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The Noise Element addresses public quality of life and land use compatibility issues. High noise levels can cause stress and irritation and must be controlled to preserve community quality. Developing effective strategies to reduce excessive noise is essential for a safe and harmonious living and working environment.

Purpose of the Noise Element

The Noise Element is a comprehensive program to identify and temper environmental factors that create excessive noise. Noise is a key factor in the quality of life in a community. The Noise Element contains policies and programs to regulate existing and proposed development located in areas subject to noise. Guidelines are established to ensure that noise-generating uses will be separated from uses where quiet conditions are valued.

Scope and Content of the Noise Element

The Noise Element complies with the requirements for the General Plan public safety element mandated in Government Code Section 65302(f).

The element also complies with the revised state guidelines for the General Plan noise element mandated by the State of California Health and Safety Code Section 56050.1. This noise information serves as the basis to

develop guidelines for compatible land uses.

The Noise Element is comprised of three sections: 1) Introduction; 2) Issues, Goals and Policies; and 3) the Noise Plan. In the Issues, Goals and Policies section, major issues pertaining to noise sources are identified, and related goals and policies are established. The goals are overall statements of the City's desires and are comprised of broad statements of purpose and direction. The policies serve as guides for reducing or avoiding adverse noise effects on residents. The Plan explains how the goals and policies will be achieved and implemented. Specific implementation programs for the Noise Element are contained in the General Plan Implementation Program (Appendix A).

Related Plans and Programs

There are a number of existing plans and programs that directly relate to the goals of the Noise Element. These plans and programs have been enacted through state and local legislation and are administered by agencies with powers to enforce state and local laws.

California Environmental Quality Act (CEQA) and Guidelines

The California Environmental Quality Act was adopted by the state legislature in response to a public mandate for a thorough environmental analysis of projects that might affect the environment. The provisions of the law, review procedure and any subsequent analysis are described in the CEQA Law and

Guidelines as amended in 1993. Excessive noise is recognized as an environmental impact under CEQA. Continued implementation of CEQA will ensure that City officials and the general public assess and mitigate potentially significant noise impacts from private and public development projects.

**California
Noise
Insulation
Standards
(Title 24)**

The California Commission of Housing and Community Development officially adopted noise insulation standards in 1974. In 1988, the Building Standards Commission approved revisions to the standards (Title 24, Part 2, California Code of Regulations). As revised, Title 24 establishes an interior noise standard of 45 dB for residential space (CNEL for Ldn). Acoustical studies must be prepared for residential structures to be located with noise contours of 60 dB or greater (CNEL or Ldn) from freeways, expressways, parkways, major streets, thoroughfares, rail lines, rapid transit lines, or industrial noise sources. The studies must demonstrate that the building is designed to reduce interior noise to 45 dB or lower (CNEL or Ldn). New residential structures constructed in the Planning Area are subject to Title 24 standards.

**Airport Land
Use Plan
(AELUP)**

The Airport Land Use Commission (ALUP) for San Mateo County has responsibility under state law for formulating a comprehensive land use plan for the anticipated growth of each public airport and its surrounding vicinity. The San Mateo County ALUC adopted the Airport Land Use Plan governing the Palo Alto Municipal Airport and other airports in the county. The purpose of the ALUP is to safeguard the general welfare of the population within the vicinity of airports and to ensure the continued operation of the airports. The ALUP provides

a basis for reviewing proposed development projects within areas impacted by airport noise. Building height and intensity restrictions are established by the ALUP for development in the defined Accident Potential Zone.

General Plans for cities subject to the ALUP must be consistent with the Plan. Three issue areas in the ALUP are addressed in the East Palo Alto General Plan: noise, safety and building height. The Safety Element of the General Plan addresses safety, the Noise Element addresses noise, and the Land Use Element addresses building height and the distribution of land use compatible with noise and safety hazards.

**San Mateo
County
General Plan
Man-Made
Hazards
Element**

The San Mateo County General Plan Element provides parameters for compatibility of noise and various land uses, and the location of new development. Noise reduction techniques are described as a means of reducing noise at its source. Other measures to protect sensitive noise receptors are also described.

*Relationship to Other General
Plan Elements*

The Noise Element must be consistent with the other General Plan elements. Each element is independent and all the elements comprise the General Plan. All elements of the General Plan are interrelated to a degree and certain goals and policies of each element may also address issues that are primary subjects of other elements. The integration of overlapping issues throughout the General Plan elements provides a strong basis for

implementation of plans and programs and achievement of community goals. The Noise Element relates most closely to the Land Use and Circulation Elements.

Policies and plans in the Noise Element are designed to protect existing and planned land uses identified in the Land Use Element from excessive noise. Potential noise sources are identified in the Noise Element, and the programs are established to avoid or mitigate noise impacts from planned development. Concurrently, the Land Use Element contains policy to ensure that environmental conditions, including noise, are considered in all land use decisions. The distribution of residential and other sensitive land uses on the Land Use Policy Map is designed to avoid areas where noisy conditions have been identified.

The Noise Element is inextricably linked to the transportation policies in the Circulation Element. Transportation noise is largely responsible for excessive noise levels in certain locations in urban environments. The projected noise distribution identified in the Noise Element directly corresponds to the Circulation Plan. Both the Noise and Circulation Elements contained policies and plans to minimize the effects of transportation noise on existing and planned land uses. Noise exposure will be a key consideration when locating and designing new arterials.

The Noise Element also relates to the Conservation and Open Space Element. Excessive noise can diminish enjoyment of parks and open space, and noise information should be considered in planning new recreational areas. Open space areas can be used to buffer noise sensitive land uses from noise producers.

Human activities in the community create noise that can affect overall quality of life. East Palo Alto will be protected from excessive noise through the Noise Element.

Two major issues are addressed by the goals, policies and plan of the Noise Element. These major issues include: 1) avoiding noise impacts through proper planning and correction of noise problems; and 2) minimizing the effects of transportation-related and non-transportation-related noise. Each issue and the related goals and policies are included in the following section of the Element.

Noise and Land Use Planning

Noise Issue 1: Desire to avoid effects of noise through proper planning and correction of noise problems.

Certain areas within East Palo Alto are subject to high noise levels. Consideration of the sources and recipients of noise early in the land use planning process can be an effective method of minimizing the impact of noise on population in the community. Areas already impacted by noise need to have noise reduced through rehabilitation of buildings.

Noise Goal 1.0: Minimize the effects of noise through proper land use planning.

Policy 1.1: Utilize noise/land use compatibility standards as a guide for future planning and development decisions.

Policy 1.2: Provide noise control measures,

such as berms, walls, and sound attenuating construction in areas of new construction or rehabilitation.

Transportation and Other Noise

Noise Issue 2: Desire to minimize the effects of transportation-related and non-transportation-related noise.

Transportation noise is a primary factor affecting the overall quality of life in East Palo Alto. Reduction in transportation-related noise is necessary to deal with the detrimental effects attributable to excessive noise.

Noise sources that are not directly related to transportation include construction noise, manufacturing noise, and property maintenance activities. Such noise sources should be controlled to minimize exposure to excessive noise levels.

Noise Goal 2.0: Minimize transportation- and non-transportation-related noise impacts.

Policy 2.1: Reduce transportation-related noise impact to sensitive land uses.

Policy 2.2: Reduce the impacts of noise-producing land uses and activities on noise-sensitive land uses.

Related Goals and Policies

The goals and policies described in the Noise Element are related to and support subjects included within other General Plan elements. In turn, many goals and policies from the other elements directly or indirectly support the goals and policies of the Land Use Element. These supporting goals and policies are identified in Table N-1.

**Table N-1
Noise
Related Goals and Policies by Element**

Noise Issue Area	Related Goals and Policies by Element						
	Land Use	Circulation	Conservation and Open Space	Noise	Safety	Economic Development	Housing
Noise and Land Use Planning	2.2, 3.2		2.1, 2.2			8.1, 9.1	
Transportation and Other Noise		4.3					

East Palo Alto, like all urban areas, experiences human activities that generate noise which impacts the quality of life. The goals and policies of the Noise Element establish a desire to safeguard the community from excessive noise. The Noise Plan defines the overall approach for achieving this desire and generally outlines a course of action. The Noise Element Implementation Program is an extension of the Noise Plan and contains specific programs that the City will enact to protect community well-being.

Noise and Land Use Planning

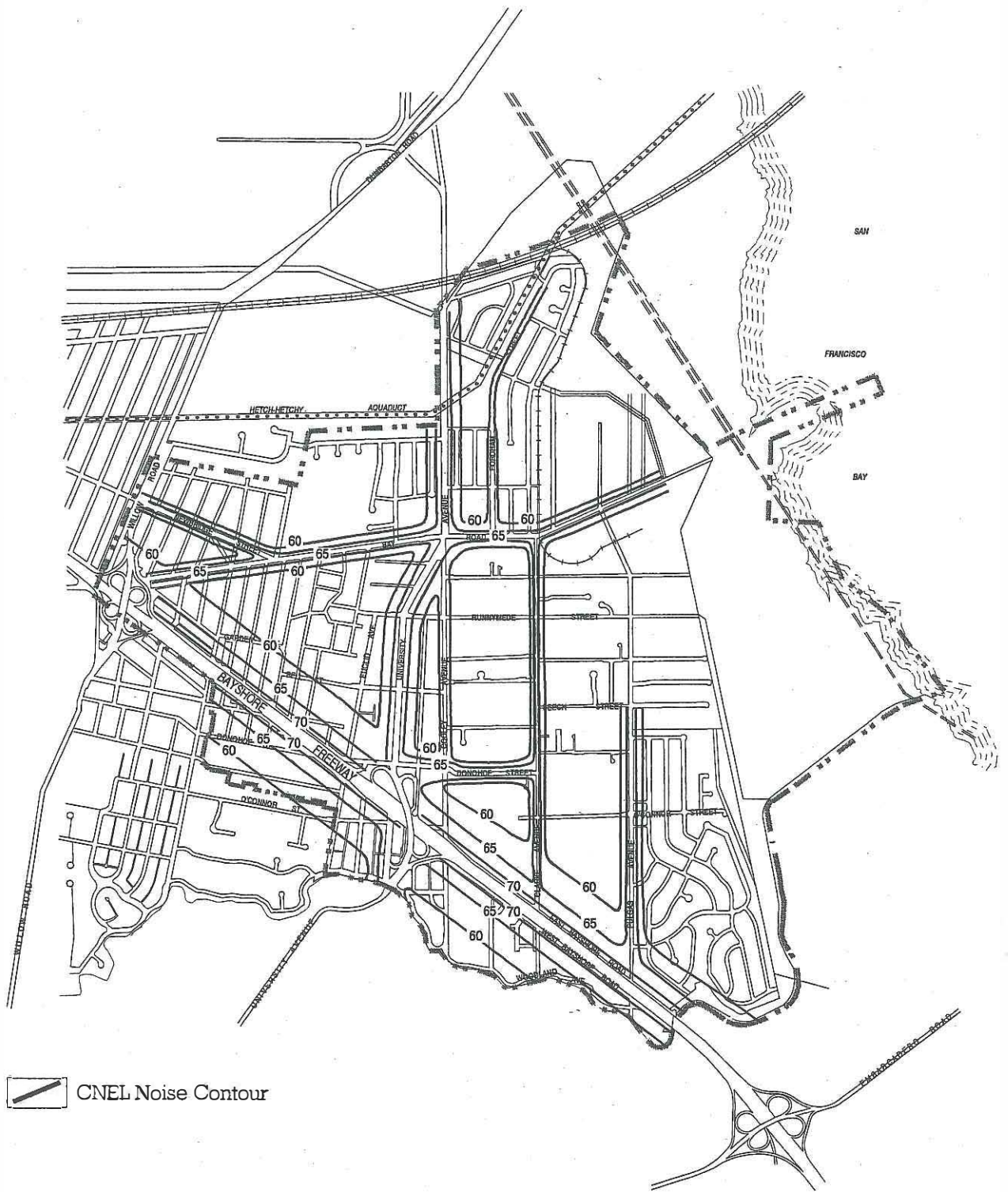
Noise in East Palo Alto is the cumulative effect of noise from transportation activities and stationary sources. Transportation noise refers to noise from automobile use, trucking, airport operations and rail operations. Non-transportation noise typically refers to noise from stationary sources such as commercial establishments, machinery, air conditioning systems, compressors and landscape maintenance equipment. Regardless of the type of noise, the noise levels are highest near the source and decrease with distance. Noise is problematic when noise sensitive land uses are affected. Noise sensitive land uses, defined as activities that are interrupted by noise, include residences, schools, hospitals, religious meetings and recreation areas. Most noise impacts can be avoided when noise sources, sensitive land uses and information about the future noise environment are considered in land use planning and development decisions.

The noise environment for East Palo Alto can be described with noise contours based on the major noise sources. Noise contours define areas of equal noise exposure. Future noise contours have been estimated with information about existing and projected development and transportation activity. Figure N-1 shows the projected noise contours for East Palo Alto, while Figure N-2 isolates noise contours from aircraft activity at Palo Alto Municipal Airport.

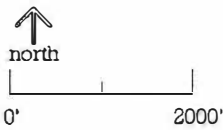
Noise Standards and Land Use Compatibility Guidelines

To ensure that noise producers do not adversely affect sensitive receptors, the City will use land use compatibility standards when making planning and development decisions. Table N-2 summarizes City noise standards for various types of land uses. The standards represent the maximum allowable noise level and will be used to determine noise impacts. The noise standards act as City policy for acceptable noise levels for development.

The noise standards are the basis for the development of land use compatibility guidelines, which are presented in a matrix in Table N-3. The primary purpose of the noise/land use matrix is to identify conflicts between proposed land uses and the existing and future noise environment. If the noise level of a project falls within Zone A or Zone B, the project is considered compatible with the noise environment. Zone A implies that no mitigation will be needed. Zone B implies



 CNEL Noise Contour

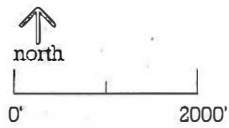


SOURCE: Cotton/Beland/Associates, August 1997

Figure N-1
Future Noise Contours



 CNEL Noise Contour



SOURCE: Santa Clara County ALUP, 1992

Figure N-2
Noise Contours from
Palo Alto Airport

**Table N-2
Interior and Exterior Noise Standards**

Land Use	Noise Standards ¹	
	Interior ^{2,3}	Exterior
Residential - Single family, multifamily, duplex, mobile home	CNEL 45 dB	CNEL 65 dB ⁴
Residential - Transient lodging, hotels, motels, nursing homes, hospitals	CNEL 45 dB	CNEL 65 dB ⁴
Private offices, church sanctuaries, libraries, board rooms, conference rooms, theaters, auditoriums, concert halls, meeting halls, etc.	Leq(12) 45 dB(A)	-
Schools	Leq(12) 45 dB(A)	Leq(12) 67 dB(A) ⁵
General offices, reception, clerical, etc.	Leq(12) 50 dB(A)	-
Bank lobby, retail store, restaurant, typing pool, etc.	Leq(12) 55 dB(A)	-
Manufacturing, kitchen, warehousing, etc.	Leq(12) 65 dB(A)	-
Parks, playgrounds	-	CNEL 65 dB ⁵
Golf courses, outdoor spectator sports, amusement parks	-	CNEL 70 dB ⁵

NOTES

1. CNEL: Community Noise Equivalent Level.
Leq(12): The A-weighted equivalent sound level averaged over a 12-hour period (usually the hours of operation).
2. Noise standard with windows closed. Mechanical ventilation shall be provided per UBC requirements to provide a habitable environment.
3. Indoor environment excluding bathrooms, toilets, closets and corridors.
4. Outdoor environment limited to rear yard of single family homes, multifamily patios and balconies (with a depth of 6' or more) and common recreation areas.
5. Outdoor environment limited to playground areas, picnic areas, and other areas of frequent human use.

Source: Title 24, California Code of Regulations

**Table N-3
Noise/Land Use Compatibility Matrix**

LAND USE CATEGORIES	COMMUNITY NOISE EQUIVALENT LEVEL CNEL						
	55	60	65	70	75	80	
Residential - Single Family, Multi-family, duplex	A	A	B	B	C		
Residential - Mobile homes	A	A	B	C	C		
Transient Lodging - Motels, Hotels	A	A	B	B	C	C	
Schools, Libraries, Churches, Hospitals, Nursing Homes	A	A	B	C	C		
Auditoriums, Concert Halls, Amphitheaters, Meeting Halls	B	B	C	C			
Sports Arenas, Outdoor Spectator Sport, Amusement Parks	A	A	A	B	B		
Playgrounds, Neighborhood Parks	A	A	A	B	C		
Golf Courses, Riding Stables, Cemeteries	A	A	A	A	B	C	C
Office and Professional Buildings	A	A	A	B	B	C	
Commercial Retail, Banks, Restaurants, Theaters	A	A	A	A	B	B	C
Industrial, Manufacturing, Utilities, Wholesale, Service Stations	A	A	A	A	B	B	B
Agriculture	A	A	A	A	A	A	A

Zone A - Clearly Compatible - Specified land use is satisfactory, based upon the assumption that any buildings involved are of normal conventional construction without any special noise insulation requirements.

Zone B - Conditionally Acceptable - New construction or development should be undertaken only after detailed analysis of the noise reduction requirement is made and needed noise insulation features in the design are determined. Conventional construction, with closed windows and fresh air supply systems or air conditioning, will normally suffice.

Zone C - Normally Incompatible - New construction or development should generally be discouraged. If new construction or development does proceed, a detailed analysis of noise reduction requirements must be made and needed noise insulation features included in the design.

Note: Shaded areas indicate new construction or development should generally not be undertaken.

Source: J.J. Van Houten & Associates/California Office of Noise Control

that minor soundproofing of the structure may be needed to meet the City noise standards.

The project proponent will be required to demonstrate that the noise standards will be met prior to project approval.

If the noise level of a project falls within Zone C, substantial noise mitigation will be necessary to meet the noise standards. Mitigation may involve construction of noise barriers and substantial building sound insulation. However, projects in Zone C can be successfully mitigated. The project proponent must demonstrate that the noise standards will be met prior to issuance of a building permit. If the noise levels falls outside of Zones A, B and C, the project is considered clearly incompatible with the noise environment and should not be approved.

The City Community Development Department will act as the noise control coordinator. This delegation of responsibility will allow consistent and continued enforcement of the established noise standards.

Noise Impact Areas

The noise contours will be used as a guide for land use and development decisions. The 60 dB CNEL defines Noise Impact Areas. When noise-sensitive land uses are proposed within the 60 dB CNEL or greater contour, an acoustical analysis must be prepared. For the project to be approved, the analysis must demonstrate that the project is designed to attenuate noise to meet the City noise standards, as defined in Table N-2. If the project is not designed to meet the noise standards, mitigation measures can be recommended in the analysis. If the analysis demonstrates that the noise standards can be met with implementation of the

mitigation measures, the project can be approved with the mitigation measures required as conditions of project approval.

Construction Standards

The provisions of the state Noise Insulation Standards (Title 24) will be enforced in East Palo Alto. Title 24 specifies that combined indoor noise for multi-family living spaces shall not exceed 45 dB CNEL. This standard must be implemented when the outdoor noise level exceeds 60 dB CNEL. The noise contour map (Figure N-1) can be used to determine when to implement the standard. Title 24 requires that the standard be applied to all new hotels, motels, apartment houses and multi-family projects.

Development Constraints from Aircraft Noise

As illustrated in Figure N-2, the easterly portion of the City is subject to noise of 60 dB from aircraft operations at Palo Alto Municipal Airport. The Airport Land Use Plan (ALUP) provides development standards to minimize impacts from aircraft noise. To conform with the ALUP and the City noise standards in Table N-2, the City has designated land within the 60 dB contour for non-residential uses such as industrial and commercial uses. Figure LU-1, *Land Use Policy Map*, in the Land Use Element graphically depicts the planned non-residential uses in areas impacted by aircraft noise. Implementation of the land use designations prevent new noise sensitive residential uses from being constructed in areas with excessive aircraft noise.

Transportation and Other Noise

Noise from transportation activity is the primary component of the noise environment in East Palo Alto. Transportation noise is related to the transportation corridors that traverse the city, (such as Highway 101, major arterials and collector roadways, Southern Pacific rail lines and the flight path of Palo Alto Municipal Airport. The most efficient and effective means of controlling noise from transportation systems is to reduce the noise at the source.

The City has little direct control over noise produced by transportation sources because state and federal noise regulations preempt local regulations. The state regulates motor vehicle noise and the federal government regulates aircraft noise. Because East Palo Alto cannot control noise at the source, City noise programs focus on reducing the impact of transportation noise on the community. Cost effective strategies to control noise impacts are an essential component of this element.

The most effective method for mitigating transportation noise impacts on the community is by utilizing the site design review process and CEQA. During these stages of the development process, potential impacts from transportation noise will be identified and mitigation measures will be required as needed to meet City noise standards. Site planning, landscaping, topography and the design and construction of noise barriers (walls, berms or combination of walls/berms) are the most common method of alleviating traffic and train noise impacts. Setbacks and buffers can also be used to achieve small noise reductions.

Noise attenuating barriers are commonly incorporated into projects and can be extremely effective in reducing noise levels. The effectiveness of the barrier depends on the relative height and materials of the barrier, the noise source, the affected area, the horizontal distance between the source and the barrier, and the horizontal distance between the barrier and affected area. Although noise barriers can be extremely effective, the aesthetic effect of barriers on neighborhoods should be considered.

Noise barriers should be included in the design of roadway, freeway and rail improvements. The City will support efforts by Caltrans and other transportation providers to provide acoustical protection for noise-sensitive development. In addition, the City will request that barriers are constructed as part of freeway, roadway and rail improvement projects to mitigate significant noise impacts. In particular, Highway 101 is a prime candidate for barriers to protect the community from excessive transportation noise.

Although the City does not have jurisdiction over railroad operation, maintenance, and construction activities occurring within the rail line right-of-way, Southern Pacific will also be requested to construct noise barriers adjacent to existing unprotected residential areas near the rail line should commuter rail service be initiated.

Noise Control at the Source

The California Vehicle Code contains noise regulations pertaining to the operation of all vehicles on public roads.

These noise standards for cars, trucks and motorcycles will be enforced through coordination with the California Highway Patrol and other law enforcement agencies.

The City will also regulate traffic flow to enforce speed limits to reduce traffic noise. Truck and bus noise will be minimized by periodically evaluating and continually enforcing established routes to avoid noise impacts on sensitive receptors.

Other Noise Sources

Sensitive receptors must also be protected from excessive noise generated by non-transportation sources such as commercial and industrial centers, restaurants and bars, religious institutions and civic centers. Application of a City Noise Ordinance is the best means to control noise from existing noise sources. Noise generated by new development will be effectively controlled through the site design review process and CEQA, and compliance with the City noise standards. During these preliminary stages in the development process, potential noise impacts will be identified and mitigation measures can be imposed.

When reviewing proposed non-residential projects, noise generation and potential impacts to surrounding development will be considered. Acoustical analyses will be required for projects that will generate noise potentially affecting sensitive receptors. Where significant impacts are identified, mitigation measures will be required. The following mitigation measures could be applied when reviewing proposed projects:

- **Furnaces** - Acoustically treat natural draft and/or forced draft units and combustion air intake plenums. Insulation of firing walls and damped and lined ducting are but a few of the treatments that could be considered.

- **Fans** - Air cooled heat exchangers can be provided with silencers where effective (i.e., primarily on small, high-speed air fans). For larger coolers, quieter equipment can be installed.
- **Motors** - Quiet-design motors can be employed and located to minimize impacts on nearby properties.
- **Centrifugal Compressors** - Centrifugal compressors can be equipped with inlet and discharge silencers. Acoustical enclosures may also be considered.
- **Centrifugal Pumps** - Centrifugal pumps may be equipped with suction and discharge piping that has been acoustically treated. Acoustical enclosures may be considered.
- **Steam and Gas Generators** - Acoustical enclosures for turbines may be effective in reducing noise. Inlet and discharge piping may be acoustically treated and expansion joints added or comparable attenuative modifications made to minimize structure-borne vibrations.
- **Control Valves** - Quiet valves should be used whenever available. In other circumstances, in-line silencers can be employed.
- **Atmospheric Vents, Exhaust and Intakes** - Noise vents should be equipped with silencers. Where safety is not an overriding concern, vents should be positioned close to the ground or below grade.
- **Paging Systems** - Loudspeaker paging systems shall be regulated pursuant to the City's noise ordinance. Whenever possible suitable alternatives such as radio or visual paging systems should be utilized.

- **Delivery/Loading Areas** - Limit delivery hours for stores with loading areas or docks fronting, bordering, or gaining access in driveways next to noise sensitive uses.
- **Operating Hours** - Restrict operation hours at night to minimize impacts to adjacent residential uses.

In addition, all City departments must comply with state and federal OSHA noise standards. Any new equipment or vehicle purchased by the City will comply with local, state and federal noise standards.

Noise Ordinance The City will adopt a Noise Ordinance designed to protect people from non-

transportation noise sources such as music, construction activity, machinery and pumps, and air conditioners. Enforcement of the ordinance ensures that adjacent properties are not exposed to excessive noise from stationary sources. Enforcing the Noise Ordinance includes requiring construction activity to comply with established work schedule limits. The Noise Ordinance will not apply to railroad operation, maintenance and construction activities occurring with the Southern Pacific right-of-way or the permitted hours for such activities. The ordinance will also not apply to noise generated by aircraft activity at Palo Alto Municipal Airport. The ordinance will be reviewed periodically for adequacy and amended as needed to address community needs and development patterns.