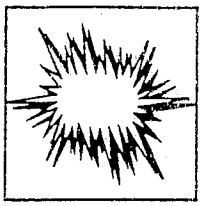
NOISE ELEMENT



The noise element identifies and appraises noise problems in the community and analyzes and quantifies current and projected noise levels for all of the following sources:

1. Freeways.
2. Primary arterials and major local streets.
3. Railroad operations and public transit (bus) systems.
4. Commercial airport operations and aircraft overflights.
5. Other ground stationary noise sources identified by local agencies as contributing to the community noise environment.

The statutory requirements for noise elements are found in California State law, Government Code Section 65302(F).

The information contained in this Element summarizes pertinent noise data contained in the Background Technical Report (BTR) of the General Plan. In addition, the Element presents goals, policies, and implementation programs designed to address the unique demands and challenges related to the City of Bellflower's unique noise environment.

Summary of Findings: The majority of Bellflower's noise is generated from automobiles. Other significant sources of noise in Bellflower include incompatible land uses (commercial and industrial uses adjacent to residential uses), railroad noise, and construction operations.

Exhibit 1 displays Bellflower's current noise contours for City streets, the Artesia (91) Freeway, and the Southern Pacific Railroad right-of-way. Noise sensitive receptors are also shown on Exhibit 1. This information, projected for the year 2010, is shown on Exhibit 2.

The nearest airport to Bellflower is located in the City of Long Beach. The City of Bellflower is also situated within Los Angeles International Airport's (LAX) flight pattern. In addition, the Los Angeles County Sheriff's Department Sky Knight utilizes local freeways (the Century (105), San Gabriel (605), and the Riverside (91) Freeways) for ground guidance.

"With a general store, a school, a post office, affordable lots, and ready access to the city, the population of Bellflower rose rapidly, increasing from an estimated 100 in 1908 to 1,000 in 1912..." Bellflower: A Pictorial Essay

In order to preserve Bellflower's quality of life, sensitive land uses (residences, schools, churches, and hospitals) should be protected from excessive noise. Useful mechanisms for the regulation of noise include: the site plan review process; utilizing noise attenuation mechanisms in redeveloped and new construction; and enforcing noise regulations set forth in the zoning code. (See Figure 1)

GOALS AND POLICIES:

The following goals and policies address citywide noise issues:

ISSUE: Due to Bellflower's urban nature, noise generated from automobiles and other urban elements can adversely affect its quality of life.

GOAL 1: Maintain or reduce noise levels throughout the City.

POLICIES:

1.1 Utilize the "State of California Noise and Land Use Compatibility Guidelines" (Figure 1) for the siting of various land uses to ensure compatibility.

1.2 Utilize noise attenuation mechanisms specified in the Uniform Building Code and the State Noise Insulation Standards (California Administrative Code, Title 24). Noise attenuation mechanisms include; double glazing, sound walls, insulation, and proper siting of land uses.

1.3 Support the enforcement of existing speed limits and ensure motor vehicle codes are enforced. Require mufflers on all vehicles.

1.4 Limit construction activities which impact adjacent residential uses to the hours of 7 A.M. to 8 P.M. during weekdays and Saturdays.

1.5 Require construction activities to incorporate feasible and practical techniques which minimize noise impacts on adjacent areas.

1.6 Restrict the use of "leaf/grass blowers" to the hours of 8 A.M. to 7 P.M.

"As for the informal life of the people, the river (San Gabriel River) seems to have been the focus of the New River Settlement. It was a congregating place where families could get together to picnic and swim." About 1915, Bellflower: A Pictorial Essay

1.7 Ensure the outdoor noise limits for residential uses do not exceed 60 dB CNEL for single family uses and 65 dB Ldn for multiple family uses.

1.8 Ensure the indoor noise limits for all residential uses do not exceed 45 dB CNEL.

1.9 Actively pursue sound wall mitigation measures with Cal Trans and the Metropolitan Transit Authority (MTA).

ISSUE: Industrial and commercial noise generators located adjacent to residential and other sensitive land uses can cause incompatible noise-related impacts.

GOAL 2: Protect residential and other sensitive land uses from the exposure of commercially- and industrially-generated noise.

POLICIES:

2.1 Through the site plan review process, require new development to locate driveways, loading and parking areas, and processing/ manufacturing areas so they do not adversely impact adjacent and nearby sensitive land uses (residences, churches, schools, and hospitals).

2.2 Use design standards and other mechanisms to contain noise generated by commercial and industrial land uses on site.

2.3 Encourage employers to participate in van-pools and other traffic management programs to reduce traffic and noise impacts in the City.

"... it was on the boulevard (Somerset/Bellflower) that Bellflower celebrated its own arrival in 1910 in classic earlier American style by staging a Fourth of July parade and picnic, complete with oration and fireworks. The townspeople kept up the habit for years ..." Bellflower: A Pictorial Essay

ISSUE: Noise impacts associated with commercial truck traffic and other vehicles traversing neighborhoods can adversely impact Bellflower's quality of life.

GOAL 3: Reduce noise impacts caused by commercial truck and vehicular traffic, especially in residential neighborhoods.

POLICIES:

3.1 Discourage through truck and vehicular traffic in residential neighborhoods by posting and enforcing speed limits and restricting access for trucks.

3.2 Through the development review process, regulate commercial delivery times and routes.

3.3 Require truck deliveries to commercial properties abutting residential uses to be limited to 8 A.M. to 8 P.M. unless there is no feasible alternative or there are overriding considerations.

Issue: Railroad noise is intrusive to residential land uses.

Goal 4: Minimize railroad noise impacts on residential areas.

POLICIES:

4.1 Encourage Southern Pacific Railroad to schedule trains during daylight hours when possible.

IMPLEMENTATION PROGRAMS

1. **IMPLEMENTATION PROGRAM:** Adopt a noise regulation ordinance which will establish land use noise incompatibility criteria and set standards for exterior and interior noise levels.

2. **IMPLEMENTATION PROGRAM:** Regularly communicate with safety providers about limiting siren usage by emergency, fire, police, and ambulance vehicles

3. **IMPLEMENTATION PROGRAM:** Enforce the California Noise Insulation Standards (Title 25, California Administrative Code) for the construction of new residential dwellings to ensure that interior noise levels do not exceed 45 dB CNEL.

4. **IMPLEMENTATION PROGRAM:** Utilize the design review process to ensure that new commercial and industrial uses do not generate noise levels (over 65 dB CNEL) that could adversely impact nearby residential and other sensitive land uses.

5. **IMPLEMENTATION PROGRAM:** Encourage the placement of noise tolerant land uses (commercial and industrial) adjacent to noise producing generators, such as

"With over 50 trains running from morning to night, it was sometimes easier and faster to go to Los Angeles than to travel a few miles from home. The Pacific Electric line permitted citizens of small county towns to enjoy a sense of local identity without the feelings of isolation characteristic of frontier life." about 1945, Bellflower: A Pictorial Essay

transportation corridors and railroads.

6. **IMPLEMENTATION PROGRAM:** Utilize the City's code enforcement mechanisms to abate noise nuisances.

7. **IMPLEMENTATION PROGRAM:** Periodically review County and regional plans for land use, transportation, and airport operations to identify any potential noise impacts.

8. **IMPLEMENTATION PROGRAM:** When improvements to the City circulation system are planned, consider and analyze the noise effects of truck mix, speed limits, and ultimate motor vehicle volumes on adjacent and nearby land uses.

"For half a century, from the 1920s to the 1970s, ranch and city did meet in Bellflower in a larger way than the creators of this Chamber of Commerce slogan could have anticipated. Beginning in the twenties, poultry and dairy farming developed from small and amateur farming operations for which Bellflower was noted." Bellflower: A Pictorial Essay

A:\NOISE.Pol/revised 9-7-95

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1.0 INTRODUCTION

The Noise Element is a statement of the City's policy and intent regarding land use in relation to environmental noise and the control of noise sources within the community. Its purpose is to provide a framework within which future planning and noise mitigating decisions will be made and implemented. It is intended to represent the consensus of the community's goals and objectives pertaining to the control of environmental noise.

In addition, the Noise Element is intended to provide a set of correlated procedural guidelines and criteria to be used by the City planning and building departments to minimize noise conflicts in existing situations and in new developments.

The Noise Element, which is a State-required General Plan Element is confined to statements of policy, intent, goals and objectives, standards and criteria, and implementation guidelines. Implementation of the Noise Element is to be achieved through improved planning and zoning regulations reflecting quantified noise criteria, development of noise abatement strategies, introduction of noise criteria in the building code, application of noise regulations controlling stationary and moving noise sources, and practical tools which can be used by the City Planning Department, the Building Department, and enforcement officials in the day-to-day activities of the City.

1.1 Statutory Requirements

California State law, Government Code Section 65302(f), requires the preparation and adoption of a noise element as follows:

The general plan shall include a noise element which shall identify and appraise noise problems in the community. The noise element shall recognize the guidelines adopted by the Office of Noise Control in the State Department of Health Services and shall analyze and quantify, to the extent practicable, as determined by the legislative body, current and projected noise levels for all of the following sources:

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

Noise contours shall be shown for all of these sources and stated in terms of community noise equivalent level (CNEL) or day-night average level (Ldn). The noise contours shall be prepared on the basis of noise monitoring or following generally accepted noise modeling techniques for the various noise sources.

The noise contours shall be used as a guide for establishing a pattern of land uses in the land use element that minimizes the exposure of community residents to excessive noise. The noise element shall include implementation measures and possible solutions that address existing and foreseeable noise problems, if any, and it should serve as a guideline for compliance with the state's noise insulation standards.

1.2 Fundamentals of Noise

The various terms used in this Element are defined as follows:

dBA	-	A measure of sound level; the "dB" denotes decibels, the 'A' denotes a weighing that results in a noise measurement which approximates the frequency response of the human ear.
Leq	-	Equivalent sound level; dBA values averaged on an energy basis over a stated time period. Leq is typically computed over 1, 8, and 24-hour sample periods.
Leq(24)	-	The Leq of a 24-hour period.
Ldn	-	Day-night average sound level. The average equivalent A-weighted sound level during a 24-hour day, obtained after addition of 10 decibels to sound levels in the night after 10 p.m. and before 7 a.m.
CNEL	-	Community Noise Equivalent Level; same as Ldn except in addition to the 10 dB night-time weighing, the evening (7:00 PM to 10:00 PM) levels are weighted by 5 dB. For most situations, the Ldn and CNEL will be equal within a fraction of a dB, and may be considered synonymous.
Ambient	-	When used in connection with sound level, refers to the prevailing background noise, exclusive of a particular intruding sound under consideration.
Contour	-	When used in connection with noise, refers to a line of constant sound level; similar to contours of constant elevation on a geological map.

1.2.1 Noise Rating Schemes

Noise levels are measured on a logarithmic scale in decibels. The measurements are then weighted and added over a specified time period to reflect not only the magnitude of the sound, but also its duration, frequency, and time of occurrence. In this manner, various acoustical scales and units of measurement have been developed such as: equivalent sound levels (Leq), day-night average sound levels

(Ldn), Community Noise Equivalent Levels (CNEL's), and Single Event Noise Exposure Levels (SENEL's).

A-weighted decibels (dBA) approximate the subjective response of the human ear to a broad frequency noise source by discriminating against the very low and high frequencies of the audible spectrum. They are essentially adjusted to reflect only those frequencies audible to the human ear. The decibel scale has a value of 1.0 dBA at the threshold of hearing and 140 dBA at the threshold of pain. Each interval of 10 decibels indicates a sound energy ten times greater than before, which is perceived by the human ear as being roughly twice as loud.

Examples of the decibel level of various noise sources are shown in Figure 1. They include: the quiet of the woods (18 dBA), a library (45 dBA), normal conversation at 5 feet (58 dBA), average street traffic (83 dBA), and a race car at 50 feet (110 dBA).

Equivalent sound levels are not measured directly. They are calculated from sound pressure levels typically measured in A-weighted decibels (dBA). The equivalent sound level (Leq) is the constant level that, over a given time period, transmits in the same amount of acoustic energy as the actual time-varying sound. Equivalent sound levels are the basis for both the Ldn and CNEL scales.

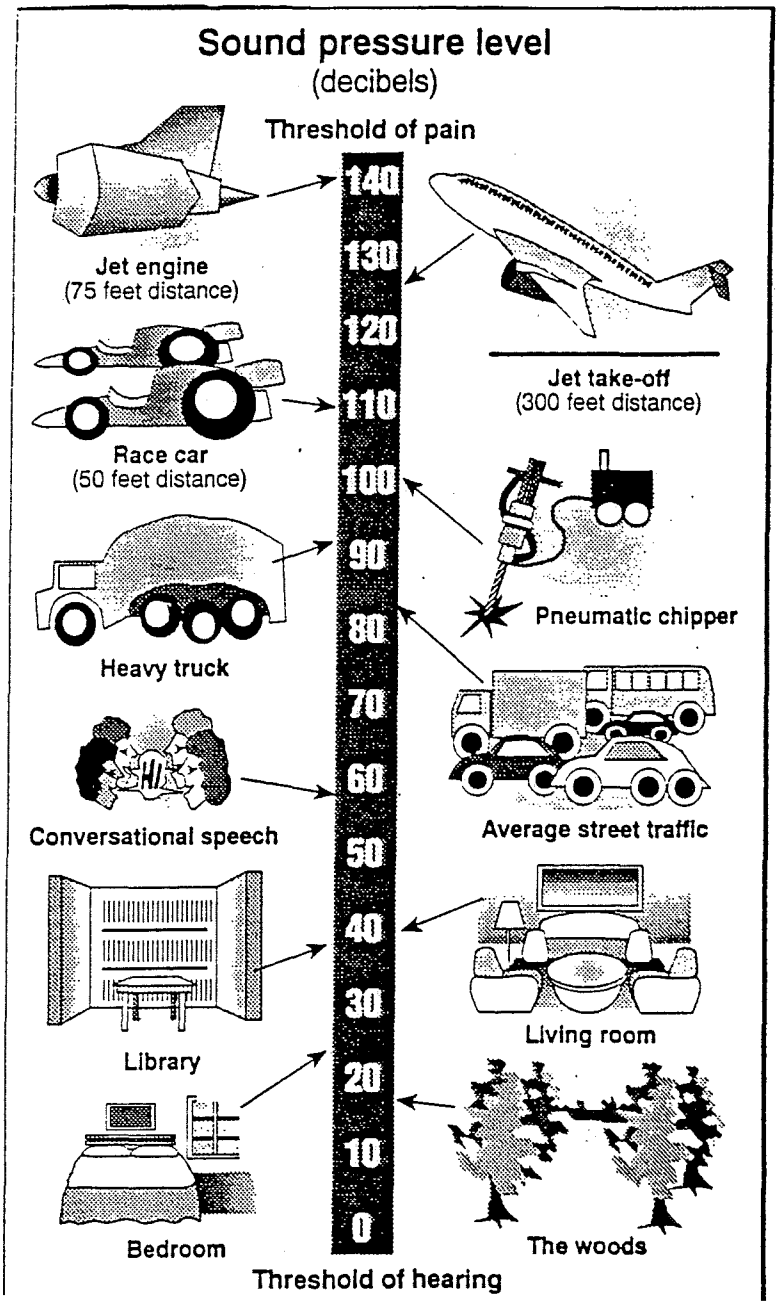
Day-night average sound levels are a measure of the cumulative noise exposure of the community. The Ldn value results from a summation of hourly Leq's over a 24-hour time period with an increased weighing factor applied to the night time period between 10:00 PM and 7:00 AM. This noise rating scheme takes into account those subjectively more annoying noise events which occur during the normal sleeping hours.

Community Noise Equivalent Levels (CNEL) also carry a weighing penalty for noises that occur during the night time hours. In addition, CNEL levels include a penalty for noise events that occur during the evening hours between 7:00 PM and 10:00 PM. Because of the weighing factors applied, CNEL values at a given location will always be larger than Ldn values, which in turn will exceed Leq values. Experience with many noise sources has shown that these two indices consistently agree within 1.0 dB. Consequently, CNEL and Ldn values are sometimes used interchangeably in planning documents.

The Single Event Noise Exposure Level (SENEL) is the most appropriate noise level-duration rating scale for a single noise occurrence. The SENEL, given in decibels, is the noise exposure level of a single event measured over the time interval between the initial and final times for which it exceeds the threshold noise level. A single event is a solitary occurrence of noise exposure such as train passby or an aircraft overflight.

For the purposes of this Element, sound levels are primarily evaluated in terms of Ldn and CNEL.

FIGURE 1
TYPICAL NOISE LEVELS OF FAMILIAR SOURCES



Source: Bruel and Kjaer

1.2.2 Sound Propagation

Noise sources may either be a "line source" (e.g., a heavily traveled highway) or a "point source" (e.g., a stationary engine or compressor). Highway traffic noise on high volume roadways simulates a "line source" and the drop-off rate of sound with distance approaches "cylindrical spreading" wherein a nominal 3.0 dBA drop with each doubling of distance between the noise source and the noise receiver occurs.

Environmental factors such as the wind direction and speed, temperature gradients, the characteristics of the ground (hard or soft) and the air (relative humidity), the presence of grass, shrubbery, and trees, often combine to increase the actual attenuation achieved outside laboratory conditions to 4.5 decibels per doubling of distance. Thus, a noise level of 74.5 decibels at 50 feet from a highway centerline would attenuate to 70.0 decibels at 100 feet, 65.5 decibels at 200 feet, and so forth.

This is particularly true where the view of the roadway is interrupted by isolated buildings, clumps of bushes, scattered trees, or the intervening ground is soft or covered with vegetation and the source or receiver is located more than 3 feet above the ground. It should be noted, however, that the nominal value of 3.0 dBA with doubling applies to sound propagation from a "line source": (1) over the top of a barrier greater than 3 feet in height, or (2) when there is a clear unobstructed view of the highway, the ground is hard, there are no intervening structures, and the height of the line-of-sight averages more than 3 feet above the ground.

In an area which is relatively flat and free of barriers, the sound resulting from a single "point of source" of noise spreads in a spherical manner away from the source and drops by 6 decibels for each doubling of distance or 20 decibels for each factor of ten in distance. This applies to fixed noise sources and mobile noise sources which are temporarily stationary such as an idling truck or other heavy duty equipment operating within a confined area (such as industrial processes). Sound attenuation from a train resembles a line source near the railroad tracks and a point source at distances beyond three-tenths of the train length.

The noise levels adjacent to the line sources of noise such as roadways increase by 3.0 dBA with each doubling in the traffic volume (provided that the speed and truck mix do not change). From the mathematical expression relating increases in the number of noise sources (motor vehicles) to the increase in the adjacent noise level, it can be shown that a 26 percent increase in the traffic volume will cause a 1.0 dBA increase in adjacent noise levels. Doubling the number of vehicles on a given route increases the adjacent noise levels by 3.0 dBA, but changing the vehicle speed has an even more dramatic effect.

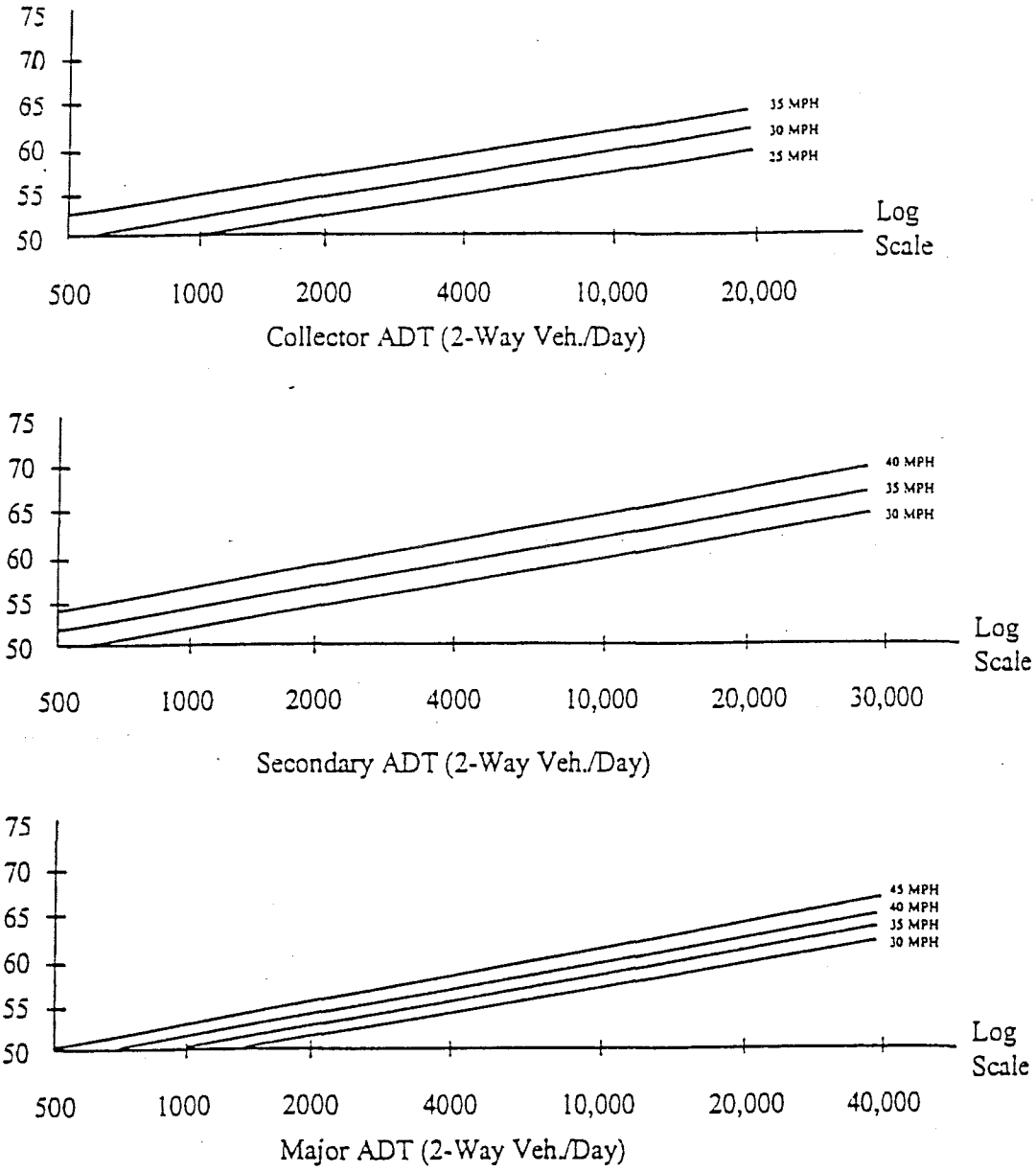
Increasing the vehicle speed from 35 to 45 mph raises the adjacent noise levels approximately 2.5 dBA. Reducing vehicle speeds from 35 to 30 mph decreases adjacent noise levels by 1.5 dBA on major roadways and 1.6 dBA on secondary and collector roadways. A speed decrease from 40 mph to 35 mph reduces adjacent noise levels by 1.3 dBA on majors and 1.4 dBA on secondaries and collectors. Consequently, lowering motor vehicle speeds can have a significant positive impact in terms of reducing adjacent noise levels.

The truck mix on a given roadway also has a significant effect on the adjacent noise levels. As the number of trucks increases and becomes a large percentage of the total vehicle volume, the adjacent noise levels increase. This effect is more pronounced if the number of heavy duty (3+ axle) trucks is large when compared to the number of medium duty (2 axle) trucks.

Noise levels adjacent to roadways vary with the volume of traffic, the mean vehicular speed, the truck mix, and the road cross-section. Figure 2 provides a nomograph for each roadway type which allows the CNEL at either 50 or 100 feet to be determined from the daily two-way traffic volume and the speed of the vehicles. For example, a major arterial carrying 33,000 ADT with a posted speed limit of 40 mph would generate approximately 66.9 dBA CNEL at 100 feet. Lowering the speed to 35 mph reduces the CNEL at 100 feet by 1.3 dBA to 65.6 dBA. At a speed of 45 mph, the noise level at 100 feet would be 68.1 CNEL (1.2 dBA higher than at 40 mph).

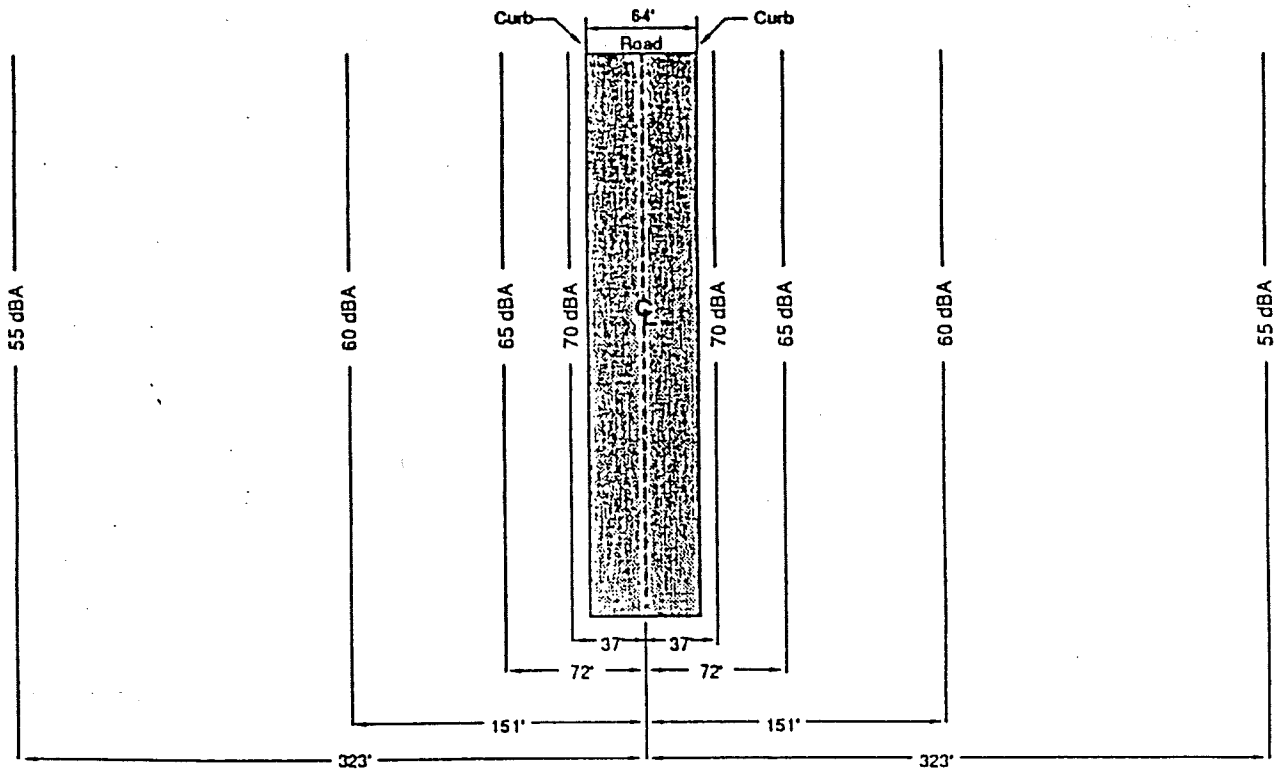
Figures 3A and 3B provide design noise levels adjacent to typical, secondary and collector roadways. The nomographs assume traffic volumes equivalent to the daily design capacity (at the upper limit of level of service D) for each roadway type as well as typical design speeds and a truck mix of 4.0 percent for major arterials and 2.58 percent for secondary and collector streets. These exhibits can be used as a general guide for planning purposes to determine the potential "worst case" future noise levels and the setbacks needed to insure an acceptable noise environment for the planned land uses.

FIGURE 2
TYPICAL NOISE LEVELS VERSUS SPEED AND VOLUME



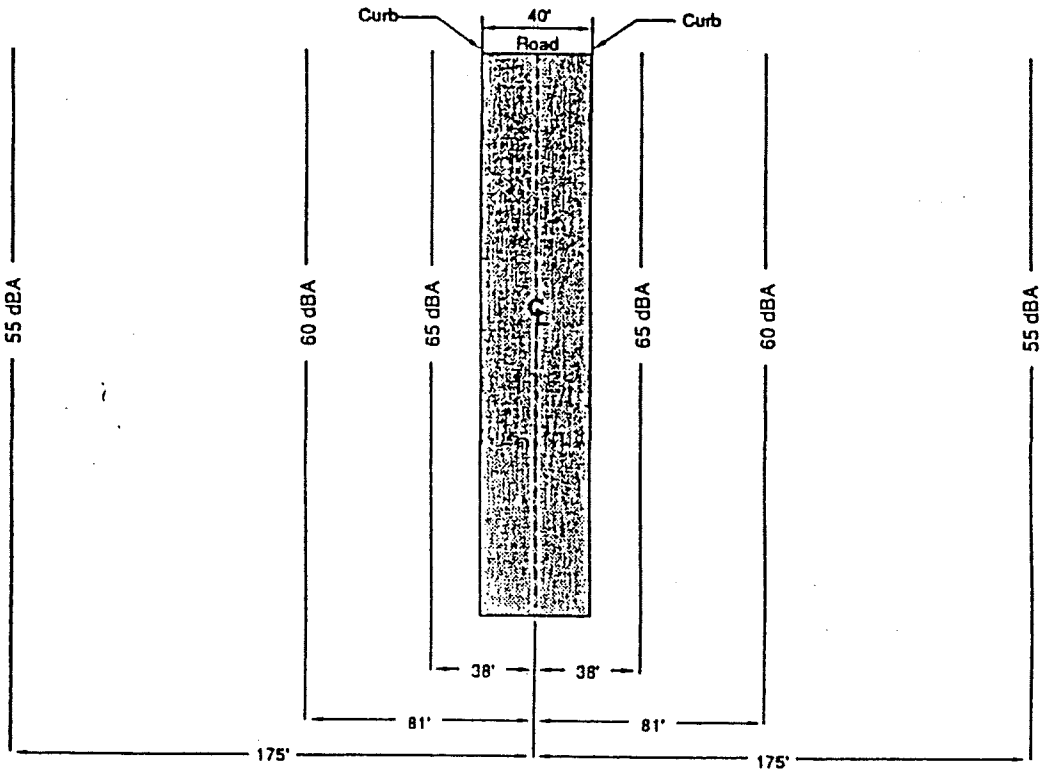
Source: Lockman & Associates, Highway Traffic Noise Prediction Model, Federal Highway Administration (RD-77-108), March 1994

FIGURE 3A
TYPICAL NOISE CONTOURS
SECONDARY HIGHWAY



Source: Lockman & Associates, Highway Traffic Noise Prediction Model, Federal Highway Administration (RD-77-108), March 1994

FIGURE 3B



Source: Lockman & Associates, Highway Traffic Noise Prediction Model, Federal Highway Administration (RD-77-108), March 1994

2.0 PERSPECTIVE ANALYSIS

The noise environment in the City of Bellflower results from a number of sources. The effects of the surrounding sound levels on land uses or humans depends on the spatial and temporal distribution of the noise source. Among the effects of noise on people are annoyance, inconvenience, pain, and serious hearing damage. The degree to which their is annoyance and/or activity interference depends upon the magnitude of the intruding noise level, frequency with which it occurs, and time of day of occurrence. There is a consensus among many of the government agencies responsible for establishing noise standards and criteria that the day-night average sound level is the preferred unit of noise exposure for use in assessing the potential impact of an intruding noise source. The CNEL (Community Noise Equivalent Level); same as Ldn except in addition to the 10 dB night-time weighing, the evening (7:00 PM to 10:00 PM) levels are weighted by 5 dB. For most situations, the Ldn and CNEL will be equal within a fraction of a dB, and may be considered synonymous.

Many sources of noise in the City of Bellflower are vehicular traffic, construction work, commercial operations, human activities, emergency vehicles, and aircraft overflights. Of these sources, noise generated by vehicular traffic is the most significant within the City. Exhibit 1 shows both 60 and 65 dB CNEL contours for transportation (mobile) noise sources.

Noise guidelines have been established by the State of California which specify levels of sound consistent with the protection of the public health and welfare, including the prevention of annoyance or discomfort caused by noise. Figure 4 depicts the ranges of noise exposure levels which are considered compatible with the principal categories of land use. Where a land use is denoted as "normally acceptable" for the given Ldn noise environment, the highest noise level in that range should be considered the maximum desirable for conventional construction which does not incorporate any special acoustic treatment. The acceptability of noise environments classified as "conditionally acceptable" or "normally unacceptable" depends on the amount of time which is normally spent outside the structure and the acoustic treatment incorporated in the structure's design. As shown in Figure 4, the highest recommended exterior noise level for commercial uses is 70 dB(A) CNEL. With regard to residential uses, the recommended outdoor noise limits of 60 dB CNEL and 65 dB CNEL for single-family and multi-family residences, respectively, would permit achievement of the 45 dB CNEL interior noise level recommended by Federal and State standards. This level would result from the noise reduction associated with typical residential construction, which ranges from 12 to 18 dB CNEL (with windows partially open).

High noise levels are typically the result of: (1) large traffic volumes, (2) high vehicle speeds, and (3) high truck mixes. All four of the roadway links generating sound levels in excess of 70 CNEL are designated as truck routes by the City.

The noise levels at 100 feet from each roadway centerline listed in Table 1 were determined by modeling each facility with Highway Traffic Noise Prediction Model developed by the Federal Highway Administration (RD-77-108). This model is currently in use nationwide and has been verified with extensive field measurements. It accepts various parameters including: the traffic volume, vehicle mix and speed, and roadway geometry in computing equivalent noise levels

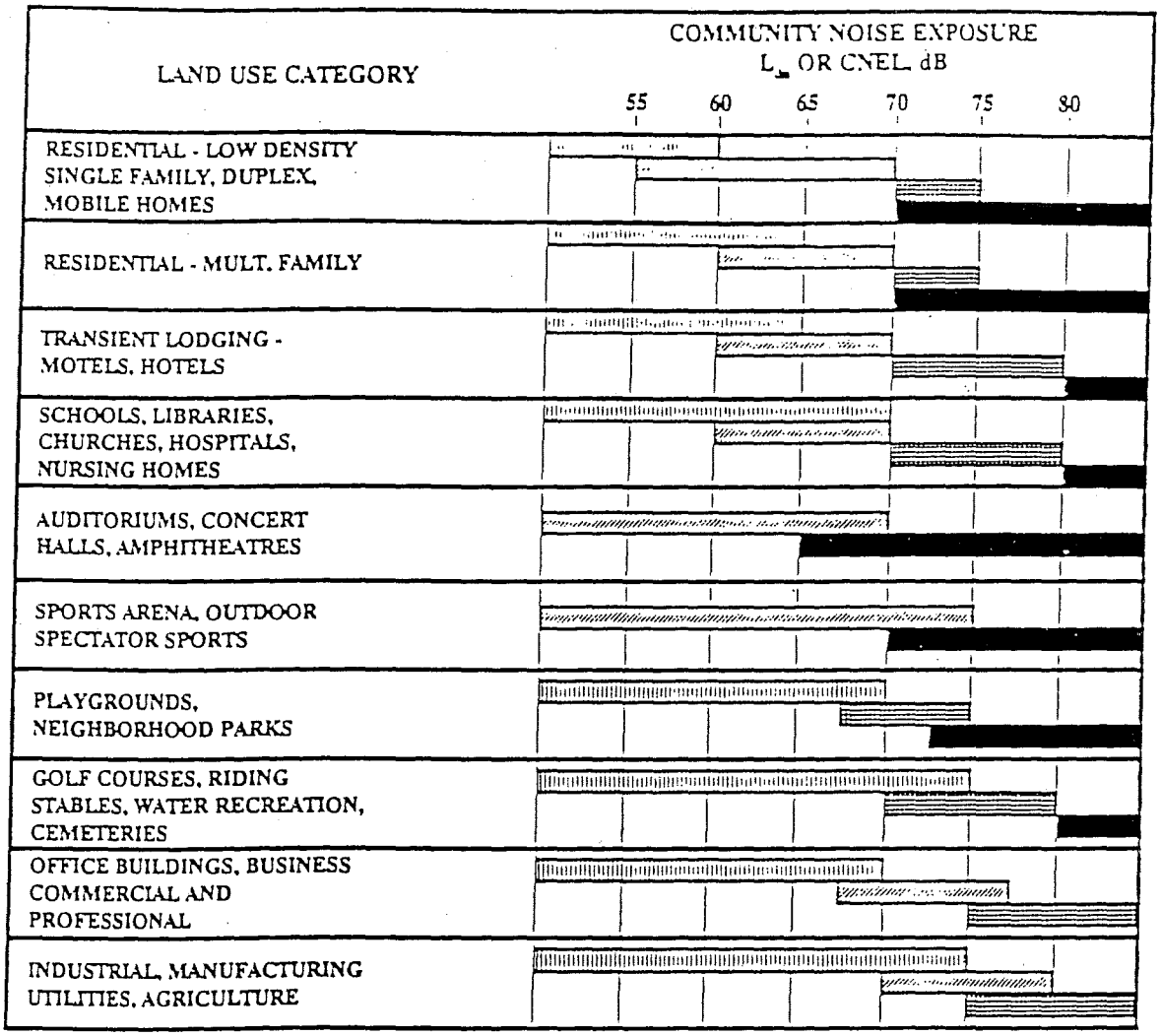
during typical daytime, evening, and nighttime hours. The resultant noise levels are then weighted, summed over 24 hours, and output as the CNEL value. CNEL contours are subsequently located through a series of computerized iterations designed to identify the 60, 65, and 70 dB CNEL contour locations.

According to Table 1, "Current Exterior Noise Levels (Streets)", the highest noise levels occurred along the City's heavily traveled commercial streets. In particular, the highest noise levels occurred on a segment of Lakewood Boulevard, south of Park Street; on Bellflower Boulevard, between Park Street and Artesia Boulevard; and along Rosecrans Avenue, east of Bellflower Boulevard.

The southern sections of Lakewood Boulevard experience noise levels of 73-76 dB(A) CNEL which significantly impact the abutting residential parcels. The principal streets with the lowest noise levels (equal to or less than 65 dB(A)) CNEL are Foster Road; Compton Boulevard; and Flower Street, east of Bellflower Boulevard.

FIGURE 4

LAND USE COMPATABILITY



NORMALLY ACCEPTABLE
Specified land use is satisfactory, based upon the assumption that any buildings involved are of normal conventional construction, without any special noise insulation requirements.

CONDITIONALLY ACCEPTABLE
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. Conventional construction, but with closed windows and fresh air supply systems or air conditioning will normally suffice.

NORMALLY UNACCEPTABLE
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.

CLEARLY UNACCEPTABLE
New construction or development should generally not be undertaken.

Source: California Office of Noise Control

TABLE 1
CITY OF BELLFLOWER
CURRENT EXTERIOR NOISE LEVELS (STREETS)
MARCH 1994

Roadway	Vehicles/ hour	CNEL (100 feet)	L_{eq} Distance to Contours (feet)[2] 70 dBA	65 dBA	60 dBA
Lakewood					
Foster to Rosecrans	2141	70	55	120	245
Rosecrans to Compton	2563	71	65	130	270
Compton to Alondra	3082	72	70	140	320
Alondra to Flower	3381	72	80	160	335
Flower to Park	3736	72	80	170	350
Park to Artesia	4644	73	95	190	400
Artesia to Rose	7678	76	120	270	560
Clark					
Foster to Rosecrans	1243	68	35	85	170
Rosecrans to Compton	1521	69	40	95	200
Compton to Alondra	1736	69	50	105	220
Alondra to Flower	2061	70	55	120	245
Flower to Park	2376	71	60	125	265
Park to Artesia	2452	71	65	130	270
Bellflower					
Foster to Rosecrans	1185	67	30	80	155
Rosecrans to Compton	1450	68	40	95	200
Compton to Alondra	1416	68	40	95	200
Alondra to Flower	1996	70	55	120	245
Flower to Park	2389	71	60	125	265
Park to Artesia	3849	72	80	170	350
Artesia to Rose	2874	71	70	140	320

Source: Lockman & Associates, Highway Traffic Noise Prediction Model calculations, Federal Highway Administration (RD-77-108), March 1994.

TABLE 1 (continued)
CITY OF BELLFLOWER
CURRENT EXTERIOR NOISE LEVELS (STREETS)
MARCH 1994

Roadway	Vehicles/ hour	CNEL (100 feet)	L_{eq} Distance to Contours (feet)[2] 70 dBA	65 dBA	60 dBA
Woodruff					
Foster to Rosecrans	2001	70	55	120	245
Rosecrans to Compton	2057	70	55	120	245
Compton to Alondra	2053	70	55	120	245
Alondra to Flower	2450	71	65	130	270
Flower to Park	2393	71	60	125	265
Park to Artesia*					
Artesia to Rose	2169	70	55	120	245
Foster					
Clark to Bellflower	1037	65	5	50	100
Bellflower to Woodruff	1016	64	5	50	100
Woodruff to City Limit	272		---	5	40
Compton					
Bellflower to Woodruff	1203	65	10	55	110
Woodruff to City Limit	553	62	---	5	75
Flower					
City Limit to Lakewood	1190	64	---	40	95
Lakewood to Clark	997	64	5	50	100
Clark to Bellflower	1092	65	10	55	115
Bellflower to Flora	1300	66	20	65	125

*No traffic data

Source: Lockman & Associates, Highway Traffic Noise Prediction Model calculations, Federal Highway Administration (RD-77-108), March 1994.

TABLE 1 (continued)
CITY OF BELLFLOWER
CURRENT EXTERIOR NOISE LEVELS (STREETS)
MARCH 1994

Roadway	Vehicles/ hour	CNEL (100 feet)	L_{eq} Distance to Contours (feet)[2] 70 dBA	65 dBA	60 dBA
Rosecrans					
Lakewood to Clark	2528	71	55	120	245
Clark to Bellflower	2603	71	65	130	270
Bellflower to Woodruff	3129	72	70	140	320
Woodruff to City Limit	3628	72	80	160	335
Alondra					
Hayster to Lakewood	2360	71	60	125	265
Lakewood to Clark	2600	71	65	130	270
Clark to Bellflower	2515	71	65	130	270
Bellflower to Woodruff	3064	70	55	120	245
Woodruff to City Limit					
Artesia					
Downey to Lakewood	2303	70	60	125	265
Lakewood to Clark	2575	71	65	130	270
Clark to Bellflower	2371	71	60	125	265
Bellflower to Woodruff	2648	71	65	130	270
Woodruff to City Limit	2725	71	65	130	270

Source: Lockman & Associates, Highway Traffic Noise Prediction Model calculations, Federal Highway Administration (RD-77-108), March 1994.

Exhibit 1 shows both 60 and 65 dB CNEL contours for transportation (mobile) noise sources. Also included is noise sensitive receptors, railroad impacted zones, and freeway impacted zones. This information is based on a citywide noise readings prepared by Lockman and Associates during March 1994.

2.1 Land Use Sensitivity to Noise

Some land uses are more tolerant of noise than others. For example, schools, hospitals, churches and residences are more sensitive to noise intrusion than commercial or industrial activities. For this reason, land use compatibility with the noise environment is an important consideration in the planning and design of new developments. As ambient noise levels affect the perceived amenity or livability of a development, so too can the mismanagement of noise impacts impair the economic health and growth potential of a community by reducing the area's desirability as a place to live, shop and work.

Planned land use compatibility with environmental noise requires identification of noise-sensitive uses. These are listed in Table 2. In addition, in determining the best use of land requires identification of those situations where a noise-sensitive use can be made compatible with a noise environment by ameliorating techniques.

Land uses deemed noise sensitive by the State of California include: schools, hospitals, rest homes, long-term care and mental care facilities. Some jurisdictions elect to also consider day care centers, single family dwellings, mobile home parks, churches, libraries, and recreation areas sensitive to noise. Moderately sensitive land uses typically include: multi-family dwellings, hotels, motels, dormitories, out-patient clinics, cemeteries, golf courses, country clubs, athletic/tennis clubs, and equestrian clubs. Relatively insensitive uses are business, commercial, and professional developments. Insensitive noise receptors include industrial, manufacturing, utilities, agriculture, natural open space, undeveloped land, parking lots, motorcycle parks, rifle ranges, warehousing, liquid and solid waste facilities, salvage yards, and transit terminals. Current land uses located within the City of Bellflower that are sensitive to intrusive noise include preschools, hospitals, convalescent care facilities, parks, schools and single-family dwellings. Exhibit 1 displays the location of sensitive receptors in Bellflower.

The City of Bellflower Noise Element deals with both of the above requirements through a system of classification of land uses by noise-sensitivity ameliorating techniques.

2.1.1 Sensitive Land Uses

Sensitive land uses are sub-classified as:

1. Sensitive - those users where a quiet outdoor environment is important to health and quality of life. This category includes residential uses which feature an outdoor lifestyle, convalescent uses where the outdoor environment is important and parks which are relaxation-oriented.

2.1.2 Conditionally Sensitive - uses which are noise-sensitive but which can be made compatible to a more severe noise environment by noise insulation features in building construction, and/or noise abatement techniques of layout, shielding, barriers, topography, etc. Uses which can meet the above criteria, under appropriate controlling conditions, include residential uses not featuring outdoor life styles, schools, churches, and general hospitals.

TABLE 2
NOISE SENSITIVE RECEPTORS
CITY OF BELLFLOWER

CONVALESCENT HOSPITALS/ RETIREMENT HOMES	HOSPITALS	PUBLIC SCHOOLS	PRIVATE SCHOOLS
Bellflower Convalescent Hospital 9710 Artesia Boulevard Bel Tooren 16910 Woodruff Avenue Woodruff Convalescent Center 17836 Woodruff Avenue Bellflower Friendship Manor 9550 Oak Street Bellflower Christian Retirement Center 9349 Rose Street Ramona Senior Center 9843 Ramona Street Rose Villa Care Center 9028 Rose Street Remery Homes 16623 Ardmore Avenue Leisure Life 10250 Beverly Boulevard Bellflower Guest Home 10337 Beach Ramona Guest Home 9555 Ramona Woodruff Care Home 16409 Woodruff Source: Lockman & Associates, March 1994	Bellflower Doctors Hospital 9542 E. Artesia Boulevard Bellwood Health Center 17800 Woodruff Avenue Kaiser Foundation Hospital 9400 Rosecrans Street	Albert Baxter Adult School 14929 S. Cerritos Avenue Bellflower High School 15301 McNab Avenue Summerset Continuation High 9242 Laurel Avenue Jefferson Elementary School 10027 E. Rose Street Pace Elementary School 9625 Van Ruiten Pyle Elementary School 14500 S. Woodruff Avenue Ramona Elementary School 9351 E. Laurel Avenue Woodruff Elementary School 15332 S. Eucalyptus Avenue	Happy Day Pre-School 9447 Flower Avenue Kids Haven Pre-School 9515 Flower Avenue School Ten, Inc. 9928 Flower Street, Unit 101 Wonderland School 10440 Artesia Boulevard St. Domini Savio Elementary 9750 Foster Road Seventh Day Adventist Elem. 15548 Santa Ana Avenue St. Bernard's Elementary 9626 Park Street Bellflower Christian School 17408 Grand Avenue St. John Bosco High School 13640 S. Bellflower Boulevard Bellflower United Methodist Pre-School 14525 Bellflower Boulevard Canaan Pre-School 17200 Clark Avenue Woodruff Christian School 16400 Woodruff Avenue Golden West Pre-School 16400 Woodruff Avenue Creative Day Pre-School 8740 Ramona Street Avis Contractor's License School 9815 Palm Avenue

2.2 Non-Sensitive Land Uses

Uses where a quiet outdoor environment is not critical to indoor or outdoor activities. Included are most commercial uses, industrial uses, parks which are sports-oriented, playgrounds, and land devoted to transportation systems. Without implying that noise mitigating considerations are not to be applied in the planning for these land uses, these uses are classified as "non-sensitive".

Exhibit 1 displays the various locations of noise sensitive receptors and the current noise contours throughout the City of Bellflower.

2.3 Noise Sensitivity Standards and Criteria

The City of Bellflower follows the State of California's Office of Noise Control standards for the three noise sensitivity land use classifications. These are presented in Table 3. The criteria developed by the Environmental Protection Agency (EPA) are issued as information only, not as standards, and are the levels deemed "requisite to protect health and welfare with an adequate margin of safety". The EPA cautions that the criteria "do not take into account cost or feasibility", and that "states and localities will approach this information according to individual needs and situations". For reasons of social and economic feasibility, the standards adopted by the City of Bellflower permit levels 10 dBA higher than the EPA criteria.

TABLE 3
CITY OF BELLFLOWER
USE SENSITIVITY NOISE STANDARDS

Land Use Sensitivity Classification	Exterior Noise Standard		Interior Noise Standard	
SENSITIVE	CNEL	65	CNEL	55
CONDITIONALLY SENSITIVE	CNEL	75	CNEL	55
NON-SENSITIVE	CNEL	75	CNEL	75

Source: State of California's Office of Noise Control

3.0 PRESENT AND FUTURE NOISE SOURCES

Present Noise Sources

The two types of noise sources which should be considered are: stationary and mobile noise sources. Fixed sources of noise in Bellflower include: industrial and construction activities, air conditioning/refrigeration units, whistles or bells (signaling breaks or shift changes), shooting ranges, high level ratio, stereo or television usage, power tools, lawnmowers, appliances used in the home, and barking dogs. Mobile noise sources are typically transportation-related and include: airplanes, helicopters, trains, automobiles, trucks, buses, motorcycles, and off-road vehicles.

Although construction activities associated with public works projects or private development occur throughout the City, they are localized and temporary. With the exception of some industrial areas, many of the fixed sources of noise are typically accepted as part of the ambient or background noise level.

Motor vehicles in the City are a major source of continuous noise. The Artesia (91) Freeway in the southern portion of the City carries appreciable volumes of both truck and commuter traffic. According to the 1981 City of Bellflower Noise Element, the noise impact area along the Artesia (91) Freeway is a 600-foot band on either side of the freeway. The noise levels measured to edge of this band typically measured 70 CNEL.

As Table 1 indicates, a number of City areas and uses are located adjacent to major arterials and are exposed to levels exceeding those considered acceptable. These include: Bellflower Doctors Hospital, Kaiser Permanente Hospital, Woodruff Convalescent Center, Ernie Pyle Elementary School, religious facilities, residential, and housing for the elderly. These generally experience noise levels of 70-71 dB(A) CNEL adjacent to major arterials, but these levels decline from the street frontage and the degree of impact depends on the extent of building setback. Common insulation standards, which generally reduce noise levels from 15-20 dB(A) CNEL, would bring noise exposure levels of these units into the acceptable levels as identified by the State Office of Noise Control.

Future Noise Sources

The future noise environment of the City has been forecast based on computation of noise levels attributable to traffic increases resulting from new land use development accommodated by the Land use Element. Exhibit 2 depicts these levels of noise. They are essentially unchanged from current conditions, based on several factors related to future land use:

1. Future commercial development in the City will primarily consist of redevelopment of existing properties;

2. Future industrial development will also involve the redevelopment of existing properties and will occur adjacent to arterial street frontages which currently fall within the 60-65 dBA noise contour interval; and,

3. In-fill residential development will occur within those areas of the City where there are vacant and underutilized parcels. A majority of these properties are located outside of the existing and future 60-65 dBA contour intervals.

General increases in traffic predicted through the year 2010 will cause increases in noise levels. This will be particularly true for those properties located adjacent to areas where new development is targeted (the Artesia Corridor). Increases in noise levels by as much as 3.0 dB(A) may occur for such areas. However, it is anticipated that future noise levels can be mitigated to current conditions through the use of noise impact mitigation measures (walls, landscaping, baffling of root-top venting and air conditioning equipment).

Automobiles using open parking lots and unenclosed parking structures also generate noise impacting adjacent residents. The sounds of squealing tires, starting of automobile engines, doors opening and closing, horns, and conversation and shouts of the drivers an passengers often disturb the adjacent residents at night.

The pipe plant and other small commercial-manufacturing businesses in the City operate during the day and, as a consequence, do not impact adjacent residences or other sensitive uses with noise in the evening.

Other sources of noise in the City include construction projects, early morning truck deliveries to commercial uses, automobile repair business, and use of leaf blowers.

3.1 The Artesia (91) Freeway

As of March 1994, the present noise impacted area is a band 600 feet wide on either side of the freeway. This affects schools and residential areas. Because of the intensive effort being applied at the Federal level in the quieting of diesel trucks, noise generated by these vehicles can be expected to drop by as much as 10 dB within the next decade (from the existing 70 CNEL to 60 CNEL).

In addition, the freeway will be modified with the installation of carpool lanes and new access ramps at Clark Avenue. These improvements, along with traffic reductions caused by the opening of the Century Freeway, will serve to maintain and even reduce future noise levels for properties located adjacent to this freeway corridor.

3.2 The Southern Pacific Railroad

Noise exposure contours along railway tracks are determined from the number and type of trains using the line, the magnitude and duration of each train pass, and the time of day when the train passes. The Southern Pacific Transportation Company operates a line within the City of Bellflower which bisects the City between Compton Boulevard and the Artesia (91) Freeway.As of March 1994, operations of the Southern Pacific Railroad were:

> One round trip operation daily, seven days per week, servicing the Douglas Oil Co. in Paramount. The train leaves Anaheim at 11:15 AM and returns no later than 11:15 PM. In addition, there are intermittent night-time operations, maximum of two a month, in the period midnight to 4:00 AM.

This limited number of operations does not permit the development of meaningful CNEL contours; however, HUD noise assessment guidelines would place the noise impact boundary line 180 feet from the right-of-way. There is no projection of increased Southern Pacific Railroad operations on this right-of-way. (At maximum traffic capacity, HUD criteria would place the noise impact boundary line 600 feet from the right-of-way.)

Although the Federal Government has preempted the setting of noise emission standards for railroads, the City can regulate the use of bells, whistles, speed, and hours of operation.

3.3 Rapid Transit Improvement Program

The Southern California Rapid Transit District (RTD) has developed a short-term Metro Rail Plan. This plan includes a Metro Green Line running from Norwalk to Los Angeles International Airport, traversing north of Bellflower along the Century (105) Freeway. The Orange County Transit District currently runs Express Freeway Service along both the Artesia (91) Freeway and the San Gabriel (605) Freeway. This service includes "Park-and-Ride" lots which impact circulation and parking facilities within the City of Bellflower, with attendant noise impacts.

The MTA (Metropolitan Transit Authority) has purchased the Southern Pacific Railroad right-of-way which bisects the City between Compton Boulevard and the Artesia (91) Freeway. This corridor is planned for future use as a combination fixed-rail commuter line, bikeway, and greenbelt. Additional noise impacts will be experienced with the operation of the commuter rail line because of the increased frequency of passenger rail trips over existing freight train trips. The exact frequency of these future commuter rail trips has yet to be determined.

3.4 Construction and Maintenance Equipment

At the present time, the only means available to the City of Bellflower for controlling noise emanating from construction and maintenance equipment is through regulation of hours of use. These sources are significant contributors to community noise exposure, and are to be subject to Federal regulation. "Quiet" jackhammers, tampers, and air compressors are currently available or under development. In its own procurement actions, the City can include noise criteria, regulate time of operation, or give preference to quieter products.

3.5 Neighborhood Noise Sources

Noise appears allowable at a citizen's property line. Sources such as radio, TV, recreational and social activities, air conditioning equipment, swimming pool pumps, animals, hawkers, peddlers, sound amplification systems, etc., are currently not quantified in terms of level and duration. These noise intrusions, as well as intrusions from industrial of commercial zones, can be regulated by a suitable noise ordinance. Citizen understanding, participation and cooperation is essential for effectiveness.

3.6 Multi-Family Dwelling Noise Sources

Transmission of noise from one dwelling unit to another can be exceedingly annoying and detrimental to quality of life. With increasing use of high density multi-family complexes, noise control in the building plan approval state is of paramount importance.

The State has adopted minimum standards for noise insulation requirements for multi-family dwellings, which address the problem of noise transmission from one dwelling unit to another, and also noise transmission from exterior to interior. The standards are intended for inclusion in local building codes and their application will improve the quality of life in multi-family dwellings.

3.7 Commercial and Industrial Noise Sources

Due to the existence of many nonconforming land uses, incompatibilities between commercial and industrial uses and sensitive receptors are a common problem in Bellflower. The City has a great many dispersed mixed industrial zones bordering residential zones. The present Planning and Zoning Regulations address the noise interface problem in qualitative terms. The regulations need to be quantified with respect to allowable interface noise, and to be simplified for ease of application, understanding and enforcement. Problems currently exist in this area and will become more acute an widespread unless controlled by regulation and ameliorating measures.

In order to preserve Bellflower's quality of life, sensitive land uses (residences, schools, churches, and hospitals) should be protected from excessive noise. Useful mechanisms for the regulation of noise include: the site plan review process; utilizing noise attenuation mechanisms in redeveloped and new construction; and enforcing noise regulations set forth in the zoning code.

3.8 Airport Noise

The nearest airport to Bellflower is located in the City of Long Beach. The City of Bellflower is also situated within Los Angeles International Airport's (LAX) flight pattern. In addition, the Los Angeles County Sheriff's Department Sky Knight utilizes local freeways (the Century (105), San Gabriel (605), and the Riverside (91) Freeways) for ground guidance.

Some noise impacts are generated from nearby airport sources. According to the 1981 City of Bellflower Noise Element, the CNEl 65 contour for Los Angeles International Airport extended to a point about 9 miles to the northwest of Bellflower. As of 1991, contours for Long Beach Municipal Airport were established only to a CNEL 70 contour, which is at the airport boundary, approximately four miles to the south of Bellflower.

3.9 Arterial Traffic

Roadways attract traffic until they reach their capacity, then drivers divert to other less congested routes. In view of this phenomenon, it is important to consider the noise impact zone adjacent to each master planned highway when traffic volumes reach capacity. This approach provides a "worst case" perspective on adjacent noise exposure.

Noise levels adjacent to each of the master planned roadway links have been analyzed to determine the location and extent of current noise problems. Table 1, calculated during March 1994, provides the noise levels based upon current traffic volumes, lane geometrics, and posted speed limits. A 4.0 percent truck mix was assumed for all other roadways.

Future traffic volumes for the master planned roadway links are provided in the General Plan Update Circulation Element. Based upon the roadway classifications, vehicular speeds and ultimate volumes, the future noise levels adjacent to roadway links within the City of Bellflower were determined. Vehicular speeds for the links analyzed were based upon the current posted speed limits. Table 4, calculated during March 1994, shows the master planned future noise levels associated with motor vehicle sources. It can be seen that the largest traffic volumes at the highest speeds result in the noisiest roadways.

The noise levels at 100 feet from each roadway centerline listed in Table 4 were determined by modeling each facility with Highway Traffic Noise Prediction Model developed by the Federal Highway Administration (RD-77-108). This model is currently in use nationwide and has been verified with extensive field measurements. It accepts various parameters including: the traffic volume, vehicle mix and speed, and roadway geometry in computing equivalent noise levels during typical daytime, evening, and nighttime hours. The resultant noise levels are then weighted, summed over 24 hours, and output as the CNEL value. CNEL contours are subsequently located through a series of computerized iterations designed to identify the 60, 65, and 70 CNEL contour locations.

4.0 Conclusion

Using the data contained in this background technical report, goals, policies, and implementation programs pertaining to noise have been prepared and are contained in the policy document of the General Plan.

As discussed, the majority of Bellflower's noise is generated from automobiles. Other significant sources of noise in Bellflower include incompatible land uses (commercial and industrial uses adjacent to residential uses), railroad noise, and construction operations. The nearest airport to Bellflower is located in the City of Long Beach and Bellflower is not located within the airport's departure and arrival flight paths, therefore, aircraft noise is not considered to be a significant noise issue in Bellflower.

In order to preserve Bellflower's quality of life, sensitive land uses (residences, schools, churches, and hospitals) should be protected from excessive noise. In particular, the policy document recommends implementation programs such as:

- Adopting a noise regulation ordinance which establishes land use noise incompatibility criteria and sets standards for exterior and interior noise levels.

- Regularly communicating with safety providers about limiting siren usage by emergency, fire, police, and ambulance vehicles

- Utilizing the California Noise Insulation Standards (Title 25, California Administrative Code) for the construction of new residential dwellings to ensure that interior noise levels do not exceed 45 CNEL.

- Utilizing the design review process to ensure that new commercial and industrial uses do not generate noise levels (over 65 CNEL) that could adversely impact nearby residential and other sensitive land uses.

TABLE 4
CITY OF BELLFLOWER
FUTURE (2010) EXTERIOR NOISE LEVELS (STREETS)

Roadway	Vehicles/ hour	CNEL (100 feet)	L_{eq} Distance to Contours (feet)[2] 70 dBA	65 dBA	60 dBA
Lakewood					
Foster to Rosecrans	3893	73	90	180	370
Rosecrans to Compton	4036	73	90	180	370
Compton to Alondra	4461	73	100	190	395
Alondra to Flower	4509	73	100	190	395
Flower to Park	5040	74	110	215	400
Park to Artesia	6361	75	120	240	500
Artesia to Rose	5573	74	120	235	495
Clark					
Foster to Rosecrans	1549	69	40	95	190
Rosecrans to Compton	1892	70	50	110	220
Compton to Alondra	2161	70	55	120	240
Alondra to Flower	2567	71	65	140	270
Flower to Park	2953	71	80	150	310
Park to Artesia	3055	72	80	160	315
Bellflower					
Foster to Rosecrans	2342	70	60	130	250
Rosecrans to Compton	2019	68	30	80	175
Compton to Alondra	1612	68	30	75	165
Alondra to Flower	1920	68	30	80	175
Flower to Park	2430	68	40	95	180
Park to Artesia	4075	70	60	130	250
Artesia to Rose	3515	71	70	140	290

Source: Lockman & Associates, Highway Traffic Noise Prediction Model calculations, Federal Highway Administration (RD-77-108), March 1994.

TABLE 4 (continued)
CITY OF BELLFLOWER
FUTURE (2010) EXTERIOR NOISE LEVELS (STREETS)

Roadway	Vehicles/ hour	CNEL (100 feet)	L_{eq} Distance to Contours (feet)[2] 70 dBA	65 dBA	60 dBA
Woodruff					
Foster to Rosecrans	2870	71	70	145	300
Rosecrans to Compton	2945	71	70	145	300
Compton to Alondra	2938	71	70	145	300
Alondra to Flower	3508	72	80	165	340
Flower to Park	3430	72	80	165	340
Artesia to Rose	3103	72	70	160	320
Foster					
Clark to Bellflower	1174	65	---	50	130
Bellflower to Woodruff	1141	65	---	50	100
Woodruff to City Limit	307	59	---	10	---
Compton					
Bellflower to Woodruff	1580	68	20	75	155
Woodruff to City Limit	726	64	---	40	100
Flower					
City Limit to Lakewood	1187	65	10	50	130
Lakewood to Clark	1251	66	15	65	140
Clark to Bellflower	1482	66	25	75	150
Bellflower to Flora	1764	67	30	80	160
Rosecrans					
Lakewood to Clark	2541	71	60	125	250
Clark to Bellflower	2658	71	65	130	300
Bellflower to Woodruff	3053	72	70	150	310
Woodruff to City Limit	3642	72	70	160	340

Source: Lockman & Associates, Highway Traffic Noise Prediction Model calculations, Federal Highway Administration (RD-77-108), March 1994

TABLE 4 (continued)
CITY OF BELLFLOWER
FUTURE (2010) EXTERIOR NOISE EXPOSURE

Roadway	Vehicles/ hour	CNEL (100 feet)	L_{eq} Distance to Contours (feet)[2] 70 dBA	65 dBA	60 dBA
Alondra					
Hayter to Lakewood	2813	71	65	135	300
Lakewood to Clark	3032	72	80	160	335
Clark to Bellflower	2952	72	70	150	310
Bellflower to Woodruff	3429	72	80	160	330
Woodruff to City Limit	3970	73	90	180	370
Artesia					
Downey to Lakewood	2934	72	70	150	310
Lakewood to Clark	3281	72	80	160	335
Clark to Bellflower	3033	72	70	150	310
Bellflower to Woodruff	3359	72	50	170	320
Woodruff to City Limit	3483	72	60	180	340

Source: Lockman & Associates, Highway Traffic Noise Prediction Model calculations, Federal Highway Administration (RD-77-108), March 1994.

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