Monica and Los Angeles neighborhoods that were under or adjacent to the SMO flight paths.

Several lawsuits were filed. The courts determined that the City of Santa Monica had an obligation to take reasonable actions to abate noise impacts. In 1982 the U.S. Department of Justice advised Santa Monica that it intended to file suit, contending that Santa Monica was in violation of federal law and contracts relating to SMO operations. Santa Monica responded that it was obligated to continue airport operations in order to comply with legal commitments to the United States. As part of a preagreement, Santa Monica in 1983 adopted a revised airport master plan and noise ordinance. The ordinance included limitation of flight departures and engine start-ups to weekdays between 7 a.m. and 11 p.m. and weekends between 8 a.m. and 11 p.m. (except for emergencies), limitation of touch-and-go pattern flying operations to daytime and nonholiday hours, prohibition of all aircraft deemed unable to meet a 95 dBA (single-event noise exposure level) standard and prohibition of use of SMO for helicopter flight training. The ordinance set criminal penalties for violations. A 1984 negotiated settlement between Santa Monica and the FAA provided for SMO to operate through July 1, 2015, under certain conditions.

Provisions of the settlement included conditions that were incorporated into the Santa Monica noise ordinance (restrictions, standards and penalties), required SMO to establish aircraft noise abatement procedures and incorporated features of the new master plan (e.g., runway realignment, relocation of noise generating activities and designation of a heliport site). A main feature of the master plan was relocation of airport uses from the south (adjacent to Los Angeles) to the north side of SMO, creation of buffer zones by converting the southeast (adjacent to Los Angeles) portion of SMO to airport oriented uses (a business park) and converting other land to park and nonresidential uses. Flight patterns were established to contain noise within SMO and the Penmar Golf Course (Exhibit E). In 1990 the final phase of the master plan was implemented by the completion of the business park. Although the federal Airport Noise Capacity Act of 1990 prohibited local authorities from adopting new noise restrictions without obtaining permission from the FAA, it grandfathered existing ordinances, including the 1983 SMO noise ordinance.

In the early 1990s over $6 million in local and federal funds was expended on noise reduction measures, including construction of noise walls. Noise abatement procedures incorporating provisions of the noise ordinance and settlement were provided to aircraft operators and were revised periodically to improve noise abatement and reflect new technology and safety considerations. Procedures included restricted flight operation hours, a minimum altitude of 900 feet over the SMO vicinity for helicopters, compliance with other SMO-FAA established helicopter noise abatement procedures and specific landing and departure routes over the golf course and adjacent freeways. Operators were urged to observe additional voluntary procedures, including increased altitude for landing and departure patterns.

Noise impacts on properties within the Los Angeles and Santa Monica generally were mitigated by the various measures that were implemented following the 1984 settlement. A greater than CNEL of 65 dB noise contour generally is retained within SMO boundaries and adjacent public, industrial and commercial areas.

Whiteman Airport

Whiteman Airport has been owned and operated by the County of Los Angeles since 1970. It is located entirely within the City of Los Angeles community of Pacoima, in the north San Fernando Valley. The 184.4-acre, general aviation airport has one lighted 4,100 foot long runway that is capable of handling aircraft of up to 12,000 pounds. Whiteman primarily serves single engine, fixed-wing, propeller driven aircraft. In 1995 it served 551 based aircraft and handled over 88,000 flights.

WHITEMAN NOISE MANAGEMENT

Noise has not been a major issue relative to Whiteman. This is largely due to the fact that the majority of aircraft operations occur during daytime hours and only propeller (not jet) aircraft use the site. Noise impacts generally are contained within the airport boundaries or adjacent industrial, open space or public lands (Exhibit F).

Much of the airport is separated from residential uses by industrial, open space or public uses. The open space and public uses include county flood control and associated recreational facilities, a county communications center and a county regional fire department headquarters (including a heliport). Hilly terrain to the north of the runway provides a natural buffer.

From the 1970s to the 1990s the economic recession contributed to a reduction in airport activity and concomitant reduction in airport related noise. Flights decreased from 140,900 flights in 1989 to 88,000 in 1995. Based aircraft decreased from 655 in the 1970s to 551 in 1995. The 1991 airport master plan indicates a projected increase to 285,000 annual flights and 930 based aircraft by the year 2010. The increase was taken into account during the updating of the Arleta-Pacoima community plan and airport rezoning (1996).

WHITEMAN - ZONING AND COMMUNITY PLAN LAND CLASSIFICATION

Even though a county can preempt municipal land use law, the county worked closely with the city planning department and neighbors during the Arelta-Pacoima community plan updating project. The county supported rezoning of airport parcels so as to emphasize its desire to maintain the airport in a low intensity use and to provide land use buffers between the community and airport uses. Concurrent with the adoption of the community plan changes in 1996, the airport site was rezoned. The current zoning is mostly in the PF (public facilities) Zone, which permits continuance of the M2 Zone uses, i.e., airport related uses by right. Portions of the property along the northeast boundary are zoned as OS (open space) and [Q]MR2 (restricted light industrial). The [Q] 'Permanent Qualified' conditions limit uses generally to the MR1 (restricted industrial) Zone and require shielding of lights and other measures to protect adjacent residential uses.

Endnotes

No.	Description
1	The term "heliport" applies to all formal heliport or helistop sites. The FAA requires that all airports provide access for helicopters. Since helicopters may land on airport runways, no formal heliport facilities or locations at airports are required.
2	The official (charter) name of the airport is "Department of Airports." However, throughout this element the agency will be referred by its business name, Los Angeles World Airports (LAWA).
3-5	Detailed descriptions of legislation and programs are contained in the Regulations and Programs section of this chapter.

Chapter III — Goals, Objectives and Policies

The following goals, objectives and policies relate to noise management within the city. The "General Plan Guidelines" issued by the Governor's Office of Planning and Research (1990) advises that a general plan should contain goals, objectives, policies, programs and implementation monitoring. Goals are described as a general setting of direction, objectives as intermediate steps in attaining the goal, policies as specific guides to decision making and programs as specific means of achieving the policies. Each policy is to have at least one corresponding implementation measure.

The programs for the noise element are contained in the Chapter IV program implementation listing. Program numbers are referenced in this chapter after each policy with the notation 'P' followed by the program number.

DEFINITION OF NOISE-SENSITIVE USES: For the purposes of implementation of policies and programs contained herein, the following land uses are deemed "noise sensitive" uses: single-family and multi-unit dwellings, long-term care facilities (including convalescent and retirement facilities), dormitories, motels, hotels, transient lodgings and other residential uses; houses of worship; hospitals; libraries; schools; auditoriums; concert halls; outdoor theaters; nature and wildlife preserves, and parks.

Goal

A city where noise does not reduce the quality of urban life.

Objective 1 (Airports and Harbor)

Reduce airport and harbor related noise impacts.

Policy

1.1 Incompatibility of airports declared by Los Angeles County to be "noise problem airports" (LAX, Van Nuys and Burbank) and land uses shall be reduced to achieve zero incompatible uses within a CNEL of 65 dB airport noise exposure area, as required by the California Department of Transportation pursuant to the California Code of Regulations Title 21, Section 5000, et seq., or any amendment thereto. (**P1** through **P4**)

Objective 2 (Nonairport)

Reduce or eliminate nonairport related intrusive noise, especially relative to noise sensitive uses.

Policy

2.2 Enforce and/or implement applicable city, state and federal regulations intended to mitigate proposed noise producing activities, reduce intrusive noise and alleviate noise that is deemed a public nuisance. (**P5** through **P10**)

Objective 3 (Land Use Development)

Reduce or eliminate noise impacts associated with proposed development of land and changes in land use.

Policy

3.1 Develop land use policies and programs that will reduce or eliminate potential and existing noise impacts. (**P11** through **P18**)

Endnotes

No.	Description
6	These standards are consistent with the standards proposed promulgated by the California Department of Health Services and recommended by the Governor's Office and Planning and Research "1990 General Plan Guidelines."

Chapter IV — Implementation

The following programs are intended to implement the policies set forth in Chapter III. All of the programs are ongoing city programs that are funded out of city funds or, as available, from federal, state or other sources.

An asterisk (*) indicates the program lead agency, if any.

DEFINITION OF NOISE-SENSITIVE USES: For the purposes of implementation of policies and programs contained herein, the following land uses are deemed "noise sensitive" uses: single-family and multi-unit dwellings, long-term care facilities (including convalescent and retirement facilities), dormitories, motels, hotels, transient lodgings and other residential uses; houses of worship; hospitals; libraries; schools; auditoriums; concert halls; outdoor theaters; nature and wildlife preserves, and parks.

Airports and Harbor:

P1 Continue to develop and implement noise compatibility ordinances and programs that are designed to abate airport related noise impacts on existing uses, to phase out incompatible uses and to guide the establishment of new uses within a CNEL of 65 dB noise exposure area of the Los Angeles International and Van Nuys airports and within those portions of the city that lie within a CNEL of 65 noise exposure area of the Burbank-Glendale-Pasadena Airport.

Responsible agencies: *Airport, Building and Safety and Planning departments.

P2 Noise abatement, mitigation and compatibility measures shall be incorporated into the city's general plan airport and harbor elements, including, where feasible, sound proofing of impacted sensitive uses, buffering, land use reconfiguration, modification of associated circulation and transportation systems, modification of operational procedures, conversion or phasing out of uses that are incompatible with airport or harbor uses, and/or other measures designed to reduce airport and harbor related noise impacts on adjacent communities.

Responsible agencies: *Airports, *Harbor and *Planning departments.

P3 Continue to incorporate airport and harbor noise compatibility measures into the city's general plan community plan elements for communities that are significantly impacted by airport and harbor related noise, including, where feasible, conversion or phasing out of land uses that are incompatible with airport and harbor uses, reclassification of zones, modification of associated circulation systems and/or other measures designed to reduce airport and harbor related noise impacts on adjacent communities.

Responsible agencies: *Planning, Airports and Harbor departments.

P4 Continue to encourage operators of the Burbank-Glendale-Pasadena, Santa Monica and Whiteman airports to continue implementing and improving noise management measures so as to maintain a CNEL of 65 dB contour within the airport and surrounding compatible use boundaries and so as to maintain or reduce any impacts on noise-sensitive uses located within the City of Los Angeles to a CNEL of 65 dB or lower noise level.

Responsible agencies: City Council and Mayor.

Nonairport:

P5 Continue to enforce, as applicable, city, state and federal regulations intended to abate or eliminate disturbances of the peace and other intrusive noise.

Responsible agencies: Animal Regulation, Building and Safety, Police, and Recreation and Parks departments.

P6 When processing building permits, continue to require appropriate project design and/or insulation measures, in accordance with the California Noise Insulation Standards (Building Code Title 24, Section 3501 et seq.), or any amendments thereto or subsequent related regulations, so as to assure that interior noise levels will not exceed the minimum ambient noise levels, as set forth in the city's noise ordinance (LAMC Section 111 et seq., and any other insulation related code standards or requirements) for a particular zone or noise sensitive use, as defined by the California Noise Insulation Standards.

Responsible agency: Building and Safety Department.

P7 Continue to periodically update city codes and plans that contain noise management provisions so as to address new issues and noise management changes.

Responsible agencies: Animal Regulation, Building and Safety, City Council, Planning, Police, and Recreation and Parks departments.

P8 Continue to periodically update guidelines for California Environmental Quality Act-required land development project review by city agencies.

Responsible agencies: Airports, Community Development, *Environmental Affairs, Harbor, Housing, Planning, Public Works, Recreation and Parks, Transportation, and Water and Power departments and Community Redevelopment Agency.

P9 Continue to operate city equipment, vehicles and facilities in accordance with any applicable city, state or federal regulations.

Responsible agencies: all.

P10 Continue to encourage public transit and rail systems operating within the city's borders, but which are not within the jurisdiction of the city, to be constructed and operated in a manner that will assure compliance with the city's noise ordinance standards.

Responsible agencies: City Council and Mayor.

Land Use Development:

P11 For a proposed development project that is deemed to have a potentially significant noise impact on noise sensitive uses, as defined by this chapter, require mitigation measures, as appropriate, in accordance with California Environmental Quality Act and city procedures.

Examples of mitigation measures to consider:

(a) increase the distance from the noise source and the receptor by providing land use buffers, e.g., parking lots, landscaped setbacks or open areas, utility yards, maintenance facilities, etc.;

(b) orient structures, use berms or sound walls, utilize terrain or use other means to block or deflect noise, provided it is not deflected to other noise-sensitive uses and that the barrier does not create a hiding place for potential criminal activity;

(c) require projects with noise generating components (e.g., auto repair and maintenance facilities) to have no openings in building walls that face sensitive uses;

(d) limit the hours of operation of a noise generating use;

(e) limit the use of the site to prohibit potential noise generating uses that otherwise are allowed by right within the zone classification of the project site;

(f) require that potential noise impacts associated with project construction be minimized by such measures as designating haul routes, requiring less noisy equipment, enclosing or orienting noisy equipment (e.g., electrical generators) away from noise sensitive uses, imposing construction hours that are more restrictive than those set forth in the Los Angeles Municipal Code, requiring vehicle parking and deployment activities to be separated and buffered from sensitive uses; or

(g) determine impacts on noise sensitive uses, such as public school classrooms, which are active primarily during the daytime and evening hours, by weighting the impact measurement to the potential interior noise level (or for exterior uses, e.g., outdoor theaters, to the exterior noise level) over the typical hours of use, instead of using a 24-hour measurement.

(h) other appropriate measures.

Responsible agencies: Airports, Community Development, Environmental Affairs, Harbor, Housing, Planning, Public Works, Recreation and Parks, Transportation, and Water and Power departments and Community Redevelopment Agency.

P12 When issuing discretionary permits for a proposed noise- sensitive use (as defined by this chapter) or a subdivision of four or more detached single-family units and which use is determined to be potentially significantly impacted by existing or proposed noise sources, require mitigation measures, as appropriate, in accordance with procedures set forth in the California Environmental Quality Act so as to achieve an interior noise level of a CNEL of 45 dB, or less, in any habitable room, as required by Los Angeles Municipal Code Section 91.

Examples of mitigation measures to consider:

(a) Impose project orientation and buffering measures similar to those cited in the prior program;

(b) orient the project so as to use structures, terrain or building design features (e.g., windowless walls or nonopening windows facing the noise source) so as to block or reduce noise impacts;

(c) orient interior features of the project to reduce or eliminate noise impacts on particularly noise sensitive portions of the project (e.g., locate bedrooms and balconies away from the noise source);

(d) require insulation and/or design measures, attested to by an acoustical expert, to the satisfaction of the city's Department of Building and Safety, to identify and mitigate potential noise impacts;

(e) determine impacts on noise sensitive uses, such as public school classrooms, which are active primarily during the daytime and evening hours, by weighting the impact measurement to the potential interior noise level (or for exterior uses, e.g., outdoor theaters, to the exterior noise level) over the typical hours of use, instead of using a 24-hour measurement.

(f) other appropriate measures.

Responsible agencies: Planning, Community Development and Housing departments and Community Redevelopment Agency.

P13 Continue to plan, design and construct or oversee construction of public projects, and projects on city owned properties, so as to minimize potential noise impacts on noise

sensitive uses and to maintain or reduce existing ambient noise levels.

Examples of noise management strategies to consider:

(a) site or alignment selection to minimize potential noise incompatibility;

(b) orientation of noise sources away from noise sensitive uses;

(c) placement of structures between noise generators and noise sensitive receptors;

(d) enclosure of noise sources;

(e) erection of sound walls, berms or other noise buffers or deflectors, providing that they do not deflect sound to other noise sensitive uses and that the barrier does not create a hiding place for potential criminal activity;

(f) restricted hours of operation;

(g) modification of noise sources (e.g., utilizing less noisy equipment); or

(h) determine impacts on noise sensitive uses, such as public school classrooms, which are active primarily during the daytime and evening hours, by weighting the impact measurement to the potential interior noise level (or for exterior uses, e.g., outdoor theaters, to the exterior noise level) over the typical hours of use, instead of using a 24-hour measurement.

(i) other appropriate measures.

Responsible agencies: Airport, Community Redevelopment Agency, Harbor, Public Works, Recreation and Parks, Transportation, and Water and Power departments.

P14 Continue to periodically update general plan public facilities and utilities elements, taking into account existing and potential noise impacts.

Responsible agencies: Airport, Harbor, *Planning, Public Works, Recreation and Parks, and Water and Power departments.

P15 Continue to take into consideration, during updating/revision of the city's general plan community plans, noise impacts from freeways, highways, outdoor theaters and other significant noise sources and to incorporate appropriate policies and programs into the plans that will enhance land use compatibility.

Approaches to consider: rezoning, street realignment, site design, recommendations that the mayor and city council request that the California Department of Transportation, or other responsible agencies take reasonable measures to mitigate noise impacts associated with their facilities, etc.

Responsible agency: Planning Department

P16 Use, as appropriate, the "Guidelines for Noise Compatible Land Use" (Exhibit I),[1] or other measures that are acceptable to the city, to guide land use and zoning reclassification, subdivision, conditional use and use variance determinations and environmental assessment considerations, especially relative to sensitive uses, as defined by this chapter, within a CNEL of 65 dB airport noise exposure areas and within a line-of-sight of freeways, major highways, railroads or truck haul routes.

Responsible agencies: City Council, Mayor and *Planning Department.

P17 Continue to encourage the California Department of Transportation, the Los Angeles County Metropolitan Transportation Authority, or their successors, and other responsible agencies, to plan and construct transportation systems so as to reduce potential noise impacts on adjacent land uses, consistent with the standards and guidelines contained in the noise element.

Responsible agencies: City Council and Mayor.

P18 Continue to support the Alameda corridor

project as a means of consolidating rail lines and improving buffering in order to reduce noise impacts on adjacent communities from railroad related uses.

Responsible agencies: City Council, Harbor, Mayor, Planning, Public Works, and Transportation departments.

Endnotes

No.	Description
6	These standards are consistent with the standards proposed promulgated by the California Department of Health Services and recommended by the Governor's Office and Planning and Research "1990 General Plan Guidelines."

Appendix A *(Not Adopted — Information Only)*
Evolution of Transportation Systems in Los Angeles:
A Context for Los Angeles Noise Issues

Automotive Vehicles

Automobile History

The first gasoline powered automobile was produced by Benz in 1885. It was a three-wheeled carriage that used Gottlieb Daimler's 1885 motorbike engine for power. The next year Daimler designed the first four-wheeled carriage. By the start of World War I a variety of gasoline powered vehicles were being produced, including Henry Ford's Model T. The new "horseless carriages" or "tin Lizzies," as they were popularly called, were scoffed at and criticized for being dangerous to horses and people and noisy nuisances. Mass production of automobiles followed Ford's introduction of assembly lines and moving conveyor belts in 1913. During the First World War inexpensive cars became readily available, rapidly displacing the horse and buggy. By 1920 Los Angeles County had become the most motorized metropolitan area in the nation with over 481,500 registered automobiles.

Los Angeles Street System

On September 4, 1781, under the authority of the King of Spain, Governor Felipe de Neve and eleven families founded el Pueblo de la Reina de los Angeles (the Village of the Queen of the Angels). The pueblo was to provide food for Spanish troops traveling between the missions of San Diego and Santa Barbara. Prior to departure de Neve drew up a plan situating the pueblo along Rio El Porciùncula (later renamed the Los Angeles River) and identifying the locations for a plaza, church, homes, farms, an irrigation system and a road connecting the pueblo with the nearby San Gabriel Mission. The pueblo's first named streets were Primavera (later named Spring) and Aliso streets.

The first Los Angeles city land use survey was prepared by U.S. army lieutenant Edward O.C. Ord in 1849, in anticipation of Los Angeles city becoming a city of the new state of California. It was prepared under contract to the city. The plan established boundaries for city-owned lands, dividing the vacant lands west and north of the central plaza into blocks and lots and with a grid street system. That was the city's first formal street map.

In 1870 the city's first engineer, Frank Lecouvreur prepared the first master plan for development of a Los Angeles infrastructure. His plan separated sewers from flood control systems and reoriented new streets in an east-west direction to facilitate the flow of rain water, thereby reducing flooding.

Introduction of motorized vehicles changed the mode of local transportation and street systems. Private cars began displacing the horse drawn vehicles during World War I, resulting in traffic hazards and vehicle conflicts. To address worsening congestion, increasing conflicts between trolleys and automobiles and a rising number of traffic accidents, especially at intersections, the private Los Angeles Traffic Commission prepared the "Major Traffic Street Plan." The plan was drafted by renowned city planners Frederick Law Olmsted, Jr. (Boston), Charles H. Cheney (Redondo Beach) and Harland Bartholomew (St. Louis), with the assistance of planning commissioner/commission secretary, Gordon Whitnall. Whitnall subsequently was appointed the city's first planning director. The plan was approved by city voters in 1924, along with bond issues to pay for a portion of the first 37.5 mile phase. Railroads and the county provided the balance of the funds. The project in-

cluded the city's first bridges to separate train and automobile traffic. This increased safety and the speed of trains by reducing traffic conflicts. The city's first traffic ordinance also was drafted by the commission. It was adopted in 1925, requiring the city's first standard signs and signals.

Until recent times, establishment and construction of integrated and efficient municipal street systems was sporadic. Local governments had difficulty purchasing or exacting land for street rights-of-way. The state Subdivision Map Act of 1907 provided for dedication of land for public purposes but efforts to secure dedications met with opposition. In 1911 the state Improvement Act empowered local governments to use easements, eminent domain, assessment districts and subdivision procedures to secure streets and other infrastructure systems. To give local jurisdictions more leverage, the Map Act was amended in 1921, enabling cities to require easements for public improvements. However, efforts to exact land were challenged. Dedications continued to be voluntary or were secured through purchase following costly, often lengthy condemnation proceedings. Systematic development of the city's street system was slow until the economic depression of the 1930s.

Following the stock market crash of 1929, private financing for public infrastructure systems dwindled. Los Angeles joined other cities in successfully campaigning for a share of the state gas tax to help complete its 1924 street plan. In 1934 the state allocated a share of the gas tax funds to cities for road projects and authorized the state Division of Highways to build and maintain city roads to link rural state highways and to create a state highway system. Cities were responsible for construction and maintenance of urban streets and highways. Federal and state public works programs provided millions of dollars for construction of streets and bridges during the period of the economic depression.

But, not until 1966 did the city gain significant leverage to exact public improvements in conjunction with land development projects. In a landmark decision, *Southern Pacific Railroad versus the City of Los Angeles*, the California Supreme Court upheld the right of Los Angeles to withhold building permits for noncompliance with public dedication requirements. The decision strengthened the ability of all municipalities to secure public facilities in conjunction with new development. Local authority was further strengthened by the 1971 California Environmental Quality Act that required development projects to mitigate potential environmental impacts associated with a project, including anticipated traffic congestion and noise. The combination of regulations (Map Act, environmental and city) enabled Los Angeles to require developers to dedicate land, construct public improvements or set aside funds for improvements. This resulted in more systematic development of the street systems. By 1996, according to the city's department of transportation, there were 6,440.1 miles of streets within the boundaries of the city, including 59.4 miles of unimproved streets, 1,028.4 miles of primary arterials (major and secondary highways), 584 bridges and 652 at-grade railroad crossings.

State Highways And Freeways

The first public road in California, El Camino Real (The Royal Road), was established in 1769 by Spanish priest-explorer Father Junipero Serra and Spain's governor of California Don Gaspar de Portolá to link the California missions. The missions were constructed approximately one day apart by horseback between San Francisco and San Diego. Following California statehood in 1850, General S.H. Marlette was commissioned to "make plans and suggestions or improvements of navigation, construction of roads, railroads and canals, preservation of forests… and surveys of boundaries of the State and counties." Although the legislature failed to allocate funds, Marlette raised money and began the first survey and construction project in 1855. It established the state's first official road, the Emigrant Wagon Toll Road from Placerville, across the Sierra Nevada Mountains to Nevada. Immi-

grants had come streaming into California following the announcement of the discovery of gold in 1849. By 1864 almost all mountain passes were accessible by toll roads that linked mining camps and immigrant routes to towns and cities. The first traffic count in 1864 was along the Lake Tahoe Wagon Road. It recorded 6,667 footmen, 833 horsemen, 3,164 stage passengers, 5,000 pack animals, 2,564 teams and 4,694 cattle.

In the 1870s the state and federal governments began planning a highway system. It was to link federal and state roads and serve the expanding freight traffic created by the land boom following the gold rush and extension of railroads to and within California. Construction was delegated to counties, which levied tolls to pay for the roads. This resulted in a variety of tolls and a disparate road system. Anticipating the popularity of automotive vehicles, the state created the bureau of highways in 1895. The bureau's 1896 highway plan laid the foundation for the California highway system as it exists today, with many of the routes following early mission and immigrant routes. Construction of the first state highway, Route 1, partially along a Pacific coast mission route from San Juan Capistrano, via Los Angeles and Santa Barbara, to San Francisco, began in 1912. Funding for maintenance and construction of state and county roads was provided by the state's first gas tax, a three-cent tax that was approved in 1923. A 1927 one-cent gas tax assured steady revenue for construction of the state road system. In that year the state Division of Highways (DOH) was created to plan, construct and maintain the highway system.

The first California nontoll highway, or "freeway," was the six-mile Arroyo Seco Parkway (later renamed the Pasadena Freeway). It was completed in 1940, connecting downtown Los Angeles with the adjacent city of Pasadena. After World War II, an infusion of state and federal funds enabled the acceleration of highway construction. By the mid-1960s California had an efficient, integrated highway system. But growing opposition to freeway construction, demands for community participation and environmental protection and a period of economic inflation slowed system expansion. People protested that planned freeways would slice through their communities, creating physical divisions, destroying neighborhoods, contributing to unplanned growth, local traffic congestion and noise. In the 1970s public opposition halted the proposed Century Freeway in south Los Angeles, a proposed Beverly Hills Freeway and other freeways and highways in the Los Angeles area. In 1972, to address shifting priorities, the state legislature established the California Department of Transportation (aka Caltrans) to replace the DOH. Caltrans was charged with the responsibility of planning and implementing a multi-modal transportation system, including over 15,000 miles of state highways and freeways. In 1974 a voter approved tax measure for the first time allowed gas tax funds to be used for non-highway system projects and enabled implementation of an integrated transportation program comprised of a variety of transportation systems (multi-modal system), e.g., roads, highways, bus, light rail, aircraft and other transportation modes.

Until the 1970s noise was not a major consideration in transportation system planning. Although manufacturers long had designed vehicles for reduced interior noise for drivers and passengers. Early in the century municipalities began regulating use of horns on city streets and eventually regulations and standards were developed for regulating engine and tailpipe noise levels. In the 1970s, in response to growing opposition of communities to new freeways and to mitigate potential noise impacts freeway and highway system design incorporated noise reduction features. Concurrently the noise abatement programs were instituted to address noise impacts of existing systems on noise sensitive uses.

Fixed Rail Systems

Railroads

Invention of the high pressure steam engine by Richard Trevithick in 1802 revolutionized land

transportation and led to the steam driven turbine engines that were used to power ships. George Stephenson built the first public steam railroad in England in 1825. This ushered in the era of railroad building around the world. Construction of the first transcontinental railroad in North America was completed on May 10, 1869 when the Central Pacific Railroad tracks were connected to the Union Pacific tracks at Promontory Point, Utah. The route linked Chicago and San Francisco by rail, enabling rapid settlement of the western frontier and stimulating a real estate boom in California that triggered construction of additional railroad lines within the state and to points east. In 1872 Los Angeles voters approved funds to help subsidize construction of a railroad between Los Angeles and San Francisco via the San Joaquin Valley. In 1876 a route from Los Angeles to Texas was completed. Southern Pacific decided to bypass Los Angeles by establishing a freight route from its yards in Colton, fifty miles east of Los Angeles, through the Cajon Pass and Palmdale, along a desert route to New Orleans. As late as 1887 railroad companies considered San Francisco a more viable city than Los Angeles as a destination and connection point for both passenger and freight lines. In that year Santa Fe established a passenger line from Chicago, via Santa Fe, New Mexico, to Los Angeles. In spite of the arduous five day trip, Santa Fe's faster trains, with their elegant Fred Harvey dining cars and Harvey Girls hostesses, helped make the Santa Fe Los Angeles line one of the most popular in the nation and to make Southern California a popular destination point for immigrants and tourists from the eastern and Midwestern United States.

By the end of World War II less polluting electric and diesel engines had replaced steam engines on major lines. But the popularity of automobiles and expansion of the trucking industry, along with rising operational costs and higher fares and freight fees, contributed to a sharp decline in the demand for rail services. Railroad companies shifted their priorities to freight services, cut passenger services and eliminated many passenger routes and operations. By the late 1960s the extinction of passenger and freight trains was predicted.

To save passenger service systems, the federal government began subsidizing designated lines. In the 1970s it established the National Rail Passenger Corporation (aka AMTRAK) as a quasi-public agency to take over operation of national passenger services. Public demand for less environmentally damaging transport and for an alternative to automobile and air transport, combined with AMTRAK's passenger train improvement program and its interfacing of passenger rail connections with bus and air transport, revived the passenger train. Concurrently, many freight rail companies formed, merged with or entered into cooperative relationships with trucking and shipping companies. By the late 1970s freight rail service had been revived by improved, more efficient equipment, especially uniform transferable cargo containers. Containers, designed to be carried by ships, trucks or trains, revolutionized the entire shipping industry.

Freight haul and AMTRAK passenger trains continue to use rail lines that cross the city. The hub for rail operations in Los Angeles is centered around Union Station (adjacent to the city's historic plaza) and the east Los Angeles rail yards. Many of the lines in the area have been in existence since the 1870s, including lines connecting the downtown with the harbor and transcontinental lines. In 1996 Union Station served five weekly or daily transcontinental passenger trains and other trains connecting Los Angeles to San Diego, San Francisco and other cities within California.

First Los Angeles Street Cars

In 1874 Judge Robert M. Widney opened the first Los Angeles street car line. It consisted of a two single open cars drawn by horses along a 2.5 mile single track beginning at the Temple Street and zigzagging down Spring to 6th Street (later extended to the Plaza and San Fernando Street). Other enterprising businessmen quickly developed competing short haul lines. One line, the Main Street and Agricultural Park Railroad, offered 308 lots in what is now Exposition Park to attract passengers. By

1885 few horse drawn cars remained. Most had been replaced by cable cars. Electric powered streetcars were introduced in 1887 by Los Angeles Electric Railway. The line went out of business in 1888 when the power plant boiler burst. In 1888 construction in Boston by Frank J. Sprague of first successful electric street car system revolutionized local transportation. Sprague's electrified trolley trains could climb steeper grades, travel faster and, because they could pull multi-cars guided by one motorman, could operate more cheaply and efficiently than conventional street cars.

Between 1890 and 1910 the city's population grew more than sixfold, from 50,395 to 319,198, fostering a period of intense competition between the street car companies. Lines were built, damaged by floods, rebuilt, bought by competitors and expanded. In 1893 General Moses H. Sherman bought out all the Los Angeles cable lines and began converting them to electrical power. Sherman was bought out by Los Angeles Consolidated Electric Railway (LACE) in 1895. In that year LACE inaugurated the first interurban trolley line. It ran between Los Angeles and Pasadena. LACE converted its remaining cable and horse car lines to electric trolley and installed handsome Pullman Company open sided cars. Although its California Car was popular, the company was unable to show a substantial profit.

Trolley competition was intense. By 1900 an estimated 72 separate trolley companies were operating in the city, carrying passengers and goods. In 1898 Henry E. Huntington, nephew of Southern Pacific railroad owner Hollis Huntington, purchased LACE and began buying up other lines throughout the region. He wanted to develop an interurban system that would compete with his uncle's company. He also was head of the Pacific Light and Power Company, which constructed the Big Creek hydroelectric plant in the Sierra Nevada Mountains in central California to power his Los Angeles Inter-Urban Railway system (L.A. Rail). As a direct challenge to Southern Pacific, he ran some of the L.A. Rail lines parallel to Southern Pacific lines, including the Los Angeles to Long Beach harbor line that opened in 1902. To encourage ridership, he hired engineers to design a new high quality, all-season wooden car with glass windows. The handsome yellow cars built by St. Louis Car Company were popular and set a national standard. Patrons dubbed them the "big yellow cars." In 1903, E. H. Harriman bought a 45% interest in L.A. Rail, eventually taking over management of the Pacific Electric Company (P&E), owner of L.A. Rail. Harriman oversaw the development of Huntington's extensive interurban P&E L.A. Rail system. The system soon was challenged by the versatile gas fueled automobiles. By 1913 the public was complaining that the P&E trolleys were crowded and noisy (compared to rubber tired vehicles), that fares were excessively high, stops inconvenient and that the trolleys were a hazard to automobiles and other vehicles.

Competition And Noise Issues

Jitneys posed the first formidable challenge to P&E's trolleys. Eager citizens purchased automobiles and entered the jitney business, providing flexible service and flexible routes with which the fixed rail system could not compete. By 1915 an estimated 1,000 jitneys plied the city's streets, drastically reducing trolley ridership. P&E reduced fares and lobbied successfully for jitney licensing and regulation, temporarily slowing jitney competition, but not affecting the public's desire for more flexible service.

Future U.S. Senator and 1924 presidential candidate William McAdoo introduced the city's first gasoline fueled buses in 1923, the People's Motor Bus Company. But Harold Huntington, who had taken over the rail company from his father, took Motor Bus to court, driving them out of business with his claim that buses were hazardous. But other bus companies were formed, again causing trolley ridership to drop. The public outcry against the noisy trolleys and their hazardous conflicts with automobiles on narrow streets and at unregulated intersections led to the adoption of the city's first

street (1924) and traffic signal plans (1925) and to construction of grade separated bridge overpasses. P&E continued to add lines. Its big yellow cars experienced a resurgence in the popularity during the economic depression of the 1930s, reaching a peak of 721 operating cars in 1932. But, with an upsurge in the economy and expansion of automobile use, ridership began to decline. To stimulate ridership, P&E in 1937 ordered new, more comfortable, streamlined, stainless steel and chrome cars and painted them red. Only two were delivered before war industry needs intervened, postponing completion of the order until 1943. The shiny new cars were dubbed the "big red cars."

At 1,164 miles of track, serving 125 cities, the P&E system was the largest electric rail system in the world. Its lines emanated from Los Angeles, reaching to Santa Monica and Ventura County (west), Redlands in San Bernardino County (east) and Riverside, Corona and Newport Beach in Riverside and Orange counties (south). The busiest year for the big red cars was in 1945 when thousands of servicemen returned from the war seeking employment opportunity in Southern California. But the era of the trolleys soon was over. Rapid population and economic expansion in all of Southern California, along with construction of the first freeways and increased automobile use created too much competition for P&E. To cut its losses the company in 1946 began eliminating short shuttle lines. Diesel powered, rubber tired buses that could operate on any street further eroded the appeal of the trolleys. The Los Angeles to Long Beach line was converted from yellow cars to red cars in 1960. By then the trolley era was over. P&E continued to close lines until only the Long Beach line remained. It was closed on March 30, 1963, temporarily ending the Los Angeles commuter rail era.

First Los Angeles Subway

A 100 mile per hour elevated, electric powered monorail was proposed by the American Rapid Transit Company in 1907. The company envisioned that the line would run from Pasadena to Santa Monica. The idea did not get beyond the planning stage.

Henry Huntington envisioned a subway system and made it a reality. He purchased the rights-of-way from 4th and Hill Streets to what is now Pico Boulevard and Rimpau Avenue. In 1907 the city council approved Huntington's subway project. By 1909 the Bunker Hill tunnel for the system had been completed. Further work was halted by an economic recession.

To address increasing conflicts between the growing automobile population and the trolley system, a 1915 study for the city proposed construction of either a subway or an elevated system. It strongly recommended a subway, so as to avoid the noise and unsightliness of elevated systems like those that had been or were under construction in New York, Chicago, Philadelphia and Boston.

In 1923, the California Railroad Commission voted to allow Huntington to increase trolley fares if he would construct an underground railroad as a means of reducing trolley and auto conflicts and potential noise. Within two years Huntington inaugurated the first Los Angeles subway, the Hollywood Subway. It had two tracks, each less than a mile in length. It ran from the new subway terminal building at Hill Street (between 4th and 5th Streets), through Crown Hill to Glendale and Beverly Boulevard near First Street. There it emerged as street trolley lines, one serving West Los Angeles and the other serving Echo Park and the cities of Glendale and, eventually, Burbank. The Beverly tunnel was used by P&E until 1955 when the Glendale-Burbank line was discontinued. The Terminal Building and the tunnel still exist as reminders of Huntington's visionary effort.

Construction of an elevated ('El') line from 6th and Main Streets to the Los Angeles River near the city's birthplace, the historic plaza, was begun in 1923. It was halted when the powerful Los Angeles Times newspaper opposed the project. The Times portrayed the El as a "dirty, deafening and hideous" contraption that would destroy the visual appear-

ance of the historic plaza and surrounding environs. To settle the issue, the city council placed two referenda on the May 1926 ballot. Proposition 8, which would have provided funding for the El, was defeated. Proposition 9, backed by the Times, was approved. It endorsed construction of a train station east of the plaza, on the site of Old Chinatown. Union Station opened in 1939.

New Fixed Rail Systems

Various measures were proposed over the next several decades for new commuter train systems but all were defeated, partially due to claims that surface and overhead systems would be noisy and unsightly. In 1959 the Metropolitan Transit Authority (MTA), a regional agency created by the state to evaluate metropolitan transit needs, proposed a new subway system from downtown Los Angeles, running east to the city of El Monte. The idea was rejected by the voters. MTA was reconstituted by the state legislature in 1964 as the Southern California Rapid Transit District (RTD). RTD was charged with the responsibility of planning, constructing and operating a regional public transit system. The system selected was a regional bus system which became one of the largest all-bus systems in the world.

Increasing congestion on highways and a heightening of interest in environmental quality, especially air quality, prompted the state legislature, in 1972, to reconstitute its transportation and highway functions into a new agency, the California Department of Transportation (Caltrans). Caltrans was directed to reduce public dependence on the air polluting, gas guzzling automobile by developing an integrated multi-modal transportation system including buses, fixed rail and aeronautics. Voters in 1974 approved a ballot measure authorizing use of gas tax monies for transportation projects other than highways and freeways. In that same year the federal Urban Mass Transit Administration allocated funds for multimodal regional transit systems. Funds allocated to the RTD enabled preparation of alternative plans for potential rapid transit fixed rail routes.

New Subway And Light Rail Systems

In 1980 Los Angeles County voters approved Proposition A, establishing the county's first tax specifically intended to fund public transportation. The half-cent sales tax was allocated for planning and implementation of a multi-modal county transportation system, including a 150-mile rail system. Additional funds from federal, state, local and private sources, including voter supported bond measures and, in 1990, a second county sales tax, enabled system implementation.

Three new mass transit systems evolved from the initial funding: (1) an urban subway system within the boundaries of the City of Los Angeles, (2) a light rail system within the county and (3) a regional commuter train system. They were designed to interconnect with each other, with bus and shuttle lines and with airport and long distance Amtrak passenger train facilities.

To better integrate planning and management of the vast system, the state in 1992 established the Los Angeles County Metropolitan Transportation Authority (MTA), consolidating the RTD and Los Angeles County Transportation Commission (LACTC). The RTD had been responsible for operating the bus and rail systems, constructing the subway system and operating the new light rail and subway systems. The LACTC had been responsible for constructing new light rail systems. The new MTA began operating on April 1, 1993.

The MTA opened its first Metro Rail Red Line subway in 1993. It was a four-mile line between Union Station (downtown) and Alvarado Street at Wilshire Boulevard (Westlake community). It was extended to Western Avenue at Wilshire (mid-city Wilshire community) in 1996. Another segment is under construction to the Los Angeles community of North Hollywood and others are being planned to serve east and west Los Angeles.

The MTA's Metro Rail Blue Line light rail system between the Los Angeles downtown and the city of Long Beach opened in 1990. In 1991 it was

extended to MTA's subterranean rail station at Flower and Seventh Streets in the city's downtown financial district. The station serves as a transfer point for the subway and Blue Line. The 20-mile east-west Metro Rail Green Line light rail system opened in 1995. Partially to reduce noise impacts, it is constructed largely within the median of the I-105 Glenn Anderson Freeway (formerly the Century Freeway). It runs from the city of Norwalk (east) to Aviation Boulevard, near the Los Angeles International Airport (west), where it becomes a grade-separated system, continuing along a 3.5 mile route to the city of Redondo Beach. Another light rail line is under construction from Union Station to the city of Pasadena.

New Interurban Trains

Concurrently with the development of the subway and light rail systems, the Southern California Regional Rail Authority established the Metrolink regional commuter train system. Metrolink quickly became operational because it used existing rail rights-of-way, thereby eliminating the need to acquire land and construct extensive rail systems. The first Los Angeles line opened in 1990, following purchase of Southern Pacific Railroad rights-of-way along a route roughly paralleling the Pacific Coast, from Union Station to San Juan Capistrano in Orange County. Metrolink lines between Los Angeles and Moorpark (Ventura County), Santa Clarita (Los Angeles County) and Pomona (San Bernardino County) opened in 1992.

Metrolink trains primarily serve commuters, thereby avoiding competition with Amtrak. They operate during weekday peak hours, with some trains operating on Saturday and midday. All Metrolink lines for southern California emanate from Union Station. Today Metrolink serves six southern California counties: Los Angeles, Ventura, San Bernardino, Orange, Riverside and San Diego. It is interconnected with other transit systems throughout the region. During the January 17, 1994 Northridge earthquake, when several freeways collapsed or were structurally damaged. Emergency expansions of Metrolink provided commuter access from Palmdale-Lancaster and other communities north of Los Angeles to areas south of the damaged freeways.

In 1997, in response to a federal mandate that Amtrak recover costs from the fare box or other means to pay for passenger lines, intrastate Amtrak lines were threatened with future closure. In response, regional coalitions were formed to devise means of assuming responsibility for lines serving their regions, including adding lines to the Metrolink system.

Train And Trolley Noise Issues

In the 1800s and the early part of the 20th century, railroad lines were built through expanses of virgin, agricultural and ranch lands. As the population and economy grew, manufacturing uses were established along the majority of rail routes within Los Angeles. Street cars serviced residential and commercial areas, much as buses do today. Noise impacts on passengers, rather than noise impacts on adjacent properties was an issue relative to the trolley system. Noise related to rail systems was a "given" of the urban environment and generally was not the subject of antinoise demands. Operation of trolleys and interurban trains primarily during daytime hours and infrequent passage of freight and passenger trains also contributed to the lack of public complaint about noise associated with railways.

Passengers complained about noise within L.A. Rail's yellow trolley cars, especially after the introduction of quieter rubber tired automobiles and buses. Rubber was installed in the new red cars to reduce noise and vibration experienced by passengers, thereby making them more appealing to riders. In the 1970s, greater public concern about the environment and health prompted promulgation of federal noise mitigation guidelines and standards. This resulted in quieter equipment and sound reducing track design.

Aircraft

Helicopters

Greek mathematician Archimedes developed a heliko or 'screw' machine around 200 B.C. to perform specific tasks. In the 16th Century Leonardo da Vinci applied the concept, using the heliko in his design of a vertical lift flying vehicle. The machine proved infeasible due to inadequate power to lift the craft. In 1907, Frenchmen Paul Cornu and Louis Breguet constructed and flew two vertical lift machines called "helicopters." The 1915 Peteroczy-Karman helicopters, which had to be tethered to the ground and could not maneuver horizontally, were used during World War I to monitor enemy military activities. In 1939 Igor Sikorsky produced the first practical helicopter that could be flown and maneuvered by pilot operated controls. By 1941 he had developed a mechanism that enabled pilots to control a helicopter's pitch and roll, thereby increasing its practical use. The Sikorsky became the first mass produced helicopter, proving its versatility during World War II. Bell Aircraft introduced the first commercial helicopter in 1947. It was powered by piston engines and was slow, noisy and vibrated so badly that it was unpopular for use in passenger travel. The introduction in the 1960s of gas turbine engines suitable for helicopters, enabled construction of lighter machines and a quieter and smoother flight. Until the 1970s the turbine engines proved impractical because they experienced frequent, recurring and expensive maintenance problems. A variety of technological advances in the late 1960s and early 1970s revolutionized helicopter technology, including stability augmentation, which improved the pilot's ability to control and maneuver the craft; solid state avionics, which reduced the size and weight of components (replacing the bulky tube radios with lighter equipment); and more reliable twin turbine engines, which provided power redundance for added safety. The improvements decreased vibration and noise levels, increased passenger comfort, decreased maintenance and reduced noise impacts on the surrounding environment.

With the improvements, use of helicopters for transportation, commercial and other civilian uses increased dramatically. Early application included use of helicopters for rescues, fire fighting and surveillance. In 1962 the Los Angeles City Fire Department acquired its first helicopter. It was used for dropping water and chemicals on targeted brush fire areas. Following the 1963 collapse of the Baldwin Hills Dam, the helicopter was used in dramatic rescues of stranded and endangered victims. The success of the operation convinced the city to purchase of a fleet of helicopters for emergency services. During the 1960s and 1970s emergency and private heliports were established throughout the city. Noise impacts were reduced by siting of facilities, flight path orientation and change in helicopter design.

Airplanes

The first successful flight of a powered, heavier-than-air craft was in 1896 by J.P. Langley whose unmanned Model No. 5 flew three quarters of a mile along the Potomac River. But it was Orville and Wilbur Wright's successful flight of the first piloted plane, a biplane, at Kitty Hawk, North Carolina in 1903 that launched the air age. Publicity flights and establishment of the first flying school by Glenn Curtis in 1907 and flight contests and air races in Europe and North America heightened public interest in flying machines. Aircraft production was accelerated during World War I when the small aircraft were used for surveillance and aerial fighting and began to be used for carrying mail and small amounts of freight, as well as for pleasure and daredevil exhibition flying. Following the war, more powerful gasoline fueled engines enabled construction of planes that could fly faster and greater distances. Soon planes were able to fly what was considered a phenomenal 200 miles per hour.

In 1927 Charles A. Lindbergh, in his Ryan NX-211 monoplane The Spirit of St. Louis, broke the U.S. transcontinental record by flying from San Diego to Long Island in 21 hours and 20 minutes with only one stop. He then flew on to Paris in 33

hours and 39 minutes, the first solo, nonstop flight across the Atlantic. His transatlantic flight caught the imagination of the public and generated increased interest in air travel. By the 1930s biplanes had been replaced for commercial and military uses by larger, faster, more versatile and more aerodynamic monoplanes.

The first jet plane, the Heinkel He-178, was produced in Germany in 1939. However, during World War II conventional propeller or "prop" planes like the DC-3 remained the primary transport and passenger aircraft. Technological advances were accelerated by wartime demands, resulting lighter planes that had greater range and speed and were more efficient and comfortable. By the 1950s jet airliners were being used for commercial flights. Not until the 1960s, with the advent of the jumbo jet with its expanded seating capacity, greater passenger comfort and reduced fares, did air passenger service become popular in the United States. In the interim the turbo props dominated the civilian market with their economical fuel consumption in carrying heavy loads over short hauls and their ability to land in difficult terrain and on short air fields. They were especially popular in rural and Third World areas.

Jet aircraft by the late 1960s had reduced the transatlantic flight time to six hours. The Anglo-French supersonic Concorde cut the time in half with its cruise speed of Mach 2, twice the speed of sound (approximately 1,350 miles per hour). The Concorde's maiden flight was in 1969. It entered commercial service in 1976. As of 1998 the single Concorde craft was the only supersonic plane in service but, due to its noise, it was barred from most airports in the United States. By the 1990s jet planes were the dominant commercial and military craft. Introduction of jet aircraft resulted in noise impacts on surrounding neighborhoods and communities. Smaller piston engine and propeller planes remained popular for private and business use and sports and generated little or no significant noise impacts on adjacent communities.

Most of the airports in the Los Angeles area initially were established within vast expanses of undeveloped or agricultural land. In some cases the airports began as test fields associated with aircraft manufacture. Communities grew up around the sites to provide homes and services for aircraft plant employees who did not complain about airport noise. With the advent of jet aircraft and transformation of surrounding neighborhoods to nonairport related populations, noise began to be considered a nuisance.

Los Angeles International Airport (LAX)

The Los Angeles Chamber of Commerce in the early 1920s recognized that the fragile airplanes, then considered a novelty, were the beginning of a new transportation era. Because federal law at that time prohibited use of federal funds for development of airports, the chamber lobbied the city to establish a municipal airport, publishing a survey (1926) suggesting 13 possible airfield sites. After assessing terrain, wind conditions and other factors of 28 sites, the city selected Mines Field (formerly called the Inglewood Site), a 640-acre bean field that had an emergency dirt air strip. When voters turned down a bond issue for purchase of the land, the city negotiated a ten-year lease, with option to buy, and began preparing three runways for the September 1928 National Air Races. At the conclusion of the races, at which Lindbergh was the main attraction, Los Angeles took over Mines Field and created the Department of Airports (DOA) to manage it.

The airfield was established as a general aviation facility. Its few buildings and a control tower served small, single-engine planes. The first permanent runway was constructed in 1929. It was 2,000 feet long and served as the landing site in August 1929 for the Graf Zeppelin. In 1930 the field was officially dedicated as the Los Angeles Municipal Airport and the lease was extended for 50 years. Voters were reluctant to fund additional improvements since the Glendale Grand Central Airport and Burbank United Terminal (later Lockheed) ap-

peared to provide adequate facilities for what was widely viewed as a passing fad. One disgruntled critic filed a lawsuit demanding that the lease be voided on the grounds that it was illegal to lease an airport without approval of the electorate. The state supreme court upheld the lease.

While the public may have been skeptical, the aircraft industry was not. It quickly established manufacturing facilities near the Municipal and Santa Monica airports. Douglas and Northrop opened plants in 1932. North American and other manufacturers followed. By 1937, 2,300 skilled workers were employed in the aircraft industries in the area. In the meantime air passenger travel had become popular and larger aircraft, such as the Douglas DC-3s, had been developed as passenger planes. Determining that the Glendale and Burbank airfields were not adequate for the new planes, TWA, American, Western and Pan American airlines agreed to make the Los Angeles airport their base if the city would make necessary improvements. Some improvements, including construction of a new runway, were made possible by a federal Emergency Relief Administration grant through the federal Works Progress Administration (WPA). WPA subsequently declined to provide funds because the site was not owned by the city. That problem was resolved when title was acquired in 1937. Between 1937 and 1939, WPA and bond monies enabled construction of runways and other facilities and improvements. The board of airport commissioners was created in 1940 to manage the DOA and in 1941 the name of the field was changed to the Los Angeles Airport.

During World War II the airport was used for military purposes. In 1943 the five major passenger airlines signed leases transferring their operations to the site. In anticipation of passenger air expansion, an airport master plan was prepared in 1944. After the war, southern California emerged as the center of the national aircraft industry with major activity taking place around the Los Angeles and Santa Monica airports. Passage of the city's 1945 airport bond issue by an overwhelming 5-to-1 majority enabled acquisition of 2,000 acres of land and construction of massive terminal facilities and major runways. Airport activity was shifted west of the original site to its present location.

The five airlines began operating at the airport in 1946, making it a major passenger terminal for the region. The following year voters approved a charter amendment making the DOA a self-managing city agency, independent of the mayor and city council and with control over its own finances. The airport commission, appointed by the mayor, quickly acted to create a regional system and to expand the airport into a world class facility. In 1950 the commission renamed the facility the Los Angeles International Airport, better known by its Federal Aviation Administration identifier LAX. The first runway overpass of its kind, the Sepulveda Boulevard overpass, was completed in 1953, enabling the extension of the two main runways above the boulevard to accommodate jet traffic.

In January 1959 American Airlines began the first jet service between New York and Los Angeles. A new terminal and the first permanent passenger facilities for LAX were completed in 1961. With the advent of jet aircraft, significant noise problems began to be experienced by neighboring communities due to jet overflights and increased airport activity. The DOA was made self sufficient by a 1963 charter amendment that allowed it to issue its own revenue bonds without having to secure voter approval. It immediately embarked on a program of diversification and expansion and began to address noise impact issues. In 1965 and 1966 the first air freight terminals were opened to accommodate an increasing demand for freight services. In anticipation of the 1984 Los Angeles Summer Olympic Games, airport passenger facilities were upgraded, new international and domestic terminals were constructed, other terminals were renovated, automobile circulation was enhanced by a new second level roadway and other facilities were added or renovated. The airport department (now calling itself Los Angeles World Airports, or LAWA) in 1998 was preparing a mas-

ter plan for LAX, of which noise management is an important consideration.

Van Nuys Airport (VNY)

Metropolitan Airport was established as a private general aviation field on October 1, 1928. Three factories, six hangers and a control tower were added in 1929. In 1942 it was purchased by the federal government for use as a military base. Los Angeles acquired the airport in 1949 for one dollar with the proviso that the California Air National Guard could remain on the site. With the completion of the Sherman Way overpass in 1957 the city renamed the airport the Van Nuys Airport. The Sherman Way extension provided VNY with a runway that could accommodate jet aircraft. Introduction of jet planes resulted in increased noise impacts on adjacent communities. Acquisitions enabled expansion of airport operations and provision of noise buffers between aircraft activities and adjacent communities. By 1971 VNY had become the busiest general aviation airport in the nation. In 1997 LAWA was preparing a master plan for VNY, in part to address noise issues.

Burbank-Glendale-Pasadena Airport (BUR)

When United Airport opened in 1930 it was the nation's first "multimillion dollar airport," boasting five 3,600-foot runways and related facilities. By 1934 the airport served more than 98,000 passengers a year and was the main terminal for the Los Angeles area. In that year its name was changed to Union Air Terminal. The Lockheed aircraft company, which owned an adjacent manufacturing facility and airfield, purchased the site in 1940, combining the two sites and using them for the production of B-17 bombers, P-8 fighters and Hudson bombers during World War II. The original site had been used by pilots, including North Hollywood resident Amelia Earhart, to test planes purchased from Lockheed. In the 1950s air cargo and commuter flights began using BUR. Subsequently commuter and distance operations were expanded, providing a convenient alternative to LAX. With increased aircraft activity came increased noise impacts on adjacent communities.

When Lockheed announced its intention to sell the airport for conversion to other uses, the state Division of Aeronautics and FAA evaluated the facility and determined that it was important to maintain the site in airport use. To do so, the state legislature in 1976 authorized formation of an airport authority to purchase and operate BUR. The cities of Burbank, Glendale and Pasadena entered into a joint powers agreement to form the authority, which was independent of the three founding cities. Los Angeles and the City of San Fernando declined to join. Each of the three members appointed three representatives to serve on the authority's board of commissioners. The board convened in 1977, formally inaugurating the Airport Authority. In 1978 the Authority purchased the airport from Lockheed with funding from the FAA and from revenue bonds issued by the Authority. The airport was renamed the Burbank-Glendale-Pasadena Airport, retaining its FAA identification call letters of BUR. The Authority's recently approved development plans are under challenge from surrounding jurisdictions, including the City of Los Angeles, in part due to noise impact issues.

Santa Monica Airport (SMO)

In 1919 the City of Santa Monica established Clover Field on a leased a portion of a barley field. Many of the private pilots who used the field were associated with the new Hollywood motion picture industry. The Douglas Aircraft Company moved to Santa Monica in 1922 and began building military aircraft, using the airstrip for test flights. With the increasing demand for airfields and expanding needs of Douglas, Santa Monica purchased 158 acres of land in 1924 for airport expansion. It was at the Santa Monica plant that Douglas began manufacturing its popular DC series of planes. In 1934 the DC-3 became the first successful mass produced plane for commercial passenger service. Growth of jobs at the plant generated a housing boom, resulting in residential development around SMO.

On the eve of World War II, the army leased the airport for army air corps and military purposes, returning it to Santa Monica in 1948. In the late 1950s Douglas shifted its primary manufacturing operations to Long Beach because SMO could not provide a long enough runway to accommodate large jet aircraft. By the 1960s, SMO rivaled VNY as the busiest general aviation airport in the nation, reaching a peak of 374,000 flights in 1966. With increased aircraft activity and surrounding land uses, noise became an increasing issue. Mitigation of impacts has been accomplished by a variety of measures, including changes in flight paths, airport use and configuration and surrounding land uses.

Whiteman Airport

Whiteman Air Park was established in 1946 as a private airfield. It was used primarily for training, business and recreational purposes. The County purchased the site in 1970 and renamed it Whiteman Airport. Noise issues have not been a major issue relative to the airport. Recent land use and zoning changes were made to assure minimal airport impacts on adjacent residential uses.

Note: additional information about history, noise issues and noise management programs is contained in the noise element text.

Exhibit G: Glossary of Terms and Acronyms

ALUC: county airport land use commission.

Ambient noise: background or existing noise level. The composite of noise from all sources near and far in a given environment, exclusive of occasional and transient intrusive noise.

Based aircraft: aircraft having legal contracts with the airport authority for use of airport property for a specific number of days. Typically the contracts are in the form of leases.

BUR: Burbank-Glendale-Pasadena Airport.

Caltrans: California Department of Transportation.

CAP: Caltrans Aeronautics Program, formerly called the Division of Aeronautics. A division of Caltrans.

CEQA: California Environmental Quality Act of 1970.

CLUP: Comprehensive (airport) Land Use Plan of the county Airport Land Use Commission.

CNEL (Community Noise Equivalent Level): a noise measurement scale applied over a 24-hour period to all noise events received at the measurement point. It is weighted more heavily for evening and night periods in order to account for the lower tolerance of individuals to noise during those periods.

CPC: Los Angeles City Planning Commission.

dB: decibel. A decibel is a unit for measuring the relative loudness of sound.

dBA: 'A' measures the level of sound the way sound is received by the human ear. Combined with dB (decibels) it is used to measure decibel level related to human hearing. CNEL is weighted, therefore the 'A' does not appear when CNEL and dB are referenced together.

DOA: Los Angeles Department of Airports. In 1997 the Board of Airports Commissioners, approved the name "Los Angeles World Airports" as the business title of the department. The official (charter) name, DOA, was not changed.

EIR: environmental impact report, a requirement of CEQA.

EIS: environmental impact statement, a requirement of NEPA.

EPA: federal Environmental Protection Agency.

FAA: Federal Aviation Administration.

FAR: Federal Aviation Regulation.

FHA: Federal Highway Administration of the U.S. Department of Transportation.

FTA: Federal Transit Administration of the U.S. Department of Transportation.

Flight: a landing or departure of an aircraft.

General aviation airport: an airport that does not serve scheduled air carriers.

Intermittent noise: periodic noise, as opposed to ambient noise.

Intrusive noise: isolated noise incidents in which the particular noise is greater than the ambient noise level.

LAMC: Los Angeles Municipal Code.

LAWA: Los Angeles World Airports, the business name for the Los Angeles Department of Airports.

LAX: Los Angeles International Airport.

Ldn: average day-night sound level weighted to account for the lower tolerance of people to noise during the night period. Approximately a half a decibel lower than CNEL.

MTA: Los Angeles County Metropolitan Transportation Authority.

NEPA: National Environmental Policy Act of 1969.

Noise contours: mapped lines around a noise source to indicate specific levels of intensity of community exposure to the noise, e.g., an airport.

Noise source: generator of the sound being measured.

SCRRA: Southern California Regional Rail Authority (Metrolink).

SMO: Santa Monica Airport.

VNY: Van Nuys Airport.

Exhibit H: Common Noise Levels

(Caltrans Noise Manual, California Department of Transportation, March 1980)

Noise Level (dBA)	Common Indoor Noise Levels	Common Outdoor Noise Levels
110	Rock Band	
100	Inside Subway Train	Jet Flyover @ 1,000 feet Gas Lawn Mower @ 3 feet
90	Food Blender @ 3 feet	Diesel Truck @ 50 feet Noisy Urban Daytime
80	Garbage Disposal @ 3 feet Shouting @ 3 feet	
70	Vacuum Cleaner @ 10 feet	Gas Lawn Mower @ 100 feet Commercial Area
60	Normal Speech @ 3 feet Large Business Office	Heavy Traffic @ 300 feet
50	Dishwasher next room	Quiet Urban Daytime
40	Small Theater/Conference Room (background)	Quiet Urban Nightime Quiet Suburban Nightime
30	Library Bedroom at Night	
20	Concert Hall (background) Broadcast & Recording Studio	Quiet Rural Nightime
10		
0	Threshold of Hearing	

Exhibit I: Guidelines for Noise Compatible Land Use

(Based on the Governor's Office of Planning and Research, "General Plan Guidelines", 1990. To help guide determination of appropriate land use and mitigation measures vis-a-vis existing or anticipated ambient noise levels)

Land Use Category	Day-Night Average Exterior Sound Level (CNEL dB)						
	50	55	60	65	70	75	80
Residential Single Family, Duplex, Mobile Home	A	C	C	C	N	U	U
Residential Multi-Family	A	A	C	C	N	U	U
Transient Lodging, Motel, Hotel	A	A	C	C	N	U	U
School, Library, Church, Hospital, Nursing Home	A	A	C	C	N	N	U
Auditorium, Concert Hall, Ampitheater	C	C	C	C/N	U	U	U
Sports Arena, Outdoor Spectator Sports	C	C	C	C	C/U	U	U
Playground, Neighborhood Park	A	A	A	A/N	N	N/U	U
Golf Course, Riding Stable, Water Recreation, Cemetery	A	A	A	A	N	A/N	U
Office Building, Business, Commercial, Professional	A	A	A	A/C	C	C/N	N
Agriculture, Industrial, Manufacturing, Utilities	A	A	A	A	A/C	C/N	N

A = Normally acceptable. Specified land use is satisfactory, based upon assumption buildings involved are conventional construction, without any special noise insulation.

C = Conditionally acceptable. New construction or development only after a detailed analysis of noise mitigation is made and needed noise insulation features are included in project design. Conventional construction, but with closed windows and fresh air supply systems or air conditioning normally will suffice.

N = Normally unacceptable. New construction or development generally should be discouraged. A detailed analysis of noise reduction requirements must be made and noise insulation features included in the design of a project.

U = Clearly unacceptable. New construction or development generally should not be undertaken.