



HEALTH AND SAFETY

Introduction

The Health and Safety Element identifies potential natural and human-made hazards to Patterson residents, including seismic events, flooding, fires, and the unhealthful effects of noise, and provides policies, programs and standards to protect people and property from such hazards.

This symbol denotes a policy that contributes to sustainability and/or sustainable practices.



Goals and Policies

Geologic Hazards

Goal HS-1 To prevent loss of life, injury, and property damage due to geologic and seismic hazards.

Policies

HS-1.1 Geotechnical reports. The City shall require the preparation of geotechnical reports and impose appropriate mitigation measures to ensure, within the limits of technical and economic feasibility, that new structures are able to withstand the effects of seismic activity, including liquefaction, slope instability, expansive soils or other geologic hazards.

HS-1.2 Seismic resistant utilities. Underground utilities, particularly water and natural gas mains, shall be designed to withstand seismic forces in accordance with state requirements.

Flood Hazard

Goal HS-2 To prevent loss of life, injury, and property damage due to flooding.

Policies

HS-2.1 Flood control management. The City shall prepare and adopt flood management plans and practices aimed at protecting life and property from the harmful effects of flooding. As part of this effort, the City shall establish criteria for:

- a. Evaluating whether new development should be located in flood hazard zones;

- b. Identifying construction methods or other methods to minimize damage if new development is located in flood hazard zones, and
- c. Maintaining the structural and operational integrity of essential public facilities during flooding.

HS-2.2 **Location of essential facilities.** The City shall ensure that new essential public facilities are located outside of flood hazard zones whenever feasible, including hospitals and health care facilities, emergency shelters, fire stations, emergency command centers, and emergency communications facilities or shall identify construction methods or other methods to minimize damage if these facilities if located within flood hazard zones.

HS-2.3 **Cooperation with others.** The City shall establish and maintain cooperative working relationships among public agencies with responsibility for flood protection.

HS-2.4 **FIRM Program.** The City shall continue to participate in the National Flood Insurance Program. To this end, the City shall ensure that its regulations are in full compliance with standards adopted by the Federal Emergency Management Agency.

HS-2.5 **Flood protection for residences.** New residential development, including mobile homes, shall be constructed so that the lowest floor is at least 12 inches above the 100-year flood level.

HS-2.6 **Flood protection for non-residential development.** Non-residential development shall be anchored and flood-proofed to prevent damage from the 100-year flood or, alternatively, elevated to at least 12 inches above the 100-year flood level.

HS-2.7 **Compliance.** Existing development shall comply with policies HS-2.2. and HS-2.3 when improvements are made that cost at least 50 percent of the estimated current market value of the structure before the improvements.

HS-2.8 **Provision of storm drains.** Construction of storm drainage improvements shall be required, as appropriate, to prevent flooding during periods of heavy rainfall.

- HS-2.9 Prevention of siltation. The City shall impose appropriate conditions on grading projects performed during the rainy season to ensure that silt is not conveyed to storm drainage systems.
- HS-2.10 Flooding impacts of new development. New development with the potential to increase flooding impacts on adjoining or downstream properties shall be prohibited.
- HS-2.11 Priority for flood control improvements. The City's first priority in preventing risks to life and property resulting from flooding shall be to designate appropriate land uses in areas subject to flooding. Only when this land use-based approach is not sufficient to reduce hazards to life and property to acceptable levels will the City support the construction of new flood control projects.
- HS-2.12 Buildable site. Parcels shall not be created upon which the presence of easements, floodplain, marsh or riparian habitat, or other features would leave insufficient land to build and operate structures. This policy shall not apply to open space lots specifically created for dedication to the City or another appropriate party for habitat protection, flood control, drainage, or wetland maintenance.
- HS-2.13 Bridge construction. New and modified bridge structures shall not cause an increase in water surface elevations of the 100-year floodplain exceeding one foot, unless analysis clearly indicates that the physical and/or economic use of upstream or downstream property will not be adversely affected.
- HS-2.14 Runoff control. The City shall require all new urban development projects to incorporate runoff control measures to minimize peak flows of runoff and/or assist in financing or otherwise implementing comprehensive drainage plans. All such control measures shall consider potential affects to adjacent property owners.
- HS-2.15 Central Valley Flood Protection Plan. The City shall continue to work to achieve consistency between the General Plan and applicable flood management practices with the provisions of the Central Valley Flood Protection Plan.

HS-2.16 Flood hazard mitigation prior to development. The City shall not approve new development in areas subject to a 100-year flood event, based on Federal Emergency Management Agency (FEMA) or on other updated mapping acceptable to the City, unless and until the flood hazard has been mitigated. Such mitigation may be accomplished by one, or a combination of, the following:

- Compliance with Title 17 of the City's Municipal Code, Flood Hazard areas.
- Installation of flood control improvements along Del Puerto Creek and/or Salado Creek.
- Avoidance of flood prone areas.

HS-2.17 Flood hazard mitigation prior to development. The City shall require any development on land subject to a 100- year flood event, based on Federal Emergency Management Agency (FEMA) or on other updated mapping acceptable to the City, to conform to National Flood Insurance Program (NFIP) standards.

HS-2.18 Low Impact Development. New development shall incorporate provisions for low impact development as defined by as minimizing or eliminating pollutants in storm water through natural processes and maintaining pre-development hydrologic characteristics, such as flow patterns, surface retention, and recharge rates.

Fire Hazards

Goal HS-3 To prevent loss of life, injury, and property damage due to wildland and structural fires, explosions and release of hazardous materials.

Policies

HS-3.1 Water service for fire protection. The City shall require that new development provides all necessary water service, fire hydrants, and roads consistent with Fire Department standards.

HS-3.2 Fire flows. The City shall ensure that adequate water fire -flows are maintained throughout the city and shall regularly monitor fire-flows to ensure adequacy. New development shall comply with the following minimum fire-flow rates:

<u>per Minute</u>	<u>Development Category</u>	<u>Gallons</u>
	Single-Family Residential	1,000
	Multi-Family Residential	1,500
	Principal Business District	2,500
	Industrial/Other Business Districts	3,000 to 6,000

HS-3.3 Inspection program. The Fire Department shall maintain an ongoing fire and life safety inspection program for all public, commercial, and industrial buildings.

HS-3.4 Fire protection codes. All new development shall be constructed according to fire safety and structural stability standards contained in the latest adopted California Fire and Building Codes and related regulations.

HS-3.5 On-site suppression. The City shall minimize the dependence of new commercial and industrial developments on City firefighting personnel and equipment by requiring on-site fire suppression systems which include sprinklers and pumps, as deemed necessary.

HS-3.6 Fire prevention. The City shall require property owners to remove fire hazards, including vegetation, hazardous structures and materials, and debris, as directed by the Fire Department.

HS-3.7 Access for fire protection equipment. The City shall ensure that new development provides for adequate fire equipment access and, where appropriate, includes the use of fire-resistant landscaping and building materials.

HS-3.8 Testing of hazardous areas. In cooperation with the Stanislaus County Health Department, the City shall require testing for contamination in areas suspected as potentially hazardous and shall require that remediation of hazardous

areas takes place prior to development.

Emergency Response

Goal HS-4 To ensure that City emergency response procedures are adequate in the event of natural or human-made disasters.

Policies

HS-4.1 **Emergency response plan.** The City shall maintain, periodically update, and test the effectiveness of its Emergency Response Plan. As part of the periodic update, the City shall review county and state emergency response plans and procedures to ensure coordination with the City's plan.

HS-4.2 **Emergency access routes.** The City shall identify emergency access routes and shall ensure that they are kept free of traffic impediments. Emergency access and evacuation routes shall be maintained for areas east and west of the railroad right-of-way.

HS-4.3 **Water sources for fire fighting.** The City shall identify alternative water sources for firefighting purposes for use during a disaster.

HS-4.4 **Siting of emergency facilities.** Critical emergency response facilities such as hospitals, fire, police, emergency service facilities, and utilities shall be sited to minimize their exposure to flooding, seismic effects, fire, or explosion, and to ensure the protection of areas on either side of the railroad right-of-way.

HS-4.5 **Command center for emergencies.** The City shall designate and develop a command center for use during times of emergency.

HS-4.6 **Mutual aid.** The City shall maintain mutual aid agreements and communications links with surrounding jurisdictions for assistance during times of emergency.

HS-4.7 Secondary access over San Joaquin River. The City shall work with StanCOG and other applicable agencies to establish a secondary emergency access across the San Joaquin River.

Noise

Goal HS-5 To protect city residents from the harmful and undesirable effects of excessive noise.

Policies

HS-5.1 Noise levels resulting from non-transportation SOURCES. New development of noise-sensitive uses shall not be allowed where the noise level due to non-transportation noise sources will exceed the noise level standards of Table HS-1, as measured immediately within the property line of the new development, unless effective noise mitigation measures have been incorporated into the development design to achieve the standards specified in Table HS-1.

HS-5.2 Noise levels resulting from non-transportation noise sources. Noise levels resulting from non-transportation noise sources shall be mitigated so as not to exceed the noise level standards of Table HS-1 as measured immediately within the property line of lands designated for noise-sensitive uses. This policy does not apply to noise sources associated with agricultural operations on lands zoned for agricultural uses.

Table HS-1: Noise Level Performance Standards For New Projects Affected By Or Including Non-Transportation Sources		
Noise Level Descriptor	Daytime (7 a.m. to 10 p.m.)	Nighttime (10 p.m. to 7 a.m.)
Hourly Leq, Db	50	45
Maximum level, Db	70	65

Each of the noise levels specified above shall be lowered by five dBA for simple tone noises, noises consisting primarily of speech or music, or for recurring impulsive noises. These noise level standards do not apply to residential units established in conjunction with industrial or commercial uses (e.g., caretaker dwellings).

HS-5.3 Acoustical analysis required. Where proposed non-residential land uses are likely to produce noise levels exceeding the performance standards of Table HS-1 at existing or planned noise-sensitive uses, an acoustical analysis shall be required as part of the environmental review process so that noise mitigation may be included in the project design. (Requirements for the content of an acoustical analysis are identified in Table HS-2.) (Note: For the purposes of these noise policies, transportation noise sources are defined as traffic on public roadways, railroad line operations and aircraft in flight. Control of noise from these sources is preempted by Federal and State regulations. Other noise sources are presumed to be subject to local regulations, such as a noise control ordinance.)

Table HS-2: Requirements For An Acoustical Analysis

An acoustical analysis prepared pursuant to the noise policies of the General Plan shall:

- a. Be the responsibility of the applicant.
- b. Be prepared by a qualified person experienced in the fields of environmental noise assessment and architectural acoustics.
- c. Include representative noise level measurements with

- sufficient sampling periods and locations to adequately describe local conditions and the predominant noise sources.
- d. Estimate existing and projected (20 years) noise levels in terms of L_v or CNEL and/or the standards of Table 11-3, and compare those levels to the adopted policies of the Noise Element.
 - e. Recommend appropriate mitigation to achieve compliance with the adopted policies and standards of the noise section of the General Plan. Where the noise source in question consists of intermittent single events, the report must address the effects of maximum noise levels in sleeping rooms in terms of possible sleep disturbance.
 - f. Estimate noise exposure after the prescribed mitigation measures have been implemented.
 - g. Describe a post-project assessment program which could be used to evaluate the effectiveness of the proposed mitigation measures.

HS-5.4 Noise standards. The feasibility of proposed projects with respect to existing and future transportation noise levels shall be evaluated by comparison to Figure HS-1.

HS-5.5 Noise sensitive land uses. New development of noise-sensitive land uses shall not be permitted in areas exposed to existing or projected levels of noise from transportation noise sources which exceed the levels specified in Table HS-3, unless the project design includes effective mitigation measures to reduce noise in outdoor activity areas and interior spaces to the levels specified in Table HS-1.



HS-5.6 Transportation noise sources and mitigation. Noise created by new transportation noise sources, including roadway improvement projects, shall be mitigated so as not to exceed the levels specified in Table HS-1 at outdoor activity areas or interior spaces of existing noise-sensitive land uses in either the incorporated or unincorporated areas.

HS-5.7 Acoustical analysis required. Where noise-sensitive land uses are proposed in areas exposed to existing or projected exterior noise levels exceeding the levels specified in Table HS-1 or the performance standards of Table HS-3, an acoustical analysis shall be required as part of the environmental review process so that noise mitigation may be included in the project design.

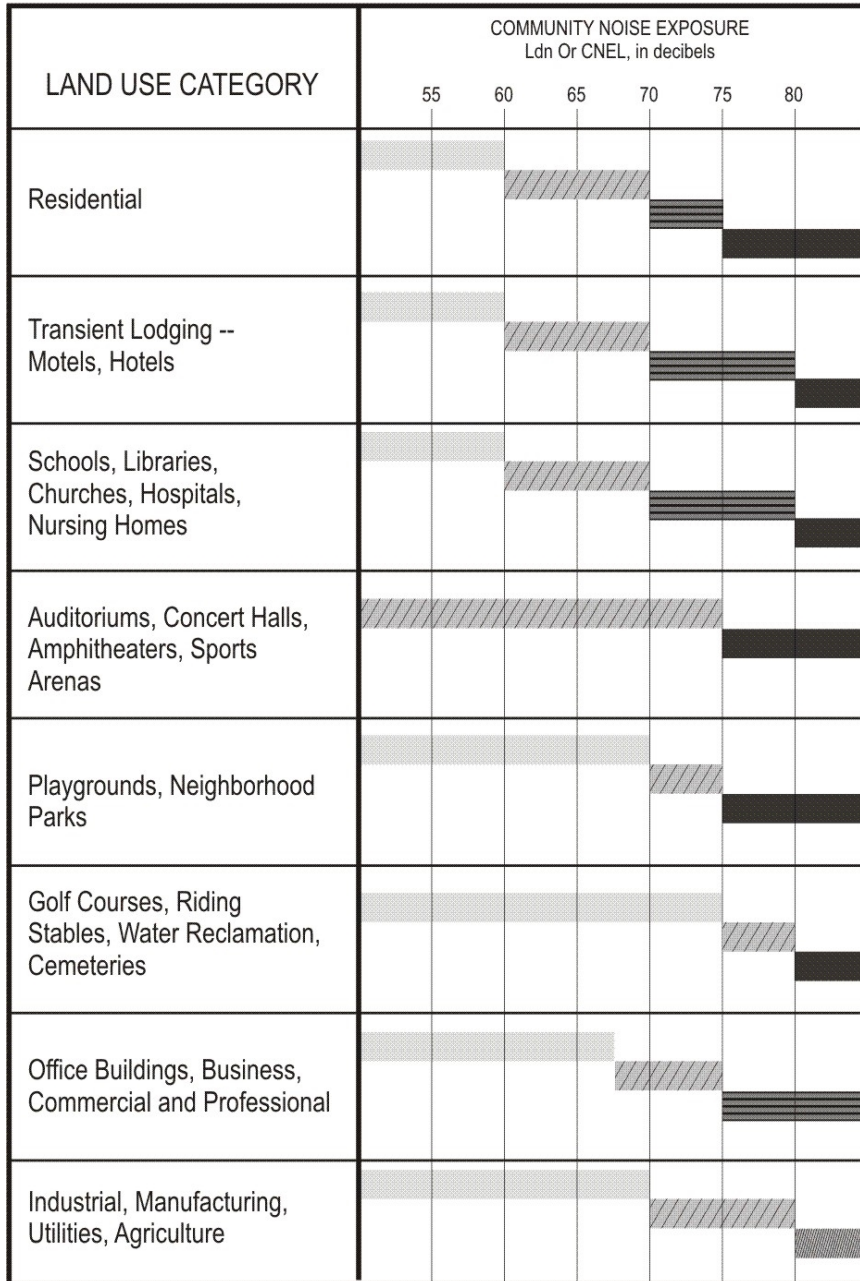
HS-5.8 Minimize the use of noise barriers. Where noise mitigation measures are required to achieve the standards of Tables HS-1 and HS-3, the emphasis of such measures shall be placed upon site planning and project design. The use of noise barriers shall only be considered a supplemental means of achieving the noise standards after all practical design-related noise mitigation measures have been integrated into the project.

Table HS-3: Noise Level Performance Standards For New Projects Affected By Or Including Transportation Sources		
Land Use	Outdoor Activity Areas ¹	Interior Spaces
	Ldn/CNEL, DbLdn/CNEL,	dbLeq, Db ²
Residential	60 ³	45
Transient Lodging	60 ³	45
Hospitals, Nursing Homes	60 ³	45
Theaters, Auditoriums, Music Halls		35
Churches, Meeting Halls	60 ³	40
Office Buildings	60 ³	45
Schools, Libraries, Museums		45
Playgrounds, Neighborhood Parks	70	

1. Where the location of outdoor activity areas is unknown, the exterior noise level standard shall be applied to the property line of the receiving land use.
1. As determined for a typical worst-case hour during periods of use.
2. Where it is not possible to reduce noise in outdoor activity areas to 60 Db Ldn/CNEL or less using a practical application of the best available noise reduction measures, an exterior noise level of up to 65 Db Ldn/CNEL may be allowed, provided that available exterior noise level reduction measures have been implemented and interior noise levels are in compliance with this table.

Figure HS-1 - Noise Compatibility Guidelines

Land Use Noise Compatibility Guidelines for New development



Normally Acceptable

Specified land use is satisfactory, based on the assumption that any buildings involved are of 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 noise analysis of the noise reduction requirements must be made and the needed noise insulation features included in the design.

Clearly Unacceptable

New construction or development should generally not be undertaken.

Crime Prevention

Goal HS-6: To prevent crime and promote the protection of people and property.

Policies

HS-6.1 Neighborhood security training. The Police Services Department shall provide neighborhood security and crime prevention information and training to neighborhood groups and homeowners' associations.

HS-6.2 Deterrence through design. The City shall encourage the use of physical site planning as an effective means of preventing crime. Developers shall design open spaces, parking lots, parks, play areas, and other public spaces so they can be under continuous surveillance by residents. To this end, the Police Department shall participate in the development review process to ensure that crime prevention considerations are incorporated in the design of residential, commercial, industrial, and public facility projects.

HS-6.3 Police staffing. The City shall provide and maintain an adequate level of police equipment and personnel consistent with city growth and development.

Hazardous Materials

Goal HS-7: To protect the health and safety of Patterson residents from the harmful effects of the use, transport and disposal of hazardous substances.

Policies

HS-7.1 **Coordination.** The City shall coordinate with the California Highway Patrol, the Stanislaus County Department of Environmental Health Services, the County Sheriff's Department, and all other appropriate local, state and federal agencies in hazardous materials route planning, notifications and incident response, to ensure appropriate first response to hazardous material incidents.

HS-7.2 **Avoidance.** The City shall seek to avoid and minimize exposure of sensitive land uses to potentially hazardous emissions along truck routes and rail lines which may be used by surface vehicles and rail cars carrying hazardous or toxic substances. These truck routes include Interstate 5, State Highway 33, and Las Palmas Avenue. Rail corridors include the two primary lines running north-south through Patterson.

HS-7.3 **Management of hazardous materials.** The City shall regulate the storage of hazardous and waste materials consistent with state and federal law. The City shall not permit above ground tanks without considering the potential hazards that would result from the release of stored liquids caused by possible rupture or collapse, and may request applicants to have an emergency response plan.

HS-7.4 **Industrial facilities.** The City shall work with responsible agencies to ensure that all industrial facilities are constructed and operated in accordance with the most current safety and environmental protection standards.

HS-7.5 **Storage.** Industries that store and process significant quantities of hazardous or toxic materials shall provide a buffer zone between the installation that houses such

substances and the property boundaries of the facility sufficient to protect the public in the event of the release or leak of the materials.

HS-7.6 Remediation. The City shall work with other responsible agencies on efforts to clean up or contain identified soil or water contamination in the city limits.

HS-7.7 Written confirmation of remediation. The City shall require written confirmation from applicable local, regional, state, and federal agencies that known contaminated sites have been deemed remediated to a level appropriate for land uses proposed prior to the City approving site development or provide an approved remediation plan that demonstrates how contamination will be remediated prior to site occupancy. This documentation shall specify the extent of development allowed on the remediated site as well as any special conditions and/or restrictions on future land uses.

Rail Safety

Goal HS-8: To facilitate the safe movement of people, goods and services throughout the General Plan area.

HS-8.1 At-grade railroad crossings and rail corridors.

The City shall initiate, and collaborate in, safety and design improvements at existing railroad-at-grade crossings and along rail corridors. Strategies to be considered include (but are not limited to) the following:

- a. Installation of grade separations at crossings where feasible;
- b. Improvements to warning devices at existing highway-rail crossings;
- c. Installation of additional warning signage;
- d. Improvements to traffic signaling at intersections adjacent to crossings, such as traffic preemption;
- e. Installation of median separation to prevent vehicles from driving around railroad crossing gates;
- f. Where soundwalls, landscaping, buildings would be installed near crossings, maintaining the visibility of warning devices and approaching trains;
- g. Prohibition of parking within 100 feet of crossings to improve the visibility of warning devices and approaching trains;
- h. Installation of pedestrian-specific warning devices and channelization;
- i. Construction of pull-out lanes for buses and vehicles transporting hazardous materials;
- j. Installation of vandal-resistant fencing or walls to limit the access of pedestrians onto the right-of-way;
- k. Elimination of driveways near crossings;
- l. Increased enforcement of traffic laws at crossings;
- m. Rail safety awareness to educate the public about the hazards of highway-rail grade crossings;

HS-8.2 Referral to PUC. The City shall refer projects with the potential to adversely impact existing or proposed railroad crossings to the California Public Utilities Commission for recommendations regarding rail safety.

Implementation Measures							
No.	Implementation Measure	Policies/ Goals	Responsibility	Timeframe			
				Near Term	Mid- Term	Long- Term	ngoing
HS-1	The City shall adopt the most current editions of the California Building Code, California Fire Code, Uniform Plumbing, Mechanical, and National Electric Codes.	HS-1.1 HS-2.5 HS-2.6 HS-2.10 HS-3.4	Building Department Fire Department				€
HS-2	The Fire Department shall endeavor to inspect commercial and industrial buildings annually in conjunction with issuance and renewal of business licenses.	HS-3.3	Fire Department				€
HS-3	The City shall maintain, periodically update, and test the effectiveness of its Emergency Response Plan. As part of the periodic update, the City shall review county and state emergency response plans and procedures to ensure coordination with the City's plan.	HS-4.1	City Council City Manager Public Works Department Police Department Fire Department				€
HS-4	The City shall periodically conduct tests of its emergency response procedures.	HS-4.1	City Council City Manager Police Department Fire Department				€
HS-5	The City shall review and revise as necessary its noise control ordinance to regulate existing noise sources.	HS-5.1 HS-5.2	City Council Community Development Department				€
HS-6	Prior to approval of a noise-sensitive use exposed to existing or projected noise exceeding the standards of the General Plan, an acoustical analysis shall be required. The acoustical analysis shall comply with the requirements set out in Table HS-2 of the Policy Document.	HS-5.3	City Council Community Development Department				€
HS-7	The City shall enforce state noise insulation standards (California Administrative Code, Title 24) and Chapter 35 of the Uniform Building Code (UB C). Title 24 requires that an acoustical analysis be prepared for all new developments of multi-family dwellings, condominiums, hotels and motels proposed for areas within the 60 Db Ld], contour of a major noise source for the purpose of documenting that an	HS-5.4	Community Development Department Building Department				€

Implementation Measures							
No.	Implementation Measure	Policies/ Goals	Responsibility	Timeframe			
				Near Term	Mid- Term	Long- Term	ngoing
	acceptable interior noise level of 45 Db L~ or below will be achieved. TJBC Chapter 35 requires that common wall and floor/ceiling assemblies within multi-family dwellings comply with minimum standards for the transmission of airborne sound and structure-borne impact noise.						
HS-8	The City shall develop and employ procedures to monitor compliance with noise mitigation standards after projects are completed.	HS-5.5	Community Development Department Building Department				¢
HS-9	The Police Department shall continue to provide neighborhood security and crime prevention information and training to neighborhood groups and homeowner's associations.	HS-6.2	City Manager Police Department				¢
HS-10	<p>The City shall require the following as a condition of project approval to mitigate the adverse noise effects of construction-related activities:</p> <ul style="list-style-type: none"> • Construction activities shall be restricted to the hours between 7:00 a.m. and 7:00 p.m., Monday through Friday, and between 9:00 a.m. and 7:00 p.m. on Saturday, with no construction on Sundays or federal and state holidays; minor construction equipment servicing and maintenance shall be exempted from this restriction. • During construction, mufflers shall be provided for all heavy construction equipment and all stationary noise sources in accordance with the manufacturers' recommendations. • Stationary noise sources and staging areas shall be located as far as is feasible from existing residences, or contractors shall be required to provide additional noise- 	HS-5.2 HS-5.4	Building Department, Planning Department				¢

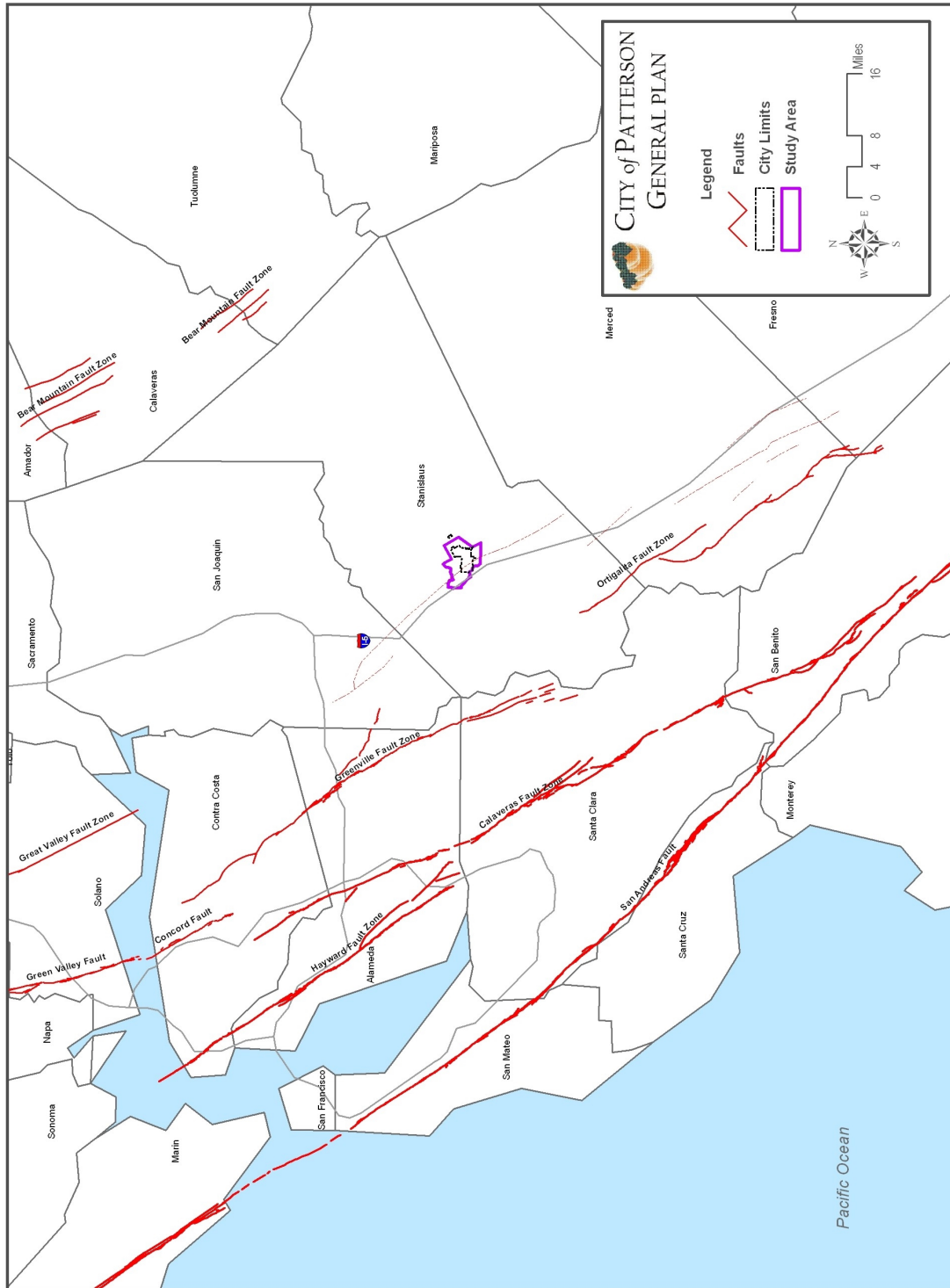
Implementation Measures

No.	Implementation Measure	Policies/ Goals	Responsibility	Timeframe			
				Near Term	Mid- Term	Long- Term	ongoing
	<p>reducing engine enclosures (with the goal of achieving approximately 10 dBA of reduction compared to uncontrolled engines).</p> <ul style="list-style-type: none"> • Air compressors and pneumatic equipment should be equipped with mufflers, and impact tools should be equipped with shrouds or shields. • If for construction purposes, locating stationary construction equipment near existing residential uses is required, an eight-foot-tall sound rated fence should be erected between the equipment and the sensitive receptor. The fence should be located as close to the equipment as is feasible. • Construction vehicle access routes shall be designed to minimize the impact on existing residences and occupied hospital facilities. • A “construction liaison” shall be designated to ensure coordination between construction staff and neighbors to minimize disruptions due to construction noise. Occupants and property owners of residences within 400 feet of construction activity shall be notified in writing of the construction schedule and the contact information for the construction liaison. • A qualified acoustical engineer should be retained during the construction phase of the project to determine if the noise levels generated from construction equipment at the project site to adjacent property lines are within the standards. 						
HS-11	Project applicants shall develop and implement a Soil Sampling and Analysis Plan to determine the presence and extent of any	HS-7.2 HS-7.3 HS-7.7	Building Department, Planning Department				¢

Implementation Measures							
No.	Implementation Measure	Policies/ Goals	Responsibility	Timeframe			
				Near Term	Mid- Term	Long- Term	ngoing
	residual herbicides, pesticides, and fumigants on currently or historically-farmed land in agricultural areas that would be disturbed during construction of the Proposed Project. The Plan shall be prepared in consultation with the Stanislaus County Department of Environmental Health Services and the work shall be conducted by an appropriate California-licensed professional and samples sent to a California Certified laboratory. At a minimum, the Plan shall document the areas proposed for sampling, the procedures for sample collection, the laboratory analytical methods to be used, and the pertinent regulatory threshold levels for determining proper excavation, handling, and, if necessary, treatment or disposal of any contaminated soils. The Plan shall be submitted to the City of Patterson and Stanislaus County Department of Environmental Health Services for review and approval at least 60 days before construction. Results of the laboratory testing and recommended resolutions for excavation, handling, dust control, and treatment/disposal of material found to exceed regulatory requirements shall be submitted to the City prior to construction.						
HS-12	Noise contours derived from the acoustical analysis prepared by Brown Buntin Associates, Inc., entitled Noise Element Update City Of Patterson, Stanislaus County, California, May, 2010 shall be incorporated into the General Plan Noise Element.	HS-5.1 HS-5.4 HS-5.5 HS-5.6	Planning Department	¢			
HS-13	New development shall be required to implement (through installation or the payment of in-lieu fees) relevant portions of the March 2010 City of Patterson General Plan Storm Drainage Study.	HS-2.1	Public Works Department Building Department, Planning Department				¢

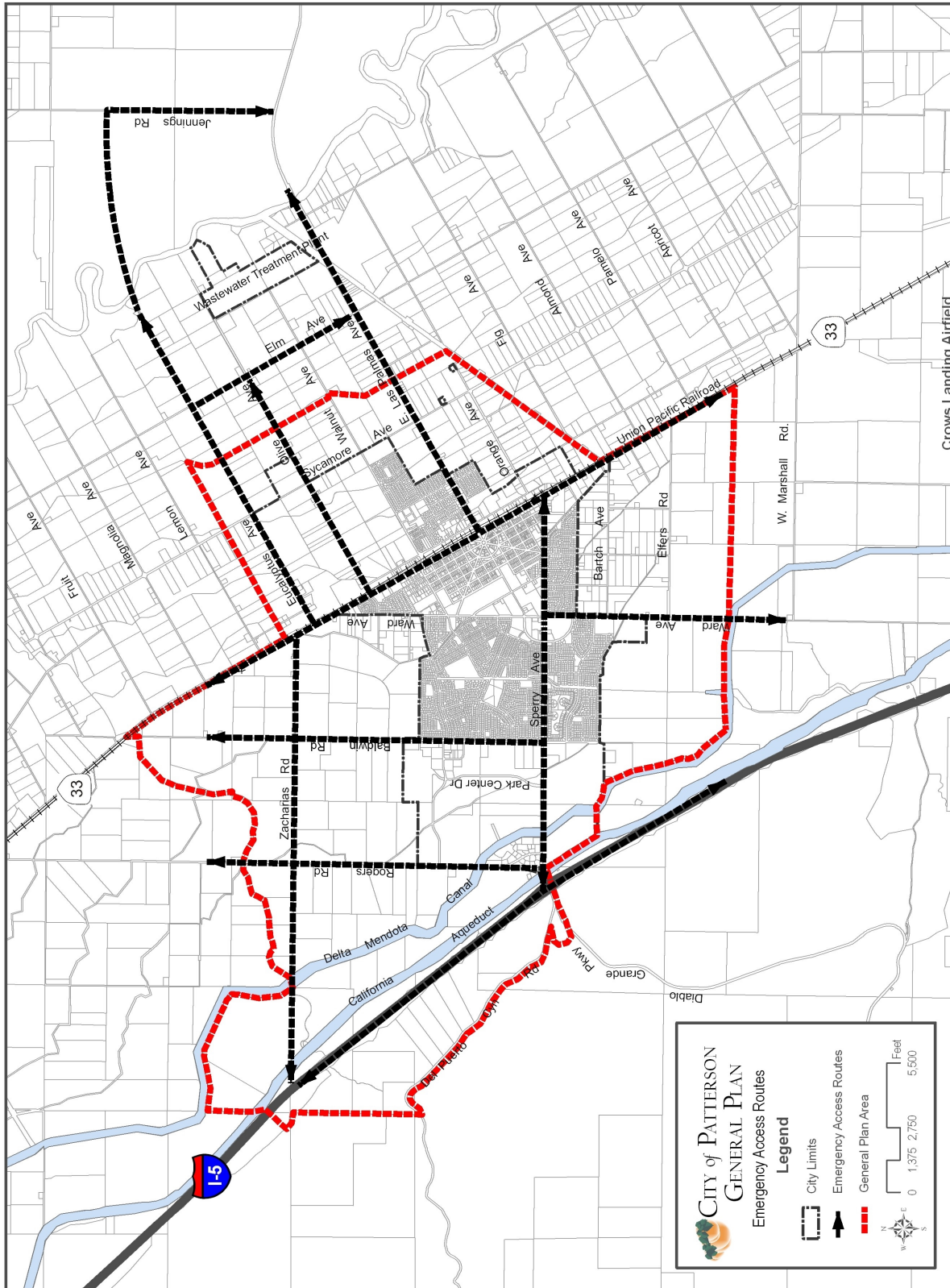
Near-Term = Within 5 Years
Mid-Term = Within 10 Years
Long-Term = 10 Years and Beyond

Figure HS-2 Areas of Known Seismic Risk and Geologic Hazards



Source: USGS Earthquake Hazards Program - Quaternary Fault and Fold Database. Accessed 06/07/07
 Note: San Joaquin Fault Zone location obtained from California Geological Survey - "Simplified Fault Activity Map of California"

Figure HS-3 Emergency Access Routes



Appendix HS-1- Noise

The Noise Environment

There are several potentially significant primary sources of community noise within Patterson. These sources include traffic on major roadways and highways, railroad operations, and agricultural and industrial activities.

A community noise survey was conducted to document existing background (ambient) noise levels at four representative locations within the City. The monitoring site locations were located in both residential and commercial areas of the City. Noise measurements were conducted concurrently at the sites, beginning at midnight on March 25, 2010. The monitoring sites are shown in Figure HS-4.

Noise measurements were conducted continuously for a 24-hour period using Larson-Davis Laboratories Model 820 sound level analyzers equipped with Bruel & Kjaer (B&K) Type 4176 ½ inch microphones. The equipment was calibrated with a B&K Type 4230 acoustic calibrator to ensure the accuracy of the measurements and complies with applicable standards of the American National Standards Institute (ANSI) for Type 1 sound level meters. Microphones were located on tripods at approximately five feet above the ground.

Site 1 was located at a self storage facility on North 1st Street between M Street and Olive Avenue. The site is a commercial area with mixed residential uses to the west and agriculture and rural residential uses to the east. The microphone was located approximately 150 feet east of State Route 33 (SR-33) and approximately 230 feet west of North 1st Street. The California Northern Railroad (CFNR) track is located approximately 80 feet to the west, and lies between SR-33 and the site. Measured hourly maximum noise levels ranged from 61-91 dBA during the sample period, and were likely caused by passing vehicles and trains. Background (L₉₀) noise levels ranged from about 50-55 dBA during the morning and afternoon commute hours to about 45-50 dBA during the middle of the afternoon, evening and night time hours. The measured DNL was 62.4 dB.

Site 2 was located at a City water storage facility approximately 475 feet northwest of the intersection of Orange Avenue and Locust Avenue. There are commercial uses located to the west of the site, and agricultural uses to the north, east and south. There are a few existing single-family homes located to the south of the monitoring site. Measured hourly maximum noise levels ranged from 55-86 dBA during the sample period and were likely caused by passing vehicles and trains. Background (L₉₀) noise levels were relatively constant throughout the sample period, and ranged from 53-55 dBA. The predominant background noise source measured at Site 2 was exhaust fans from the Sierra Pacific facility. The measured DNL was 62.1 dB.

Site 3 was located at a City fire station at 1950 Keystone Pacific Parkway. The microphone was located approximately 325 feet east of Park Center Drive and approximately 350 feet south of Keystone Pacific Parkway. The site is surrounded by existing commercial uses and open land. There are existing single-family homes located approximately 1,500 feet east of the monitoring site. Measured hourly maximum noise levels ranged from 55-80 dBA during the sample period and were likely caused by passing trucks. Background (L₉₀) noise levels ranged from below 40 dBA during the late

night and early morning hours to about 47 dBA during the morning commute hours. The measured DNL was 55.4 dB.

Site 4 was located in a vacant lot on Peach Blossom Lane between Plumeria Drive and Garden Patch Way. The meter was located in a residential area surrounded by single-family homes. Measured hourly maximum noise levels ranged from 48-73 dBA during the sample period and were likely caused by passing vehicles. Background (L₉₀) noise levels ranged from below 40 dBA during the late night and early morning hours to about 47 dBA late afternoon and early evening hours. The measured DNL was 50.6 dB.

Stationary Noise Sources

Major existing stationary noise sources within the City of Patterson include the central core commercial/industrial area along SR-33, the CFNR tracks and the CVS Pharmacy and Kohls distribution centers on the west side of town. There are also various smaller sources located within the Study Area.

Central Core Commercial/Industrial Area. This commercial/industrial area represents the area east of SR-33 extending from approximately Las Palmas Avenue to Orange Avenue. This area includes Patterson Vegetable, Sierra Pacific, Trinidad Benham, Traina Foods, George Lowry Petroleum, and other agricultural- and industrial- related facilities. Noise levels generated within this area were measured at multiple short-term locations on March 25-26, 2010, as noted in Figure HS-4.

Table HS-4 documents the measured noise levels and locations of the short-term monitoring sites. Noise levels varied widely throughout the area, with the loudest areas being to the north along Las Palmas Avenue in the vicinity of Patterson Vegetable, as well as in the southern portion along 2nd Street near Trinidad Benham. The closest residential uses are the Las Palmas trailer park to the east. Noise measurements were obtained at two locations within the trailer park (Enrique Way/El Camino Drive and Shirlinda Way/Pasa Felix Drive). Noise levels at these locations ranged from approximately 46-52 dBA.

Table HS-4: Measured Noise Levels (Dba) Central Core Commercial/Industrial Area March 25-26, 2010		
Location	Range (dBA)	Primary Source
Enrique Way and El Camino Drive	50-52	Patterson Vegetable
Las Palmas Avenue and 1 st Street	69-71	Patterson Vegetable
110 E Las Palmas Avenue	73-74	Patterson Vegetable
495 S. 2 nd Street	66-67	Trinidad Benham
341 S. 1 st Street	60-65	Trinidad Benham
Orange Avenue and Locust Avenue	48-51	Traina Foods
Shirlinda Way and Pasa Felix Drive	46-47	Patterson Vegetable
2 nd Street and Las Palmas Avenue	64-67	Patterson Vegetable
Salado Avenue and El Circulo Avenue	64-66	Patterson Vegetable
Orange Avenue and 1 st Street	54-57	Sierra Pacific

261 Orange Avenue	49-52	Sierra Pacific
Source: Brown-Buntin Associates, Inc.		

CVS Pharmacy Distribution Center. CVS Pharmacy operates a distribution center southwest of the intersection of Keystone Pacific Parkway and Park Center Drive. Noise sources include trucks entering and exiting the facility, rooftop fans, occasional outdoor forklift movements, and back-up warning beepers. Short term noise measurements were obtained at a distance of approximately 500 feet from the east side of the facility as noted in Figure HS-4. Measured noise levels at that site ranged from 42-45 dBA. Long term monitoring Site 3 was also located east of the distribution center, and background noise levels measured for the 24-hour period ranged from approximately 33-48 dBA. Truck traffic along Keystone Pacific Parkway and Rogers Road was observed to represent a greater noise source than activities at the distribution center.

Kohl's Distribution Center. Kohl's Department Store operates a distribution center along the north side of Keystone Pacific Parkway, approximately 1,300 feet northeast of the CVS Pharmacy Distribution Center. Noise sources include trucks entering and exiting the facility, occasional fork lift movements, and back-up warning beepers. Short term noise measurements were obtained at a distance of approximately 800 feet from the south side of the facility as noted in Figure HS-4. Facility-related noise levels at that site ranged from approximately 44-46 dBA. As was the case with the CVS Pharmacy distribution center, activities related to the Kohl's facility were often inaudible above other ambient noise sources, namely roadway vehicle traffic. Truck traffic along Keystone Pacific Parkway and Rogers Road was observed to represent a greater noise source than activities at the distribution center.

Various Commercial/Industrial-related Industries. Observations on March 25, 2010 indicated that there are a number of commercial/industrial-related uses located north of Las Palmas Avenue generally between North 1st Street and SR-33. There are existing residential uses along the east side of North 1st Street in close proximity. Noise levels were measured in front of a residence along North 1st Street at a distance of approximately 60 feet from Peck & Hiller Concrete, and noise levels ranged from approximately 53-61 dBA. Noise sources included welding, cutting, and grinding activities, and truck movements. Additionally, noise measurements were obtained near Designed Mobile Systems, a manufacturer of modular buildings, located west of SR-33 and north of Poppy Avenue. Noise levels were obtained at a nearby residence at 349 Poppy Avenue, and were measured to be in the range of 49-51 dBA. Noise sources included forklift movements and back-up warning beepers. Short-term noise monitoring sites are noted in Figure HS-4.

Roadways

Automobile traffic on roadways is one of the primary sources of noise within the Study Area. The eastern portion of the Study Area is most affected by noise generated by State Route 33, with the existing baseline ranging from 67-69 dB. Additional roadways within the eastern portion of the Study Area which generate significant levels of noise consist of Walnut, Sycamore, and Eucalyptus Avenues; however, these roadways do not generate baseline noise levels in excess of 56 dB.

Within the western portion of the Study Area, a substantial amount of vehicular noise is generated by Interstate-5. Approximately 25,000 vehicles per day travel the I-5 corridor through the Study Area, with approximately 25 percent of these vehicles classified as heavy-duty or lighter trucks. Additional roadways within the western portion of the Study Area expected to generate moderate noise levels are Sperry Avenue, Baldwin Road, and Ward Avenue. These roads are rural or transitional connector streets that may have occasionally fast-moving traffic, but are not heavily-traveled at night, causing only moderate levels of noise during the day. It is estimated that noise levels beyond about 65 feet of the centerline of Sperry Avenue are below 60 dBA.

The Federal Highway Administration (FHWA) Highway Traffic Noise Prediction Model (FHWA-RD-77-108) was used to develop DNL contours for I-5, SR-33, and major local roadways. The FHWA Model is an analytical method favored by most state and local agencies, including Caltrans, for highway traffic noise prediction. The FHWA 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 to within ± 1.5 dB. To determine DNL values, it is necessary to estimate the day/night distribution of traffic so that an hourly equivalent traffic volume may be calculated. The FHWA Model assumes a clear view of traffic with no shielding at the receiver location.

Average Daily Traffic (ADT) volumes and speeds used for noise modeling were provided by TJKM Transportation Consultants, the project traffic engineers. The day/night distribution of traffic was estimated by BBA based upon studies along similar roadways. The percentage of trucks on I-5 and SR-33 were obtained from Caltrans. The percentage of trucks on major local streets was estimated by BBA based upon studies along similar roadways. It was assumed that Rogers Road north of Sperry Avenue is a truck route with higher percentages of trucks than other major local streets. Appendix 5.8 summarizes the noise modeling assumptions used to calculate traffic noise exposure for existing conditions along I-5, SR-33 and major local streets.

Table HS-5 summarizes calculated noise exposure at typical building setbacks and the distances to the DNL 60 and 65 dB contours for existing traffic conditions. Figure HS-5 shows the roadways where distances to DNL contours were calculated for existing traffic conditions. The streets are color coded to indicate the approximate distances to the 60 dB DNL contours. Traffic noise exposure information is generalized for flat terrain and the absence of acoustical shielding or reflections that may be caused by site-specific conditions.

Table HS-5: Generalized Traffic Noise Exposure, 2010

Roadway	Segment	DNL @ Typical Setback, dB ¹	Distance, Feet ²	
			60 dB DNL	65 dB DNL
I-5	n/o Sperry Ave.	73.4	1564	726
	s/o Sperry Ave.	74.0	1705	792
SR-33	w/o Baldwin Rd.	65.4	172	80
	e/o Baldwin Rd.	63.3	125	58
	n/o Zacharias Rd.	62.1	104	48
	s/o Zacharias Rd.	62.5	110	51
	n/o Las Palmas Ave.	62.1	103	48
	s/o Las Palmas Ave.	63.7	132	61
	n/o Sperry Ave.	63.6	131	61
	s/o Sperry Ave.	64.8	156	73
Rogers Rd.	s/o SR-33	52.6	24	11
	n/o Sperry Ave.	63.2	122	57
	s/o Sperry Ave.	---	---	---
Sperry Ave.	w/o Rogers Rd.	62.0	102	47
	e/o Rogers Rd.	61.2	90	42
	w/o Baldwin Rd.	61.0	88	41
	e/o Baldwin Rd.	60.7	83	39
	w/o Ward Ave.	61.2	90	42
	e/o Ward Ave.	61.4	93	43
	w/o SR-33	59.4	69	32
	e/o SR-33	54.8	34	16
Baldwin Rd.	n/o Sperry Ave.	56.2	42	19
	s/o Sperry Ave.	52.3	23	11
	s/o SR-33	49.3	15	7
Ward Ave.	n/o Sperry Ave.	58.4	58	27
	s/o Sperry Ave.	56.2	42	20
Zacharias Rd.	w/o SR-33	50.0	16	7
	e/o SR-33	---	---	---
Eucalyptus Ave.	e/o SR-33	48.1	12	6
Las Palmas Ave	w/o SR-33	59.5	69	32
	e/o SR-33	62.7	113	53
	w/o Poplar Ave.	63.6	130	60
	e/o Poplar Ave.	63.6	130	61
Sycamore Ave.	n/o Las Palmas Ave.	54.3	31	14
	s/o Las Palmas Ave.	56.3	42	20
Poplar Ave.	n/o Las Palmas Ave.	49.1	14	7
W. Main Ave.	n/o Las Palmas Ave.	61.3	91	42
	s/o Las Palmas Ave.	59.9	73	34

Source: Brown-Buntin Associates, Inc.

Notes:

1. Assumed to be 75 feet from the center of all roadways except I-5 where a setback of 200 feet was assumed. Calculations are generalized and do not take into consideration sound walls or other site-specific conditions.
2. From the center of the roadway.

Figure HS-4: Stationary Source Monitoring Sites



Railroads

The California Northern Railroad (CFNR) currently operates freight trains over the Westside Branch of the Union Pacific Railroad (UPRR) through Patterson between Tracy and Los Banos. According to the Federal Railroad Administration rail crossing inventory (01/01/96), an average of six trains per day pass through Patterson. It should be noted that this figure includes switching movements at local industries, and that, based upon field observations, this may be a high estimate for current operations over the line. Freight trains may occur at any time during the day or night. The current maximum train speed through Patterson is 25 mph.

There are approximately 20 public or private roadway grade crossings within the Study Area. Train engineers are required to sound the warning horn when approaching within approximately 1,000 feet of a grade crossing. Train noise levels are therefore higher at locations near grade crossings. Due the number of grade crossings within the Study Area, warning horns are used frequently as trains pass through Patterson.

Noise levels produced by a northbound freight train with two locomotives and 15 cars were recorded by Brown-Buntin Associates, Inc. (BBA) near the M Street grade crossing on March 25, 2010. At a distance of 100 feet from the track, the measured maximum (L_{max}) and Sound Exposure Level (SEL) values were 103.3 and 109.8 dBA, respectively. The SEL is a measure of total sound energy produced by a noise event, normalized to a reference duration of one second. The SEL is not actually heard but is the noise metric used for the calculation of cumulative noise exposure as defined by the DNL. Noise levels produced by passing trains are variable, depending upon speed, length of train, condition of equipment and tracks, perceived safety conflicts of individual train crews and other variables.

Railroad noise exposure within the City of Patterson was calculated based upon the above-described operations data and noise level data for freight train movements recorded by BBA for numerous studies along the UPRR and other railroads in the Central Valley. At a distance of 100 feet from the center of the track, typical freight train pass-bys near a grade crossing have been shown to produce average SEL values of 106.3 dBA. At distances greater than 1,000 feet from a grade crossing, typical freight train pass-bys have been shown to produce average SEL values of 102.1 dBA at 100 feet from the tracks.

It was assumed for the calculations that freight train operations may occur at any time of the day or night. Within 1,000 feet of a grade crossing, the calculated distance to the 60 dB DNL contour for current railroad activity is 575 feet from the center of the tracks. At distances greater than 1,000 feet from a grade crossing, the calculated distance to the 60 dB DNL contour is 288 feet from the center of the tracks. Calculated distances are generalized and do not take into consideration site-specific conditions such as acoustic shielding or reflections caused by nearby buildings.

Aircraft Noise

The Patterson Airport and former Crow's Landing Airfield Facility (CLAF) are located within or affecting the Study Area. Only the Patterson Airport is still active. The Patterson Airport is a private airport consisting of a single 2,500 foot-long runway. According to FAA records, there are 12 aircraft based at the airport and an average of 33 aircraft operations per day. However, no aircraft operations were observed during field

studies and aircraft were not observed on the airfield. If aircraft operations do occur, they are sporadic and do not generate significant noise exposure as defined by the CNEL noise metric. However, such operations would be distinctly audible in the vicinity of the airport.

Crows Landing Airfield is currently not in use. However, Stanislaus County has proposed that it be reopened as a general aviation airport as part of the Stanislaus County public airport system. According to the January 2009 draft of the Crows Landing Airport Land Use Compatibility Plan (ALUCP), the airport would reopen with a single 5,300 foot-long runway with approximately 4,000 annual aircraft operations. In the “ultimate” configuration (20 years+), the airfield would have two parallel runways 6,300 feet long and 200,000 annual operations. Operations would be mostly single and twin engine propeller or turboprop aircraft and helicopters, with approximately 10% business jet operations. The airport design aircraft for the ultimate development of the airport is the Gulfstream III business jet.

Noise-Sensitive Land Uses

Noise-sensitive land uses are generally considered to include those uses that would result in noise exposure that could cause health-related risks to individuals. Places where quiet is essential are also considered noise-sensitive uses. Residential dwellings are of primary concern because of the potential for increased and prolonged exposure of individuals to both interior and exterior noise levels. Other land uses such as parks, historic sites, cemeteries, and recreation areas are also considered sensitive to increases in exterior noise levels. School classrooms, places of assembly, hotels, libraries, and other places where low interior noise levels are essential are also considered noise-sensitive land uses.

Table HS-6: Generalized 2030 Traffic Noise Exposure		
Roadway	Segment	DNL @ Typical Setback, dB ¹
I-5	n/o Sperry Ave.	75.7
	s/o Sperry Ave.	76.2
SR-33	w/o Baldwin Rd.	68.0
	e/o Baldwin Rd.	65.4
	n/o Zacharias Rd.	65.7
	s/o Zacharias Rd.	67.5
	n/o Las Palmas Ave.	66.9
	s/o Las Palmas Ave.	67.3
	n/o Sperry Ave.	66.8
	s/o Sperry Ave.	69.8
Rogers Rd.	s/o SR-33	61.8
	n/o Sperry Ave.	69.1
	s/o Sperry Ave.	61.4
Sperry Ave.	w/o Rogers Rd.	66.8
	e/o Rogers Rd.	67.1
	w/o Baldwin Rd.	68.0
	e/o Baldwin Rd.	67.9
	w/o Ward Ave.	66.3
	e/o Ward Ave.	65.5
	w/o SR-33	63.2
	e/o SR-33	60.4
Baldwin Rd.	n/o Sperry Ave.	63.6
	s/o Sperry Ave.	63.5
	s/o SR-33	59.8
Ward Ave.	n/o Sperry Ave.	64.4
	s/o Sperry Ave.	62.2
Zacharias Rd.	w/o SR-33	64.8
	e/o SR-33	62.9
Eucalyptus Ave.	e/o SR-33	60.3
Las Palmas Ave	w/o SR-33	62.6
	e/o SR-33	65.5
	w/o Poplar Ave.	65.1
	e/o Poplar Ave.	66.3
Sycamore Ave.	n/o Las Palmas Ave.	63.7
	s/o Las Palmas Ave.	63.9
Poplar Ave.	n/o Las Palmas Ave.	60.6
W. Main Ave.	w/o Carpenter Ave.	64.6
W. Main Ave.	e/o Carpenter Ave.	64.2
Source: Brown-Buntin Associates, Inc.		
Notes:		
<ol style="list-style-type: none"> 1. Assumed to be 75 feet from the center of all roadways except I-5 where a setback of 200 feet was assumed. 2. Calculations are generalized and do not take into consideration sound walls or other site-specific conditions. 		

Table HS-7: Generalized Buildout Traffic Noise Exposure	
Roadway Segment	DNL @ Typical Setback, dB ¹
I-5 n/o Sperry Ave.	77.9
I-5 s/o Sperry Ave.	78.2
Rogers Rd. s/o Zacharias	71.5
Sperry Ave. e/o Rogers Rd.	68.0
Baldwin Rd. n/o Sperry Ave.	63.4
Sperry Ave. e/o Ward Ave.	64.7
Ward Ave. n/o Las Palmas Ave.	63.0
Zacharias Rd. w/o SR-33	68.1
SR-33 n/o Zacharias Rd.	67.8
SR-33 s/o Walnut Ave.	68.8
Ward Ave. n/o Marshall Rd.	65.7
SR-33 s/o Sperry Ave.	68.1
Las Palmas Ave. w/o Sycamore Ave.	66.4
Main St. e/o Carpenter Rd.	65.5
<p>Source: Brown-Buntin Associates, Inc.</p> <p>Notes:</p> <ol style="list-style-type: none"> 1. Assumed to be 75 feet from the center of all roadways except I-5 where a setback of 200 feet was assumed. 1. Calculations are generalized and do not take into consideration sound walls or other site-specific conditions. 	

Figure HS-5: Distance to 60 dB DNL Contour for the 20-Year Timeframe

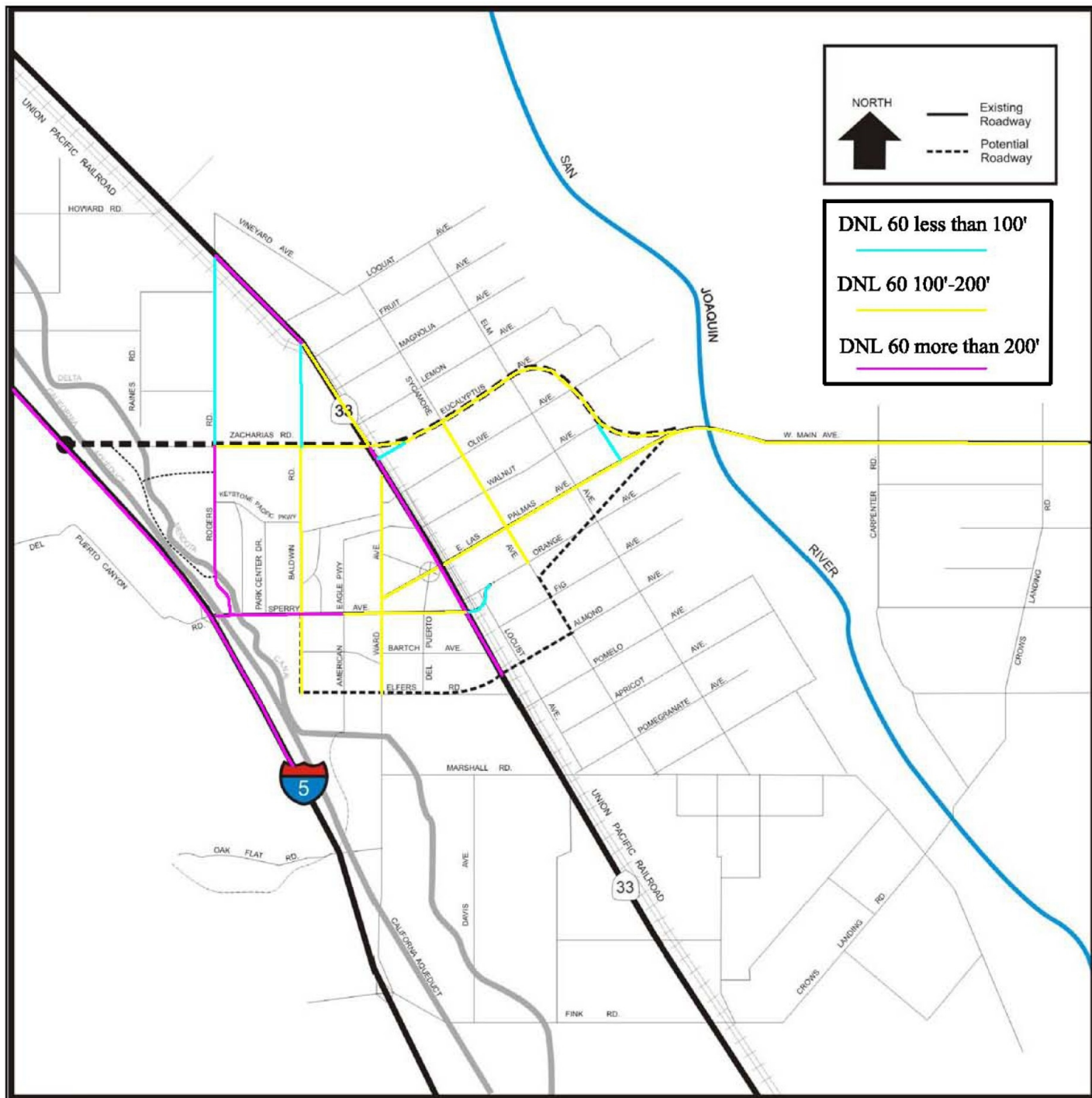


Figure HS-6: Future 60 dB DNL Contour from Rail Traffic

