CITY OF DALY CITY

Noise Element

Introduction

Scope and Role of the Noise Element

Noise in excessive levels and over prolonged time periods has the potential to incrementally degrade the quality of life in Daly City. Studies have shown that excessive noise can have adverse physiological and psychological effects. Extreme levels can cause pain and hearing loss. Continuous exposure to low-level noise can present long-term impacts to human health such as raising blood pressure, lessening the quality of sleep, or inhibiting children's ability to learn.

In Daly City, the most prevalent noise sources are from motor vehicle traffic on heavily traveled roadways like Mission Street or Interstate 280, BART trains, and noise from aircraft associated with San Francisco International Airport (SFO). Although the city is largely built-out, redevelopment of properties with more intense land uses, expansion of BART and San Francisco International Airport operations, and increased peak-hour traffic along area roadways will likely add to the City's noise levels. Because the City's population will rise in locations most likely to experience increases in noise (e.g., in close proximity to freeways and transit), an increasingly greater proportion of the population will be exposed to these increasing noise levels.

Controlling noise at its source to acceptable levels can make a substantial improvement in the quality of life for people living and working in Daly City. When this is not feasible, the city can apply additional measures to limit the effect of noise on future land uses, which include spatial separation, site planning, and building design.

The Noise Element provides an overview of how much noise is already in the environment, a framework for how sound will be measured and regulated, and policy direction to guide decision makers in regulating new uses that either produce excessive noise or expose persons or institutions to unacceptable noise levels.

State Laws Affecting the Noise Element

State planning law requires every city and county to adopt a Noise Element. In preparing the Noise Element, state law requires that the City recognize guidelines for noise element preparation set forth by the State Office of Noise Control (Government Code Section 65302).

According to the guidelines, the City must identify the extent of noise exposure through actual measurement or the use of noise modeling. Noise level contours must be mapped and the conclusions

of the element used as a basis for land use decisions. Technical data relating to mobile and point sources must be collected and synthesized into a set of noise control policies and programs identified that "minimizes the exposure of community residents to excessive noise." The element must include implementation measures and possible solutions to existing and foreseeable noise problems. Furthermore, the policies and standards must be sufficient to serve as a guideline for compliance with sound transmission control requirements. The noise element directly correlates to the land use, circulation, and housing elements.

In addition to specific requirements for the Noise Element, state law obligates the City to ensure that its General Plan is in conformance with the San Mateo County Comprehensive Airport Land Use Plan (CLUP), adopted in 1996. The CLUP identifies policies and criteria to help achieve compatibility between proposed land use development and/or proposed airport development with airport and aircraft operations. The plan is administered by the City/County Association of Governments of San Mateo County (C/CAG), which has conferred the airport land use planning process to the Airport Land Use Committee. The Committee advises and recommends actions to C/CAG regarding the updating of the Plan, and other land use compatibility issues affecting the three airports in San Mateo County.

Background Information

Identifying and Measuring Noise

Noise is generally defined as unwanted sound. Whether a sound is unwanted or not depends on a number of factors, including when it occurs, what the listener is doing when it occurs, the characteristics of the sound, and how intrusive it is above background (ambient) noise levels. In the urban environment, different sounds possess different characteristics that make some sounds more unwanted than others, including the loudness or intensity of the sound, its duration, its repetition rate, and its unfamiliarity or uniqueness.

Common noise levels are identified in Figure NE-1. As shown in the figure, noise is measured in decibels (dBA) using a measuring device which closely approximates the way the human ear responds to sound. The threshold of human hearing roughly corresponds to 0 dBA while the threshold of pain is approximately 120 dBA; 120 dBA corresponds to a jet taking off at 200 feet from the source. Decibels are calculated on a logarithmic scale. An increase of 10 decibels represents a ten-fold increase in sound level, although the sound is perceived as twice as loud. For example, 65 dBA is perceived to be about twice as loud as 55 dBA. An increase of 3 dBA is just barely perceptible to the human ear; a 5 dBA increase is clearly noticeable; and a 10 dBA increase is heard as an approximate doubling in loudness.

Although a single noise level value may adequately describe the noise at a particular location at any given instant in time, noise levels vary continuously throughout the day and include different types of noise. Continuous noise in the distance for example, is called ambient noise. Ambient noise contributes to noise levels when the listener experiences it in combination with a succession of identifiable or intrusive noise events.

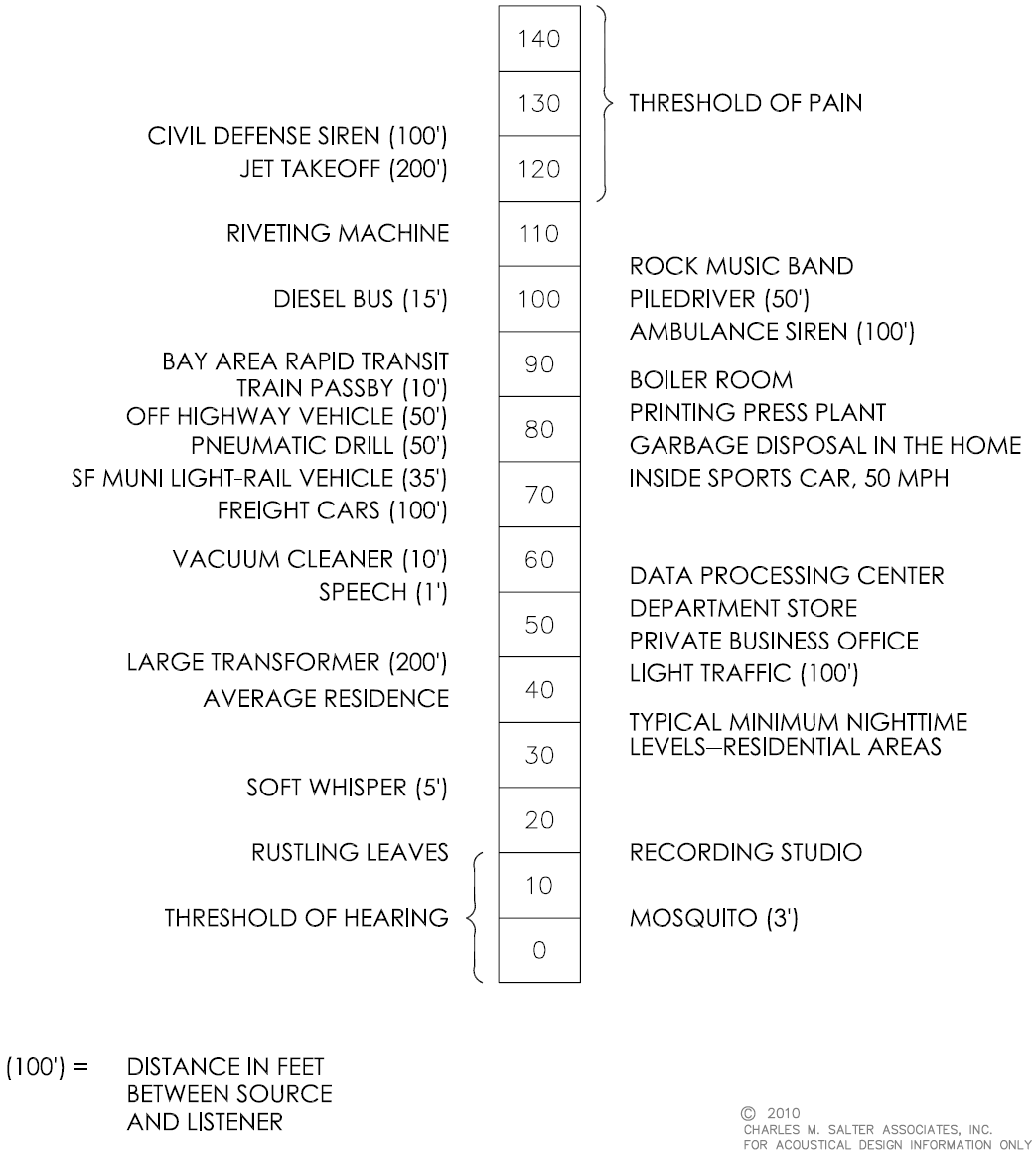
Noise descriptors are used to describe the time-varying character of ambient noise by itself and when in combination with intrusive noise events. The Noise Equivalent Level (L_{eq}) is such a descriptor and is representative of an equivalent constant sound level over a given period of time. The actual noise measured during a given period of time, say 24 hours, varies; a single noise event during the time period may have reached 90 dBA the L_{max} and the lowest may have been 45 dBA while the L_{eq} representing that time frame may be 55 dBA L_{eq}. The 90 dBA level represents the most intrusive noise event during the measuring period and is referred to as the L_{max}. Intrusive noise events are of particular importance in understanding and assessing aircraft noise impacts.

Community Noise Equivalent Level (CNEL)

People are usually more sensitive to noise in the nighttime than they are during the daytime. Two factors contribute to this increased sensitivity. First, during the evening and nighttime, outdoor ambient noise levels are generally lower than in the daytime. Most offices and businesses are closed and automobile traffic has decreased. Second, as household noise levels decrease during the evening, changes in exterior nighttime noise levels can be more noticeable and annoying than such changes are during the day.

To account for this sensitivity, a calculation called the Community Noise Equivalent Level (CNEL) is used to divide the 24-hour day into three time periods: daytime (7:00 a.m. to 7:00 p.m.), evening (7:00 p.m. to 10:00 p.m.), and nighttime (10:00 p.m. to 7:00 a.m.). The evening sound levels are assigned a five decibel penalty (or weighting) and the nighttime sound levels are assigned a 10 decibel penalty (or weighting) prior to averaging with daytime hourly sound levels. In this way, the CNEL is a noise metric that, if used to regulate noise, provides for a quieter evening and nighttime environment.

Figure NE-1: A-Weighted Sound Pressure Level (in decibels)

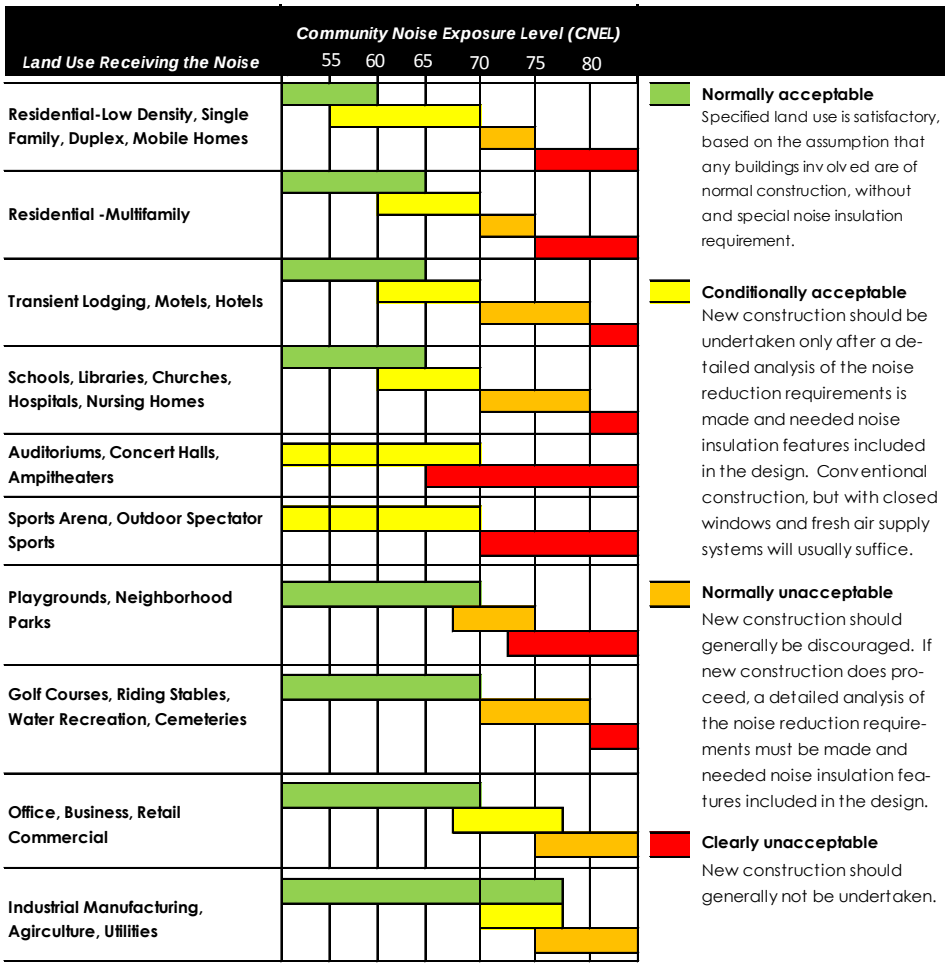


Noise Compatibility Guidelines

Because of its ability to account for human sensitivities, the CNEL is used in the implementation of the Noise Compatibility Guidelines developed by the State Office of Noise Control and first adopted by the City of Daly City in 1978. These guidelines establish compatibility criteria for common land uses and are intended to ensure that new development proposals do not introduce excessive noise in a given location to the detriment of existing uses. Conversely, the guidelines also discourage introducing new uses to existing noise sources. For example, new residential construction in a location next to a busily traveled roadway exhibited unacceptably high existing noise levels may be allowed, but only with proper mitigation.

Figure NE-1 provides a matrix illustrating the compatibility of common land uses and a corresponding range of noise levels. A "compatible" land use indicates that standard construction methods will sufficiently attenuate exterior noise to an acceptable indoor noise level and people can carry out outdoor activities with essentially no noise interference. In general, evaluation of a land use that falls into the "conditionally compatible" noise environment should include consideration of the type of noise source, the sensitivity of the noise receptor, and the degree to which the noise source may interfere with speech, sleep, or other activities characteristic of the land use. Land uses which are normally acceptable may require the implementation of mitigation measures supported by detailed noise analyses. If the noise environment exceeds a certain criterion, new construction is prohibited.

Figure NE-2: Noise Compatibility Guidelines



Source: State of California Office of Noise Control

Existing Noise Environment

Introduction

This section describes the existing noise environment in Daly City. The section first describes various noise sources and sensitive receptors in general, and in Daly City. A discussion of the noise monitoring and modeling program that was used to develop the existing and projected (2035) noise contours in Daly City closes the section.

Continuous Noise Sources

Noise sources in Daly City include freeways, arterials, and local major streets; noise from aircraft associated with San Francisco International Airport; BART train operations; and to a lesser extent commercial and industrial land uses. The level of noise along and nearby a freeway, arterial, or local street is a function of the traffic volume, the speed of the traffic, and the types of vehicles in the traffic stream (car, light or heavy truck). Heavier volumes of traffic produce more noise than lighter volumes of traffic. Slower or congested traffic travelling along a freeway produces more noise than traffic travelling at the posted freeway speed. Heavy trucks, tractor-trailers, and diesel buses are noisier than standard passenger cars. Traffic volumes, however, must double over existing volumes for there to be a perceptible (3 dBA) increase in noise levels. Traffic noise is usually more pronounced during morning and evening peak commute hours. Major traffic noise sources in Daly City are Interstate 280, Highway 35, and Highway 1; John Daly, Hickey, Serramonte, Callan, Gellert, San Pedro, South Hill, Bayshore, and Lake Merced Boulevards; Southgate, Eastmoor, St. Francis, Geneva, San Jose, El Camino, and Bellevue Avenues; East Market, School, Mission, and 87th Streets; and King Drive.

Heliport and airport noise sources tend to be intrusive noise events that are short in duration. Intrusive noise events resulting from aircraft fly-overs can reach 90-100 dBA, L_{eq} for the brief (few seconds) fly-over period. Intrusive noise events resulting from aircraft fly-over can raise the hourly noise level to 75 dBA, L_{eq}. The San Francisco International Airport is the only airport that has an effect on Daly City. Noise from aircraft fly-overs affects the Serramonte neighborhood in the southeastern tip of the City. Seton Medical Center was the location of the only heliport in Daly City prior to 2006 when medical transports to the hospital ceased due to budget constraints.

Rapid transit lines, such as Bay Area Rapid Transit District (BART) are a source of noise. Noise from BART trains is less intrusive and less intense than aircraft fly-overs. The highest hourly noise level from BART operations in Daly City is less than 70 dBA, L_{eq}. Bus lines that serve the BART Station are a source of noise in Daly City. The noise from bus operations drops dramatically after midnight when BART ceases running for the day.

Commercial and industrial land uses are a source of noise. Commercial land uses generate vehicular and pedestrian traffic both of which add to the noise environment. Commercial uses, by their nature, include noise sources such as the delivery of goods to a site; the unloading of the delivery; and sometimes minor processing of the goods. Commercial uses in Daly City are centered along the Mission Street corridor, at shopping centers such as Westlake, Serramonte, Skyline Plaza and St. Francis Square, and pocketed in neighborhood commercial areas that serve an immediate neighborhood.

Industrial noise sources are usually more intrusive in nature than commercial noise sources. Delivery of raw and finished materials, usually in large tractor-trailers; use of heavy equipment such as saws, grinders and other machinery; and speaker systems add to the noise environment. Industrial land uses are minimal in Daly City; are centered in the Bayshore neighborhood; and are of a less intense nature than typical industrial uses.

Temporary Noise Sources

The noise sources described above are fairly continuous noise sources. The noise levels the uses generate do vary over a 24-hour period, from business hours to evening hours, and they may cease on weekends, Sundays or holidays; their pattern, however Is fairly continuous year round. Another type of noise worthy of mention is temporary noise generated from construction activities.

Construction noise is intrusive and can reach up to 105 decibels at fifty feet from the source for pile driving. Earthmoving equipment such as compactors, backhoes, tractors, trucks and graders range from 70 to 95 dBA at 50 feet from the source. Impact equipment such as pneumatic wrenches, jack hammers and pile drivers generate higher levels of noise. The noise range for this type of equipment is 80 to 105 dBA at 50 feet from the source.

Construction noise is shorter in duration than noise associated with fixed land uses. The typical time frame for construction noise is three to nine months. Construction noise is regulated in Daly City through the environmental review process by the Engineering and Planning Divisions. Typically, construction activities are limited to the daytime hours, 8:00 a.m. to 5:00 p.m., and prohibited on weekends and holidays. The time limitation protects residents near the construction activity from the higher noise levels during the noise sensitive times of the day (evening and nighttime) and noise sensitive times of the week (weekends when people are usually home).

Sensitive Receptors

Residential areas, hospitals and extended care facilities, schools, libraries, and parks and open spaces are land uses that are considered more sensitive to high noise levels and changes in ambient noise levels. High noise levels and intrusive noise can disrupt relaxation and sleep, convalescing, and the enjoyment of open space and recreational areas.

Approximately 53 percent of Daly City is residential and of this, approximately 90 percent is low to medium density and consists of predominantly single-family and duplex units. This land use category also includes residential care facilities. Residential care facilities serve the elderly and physically and mentally handicapped individuals in a home setting.

Seton Medical Center is the only hospital in Daly City. Other supervised medical care facilities include three skilled nursing homes. Additionally there are three retirement communities in Daly City designed to provide group residential care for the elderly,

Daly City has twenty-seven public elementary and high schools, and four libraries. Approximately sixteen percent of Daly City is open space. Approximately fourteen percent of the total open space is public and includes tot lots, and state, regional and local parks. Fifty-three percent of the total is open space for preservation because of environmental factors that render the site undevelopable such as soil and slope instability or because of lack of Infrastructure serving the site. Thirty-two percent of the open space is private and includes golf courses, country clubs, and horse stables. Although there are different categories of open space, the expected use is primarily relaxation and recreation. The general location of sensitive receptors in Daly City is shown on the General Plan Land Use Map.

Noise Monitoring, Modeling and Mapping Methodology

State Planning Law (Government Code Section 65302) requires cities to prepare noise contours around major noise sources. The requirement is designed to identify areas of noise impact. Daly City retained the services of an acoustical consultant to conduct a noise monitoring program. The program included six 24-hour noise measurements and thirteen short-term noise measurements. Noise contours were developed and mapped in four decibel bands using the Community Noise Equivalent Level (CNEL) metric.

Existing Noise Levels

Six 48-hour and thirteen short-term noise measurements were taken throughout Daly City in July of 2011. Freeway and major arterial roadway noise has generally increased by approximately one to two decibels since noise measurements were taken in 1987 for the 1989 Noise Element. Noise levels in the Serramonte area due to aircraft fly-overs have increased by approximately five decibels since 1987. Increases in noise levels for the projected future year, 2035, will be insignificant in most areas. Increases are expected to occur along freeways and arterials near the Bayshore neighborhood and some segments of Junipero Serra Boulevard. Increases are projected to be between 0.5 and 7 decibels.

In establishing noise contours for land use planning it is customary to ignore noise attenuation afforded by buildings, roadway elevations, and depressions, and to minimize the barrier effect of natural terrain features. The result is a worst-case estimate of the existing and future (projected) noise environment. The purpose of noise contours is to identify the potential need for more detailed acoustical studies, not to predict with certainty the noise level throughout the City. The assumption is that it is desirable to overestimate the potential noise at a future sensitive development site, than to underestimate the noise environment and allow for potentially incompatible land use development. Buildings may be removed as a part of future development which would result in eliminating the particular noise attenuation feature. The noise attenuation provided by existing earthen berms or terrain may also be diminished by future development.

Two types of noise contours are provided: one set reflecting traffic noise and another set reflecting aircraft noise. The traffic noise contours, produced by computer modeling, utilize the time tested Federal Highway Traffic Noise Prediction Model. This model represents more than 40 years of traffic noise research.

The aircraft noise contours are based on contours produced by the Aircraft Noise Abatement Office of the San Francisco International Airport (SFO). These contours are based on computer modeling and validated by a noise monitoring system operated by SFO. This monitoring system includes 29 monitors located around the Bay Area, one of which is located in the Serramonte area. This method is most reliable in that it represents actual long term measurement data rather than computer modeling alone.

Results of Noise Monitoring: Existing Conditions

The Environmental Protection Agency has established 70 dBA, L_{eq} as the noise level requisite to protect the public from the health effects of severe noise exposure year round. This level also assumes a 24-hour day exposure. The L_{eq} (Noise Equivalent Level) is a fairly constant noise level and is less stringent than the CNEL. CNEL values are typically three to four decibels higher than the L_{eq}. Daly City meets the 70 dBA, L_{eq} exposure level throughout the City in areas where there are sensitive receptors except for the second story of homes along Station Avenue (discussed in Location C below), and buildings along Mission Street and Geneva Avenue setback less than 65 feet from the centerline of the roadway. See Figure NE-3 on page 222 for a depiction of the noise contours.

Location A: Serramonte Area. The purpose of this measurement was to characterize the noise exposure in the Serramonte neighborhood from aircraft departing westbound from the San Francisco International Airport. The background noise in the area is 50 to 55 dBA, L_{eq} which is relatively low. The maximum noise from aircraft flyovers often reaches 85 to 95 dBA, L_{max} for a brief few seconds of the flyover. As a result, the hourly noise levels fluctuate in this neighborhood depending on airport activity. Table NE-1 below identifies the maximum noise levels and the time of those noise levels associated with aircraft activity. The CNEL at this location is 70 dBA and the L_{eq} is 65 dBA.

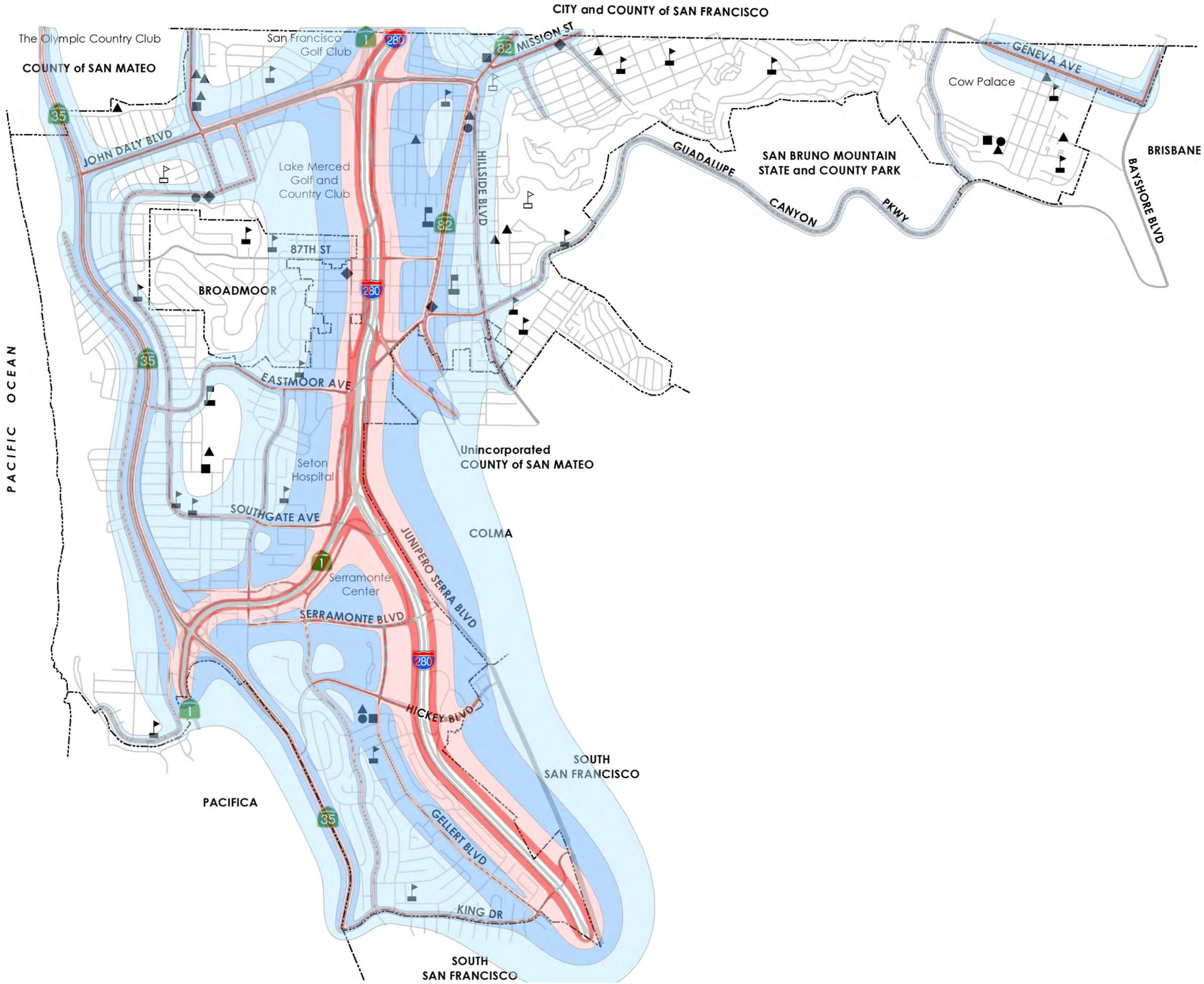


Figure NE-3

EXISTING NOISE LEVELS

Noise Levels

- 60-65 CNEL
- 65-70 CNEL
- 70-75 CNEL
- Greater Than 75 CNEL

Source: Charles Salter and Associates

CITY OF DALY CITY

NOISE ELEMENT

- Residential Low Density
- Residential Medium Density
- Residential High Density
- Agriculture
- Industrial
- Commercial
- Public
- Institutional
- Public Utilities
- Recreation
- Open Space
- Mixed Use
- Neighborhood
- Other

Table NE-1: Aircraft Events in the Serramonte Area

6-Jul-11		7-Jul-11				8-Jul-11	
Time	Lmax	Time	Lmax	Time	Lmax	Time	Lmax
1:08 PM	87	1:37 AM	83	1:52 PM	85	12:20 AM	91
1:19 PM	83	1:44 AM	92	2:02 PM	93	1:36 AM	82
1:33 PM	82	1:54 AM	83	2:23 PM	92	1:45 AM	84
1:41 PM	81	1:59 AM	92	2:26 PM	92	2:07 AM	91
1:45 PM	81	2:37 AM	86	2:34 PM	86	2:16 AM	92
1:49 PM	83	3:02 AM	93	2:50 PM	87	2:41 AM	90
2:17 PM	91	7:26 AM	83	3:08 PM	89	8:05 AM	87
2:22 PM	93	8:02 AM	86	4:27 PM	86	9:04 AM	84
2:24 PM	94	9:04 AM	83	4:41 PM	85	9:11 AM	84
2:31 PM	81	9:08 AM	87	4:57 PM	88	9:23 AM	84
2:37 PM	85	9:10 AM	84	5:19 PM	86	9:28 AM	87
2:43 PM	91	9:22 AM	87	5:25 PM	91	11:04 AM	81
3:18 PM	89	11:06 AM	83	6:29 PM	86	11:30 AM	93
4:26 PM	86	11:47 AM	93	6:34 PM	88	11:58 AM	92
5:16 PM	89	11:59 AM	93	7:07 PM	89	12:00 PM	93
7:15 PM	89	12:06 PM	90	7:17 PM	92	12:12 PM	86
7:46 PM	88	12:17 PM	86	7:42 PM	90	12:19 PM	88
7:48 PM	80	1:00 PM	83	7:45 PM	85	12:54 PM	82
11:20 PM	93	1:21 PM	84	9:20 PM	84		
11:50 PM	89	1:24 PM	82	10:11 PM	89		
		1:33 PM	83	10:27 PM	84		
		1:46 PM	93	11:23 PM	95		

Location B: Clarinada Drive. The purpose of this measurement is to quantify the noise exposure to the residents along Clarinada Drive. Homes in the area are somewhat protected from freeway noise as the freeway is elevated and thus breaks the line of sight from the noise source to the receiver. The neighborhood is also exposed to aircraft noise and local street traffic on Clarinada Drive. The measured noise level at this location increased approximately seven decibels from the 1987 measurement due to aircraft and traffic noise. The CNEL at this location is 70 dBA and the Leq is 66 dBA.

Location C: Station Avenue. The purpose of this measurement is to quantify the noise exposure to the second story of homes along Station Avenue. The second-story of the homes are exposed to higher noise levels than the first floor; this is because the first floors are shielded from noise by existing terrain. The terrain shielding reduces noise exposure on the first floors by 5 to 10 decibels compared to the second floors.

Environmental noise at this location is primarily generated by Interstate 280 traffic and BART train operations. The CNEL in this location is 76 dBA and the Leq is 71 dBA. This represents the worst case exterior noise exposure at the second story. The first story CNEL and L_{eq} levels are 66 dBA and 61 dBA.

Location D: Mission Street. The purpose of this measurement is to quantify the noise exposure to homes located on the east side of Mission Street behind the commercial frontage. Homes on the west side of Mission Street are at a lower elevation that street level and are thus shielded from traffic noise. The extent of the shielding is approximately 10 decibels; so quantification of the east side of Mission Street represents a worst-case analysis. The CNEL is 70 dBA and the L_{eq} is 64 dBA.

Location E: Daly City BART. The purpose of this measurement is to quantify the noise exposure to homes on the east side of the Daly City BART Station along Delong Street. The primary source of noise in the area is bus traffic rather than BART trains. The noise level in the area drops significantly after bus and BART train traffic ceases. The CNEL at this location is 68 dBA and the L_{eq} is 64 dBA.

Location F: Geneva Avenue. The purpose of this measurement is to quantify the noise exposure to buildings along Geneva Avenue generated by normal street traffic. The CNEL at this location is 74 dBA and the L_{eq} is 70 dBA. Increased noise levels expected along Geneva Avenue reflect the near doubling of traffic along this arterial projected as a result of increased development in the Bayshore neighborhood, Brisbane, and southeast San Francisco.

Projected Future Noise Environment

The following section describes the projected future noise environment in Daly City. The projected future year selected on which to base the noise contours is 2030, the end of the planning period of the current General Plan. See Figure NE-4 on page 225 for a depiction of future noise contours.

Future Noise Environment Predictions

The increase in CNEL noise exposure levels between the existing conditions and the 2035 future conditions is low throughout the City. It is generally accepted that a three decibel increase is barely perceptible.

Arterial roads in the Bayshore neighborhood are expected to increase between three and five decibels. Bayshore Boulevard is projected to increase by 3 dB (to CNEL 72 dBA), Geneva Avenue by 2 dB (to CNEL 76 dBA), Carter Street by 4 dB (to CNEL 68 dBA), and Guadeloupe Canyon Parkway by 5 dB (to CNEL 68 dBA).

Portions of Junipero Serra Boulevard are expected to see a noise increase of 6 dB to 7 dB from new developments. Hickey Boulevard between Gellert Boulevard and Interstate 280 is expected to increase by 4 dB.

Portions of Lake Merced Boulevard, Serramonte Boulevard, Skyline Boulevard (Highway 35), Templeton Avenue, and John Daly Boulevard are expected to have noise levels increase 2 dB. Interstate Highway 280 and State Highways 1 and 82 are expected to see increases of 1 dB. Other roads are expected to see increases of 1 dB or less.

Generally, aircraft noise is projected to be reduced in the future based on quieter aircraft technology and stricter regulations surrounding aircraft operations. An absolute prediction, however, cannot be made due to the lack of data on future airport operations.

San Francisco International Airport Noise Environment

San Francisco International Airport (SFO) is located approximately six miles southwest of the City of Daly City in a mostly unincorporated area of San Mateo County. The airport serves as the primary air carrier airport in the San Francisco Bay area and the Northern California region. In 2009, approximately 18.2 million enplaned passengers (37.3 million annual passengers) used the airport, making it the tenth busiest airport in the country and 20th busiest in the world based on passenger totals. SFO is owned and operated by the City and County of San Francisco, and is administered by the San Francisco Airport Commission and the Airport Director.

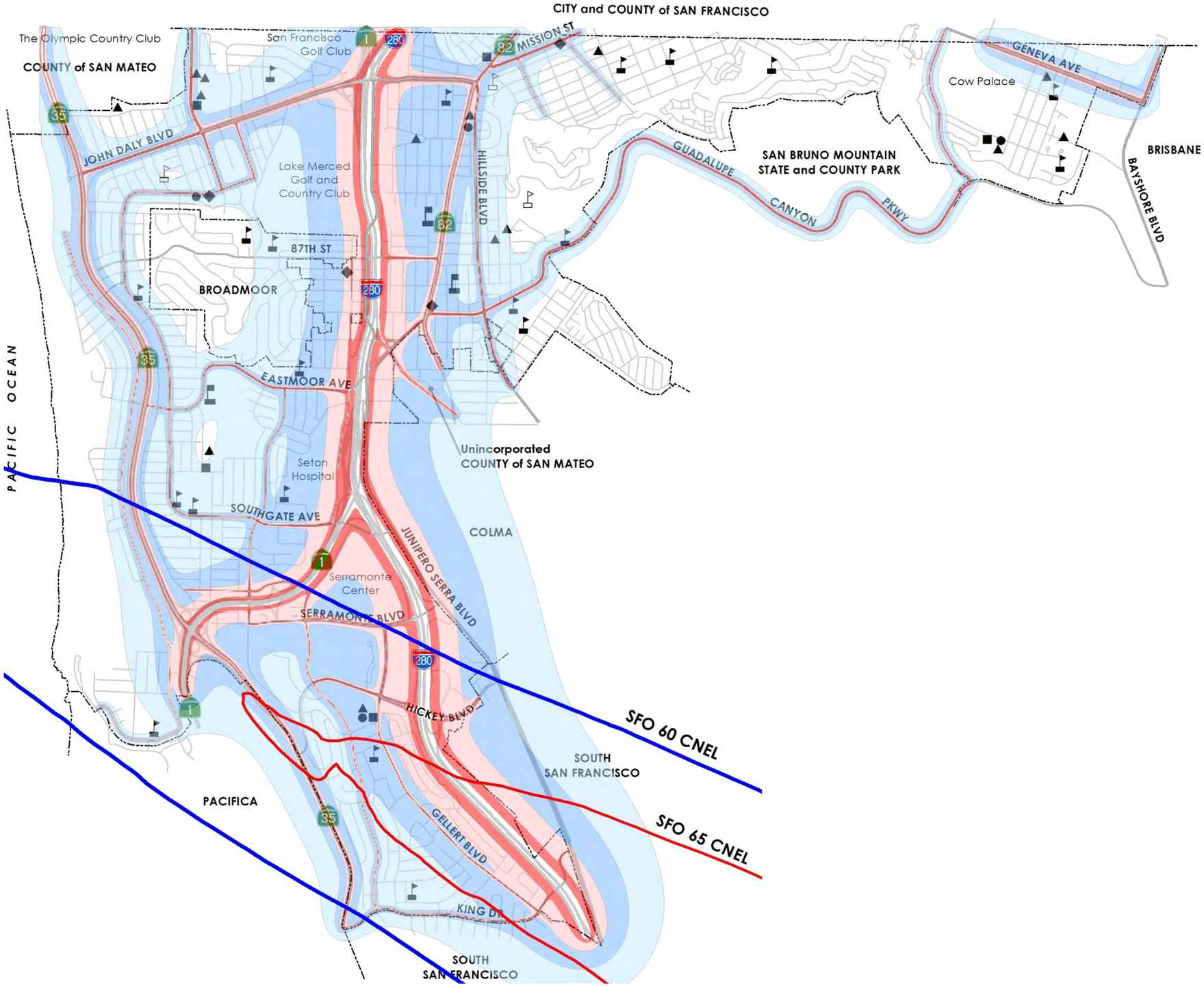


Figure NE-4

FUTURE NOISE LEVELS

Traffic Noise Levels 2035

- 60-65 CNEL
- 65-70 CNEL
- 70-75 CNEL
- Greater Than 75 CNEL

SFO Noise Levels

- 60 CNEL
- 65 CNEL

Sources: Charles Salter and Associates
City and County of San Francisco

CITY OF DALY CITY

NOISE ELEMENT

NORTH

0 0.5 1 1.5 mi

Airport Land Use Compatibility Plan

State law requires airport land use commissions to prepare and adopt an Airport Land Use Compatibility Plan (ALUCP) for airports within their jurisdiction. In San Mateo County, the City/County Association of Governments (C/CAG) has prepared the ALUCP for SFO in its designated role as the Airport Land Use Commission (ALUC) for San Mateo County. C/CAG adopted the SFO ALUCP in November 2012. The Plan identifies the following four areas of concern:

- Aircraft Noise Impact Reduction – To reduce the potential number of future airport area residents who could be exposed to adverse noise impacts from airport and aircraft operations.

- Overflight Notification – To establish an area within which aircraft flights to and from the Airport occur frequently enough and at a low enough altitude to be noticeable by noise-sensitive residents.

- Safety of Persons on the Ground and in Aircraft in Flight – To minimize the potential number of future residents and land use occupants exposed to hazards related to aircraft operations and accidents.

- Height Restrictions/Airspace Protection – To protect the navigable airspace around the Airport for the safe and efficient operation of aircraft in flight.

Airport Influence Areas

In compliance with State law, the ALUCP identifies the Airport Influence Areas (AIA) for SFO where airport-related factors may significantly affect land uses or necessitate restrictions on those uses as determined by the Airport Land Use Commission. The AIA includes two parts: Area A and Area B (see SFO ALUCP adopted November 2012). Area A is the larger of the two areas and encompasses all of San Mateo County. Area B lies within Area A and includes much of westerly Daly City exposed either to aircraft noise above CNEL 65 dB or lying below critical airspace surfaces. Within Area A, state law requires that people offering subdivided property for sale or lease to disclose the presence of all existing and planned airports within two miles of the property. Within Area B, the ALUC reviews proposed land use policy actions, including new general plans, specific plans, zoning ordinances, plan amendments, rezonings, and land development proposals for consistency with the relevant land use compatibility criteria in the plan. Task NE-11.1 requires routing such projects to the ALUC in compliance with this requirement.

Noise Compatibility Criteria

When reviewing proposed policy actions and/or related development, the ALUC is required to determine airport/land use compatibility using the safety compatibility criteria, airspace protection/height limitation criteria, and noise compatibility criteria identified in the ALUCP. Figure NE-4 identifies the area within Daly City where airport noise exposure is great enough to warrant land use controls to promote noise compatibility. This area is generally where aircraft noise is or is projected in the year 2020 to be at levels above CNEL 65 dB, and primarily lies within the Serramonte neighborhood.

Within this area, compatibility of proposed land uses shall be determined according to the noise/land use compatibility criteria shown in Table NE-2, which reflects the compatibility criteria identified in the ALUCP. These criteria indicate whether a proposed land use is "compatible," "conditionally compatible," or "not compatible" within each zone, designated by the identified CNEL ranges.

Any action that would either permit or result in the development or construction of a land use considered to be conditionally compatible with aircraft noise of CNEL 65 dB or greater may be required by the ALUC to record an avigation easement to the benefit of the City and County of San Francisco, as proprietor of the Airport. Policy NE-11 ensures the City's continued compliance with the ALUCP, and provides that the City shall ensure that any ALUC requirement for an avigation easement will be

implemented prior to final approval or, if the project requires construction, prior to building permit issuance.

Table NE-2: SFO Noise/Land Use Compatibility Criteria

LAND USE	COMMUNITY NOISE EQUIVALENT LEVEL (CNEL) < 65 dB	65-70 dB	70-75 dB	> 75 dB
Residential				
Residential, single family detached	Y	C	N *(a)*	N
Residential, multi-family and single family attached	Y	C	N *(a)*	N
Transient lodgings	Y	C	C	N
Public/Institutional				
Public and Private Schools	Y	C	N	N
Hospitals and nursing homes	Y	C	N	N
Places of public assembly, including places of worship	Y	C	N	N
Auditoriums, and concert halls	Y	C	C	N
Libraries	Y	C	C	N
Outdoor music shells, amphitheaters	Y	N	N	N
Recreational				
Outdoor sports arenas and spectator sports	Y	Y *(c)*	Y *(c)*	N
Nature exhibits and zoos	Y	Y	N	N
Amusements, parks, resorts and camps	Y	Y	Y	N
Golf courses, riding stables, and water recreation	Y	Y	Y	Y
Commercial				
Offices, business and professional, general retail	Y	Y	Y	Y
Wholesale; retail building materials, hardware, farm equipmen	Y	Y	Y	Y
Industrial and Production				
Manufacturing	Y	Y	Y	Y
Utilities	Y	Y	Y	Y
Agriculture and forestry	Y	Y *(b)*	Y *(d)*	Y *(d)*
Mining and fishing, resource production and extraction	Y	Y	Y	Y

Notes:

CNEL = Community Noise Equivalent Level, in A-weighted decibels.

Y (Yes) = Land use and related structures compatible without restrictions.

C (conditionally compatible) = Land use and related structures are permitted, provided that sound insulation is provided to reduce interior noise levels from sources to CNEL 45 dB or lower and that an avigation easement is granted to the City and County of San Francisco as operator of SFO. See Policy NE-X.exterior

N (No) = Land use and related structures are not compatible.

(a) Use is conditionally compatible only on an existing lot of record zoned only for residential use as of the effective date of the ALUCP. Use must be sound-insultated to achieve an indoor noise level of CNEL 45 dB or less from exterior sources. The property owners shall grant an avigation easement to the City and County of San Francisco prior to issuance of a building permit for the proposed building or structure. If the proposed development is not built, then, upon notice by the local permitting authority, SFO shall record a notice of termination of the avigation easement.

(b) Residential buildings must be sound-insulated to achieve an indoor noise level of CNEL 45 dB or less from exterior sources.

(c) Accessory dwelling units are not compatible.

SOURCES: Jacobs Consultancy Team 2010. Based on State of California General Plan Guidelines for noise elements of general plans; California Code of
Regulations, Title 21, Division 2.5, Chapter 6, Section 5006; and 14 CFR Part 150, Appendix A, Table 1.
PREPARED BY; Ricondo & Associates, Inc., June 2012.

Noise Goal, Policies, and Tasks

The noise goal reflects the general direction the City wishes to advance. The objectives represent actions which can be measured over time, that provide a general direction toward achievement of the goal, while the policies reflect more specific actions that the City will take in order to attain the noise goal. The City's Noise goal is:

> "Promote a noise environment that reflects a balance of the various City objectives while providing an environment that maintains a healthy living environment; fosters relaxation and recreation; is conducive to the work environment; and provides pleasant living conditions."

Many factors of this goal must be considered. First of all, objectives that must be considered in conjunction with noise concerns include the provision of housing for all segments of the City: the provision of an efficient transportation and infrastructure system; economic and commercial development in the City; and a safe and pleasant environment within which to work and live. No element of the General Plan can be considered in isolation from the others and this is particularly true of the Noise Element. For example, transportation modes are a major source of noise in Daly City. Not expanding roadways or improving roadway surfaces, when needed, can add to the noise environment and locating new housing close to major transportation corridors can expose residents to high noise levels. Take as another example the construction of housing, a City objective addressed in the Housing Element. Short term noise impacts occur during housing construction and additional people and traffic also add incrementally to the noise environment. Moreover, potential sites for infill housing must be carefully evaluated in terms of the location of noise sources that could impact future residents. Various City goals must be considered as a whole and not incrementally, In order to provide a balanced and well-functioning City.

Although various City objectives influence the noise environment, the noise goal should not lose sight of quality of life issues; such as quiet areas for relaxation and recreation. Open spaces, parks and private backyards should be maintained in a relatively quiet environment. An environment that one can relax in without intrusive or jarring noise impinging upon the experience is essential to personal well-being and the quality of life one enjoys in their community.

Conducive work environments and pleasant living conditions are easier to attain than providing quiet open space areas. A conducive work environment is of primary importance in worker productivity and physical well-being. Pleasant living conditions are tied to reduced noise levels in the home thus providing an environment where people can converse, dine, relax, and rest. Noise insulation standards and alteration of building placement in relationship to noise sources are two common methods utilized to reduce interior noise levels. Title 24 Noise Insulation Standards and careful site planning shall continue to be employed in Daly City as a means to reduce interior noise levels.

To implement the noise goal, this element provides for the following policies and tasks:

Noise Identification and Mitigation

Policy NE-1: **Use the future noise contour map to identify existing and potential noise impact areas.**

Task NE-1.1: Use the existing and projected noise contours in conjunction with the State Office of Noise Control Guidelines (Guidelines) to identify areas where land use

incompatibilities exist and to guide future noise sensitive development to appropriate and compatible locations.

Task NE-1.2: Use the existing and projected noise contours to identify existing noise impact areas that could benefit from noise insulation programs.

Policy NE-2: Use the State Office of Noise Control Guidelines as a guide to assess development that will need additional noise study and mitigations.

Task NE-2.1: Use the Noise Control Guidelines to assess the suitability of a site for new development in combination with the noise contours to accurately identify areas that may need additional noise study and mitigation. Noise mitigations include additional insulation, double glazing of windows and increasing building setbacks from the noise source. Mitigations should also be creative and attractive whenever possible and appropriate. Creative noise mitigation measures can include incorporation of fountains using water to mask freeway noise and noise walls of an appropriate scale painted with decorative murals.

Policy NE-3 Maintain a CNEL level of not more than 70 dBA L_{eq} in residential areas.

Task NE-3.1: Continue to enforce the environmental noise requirements of the State Building Code (Title 24).

Task NE-3.2: Encourage noise insulation programs in areas that do not meet the current noise standard and ensure that future development is mitigated appropriately or avoided in areas where the noise levels exceed or is projected to exceed 70 dBA, L_{eq}.

Policy NE-4: Maintain a noise level not in excess of 75 dBA CNEL in open space, parks, and tot lots, including outdoor activity areas such as outdoor entertainment or green space of multi-family projects.

Task NE-4.1: When feasible, situate new parks and tot-lots away from busy streets or other known noise sources.

Policy NE-5: Maintain the City's current standard of 75 dBA CNEL for office, commercial and professional areas.

Task NE-5.1: Additional noise studies should be conducted in "Conditionally Acceptable" noise environments to ensure adequate mitigation features are employed. Usually conventional construction with closed windows and fresh air supply systems will maintain a healthy noise environment.

Policy NE-6: Require new development to perform additional acoustical studies in noise environments that are identified as 'Conditionally Acceptable' or 'Normally Unacceptable' to the Guidelines.

Task NE-6.1: Require acoustical studies for new development through the discretionary review and California Environmental Quality Act processes, while paying particular attention to borderline noise environments. Conditions and mitigations, as appropriate, should be attached to projects.

Task NE-6.2: As part of the development of the new Commercial Mixed-Use zone, identify and codify, where possible, noise attenuation measures to assure that noise impacts by more intensive development to adjacent residential uses are reduced.

Policy NE-7: **Require proposed intensification of development and proposed new development in noise environments identified as "Clearly Unacceptable" in the Guidelines to reduce ambient interior noise levels to 45 dBA, CNEL.**

Task NE-7.1: Either discourage new development or mitigate the noise impacts to it in areas identified as "Clearly Unacceptable" in the Noise Compatibility Guidelines.

Policy NE-8: **Discourage noise sensitive land uses from locating in areas of inappropriate or high noise levels.**

Task NE-8.1: Work to ensure that the outdoor ambient noise levels for uses such as day care centers, extended care facilities, and group care homes in residential neighborhoods not exceed 70 dBA, CNEL. For such uses allowed by right, the City should encourage a potential care provider to maintain an appropriate noise environment.

Task NE-8.2: Continue to attach conditions of project approval to residential day care centers in excess of eight children through the administrative use permit process to maintain an appropriate noise environment.

Policy NE-9: **Work to ensure that the expansion of or changes to existing land uses do not create additional noise impacts for sensitive receptors in the vicinity of the project from intensification or alteration of existing land uses by requiring applicants .**

Task NE-9.1: Depending upon the hours of operation, intensity of use, and the location of sensitive receptors in the area, the expansion or change of use could cause noise impacts. Acoustical studies should be performed, at the applicant's expense, during the discretionary and environmental review processes and conditions should be placed on the project accordingly.

Policy NE-10: **Work with SamTrans and MUNI in the placement of bus stops in order to reduce noise associated with bus activity to noise sensitive receptors.**

San Francisco International Airport Noise Environment

Policy NE-11: **Require that all future land use actions and/or associated development conforms to the relevant height, aircraft noise, and safety policies and compatibility criteria contained in the most recently adopted version of the Airport Land Use Compatibility Plan for the Environs of San Francisco International Airport.**

Task NE-11.1: Route any proposed land use policy actions, including new specific plans, zoning ordinances, general plan amendments, and rezoning involving land development to the Airport Land Use Commission in compliance with the Airport Land Use Plan.

Task NE-11.2: Require that development involving the construction of one or more dwelling units within the 65 dBA CNEL SFO noise contour to submit an avigation easement to the airport, when required by the Airport Land Use Commission. Specific avigation easement requirements shall be consistent with the Airport Land Use Compatibility Plan for the Environs of San Francisco International Airport. This requirement shall be implemented prior to final project approval or, if the project requires construction, prior to building permit issuance.

Task NE-11.3: Require all future development within the Airport Influence Area B boundary for San Francisco International Airport to conform to the relevant height/airspace protection, aircraft noise, and safety policies and land use compatibility criteria contained within the most recent adopted version of the comprehensive airport/land use compatibility plan (ALUCP) for the environs of San Francisco International Airport.

Task NE-11.4: Ensure that all future development in Daly City complies with all relevant FAA standards and criteria for safety, regarding flashing lights, reflective building material, land uses that may attract large concentrations of birds, HVAC exhaust vents, thermal plumes, and uses that may generate electrical/electronic interference with aircraft communications and/or instrumentation.

Noise Programs

Noise Programs are action programs defining what Daly City is doing or intends to do to implement the policies and achieve the Goal and Objectives of the Noise Element. The Noise Programs are organized into two major categories: Current Programs for Noise Reduction and Proposed Programs for Noise Reduction. The program identifies the specific action; the existing or anticipated funding source, as appropriate; the responsible agency; and, the time frame for each component. The following specific actions have been undertaken by Daly City in response to the needs of the noise environment.

Current Programs for Noise Reduction

Daly City Municipal Code

Chapter 9.22 of the Daly City Municipal Code contains language to protect residents from excessive noise exposure. Section 9.22.010 prohibits an individual from causing a disturbance such that it disturbs the public peace off-site. Section 9.22.020 states that no person shall maintain, operate, or conduct any loudspeaker or amplifier in such a manner as to cause the sound to be projected outside any building or out of doors in any part of the City without first obtaining a permit to do so, Section 9.22.030 deals more specifically with noise and states that between the hours of 10:00 p.m. and 6:00 a.m. no person shall cause, create, or permit any noise which may be heard beyond the confines of the property of origin. The Police Department enforces Chapter 9.22 of the Municipal Code.

Title 24 Noise Insulation Standards for Multi-Family Development

Title 24 of the California Administrative Code requires a particular set of noise insulation features be incorporated into multi-family residential construction. Additional noise insulation is required because multi-family development is usually permitted in a slightly noisier environment than single-family and because adjacent apartments are an additional source of noise in multi-family areas. Title 24 is prescribed by state law and enforced by the Building Division through the permit process and building inspection prior to issuance of the Certificate of Occupancy.

Discretionary Review of Projects

Title 17 Zoning of the Daly City Municipal Code provides for discretionary review of projects through the use permit and variance process. An application for development is analyzed in light of many concerns including comparing the proposed use against the noise contours and Noise Compatibility Guidelines. The Planning Division attaches conditions of project approval to reduce noise impacts to future occupants of the proposed development as well as conditioning times construction activities may occur in order to reduce noise impacts to surrounding land uses.

California Environmental Quality Act Review

The California Environmental Quality Act (CEQA) mandates an initial study be prepared on all projects except for those that are categorized as exempt or administrative. Administrative projects are projects that are allowed by right in a particular zoning district for which an applicant need only apply for a plan check and a building permit. The courts however, in the recent past, have interpreted the law to include administrative projects of substantial size or magnitude to be included under the provisions of CEQA.

An initial study is prepared for such projects and based upon the findings of the study. The project is conditioned accordingly. If significant potential impacts are identified an environmental impact report may be required and mitigations are applied to the project accordingly.

Environmental impact reports are an important tool when assessing potential noise impacts from proposed development projects. A noise study is conducted, if determined necessary. A noise study usually involves actual noise measurements of the existing noise environment in the vicinity of the proposed project. Population and traffic projections are used to determine the percent of increased vehicle trips in the project area, or project region depending on the size or type of the proposal. The extent that vehicular traffic increases has a direct quantifiable bearing on the potential noise impacts of a proposed project. Traffic data, including traffic speeds, and percent of trucks present in a traffic stream, is entered into a computer model. The end result of the modeling is a reasonable projection of the noise impacts associated with a particular project.

The projected noise environment is then compared to the State Noise Compatibility Guidelines, for the particular land use in question. A project may go forth without additional noise insulation or mitigation features if the noise level is within the "Normally Acceptable" range, The "Conditionally Acceptable" range sometimes requires additional noise reduction requirements while the 'Normally Unacceptable' and 'Clearly Unacceptable' noise ranges provide a basis to deny a project in terms of noise impacts, Noise reduction techniques can include additional insulation, double glazing of windows. increasing building setbacks from the noise source, altering the placement of the buildings in order to utilize noise reflection in a beneficial manner, and construction of a sound wall, If noise generated from a proposed project is determined to have a significant unavoidable impact in other areas, and it is an impact that cannot be mitigated, the project may be denied.

Noise, of course, is not the only consideration when determining the merits of a particular project. Approval or denial of a project requires weighing all the potential impacts and benefits of a project. Benefits and impacts may occur in areas such as housing and density; land use compatibilities or incompatibilities; air quality, circulation, transportation and parking; socio-economics such as the location of job force, economic impacts or benefits to the city or region; the consideration of public services and infrastructure available to support the project; the location and extent of natural and man-made hazards, such as earthquake and slide areas or the presence of hazardous materials.

Proposed Programs for Noise Reduction

The following specific actions will be undertaken by the City in order to implement the policies outlined in this element.

Apply Title 24 Noise Insulation Standards to Single-Family Development

Objective: Ensure ambient interior noise levels sufficient to protect public health in single-family development

Responsible Agency: Planning Division, Engineering Division, Building Division

Time Frame: [insert timeframe]

Funding Source: Developer

Activity:

Title 24 noise insulation standards are required by state law to be applied to multi-family residential development. These same standards can be applied to single-family development in appropriate cases to insure that the interior ambient noise levels are sufficient to protect the residents from adverse noise impacts. Title 24 would not be applied in every case; but in cases where new residential development is proposed in a noise environment above 60 dBA, CNEL. The Planning and Engineering Divisions would identify the project, through discretionary or California Environmental Quality Act review, where this condition or mitigation should be applied, The Building Division, through plan check and building inspection, would insure that the standards were being incorporated in building design, and construction.

Program NE-1: Apply for Federal Monies to Retrofit Homes Affected by Aircraft Noise

Objective: Reduce noise levels to homes affected by airport noise
Responsible Agency: Department of Economic and Community Development
Time Frame: Continuing
Funding Source: City and County of San Francisco, Federal Aviation Administration, Private Funds
Activity: The City has applied for federal monies to retrofit homes that are affected by aircraft noise. Homes affected by aircraft noise in Daly City are located in the southeastern portion of the City. The program consists of installing additional noise insulation to homes. The City and County of San Francisco would pay 20 percent of the costs and the Federal Aviation Administration (FAA) would supply the remaining 80 percent. Under FAA guidelines retrofit homes must be within the 65 dBA, CNEL contour area. At this time it is questionable if the City falls within this noise contour. A final determination will be made by the FAA.

Program NE-2: Amend the Municipal Code to Include Standard Noise Conditions for Construction Activities

Objective: Enforce unilateral noise control measures for all construction related noise
Responsible Agency: Planning Division, Engineering Division, Building Division, City Attorney
Time Frame: 2015

Funding Source: General Fund

Activity: Currently through the Planning and Building Divisions the City enforces construction related noise by attaching conditions to project approval. The conditions regulate the time that grading and site preparation activities may occur; times that machinery may be started up; and the times that cleaning and shut-down may occur. The conditions protect surrounding properties from excessive noise after 5:00 P.M. Monday through Friday, and on the weekends. There are provisions for emergency work provided the developer or the contractor secure permission from the City Engineer and certain findings are made.

Amending Chapter 15 Building of the Municipal Code would apply these types of noise conditions to all construction. The Engineering and Planning Divisions and the City Attorney would draft language for adoption. The City would adopt the changes by ordinance and the provisions would be enforced by the Building Division through the building permit process.

Appendix NE-A

Glossary

The following section defines some of these technical terms used in this document in an attempt to clarify their meaning. Many of the terms described below are also used in other planning documents, such as environmental impact reports, when estimating the traffic impact of a proposed development project.

A-Weighted Sound Level (dBA) is the sound pressure in decibels as measured on a sound meter using the A-filtering network. The A-filtering network de-emphasizes the very low and very high components of sound in a manner similar to the response of the human ear. The acronym dBA accompanies a given measurement or calculation and indicates a particular noise level measured with an A-filtering device.

Absorption reduces (attenuates) noise. Some portions of sound energy that strike a surface are converted to heat (thermal) energy rather than being reflected as noise; this reduces the amount of energy that is heard as noise. Absorptive materials include thick glass, spun fiberglass and materials such as upholstered furniture (as opposed to wood furniture), drapes and carpeting.

Airborne sound is sound that reaches the point of interest by travelling through air.

Ambient Noise Level constitutes the "normal" or "background" noise components and level of noise at a given location. Ambient noise is a composite from all noise sources that are experienced in a given location, Ambient noise in a residential area, for example, could consist of sounds of people talking, dogs barking, children playing and cars passing by. Ambient noise in an office might consist of people talking, telephones ringing, and the sound of typewriter or computer keyboards clicking. Ambient noise in a cabinet shop could include saws, grinders, drills, sanders, and people shouting.

Attenuation refers to the lessening or reduction of a noise level, Noise attenuates by travelling a distance from the source or by other mechanisms such as absorption or reflection. The placement of buildings, sound walls, and noise insulation features are predicated on noise attenuation. Noise will attenuate at different levels depending if the noise source originates from a point or line source and if it travels over a hard or soft surface and if it is absorbed or reflected by a noise mitigation feature. Basically five things are taken into consideration when calculating noise attenuation: the type of noise; level of noise at the source; distance the noise travels to the point of interest; type of terrain over which the noise travels; and the presence or absence of noise barriers.

Building Envelope is a technical term which refers to the components of a building such as the foundation, walls, windows and insulation and is an important concept in noise attenuation. Portions of the building envelope will reflect noise, some portions will absorb noise and some noise will be transmitted through to the interior of the building. This term is discussed further in the following section, as characteristics of the building envelope have an important impact on noise reduction for residential, and other, areas.

Community Noise Equivalent Level (CNEL) is the average equivalent A-filtered sound level during a 24-hour period. The value is obtained after the addition of 5 decibels to sound levels in the evening from 7:00 p.m. to 10:00 p.m. and after the addition of 10 decibels in the night after 10:00 p.m. and 7:00 a.m. The CNEL weights the actual noise measurements taken to account for the increased sensitivity people have to noise during the evening and nighttime hours. Daly City's Noise Element employs this noise weighting metric.

Cycles per second is a measure of frequency numerically equivalent to hertz.

Decibel is a logarithmic unit of sound intensity. Sound waves travel out from a source and exert a force known as sound pressure. The sound pressure level of intensity is measured in decibels and is usually referred to as the sound level.

Doubling Distance refers to the doubling of a given distance (in feet) from a particular noise source. Doubling distance is used to calculate the amount noise will attenuate (reduce) from the noise source to the noise receiver.

Pay Night Average Noise Level (L_{dn}) is the average equivalent A-filtered sound level during a 24-hour period obtained after the addition of 10 decibels to sound levels in the night after 10:00 P.M. and before 7:00 A.M.. The L_{dn} weights noise measurements taken to account for the increased sensitivity people have to noise during the nighttime hours.

Energy Equivalent Noise Level (L_{eg}) is the sound level corresponding to a steady state sound level containing the same total energy over a given period of time.

Environmental noise is a combination of noise from various sources which produce a relatively steady or ambient noise level. Environmental noise is a term often uses to describe outdoor ambient noise that one experiences in our daily environment.

Frequency is the number of times per second that the sine-wave of sound repeats itself, or that the vibrating object repeats itself. Frequency is expressed in hertz (Hz) and was formally expressed in cycles per second.

Hard surfaces (terrain) include paved surfaces and concrete buildings. Hard surfaces reflect noise and tend to absorb less noise than do soft surfaces and thus. in the absence of other noise mitigation features, tend to attenuate noise less than soft surfaces. The importance of hard or soft surfaces comes into play in absence of other noise attenuation features and are most important when calculating noise attenuation due to distance from the noise source.

Hertz (Hz) is the unit of measurement of frequency numerically equal to cycles per second.

Intrusive noise is a noise that intrudes over the existing ambient noise in a given location. The relative intrusiveness of the sound depends upon the amplitude, duration, frequency and time of occurrence of the intrusive noise as well as the level of the ambient noise.

Line of site is often used when describing the noise source and noise receiver relationship. Basically, if one can see the noise source then one can hear the noise; if however, the line of sight is broken by a wall, building, mountain, or other barrier, then the noise source is reduced accordingly. Various features reduce noise at different levels and these differences are discussed throughout this noise element,

L_{max} is the highest noise (sound pressure) level recorded during the measurement period. The L_{max}, then represents one intrusive noise event, there may be others of less intensity, during the measurement period. Intrusive noise can typically be from such sources as an aircraft flyover, a horn or siren, or construction activities.

Line source is a noise originating from a line such as a stream of moving traffic, a moving train, conveyor belt, or even a river. Noise from a line source produces parallel sound waves moving linearly outward from the source, Noise will attenuate 3 dBA per doubling of distance from a line source in hard terrain and approximately 4.5 dBA per doubling of distance in soft terrain. The significance in the distinction between a line and point surface is the rate of attenuation.

Noise is a sound that is undesirable because it interferes with speech or hearing, or has the intensity or duration of such to damage hearing, or, is otherwise annoying.

Noise Compatibility Guidelines, developed by the State Office of Noise Control, establish certain criteria for noise levels with regard to land use compatibility. Each category of land use enjoys a range of noise levels considered compatible with the use and the noise levels may increase provided certain noise insulation features are employed. Daly City has adopted the Noise compatibility Guidelines.

Noise exposure contours are lines drawn about a noise source which indicate a constant level of noise exposure. Noise contours are similar to contours drawn on a topographical map which represent areas of the same elevation. Noise contours are significant inasmuch as they indicate areas where noise mitigation measures may be needed and they indicate what types of land uses are subject to particular noise exposures.

Point source noise originates from a single source such as a horn, motor and machinery. Point source noise produces spherical waves which travel outward in a circular pattern from the source. Point source noise attenuates approximately 6 dBA per doubling of distance from the source in hard terrain and approximately 9 dBA per doubling of distance in soft terrain. The significance in the distinction between a line and a point source is the rate of attenuation.

Reflection is a method that can reduce noise, Noise strikes a hard surface and is reflected back toward the source of the noise. Reflection can reduce noise in one area while adding noise in another area.

Sensitive receptor includes people engaging in activities that are sensitive to noise. Residential areas, hospitals, extended care facilities, schools, libraries and open spaces are land uses sensitive to noise.

Soft surfaces (terrain) include surfaces such as barren earth, soil, landscaped areas, and acoustically absorptive materials. Soft surfaces absorb more sound energy than hard surfaces and thus more noise is attenuated in a soft environment. The importance of hard or soft surfaces comes into play in absence of other noise attenuation features and are most important when calculating noise attenuation due to distance: the further one is from the noise source the lesser the noise level (sound energy) at that location.