Introduction

Purpose and Scope

The Noise Element of the General Plan is a planning document which provides a policy framework for addressing potential noise impacts encountered in the planning process.

The content of a Noise Element and the methods used in its preparation have been determined by the requirements of Section 65302 (f) of the California Government Code and by the *State of California General Plan Guidelines* published by the California Office of Planning and Research in 1990. The Guidelines require that major noise sources and areas containing noise-sensitive land uses be identified and quantified by preparing generalized noise exposure contours for current and projected conditions.

According to the Government Code requirements, noise exposure information should be included in a Noise Element for the following major noise sources:

1. Highways and freeways
2. Primary arterials and major local streets
3. Railroad operations
4. Aircraft and airport operations
5. Local industrial facilities
6. Other stationary sources

Noise-sensitive uses identified by the Government Code and by the City of Gustine include the following:

1. Residential development
2. Schools
3. Hospitals, nursing homes
4. Churches
5. Libraries

The Noise Element is directed at minimizing future noise conflicts. A noise ordinance, on the other hand, is directed at resolving existing noise conflicts. A noise ordinance may be used to address noise levels generated by existing industrial and residential uses, which are not regulated by federal or state noise level standards. The regulation of noise sources such as traffic on public roadways, railroad line operations and aircraft in flight is preempted by existing federal and/or state regulations, meaning that such sources generally may not be addressed by a noise ordinance. The Noise Element addresses the prevention of noise conflicts from all of these sources.

Definitions

1. A-Weighted Sound Level (dBA): Except as specified, all sound levels referred to in this policy document are in *A-weighted* decibels. A-weighting de-emphasizes the very low and very high frequencies of sound in a manner similar to the human ear. Most community noise standards utilize A-weighting, as it provides a high degree of correlation with human annoyance and health effects.

2. Community Noise Equivalent Level (CNEL): The average equivalent sound level during a 24-hour day, obtained after addition of approximately five

decibels to sound levels in the evening from 7:00 p.m. to 10:00 p.m. and ten decibels to sound levels in the night before 7:00 a.m. and after 10:00 p.m.

3. Day/Night Average Sound Level (L_{dn}): The average equivalent sound level during a 24-hour day, obtained after addition of ten *A-weighted* decibels to sound levels in the night after 10:00 p.m. and before 7:00 a.m.

4. Equivalent Sound Level (L_{eq}): The sound level containing the same total energy as a time varying signal over a given sample period. L_{eq} is typically computed over 1, 8 and 24-hour sample periods.

5. Maximum Sound Level (L_{max}): The maximum sound level recorded during a noise event.

6. New Development: Projects requiring land use approval or building permits, but excluding remodeling or additions to existing structures.

7. Noise-Sensitive Land Use: Residential land uses, transient lodging, schools, libraries, churches, hospitals and nursing homes.

8. Outdoor Activity Areas: Patios, decks, balconies, outdoor eating areas, swimming pool areas, yards of dwellings and other areas which have been designated for outdoor activities and recreation.

9. Stationary Noise Source: Any fixed or mobile source not preempted from local control by existing federal or state regulations. Examples of such sources include industrial and commercial facilities, and vehicle movements on private property.

10. Transportation Noise Source: Traffic on public roadways, railroad line operations and aircraft in flight. Control of noise from these sources is preempted by existing federal or state regulations. However, the effects of noise from transportation sources may be controlled by regulating the location and design of adjacent land uses.

Existing and Future Noise Environment

Overview of Sources

Based on the requirements of the Government Code and field studies conducted during the preparation of this document, it was determined that the following noise sources should be addressed in the Noise Element:

- Traffic on State Highways and Major City Roadways
- Industrial Activities

Methods Used to Develop Noise Exposure Information

According to the Government Code and General Plan Guidelines, noise exposure contours should be developed in terms of the Day-Night Average Level (L_{dn}) or Community Noise Equivalent Level (CNEL). Both of these descriptors represent the weighted energy noise level for a 24-hour day after including a 10 dB penalty for noise levels occurring at night between the hours of 10:00 p.m. and 7:00 a.m.

The CNEL descriptor additionally includes a penalty of about 5 dB for noise levels occurring during the evening hours of 7:00 p.m. and 10:00 p.m. The CNEL descriptor was developed to quantify aircraft noise, and its use is required when preparing noise exposure maps for airports within the State of California. The CNEL and L_{dn} descriptors are generally considered to be equivalent to each other for most community noise environments within □1.0 dB. The L_{dn} descriptor has been used in this Noise Element to quantify noise from the above-described major noise sources.

To supplement the L_{dn} noise descriptor, the hourly L_{eq} and L_{max} descriptors have been used to characterize noise levels from stationary noise sources that are addressed in this Noise Element. Because many stationary noise sources operate sporadically, the hourly L_{eq} and L_{max} are more useful for predicting noise conflicts from such sources than is the L_{dn}. The L_{dn}, by definition, is a modified average noise exposure over 24 hours. If a noise source operates only a few hours a day, averaging the noise over 24 hours may under-estimate its nuisance potential.

Analytical noise modeling techniques were used to develop generalized noise contours for existing and future conditions. Analytical noise modeling techniques generally use source-specific data, including descriptions of noise-generating equipment or activities, hours of operation, seasonal fluctuations, and average levels of noise from source operations. Analytical methods have been developed for many environmental noise sources, including roadways, railroad line operations, railroad yard operations, industrial plants and aircraft/airport operations. Such methods will produce reliable results as long as data inputs and assumptions are valid for the sources being studied.

The noise exposure information developed during the preparation of the Noise Element does not include all conceivable sources of industrial or commercial noise within the City of Gustine, but rather focuses on the existing sources of noise which have been identified by the City as being significant. As the policies of this Noise Element are applied in the future, it is possible that other potentially significant sources will be identified.

Roadways

The Federal Highway Administration (FHWA) Highway Traffic Noise Prediction Model (FHWA-RD-77-108) was used to develop L_{dn} contours for State Highways and major City roadways. The FHWA Model is the analytical method currently favored by most state and local agencies, including Caltrans, for highway traffic noise prediction. The model is based upon reference energy emission levels for automobiles, medium trucks (2 axles) and heavy trucks (3 or more axles), with consideration given to vehicle volume, speed, roadway configuration, distance to the receiver, and the acoustical characteristics of the site. The FHWA Model was developed to predict hourly L_{eq} values for free-flowing traffic conditions, and is generally considered to be accurate within $\pm$ 1.5 dB. The model assumes a clear view of traffic with no shielding at the receiver location. To predict L_{dn} values, it is necessary to determine the hourly distribution of traffic for a typical day and adjust the traffic volume input data to yield an equivalent hourly traffic volume. The Calveno traffic noise emission curves were used as recommended by Caltrans to more accurately calculate noise levels generated by California traffic.

Existing (1998) and future (2020) traffic volumes used to calculate traffic noise levels were based on the traffic study data provided by the Merced County Association of Government (MCAG). The Day/Night distribution of traffic and truck volumes were based on assumptions used by BBA for comparable streets, since these data were unavailable from any other source. Vehicle speeds assumed during the traffic noise modelling process were the posted vehicle speeds.

Appendices A and B show the traffic assumptions used in the FHWA Model for existing and future conditions. Appendices C and D show the distances to noise contours from roadway centers. Figures 1 and 2 show the existing and future noise contour locations on the City base map.

Major Stationary Noise Sources

The production of noise is an inherent part of many industrial, commercial and agricultural processes, even when the best available noise control technology applied. Noise production within industrial or commercial facilities is controlled indirectly by Federal and State employee health and safety regulations (OSHA and Cal-OSHA), but exterior noise emissions from such operations have the potential to exceed locally acceptable standards at nearby noise-sensitive land uses.

Stationary noise sources that were studied were selected by the City and BBA. Noise exposure information was developed from operational data obtained from source operators (when available) and noise level measurements conducted at reference locations around the noise source. Only existing noise levels are described since there are too many variables and unknown conditions to predict future noise exposure.

The following discussions provide generalized information concerning the relative noise impacts of each source, and identify specific noise sources which should be considered in the review of development proposals where potential noise conflicts could result. Not all industrial noise sources in the City are discussed. Unidentified industries or other major noise sources may exist, which could generate significant noise levels and result in noise-related land use conflicts. Generalized 50 and 55 dBA hourly L_{eq} noise contours were prepared for major stationary noise sources where it was determined that such contours would be located off the property occupied by the source. These contours are included in Map 8-1 of this document. The generalized contours contained within Map 8-1 should be used as a screening device to determine when potential noise-related land use conflicts may occur, and when site-specific studies may be required to properly evaluate noise at a given noise-sensitive receiver location.

Beatrice Cheese:

This facility is located south of S.R. 33 between Second and Third Streets. The Beatrice plant processes cheese and cheese by-products. The major noise sources at the plant are cooling towers, pumps, fans, compressors and similar equipment. A residential area is located south and east of the plant. During the morning of February 12, 1999, sound level measurements were conducted at the southeast corner of Second Avenue and Second Street, which is about 120 feet from the plant's cooling tower. Sound levels at this location ranged from about 66-70 dBA, with an energy average (L_{eq}) of 68.8 dBA. Another measurement was

conducted at Second Street and Fourth Avenue which is about 700 feet from the cooling tower. Sound levels at this location ranged from about 48-51 dBA, with an L_{eq} of 50.4 dBA.

This distance to the 50 and 55 dBA hourly L_{eq} contours are about 1,050 and 600 feet, respectively, using the standard assumption that sound from a point sources diminishes at the rate of 6 dB/doubling of distance. These contours are shown on Figure 1.

Avoset Foods:
This food processing plant is located east of S.R. 33 and south of Fourth Avenue. Major noise sources at the plant are fans and refrigerated trucks. A residential area is located east of the plant. Sound level measurements were conducted during the morning of February 12, 1999 at Fifth Avenue and Second Street, which is about 150 feet from the fans on the east side of the building. Sound levels ranged from about 48-51 dBA, with an L_{eq} of 50.4 dBA.

The distance to the 50 and 55 dBA hourly L_{eq} contours are about 350 and 200 feet, respectively, using the standard assumption that sound diminishes from a point source at 6 dB/doubling of distance. These contours are shown on Map 8-1.

Goals and Policies

Goals

The goals of the City of Gustine Noise Element are:

1. To protect the citizens of the City from the harmful and annoying effects of exposure to excessive noise.

2. To protect the economic base of the City by preventing incompatible land uses from encroaching upon existing or planned noise-producing uses.

3. To preserve the tranquility of residential areas by preventing noise-producing uses from encroaching upon existing or planned noise-sensitive uses.

4. To educate the citizens of the City concerning the effects of exposure to excessive noise and the methods available for minimizing such exposure.

Policies

The following specific policies have been adopted by the City of Gustine to accomplish the goals of the Noise Element:

Prevention of Adverse Noise Impacts due to Transportation Noise Sources:	
Policy 8.1.1	New development of noise-sensitive land uses shall not be permitted in areas exposed to existing or projected future levels of noise from transportation noise sources which exceed 65 dB L_{dn} in outdoor activity areas or 45 dB L_{dn} in interior spaces.
Policy 8.1.2	Noise created by new transportation noise sources, including roadway improvement projects, shall be mitigated so as not to exceed 65 dB L_{dn} within outdoor activity areas and 45 dB L_{dn} within interior spaces of existing noise-sensitive land uses.
Prevention of Adverse Noise Impacts due to Stationary Noise Sources:	
Policy 8.1.3	New development of noise-sensitive land uses shall not be permitted where the noise level from existing stationary noise sources exceeds the noise level standards of Table I.
Policy 8.1.4	Noise created by new proposed stationary noise sources or existing stationary noise sources which undergo modifications that may increase noise levels shall be mitigated so as not to exceed the noise level standards of Table 8-I at noise-sensitive uses.

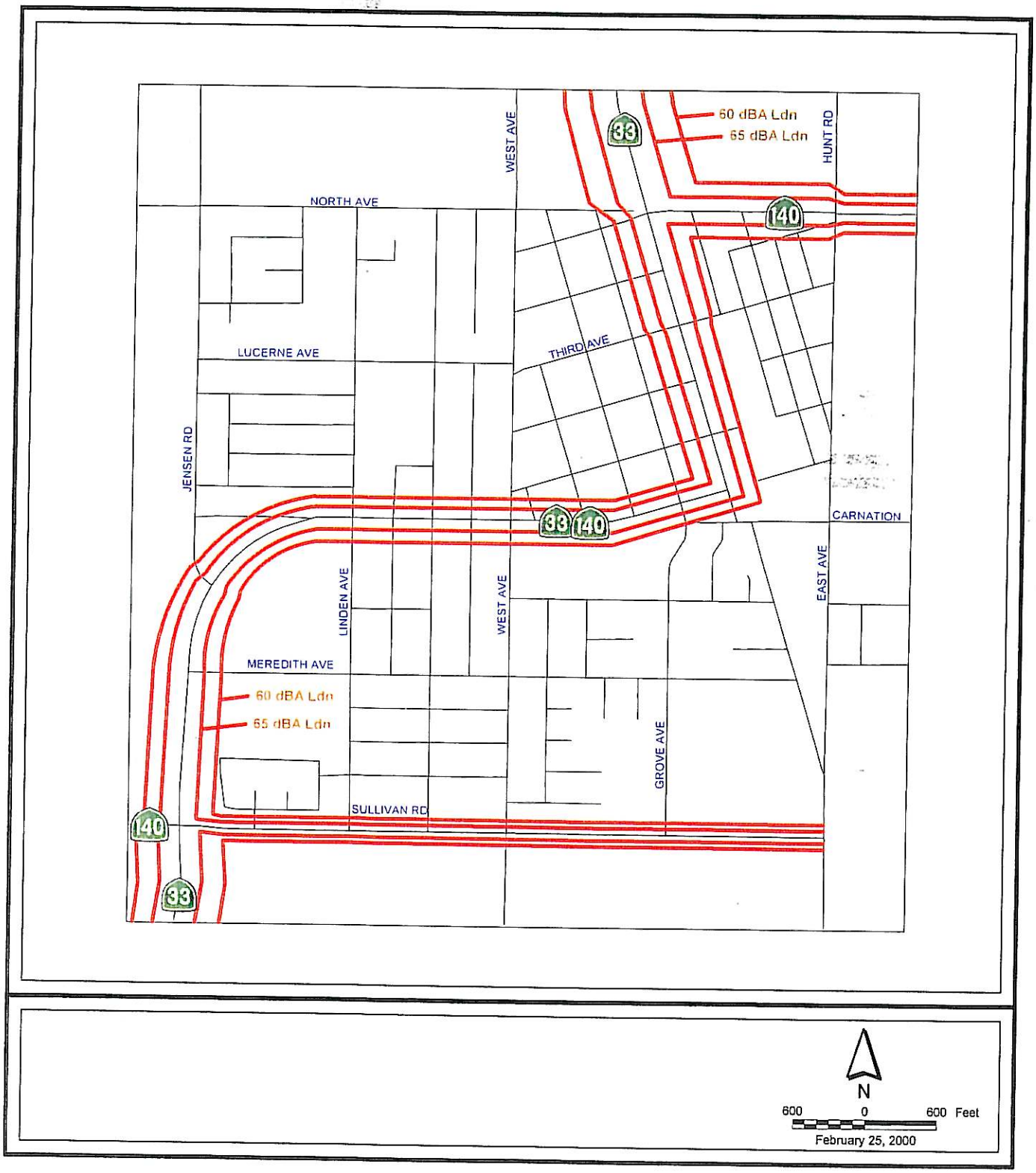
TABLE 8-I

MAXIMUM ALLOWABLE NOISE EXPOSURE-STATIONARY NOISE SOURCES[1]		
	Daytime (7 a.m. to 10 p.m.)	**Nighttime (10 p.m. to 7 a.m.)**
Hourly L_{eq}, dB	55	50
Maximum level, dB	75	70

[1]As determined at the property line of the receiving land use. When determining the effectiveness of noise mitigation measures, the standards may be applied on the receptor side of noise barriers or other property line noise mitigation measures.

Map 8-1 indicates Noise Contours for 2020. Most notably, the contours are derived from traffic sources.

Map 8-1: Future (2020) Noise Contours



To achieve compliance with the policies of the Noise Element, the City of Gustine shall undertake the following implementation program. The implementation program focuses on the prevention of new noise-related land use conflicts by requiring that new development be reviewed to determine whether it complies with the policies in this chapter.

IMPLEMENTATION	
8.2.1	The City shall review new public and private development proposals to determine conformance with the policies of this Noise Element.
8.2.2	The City shall require an acoustical analysis in those cases where a project potentially threatens to expose noise-sensitive land uses to excessive noise levels. The presumption of excessive noise levels shall be based on the location of new noise-sensitive uses to noise contours, or staff's professional judgement that a potential for adverse noise impacts exists. Acoustical analyses shall be required early in the review process so that noise mitigation may be included in the project design. For development not subject to environmental review, the requirements for an acoustical analysis shall be implemented prior to the issuance of building permits.
8.2.3	The City shall develop and employ procedures to ensure that noise mitigation measures required pursuant to an acoustical analysis are implemented in the development review and building permit processes.
8.2.4	The City shall develop and employ procedures to monitor compliance with the policies of the Noise Element after completion of projects where noise mitigation measures have been required.
8.2.5	The City shall enforce the State Noise Insulation Standards (California Code of Regulations, Title 24) and Chapter 35 of the Uniform Building Code (UBC) concerning interior noise exposure for multi-family housing, hotels and motels.
8.2.6	The City shall periodically review and update the Noise Element to ensure that noise exposure information and specific policies are consistent with changing conditions within the City and with noise control regulations or policies enacted after the adoption of this element.