APPENDIX I

Environmental Noise Assessment

Merced General Plan Background Document

Merced, California

Job # 2006-160

Prepared For:

Quad Knopf

One Sierragate Plaza, Suite 270C
Roseville, California 95678

Attn: Ms. Kim Hudson

Prepared By:

j.c. brennan & associates, Inc.

Jim Brennan
President
Member, Institute of Noise Control Engineering

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j.c. brennan & associates
consultants in acoustics

P.O. Box 6748 - 263 Nevada Street - Auburn, California 95603 -p: (530) 823-0960 -f: (530) 823-0961

NOISE

EXISTING NOISE ENVIRONMENT

General

Noise is often defined as unwanted sound, and its perception can be characterized as a subjective reaction to a physical phenomenon. Researchers have grappled for many years with the problem of translating objective measurements of sound into directly correlated measures of public reaction to noise. The descriptors of community noise in current use are the results of these efforts, and represent simplified, practical measurement tools to gauge community response. Table 1 provides examples of maximum or continuous noise levels associated with common noise sources.

Table 1
Typical A-Weighted Maximum Sound Levels of Common Noise Sources

Decibels	Description
130	Threshold of pain
120	Jet aircraft take-off at 100 feet
110	Riveting machine at operators position
100	Shot-gun at 200 feet
90	Bulldozer at 50 feet
80	Diesel locomotive at 300 feet
70	Commercial jet aircraft interior during flight
60	Normal conversation speech at 5-10 feet
50	Open office background level
40	Background level within a residence
30	soft whisper at 2 feet
20	Interior of recording studio

A common statistical tool to measure the ambient noise level is the average sound level (Leq), which is the sound level corresponding to a steady-state A-weighted sound level in decibels (dB) containing the same total energy as a time-varying signal over a given time period (usually one hour). The Leq, or average sound level, is the foundation for determining composite noise descriptors such as Ldn and CNEL (see below), and shows very good correlation with community response to noise.

Two composite noise descriptors commonly used are: Ldn and CNEL. The Ldn (Day-Night Average Level) is based upon the average hourly Leq over a 24-hour day, with a +10 decibel weighting applied to nighttime (10:00 p.m. to 7:00 a.m.) Leq values. The nighttime penalty is based upon the assumption that people react to nighttime noise exposures as though they were

subjectively twice as loud as daytime exposures. The CNEL (Community Noise Equivalent Level), like Ldn, is based upon the weighted average hourly Leq over a 24-hour day, except that an additional +4.77 decibel penalty is applied to evening (7:00 p.m. to 10:00 p.m.) hourly Leq values.

The CNEL was developed for the California Airport Noise Regulations, and is normally applied to airport/aircraft noise assessment. The Ldn descriptor is a simplification of the CNEL concept, but the two will usually agree, for a given situation, within 1 dB. Like the Leq, these descriptors are also averages and tend to disguise short-term variations in the noise environment. Because they presume increased evening or nighttime sensitivity, these descriptors are best applied as criteria for land uses where nighttime noise exposures are critical to the acceptability of the noise environment, such as residential developments.

The State Office of Planning and Research Noise Element Guidelines require that major noise sources be identified and quantified by preparing generalized noise contours for current and projected conditions. Noise measurements and modeling are used to develop these contours. Significant noise sources include traffic on major roadways and highways, railroad operations, airports, representative industrial activities and fixed noise sources.

Noise modeling techniques use source-specific data, including average levels of activity, hours of operation, seasonal fluctuations, and average levels of noise from source operations. Modeling methods have been developed for a number of environmental noise sources such as roadways, railroad line operations and industrial plants. Such methods produce reliable results so long as data inputs and assumptions are valid.

The modeling methods used in this report closely follow recommendations made by the State Office of Noise Control, and were supplemented, where appropriate, by field-measured noise levels to account for local conditions. The noise exposure contours are based upon annual average conditions. Because local topography, vegetation or intervening structures may significantly affect noise exposure at a particular location, the noise contours should not be considered site-specific.

A community noise survey was also conducted to describe existing noise levels in noise-sensitive areas within the General Plan study area so that noise level performance standards may be developed to maintain an acceptable noise environment.

Existing Regulatory Framework

The existing City of Merced General Plan Noise Element is based upon recommendations by the California State Office of Noise Control as contained in the Guidelines for the Preparation and Content of Noise Elements of the General Plan.

The criteria in the Noise Element are established for determining potential noise conflicts between various land uses, and noise sources. The standards for all noise sources are based upon the CNEL/Ldn descriptor. Figure 1 shows the land use compatibility chart contained in the existing City of Merced Noise Element. The Goals and Policies of the existing City of Merced Noise Element are described below:

Existing Noise Element Goals and Policies

Goals N-1

- *A quiet Environment*
- *Sensitive Land Uses Protected From Excessive Noise*

Policies

N-1.1 *Minimize the impacts of aircraft noise.*

N-1.2 *Reduce surface vehicle noise.*

N-1.3 *Reduce equipment noise levels.*

N-1.4 *Reduce noise levels at the receiver where noise reduction at the source is not possible.*

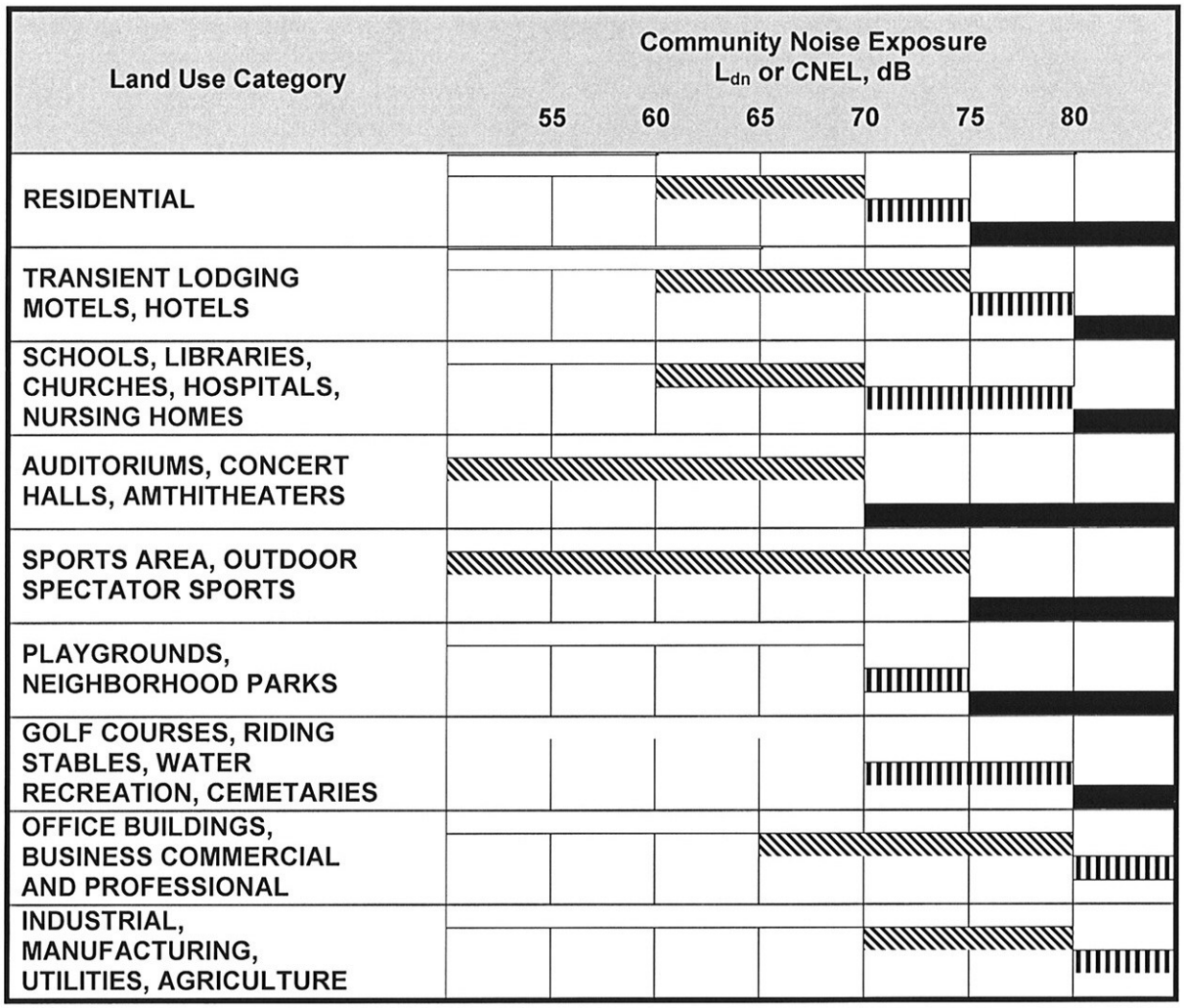
N-1.5 *Coordinate planning efforts so that noise-sensitive land uses are not located near major noise sources.*

N-1.6 *Mitigate all significant noise impacts as a condition of project approval for sensitive land uses.*

As described earlier, the CNEL and Ldn are 24-hour average noise level descriptors, which assume that individuals are more sensitive to noise occurring during the evening and nighttime hours. The CNEL and Ldn descriptors have been found to provide good correlation to the potential for annoyance from transportation-related noise sources (ie: roadways, airports and, to a lesser extent, railroad operations). However, these descriptions do not provide a good correlation to the potential for annoyance from non-transportation or stationary noise sources, such as industrial and commercial operations, because many times stationary noise sources operate sporadically or for short durations. Examples of these types of noise sources include loading docks, special event concerts, pressure relief valves or alarms, which tend to be short duration noise events. When applying an Ldn or CNEL descriptors, the noise levels associated with these types of short term operations will be averaged over a 24-hour period, underscoring the potential for annoyance.

The State of California "Model Community Noise Control Ordinance" suggests that an exterior hourly L50/Leq noise level of 55 dBA should be used for evaluating stationary noise source impacts during the daytime period (7 am - 10 pm) and 45 dBA during the nighttime period (10 pm - 7 am), within "suburban" areas. The hourly Leq, or hourly average noise level, has been found to provide good correlation to noise sources which operate for a short duration.

Figure 1
Land Use Compatibility



NORMALLY ACCEPTABLE

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

NORMALLY UNACCEPTABLE

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

CLEARLY UNACCEPTABLE

New construction or development clearly should not be undertaken.

Source: Adapted from the State of California General Plan Guidelines, 1990. Office of Planning and Reasearch. Suggested CNEL/Ldn metrics for evaluating land use noise compatibility.

Since the Leq is calculated on a logarithmic scale, loud noise levels of short duration are emphasized. For example, a maximum noise level of 70 dBA can only be generated for 2 minutes without exceeding an hourly average (Leq) noise level of 55 dBA. If an on-site noise source generated a noise level of 73 dBA for 1 minute, the hourly average (Leq) noise level would be approximately 55 dBA.

Research indicates that interior noise levels suitable for sleeping areas is within the range of 38 dBA to 48 dBA. The State of California "Model Community Noise Control Ordinance" suggests that an interior maximum noise level (Lmax) of 45 dBA should be used for residential uses between the hours of 10 pm and 7 am.

Roadway Noise Levels

The Federal Highway Administration's (FHWA) Highway Traffic Noise Prediction Model (FHWA-RD 77-108) was used to develop Ldn (24-hour average) noise contours for all highways and major roadways in the General Plan study area. The model is based upon the CALVENO noise emission factors for automobiles, medium trucks, and heavy trucks, with consideration given to vehicle volume, speed, roadway configuration, distance to the receiver and the acoustical characteristics of the site. The FHWA Model predicts hourly Leq values for free-flowing traffic conditions, and is generally considered to be accurate within 1.5 dB. To predict Ldn values, it is necessary to determine the hourly distribution of traffic for a typical 24-hour period.

Traffic data representing annual average traffic volumes for existing conditions were obtained from Caltrans and the project traffic consultant. Day/night traffic distribution for Highway 99, State Route 59, and State Route 140 were based upon continuous hourly noise measurement data collected for those roadways. Truck mix data were also based upon Caltrans and j.c. brennan & associates, Inc. file data. Using these data sources and the FHWA traffic noise prediction methodology, traffic noise levels were calculated for existing traffic volumes in terms of the Ldn metric. Distances from the centerlines of selected roadways to the 60 and 65 dB Ldn contours are summarized in Table 2. Continuous noise measurement data is shown in Appendix B.

In many cases, the actual distances to noise level contours may vary from the distances predicted by the FHWA model. Factors such as roadway curvature, roadway grade, shielding from local topography or structures, elevated roadways, or elevated receivers may affect actual sound propagation. The distances reported in Table 2 are generally considered to be conservative estimates of noise exposure along roadways in the City of Merced.

The effects of factors such as roadway curvature, and grade, can be determined from site-specific traffic noise measurements. The noise measurement results can be compared to the FHWA model results by entering the observed traffic volumes, speed and distance as inputs to the FHWA model. The differences between the measured and predicted noise levels can be used to adjust the FHWA model and more precisely determine the locations of the traffic noise contours.

Table 2
Predicted Existing Traffic Noise Levels
City of Merced

Roadway	Segment	Ldn at 100 feet	Distances to Ldn Contours (feet)		
			55 dB	60 dB	65 dB
SR 99	Childs Ave to Route 140 Jct.	78 dB	3631	1685	782
SR 99	Route 140 to G St	78 dB	3648	1693	786
SR 99	G St to Hwy 59 North	79 dB	3992	1853	860
SR 140	Massasso to X St	63 dB	336	156	72
SR 140	X St to Route 99/59	64 dB	406	188	87
SR 140	Route 99 to Santa Fe	67 dB	605	281	130
SR 140	Santa Fe Ave to Planada	67 dB	667	310	144
SR 59	16th & V St. to 16th split	68 dB	704	327	152
SR 59	16th split to Olive Ave	64 dB	403	187	87
SR 59	Childs Ave to Route 140 Jct.	64 dB	399	185	86
SR 59	Olive Ave to Bellevue	65 dB	484	225	104
SR 59	Route 140 to 16th & V St.	68 dB	722	335	155
16th Street	Route 140 to G	59 dB	195	90	42
16th Street	G to M.L. King Jr. Way	61 dB	271	126	58
16th Street	M.L. King Jr. Way to M St.	62 dB	272	126	59
16th Street	M St. to V St.	62 dB	296	137	64
16th Street	V St. to Route 59	63 dB	327	152	71
G Street	Bellevue to Yosemite	61 dB	265	123	57
G Street	Yosemite to Donna	63 dB	336	156	72
G Street	Donna to El Portal	64 dB	385	179	83
G Street	El Portal to Olive	65 dB	459	213	99
G Street	Olive to Alexander	65 dB	458	213	99
G Street	Alexander to Bear Creek	65 dB	494	229	106
G Street	Bear Creek to 26th	64 dB	426	198	92
G Street	26th to 18th	64 dB	379	176	82
G Street	18th to Main St	63 dB	317	147	68
G Street	South of Main St	62 dB	278	129	60
M St	18th to Main St	61 dB	257	119	55

Table 2
Predicted Existing Traffic Noise Levels
City of Merced

Roadway	Segment	Ldn at 100 feet	Distances to Ldn Contours (feet)		
			55 dB	60 dB	65 dB
M St	21st to 18th	62 dB	288	134	62
M St	23rd to 21st	62 dB	312	145	67
M St	Bear Creek to 23rd	63 dB	362	168	78
M St	Olive to Bear Creek	63 dB	333	155	72
M St	South of Main St	61 dB	245	114	53
M St	Yosemite to Olive	64 dB	395	183	85
M.L. King Jr. Way	23rd to 16th	56 dB	121	56	26
M.L. King Jr. Way	16th to Childs Ave	58 dB	157	73	34
Olive Ave	East of Park	65 dB	441	205	95
Olive Ave	Park to M St.	65 dB	486	226	105
Olive Ave	M St. to R St.	66 dB	506	235	109
Olive Ave	R St. to V St.	66 dB	506	235	109
R St	Yosemite to Olive	63 dB	331	154	71
R St	Olive to Bear Creek	62 dB	288	134	62
R St	Bear Creek to 20th	62 dB	295	137	64
R St	18th to Main St	61 dB	254	118	55
R St	20th to 18th	61 dB	255	118	55
R St	Main to 15th	61 dB	257	119	55
R St	15th to 13th	61 dB	234	109	50
V St	16th to 23rd	59 dB	198	92	43
V St	West Ave to 16th	62 dB	281	131	61
Yosemite Ave	G St to McKee Rd	64 dB	379	176	82
Yosemite Ave	SR 59 to G St	63 dB	342	159	74

Notes: Distances to traffic noise contours are measured in feet from the centerlines of the roadways.
Source: j.c. brennan & associates, Inc., 2007

Railroad Noise Levels

Railroad activity in the City of Merced General Plan Study Area occurs along the Union Pacific Railroad (UPRR) and Burlington Northern/Santa Fe (BNSF) railroad tracks. The UPRR mainline track generally runs parallel to the State Route 99 outside of the downtown area. Within the downtown area of Merced, the Union Pacific Railroad (UPRR) runs parallel and directly between 16th Street and 15th Street. The Burlington Northern Santa Fe Railroad generally runs parallel to Santa Fe Avenue until reaching the intersection of Highway Ca-140. At which point the tracks redirect easterly and follow Highway 140/Yosemite Parkway towards Planada.

In order to quantify existing train usage, j.c. brennan & associates, Inc., conducted continuous noise level monitoring at three location within the General Plan study area. The purpose of the noise level measurements was to determine typical sound exposure levels (SEL) for railroad line operations in the General Plan study area, accounting for the effects of travel speed, warning horns and other factors which may affect noise generation. In addition, the noise measurement equipment was programmed to identify individual train events, so that the typical number of train operations could be determined. Locations of continuous noise monitoring sites are shown on Figure 2. Table 3 shows a summary of the continuous noise measurement results for the UPRR and BNSF railroad lines. Figures 3A through 3C show the results of the continuous railroad noise measurements.

Table 3
Railroad Noise Measurement Results

Measurement Location	Railroad Track	Grade Crossing /Warning Horn	Trains Events Per Day	Distance to CL	Average SEL
Site B	BNSF	No	26	110'	100 dB
Site C	UPRR	No	16	114'	103 dB
Site D	UPRR	Yes	16	46'	108 dB

Source: j.c. brennan & associates, Inc - 2007

Noise measurement equipment consisted of Larson Davis Laboratories (LDL) Model 820 and Model 824 precision integrating sound level meter equipped with a LDL ½" microphone. The measurement systems were calibrated using a LDL Model CAL200 acoustical calibrator before testing. The measurement equipment meets all of the pertinent requirements of the American National Standards Institute (ANSI) for Type 1 (precision) sound level meters.

Based upon the noise level measurements shown in Table 3, the average SEL for train operations along the UPRR line is 103 dB at 100 feet, with approximately 16 train events occurring per day. The average SEL for train operations along the BNSF railroad line is 101 dB, with

approximately 26 train events occurring per day. Train operations for each railroad line are assumed to be equally and randomly distributed throughout the daytime and nighttime hours.

To determine the distances to the Ldn railroad contours, it is necessary to calculate the Ldn for typical train operations. This was done using the SEL values and above-described number and distribution of daily freight train operations for each railroad line. The Ldn may be calculated as follows:

$Ldn = SEL + 10 \log N_{eq} - 49.4$ dB, where:

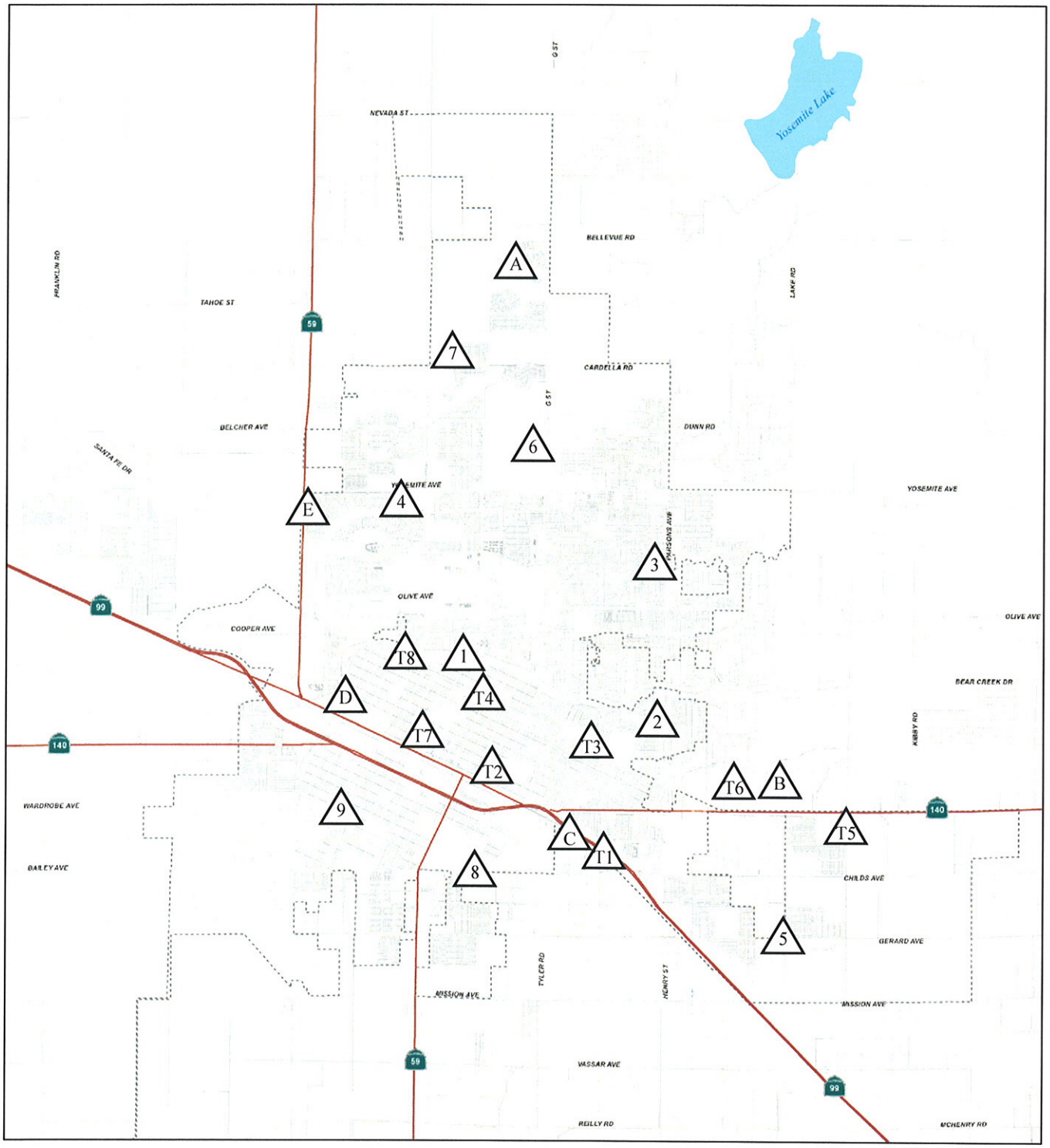
SEL is the mean Sound Exposure Level of the event, N_{eq} is the sum of the number of daytime events (7 a.m. to 10 p.m.) per day, plus ten times the number of nighttime events (10 p.m. to 7 a.m.) per day, and 49.4 is ten times the logarithm of the number of seconds per day. Based upon the above-described noise level data, number of operations and methods of calculation, the Ldn value for railroad line operations have been calculated, and the distances to the Ldn noise level contours are shown in Table 4.

Table 4
Approximate Distances to the Railroad Noise Contours
Without Horn Use

	Distance to Ldn Contour		
Ldn at 100 feet	60 dB	65 dB	70 dB
UPPR line			
72.6 dB	700 feet	325 feet	151 feet
BNSF line			
72.0 dB	635 feet	295 feet	137 feet
Source: j.c. brennan & associates, Inc.			

In addition j.c. brennan & associates, Inc. conducted short-term noise measurements of train operations at eight locations throughout the City. The intent of the short-term noise monitoring was to determine the effects of railroad grade-crossings and the use of warning horns on environments in the vicinity of railroad tracks. Short-term noise monitoring was conducted for the UPRR line at: the End of Brantley St, 16th and "G" St., and 16th and "M" Street. Noise measurements of the BNSF railroad line were conducted at: Santa Fe and Glenn Ave, The Amtrak Station, end of Baker Dr., off SR 140 near Santa Fe, and "R" Street. Union Pacific Railroad sound exposure levels (SEL) within the City ranged from 101 dB to 103 dB, with maximum noise levels ranging from 92 dB to 96 dB Lmax at a distance of 100 feet. Burlington Northern Santa Fe Railroad sound exposure levels (SEL) within the City ranged from 100 dB to 108 dB, with maximum noise levels ranging from 89 dB to 103 dB Lmax at a distance of 100 feet. Grade crossings and the use of warning horns was found to raise noise levels associated with train operations 5 dB to 10 dB.

Figure 2
Merced General Plan Noise Element – City of Merced, California
Base Map and Noise Measurement Site Locations



N

△ : Noise Measurement Site

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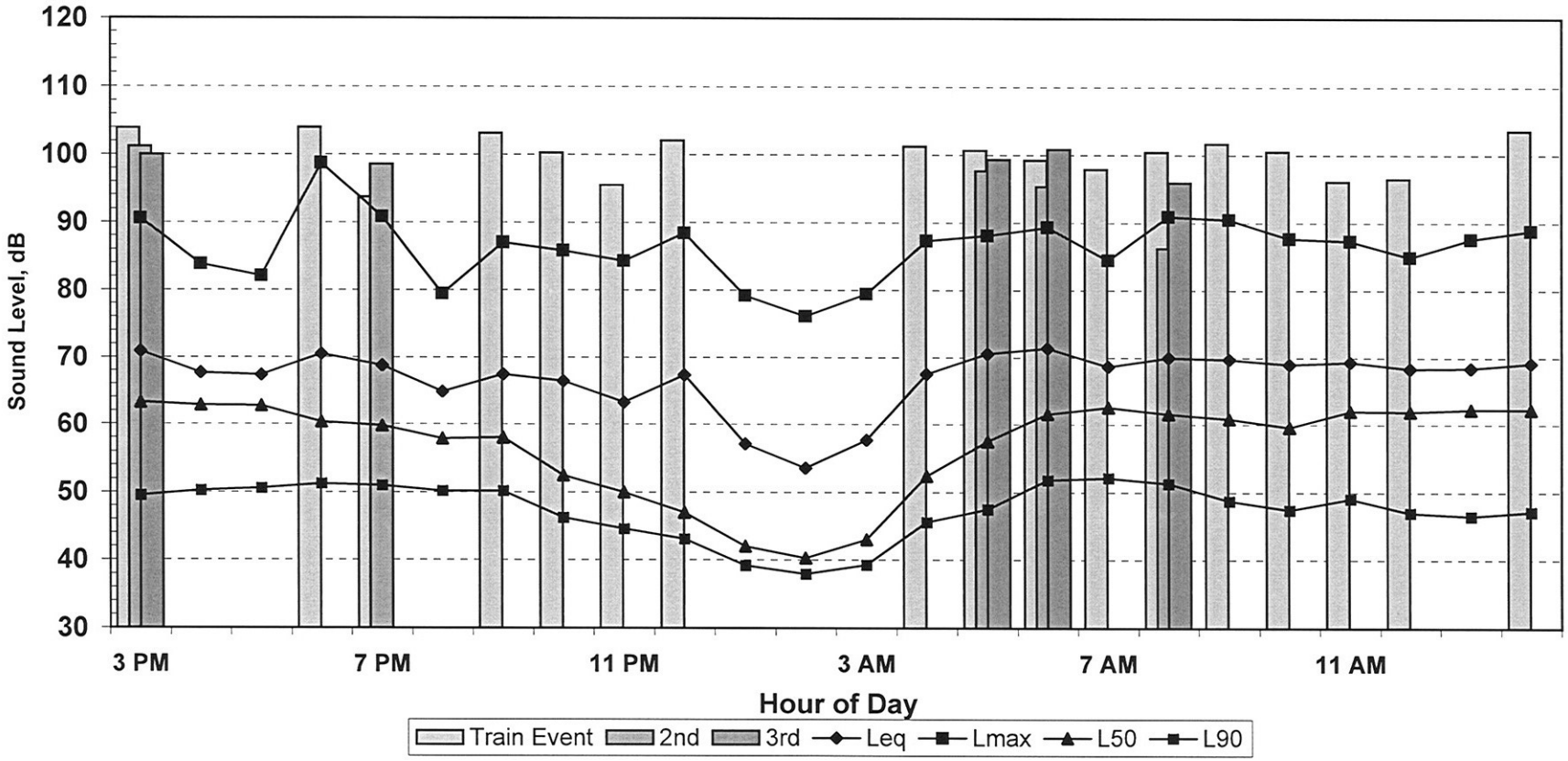
Figure 3A
Continous Measured Railroad and Hourly Noise Levels - Site B
City of Merced General Plan
June 11-12, 2007



Ldn : 73.7 dB **Train Ldn: 71.4 dB**

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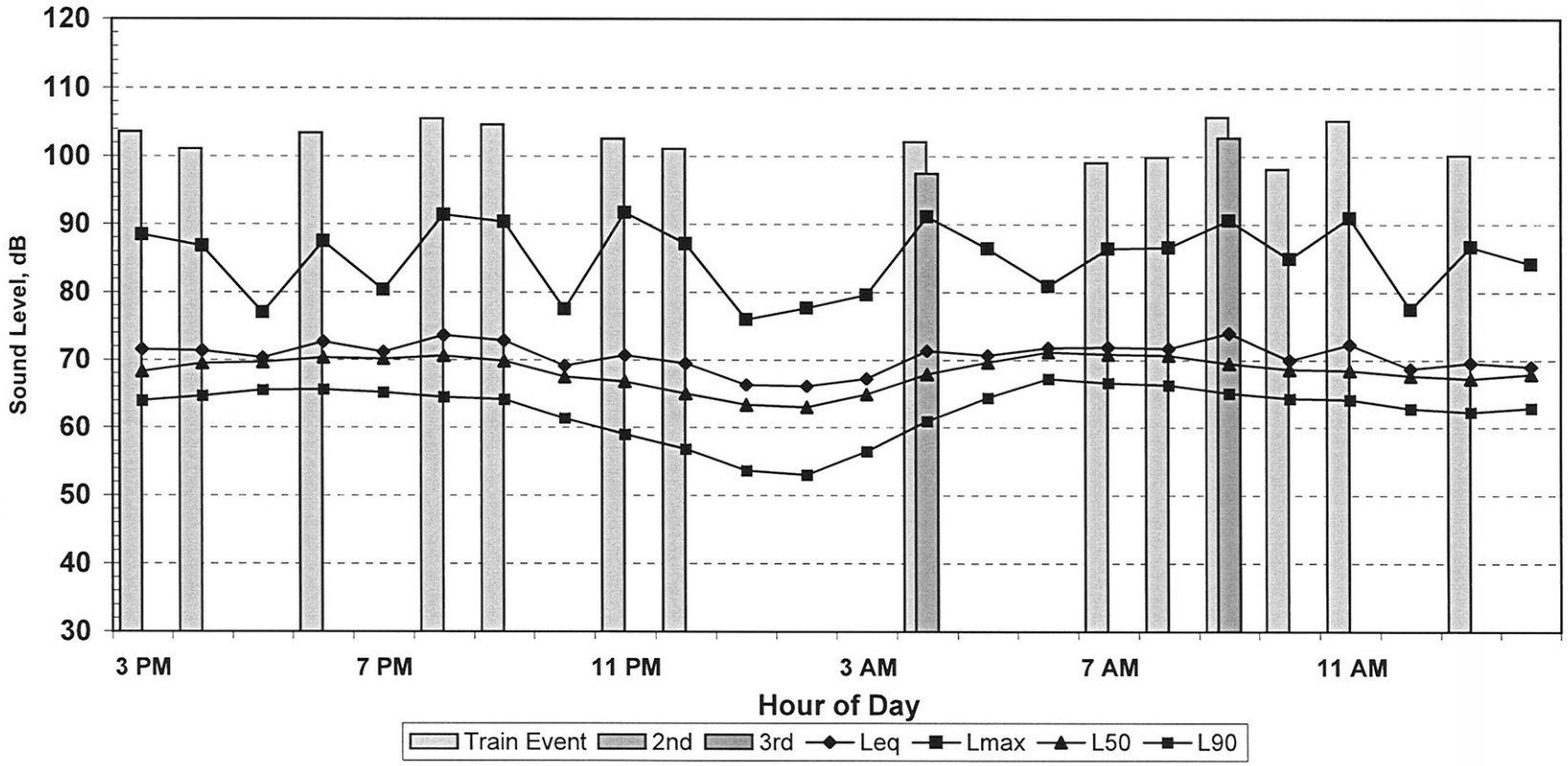
Figure 3B
Continous Measured Railroad and Hourly Noise Levels - Site C
City of Merced General Plan
June 11-12, 2007



Ldn : 76.4 dB **Train Ldn: 71.8 dB**

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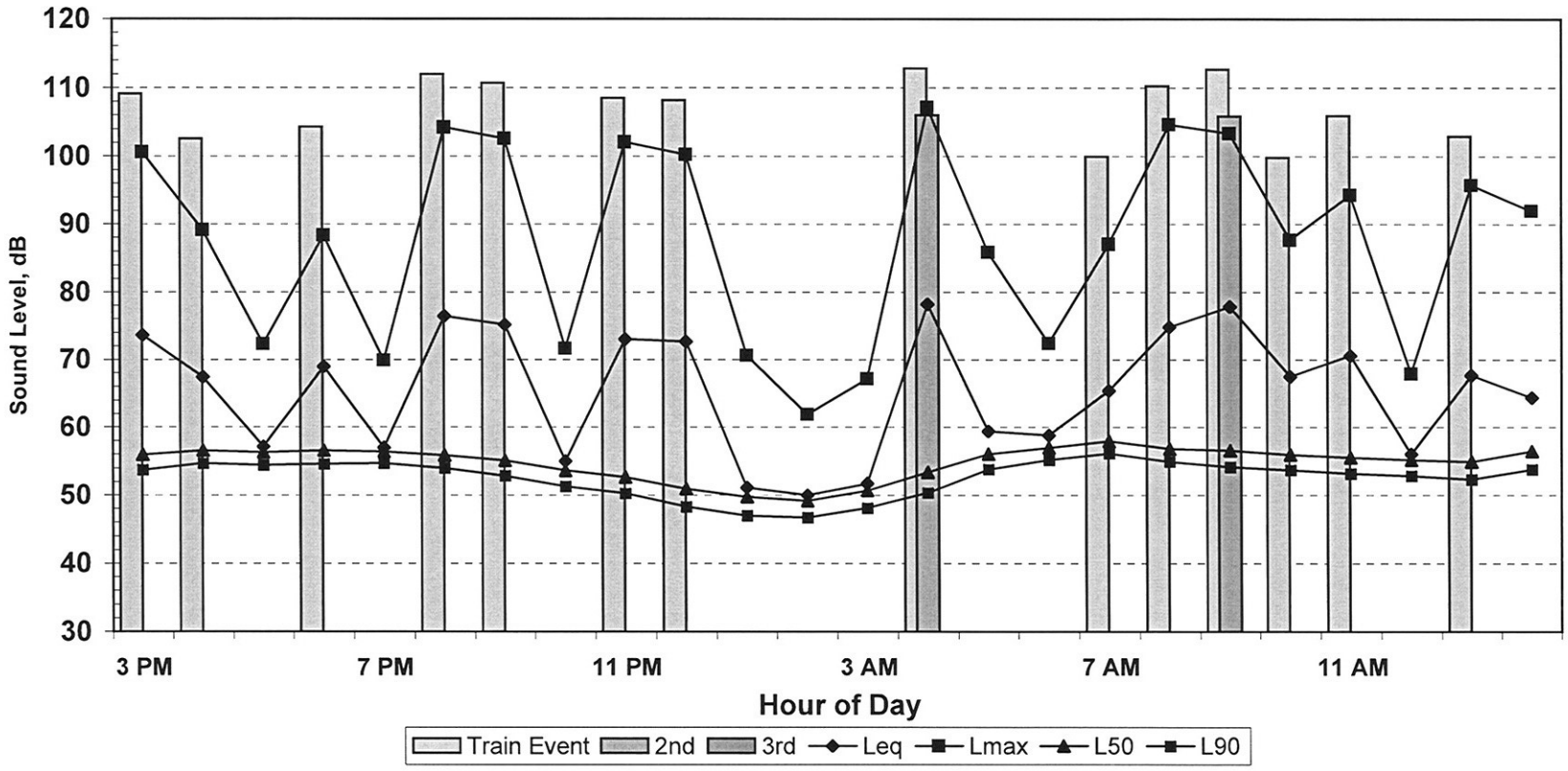
Figure 3C
Continous Measured Railroad and Hourly Noise Levels - Site D
City of Merced General Plan
June 11-12, 2007



Ldn : 77.3 dB **Train Ldn: 77.7 dB**

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Aviation Noise Levels

In the vicinity of the City of Merced there are currently two public airports in operation: Castle Airport, and Merced Municipal Airport. The Merced Municipal Airport is owned and operated by the City of Merced. Ownership of Castle Airport was turned over from the US Military to the Castle Joint Powers Authority (CJPA). The CJPA consists of membership from the County of Merced and the Cities of Atwater and Merced. Additionally, there are a number of privately owned and operated airfields in the area surrounding the City of Merced.

Noise Impacts and contours associated with Castle Airport and Merced Municipal Airport are addressed in the Merced County Airport Land Use Compatibility Plan, Adopted by the Airport Land Use Commission on April 15, 1999.

Merced Municipal Airport

The Merced Municipal Airport / Macready Field is located 2 miles southwest of the center of the City of Merced. This airport has a single runway with a heading of 12/30, at an elevation of 157 feet above sea level. The airport is open 24 hours per day, and has a lighted runway for night operations. Primary use of the airport is single-engine fixed wing aircraft used for general aviation purposes. Twin engine, Business jet, and turbo prop aircraft also frequent the airport. Commercial passenger flights occur at the airport on a limited basis. On an annual average basis, there are approximately 229 operations per day, with the majority of aircraft using the southeast approach (Runway 30). Further information and analysis for this airport can be found in the above referenced ALUCP. Figure 4 show the Merced Municipal Airport noise impact area for year 2010.

Castle Airport

Castle Airport is located approximately 6 miles northwest of the City of Merced. Prior to October 1995 Castle Airport was operated for more than fifty years by the military. The Airport consists of a single runway with a heading of 13/31. The airport is open 24 hours per day, and has a lighted runway for night operations. Aircraft that primarily use the airport are single-engine fixed-wing general aviation aircraft. Twin-engine aircraft, business jets, and commercial jet airplanes also utilize the airport. On an annual average basis, there are approximately 579 operations per day, with the majority of aircraft using the southeast approach (Runway 31). Further information and analysis for this airport can be found in the above referenced ALUCP. Figure 5 show the Castle Airport noise impact area.

Other Aviation Activity

Other general aviation activities can be expected to occur in the vicinity of the City of Merced. The Mercy Medical Center Merced owns and operates a Bell 407 helicopter for emergency airlift services, which is operated as needed 24 hours a day. Other general aviation may be associated with agricultural, forestry, recreational or other private operation.

Figure 4

Merced General Plan Noise Element – City of Merced, California

Merced Municipal Airport Noise Contours

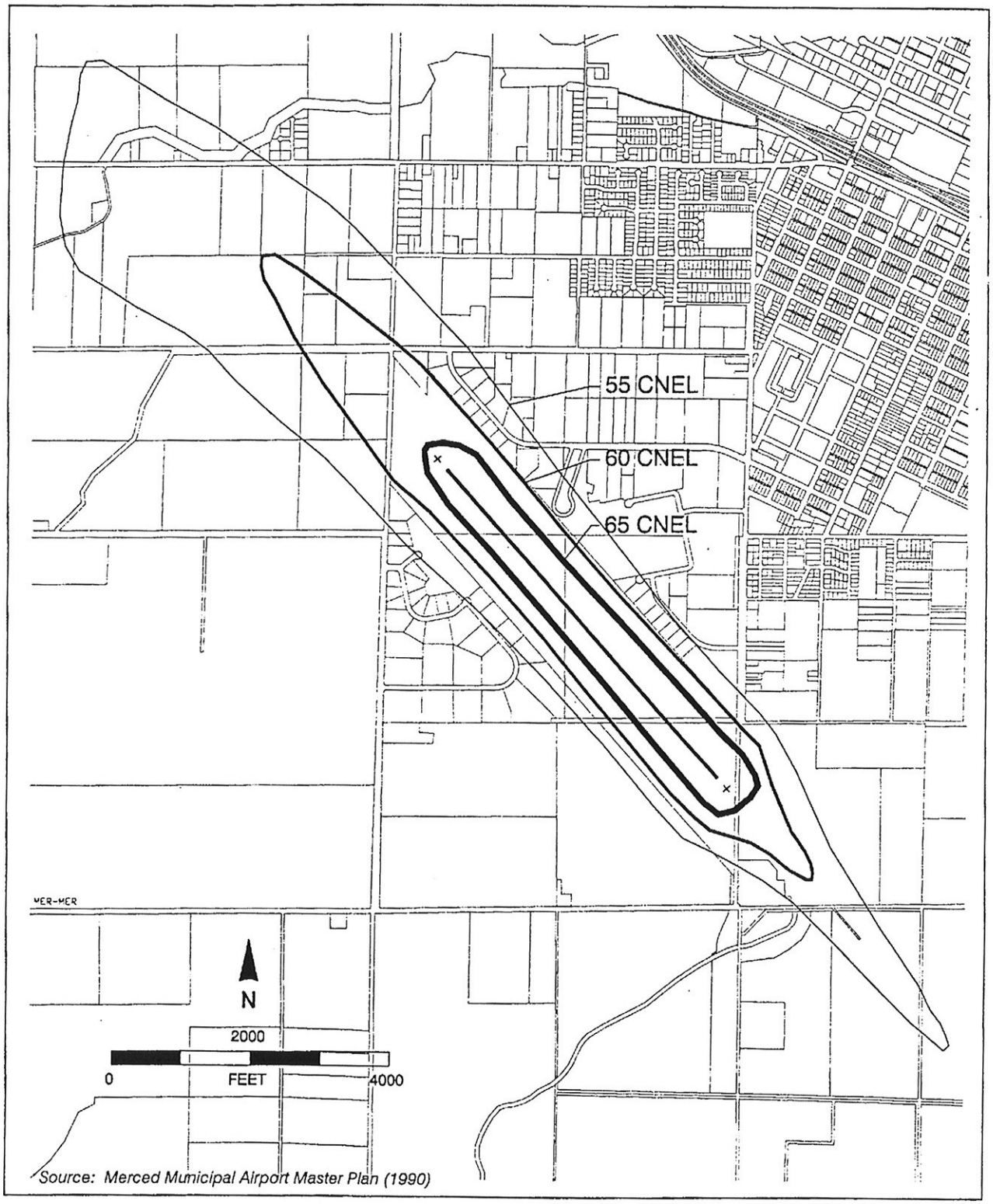

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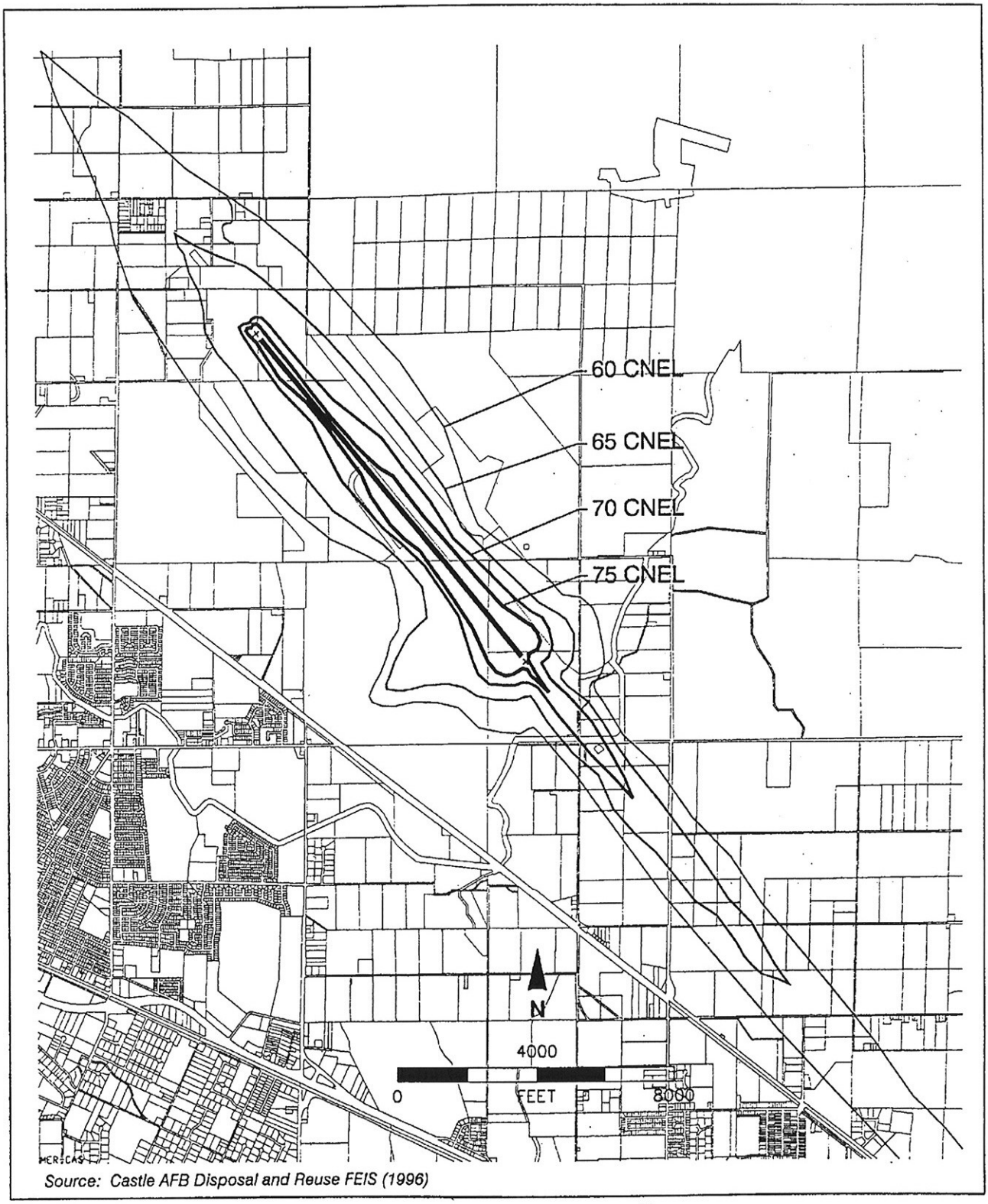
Figure 5
Merced General Plan Noise Element, City of Merced, California
Castle Airport Noise Contours



Source: Castle AFB Disposal and Reuse FEIS (1996)

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Fixed Noise Sources

The production of noise is a result of many industrial processes, even when the best available noise control technology is applied. Noise exposures within industrial facilities are controlled by Federal and State employee health and safety regulations (OSHA and Cal-OSHA), but exterior noise levels may exceed locally acceptable standards. Commercial, recreational and public service facility activities can also produce noise which affects adjacent sensitive land uses. These noise sources can be continuous and may contain tonal components which have a potential to annoy individuals who live nearby. In addition, noise generation from fixed noise sources may vary based upon climatic conditions, time of day and existing ambient noise levels.

From a land use planning perspective, fixed-source noise control issues focus upon two goals:

1) To prevent the introduction of new noise-producing uses in noise-sensitive areas, and

2) To prevent encroachment of noise sensitive uses upon existing noise-producing facilities.

The first goal can be achieved by applying noise level performance standards to proposed new noise-producing uses. The second goal can be met by requiring that new noise-sensitive uses in near proximity to noise-producing facilities include mitigation measures that would ensure compliance with noise performance standards.

Fixed noise sources which are typically of concern include but are not limited to the following:

HVAC Systems	Cooling Towers/Evaporative Condensers
Pump Stations	Lift Stations
Steam Valves	Steam Turbines
Generators	Fans
Air Compressors	Heavy Equipment
Conveyor Systems	Transformers
Pile Drivers	Grinders
Drill Rigs	Gas or Diesel Motors
Welders	Cutting Equipment
Outdoor Speakers	Blowers
Chippers	Cutting Equipment
Loading Docks	Amplified music and voice

The types of uses which may typically produce the noise sources described above, include, but are not limited to: wood processing facilities, pump stations, industrial facilities, trucking operations, tire shops, auto maintenance shops, metal fabricating shops, shopping centers, drive-up windows, car washes, loading docks, public works projects, batch plants, bottling and canning plants, recycling centers, electric generating stations, race tracks, landfills, sand and gravel operations, special events such as concerts, and athletic fields.

The City of Merced has three primary areas where industrial noise sources exist. The primary industrial noise generating areas are located along the western, southwestern and southeastern City boundaries. The following descriptions are intended to be representative of the relative noise impacts of such uses and to identify individual noise sources needing consideration during the environmental review process of developments in their vicinity. Pepsi-Cola Metropolitan Bottling and Distribution facility, Werner Corporation, McLane Pacific Grocery Distribution, and Quebecor World have been identified as primary industrial noise generators located within the City of Merced.

Pepsi-Cola Bottling Facility

Pepsi-Cola operates a bottling, production, and distribution facility at the corner of West Avenue and Eagle Street. Noise sources associated with the facility include air compressors, cooling towers and evaporator equipment located at the north side of the facility, and on-site truck circulation along the southern and western property boundaries. Liquid carbon dioxide is delivered generally once per week, causing 15-20 minutes of elevated noise levels along the eastern portion of the facility. The facility is operated continuously year-round, 24 hours a day. Noise measurements were conducted outside the northern property line, adjacent to the facilities cooling towers.. The cooling towers generated an average noise level of 69.8 dB Leq and a maximum noise level of 70.8 dB Lmax, at a distance of 50 feet.

Werner Corporation

The Werner Corporation is located west of the Grogan Avenue and West avenue intersection. The facility manufactures, assembles, and distributes fiberglass, wood, and metal climbing equipment such as ladders and scaffolding. Hours of operation are 6:00 a.m. to 11:15 p.m. seven days a week. Noise sources include manufacturing equipment located inside the building, audible through bay doors at the northwestern façade, and on-site truck operations. Werner Co. receives and dispatches approximately ten semi tractor-trailers per day. j.c. brennan & associates file data indicates that slowly moving trucks may produce maximum noise levels of 71-74 dB at 100 feet, and idling trucks generate approximately 62-63 dB at 100 feet. Noise measurements of manufacturing operations ranged from 71 dB to 75 dB Lmax 110 feet north of the facility.

McLane Pacific

McLane Pacific operates a 250,000 square foot food service/grocery processing and distribution facility located at the northwest corner of Childs Ave and Kibby Rd. Hours of operation are 24 hours a day, Sunday through Saturday. Primary noise sources associated with the facility include rooftop cooling towers, refrigeration equipment, loading dock activities, and on-site truck circulation. Due to the nature of the product the majority of trailers are outfitted with diesel powered refrigeration units and may remain idling at the facility for extended periods of time. Mclane Pacific dispatches between 30 and 35 trucks per day and receives 45 to 60 trucks per day. Noise measurements conducted east of the McLane Pacific facility ranged from 56 dB to 63 dB Leq, and 72 dB to 77 dB Lmax approximately 450 feet from the primary noise sources.

Quebecor World

Quebecor World Incorporated operates a 500,000 square foot digital media production, printing, and distribution facility located northwest of Cooper Avenue and Highway 59 in Merced, California. A representative for the facility was not available for comment during our survey, and therefore operational statistics are unknown. Daytime noise levels associated with the facility were at or below the ambient noise environment in the vicinity, which was primarily comprised of transportation noise on Highway 59 and Santa Fe Boulevard. Nighttime noise measurements of the Quebecor World facility resulted in noise levels of 64 dB Leq, and 68 dB Lmax at a distance of 650 feet.

Aggregate Batch Plants

There are three aggregate/rock processing facilities in the vicinity of Merced: Builders Concrete, Boulders Unlimited, and Central Valley Concrete/Trucking. Central Valley Concrete processes batches of concrete and supplies sand and gravel throughout Merced and many neighboring counties. The main plant is located at the Highway 59 and Buena Vista Ave intersection, with a secondary plant located in southern Merced on Brantley Street. Operations at the facility are dependent on type of material, demand from contractors, and number of internal CVC jobs in operation. Typical hours of operation are 6:00 a.m. to 4:00 p.m., four to five days per week. Approximately 30-40 trucks of concrete are produced per day; however, when demand peaks production can accommodate 120 trucks per day.

Builders Concrete located northwest of the City limits operates in a similar manner to Central Valley Concrete. Hours of operation are typically 5:00 a.m. to 3:00 p.m. but may vary considerable to meet demand. Builders Concrete operates locally in the Merced area with a fleet of 10-22 trucks making multiple trips when required. At a distance of 280 feet from the center of the batch plant the average noise level was 59 dB Leq, with a maximum noise level of 63 dB Lmax.

Boulders Unlimited, located at the Highway 59 and Yosemite Avenue intersection, batches concrete and supplies sand, gravel, boulders, and landscaping materials. Hours of operation are 7:30 am to 5:30 pm, five days per week. Boulders Unlimited also provides crane, and general trucking services which are dispatched from the facility.

Merced County Fairgrounds

The Merced County Fairgrounds are located on Martin Luther King Junior Way, between East 11th street and Childs Avenue, in the City of Merced. There are a variety of potential noise sources associated with fairground operations including parking lot noise, amplified speech/music, amusement/carnival rides, livestock, concerts, and the Merced Speedway. The majority of these activities are limited to one week of operation during the Merced County Fair. Off-season use of the fairgrounds is generally associated with the Merced Flea Market, held weekly year-round, private facilities rentals, and the Merced Speedway.

Merced Speedway

Merced Speedway is a 3/8th of a mile dirt oval located on the northwestern portion of the Merced County fairgrounds. The speedway can accommodate 3,250 guests in grandstand seating and an additional 1,750 in bleacher seating. Racing series' range from super modified, high output classes to small sport compacts. The Merced Speedway track schedule shows the pit areas opening at 4 pm, racing beginning at 7 pm, and awards/standings closing between 9:30 pm and 10:00 pm. Racing events occur Saturdays and some Sundays from March through October.

In order to evaluate noise levels associated with the Merced Speedway, j.c. brennan & associates, Inc. conducted short-term noise level measurements at the fairgrounds. Short-term measurements were conducted at three locations at the speedway. Continuous noise level measurements were conducted at a nearby residential receiver, located adjacent speedway along East 11th street. Table 5 summarizes the results of the noise monitoring. Noise measurement locations are shown on Figure 7.

Nightly Concert Series

The Merced County Fair hosts a nightly concert series during the county fair. Nightly concerts are held at a temporary outdoor theater located in the western portion of the fairgrounds. The outdoor theater is arranged with a main seating area for 2,000 attendees surrounded by bleacher seating for an additional 3,000 guests. Performances at the outdoor theater ranged from contemporary/pop styles to country, and alternative rock music. The performance stage was approximately 72 feet by 40 feet, and was outfitted with four JBL Vertec line array speaker cabinets and four sub woofers per side. Noise levels associated with concerts and musical events such as these can vary considerably depending on several factors: crowd size, type of music, operational levels of the sound system, and the duration of the event. During the July 17th, 2007 visit to the Merced County Fair, j.c. brennan & associates, Inc. performed short-term noise measurements at five locations at the outdoor theater. Table 5 shows the results of noise monitoring for the concert series.

Table 5
Existing Merced County Fair Noise Measurement Results
July 17, 2007

Site	Location	Time	Measured Noise Level, dBA		
			Leq	L50	Lmax
1	145 West 11th Street, 800' from Speedway Center	Continuous Monitoring – 6:00 pm to 10:00 pm	61.2	57.9	85.7
			63.0	60.7	75.4
			66.4	61.6	91.1
			64.0	60.5	88.7
			65.3	61.8	82.6
Speedway – Short Term					
2	105' South of Track Center Line, 350' to Center of Oval	7:11 pm	90.0	82.0	99.6
2	105' South of Track Center Line, 350' to Center of Oval	7:22 pm	90.4	86.3	98.8
3	Center of Speedway Oval	7:29 pm	88.9	81.7	99.3
4	300' North of Speedway Center, Crowd Cheering & Announcer over PA	7:48 pm	69.1	69.1	71.2
4	300' Northeast of Speedway Center,	7:53 pm	86.5	80.6	96.3
Concert Series – Short Term					
5	Center of Main Seating Area, 100' South of Center Stage	9:08 pm	86.8	86.0	97.6
6	200' South of Center Stage	9:27 pm	85.3	84.8	88.9
7	100' West of Center Stage	9:35 pm	93.0	80.8	92.7
8	100' North of Center Stage	9:39 pm	75.2	74.2	80.0
9	100' West of Center Stage	9:42 pm	86.0	85.5	90.7
Source: j.c. brennan & associates, Inc. - 2007					

Figure 7
Merced General Plan Noise Element – City of Merced, California
Fair Configuration/ Measurement Site Locations

N △ : Noise Measurement Site

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Community Noise Survey

A community noise survey was conducted to document noise exposure in the City containing noise sensitive land uses and for major roadways. Noise monitoring sites were selected to be representative of typical residential, commercial or recreational areas within the City.

Three sets of short-term noise measurements were conducted at nine locations on July 11, 2007 through July 13, 2007. In addition, five continuous 24-hour noise monitoring sites were also established throughout the City of Merced to record day-night statistical noise level trends. The data collected included the hourly average (Leq), and the maximum level (Lmax) during the measurement period. Noise monitoring sites and the measured noise levels at each site are summarized in Table 6 and Table 7. Figure 2 shows the locations of the noise monitoring sites. A comprehensive listing and graphical representation of the continuous noise measurement data is provided in Appendix B.

Community noise monitoring equipment included Larson Davis Laboratories (LDL) Model 820 precision integrating sound level meters equipped with a LDL ½" microphone. The measurement systems were calibrated using a LDL Model CAL200 acoustical calibrator before testing. The measurement equipment meets all of the pertinent requirements of the American National Standards Institute (ANSI) for Type 1 (precision) sound level meters.

Table 6
Existing Continuous 24-Hour Ambient Noise Monitoring Results
July 11-12, 2007

			Average Measured Hourly Noise Levels, dBA							
			Daytime (7:00 am - 10:00 pm)				Nighttime (10:00 pm – 7:00 am)			
Site	Location	Ldn (dBA)	Leq	Lmax	L50	L90	Leq	Lmax	L50	L90
A	West of the Gilmore Ct. and Beckman Way intersection.	54.0	47.5	67.8	42.4	38.7	47.7	62.1	43.5	38.6
B	State Route 140 near Santa Fe Avenue.	73.7	68.9	87.6	61.2	49.5	66.9	84.2	49.6	43.9
C	South of State Route 99 near the Childs Avenue over-crossing.	76.4	71.7	86.0	69.3	64.5	69.7	83.1	66.6	59.2
D	West of the 16th Street, V Street intersection.	77.3	71.9	90.7	56.1	54.0	70.7	82.1	52.6	50.1
E	Southwest of the State Route 59, Yosemite Avenue Intersection.	70.4	67.0	81.5	62.4	50.6	63.2	79.5	52.3	43.6

Source – j.c. brennan & associates, Inc. - 2007

Table 7
Existing Short-Term Community Noise Monitoring Results

Site	Location	Date	Time[1]	Measured Sound Level, dB			
				Leq	Lmax	L50	L90
1	Applegate Community Park – Near Entrance	July 11, 2007	7:37 pm	59.0	74.1	55.1	52.8
		July 12,2007	1:48 am	45.2	51.1	44.6	43.3
		July 12, 2007	1:31 pm	54.7	68.2	51.7	48.5
2	Entrance to Ada Givens Park	July 11, 2007	8:45 pm	54.4	64.3	52.6	48.8
		July 12,2007	12:12 am	44.6	51.8	44.5	43.5
		July 12, 2007	10:36 am	51.9	68.6	45.1	43.1
3	Nottingham @ Rahilly Park	July 11, 2007	9:24 pm	46.3	56.7	45.0	43.5
		July 12,2007	12:31 am	40.1	51.6	39.8	38.2
		July 12, 2007	11:00 am	44.8	58.8	42.5	40.0
4	Donna and Tres Logos (Open Space Area)	July 11, 2007	8:07 pm	49.3	61.6	48.6	46.3
		July 12,2007	1:28 am	40.3	48.0	39.9	39.1
		July 12, 2007	3:02 pm	44.6	54.2	44.1	42.5
5	60' NW of Coffee and Gerard	July 11, 2007	7:36 pm	51.2	69.5	46.3	43.3
		July 11,2007	11:32 pm	48.2	55.4	48.6	45.8
		July 12, 2007	9:51 am	54.8	74.1	48.8	45.7
6	Merced Community College	July 11, 2007	8:43 pm	55.4	65.9	52.4	44.7
		July 12,2007	12:52 am	39.2	46.4	38.8	38.1
		July 12, 2007	11:26 am	59.1	71.5	55.7	48.8
7	Cardella Road and Freemark Avenue	July 11, 2007	9:02 pm	42.8	61.8	42.0	39.9
		July 12,2007	1:08 am	40.3	48.0	39.9	39.1
		July 12, 2007	3:24 pm	41.5	62.7	38.5	36.5
8	"G" Street and Childs Avenue	July 11, 2007	7:56 pm	60.1	70.3	56.3	51.6
		July 12,2007	2:08 am	59.3	77.1	50.2	47.2
		July 12, 2007	2:07 pm	58.7	71.1	62.2	55.5
9	"S" Street and 6th Street	July 11, 2007	8:19 pm	53.5	63.3	51.8	49.6
		July 12,2007	2:26 am	48.5	53.3	48.1	46.0
		July 12, 2007	2:28 pm	58.7	65.9	58.1	55.3
10	Kibby and E. Childs Avenue	July 11, 2007	7:20 pm	62.1	74.4	57.9	55.0
		July 11,2007	11: 49 pm	56.3	72.2	50.7	48.8
		July 12, 2007	10:13 am	63.0	77.1	52.4	49.1

1 - All Community Noise Measurement Sites have a test duration of 10:00 minutes.
Source - j.c. brennan & associates, Inc.

The results of the community noise survey shown in Table 6 and 7 are indicative of the major noise sources, such as SR 99, Highway 59, Highway 140, Union Pacific Railroad, Burlington Northern Santa Fe Railroad, and some industrial uses which are located in close proximity to noise-sensitive receivers such as residential uses. Measured noise levels within most areas of Merced are consistent with typical urban and suburban communities. Recently developed residential areas within the City of Merced are generally located away from major noise sources, or have included noise mitigation in the project designs, so as to reduce overall noise levels at the developments.

CONCLUSIONS

This completes our analysis of existing background noise levels for the City of Merced General Plan Update.

Appendix A
Acoustical Terminology

Acoustics	The science of sound.
Ambient Noise	The distinctive acoustical characteristics of a given space consisting of all noise sources audible at that location. In many cases, the term ambient is used to describe an existing or pre-project condition such as the setting in an environmental noise study.
Attenuation	The reduction of an acoustic signal.
A-Weighting	A frequency-response adjustment of a sound level meter that conditions the output signal to approximate human response.
Decibel or dB	Fundamental unit of sound, A Bell is defined as the logarithm of the ratio of the sound pressure squared over the reference pressure squared. A Decibel is one-tenth of a Bell.
CNEL	Community Noise Equivalent Level. Defined as the 24-hour average noise level with noise occurring during evening hours (7 - 10 p.m.) weighted by a factor of three and nighttime hours weighted by a factor of 10 prior to averaging.
Frequency	The measure of the rapidity of alterations of a periodic signal, expressed in cycles per second or hertz.
Ldn	Day/Night Average Sound Level. Similar to CNEL but with no evening weighting.
Leq	Equivalent or energy-averaged sound level.
Lmax	The highest root-mean-square (RMS) sound level measured over a given period of time.
L(n)	The sound level exceeded a described percentile over a measurement period. For instance, an hourly L50 is the sound level exceeded 50% of the time during the one hour period.
Loudness	A subjective term for the sensation of the magnitude of sound.
Noise	Unwanted sound.
Peak Noise	The level corresponding to the highest (not RMS) sound pressure measured over a given period of time. This term is often confused with the "Maximum" level, which is the highest RMS level.
RT_{60}	The time it takes reverberant sound to decay by 60 dB once the source has been removed.
Sabin	The unit of sound absorption. One square foot of material absorbing 100% of incident sound has an absorption of 1 sabin.
SEL	A rating, in decibels, of a discrete event, such as an aircraft flyover or train passby, that compresses the total sound energy into a one-second event.
Threshold of Hearing	The lowest sound that can be perceived by the human auditory system, generally considered to be 0 dB for persons with perfect hearing.
Threshold of Pain	Approximately 120 dB above the threshold of hearing.
Impulsive	Sound of short duration, usually less than one second, with an abrupt onset and rapid decay.
Simple Tone	Any sound which can be judged as audible as a single pitch or set of single pitches.

Appendix B1

City of Merced General Plan - Site A
Continuous Measured Hourly Noise Levels
July 11-12, 2007

Hour	Leq	Lmax	L50	L90
15:00	51	78	47	42
16:00	44	67	40	37
17:00	45	63	41	38
18:00	52	77	43	40
19:00	47	65	44	40
20:00	45	66	42	38
21:00	47	65	45	39
22:00	46	70	41	38
23:00	41	60	39	36
0:00	44	60	43	42
1:00	41	53	40	32
2:00	44	56	43	39
3:00	42	69	36	32
4:00	50	63	51	35
5:00	52	65	51	48
6:00	51	64	48	44
7:00	47	66	45	42
8:00	48	65	45	41
9:00	47	67	43	40
10:00	43	63	39	36
11:00	45	63	39	36
12:00	45	66	42	38
13:00	47	75	40	36
14:00	49	71	41	37

	Statistical Summary					
	Daytime (7 a.m. - 10 p.m.)			Nighttime (10 p.m. - 7 a.m.)		
	High	Low	Average	High	Low	Average
Leq (Average)	51.7	43.5	47.5	51.8	41.3	47.7
Lmax (Maximum)	78.0	62.8	67.8	70.3	53.0	62.1
L50 (Median)	47.1	39.3	42.4	51.1	36.1	43.5
L90 (Background)	42.5	35.5	38.7	48.2	32.4	38.6

Computed Ldn, dB	54.0
% Daytime Energy	61%
% Nighttime Energy	39%

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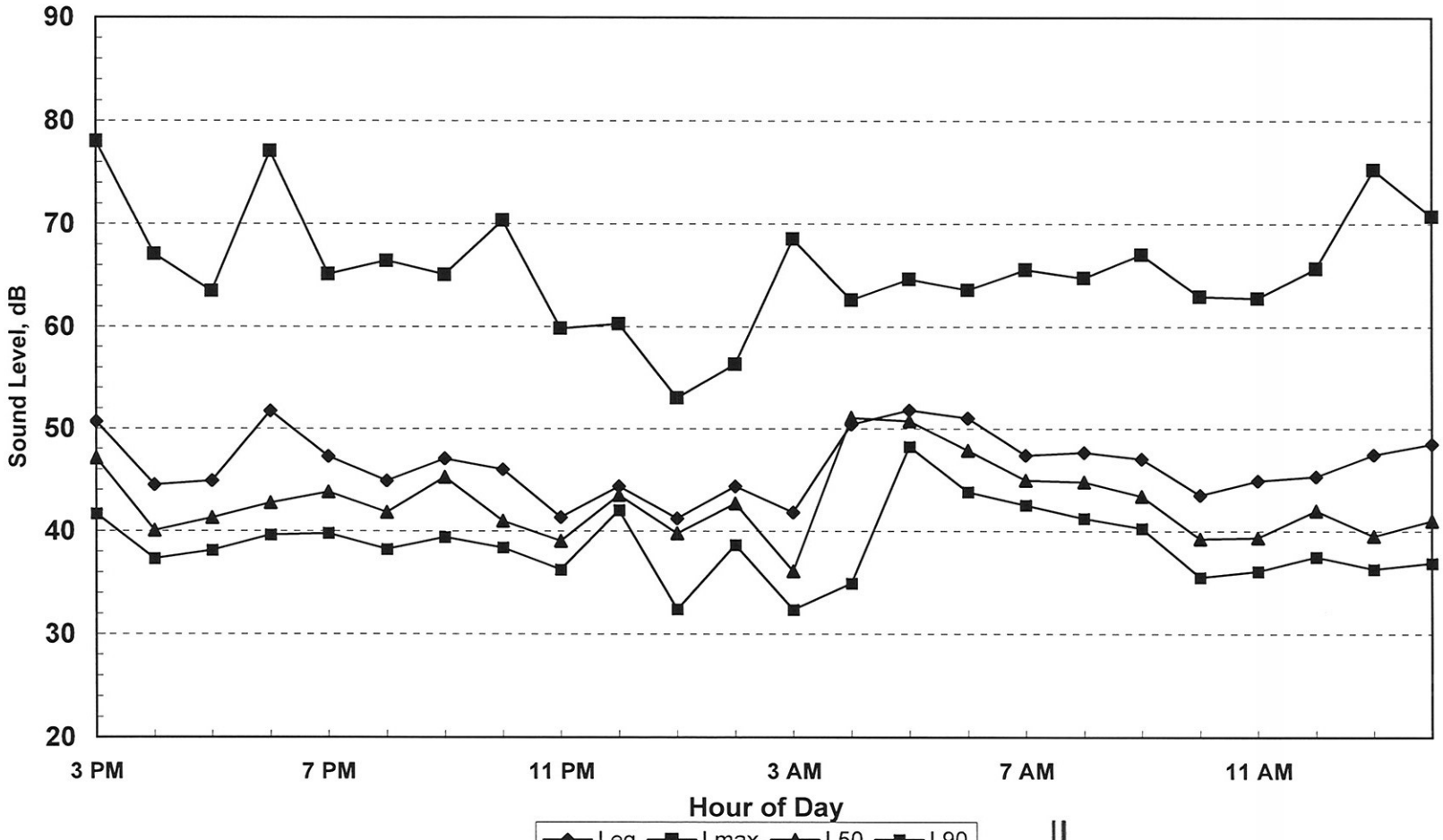
Appendix B1
Continuous Measured Hourly Noise Levels
City of Merced General Plan - Site A
July 11-12, 2007



Ldn = 54.0 dB

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Appendix B2
City of Merced Gerneral Plan - Site B
Continuous Measured Hourly Noise Levels
June 11-12, 2007

Hour	Leq	Lmax	L50	L90
15:00	71	91	63	49
16:00	68	84	63	50
17:00	67	82	63	51
18:00	71	99	60	51
19:00	69	91	60	51
20:00	65	79	58	50
21:00	67	87	58	50
22:00	66	86	52	46
23:00	63	84	50	45
0:00	67	88	47	43
1:00	57	79	42	39
2:00	54	76	40	38
3:00	58	79	43	39
4:00	68	87	52	46
5:00	71	88	58	48
6:00	71	89	62	52
7:00	69	84	63	52
8:00	70	91	62	51
9:00	70	90	61	49
10:00	69	88	60	47
11:00	69	87	62	49
12:00	68	85	62	47
13:00	68	88	62	47
14:00	69	89	62	47

	Statistical Summary					
	Daytime (7 a.m. - 10 p.m.)			Nighttime (10 p.m. - 7 a.m.)		
	High	Low	Average	High	Low	Average
Leq (Average)	70.9	64.8	68.9	71.4	53.6	66.9
Lmax (Maximum)	98.8	79.4	87.6	89.3	76.1	84.2
L50 (Median)	63.3	57.9	61.2	61.6	40.3	49.6
L90 (Background)	52.1	46.5	49.5	51.8	38.0	43.9

Computed Ldn, dB	73.7
% Daytime Energy	72%
% Nighttime Energy	28%

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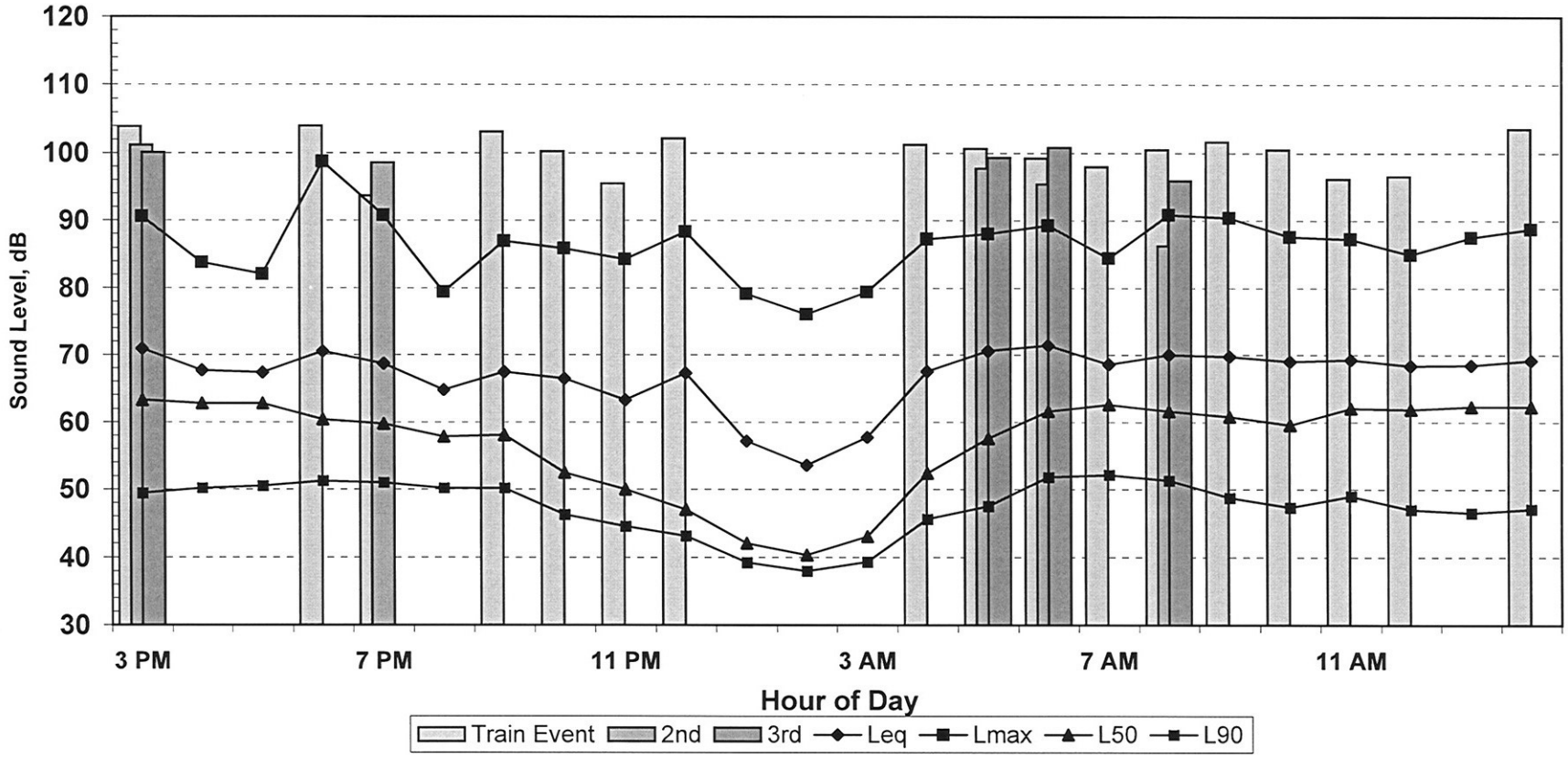
Appendix B2
Continuous Measured Railroad and Hourly Noise Levels - Site B
City of Merced General Plan
June 11-12, 2007



Ldn : 73.7 dB **Train Ldn: 71.4 dB**

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Appendix B3
City of Merced General Plan - Site C
Continuous Measured Hourly Noise Levels
June 11-12, 2007

Hour	Leq	Lmax	L50	L90
15:00	72	88	68	64
16:00	71	87	70	65
17:00	70	77	70	66
18:00	73	87	70	66
19:00	71	80	70	65
20:00	74	91	71	64
21:00	73	90	70	64
22:00	69	77	68	61
23:00	71	92	67	59
0:00	69	87	65	57
1:00	66	76	63	54
2:00	66	78	63	53
3:00	67	80	65	56
4:00	71	91	68	61
5:00	71	86	70	64
6:00	72	81	71	67
7:00	72	86	71	67
8:00	72	87	71	66
9:00	74	91	69	65
10:00	70	85	69	64
11:00	72	91	68	64
12:00	69	78	68	63
13:00	70	87	67	62
14:00	69	84	68	63

	Statistical Summary					
	Daytime (7 a.m. - 10 p.m.)			Nighttime (10 p.m. - 7 a.m.)		
	High	Low	Average	High	Low	Average
Leq (Average)	74.0	68.8	71.7	71.8	66.1	69.7
Lmax (Maximum)	91.4	77.0	86.0	91.7	76.0	83.1
L50 (Median)	70.9	67.2	69.3	71.2	63.0	66.6
L90 (Background)	66.6	62.3	64.5	67.2	53.0	59.2

Computed Ldn, dB	76.4
% Daytime Energy	73%
% Nighttime Energy	27%

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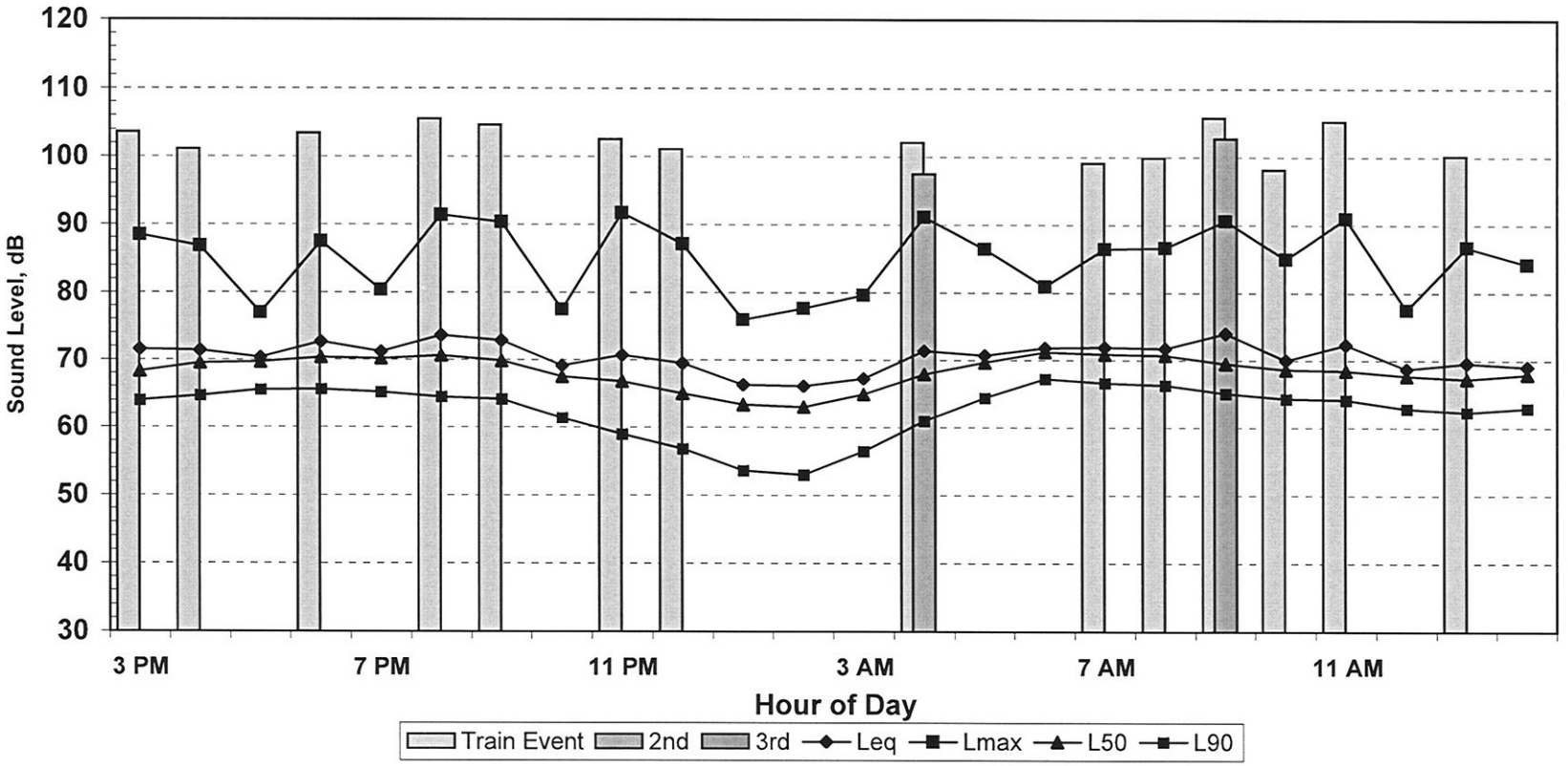
Appendix B3
Continuous Measured Railroad and Hourly Noise Levels - Site C
City of Merced General Plan
June 11-12, 2007



Ldn : 76.4 dB **Train Ldn: 71.8 dB**

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Appendix B4
City of Merced Gerneral Plan - Site D
Continuous Measured Hourly Noise Levels
June 11-12, 2007

Hour	Leq	Lmax	L50	L90
15:00	74	101	56	54
16:00	67	89	57	55
17:00	57	72	56	54
18:00	69	88	57	55
19:00	57	70	56	55
20:00	76	104	56	54
21:00	75	103	55	53
22:00	55	72	54	51
23:00	73	102	53	50
0:00	73	100	51	48
1:00	51	71	50	47
2:00	50	62	49	47
3:00	52	67	51	48
4:00	78	107	53	50
5:00	59	86	56	54
6:00	59	72	57	55
7:00	65	87	58	56
8:00	75	105	57	55
9:00	78	103	57	54
10:00	67	88	56	54
11:00	71	94	56	53
12:00	56	68	55	53
13:00	68	96	55	52
14:00	64	92	56	54

	Statistical Summary					
	Daytime (7 a.m. - 10 p.m.)			Nighttime (10 p.m. - 7 a.m.)		
	High	Low	Average	High	Low	Average
Leq (Average)	77.8	56.0	71.9	78.2	50.0	70.7
Lmax (Maximum)	104.7	67.9	90.7	107.1	61.9	82.1
L50 (Median)	58.0	54.9	56.1	57.0	49.1	52.6
L90 (Background)	56.1	52.4	54.0	55.2	46.8	50.1

Computed Ldn, dB	77.3
% Daytime Energy	69%
% Nighttime Energy	31%

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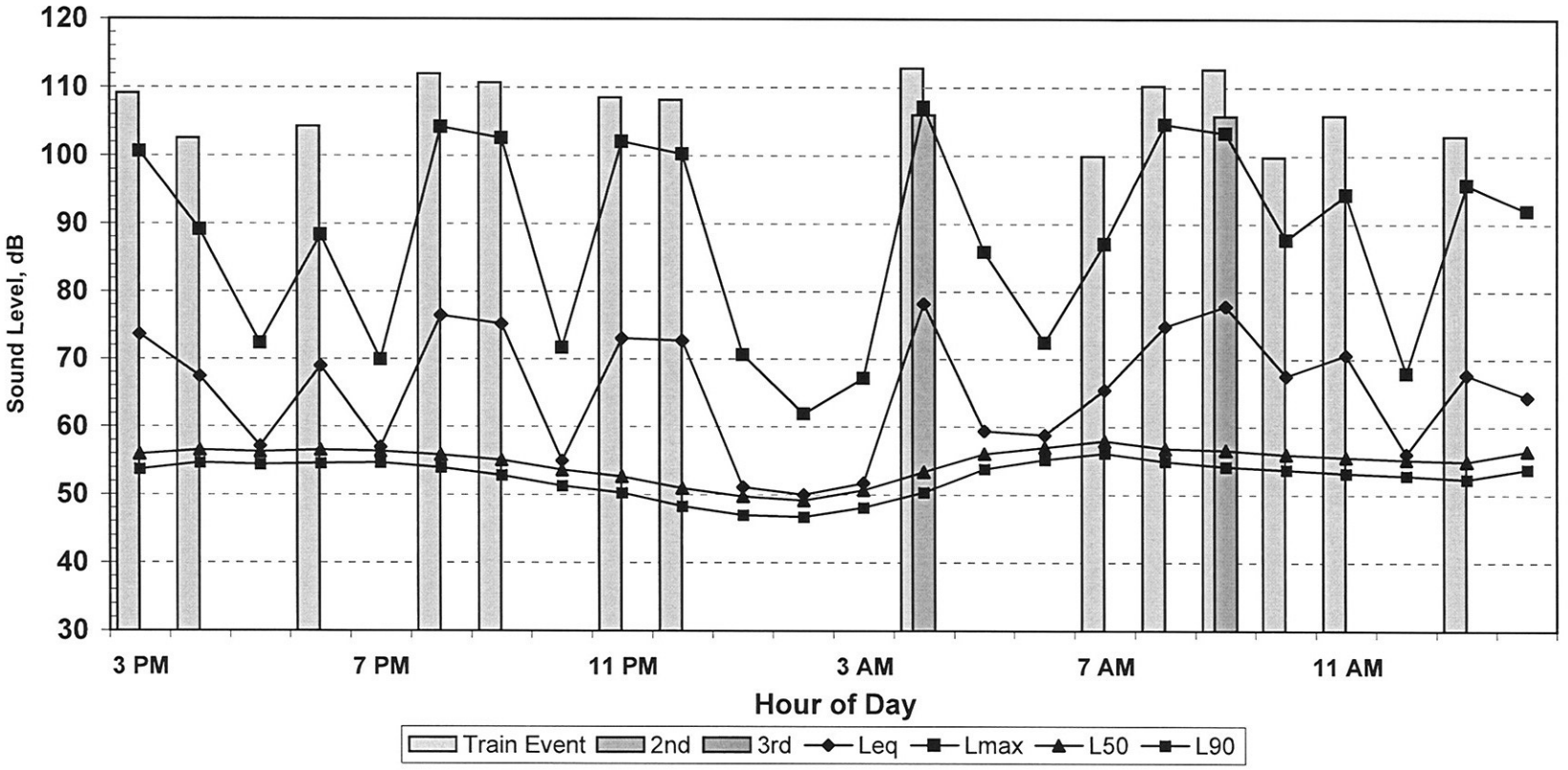
Appendix B4
Continuous Measured Railroad and Hourly Noise Levels - Site D
City of Merced General Plan
June 11-12, 2007



Ldn : 77.3 dB **Train Ldn: 77.7 dB**

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Appendix B5
City of Merced General Plan - Site E
Coninuous Measured Hourly Noise Levels
July 11-12, 2007

Hour	Leq	Lmax	L50	L90
14:00	67	85	64	51
15:00	67	80	63	51
16:00	67	82	64	51
17:00	67	80	64	52
18:00	66	85	62	53
19:00	65	82	59	52
20:00	65	80	59	51
21:00	64	83	58	49
22:00	62	83	56	47
23:00	60	81	50	42
0:00	58	74	47	41
1:00	56	78	41	39
2:00	58	79	44	40
3:00	59	78	56	41
4:00	62	80	53	43
5:00	66	79	59	48
6:00	69	83	64	52
7:00	69	81	65	52
8:00	68	79	64	52
9:00	68	81	62	49
10:00	68	81	63	50
11:00	67	80	63	48
12:00	67	81	63	49
13:00	68	81	63	49

	Statistical Summary					
	Daytime (7 a.m. - 10 p.m.)			Nighttime (10 p.m. - 7 a.m.)		
	High	Low	Average	High	Low	Average
Leq (Average)	68.6	64.0	67.0	68.7	56.5	63.2
Lmax (Maximum)	85.2	79.5	81.5	83.5	74.2	79.5
L50 (Median)	64.8	57.6	62.4	63.7	41.0	52.3
L90 (Background)	52.5	48.3	50.6	51.6	39.1	43.6

Computed Ldn, dB	70.4
% Daytime Energy	80%
% Nighttime Energy	20%

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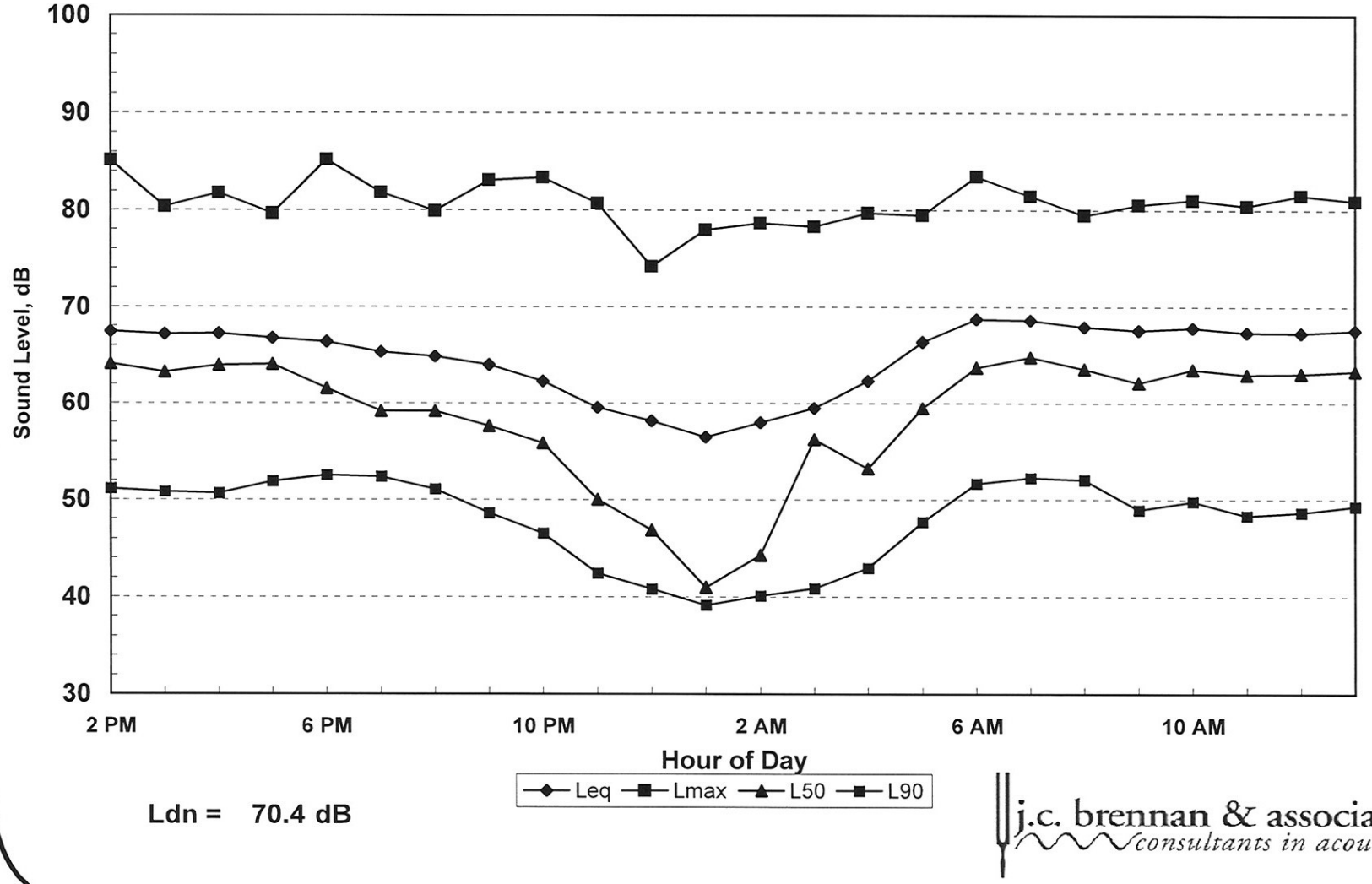
Appendix B5
Coninuous Measured Hourly Noise Levels
City of Merced General Plan - Site E
July 11-12, 2007



Ldn = 70.4 dB

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Appendix C-1

FHWA-RD-77-108 Highway Traffic Noise Prediction Model

Data Input Sheet

Project #: 2006-160 Merced General Plan Update
Description: Existing Traffic Conditions
Ldn/CNEL: Ldn
Hard/Soft: Soft

Segment	Roadway Name	Segment Description	ADT	Day %	Eve %	Night %	% Med. Trucks	% Hvy. Trucks	Speed	Distance	Offset (dB)
1	SR 99	Childs Ave to Route 140 Jct	43500	78		22	4	23	65	100	
2	SR 99	Route 140 to G St	53000	78		22	3	17	65	100	
3	SR 99	G St to Hwy 59 North	54000	78		22	5	20	65	100	
4	SR 140	Massico to X St	7100	80		20	1	3	45	100	
5	SR 140	X St to Route 99/59	12000	80		20	1	5	35	100	
6	SR 140	Route 99 to Santa Fe	17100	80		20	1	3	45	100	
7	SR 140	Santa Fe Ave to Planada	8000	80		20	1	10	55	100	
8	SR 59	16th & V St. to 16th split	24000	85		15	5	7	35	100	
9	SR 59	16th split to Olive Ave	16000	85		15	1	4	35	100	
10	SR 59	Childs Ave to Route 140 Jct	12200	85		15	1	6	30	100	
11	SR 59	Olive Ave to Bellevue	5600	85		15	1	11	55	100	
12	SR 59	Route 140 to 16th & V St.	20000	85		15	1	11	35	100	
13	16th Street	Route 140 to G	9030	87		13	2	1	35	100	
14	16th Street	G to M.L. King	14850	87		13	2	1	35	100	
15	16th Street	M.L. King to M St.	14910	87		13	2	1	35	100	
16	16th Street	M St. to V St.	16920	87		13	2	1	35	100	
17	16th Street	V St. to Route 59	19700	87		13	2	1	35	100	
18	G Street	Bellevue to Yosemite	4780	87		13	2	1	55	100	
19	G Street	Yosemite to Donna	11250	87		13	2	1	45	100	
20	G Street	Donna to El Portal	13820	87		13	2	1	45	100	
21	G Street	El Portal to Olive	18000	87		13	2	1	45	100	
22	G Street	Olive to Alexander	23870	87		13	2	1	40	100	
23	G Street	Alexander to Bear Creek	26710	87		13	2	1	40	100	
24	G Street	Bear Creek to 26th	29270	87		13	2	1	35	100	
25	G Street	26th to 18th	24590	87		13	2	1	35	100	
26	G Street	18th to Main St	18810	87		13	2	1	35	100	

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Appendix C-2

FHWA-RD-77-108 Highway Traffic Noise Prediction Model

Data Input Sheet

Project #: 2006-160 Merced General Plan Update
Description: Existing Traffic Conditions
Ldn/CNEL: Ldn
Hard/Soft: Soft

Segment	Roadway Name	Segment Description	ADT	Day %	Eve %	Night %	% Med. Trucks	% Hvy. Trucks	Speed	Distance	Offset (dB)
1	G Street	South of Main St	15390	87		13	2	1	35	100	
2	M St	18th to Main st	13670	87		13	2	1	35	100	
3	M St	21st to 18th	16230	87		13	2	1	35	100	
4	M St	23rd to 21st	18320	87		13	2	1	35	100	
5	M St	Bear Creek to 23rd	22910	87		13	2	1	35	100	
6	M St	Olive to Bear Creek	20220	87		13	2	1	35	100	
7	M St	South of Main St	12750	87		13	2	1	35	100	
8	M St	Yosemite to Olive	19080	87		13	2	1	40	100	
9	M.L. King	23rd to 16th	5660	87		13	2	1	30	100	
10	M.L. King	16th to Childs Ave	6530	87		13	2	1	35	100	
11	Olive Ave	East of Park	22530	87		13	2	1	40	100	
12	Olive Ave	Park to M st.	26080	87		13	2	1	40	100	
13	Olive Ave	M St. to R St.	27670	87		13	2	1	40	100	
14	Olive Ave	R St. to V St.	27690	87		13	2	1	40	100	
15	R St	Yosemite to Olive	20070	87		13	2	1	35	100	
16	R St	Olive to Bear Creek	20760	87		13	2	1	30	100	
17	R St	Bear Creek to 20th	21580	87		13	2	1	30	100	
18	R St	18th to Main st	17250	87		13	2	1	30	100	
19	R St	20th to 18th	17330	87		13	2	1	30	100	
20	R St	Main to 15th	17530	87		13	2	1	30	100	
21	R St	15th to 13th	15220	87		13	2	1	30	100	
22	V St	16th to 23rd	9290	87		13	2	1	35	100	
23	V St	West Ave to 16th	15710	87		13	2	1	35	100	
24	Yosemite	G st to McKee Rd	13470	87		13	2	1	45	100	
25	Yosemite	SR 59 to G st	15390	87		13	2	1	40	100	

Appendix D-1

FHWA-RD-77-108 Highway Traffic Noise Prediction Model
Predicted Levels

Project #: 2006-160 Merced General Plan Update
Description: Existing Traffic Conditions
Ldn/CNEL: Ldn
Hard/Soft: Soft

Segment	Roadway Name	Segment Description	Autos	Medium Trucks	Heavy Trucks	Total
1	SR 99	Childs Ave to Route 140 Jct	72.3	65.8	76.9	78
2	SR 99	Route 140 to G St	73.5	65.4	76.4	78
3	SR 99	G St to Hwy 59 North	73.3	67.7	77.2	79
4	SR 140	Massico to X St	60.7	49.1	58.4	63
5	SR 140	X St to Route 99/59	59.8	49.7	61.9	64
6	SR 140	Route 99 to Santa Fe	64.5	53.0	62.2	67
7	SR 140	Santa Fe Ave to Planada	63.4	51.0	65.0	67
8	SR 59	16th & V St. to 16th split	61.7	59.0	65.6	68
9	SR 59	16th split to Olive Ave	60.3	50.2	61.4	64
10	SR 59	Childs Ave to Route 140 Jct	57.1	48.0	62.9	64
11	SR 59	Olive Ave to Bellevue	61.0	48.7	63.1	65
12	SR 59	Route 140 to 16th & V St.	60.9	51.2	66.8	68
13	16th Street	Route 140 to G	57.5	50.4	52.6	59
14	16th Street	G to M.L. King	59.7	52.5	54.7	61
15	16th Street	M.L. King to M St.	59.7	52.6	54.7	62
16	16th Street	M St. to V St.	60.3	53.1	55.3	62
17	16th Street	V St. to Route 59	60.9	53.8	56.0	63
18	G Street	Bellevue to Yosemite	60.4	50.7	51.6	61
19	G Street	Yosemite to Donna	61.6	53.0	54.5	63
20	G Street	Donna to El Portal	62.5	53.9	55.4	64
21	G Street	El Portal to Olive	63.7	55.1	56.6	65
22	G Street	Olive to Alexander	63.4	55.5	57.3	65
23	G Street	Alexander to Bear Creek	63.9	56.0	57.8	65
24	G Street	Bear Creek to 26th	62.7	55.5	57.7	64
25	G Street	26th to 18th	61.9	54.7	56.9	64
26	G Street	18th to Main St	60.7	53.6	55.8	63

Appendix D-2

FHWA-RD-77-108 Highway Traffic Noise Prediction Model
Predicted Levels

Project #: 2006-160 Merced General Plan Update
Description: Existing Traffic Conditions
Ldn/CNEL: Ldn
Hard/Soft: Soft

Segment	Roadway Name	Segment Description	Autos	Medium Trucks	Heavy Trucks	Total
1	G Street	South of Main St	59.9	52.7	54.9	62
2	M St	18th to Main st	59.3	52.2	54.4	61
3	M St	21st to 18th	60.1	52.9	55.1	62
4	M St	23rd to 21st	60.6	53.5	55.6	62
5	M St	Bear Creek to 23rd	61.6	54.4	56.6	63
6	M St	Olive to Bear Creek	61.0	53.9	56.1	63
7	M St	South of Main St	59.0	51.9	54.1	61
8	M St	Yosemite to Olive	62.5	54.5	56.3	64
9	M.L. King	23rd to 16th	53.6	47.3	51.4	56
10	M.L. King	16th to Childs Ave	56.1	49.0	51.2	58
11	Olive Ave	East of Park	63.2	55.3	57.1	65
12	Olive Ave	Park to M st.	63.8	55.9	57.7	65
13	Olive Ave	M St. to R St.	64.1	56.1	58.0	66
14	Olive Ave	R St. to V St.	64.1	56.2	58.0	66
15	R St	Yosemite to Olive	61.0	53.8	56.0	63
16	R St	Olive to Bear Creek	59.2	53.0	57.1	62
17	R St	Bear Creek to 20th	59.4	53.1	57.2	62
18	R St	18th to Main st	58.4	52.1	56.3	61
19	R St	20th to 18th	58.5	52.2	56.3	61
20	R St	Main to 15th	58.5	52.2	56.3	61
21	R St	15th to 13th	57.9	51.6	55.7	61
22	V St	16th to 23rd	57.7	50.5	52.7	59
23	V St	West Ave to 16th	60.0	52.8	55.0	62
24	Yosemite	G st to McKee Rd	62.4	53.8	55.3	64
25	Yosemite	SR 59 to G st	61.5	53.6	55.4	63

Appendix E-1

FHWA-RD-77-108 Highway Traffic Noise Prediction Model
Noise Contour Output

Project #: 2006-160 Merced General Plan Update
Description: Existing Traffic Conditions
Ldn/CNEL: Ldn
Hard/Soft: Soft

Segment	Roadway Name	Segment Description	-------- Distances to Traffic Noise Contours -------- 75	70	65	60	55
1	SR 99	Childs Ave to Route 140 Jct	169	363	782	1685	3631
2	SR 99	Route 140 to G St	169	365	786	1693	3648
3	SR 99	G St to Hwy 59 North	185	399	860	1853	3992
4	SR 140	Massico to X St	16	34	72	156	336
5	SR 140	X St to Route 99/59	19	41	87	188	406
6	SR 140	Route 99 to Santa Fe	28	60	130	281	605
7	SR 140	Santa Fe Ave to Planada	31	67	144	310	667
8	SR 59	16th & V St. to 16th split	33	70	152	327	704
9	SR 59	16th split to Olive Ave	19	40	87	187	403
10	SR 59	Childs Ave to Route 140 Jct	19	40	86	185	399
11	SR 59	Olive Ave to Bellevue	22	48	104	225	484
12	SR 59	Route 140 to 16th & V St.	33	72	155	335	722
13	16th Street	Route 140 to G	9	19	42	90	195
14	16th Street	G to M.L. King	13	27	58	126	271
15	16th Street	M.L. King to M St.	13	27	59	126	272
16	16th Street	M St. to V St.	14	30	64	137	296
17	16th Street	V St. to Route 59	15	33	71	152	327
18	G Street	Bellevue to Yosemite	12	27	57	123	265
19	G Street	Yosemite to Donna	16	34	72	156	336
20	G Street	Donna to El Portal	18	39	83	179	385
21	G Street	El Portal to Olive	21	46	99	213	459
22	G Street	Olive to Alexander	21	46	99	213	458
23	G Street	Alexander to Bear Creek	23	49	106	229	494
24	G Street	Bear Creek to 26th	20	43	92	198	426
25	G Street	26th to 18th	18	38	82	176	379
26	G Street	18th to Main St	15	32	68	147	317

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Appendix E-2

FHWA-RD-77-108 Highway Traffic Noise Prediction Model
Noise Contour Output

Project #: 2006-160 Merced General Plan Update
Description: Existing Traffic Conditions
Ldn/CNEL: Ldn
Hard/Soft: Soft

Segment	Roadway Name	Segment Description	-------- Distances to Traffic Noise Contours --------				
			75	70	65	60	55
1	G Street	South of Main St	13	28	60	129	278
2	M St	18th to Main st	12	26	55	119	257
3	M St	21st to 18th	13	29	62	134	288
4	M St	23rd to 21st	14	31	67	145	312
5	M St	Bear Creek to 23rd	17	36	78	168	362
6	M St	Olive to Bear Creek	15	33	72	155	333
7	M St	South of Main St	11	24	53	114	245
8	M St	Yosemite to Olive	18	39	85	183	395
9	M.L. King	23rd to 16th	6	12	26	56	121
10	M.L. King	16th to Childs Ave	7	16	34	73	157
11	Olive Ave	East of Park	20	44	95	205	441
12	Olive Ave	Park to M st.	23	49	105	226	486
13	Olive Ave	M St. to R St.	23	51	109	235	506
14	Olive Ave	R St. to V St.	23	51	109	235	506
15	R St	Yosemite to Olive	15	33	71	154	331
16	R St	Olive to Bear Creek	13	29	62	134	288
17	R St	Bear Creek to 20th	14	30	64	137	295
18	R St	18th to Main st	12	25	55	118	254
19	R St	20th to 18th	12	26	55	118	255
20	R St	Main to 15th	12	26	55	119	257
21	R St	15th to 13th	11	23	50	109	234
22	V St	16th to 23rd	9	20	43	92	198
23	V St	West Ave to 16th	13	28	61	131	281
24	Yosemite	G st to McKee Rd	18	38	82	176	379
25	Yosemite	SR 59 to G st	16	34	74	159	342

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