



Transportation Noise

Introduction

People who can clearly recollect the sights and sounds of San Francisco during the 1930's and 1940's remember how noisy the streets were then. Numerous cable cars and streetcar lines operated throughout the city. Market Street, with four sets of streetcar tracks, was extraordinarily noisy. The streetcars then were not the quieter types that came into use later. Automobiles, although much less numerous, were noisier than today's models. Then, of course, the bustling waterfront activity and vessels in the Bay further contributed to the sounds of the city.

Despite these noisy transportation systems, ambient or background noise levels over most of the city then were lower than now. Over the years, however, motor traffic - automobiles, trucks, and buses - has risen dramatically. Aircraft flights have multiplied. Today, in some parts of the city, background noise levels are so high that for many people, quiet can only be found inside a building with the windows shut.

We are learning that not only does noise annoy, it can endanger our physical and even mental health. Because of this potential health hazard, some people are becoming convinced that we are as much entitled to a quiet environment as to unpolluted air and water and pure food.

Purpose

Ground transportation noises from trucks, buses, motorcycles, and poorly muffled automobiles predominate over other types of noises as the most persistent cause for complaint. This is why Section 6530(g) of the California Government Code, added in 1972, requires all cities and counties to include a transportation noise element in their general plans.

This Transportation Noise Element is designed to comply with that law. The plan, furthermore, is based on an analysis of present noise levels and 1995 projected noise levels and on the following basic assumptions:

- Surface transportation facilities constitute a major contributor to today's noise levels.
- People do react adversely to excessive noise when it interferes with sleep and other activities.
- People want and are entitled to a quiet environment.
- The technological means are available for reducing transportation noise levels.

OBJECTIVES AND POLICIES

The Transportation Noise Plan is directed toward achieving an environment in which noise levels will not interfere with the health and welfare of people in their everyday activities. Much of the adverse effect of transportation noise can be reduced through sound land use planning and transportation planning. How those elements of the general planning process are implemented is crucial to achieving the goal of a quieter environment. However, in a fully developed city, such as San Francisco, where the land use and circulation patterns are by and large fixed, the ability to reduce the noise impact through a proper relationship of land use and transportation facility locations is limited. In San Francisco, major attention must be given to three main aspects of the problem: the source of the noise, the path it travels, and the receiver of the noise. In general, techniques should be designed to quiet the noise at the source, to block the path over which it is transmitted, and to shield or remove the receiver from the noise.

OBJECTIVE 9 REDUCE TRANSPORTATION-RELATED NOISE.

Much can be done to reduce noise at the source. Technological means are available for reducing vehicular noise emissions well below present levels.

POLICY 9.1 Enforce noise emission standards for vehicles.

The noise emission standards of the State Vehicle Code are enforced by the California Highway Patrol on the freeways, and by the local police on the city streets. The Noise Abatement Unit of the Police Department is responsible for identifying vehicles that violate the noise emission standards and for securing the correction of the problem. This work should be continued and expanded.

POLICY 9.2 Impose traffic restrictions to reduce transportation noise.

Transportation noise levels vary according to the predominance of vehicle type, traffic volume, and traffic speed. Curtailing any of these variables ordinarily produces a drop in noise level. In addition to setting the speed limit, the City has the authority to restrict traffic on city streets, and it has done so on a number of streets. In addition, certain movement restraints can be applied to slow down traffic or divert it to other streets. These measures should be employed where appropriate to reduce noise.

POLICY 9.3 Limit City purchases of vehicles to models with the lowest noise emissions and adequately maintain City-owned vehicles and travel surfaces.

The City owns and operates over a thousand vehicles in addition to its large fleet of automobiles. Street noise performance specifications for City vehicles (transit; trucks; specialized vehicles, such as street sweepers, brush chippers, etc.) should be included in the purchasing procedures of the City so that the City will obtain the quietest available models.

With proper maintenance, the City's inventory of vehicles can be kept in good working order, thereby reducing the noise they generate. Proper emphasis must also be placed on smooth street surfaces and on smooth rails for the streetcars and cable cars. Trackbeds for the rail vehicles also require special attention as do the various underground elements of the cable car traction system.

POLICY 9.4***Regulate use of emergency sirens.***

Police Vehicles, fire engines, and ambulances, in their function as emergency vehicles, are entitled to the use of emergency warning sirens. Under State law, sirens must produce a sound level of at least 90 decibels at 100 feet. Many persons find these sirens - especially the warbling type - annoying. The warbling siren should be replaced by conventional sirens and measures should be taken to assure that the use of all sirens is restricted to assuring the emergency vehicle the right-of-way only in genuine emergencies.

POLICY 9.5***Retain and expand the electric trolley network.***

Electric trolley buses are quiet, economical, and relatively pollution-free in their use. These benefits outweigh the adverse environmental impact of power generation or fossil fuel utilization. Electric trolleys should be retained where feasible and consideration should be given to electrifying selected existing diesel bus routes.

POLICY 9.6***Discourage changes in streets which will result in greater traffic noise in noise-sensitive areas.***

Widening streets for additional traffic lanes or converting streets to one-way direction can induce higher traffic volume and faster speeds. Other techniques such as towaway lanes and traffic light synchronization also facilitate heavier traffic flows. Such changes should not be undertaken on residential streets if they will produce an excessive rise in the noise level of those streets.

OBJECTIVE 10**MINIMIZE THE IMPACT OF NOISE ON AFFECTED AREAS.**

The process of blocking excessive noise from our ears could involve extensive capital investment if undertaken on a systematic, citywide scale. Selective efforts, however, especially for new construction, are both desirable and justified.

POLICY 10.1***Promote site planning, building orientation and design, and interior layout that will lessen noise intrusion.***

Because sound levels drop as distance from the source increases, building setbacks can play an important role in reducing noise for the building occupants. (Of course, if provision of the setback eliminates livable rear yard space, the value of the setback must be weighed against the loss of the rear yard.) Buildings sited with their narrower dimensions facing the noise source and sited to shield or be shielded by other buildings also help reduce noise intrusion. Although walls with no windows or small windows cut down on noise from exterior sources, in most cases it would not be feasible or desirable to eliminate wall openings. However, interior layout can achieve similar results by locating rooms whose use require more quiet, such as bedrooms, away from the street noise. In its role of reviewing project plans and informally offering professional advice on site development, the Department of City Planning can suggest ways to help protect the occupants from outside noise, consistent with the nature of the project and size and shape of the building site.

POLICY 10.2

Promote the incorporation of noise insulation materials in new construction.

State-imposed noise insulation standards apply to all new residential structures except detached single-family dwellings. Protection against exterior noise and noise within a building is also important in many nonresidential structures. Builders should be encouraged to take into account prevailing noise levels and to include noise insulation materials as needed to provide adequate insulation.

POLICY 10.3

Construct physical barriers to reduce noise transmission from heavy traffic carriers.

If designed properly, physical barriers such as walls and berms along transportation routes can in some instances effectively cut down on the noise that reaches the areas beyond. There are opportunities for a certain amount of barrier construction, especially along limited access thoroughfares and transit rights-of-way (such as BART), but it is unlikely that such barriers can be erected along existing arterial streets in the city. Barriers are least effective for those hillside areas above the noise source. Where feasible, appropriate noise barriers should be constructed.

OBJECTIVE 11

PROMOTE LAND USES THAT ARE COMPATIBLE WITH VARIOUS TRANSPORTATION NOISE LEVELS.

Because transportation noise is going to remain a problem for many years to come, attention must be given to the activities close to the noise. In general, the most noise-sensitive activities or land uses should ideally be the farthest removed from the noisy transportation facilities. Conversely, those activities that are not seriously affected by high outside noise levels can be located near these facilities.

POLICY 11.1

Discourage new uses in areas in which the noise level exceeds the noise compatibility guidelines for that use.

LAND USE COMPATIBILITY CHART FOR COMMUNITY NOISE

LAND USE CATEGORY	Sound Levels and Land Use Consequences <small>(see explanation below)</small>						
	L _{eq} Value in Decibels						
	55	60	65	70	75	80	85
RESIDENTIAL All Dwellings, Group Quarters							
TRANSIENT LODGING Hotels, Motels							
SCHOOL CLASSROOMS, LIBRARIES, CHURCHES, HOSPITALS, NURSING HOMES, ETC.							
AUDITORIUMS, CONCERT HALLS, AMPHITHEATRES, MUSIC SHELLS							
SPORTS ARENA, OUTDOOR SPECTATOR SPORTS							
PLAYGROUNDS, PARKS							
GOLF COURSES, RIDING STABLES, WATER-BASED RECREATION AREAS, CEMETERIES							
OFFICE BUILDINGS Personal, Business, and Professional Services							
COMMERCIAL Retail, Movie Theatres, Restaurants							
COMMERCIAL Wholesale and Some Retail, Industrial/Manufacturing, Transportation, Communications and Utilities							
MANUFACTURING COMMUNICATIONS Noise-Sensitive Noise-Sensitive							



Satisfactory, with no special noise insulation requirements.



New construction or development should be undertaken only after a detailed analysis of the noise reduction requirements is made and needed noise insulation features included in the design.



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



New construction or development should generally not be undertaken.

New development should be examined to determine whether background and/or thoroughfare noise level of the site is consistent with the guidelines for the proposed use. If the noise levels for the development site, as shown on maps 1 and 2 (which should be revised periodically to keep them current), exceed the sound level guidelines established for that use, as shown in the accompanying land use compatibility chart, then either needed noise insulation features should be incorporated in the design or else the construction or development should not be undertaken. Since the sound levels shown on the maps are estimates based on both traffic data and on a sample of sound level readings, actual sound levels for the site, determined by accepted measurement techniques, may be substituted for them.

POLICY 11.2

Consider the relocation to more appropriate areas of those land uses which need more quiet and cannot be effectively insulated from noise in their present location, as well as those land uses which are noisy and are presently in noise-sensitive areas.

Many commercial and industrial activities do not need to be in a quiet area, because interior noise levels typically are already high and tend to override noise from exterior sources. On the other hand, some uses require quiet locations and cannot be effectively insulated from noise. When feasible and desirable to do so, such activities should be encouraged to relocate to quieter areas. Conversely, there may on occasion be opportunities to relocate noisy uses to areas where the noise they generate will be less disturbing to their neighbors.

POLICY 11.3

Locate new noise-generating development so that the noise impact is reduced.

Developments which will bring appreciable traffic into or through noise-sensitive areas should be discouraged, if there are appropriate alternative locations where the noise impact would be less. For those activities — such as a hospital — that need a quiet environment, yet themselves generate considerable traffic, the proper location presents a dilemma. In those cases, the new development should locate where this traffic will not present a problem and, if necessary, incorporate the proper noise insulation.

The feasibility of making noise-reducing changes to existing transportation facilities remains an obstacle to any large-scale transformation. New thoroughfares and new Municipal Railway facilities, however, offer opportunities to overcome objectionable noise aspects. Ideally, new transportation facilities should be located in areas or along routes of least noise-sensitive land uses. Where it is infeasible or undesirable to do so, special noise-suppressing design features should be incorporated into the facilities in order to make them acceptable neighbors.