PUBLIC SAFETY ADVISORY COMMITTEE

AGENDA

Regular Meetings
2nd Tuesday
January, April, July, and October

*Date**: October 11, 2016***
(Regular Meeting)

Time: ***6:00 P.M.***

COMMITTEE MEMBERS

Chair Sam Thatte

Vice Chair Richard Amos

Member John Holland

Member James Roberts

Member Don Webb

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Council Member Mike Leonard,
Council Liaison

City of Hesperia
Council Chambers
9700 Seventh Avenue
Hesperia, CA 92345

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www.cityofhesperia.us

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CITY OF HESPERIA
9700 Seventh Avenue
Hesperia, CA 92345

AGENDA
PUBLIC SAFETY ADVISORY COMMITTEE
October 11, 2016

REGULAR MEETING

CALL TO ORDER 6:00 p.m.

A. Roll Call:
   Chair Thatte
   Vice Chair Amos
   Member Webb
   Member Roberts
   Member Holland

B. Pledge of Allegiance to the Flag

PUBLIC COMMENTS

Please submit a "Comment Card" to the Recording Secretary. Comments are limited to three (3) minutes. Please state your name for the record.

The Brown Act prohibits taking action on oral requests. However, Members may respond briefly or refer the communication to staff.

PRESENTATIONS/ ANNOUNCEMENTS

1. **Advisory Committee program review update by Heather Galluzzi, Staff Analyst.**
2. **Quarterly Polices services update by Hesperia Police Captain Gregg Wielenga of the San Bernardino County Sheriffs.**
3. **Quarterly Fire services update by Assistant Chief Ron Walls of the San Bernardino County Fire Department.**

ITEMS FOR CONSIDERSATION

1. **Draft Minutes from the July 12, 2016 meeting. Staff person: Heather Galluzzi, Staff Analyst.**
2. **City of Hesperia Hazard Mitigation Plan revision and solicitation of input. Staff person: Rachel Molina, Assistant to the City Manager.**

COMMITTEE MEMBER AND STAFF COMMENTS

Committee Members may make comments of general interest

ADJOURNMENT

I, Heather Galluzzi, Recording Secretary of the City of Hesperia, California do hereby certify that I caused to be posted the foregoing agenda on Wednesday, October 5, 2016 at 4:00 p.m. pursuant to California Government Code §54954.2.

Heather Galluzzi,
Recording Secretary

Attachment received after posting of the agenda

CITY OF HESPERIA

Meeting Minutes
PUBLIC SAFETY ADVISORY COMMITTEE
July 12, 2016

CALL TO ORDER 6:00 p.m.

A. Roll Call:

Chair – Thatte - Present
Vice-Chair – Amos – Present
Member Holland - Present
Member Roberts - Present
Member Webb - Present

B. Invocation – James Roberts

C. Pledge of Allegiance to the Flag

PUBLIC COMMENTS

There were no members of the public in the audience.

PRESENTATIONS/ANNOUNCEMENTS

1. Introduction of the Hesperia Police Captain Gregg Wielenga of the San Bernardino County Sheriff and quarterly update.

2. Introduction of the Hesperia Assistant Chief Ron Walls of the San Bernardino County Fire Department and quarterly update.

ITEMS FOR CONSIDERATION

1. Approval of Minutes of regular meeting held on January 12, 2016.

   A motion was made by Member Holland and seconded by Committee Member Roberts to approve the Draft Minutes from the meeting held January 12, 2016. The motion carried the following vote:

   Aye: 5 – Chair Thatte, Vice-Chair Amos, Committee Member Holland, Committee Member Roberts and Committee Member Webb

   Noes: 0

2. Police Department Introduction and Quarterly Update report by Captain Gregg Wielenga

   Introduced himself and updated the Committee on quarterly stats, new practices and ways of doing business.

3. Fire Department Introduction and Quarterly Update report by Assistant Chief Ron Walls

   Introduced himself and updated the Committee on response time stats, new practices and ways of doing business

COMMITTEE MEMBER AND STAFF COMMENTS

Chair Thatte – Would like to know if the Committee can do anything further to be more involved. He also asked if a City Staff Member could be present at future meetings.

Committee Member Roberts – Asked about making recommendations and sending questions to the City Council

Committee Member Holland – requested meetings to be held monthly, rather than quarterly

Vice Chair Amos – Asked if social media could be used to advertise the PSAC meetings in order to have more public participation

Committee Member Webb – Nothing

ADJOURNMENT

Meeting adjourned at 7:49 PM.

_____
Heather Galluzzi,
Recording Secretary

City of Hesperia

STAFF REPORT

DATE: Tuesday, October 11, 2016

TO: Chair and Committee Members, Public Safety Advisory Committee

FROM: Nils Bentsen, City Manager

BY: Rachel Molina, Assistant to the City Manager

SUBJECT: Hazard Mitigation Plan Revision

RECOMMENDED ACTION

It is recommended that the Public Safety Advisory Committee receive the attached Hazard Mitigation Plan last updated and adopted in April of 2012 in order to review and provide input on Mitigation Programs, Strategies, Preparedness Goals and Priorities found in sections 5.4 through 6.5 and comments at a future Committee Meeting.

ATTACHMENT(S)

1. City of Hesperia Hazard Mitigation Plan

Hazard Mitigation Plan
City of Hesperia, CA

Adoption Date: – April 6, 2005
Updated - December 14, 2010
2010 Update City Council Adoption – April 3, 2012

Primary Point of Contact

Brigit K. Bennington
Emergency Services Coordinator
City of Hesperia
9700 Seventh Avenue
Hesperia, CA 92345
760 947-1245 (Office)
760 947-2881 (Fax)
bbennington@cityofhesperia.us

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Executive Summary

The Disaster Mitigation Act of 2000 (DMA) was passed by Congress to emphasize the need for mitigation planning to reduce vulnerability to natural and human-caused hazards. DMA 2000 amended the Robert T. Stafford Disaster Relief and Emergency Assistance Act (Stafford Act; 42 United States Code 5121 et seq.) by repealing the act's previous Mitigation Planning section (409) and replacing it with a new Mitigation Planning section (322).

To implement the DMA 2000 planning requirements, the Federal Emergency Management Agency (FEMA) established mitigation planning requirements for states, tribes, and local communities, including the requirement to develop a Hazard Mitigation Plan to address known hazards that impact the City of Hesperia. The City of Hesperia Hazard Mitigation Plan includes resources and information to assist City residents, public and private sector organizations, and others interested in participating in planning for natural hazards. This Hazard Mitigation Plan provides a list of activities that may assist Hesperia in reducing risk and preventing loss from future hazard events. The action items address multi-hazard issues, as well as activities for earthquakes, flooding, and wildfires. While we cannot predict or protect ourselves against every possible hazard that may strike the community, we can anticipate many impacts and take steps to reduce the harm they will cause. This Hazard Mitigation Plan starts an ongoing process to evaluate the risks different types of hazards pose to the City, and to engage the City and the community in dialogue to identify which steps are most important to pursue to reduce these risks. The Plan contains a background on the purpose and methodology used to develop the mitigation plan, a profile of Hesperia, and sections on hazards that occur within the City.

The City and community members have worked to address certain aspects of the risk – such as strengthening infrastructures, developing strategies, and establishing emergency preparedness plans. This Plan will formalize this process and assure that these activities continue to be explored and improved over time. Over many years, this constant focus on disasters will make the City, its residents, and businesses much safer.

This Plan meets the requirements of the federal DMA 2000, which calls for all communities to prepare mitigation plans. By preparing this plan, the City of Hesperia is eligible to receive federal mitigation funding after disasters and to apply for mitigation grants before disasters strike.

This Plan promotes sound public policy designed to protect citizens, critical facilities, infrastructure, private property, and the environment from natural hazards. This can be achieved by increasing public awareness, documenting the resources for risk reduction and loss-prevention, and identifying activities to guide the City toward building a safer, more sustainable community.

Section 1 – Introduction

1.1 General Description

Emergencies and disasters cause death or leave people injured or displaced, cause significant damage to our communities, businesses, public infrastructure and our environment and cost tremendous amounts in terms of response and recovery dollars and economic loss.

Hazard mitigation reduces or eliminates losses of life and property. After disasters, repairs and reconstruction are often completed in such a way as to simply restore to pre-disaster conditions. Such efforts expedite a return to normalcy; however, the replication of pre-disaster conditions results in a cycle of damage, reconstruction and repeated damage. Hazard mitigation ensures that such cycles are broken and that post-disaster repairs and reconstruction result in a reduction in hazard vulnerability.

While we cannot prevent disasters from happening, their effects can be reduced or eliminated through a well-organized public education and awareness effort, preparedness and mitigation. For those hazards, which cannot be fully mitigated, the community must be prepared to provide efficient and effective response and recovery.

1.2 Purpose and Authority

The Disaster Mitigation Act of 2000 (DMA 2000), Section 322 (a-d) requires that local governments, as a condition of receiving federal disaster mitigation funds, have a mitigation plan that describes the process for identifying hazards, risks and vulnerabilities, identify and prioritize mitigation actions, encourage the development of local mitigation and provide technical support for those efforts. This mitigation plan serves to meet those requirements.

1.3 Community Information

The section is to provide a broad perspective, brief history and describes the makeup and development of the City of Hesperia.

Physical Setting

The City of Hesperia is located in the Victor Valley, situated in the high desert region of San Bernardino County, approximately 35 miles north of the City of San Bernardino. The City limits are irregularly shaped (see City Limits Map) and other than the northernmost boundary, there are no consistent physical or geographic borders.

Figure 1 – Physical Setting

The communities of Adelanto, Apple Valley, Victorville and the County of San Bernardino unincorporated areas of Oak Hills and Summit Valley border Hesperia's City limits. The western banks of the dry bed of the Mojave River generally delineate most of the eastern boundary of the City. The northwestern portion of Hesperia borders the northbound lanes of Interstate 15, with a portion of the City limits just west of Highway 395 marking a smaller western boundary.

The total land area in the City of Hesperia's service area encompasses approximately 110 square miles; most of Hesperia's land is located east of Interstate 15. However, the unincorporated areas of Oaks Hills and Summit Valley add 36.40 square miles to the City's total sphere of influence.

The City is situated on an alluvial plain, running in a northeasterly direction from the San Bernardino Mountains to the south. Scrub Oak, several Juniper species, Chaparral, Sagebrush and Joshua trees are the primary natural vegetation found in Hesperia. The average elevation of the City is 3,250 feet above sea level.

months as well as, day and night times, that characterizes the high desert's climate. The average humidity level is approximately 43% and typically, the high desert experiences daily winds of 10.9 mph.

The average annual rainfall is just 5.5 to 6", a major portion of the precipitation occurs between the months of November through February, with the occasional summer thunderstorm. High desert residents are often delighted to see snowfall during winter months, however, without the severe cold weather. The average snowfall is 1.06".

The following are average seasonal highs and lows:

JANUARY	Min	31°	Mean	45°	Max	60°
APRIL	Min	42°	Mean	59°	Max	75°
JULY	Min	61°	Mean	80°	Max	99°
OCTOBER	Min	45°	Mean	63°	Max	81°

Hesperia residents also enjoy an average of 277 days of sunny or partly sunny days.

Major River/Watersheds

The High desert area is surrounded by many steep mountain ranges that frequently experience summer thunderstorms, which may result in flash flooding in many of the dry washes on the desert floor. As a result, runoff water collects in dry lakebeds throughout the desert area.

Environmental permit processing has delayed or prohibited work in the washes needed to provide adequate flow lines to the many bridges on City roadways. Many of the City's roadways are not outfitted with bridges, resulting in large amounts of water and debris flowing over the roadways and dip crossings. Flash flooding cause road and bridge washouts, erosion of earthen channels and basins near these roadways and dip crossings. The City of Hesperia may experience street closures for several days due to sediment transport and road damage. Many private properties may also experience erosion and sediment deposits due to the sheet flow character of the high desert.

Mojave River

The Mojave River could be called an "Upside-down and Backwards" river:

- Upside-down - as the water flows below ground and under the sand.
- Backwards – because instead of flowing toward the ocean, as most rivers tend to do, the Mojave flows inland, ending in the middle of the desert.

The Mojave River does come above the ground, first, just before the confluence at Deep Creek and west Miller Creek flowing out of the San Bernardino Mountain watershed, then further north, at the upper narrows, between Victorville and Apple Valley and downstream past Barstow at the lower narrows and through Afton

Canyon. The river winds down the canyon and seeps into the sand disappearing before it reaches Soda Lake near Baker.

Transportation

While the majority of Hesperia's population resides in the eastern portion of City limits, the westernmost area of Hesperia sits in a major transportation corridor formed by U.S. Highway 395 and Interstate 15, providing a direct connection to other major interstates and highways serving Los Angeles, San Diego, Northern California and Nevada. Interstate 15 also connects to Interstate 40 that serves the southwestern states including Arizona and beyond.

In the late 1990's, a regional poll showed that an upwards of 50,000 High Desert residents commuted using Interstate 15 daily; it is reasonable to estimate the same numbers still commute.

Five major arterials serve as the main east and west thoroughfares of the City: Main Street, Bear Valley Road, Eucalyptus Street, Mojave/Mauna Loa and Ranchero Road. The main north and south arterial through the City is Hesperia Road; other north and south arterials include Mariposa Road, Escondido Avenue, Maple Avenue, Peach Avenue and I Avenue.

A grade separation is planned to begin construction January 2011 for Ranchero Road involving the installation of an under crossing for the Burlington Northern Santa Fe (BNSF) Railroad to extend Ranchero Road. Currently, Ranchero Road terminates at either side of the railroad's right-of-way. The construction of the new crossing will have a tremendous positive impact on peak hour traffic on Main Street.

Victor Valley Transit Authority (VVTA) provides public transportation services to the residents of the high desert. VVTA operates Monday through Saturday on a fixed route schedule serving the communities of Hesperia, Victorville, Apple Valley and Adelanto.

Rail services are provided by Amtrak, with a passenger rail terminal located in Victorville. The BNSF rail line runs north and south along Hesperia Road through Hesperia, with an east and west branch line for freight terminating at the Mitsubishi plant located in Lucerne Valley. In addition, the Union Pacific railroad runs in a north and south direction in the southwest area of Hesperia.

There are three local airports in the Victor Valley: Hesperia, Apple Valley and Southern California Logistics Airport (SCLA), the larger of the three that includes a 2,500-acre world-class aviation and air cargo facility serving domestic and international needs.

History

Hesperia was officially named in 1885 with the opening of a train depot along the Atchison, Topeka and Santa Fe railroad (known today as the BNSF railroad). The old town site was laid out and subdivided soon after in the area immediately northwest of Hesperia Road and Main Street.

In the late 1800's, agricultural uses were popular in this area, grapes for wine and raisins were the main crops. For a brief period at the turn of the century, the City was the last stop on Route 66 before the Cajon Pass. However, the route was realigned to the west of Hesperia is 1924, significantly reducing the number of tourists that passed through the area.

In the 1950's, M. Penn Phillips subdivided much of the area between Ranchero Road, BNSF railroad and Maple Avenue into one acre lots or larger. These areas have remained rural and agricultural in nature today.

In 1988, Hesperia incorporated, because of increased development with little or no infrastructure to support it. The City's population at that time was approximately 50,000 residents. Hesperia became popular because of its affordability, which continues on today.

Population/Demographics

In 1980, Hesperia was a small, unincorporated City of approximately 13,540 people (U.S. Census 1990), with only two traffic signals, a handful of stores, one post office and few schools. Within twenty years, the population has increased to approximately 91,496 people and anticipated growth is more than 243,000 at build-out.

Today Hesperia's population is approximately 91,496, which is about 4.5% of the total population of San Bernardino County as of April 5, 2010 (US Census Bureau). Hesperia has an average of four persons per household with approximately 20,409 housing units, 72.58% owner occupied and 27.42% renter occupied.

According to Claritas 2009, 67% of the City's residents are white, 4.74% are black or African American, 1.46% are American Indian & Alaskan Native, 1.19% are Asian, .20% are Native Hawaiian & Other Pacific Islander, with 19.57% of the population classified as Other Races including Hispanic/Latino (2009 Supplemental Demographics © 2010 Claritas Inc.).

Community Characteristics

Hesperia has been attracting residents to more affordable housing in a safe family-orientated environment. Demographics suggest that this community is comprised mostly of residents and as result, Hesperia has remained predominately a residential community.

Hesperia's households have an average income of $58,050; in comparison nationwide, the average household income is $65,849. Hesperia has the highest Median Household Income in the Victor Valley at $58,050; Apple Valley follows at $46,289, Victorville at $41,448 and Adelanto at $38,354. Most residents of Hesperia are married with the majority of households comprised of two-persons followed closely by three-and four-person households.

The Victor Valley's greatest percentage (72.58 %) of owner occupied homes is in Hesperia, which ranks above the percentage of owner occupied homes nationally and in San Bernardino County.

Because of its proximity to the Cajon Pass, Hesperia is the most commuter friendly community in the high desert, with the average commute to work being just under 40 minutes a day. However, the largest percentage of the residents (28.48%) spends 15 to 29 minutes driving to work. Hesperia residents on average, own more vehicles than do other Victor Valley residents with the average being almost two vehicles per household.

Medical Care

Hesperia has access to three 24-hour medical centers with a total of 904 beds and 406 physicians in its surrounding areas. Both air and ground ambulance service is available twenty-four hours a day. The medical facility closest to Hesperia is Desert Valley Medical Center located at Second Street and Bear Valley Road in Victorville.

Hospitals in the high desert include:

- Desert Valley Medical Center
- Saint Mary Hospital
- Victor Valley Hospital

Utilities

Southwest Gas Corporation located at 13471 Mariposa Road in Victorville provides natural gas to most of Hesperia. For those areas in which there are no service lines available, many residents rely on propane offered by private companies.

Southern California Edison located at 12353 Hesperia Road in Victorville supplies electrical power to the area.

The Hesperia Water District is an independent County Water District incorporated pursuant to California Water Code Sections. The water supply is obtained entirely from groundwater located in the Alto Sub-Basin of the Mojave River Watershed and groundwater aquifer. The Water District serves in excess of 67,000 persons, averaging 12.7 million gallons per day. The capacity is 41 million gallons of water with the peak demand of 25 million gallons. In addition, sewer collection, storm

drains and flood control are serviced and administered by Hesperia Public Works Department.

Sanitation services are administered by Advance Disposal located at 17105 Mesa Street in Hesperia. Advance Disposal a private organization contracted to collect solid waste within the City. They operate a Materials Recovery Facility (MRF), which has a capacity of 600 tons per day. Advance Disposal's long-term plans are to expand the capacity of the facility to meet the need of the City and sphere of influence, which is the company's ultimate service area.

The City's designated hazardous waste site is Hesperia Fire Station located at 17443 Lemon Avenue in Hesperia.

Cable television is provided by Charter Communications located at 10490 Business Center Drive in Victorville.

Existing Land Use

The Land Use Element of the City of Hesperia's General Plan describes the general location, type and intensity of development and identifies the distribution of land uses throughout the City of Hesperia. Land uses such as residential, commercial, industrial, open space and public uses are planned to meet the needs of residents, support economic/fiscal goals and provide for the orderly development of the City.

In the Appendices Section of the HMP, a General Plan Land Use Map is included depicting the City's long-range plans for development within its incorporated boundaries and sphere of influence. The land use map identifies the preferred distribution and extent of residential, commercial, industrial, public and open space uses.

Development Trends

The City's Land Use Plan section of the General Plan, illustrates future development trends. The area west of Maple Avenue, is indented for suburban residential development, the freeway corridor is planned for commercial and industrial development to support the creation of industry, a local job base as well as sales-tax producing businesses. The area east of Maple Avenue, the General Plan illustrates office and neighborhood commercial development along Main Street and a local industrial area between BNSF Railroad and I Avenue. Multiple-family development projects are included south of this retail corridor and near the City's Civic Plaza. The balance of this area is subdivided into single-family residential lots intended for rural residential and agricultural use and are identified as ½ to over 5 acres in size.

Section 2 - Jurisdiction Information

2.1 Adoption by Local Governing Body

A Resolution of the City Council of the City of Hesperia, California, adopting the Local Hazard Mitigation Plan, as required by the Disaster Mitigation Act of 2000 (Resolution No. 2005-58) was adopted on April 6, 2005.

The City of Hesperia Hazard Mitigation Plan is part of the San Bernardino Operational Area Multi-Jurisdictional Hazard Mitigation Plan.

RESOLUTION NO. 2012-XX

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF HESPERIA, CALIFORNIA, ADOPTING THE 2010 HAZARD MITIGATION PLAN UPDATE, AND AUTHORIZING FUTURE NON-SUBSTANTIVE AMENDMENTS TO THE PLAN.

WHEREAS, the preservation of life and property is an inherent responsibility of local, state and federal government; and

WHEREAS, the City of Hesperia joined with the 24 cities and towns in the San Bernardino County Operational Area to develop, adopt and maintain a multi-jurisdictional Hazard Mitigation Plan; and

WHEREAS, the City is charged and entrusted with the protection of persons, property and the environment prior to and during emergency and/or disaster conditions; and

WHEREAS, the goal of a Hazard Mitigation Plan is to minimize, reduce or eliminate the loss of life, property and environment; and

WHEREAS, this Hazard Mitigation Plan represents a comprehensive description of the City's commitment to reducing, preventing or eliminating potential impacts of disasters caused by natural and manmade hazards; and

WHEREAS, the City of Hesperia previously adopted its Hazard Mitigation Plan with the adoption of Resolution No. 2005-058; and

WHEREAS, the City has undertaken a comprehensive planning effort in developing the Hazard Mitigation Plan by organizing resources, assessment risks, and developing and implementing a mitigation plan and monitoring process; and

WHEREAS, the Hazard Mitigation Plan is a federal requirement under the Disaster Mitigation Act of 2000 for the City to receive state and/or federal funds for disaster recovery and mitigation; and

WHEREAS, the Hazard Mitigation Plan establishes a coordinated effort to support mitigation activities and identify measures to combat natural and manmade hazards within our City; and

WHEREAS, the Hazard Mitigation Plan is an extension of the State of California Multi-Hazard Mitigation Plan, and will be reviewed and exercised periodically and revised as necessary to meet changing conditions; and

WHEREAS, the City of Hesperia agrees to adopt this Hazard Mitigation Plan and urges all officials, employees, public and private organizations, and citizens,

individually and collectively to do their share in furthering the goals and objectives of hazard mitigation within the City of Hesperia.

NOW THEREFORE, BE IT RESOLVED BY THE CITY OF HESPERIA CITY COUNCIL AS FOLLOWS:

Section 1. The City Council approves the 2010 Hazard Mitigation Plan Update of the City of Hesperia.

Section 2. The City Council authorizes the Emergency Services Coordinator to make necessary administrative and operational changes to the Hazard Mitigation Plan that is in keeping with the intent of the Plan as approved

Section 3. The City council authorizes the Emergency Services Coordinator, or designee, to perform all duties required to carry out the Hazard Mitigation Plan

Section 4. That City Clerk shall certify to the passage and adoption of this resolution and enter it into the book of original resolutions.

ADOPTED AND APPROVED this day of 2012.

_____
Russ Blewett, Mayor

ATTEST:

_____
Melinda Sayre-Castro
Assistant City Clerk

Promulgation Authority Information

The Hazard Mitigation Plan was reviewed and approved by the following Promulgation Authorities:

Mayor and City Council Members

Description of Involvement: Promulgation authorities will consist of the Mayor and City Council Members.

Contact Information:
City of Hesperia
9700 Seventh Avenue
Hesperia, CA 92345
(760) 947-1018

Associated Files: Resolution No. 2005-58

Name	Title
Russell Blewett	Mayor
Bill Holland	Mayor Pro Tem
Paul Bosacki	Councilmember
Mike Leonard	Councilmember
Thurston "Smitty" Smith	Councilmember

Multi-Jurisdictional Plan Adoption

The City of Hesperia Hazard Mitigation Plan is part of the San Bernardino Operational Area Multi-Jurisdictional Hazard Mitigation Plan.

2.2 Primary Point of Contact

The Point of Contact for information regarding this plan is:

Brigit Bennington
Emergency Services Coordinator
City of Hesperia
9700 Seventh Avenue
Hesperia, CA 92345
(760) 947-1245 (Office)
(760) 947-2881 (Fax)
bbennington@cityofhesperia.us

Section 3 – Planning Process

3.1 Preparing for the Plan

Using the July 1, 2008 Mitigation Plan Review Crosswalk as a guide, the City of Hesperia adopted a comprehensive approach to develop its annex to the San Bernardino County Multihazard Multijurisdictional Mitigation Plan.

Further, and in support of San Bernardino County's guidelines, the City of Hesperia used the public portal supplied by the County's consultant as a means to develop reports, charts, graphs, and similar data specific to the community and to the State of California. This includes, but is not limited to, Hesperia's existing Multihazard Mitigation Plan, San Bernardino County Multihazard/Multijurisdictional Mitigation Plan, the 2007 Enhanced State (of California) Multihazard Plan and review of the 2010 (draft) State Plan.

Additionally, it was concluded that the Plan will include information and data supplied by supporting local agencies as listed in Section 3.2 "Coordination with Other Jurisdictions, Agencies, and Organizations", and 3.3 "Public Involvement", of this Plan, along public comments received during community-wide events after-action reports prepared for the 2010 Severe Winter Storm, and other sources developed through discussions during Planning Team meetings.

Drafting the Hazard Mitigation Plan was accomplished in 8 Phases.

- *Phase I – Establish the Planning Team*
- *Phase 2 – Coordination with Other Jurisdictions, Agencies, and Organizations*
- *Phase 3 – Public Involvement*
- *Phase 4 – Assess the Hazards*
- *Phase 5 – Set Goals*
- *Phase 6 – Review and Propose Possible Mitigation Measures*
- *Phase 7 – Draft the Hazard Mitigation Plan*
- *Phase 8 – Adopt the Plan*

The City initiated its Plan Update by meeting the requirements of Title 44, Code of Federal Regulations, Part 201 (44 CFR 201.6). Based upon past Mitigation Plan participation, and in consideration of the length of time (five years) between development of the initial Plan and the time period which evolved by the time this Plan is approved, the City recognized the need to resurvey potential participants and update correlating information. The Planning Team agreed to meet as necessary during the ensuing review process so that the culmination of information would be available for review by constituents and partners prior to adoption.

The Planning Team agreed that the initial Hazard Mitigation Plan (2005) was sufficient to meet the requirements set forth by 44 CFR Section 201.6 at that time. Since that time, the community has expanded its awareness of hazards and their specific relativity to protect the needs of the community and it is the intent of the

Planning Team to ensure that this is captured in the 2010 Plan update. In addition, the Planning Team agreed that a more specific approach would provide that benefit and promote improved quality of life.

Planning Team

The Planning Team agreed that the updated plan will conform to the requirements of 44 CFR Section 201.6 and will include a description and documentation of:

1. Why the update is necessary and how the update will build on the existing approved mitigation plan;
2. The process and data deficiencies/limitations that will be addressed;
3. The participatory planning process used to develop the plan to include how each section was reviewed and analyzed and how/why the decision was made to modify (or not) specific areas in the plan.
4. The opportunities provided for public participation, modified as necessary, based on previous experience;
5. The contribution from other stakeholders;
6. The new/additional research conducted and data included in the plan;
7. The modified risk assessment based on latest best available data;
8. The prioritized mitigation action plan;
9. The progress made in local mitigation efforts;
10. The plan maintenance process to include: an evaluation of what was supposed to happen verses what happened; a discussion of how the community was involved in the plan maintenance process; and a discussion of how the mitigation plan was incorporated into other planning mechanisms, and what worked/did not work.

Planning Team

Leadership, management and oversight for the plan development process were provided through the City's Planning Team. Team members were selected based on current emergency management responsibilities and familiarity with prior mitigation planning and programs. The Planning Team met monthly to provide guidance, review progress, identify issues, and to coordinate stakeholder meetings. The Planning Team also provided background documents, facilitated data collection, and reviewed all draft documents.

The resulting plan, along with the entire planning process, is a living document that will continue to place mitigation as a priority in the City of Hesperia.

This Hazard Mitigation Plan was compiled and authored under the direction of the following Planning Team members:

Kim Summers
Assistant to the City Manager
Description of Involvement: Assistant to the City Manager

Contact Information:
City of Hesperia
9700 Seventh Avenue
Hesperia, CA 92345
(760) 947-1006
ksummers@Cityofhesperia.us

Georgia Graham
Management Analyst
Description of Involvement: Management Analyst

Contact Information:
City of Hesperia
9700 Seventh Avenue
Hesperia, CA 92345
(760) 947-1059
ggraham@Cityofhesperia.us

Dave Reno
Principal Planner
Description of Involvement: Principal Planner

Contact Information:
City of Hesperia
9700 Seventh Avenue
Hesperia, CA 92345
(760) 947-1253
dreno@Cityofhesperia.us

Tom Thornton
Senior Engineer
Description of Involvement: Senior Engineer

Contact Information:
City of Hesperia
9700 Seventh Avenue
Hesperia, CA 92345
(760) 947-1014
tthornton@Cityofhesperia.us

Brigit Bennington
Emergency Services Coordinator
Description of Involvement: Emergency Services Coordinator

Contact Information:
City of Hesperia
9700 Seventh Avenue

Hesperia, CA 92345
(760) 947-1245
bbennington@Cityofhesperia.us

3.2 Coordination with Other Jurisdictions, Agencies and Organizations

There are many agencies, organizations, businesses and non-governmental entities that contend with natural hazards. Planning Team members contacted representatives of these various entities to solicit input and concerns relative to natural and man-made hazards and to determine how their programs could best collaborate with the City's mitigation program.

The following agencies and organizations involved include, but are not limited to, the following:

- Building Industry Association of Southern California
- California Department of Transportation (Cal Trans)
- California Emergency Management Agency (Cal EMA)
- California Highway Patrol
- Community Members
- Federal Emergency Management Agency (FEMA)
- Hesperia Unified School District
- Hesperia Parks and Recreation District
- Local Consultants
- Local Non-Profit Agencies (American Red Cross, United Way)
- Local Utility Companies
- Local Waste hauler
- Medical Sector (local clinics)
- National Weather Service (NWS)
- Public and Private Business Sectors
- San Bernardino County (OES, Dept. of Public Health, Animal Control)
- US Army Corps of Engineers
- USDA Natural Resource Conservation Service

In addition, the City of Hesperia Planning Team members participated in the San Bernardino County Fire Department Office of Emergency Services (OES) Stakeholder meetings. San Bernardino County Fire OES hired a contractor (ICF International) to support the County, Cities and Towns, and Special Districts to update the 55 local Hazard Mitigation Plans and the San Bernardino County Operational Area Multi-Jurisdictional Multi-Hazard Mitigation Plan. The ICF Team, which included subcontractors MMI Engineering and Natural Hazards, offered experienced, field-tested Hazard Mitigation and planning professionals who have developed similar comprehensive Hazard Mitigation Plans. This support included providing technical

expertise and resource material and tools to help ensure that the updates are in compliance with federal requirements of the program.

3.3 Public Involvement Items

Public Involvement consisted of the following items:

Stakeholder Meetings

Date	Item	Location
December 8, 2010	High Desert Emergency Manager's Networking Group Hazard Mitigation Plan Update	City of Hesperia Library
September 9, 2010	Stakeholder Meeting Hazard Mitigation Planning	Virtual Meeting
August 26, 2010	Stakeholder Meeting Hazard Mitigation Planning	County OES
August 19, 2010	Stakeholder Meeting Hazard Mitigation Planning	Virtual Meeting
August 12, 2010	Stakeholder Meeting Hazard Mitigation Planning	Virtual Meeting
July 29, 2010	Stakeholder Meeting Hazard Mitigation Planning	Virtual Meeting
July 15, 2010	Stakeholder Meeting Hazard Mitigation Planning (time line, next steps	Virtual Meeting
July 7, 2010	Stakeholder Meeting Hazard Mitigation Planning – Portal Rollout 2	County OES
July 1, 2010	Stakeholder Meeting Hazard Mitigation Planning – Portal Rollout	County OES
June 14, 2010	Citizen Corps Advisory Committee	City of Hesperia
June 10, 2010	Stakeholder Meeting Hazard Mitigation Planning – Project Kick off meeting	County OES
June 8, 2010	Hazard Mitigation Planning Working Group Meeting	County OES
May 5, 2010	SB County Operational Area Coordinating Council Meeting	County OES
August 5, 2010	Operational Area Meeting Hazard Mitigation Planning	County OES

Table 1 – Stakeholder Meetings

City of Hesperia Website

The Hazard Mitigation Plan is a comprehensive resource document that serves many purposes, including; enhancing public awareness and understanding, creating a decision tool for management, promoting compliance with county, state and federal program requirements, enhancing local policies for hazard mitigation capability and providing inter-jurisdictional coordination. The Federal Disaster Mitigation Act of 2000 requires all local governments to create such a disaster plan in order to qualify for funding in the future.

For information regarding the Hesperia Hazard Mitigation Plan, contact Brigit Bennington, Emergency Services Coordinator, at (760) 947-1245, or email bbennington@cityofhesperia.us.

Section 3.4 Assess the Hazard

Working with our planning team, we will identify and develop a mitigation strategy including developing goals, objectives and prioritized mitigation actions. The mitigation strategy serves as the long-term blueprint for reducing the potential losses identified in the risk assessment.

Mitigation Objectives

Mitigation Objectives are designed to support and correspond directly with the City's Safety Element goals identified in the General Plan.

Mitigation Actions

The Mitigation Actions are specific measures to be undertaken by the City in order to achieve identified objectives. Each action identifies the goal it is intended to achieve, some general background information justifying the proposed action and proposed measures to assure successful and timely implementation, if resources and funding are obtainable.

Each Mitigation Objective and Action is designed to be performance-based, making it easier for the City to measure the HMP's progress over time and during the HMP's future.

It is expected that while the goals established in this section may remain the same for an extended period of time, the objectives and actions will be updated and/or revised through regular revisions to this HMP.

Section 3.5 Set Goals

Goal 1: Minimize injury, loss of life, property damage and economic and social disruption caused by seismic shaking and other earthquake-induced hazards, for example, geological hazards such as slope instability, compressible and collapsible soils and subsidence.

Goal 2: Minimize injury, loss of life, property damage and economic and social disruption caused by flooding and inundation hazards.

Goal 3: Reduce the risk of death, injury, property damage and economic loss due to vegetation and structure fires.

Goal 4: Reduce the potential for hazardous materials contamination in the City.

Section 3.6 Review and Propose Mitigation Measures

Goal 1: Minimize injury, loss of life, property damage and economic and social disruption caused by seismic shaking and other earthquake-induced hazards, for example, geological hazards such as slope instability, compressible and collapsible soils and subsidence.

- Require that all new habitable structures are designed and built in accordance with the most current California Building Code adopted by the City, including the provisions regarding lateral forces and grading.

- Require that all discretionary development proposals and capital improvement projects in the City conduct, as a condition of approval, geotechnical and engineering geological investigations, prepared by State-certified professionals (geotechnical engineers and engineering geologists, as appropriate), following the most recent guidelines by the California Geological Survey and similar organizations, that addresses, at minimum, the site-specific seismic and geologic hazards identified in the City's Technical Background Report. These reports shall provide mitigation measures to reduce those hazards identified at a site to an acceptable level. Recent reports completed for adjacent projects may be used if they meet the standards described above and the project proponents receives approval from the City's Building and Safety Division to rely on previously obtained data from an adjacent lot.

- City Staff or representatives will conduct routine inspections of grading operations to ensure site safety and compliance with approved plans and specifications.

- City Staff assigned to review geotechnical, geological and structural reports submitted by development applicants and grading operations, shall have the

necessary professional credentials and certifications within their area of expertise.

- Liquefaction assessment studies shall be conducted as a condition of approval for all projects in areas identified as potentially susceptible to liquefaction (Appendix A - Liquefaction). The studies shall be conducted in accordance with the California Geological Survey's Special Publication 117: Guidance for Evaluating and Mitigating Seismic Hazards in California 2008 (or the most current version) and the Earthquake Engineering Research Center's Report No. EERC-2003-06 (or the most current version): Recent Advances in Soil Liquefaction Engineering.

- If and when the California Geological Survey issues a Seismic Hazards Zoning Map, the City's Building and Safety and Planning Divisions will adopt this map as the replacement for the Seismic in the City's General Plan. Similarly, if new or revised Alquist-Priolo Earthquake Fault Zone maps are issued, these maps will be adopted and enforced in conformance with the requirements of the Alquist-Priolo Earthquake Fault Zone Act.

- If a critical facility is proposed across any of the secondary faults identified within the City or its sphere, the City's Building and Safety Division shall require, as a condition of approval, that geological studies to assess the location and recent activities on the fault be performed. These studies will be performed at the level of detail required by the California Geological Survey for fault studies in Alquist-Priolo Earthquake Fault Zones following guidelines in California Geological Survey's Note 49. Critical facilities shall include fire and police stations, City communication centers, hospitals, schools, pre-schools, nursing homes and other limited-mobility or high-occupancy populations, electrical substations and towers, water reservoirs, high-pressure or large-diameter pipelines and bridges or other key transportation structures.

- The Building and Safety Division will encourage owners of potentially hazardous buildings, including pre-1952 wood-frame structures, concrete tilt-ups, pre-1971 reinforced masonry, soft-story structures and the one unreinforced masonry building to assess the seismic vulnerability of their structures and conduct seismic retrofitting as necessary to improve the buildings resistance to seismic shaking.

- The City's Office of Emergency Services will develop, update and make available to the community, literature on hazard prevention and disaster response, including information on how to earthquake proof homes and businesses. All residents and business owners will have easy access to information on what to do before, during and after an earthquake. Reminders will be issued periodically to encourage the review and renewal of earthquake preparedness kits and other emergency preparedness materials and procedures.

Goal 2: Minimize injury, loss of life, property damage and economic and social disruption caused by flooding and inundation hazards.

- The City shall continue enforcing the City's Municipal Code provisions for flood hazard reduction (Title 8: Safety, Chapter 8.28: Flood Hazard Protection and Regulations). This code applies to new construction and existing projects undergoing substantial improvements. Title 8: Safety, Chapter 8.28, provides construction standards addressing the major causes of flood damage, including provisions for anchoring, placing utilities, raising floor evaluations, using flood-resistant construction materials and other methods to reduce flood damage.

- The City will require that new discretionary development proposals include as a condition of approval, hydrological studies prepared by a state certified engineer with expertise in this area. The approval process shall assess the impact that the new development will have on the flooding potential of any existing development down gradient. The studies will provide mitigation measures to reduce the impact to an acceptable level. Single-family residences on existing lots shall be exempt.

- The City will continue participating in the National Flood Insurance Program (NFIP) and require that all owners of properties located within the 100-year floodplain purchase and maintain flood insurance on their properties. (Currently, there are no structures built along the 100-year floodplain and the City's Planning and Building and Safety Divisions discourage development in the 100-year floodplain).

- The City will continue to participate in the StormReady Program through the National Weather Service. Continued participation in StormReady requires, monitoring of precipitation and snow levels on the mountains to the south, providing storm watches and warnings in real-time and issuing evacuation notices for affected neighborhoods in a timely manner through a citizen notification or similar system.

- The City will not authorize new facilities that use or store hazardous materials in quantities that would place them in the State's TRI or SQG databases to be located in the flood zone. However, the City has the ability to make exceptions if, all standards of elevation, anchoring and flood proofing have been implemented to the satisfaction of Building and Safety Division and the San Bernardino County Fire Department. If authorization by these two departments has been granted, the hazardous materials will be stored in watertight containers that are not capable of floating or similar flood-proof receptacles or tanks.

- The City will require all essential and critical facilities in or within 200 feet of Flood Zones, or the dam inundation pathways develop disaster response and

evacuation plans that address actions to be taken in the event of flooding or inundation.

- The City will regulate development in drainages, especially Flood Zones, pursuant to FEMA regulations.

- The City will continue to maintain and improve storm drain systems, with an emphasis on those areas that have a tendency to flood repeatedly. This includes maintaining and regularly cleaning the storm drains and other flood-control structures in low-lying areas.

- The City will identify repetitive flood properties located within the City and develop feasible mitigation options for these sites. Funding to implement the mitigation measures may be available through FEMA's Hazard Mitigation Grant, Flood Mitigation Assistance and Pre-disaster Mitigation Programs.

- The City will encourage the development of areas in floodplains as parks, nature trails, equestrian areas, golf courses, or other types of recreational facilities that can withstand periodic inundation. Proposed development in these areas may be offered incentives to retain floodplains as open space.

Goal 3: **Reduce the risk of death, injury, property damage and economic loss due to vegetation and structure fires.**

- The City shall continue to require all new habitable structures be designed in accordance with the most recent California Building and Fire Codes and local amendments adopted by the City Council.

- The City will conduct regular inspections of parcels throughout the City and direct property owners to bring properties into compliance with fire inspection standards. This includes enforcing the weed abatement and notification program, to reduce the potential for vegetation fires in vacant or poorly maintained lots and encouraging homeowners to follow fire-safe practices, including maintaining a fire-safe landscape and keeping combustibles (such as fire wood) a safe distance away from all structures.

- The Emergency Services Coordinator will coordinate with the San Bernardino County Fire Department to provide assistance during an emergency. The City's Office of Emergency Services will conduct emergency response exercises, including earthquake induced fire-scenario exercises, to evaluate and improve, the City's ability to respond to the multiple ignitions that an earthquake is likely to generate.

- The City's Office of Emergency Services in cooperation with the San Bernardino County Fire and Sheriff's Departments will evaluate citizen

notification systems to be used to warn residents of an approaching fire threat and to provide evacuation instructions to affected areas.

- The City will encourage owners of non-sprinklered high-occupancy structures to retrofit their buildings to include automatic fire sprinklers.

- The City, in cooperation with the San Bernardino County Fire Department, will ensure, to the maximum extent possible, that fire services, such as firefighting equipment, personnel, infrastructure and response times, are adequate for all sections of the City.

- The City will utilize the San Bernardino County Fire Department's "Community Safety Division Standards", the latest adopted addition of the California Building and Fire Codes and local amendments adopted by the City Council to provide fire safety to the community.

- The City and the San Bernardino County Fire Department will ensure that Hesperia Water District conducts annual fire flow tests and addresses any deficiencies found as soon as possible.

- The City's Office of Emergency Services will develop and hold training exercises that involve residents as much as possible, through the City's Community Emergency Response Team (CERT) program and/or any community safety related events, to empower individuals and neighborhoods to be self-reliant in the aftermath of a natural or man-made disaster.

- The City will adopt the most recent version of the Wildland-Urban Interface Code and Chapter 7A of the California Building Code for use in the City where the Insurance Services Offices (ISO) number exceeds 5 (greater than 5).

Goal 4: Reduce the potential for hazardous materials contamination in Hesperia.

- The City, in cooperation with the San Bernardino County Fire Department, Hazardous Materials Division, will enforce disclosure laws that require all users, generators and transporters of hazardous materials and wastes clearly identify the materials they store, use or transport. Users, generators and transporters are required to notify the appropriate City, county, state and federal agencies of a change in the quantity or type of hazardous materials and any violations.

- The City, in cooperation with the San Bernardino County Fire Department, will ensure safe and effective response to any hazardous materials incident within the City or along the freeway or railroads that extend across the City.

- The City will collaborate with County Fire and Sheriff Departments, to ensure that all residents, workers and visitors to Hesperia are protected from exposure to hazardous materials.

- The City will identify roadways and railways that hazardous materials are routinely transported. If critical facilities, such as schools, medical facilities, childcare centers or other facilities with special evacuation needs are located along these routes, the City will coordinate with these facilities, in identifying emergency response plans to be implemented in the event of a hazardous materials incident.

- The City will continue to reduce or eliminate the use of hazardous materials by using non-toxic, safer alternatives that do not pose a threat to the environment, or buy and use only the smallest amount of a hazardous substance to get the intended job done. The City will encourage residents and businesses to do the same.

- Any proposed new facilities that involve production, use, storage, transport, or disposal of hazardous materials will not be allowed within the 100-year floodplain or near existing land uses that may be adversely impacted by such activities. Conversely, new critical facilities; such as, schools, childcare centers, nursing homes will not be allowed to be located near existing sites using, storing or generating hazardous materials without prior review and consideration by the Planning Commission.

- The City will support the operation of programs and recycling centers that accept hazardous substances, such as paint, paint thinner, used waste oil, etc.

- The City will work with the Hesperia Water District to monitor the potential presence of perchlorate in well water. If perchlorate continues to be detected at measurable concentrations, programs to find and eradicate the source of this contaminant and clean up the perchlorate in the water will be evaluated and implemented as appropriate.

Section 3.7 Draft the Hazard Mitigation Plan

The development of actions and projects to meet the the goals and objectives identified in the HMP, is based on the City's abilities under state law; zoning, health regulations; and financial resources available required to reduce losses and vulnerability from potential hazards. The HMP's goals and objectives are long-term and support the City's mitigation strategy. For example, the objective for, goal 3 in Section 3.6, "to reduce the risk of death, injury, property damage and economic loss due to vegetation and structure fires", could be that the City Council adopts an ordinance mandating the installation of sprinklers in residential homes.

Following the identification of goals and objectives, the mitigation planning regulation 44 CFR 201 requires the City to identify, analyze and prioritize alternative actions by hazard types. These actions must be quite specific. An example of an action plan for goal 3 might be "to seek grant opportunities to promote fire prevention in the City".

Federal guidance for the HMP recommends that the City develop objectives/actions that can be implemented using local tools, such as, capital improvement projects, special district funds, or executing changes by adopting laws, policies, or procedures. HMP requirements recommend the consideration of mitigation actions that may are not currently feasible, but may be possible following a catastrophe event, for example, goal 2 in Section 3.6, "minimize injury, loss of life, property damage and economic and social disruption caused by flooding and inundation hazards", could be to extend storm drain facilities, through available federal or state funding.

The City is required, after five years of implementing mitigation strategies, to update goals and actions. In all HMP updates, the goals and objectives may be reaffirmed or updated based on current conditions, including the completion of mitigation proposals, an updated risk assessment. At five-year intervals, the City is required to review any changes of approved HMP to determine whether goals were met or if they remain consistent with current conditions.

Section 3.5 of the HMP plan identifies potential loss reduction actions and analyzes various actions that achieve the stated goals and objectives to reduce or avoid the affects of the identified hazards. In this section, included is a comprehensive range of mitigation actions that consists of multiple mitigation actions for each profiled hazard and outlines the City's overall strategy to reduce our community's vulnerability to the affects of natural hazards.

Section 3.8 Adopt the Plan

In order to secure buy-in and officially implement the City of Hesperia HMP, the HMP is being scheduled for adoption by the City of Hesperia City Council at the December 21, 2010 Council meeting. A copy of the adopted Resolution will be included in Appendix C. Once the adoption is completed, formal approval by FEMA can proceed.

Section 4 - Risk Assessment

4.1 Hazard Identification

The goal of mitigation is to reduce the future impacts of a hazard including property damage, disruption to local and regional economies and the amount of public and private funds spent to assist with recovery. However, mitigation should be based on risk assessment.

A risk assessment is measuring the potential loss from a hazard event by assessing the vulnerability of buildings, infrastructure and people. It identifies the characteristics and potential consequences of hazards, how much of the community could be affected by a hazard and the impact on community assets. A risk assessment consists of three components:

- Hazard identification.
- Hazard profile.
- Vulnerability analysis

Technically, these are three different items used for risk assessment, but the terms are sometimes used interchangeably.

Data collection and document review were important first steps to identify and screen hazards relevant to the City. The Planning Team was able to identify new or emerging hazards, obtain current hazard maps, hazard probability studies and reports, by reviewing data from the City's 2010 General Plan in the Safety Element. By reviewing the 2005 HMP, the Planning Team were able to assess threat assessments, disaster planning scenarios, community wildfire protection plans and obtain information about emergencies or disasters that have occurred since the adoption of the 2005 HMP to provide valuable insights into which parts of the risk assessment required updates.

The first step in the hazard identification process was to identify existing natural and manmade hazards and identify which of hazards were reoccurring or showed an increase. After the Planning Team indentified all potential hazards, the next step was to screen all the hazards.

The intent of screening of hazards was to help prioritize hazards creating the greatest concern for the the City. Since the original process used to rank hazards in the 2005 HMP Critical Priority Risk Index (CPRI) software was not utilized in the 2010 update, an alternative approach was used. See Section 4.1.2 Hazard Assessment Matrix for additional information on hazard assessment.

The Planning Team utilized a non-numerical ranking system for the update process. This process consisted of generating a non-numerical ranking, High, Medium, or Low rating for the 1) probability and 2) impact from each screened hazard. The Hazards were placed in the appropriate/corresponding box/cell in a matrix.

To further assist with the process, the following definition of "High", "Medium" and "Low" Probability and Impact are provided, the same definitions were utilized in the 2005 HMP hazard identification process.

Probability		Impact	
High:	Highly Likely/Likely	High:	Catastrophic
Medium:	Possible	Medium:	Limited
Low:	Unlikely	Low:	Negligible

Additionally, a 'Yes" or "No" value was provided for each hazard indicating the potential for implementing mitigation measures to reduce the risk. This assessment was used to support decisions not supported by the matrix.

This HMP focuses on the natural hazards that are more likely to occur in the City; wildfire, flood and earthquake/geologic hazards.

Natural Hazards

Earthquake

General Definition

An earthquake is a sudden, rapid shaking of the Earth caused by the breaking and shifting of rock beneath the Earth's surface. For hundreds of millions of years, the forces of plate tectonics have shaped the Earth as the huge plates that form the Earth's surface move slowly over, under and past each other. Sometimes the movement is gradual, at other times; the plates are locked together, unable to release the accumulating energy. When the accumulated energy grows strong enough, the plates break free causing the ground to shake. Most earthquakes occur at the boundaries where the plates meet; however, some earthquakes occur in the middle of plates.

Ground shaking from earthquakes can collapse buildings and bridges; disrupt gas, electric and phone service; and sometimes trigger landslides, avalanches, flash floods, fires and huge destructive ocean waves (tsunamis). Buildings with foundations resting on unconsolidated landfill and other unstable soils, trailers and homes not tied to their foundations are at risk because they can be shaken off their mountings during an earthquake. When an earthquake occurs in a populated area, it may cause deaths, injuries and extensive property damage.

Earthquakes strike suddenly and without warning. Earthquakes can occur at any time of the year and at any time of the day or night. On a yearly basis, 70 to 75 damaging earthquakes occur throughout the world. Estimates of losses from a future earthquake in the United States could approach $200 billion.

There are 45 states and territories in the United States at moderate to very high risk from earthquakes and they are located in every region of the country. California experiences the most frequent damaging earthquakes; however, Alaska experiences the greatest number of large earthquakes—most are located in uninhabited areas. The largest earthquakes felt in the United States were along the New Madrid Fault in Missouri, where a three-month long series of quakes from 1811 to 1812 included three quakes larger than a magnitude (M) of eight on the Richter Scale. These earthquakes were felt over the entire eastern United States, with Missouri, Tennessee, Kentucky, Indiana, Illinois, Ohio, Alabama, Arkansas and Mississippi experiencing the strongest ground shaking.

Description

Hesperia lies across the boundary of two very distinct geomorphic provinces, each having a unique landscape that reflects the geologic, seismic and climatic processes that have affected this region in the last few million years. The very southern edge of the City encroaches into the Transverse Ranges Province, a region whose characteristic features are a series of east-west trending ranges that include the San Gabriel and San Bernardino Mountains. The ranges are called "transverse" because they lie at an oblique angle to the prominent northwesterly grain of the Southern California landscape, a trend that is aligned with the San Andreas Fault. The Transverse Ranges are being intensely compressed by active tectonic forces; therefore, they are some of the fastest rising and fastest eroding mountains in the world. The rocks that form these mountains have been sheared and fractured under the strain of tectonic movement.

The greater part of Hesperia lies north of the mountains within the Mojave Desert Province, an arid region of overlapping alluvial fans, desert plains, dry lakebeds and scattered mountain ranges. Hesperia is underlain by the informally named Victorville Fan, which is composed of sediments ranging in age from early Pleistocene to Holocene, which is approximately one million years to less than 10,000 years old that were shed primarily from the San Gabriel Mountains. Their composition reflects that of the rocks eroded by the various streams that enter the valley from the south. Deposition is still ongoing, with the younger alluvium filling drainage channels and the Mojave River floodplain.

Faults in the Mojave Desert Province have a predominant northwesterly trend; however, some faults aligned with the Transverse Ranges are present. The east-west trending Garlock Fault defines the northern boundary of the province, whereas the northwest-trending San Andreas Fault roughly defines its western boundary. Hesperia is near the San Andreas Fault and other seismically active earthquake sources including the North Frontal, Cleghorn, Helendale and San Jacinto Faults. All these faults have the potential to generate moderate to large earthquakes that will shake Hesperia.

North Frontal Fault

Given its proximity to Hesperia, the North Frontal Fault has the potential to generate the strongest seismic shaking in the City. This south-dipping, partially blind reverse fault zone along the east flank of the San Bernardino Mountains consists of several fault splays that have a combined total length of approximately 40 miles (65 kilometers (km). Several of the fault splays interact to offset the North Frontal Fault Zone, dividing it into two main segments. The west segment 22 miles (35 km) long at its closest approach less than two miles (3.2 km) from Hesperia.

The North Frontal Fault is thought to have moved in the past 10,000 years, making it an active fault. However, the fault has not been studied in detail and its recurrence interval, slip rate and other fault parameters are not well understood, although a slip rate of about 0.5 millimeters (mm)/yr has been attributed to it. Furthermore, movement on this fault is thought to be responsible for an average uplift rate of about 1 mm/yr of the San Bernardino Mountains. Based on its length, the west segment of the North Frontal Fault Zone is thought capable of generating a maximum M 7.2 earthquake. An earthquake of that size on this fault would be felt in Hesperia with peak ground accelerations of between about 0.58g and 0.23g, resolving in Modified Mercalli Intensity (MMI) Scale (See Table 1) intensities as high as X.

San Andreas Fault

The San Andreas Fault is the principal boundary between the Pacific and North American Plates. The fault extends over 750 miles (1,200 km), from near Cape Mendocino in Northern California to the Salton Sea region in Southern California. This fault is considered the "Master Fault" in Southern California because it has frequent, large earthquakes and controls the seismic hazards of the area. Many refer to an earthquake on the San Andreas Fault as "The Big One", however, as shown above, at least one other fault closer to Hesperia have the potential to cause stronger ground shaking and more damage than the San Andreas Fault. Nevertheless, the San Andreas Fault should be considered in all seismic hazard assessment studies in Southern California given its high probability of causing an earthquake in the near future. A group of scientists referred to as the 2007 Working Group on California Earthquake Probabilities (WGCEP) 2008, has calculated that the southern San Andreas Fault has a 59% probability of causing an earthquake of at least M 6.7 in the next 30 years.

Large faults, such as the San Andreas Fault, are often divided into segments in order to evaluate their future earthquake potential. The segmentation is based on physical characteristics along the fault, particularly discontinuities that may affect the rupture length. In Central and Southern California, the San Andreas Fault is divided into five segments named, from north to south:

- Cholame
- Carrizo

- Mojave
- San Bernardino Mountains
- Coachella Valley

At its closest approach, the southern portion of Hesperia is about 4 miles (6.5 km) from the San Bernardino Mountains segment and 7 miles (11 km) from the Mojave segment. Each segment is assumed to have a characteristic slip rate - rate of movement averaged over time, recurrence interval - time between moderate to large earthquakes and displacement - amount of offset during an earthquake.

While this methodology has some value in predicting earthquakes, historical records and studies of prehistoric earthquakes show it is possible for more than one segment to rupture during a large quake or for ruptures to overlap into adjacent segments. For example, the last major earthquake on the southern portion of the San Andreas Fault (and the largest earthquake reported in California) was the 1857 Fort Tejon an M 8 event. The 1857 earthquake ruptured the Cholame, Carrizo and Mojave segments of the fault, resulting in displacements of as much as 27 feet (9 meters (m) along the rupture zone. These fault segments are thought to have a recurrence interval of between 104 and 296 years. Peak ground accelerations in Hesperia because of the 1857 earthquake are estimated to have been as high as 0.32g. However, another similar earthquake that ruptured the entire southern San Andreas Fault, with its epicenter along the section of fault closest to Hesperia, could generate even higher peak ground accelerations in Hesperia, estimated at between 0.46g and 0.3g (see Table 2).

Cleghorn Fault

The Cleghorn Fault is an approximately 19 miles (30 km) long, steeply north-dipping, left lateral strike-slip fault with a slight normal component of movement. The fault extends across Silverwood Lake and therefore it is referred to as the Silverwood Lake Fault. (Meisling and Weldon 1989) suggest that the fault zone has had about 200 m of motion in the last 50,000 to 100,000 years, which resolves into a slip rate of between two and four mm/yr. However, some researchers have suggested that this rate is overstated, as the fault is not sufficiently well expressed in the landscape to support such a rate of slip. The fault is thought to have last moved in either the late Quaternary or Holocene, although (Hart, Bryant, Willis, Treiman and Kahle, 1989) suggest that Holocene displacement and surface ruptures reported on this fault are actually a manifestation of land sliding and not faulting. An M 6.5 earthquake on this fault is thought capable of generating horizontal peak ground accelerations in the Hesperia area of between about 0.42g and 0.18g, with MMI in the X to VIII range.

Cucamonga Fault

The Cucamonga Fault Zone is a youthful, 25 km-long element of the Transverse Ranges family of thrust faults (Matti, Tinsley, McFadden, Morton, 1982); (Morton and Matti, 1987). The Transverse Ranges extend along the southern front of the

San Gabriel Mountains from San Antonio Canyon eastward to the Lytle Creek area, where it appears to be truncated by the Lytle Creek Fault, one of the many faults that form the San Jacinto Fault Zone (Burnett and Hart, 1994). Paleoseismic (trenching) studies of the Cucamonga Fault suggest that this fault has a slip rate of between 4.5 and 5.5 mm/yr (Matti, Tinsley, McFadden, Morton, 1982); (Matti, Morton, Cox, 1992).

Taking into account the uncertainties in carbon-14 dating, the 1988 WGCEP assigned a slip rate of 4.0±2.0 mm/yr to the fault, whereas more recently, the California Geological Society (CGS) assigned this fault a slip rate of 5.0±2.0 mm/yr. (Morton and Matti, 1987) and (Matti, Morton, Cox, 1992) estimate an average recurrence interval on this fault of 625 years, but additional studies are necessary to confirm this. Based on its length, the Cucamonga Fault is thought capable of generating a maximum credible earthquake of M 6.9. Such an event would generate peak horizontal ground acceleration in the Hesperia area of between about 0.35g and 0.16g, with MMI in the IX to VIII range.

Helendale Fault-South Lockhart Fault

The Helendale Fault is a right-lateral strike-slip fault that is 56 miles (90 km) long and one of the northwest-trending faults that collectively appear to be accommodating between 9 and 23% of the motion between the North American and Pacific Plates. Combined, these faults are referred to as the Eastern California Shear Zone. The Helendale Fault cuts through and offsets the North Frontal Fault Zone, as described above. The Helendale Fault also seems to form a continuous fault with the South Lockhart Fault to the north. The South Lockhart Fault is a right-lateral strike-slip fault with a minor dip-slip component (Bryant, 1987). The central and southern segments of the South Lockhart Fault display evidence of Holocene rupture, which includes deformed Holocene sediments and well-defined scarps (Bryant, 1987). The northern segment of the South Lockhart Fault is poorly defined and does not show evidence of Holocene rupture, which indicates that the whole fault may not rupture at the same time. Rupture of multiple segments of both the Helendale and the South Lockhart Faults may result in a large-magnitude earthquake that would be greater than if the South Lockhart, or the Helendale Faults ruptured alone.

(Petersen and Wesnousky, 1994) calculated a slip rate for the Helendale Fault of 0.8 mm/yr and a recurrence interval for large surface-rupturing events of 3,000 to 5,000 years. Paleoseismic studies of the Helendale Fault indicate, however, a recurrence interval of 6,000 to 11,000 years (Bryan and Rockwell, 1995). Paleoseismic studies on the South Lockhart Fault are required to resolve this discrepancy. It is possible that the actual slip rate on this fault is less than 0.8 mm/yr, or that the South Lockhart Fault ruptures more often than the Helendale Fault. Based on the data available at this time, the CGS uses a maximum earthquake of M 7.3 to estimate the ground motion hazard resulting from the combined Helendale-South Lockhart Faults. An earthquake of that size is

anticipated to generate horizontal peak ground accelerations in Hesperia of about 0.27g to 0.16g, with MMI of IX to VIII.

San Jacinto Fault Zone

The San Jacinto Fault Zone consists of a series of closely spaced faults that form the western margin of the San Jacinto Mountains. The zone extends from its junction with the San Andreas Fault in San Bernardino, southeasterly toward the Brawley area, where it continues south of the international border as the Imperial Fault. This fault zone has a high level of historical seismic activity, having generated at least ten moderate M 6–7 earthquakes between 1890 and 1986. Offset across the fault traces is predominantly right lateral, similar to the San Andreas Fault, although (Brown, 1990) has suggested that vertical motion contributes up to ten percent of the net slip. The San Jacinto Fault Zone has been divided into seven segments, each segment, in turn, consists of a series of sub-parallel faults. The segments of the San Jacinto Fault closest to Hesperia are the San Bernardino and San Jacinto Valley segments. Fault slip rates on the various segments of the San Jacinto Fault are less well constrained than for the San Andreas Fault. Data available suggest slip rates of 12-±6 mm/yr for the northern segments of the fault including the San Bernardino and San Jacinto Valley segments and slip rates of four ± two mm/yr for the southern segments (WGCEP, 1995). Various investigators have suggested a recurrence interval for large ground-rupturing earthquakes on the San Jacinto fault of between 150 and 300 years (Petersen and Wesnousky, 1994). It is unknown when the traces of the San Jacinto Fault closest to Hesperia last ruptured. Radiocarbon dating of faulted and unfaulted deposits trenched at Sycamore Flat suggest that the San Jacinto Fault trace last broke in this area between 280(±70) and 490(±70) years before present (Johnston, 1998) personal communication, as reported in (Burnett and Hart, 1994). If these dates are correct, the San Bernardino segment of the San Jacinto Fault is near or at the end of its strain cycle and therefore capable of generating an earthquake in the not too distant future. The (WGCEP, 1995) gave the San Bernardino and San Jacinto Valley segments a 37% and 43% probability, respectively, of rupturing sometime between 1994 and 2024. A maximum credible earthquake of M 6.7 on the San Bernardino segment of the San Jacinto Fault has the potential to generate peak horizontal ground accelerations of between 0.26g and 0.12g in the Hesperia area. Similarly, a M 6.9 earthquake on the more distant San Jacinto Valley segment would generate peak horizontal ground accelerations in Hesperia of between 0.11g and 0.08g.

Sierra Madre Fault

The Sierra Madre Fault Zone is a northeast-dipping reverse fault complex approximately 47 miles (75 km) long that extends along the base of the San Gabriel Mountains from the San Fernando Valley to San Antonio Canyon (Lamar et al., 1973); (WGCEP, 1988), where it continues southeastward as the Cucamonga Fault. Structurally, the Sierra Madre and Cucamonga Faults are interpreted as related segments of a through-going frontal fault zone, with the Cucamonga Fault Zone transferring strain onto the Sierra Madre Fault Zone to the west (Morton and Matti,

1987). Until recently there was very limited geomorphic evidence for quantifying either slip rate or earthquake recurrence along most of the Sierra Madre Fault's length. The fault zone has been divided into five segments and each segment seems to have a different rate of activity. The northwestern-most segment, the San Fernando segment, ruptured in 1971, causing the M 6.7 San Fernando (or Sylmar) earthquake. Because of this earthquake, the Sierra Madre Fault has been known to be active. Trenching studies of this fault after the 1971 earthquake led (Bonilla, 1973) to infer a 200-year recurrence interval for the San Fernando segment. In the 1980's, (Crook et al., 1987) studied the Transverse Ranges using general geologic and geomorphic mapping, combined with a few trenching studies, to suggest that the segments of the Sierra Madre Fault east of the San Fernando segment have not generated major earthquakes for several thousand years and possibly for as long as 11,000 years. Then, in the mid 1990's Rubin trenched a section of the Sierra Madre Fault in Altadena and determined that this segment has ruptured at least twice in the last 15,000 years, causing M 7.2 to 7.6 earthquakes (Rubin, Lindvall, Rockwell, 1998).

Lenwood – Lockhart – Old Woman Springs Faults

The Lenwood Fault is a right-lateral strike slip fault approximately 47 miles (75 km) long with a slip rate of about 0.8 mm/year. Trenching of the fault indicates that the fault has ruptured at least three times in the Holocene, 200-400, 5,000-6,000 and 8,300 years ago, for a recurrence between major surface ruptures of 4,000 to 5,000 years. Prior to the 1992 Landers Earthquake, when the fault experienced triggered slip near its southeast end, seismic creep on this fault had been recorded but not verified. The Lockhart Fault is a right-lateral strike-slip fault approximately 44 miles (70 km) long to the north of the Lenwood Fault. The North Lockhart Fault – a segment that shows no evidence of Holocene activity adds 6 miles (10 km) to the length above. The interval between major surface-rupturing earthquakes on the Lockhart Fault is estimated at between 3,000 and 5,000 years (Jennings, 1994), with the central portion of the fault having ruptured during the Holocene and segments both to the north and south having last ruptured in the Quaternary. The Old Woman Springs segment is the main trace in a complex system of faulting at the junction between the Eastern segment of the North Frontal Fault Zone and the Lenwood Fault. The Old Woman Springs trace is about 6 miles (10 km) long and exhibits right-lateral strike-slip movement with some vertical slip. The fault is thought to have last moved in the Holocene and is therefore defined as active. Although the Lenwood and Lockhart Faults form essentially a continuous, 90-miles (150 km) long system, there is no evidence that both of these faults have ruptured together in the past. Nevertheless, such an event might be possible, as evidenced by rupture of five separate fault segments during the Landers Earthquake. These together with the Old Woman Springs Fault, are assumed to rupture together in M 7.5 maximum earthquake. Such an event would generate peak ground accelerations in Hesperia of about 0.15g to 0.10g, with MMI in the VIII to VII range. If only one of these faults ruptures in an earthquake, the smaller magnitude event would cause lesser ground motions in the City than those reported above.

Fault rupture refers to offset of the ground surface along a rupturing fault during an earthquake. Structures that straddle a rupturing fault generally do not perform well. Thus, the Alquist-Priolo Earthquake Fault Zoning Act prohibits the construction of new habitable structures astride an active fault and requires that geologic studies to locate and evaluate whether the fault has moved in the Holocene be conducted prior to the development. The State geologist has identified several faults in California for which these studies are required, but there are several other active faults not been zoned that should be evaluated in the same way. There are no faults zoned by the State of California within the General Plan area. The closest zoned faults include the North Frontal and the San Andreas. However, some of the faults on the east side of Summit Valley, just south of the City limits, may be active. Similarly, the east-to-northeast-trending faults that extend across Hesperia's southeastern corner may be transferring strain between the San Andreas and the North Fontal Faults. Critical facilities should not be placed across the trace of any of these faults without first conducting site-specific studies to evaluate the location and activity of the fault in question.

Modified Mercalli Intensity (MMI) Scale

MMI Value	Full Description
I	Not felt, except by a few under especially favorable conditions.
II	Felt only by a few persons at rest, especially on upper floors of buildings.
III	Felt quite noticeable by persons indoors, especially on upper floors of buildings. Many people do not recognize it as an earthquake. Standing motor cars may rock slightly. Vibrations similar to the passing of a truck. Duration estimated.
IV	Felt indoors by many, outdoors by few during the day. At night, some awakened. Dishes, windows, doors disturbed; walls make cracking sound. Sensation like heavy truck striking building. Standing motor cars rocked noticeably.
V	Felt by nearly everyone; many awakened. Some dishes, windows broken. Unstable objects overturned. Pendulum clocks may stop.
VI	Felt by all, many frightened. Some heavy furniture moved; a few instances of fallen plaster. Damage slight.
VII	Damage negligible in buildings of good design and construction; slight to moderate in well-built ordinary structures; considerable damage in poorly built or badly designed structures; some chimneys broken.
VIII	Damage slight in specially designed structures; considerable damage in ordinary substantial buildings with partial collapse. Damage great in poorly built structures. Fall of chimneys, factory stacks, columns, monuments, walls. Heavy furniture overturned.
IX	Damage considerable in specially designed structures; well-designed frame structures thrown out of plumb. Damage great in substantial buildings, with partial collapse. Buildings shifted off foundations.
X	Some well-built wooden structures destroyed; most masonry and frame structures destroyed with foundations. Rails bent.
XI	Few, if any masonry structures remain standing. Bridges destroyed. Rails bent greatly.
XII	Damage total. Lines of sight and level are distorted. Objects thrown into the air.

Table 2 – Modified Mercalli Intensity (MMI) Scale

Estimated Horizontal Peak Ground Accelerations and Seismic Intensities in the Hesperia Area

Fault Name	Distance to Hesperia – miles	Distance to Hesperia – kilometers	Magnitude of MMax	PGA (g) from MMax	MMI from MMax
North Frontal Fault (West)	2 – 14.5	3.2 – 23	7.2	0.58 – 0.23	X – IX
San Andreas (Whole Southern)	4 – 16.5	6.5 – 26.5	8.0	0.49 – 0.34	X – IX
San Andreas (San Bernardino – Coachella)	4 – 16.5	6.5 – 26.5	7.7	0.47 – 0.29	X – IX
San Andreas (1857 Rupture or Cholame – Mojave)	7 - 17.5	11 – 28	7.8	0.46 – 0.3	X – IX
San Andreas (San Bernardino)	5.5 – 16.5	9.5 - 26.5	7.5	0.45 – 0.26	IX
Cleghorn	3 – 12	5 – 19.5	6.5	0.42 – 0.18	X – VIII
San Andreas (Mojave)	7 – 17.5	11 - 28	7.4	0.42 – 0.23	X – IX
Cucamonga	9 - 19	14.5 – 30.5	6.9	0.35 – 0.16	IX – VIII
Helendale – South Lockhart	13 – 24	21 – 38	7.3	0.27 – 0.16	IX – VIII
San Jacinto (San Bernardino)	9 – 20	14.5 – 32	6.7	0.26 – 0.12	IX – VII
Sierra Madre	20 – 29	32 – 47.5	7.2	0.18 – 0.12	VIII – VII
Lenwood – Lockhart Old Women Springs	28 – 39	45 – 62.5	7.5	0.15 – 0.10	VIII – VII
San Jacinto (San Jacinto Valley)	23 – 31.5	37.5 – 50	6.9	0.11 – 0.08	VII
Abbreviations used in table 1-2; MMAx – Maximum magnitude earthquake; PGA – Peak ground acceleration as a percentage of g, the acceleration of gravity; MMI – Modified Mercalli Intensity (see Table 1-2).					

Table 3 - Estimated Horizontal Peak Ground Accelerations and Seismic Intensities in the Hesperia Area

Figure 3 – Seismic Hazard Zones

Figure 4 – Fault Zone

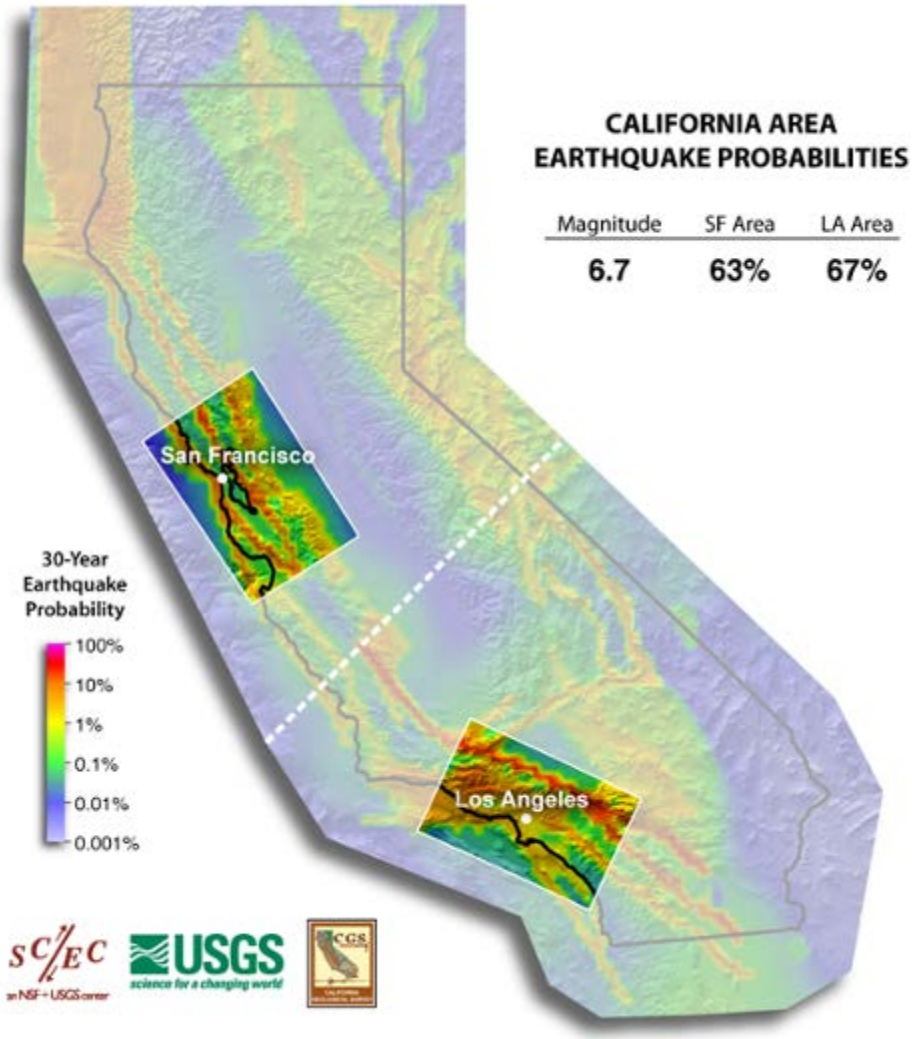


Figure 5 - California Area Earthquake Probabilities

Liquefaction is a secondary effect of seismic shaking that can cause various types of ground failure. Soils that liquefy lose the ability to support structures and may cause structures to sink or tilt with the potential for extensive structural damage.

For liquefaction to occur, three conditions must be met:

1) Loose, recently deposited sediments typically sandy in composition.
2) Shallow groundwater, typically within 50 feet of the ground surface.
3) Seismic shaking with ground accelerations over *0.2g.

Geologically young, loose, unconsolidated sediments occur throughout Hesperia, but shallow groundwater occurs only within the Mojave River floodplain, where water at depths of less than 30 feet has been recorded. Ground shaking of 0.2g and a relatively long duration can be expected in Hesperia because of an earthquake on

any of the several faults in the region. Based on this information, the Mojave River floodplain has been identified as a liquefaction-susceptible area, (see Exhibit SF-1). Liquefaction-related spreads can occur adjacent to stream channels and deep washes that provide a free face along which the liquefied mass of soil fails. Lateral spreads can cause extensive damage to pipelines, utilities, bridges, roads and other structures.

Seismic shaking can also cause loose, geologically young deposits to become more tightly packed, resulting in a reduction of the soil column and differential settlement at the ground surface. Several areas in Hesperia are underlain by unconsolidated, young alluvial deposits and artificial fill that may be susceptible to settlement. Geotechnical studies prior to development should address this hazard on a site-specific basis.

Seismically induced slope failure is a common secondary effect of seismic shaking. Although, most of Hesperia is on relatively level to gently sloping terrain, some natural slopes in the City that may be vulnerable to this hazard.

The hazards of side hill fill deformation, ridge top fissuring and shattering and seiching may occur locally only in a few areas of Hesperia. Side hill deformation could potentially occur along some of the approaches to the bridges that extend across the I-15 or the Mojave River, where minor settlement of the bridge embankment could result in a step-up of a few inches to the actual bridge. Failure of side hill fills could also occur locally in the foothills of the San Bernardino Mountains, on lots where grading involved the placement of fill to make a level building pad. Ridge top shattering may occur locally in the southern part of Hesperia, the San Bernardino Mountains and in the foothills at the base of the mountains, to the south and east of Summit Valley Road. Seiches due to seismic shaking could occur in Silverwood and Hesperia Lakes and any recharge basin in the City, if filled with water at the time of the earthquake. In unlined lakes and basins, sloshing of water against the basin sides could result in erosion and even some surficial slope failures. Water in swimming pools is also known to slosh during earthquakes, although in most cases, the sloshing of water does not cause any significant damage. Given its distance from the ocean, Hesperia does not have a tsunami hazard.

*0.2 * gravitational constant = 1.3346×10^{-11} m^3 kg^{-1} s^{-}

Figure 6 – Slope Distribution Map

Dam Failure

General Definition

A dam is an artificial barrier that has the ability to impound water, wastewater, or any liquid-borne material for the purpose of storage or control of water.

Description

Dams can fail for one or a combination of the following reasons:

- Overtopping caused by floods that exceed the capacity of the dam.
- Deliberate acts of sabotage.
- Structural failure of materials used in dam construction.
- Movement and/or failure of the foundation supporting the dam.
- Settlement and cracking of concrete or embankment dams.
- Piping and internal erosion of soil in embankment dams.
- Inadequate maintenance and upkeep.

A dam impounds water in the upstream area, referred to as the reservoir. The amount of water impounded is measured in acre-feet. An acre-foot is the volume of water that covers an acre of land to a depth of one foot. As a function of upstream topography, even a very small dam may impound or detain many acre-feet of water. Two factors influence the potential severity of a full or partial dam failure: the amount of water impounded and the density, type and value of development and infrastructure located downstream.

Of the approximately 80,000 dams identified in the National Inventory of Dams, a majority are privately owned, 2,131 are federally owned; 3,627 are state owned; 12,078 are local agency owned; 1,626 are owned by public utilities; 43,656 are private entity or individually owned and 15,000 of ownership is undetermined.

The inventories of dams are categorized according to their primary function:

- Recreation (31.3 percent).
- Fire and farm ponds (17.0 percent).
- Flood control (14.6 percent).
- Irrigation (13.7 percent).
- Water supply (9.8 percent).
- Tailings and other (8.1 percent).
- Hydroelectric (2.9 percent).
- Undetermined (2.3 percent).
- Navigation (0.3 percent).

Each dam in the inventory is assigned a downstream hazard classification based on the potential loss of life and damage to property should the dam fail. The three

classifications are high, significant and low. With changing demographics and land development in downstream areas, hazard classifications are updated continually.

The hazard classification is not an indicator of the adequacy of a dam or its physical integrity. Dam failures typically occur when spillway capacity is inadequate and excess flow overtops the dam, or when internal erosion (piping) through the dam or foundation occurs.

Dam failures can result from any one or a combination of the following:

- Prolonged periods of rainfall and flooding.
- Inadequate spillway capacity, resulting in excess overtopping flows.
- Internal erosion caused by embankment or foundation leakage or piping.
- Improper maintenance, including failure to remove trees, repair internal seepage problems, replace lost material from the cross-section of the dam and abutments.
- Improper design, including the use of improper construction materials and construction practices.
- Negligent operation including failure to remove or open gates or valves during high flow periods.
- Failure of upstream dams on the same waterway.
- Landslides into reservoirs, which cause surges that result in overtopping.
- High winds, which can cause significant wave action and result in substantial erosion.
- Earthquakes cause longitudinal cracks at the tops of embankments that weaken entire structures.

Dam failure warning ability is generally determined by the frequency of inspections for structural integrity, the flood wave arrival time (the time it takes for the flood wave to reach its maximum distance of inundation), or the ability as it relates to the emergency to notify and evacuate persons downstream.

If the City is impacted by an imminent or actual dam failure, personnel assigned responsibilities of firefighting and/or rescue operations will be confronted by a number of problems and unusual tasks:

- A catastrophic dam failure, depending on size of dam and population downstream could exceed the response capability to residents.
- Damage control and disaster relief support would be required from county, state, federal, local governments and private organizations.
- Mass evacuation of the inundation areas would be essential to save lives, if warning time is allowed.
- Extensive search and rescue operations may be required to assist trapped or injured persons.
- Emergency medical care, food and temporary shelter may be required for the injured or displaced residents.

- Identification and burial of the deceased would pose difficult problems, public health will be a major concern
- Many families may be separated, especially if the failure occurred during the daytime, if this were the case, a personal inquiry or locator system would have to be implemented and maintained.
- Rescue operations could be seriously hampered by a potential loss of communications, damage to transportation routes and/or the disruption of public utilities and other essential services.

Outside assistance may be required and may continue for an extended period, these efforts would be required to assist with removing debris, clearing roadways, red tagging unsafe structures, reestablishing public services, utilities and providing care and welfare for the affected population including, if required, temporary housing for displaced residents.

Background

The Army Corps of Engineers completed the Mojave Forks Dam in May 1971. The Mojave Forks Dam, which temporarily ponds high flows and releases floodwater through a controlled outlet, affords flood protection from the Mojave River within the City.

The Mojave River Dam is an un-gated flood control structure located on the northern side of the San Bernardino Mountains. The drainage area above the dam consists of about 215 square miles of mountainous terrain. The two main arms that drain in this area are, Deep Creek and West Fork Mojave River, which converge just above the dam to form the Mojave River. In its entirety, the Mojave River basin comprises about 4,700 square miles of which 95 percent is open desert. The eastern extent of the river is a dry lakebed near Baker. The relatively small area above the dam contributes nearly all of the surface water, which reaches the Mojave River. The Mojave River Dam is the only flood control reservoir in the basin, but the area above the dam does include Lake Arrowhead and Lake Gregory both are manmade recreational lakes. Also, located in the basin is Cedar Springs Dam and Silverwood Lake, which are part of the California Aqueduct System, used for water supply and recreational fishing, operated by the State of California Department of Water Resources.

The Mojave River Dam controls an inflow of magnitudes up to and including the reservoir design flood. During a reservoir design flood, inflow peaks at 94,000 cubic feet per second (cfs) while the maximum outflow is kept to a maximum of about 23,500 cfs. All inflows are released from the reservoir through the outlet tunnel; the outlet does not include any mechanical equipment that would permit adjustment to outflows.

Physical Data

Embankment

Type: Rolled earth fill.
Crest Elevation: 3,172 feet NGVD 967 meters NGVD.
Invert elevation: 2,988 feet NGVD 911 meters NGVD.
Height above original streambed: 200 feet 61 meters.
Crest Length: 2,223 feet 678 meters.
Top Width: 20 feet 6.1 meters.
Probable Maximum Flood (PMF) Freeboard: 6.6 feet 2.0 meters.

Spillway

Type Crest: Block.
Crest Elevation: 3,134 feet NGVD 955 meters NGVD.
Crest Length: 200 feet 61 meters.
Elevation of Maximum Water Surface: 3165.5 feet NGVD 965 meters NGVD.
Discharge at Maximum Water Surface: 105,400 cfs 2,985 cms.

Outlet

Invert Elevation: 2,988 National Geodetic Vertical Datum (NGVD) 911 meters.
Height: 17.75 feet 5.4 meters.
Width; 19 feet 5.8 meters.
Length: 974 feet 297 meters.
Capacity at Spillway Crest: 23,500 cfs 665 cms.

Surface Area & Storage Capacity

Area at Spillway Crest: 1,980 acres 8,012,775 sm.
Area at Top of Dam; 3,390 acres 13,718,842 sm.
Storage Capacity at Spillway Crest: 89,700 acre-feet 110.6 million cubic meters (MCM).
Storage at Spillway Design Surcharge Level: 179,400 acre-feet 221.3 MCM.
Storage Capacity at Top of Dam: 191,000 acre-feet 235.6 MCM.
Sedimentation Allocation; 11,000 acre-feet 13.6 MCM.

Reservoir Design Flood

Duration of Inflow; 3 days 3 days.
Total Volume: 154,000 acre-feet 190.0 MCM.
Peak Inflow: 94,000 cfs 2,662 cms.
Peak Outflow: 23,500 cfs 665 cms.

Spillway Design Flood

Duration of Inflow: 5 day 5 day.
Total Volume: 383,000 acre-feet 474.4 MCM.
Peak Inflow: 186,000 cfs 5,267 cms.
Peak Outflow: 131,300 cfs 3,718 cms.

Acronyms

NGVD = National Geodetic Vertical Datum of 1929.
MCM = million cubic meters.
cfs = cubic feet per second.
cms = cubic meters per second.
sm = square meters.

The presence of dams in and around the City cause this issue to be noted in this plan, however there is not history representing any forms of dam failures. Flood inundation maps represent the possibilities of floodwaters, due to a catastrophic failure of the Cedar Springs Dam (Lake Silverwood) to affect the Mojave Forks Dam in 25 minutes. Water from a failure of the Lake Arrowhead Dam is estimated at 35 minutes.

There are no known inundation maps representing a total failure of both facilities concurrently. As these large bodies are outside City boundaries. Both dams were built only miles apart and both are located on seismically active faults. The individual cities or responsible agencies should address their construction and failure history. The Mojave River Dam, while small in consequence, is adjacent to the City and assists in the control of water flows affecting the neighboring properties and roadways along its course.

Figure 7 – Dam Inundation Map

Flooding

General Definition

A general and temporary condition of partial or complete inundation of two or more acres of normally dry land or of two or more properties (at least one of which is your property) from: "Overflow of inland or tidal waters, unusual and rapid accumulation or runoff of surface waters from any source, or a mudflow. The collapse or subsidence of land along the shore of a lake or similar body of water as a result of erosion or undermining caused by waves or currents of water exceeding anticipated cyclical levels that result in a flood", definition by the National Flood Insurance Program (NFIP).

Description

Floods are the most common and widespread of all natural disasters—except fire. Most communities in the United States have experienced some kind of flooding, after spring rains, heavy thunderstorms, or winter snow thaws.

Similarly, to earthquakes, floods are natural and recurrent events that generally do not pose a hazard when they occur in an underdeveloped area; it is only when the floods interact with the built environment, typically in the form of structures built on the floodplain, where they obstruct floodwaters. Unfortunately, as development in floodplains has increased, the average annual losses due to flooding have steadily increased.

Like most of Southern California, Hesperia is subject to unpredictable seasonal rainfall. Every few years, the region is subjected to periods of intense and sustained precipitation. Most of the flooding occurs in the numerous washes, natural drainage courses, drainage easements and floodways. Construction of the Mojave Forks Dam in 1971 greatly reduced the impact of flooding along the Mojave River, although a few parcels adjacent to the river are still at risk. Most of Hesperia is located on alluvial fans, relatively flat to sloping areas covered with sediment deposited by shallow, intermittent streams that spread out away from their source in the mountains to the south. The historical and geological records show that alluvial fan flooding is predictable and floodwaters can travel at dangerously high speeds, be highly erosive and can carry large amounts of sediment and other debris. These characteristics make it difficult to assess the flood risk and develop reliable mitigations for alluvial fans.

Hesperia has participated in the National Flood Insurance Program since 1989. The extent of flooding in the Mojave River, Antelope Wash, the Oro Grande Wash and the Summit Valley area has been analyzed through Flood Insurance Studies, but the entire Hesperia area has not been studied and the flood zones are incomplete (see Exhibit SF-2). Inundation due to a 100-year flood (a flood that has a 1 percent probability of being equaled or exceed in any given year) can occur along the Mojave River, Antelope Valley Wash and Summit Valley. Several structures in the Antelope

Valley Wash area are located within this zone. In the Summit Valley Area, most homes are above the flood zone, but access to these homes can be cut off during the severe flooding of the West Fork of the Mojave River. Highways 138 and 173 and several major roadways, including I Avenue, Rock Springs Road and Ranchero Road extend across these 100-year flood zones. Federally subsidized flood insurance is available to all Hesperia residents. Owners of all structures with the 100-year flood zone are required to purchase and maintain flood insurance as a condition receiving a federally related mortgage or home equity loan on that structure. Residents outside the 100-year flood zone, but in areas of recurrent flooding should consider flood insurance.

Development in Hesperia began gradually and in a piecemeal fashion, without the benefit of planned drainage systems. Development occurred with only minor alterations to the natural topography. As a result, natural drainage courses meander through developed areas and most streets follow the natural contours of the land, often without culverts or bridges across drainage channels. Underground pipelines, culverts, bridges and basins are present, but not common. This leads to localized flooding, road closures, erosion damage, sedimentation during and following strong storms, particularly if the ground is already saturated. Since the City's incorporation, more of the recent developments include on-site retention basins and other engineered structures, as needed. Furthermore, in the last decade, the City has constructed several drainage facilities, including portions of the H-01, G-01, D-02, D-01-02 and A-01 lines that drain several portions of the City. Asphalt berms along several roadways control surface flows and a nearly two-mile long channel with levees affords some protection to the homes near the bottom of the Antelope Valley Wash.

Flood losses in other parts of the City are caused by structures that obstruct runoff. The bermed or elevated rail lines, for example and pond water on the upstream side. The California Aqueduct has over chutes and top inlets where it crosses the larger natural drainages, but these are sometimes inadequate and the smaller drainages may be blocked altogether. The cumulative effect of obstructions in the flood hazard areas can lead to increased flood heights and velocities. Maintenance of the numerous natural drainages is also challenging, since many channels meander through private properties. The City has planned additional improvements to the City's drainage infrastructure, including several new storm drains and the Ranchero Road Grade Separation Project. This project will not only significantly improve east-west travel across the City, but will elevate the road where it crosses the Antelope Valley Wash, thereby reducing the potential for flood-induced road closures.

Seismically induced inundation refers to flooding that result when water retention structures, such as dams, fail due to an earthquake. The three dams near Hesperia that can inundate portions of the City should they fail catastrophically include, The Mojave Forks Dam, Cedar Springs Dam and Lake Arrowhead Dam.

Inundation in a smaller scale can also occur if an aboveground water storage tank suffers damage from ground shaking, releasing the water stored therein. Flexible

joints at the inlet/outlet connections, in addition to bracing and baffling, can help mitigate the damage resulting from water sloshing inside the tank. Nine of the water tanks in the City currently meet the latest standards in water tank design; the remaining eight need to have their inlet connections retrofitted. Maintaining the structural integrity of these water tanks during an earthquake is important not only to provide water to residents, but also to fight any fires that may occur from an earthquake. This is especially important given that an earthquake could damage the California Aqueduct and the groundwater wells in the region.

Once flooding begins, personnel will be needed to assist in rescuing persons trapped by floodwater, securing utilities, cordoning off flooded areas and controlling traffic. These actions may overtax local agencies and additional personnel and resources may be required. It is anticipated that existing mutual aid resources would be used as necessary to augment local resources, however as with all mutual aid requests, these are resources to be used only if they are not assigned to an emergency incident of their own. In the event of a flood threat or actual flood, emergency services will be taxed with additional duties.

Examples of duties that may be faced by rescue personnel include:

- Fires from electrical shorts or gas main leaks caused by floodwaters.
- Persons trapped in buildings.
- Other agencies, law enforcement, medical or public health may request assistance from the fire department.
- Personnel shortages or equipment in flooded areas may be inaccessible.
- Water pressure may be affected if water mains have ruptured or hydrants have been broken off by debris flow.

Figure 8 – FEMA Flood Map

Severe Thunderstorm

General Definition

Severe Thunderstorms are best described by their name. They exhibit similar characteristics as a summer electrical storm, however, due to their nature, they have extreme up and down drafts, rapid cloud buildup, increased rain levels, hail and may include wind shear, heavy winds at all elevation levels, severe lightening, which could develop into a tornado.

Description

The majority of flooding and high winds has been related to severe storms. The City's emergency plan represents all weather related storms as extreme weather, thus incorporating not only the summer thunderstorms, but winter storms as well.

Wildfires

General Definition

There are three different classes of wild land or wildfires:

1) A surface fire is the most common type and burns along the floor of a forest, moving slowly and killing or damaging trees.

2) A ground fire is usually started by lightning and burns on or below the forest floor.

3) Crown fires spread rapidly by wind and move quickly by jumping along the tops of trees. Wildfires are usually signaled by dense smoke that fills the area for miles around. Wildfires present a significant potential for disaster in the southwest, a region of relatively high temperatures, low humidity and low precipitation during the summer and spring and moderately strong daytime winds. Combine these severe burning conditions with people or lightning and the stage is set for the occurrence of large, destructive wildfires.

Description

Wildfires are a necessary part of the natural ecosystem in Southern California, but they become a hazard when they extend out of control into developed areas, with the resultant of loss of property, injuries or the loss of life. The wildfire risk in the United States has increased in the last few decades with the increasing encroachment of residences and other structures into the wild land environment and the increasingly larger number of people living and playing in wild land areas.

Hesperia is located in the lower Mojave section of the Southeastern Deserts Bioregion. The predominate vegetation assemblages in this area include, desert

shrub, creosote brush shrub and succulent shrub. Other important vegetation types include Joshua Trees, woodland, shad-scale scrub, black brush scrub and desert scrub-steppe. About one-third of the desert floor in the Mojave section is devoid of vegetation, limiting amount of surface fuel loads available to burn.

Variations in the annual precipitation for the Mojave region and as a result, there is a significant variation in the frequency and extent of wildfires in the area. Several historical wildfires have occurred primarily in the southern part of Hesperia and its sphere between 1930 and 2010. The very high fire hazard severity zones under the jurisdiction of the City are shown on Exhibit SF-2. In the City's Sphere of Influence, the California Department of Forestry and Fire Protection (CDF or CalFire) has mapped fire hazard zones that are under the jurisdiction of either state or federal agencies, these zones are shown on Exhibit SF-3.

Dozens of small vegetation fires, typically less than one acre in size, are reported in Hesperia annually. Experience and research have shown that vegetation management of fuel modifications is an effective means of reducing the wildfire hazard. Therefore, property owners are encouraged to follow maintenance guidelines aimed at reducing the amount and continuity of vegetation fuel available. If high weeds, plant material and other prohibited items are present on a property, the Fire Marshal has authority to give the property owner of record a notice to abate the hazard. If the owner does not comply within 30 days of receipt of the order, the City has the authority to abate the hazard and charge the property owner for the cost. Vegetation treatments include thinning or removing vegetation within a given distance from habitable structures to create a defensible space. A fuel modification zone is a ribbon of land surrounding a development that is designed to diminish the intensity of a wildfire as it approaches the structures. Fuel modification treatments are being developed for Rancho Los Flores.

Building construction standards can also help reduce the fire hazard. Fire resistant and non-combustible roofing materials finely screened attic ventilation openings, non-combustible exterior siding materials, multiple pane windows and tempered glass windows all can help a structure perform better in the event of a fire. Every proposed construction project in Hesperia is reviewed by the San Bernardino County Fire Department for compliance using the most recent version of the California Fire Code adopted by the City, including current City amendments to the Code.

California State law requires that the fact a property is located in a very high fire hazard severity zone, areas identified on Exhibit SF-2, or in a State responsible area (Exhibit SF-3) be disclosed in real estate transactions. This is important because the relatively rapid turnover of residential ownership can create an information gap; as a result, uninformed homeowners in fire hazard areas may attempt landscaping or other modifications to their homes that could be a detriment to the fire-resistant qualities of the original structure, with potentially negative consequences. Fire hazard education of homeowners is critical.

There are a relatively small number of structure fires reported annually in Hesperia, but depending on the size, age and occupancy of the structure, the economic and social losses can be substantial. Fire prevention and suppression services in Hesperia are provided on a contract basis by the San Bernardino County Fire Department. The San Bernardino County Fire Department also provides ambulance service to the three local high desert hospitals. Fire-fighting resources in and near Hesperia include six fire stations. Due to the rapid increase in population and associated rise in traffic in the past few years, emergency calls to the Fire Department have steadily risen by about 3 to 5 percent each year. Based on data provided by the City, average fire response time in the City during the 2007 to 2009 years is approximately seven minutes and sixteen seconds. Response times are controlled by the distance between the responding fire station and the site; factors that may affect the response time include obstructions provided by the California Aqueduct, railroad lines, multiple alarms and traffic congestion.

The Insurance Services Office (ICO) ranks a community's fire protection needs and services, rating varies from Class 1 being the best to Class 10 the worst. Hesperia currently has a Class 5 ISO rating in the developed portions of the City and a rating of Class 9 in the outlaying areas. This fire rating is based on a cumulative point system that weighs a community's fire suppression delivery system, that includes, fire dispatch, fire department representation in the form of equipment, personnel, training and distribution of fire stations, water supply adequacy and condition.

If needed, Apply Valley Fire Protection District may respond to emergency calls in Hesperia. The Town of Apple Valley and the City are part of the San Bernardino County Operational Area. The jurisdictions that form an Operational Area have mutual aid agreements that allow the response of additional emergency resources, as needed, from non-affected members in the group. Numerous other local, state and federal agencies are available to assist the San Bernardino County Fire Department as needed, depending on the type of incident.

Earthquakes can cause multiple ignitions distributed over a broad geographic area. Fires can be ignited by a variety of sources, including arcing downed electrical lines, sparks near ruptured gas pipelines, overturned electrical appliances, such as water heaters and spills of reactive chemicals. If the earthquake has also impaired the water distribution system, limiting the water available to fight these fires and fire personnel are busy conducting search and rescue operations, earthquake induced fires have the potential to be the worst case fire-suppression scenarios for the City.

Figure 9 – High Fire Hazard Areas

Technology Hazards

Hazardous Materials

General Definition

These are dangerous situations caused by the unintentional dispersion of hazardous materials, by a multitude of possible reasons.

Description

Hazardous materials incidents can occur either in transit or at a fixed facility. The United States and Southern California in particular, have taken part in the rapid and innovative development of the new technologies and technological and chemical processes. One crucial result of these developments has been the purification and synthesis of chemical elements and compounds, which have proven to be highly toxic. Hazardous materials, including injurious substances such as pesticides, herbicides, toxic metals and chemicals, liquefied natural gas, explosives, volatile chemicals and nuclear fuels and waste products have become prevalent in both industrial and commercial activities.

Hazardous materials are used every day in industrial, commercial, medical and residential applications. The primary concern associated with a hazardous materials release is the short-and/or long-term effect to the public with exposure to these substances. Compared to other cities in Southern California, Hesperia has a relatively low number of sites that generate, use or store hazardous materials. According to the Environmental Protection Agency (EPA), there are no Superfund sites in Hesperia, although there is one Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLIS) site that is not on the National Priority List. There are three facilities in Hesperia listed in the most recent Toxics Release Inventory (TRI) with in Victorville within a half mile of Hesperia. There are approximately 46-registered small-quantity and two large-quantity generators of hazardous materials in Hesperia. The CERCLIS site, TRI facilities and large-quantity generators of hazardous materials in or near Hesperia are shown on Exhibit SF-2.

There are two registered transporters of hazardous waste in Hesperia; several more are registered in Victorville and Apple Valley. Trucks and the Burlington-Northern Santa Fe and Union Pacific railroad lines transport hazardous materials through the City on Interstate 15 and rail line, a prescribed route for all types of non-radioactive hazardous materials, radioactive materials and toxic inhalation hazard materials. All transport vehicles and rail lines carrying hazardous materials are required to have placards that that indicate, at a glance, the chemical carried and if it is corrosive, flammable and/or explosive. The conductors are required to carry detailed Material Safety Data Sheets (MSDS) for each of the substances onboard. These documents are designed to help emergency response personnel assess the situation immediately upon arrival at the scene of an accident and take the appropriate precautionary and mitigation measures. The California Highway Patrol is in charge of

spills that occur in or along freeways, with Caltrans and local sheriffs and fire departments are responsible for providing additional enforcement and routing assistance.

High-pressure gas and hazardous liquid pipelines also extend across the City. Pipeline operators are responsible for the continuous maintenance and monitoring of their pipelines. All excavations or drilling to be conducted near pipelines should be conducted only after proper clearance by the appropriate utility agencies or companies. This is done locally by the Underground Services Alert of Southern California, or Dig Alert.

All businesses that handle more than a specified amount of hazardous or extremely hazardous materials are required to submit a Hazardous Materials Business Plan to the local Certified Unified Program Agency (CUPA). In Hesperia, the local CUPA is the San Bernardino County Fire Department, Hazardous Materials Division (SBCFD-HMD). These businesses are required to prepare Risk Management Plans, detailed engineering analyses that identify the potential accident factors present and the mitigation measures that can be implemented to reduce this accident potential. The County of San Bernardino is designated as the Administering Agency for hazardous materials in the City of Hesperia.

Leaking underground storage tanks (LUSTs) are the primary cause of groundwater contamination by gasoline compounds and solvents. There are several federal and state programs aimed at leak reporting, investigation regulations and standards for cleanup and remediation. California now requires all fuel tanks to be double-walled and prohibits the delivery of gasoline or diesel to non-compliant tanks. The State Water Resources Control Board (SWRCB) is the leading regulatory agency in the development of regulations and policy for underground storage tanks. The SWRCB, in cooperation with the Office of Emergency Services, maintains an inventory of LUSTs in a statewide database called GeoTracker. As of January 2010, there were twelve reported LUST cases in Hesperia. All of these sites have been remediated; and additional actions, in the form of monitoring, testing and remediation, are not necessary. The GeoTracker list should be reviewed on a regular basis for new leaks, especially since there are at least 31 permitted underground storage tanks in the City.

The Hesperia Water District provides drinking water to the residents of Hesperia, except for those that have their own private well on their property. The City's water comes from a network of 14 groundwater wells located throughout the City. Since 1993, when data recording began, the Water District has had only one health-based violation, in February 2005, for the concentration of total coliform (bacteria) exceeding the Maximum Contaminant Level (MCL). Hesperia has a particularly good record compared to all other water purveyors providing data to the EPA. Perchlorates substances that are persistent in the environment and that can pose a health hazard, especially to infants and women, have been detected in water from three of the City wells. Regular monitoring of these wells will help determine whether the perchlorate readings were anomalous, or if the water in these wells is indeed

affected and will require remediation. According to the Consumer Confidence Reports issued by the Water District in 2007 and 2008, drinking water in the community does not contain this contaminant.

Given that hazardous materials are often used at home and any surplus of these materials cannot be disposed in the regular trash, San Bernardino County Fire Department and the City of Hesperia have adopted a Household Hazardous Waste and Oil-Recycling Program free to residents, the local drop-off facility is located at 17443 Lemon Street. The City also has a series of programs designed to reduce the amount of waste that is taken to the landfill. There are no active landfills in Hesperia; the Hesperia Sanitary Landfill closed in 2005.

The most serious concern regarding the significant hazardous materials sites in Hesperia is the potential for leaks and reactive chemical interactions to occur because of an earthquake compromising their storage containers. Past earthquakes have shown that hazardous materials spills can occur even when the building does not suffer significant damage.

Several types of emergencies involving hazardous materials are conceivable within the limits of the City; among the possibilities are the following:

- A spill at a commercial or industrial facility, endangering the employees of the site and/or adjacent properties.
- A highway accident involving vehicles carrying hazardous or flammable materials.
- An accident on a railway line involving cars that are carrying hazardous materials.
- A local street traffic collision involving trucks making a delivery to a gas station or business that uses hazardous materials.
- An unknown substance found on a local street.
- The illegal storage and/or dumping of hazardous materials used in drug labs.
- Incidents involving the intentional or accidental discharge of military explosives or fire where munitions are stored.

As illustrated by the above examples, a hazardous materials emergency can involve by either a transportation or on-site incident. A hazardous materials incident may affect a wide or unknown range and HazMat Teams being able to identify an unknown substance. In most cases, these incidents would be local in nature and would not be anticipated to create widespread affect. However, hazardous materials can enter rivers, creeks, streams, lakes, storm drains or the atmosphere affecting several jurisdictions.

If the City of Hesperia is impacted by a major hazardous materials incident, personnel assigned responsibilities for firefighting and rescue operations will be confronted by a number of problems and unusual tasks.

Listed below are some of the most noteworthy:

- Identification of substances will require increased coordination between emergency responders and shippers.
- Responders may need to contact other resources to determine the nature of spilled substances.
- Leaking substances may or may not be identifiable because communications may be interrupted by other disastrous events.
- Until the hazardous material is identified, an Incident Command Post (ICP) will have to be established a considerable distance from the impacted area.
- Identifying the health threat to firefighters could become increasingly difficult as the complexities of leaks increase, especially if several chemicals mix.
- Concurrent disasters could limit the availability of specially trained personnel to respond to each incident.
- Concurrent disasters may require personnel to fill responsibilities normally handled by other services.
- If law enforcement or public works personnel are unavailable, site access, security and crowd control may have to be established by police and fire department personnel.
- Weather conditions could hinder cleanup operations, especially high winds or rain that might dissipate the spill or cause flooding.
- Water intake systems will be important to identify if leaks occur near an urban area.
- Specialized equipment and personnel may be required to operate in the contaminated environment, especially for rescue.

Figure 10 – Hazardous Materials Sites

Human Hazards

Terrorism

General Definition

Terrorism is the use of violence or the threat of violence to create a climate of fear in a given population or to intimidate, coerce or frighten a government or civilian population to further a political, social or religious objective. Terrorist violence targets ethnic or religious groups, governments and political parties, corporations and media enterprises. Organizations that engage in acts of terror are usually small and limited in resources compared to the populations and institutions they oppose. Through publicity and fear generated by their violence, they seek to magnify their influence and power to effect political change on either a local or an international scale.

The definition of a terrorist is an individual who identified as a person committing a violent criminal act in the furtherance of his particular political or social objective.

Description

In the United States, most terrorist incidents have involved small domestic extremist groups using terrorism to achieve their designated objective. Local, state and federal law enforcement officials routinely monitor suspected terrorist groups and as information becomes available, try to prevent or protect against an attack. The United States government also works closely with other countries to limit the sources of support for terrorism and to maintain counter-terrorism activities worldwide.

Domestically, the United States averages nearly 200 attacks per year within our boarders, many of these groups receive financing from organizations within the U.S. The Department of Justice (DOJ) identifies these attacks by five major motivations/classifications:

- Political
- Religious
- Racial
- Environmental
- Other (special interest groups and causes)

Terrorist attacks can take several forms. Bombings have been the most frequently used terrorist method in the United States. Other possibilities include an attack at transportation facilities, utilities or other public services or an incident involving chemical or biological agents. The type of attack depends on the technological means available to the terrorist, the nature of the political issue/group motivating the attack and/or the weak points of the terrorist's target.

Terrorist incidents in this country prior to the September 11, 2001, attack have included bombings of the World Trade Center in New York City, the United States Capitol Building in Washington, D.C., Mobil Oil Co., Amtrak rail lines outside Phoenix and the Veterans Building in Oklahoma City.

For these reasons and by order of the President of the United States, terrorist programs have been established to provide information to the citizens regarding their personal safety and the preparedness of the United States. Presidential mandates have been implemented requiring all states to develop Terrorism Response Plans. The State of California's Terrorism Response Plan was developed and maintained by California's Office of Emergency Services (Cal EMA).

The Homeland Security Advisory System is binding on the executive branch and suggested, although voluntary, to other levels of government and the private sector.

Threat Conditions can be assigned to advise the nation, or they may be set for a particular geographical or industrial area. All assigned "Threat Conditions" are reviewed at regular intervals to determine whether adjustments are necessary. There are five identified "Threat Conditions" each condition is identified by a description and an assigned corresponding color. Below are the conditions rating from, lowest to highest:

1. Low Condition (Green) - low risk of terrorist attacks.
2. Guarded Condition (Blue) - general risk of terrorist attacks.
3. Elevated Condition (Yellow) - significant risk of terrorist attacks
4. High Condition (Orange) - high risk of terrorist attacks.
5. Severe Condition (Red) - severe risk of terrorist attacks.

4.1.1 Hazard Screening Criteria

Identified hazards from the 2005 HMP are:

- Earthquake
- Dam Failure
- Flooding
- Severe Thunderstorm
- Wildfires
- Technology Hazards
    - Hazardous Materials
- Human Hazards
    - Terrorism

These hazards were ranked in 2005 through the CPRI developed by Visual Risk Technologies. Using the 2005 rankings, the last five-year occurrences and information of specific hazard probabilities the Hazard Assessment Matrix was developed by the Planning Committee.

4.1.2 Hazard Assessment Matrix

The following is a table represents the CPRI for each hazard facing the City.

In this Matrix, the "Green" boxes represent the higher priority hazards; the "Pink" and "White" boxes represent additional lower levels of priority. Additionally, a 'Yes" or "No" value can be provided for each hazard indicating the potential for implementing mitigation measures to reduce the risk. This assessment is to be used to support decisions not supported by the matrix.

HAZARD ASSESSMENT MATRIX				
		Impact		
		High	Medium	Low
Probability	High	Wildfire/Earthquake/ Geologic Hazards	Severe Thunderstorms Hazardous Materials	Extreme Heat
	Medium	Flash Flooding	Winter Storm High Winds Straight Line Winds	Infestation Drought Dam Failure
	Low		Lightning Tornado	Terrorism

Table 4 Hazard Assessment Matrix

Probability	Impact
High: Highly Likely/Likely	High: Catastrophic/Critical
Medium: Possible	Medium: Limited
Low: Unlikely	Low: Negligible

4.1.3 Hazard Prioritization

By combining the Hazard Ranking Matrix showing 1) probability and 2) impact for each screened hazard and indicating the potential for implementing mitigation measures to reduce the risk, a prioritized ranking of the hazards was developed. "Green" boxes represent the higher priority hazards; and the "Pink" and "White" boxes represent additional levels of priority. Additionally, a 'Yes" or "No" value can be provided for each hazard indicating the potential for implementing mitigation measures to reduce the risk. This assessment is to be used to support decisions not supported by the matrix.

4.2 Hazard Profile

This section lists the three highest priority natural hazards the City is expected to experience. Also, included are the remainders of identified risks that threaten the City. The hazard ranking for the three profiles was determined by the Planning Team using the Hazard Assessment Matrix – Table 3.

4.2.1 Wildfire

The fire hazard of an area is typically based on the combined input of several parameters. These conditions include:

- Fuel loading - type of fuel or vegetation, its density and continuity.
- Topography - elevation and slope.
- Weather.
- Dwelling density.
- Wildfire history.
- Existing mitigation measures in place that help reduce the zone's fire rating, for example, an extensive network of fire hydrants, fire-rated construction, fuel modification zones, etc.

These conditions, as they pertain to the City are discussed in more detail in the following paragraphs. Hesperia is located in the lower Mojave Section of the Southeastern Deserts Bioregion, an area characterized by isolated, steep-sided mountain ranges separated by broad alluvial basins. The predominant natural vegetation assemblage in the lower elevation areas of the Mojave section is desert shrub, which may include alkali sink vegetation, creosote bush scrub and succulent scrub (Brooks and Minnich, 2006). Other important vegetation types include Joshua Trees woodland (Figure 4), shad-scale scrub, creosote bush scrub, black brush scrub and desert scrub-steppe. Importantly, about one-third of the desert floor in the Mojave section is typically barren of vegetation (Figure 5). The limited amount of vegetation and low surface fuel loads typically hinder the spread of fire.

Figure 11: Undeveloped slopes along the Mojave River and Hesperia Lake Park, showing some of the vegetation common to the area.

Figure 12: Typical Fuel Loads in Hesperia, consisting of scattered tree stands and scrubland separated by areas barren of vegetation.

Hesperia is predominantly dry due to the rain-shadow effect caused by the Peninsular Ranges. Average annual precipitation in Hesperia is about 5 to 6 inches, with nearly 70 percent of this precipitation measured in the winter months, between December and March. About 10 percent of the precipitation falls in the summer, between July and September, associated with thundershowers triggered by the North American monsoon that originates in the Gulfs of California and Mexico. Variations in the annual precipitation for this region is relatively high compared to other California regions, however and as a result, there is a significant variation in the frequency and extent of wildfires in the area. In years when rainfall is above average, an increased amount of fine fuels in the desert floor can result in an increase of fire spread. Long-term variations in rainfall rates have also been noted in this region, with alternating periods of high rainfall and drought, each lasting 20 to 30 years. For example, a mid-century drought was reported between 1946 and 1977, followed by a high-rainfall period between 1977 and 1998. More recently, below-average rainfall was recorded between 1999 and 2004 and on January and February of 2010, the City received 5.5

inches of rain in three days, with the the total rainfall a two week period of approximately 8.6 inches.

4.2.2 Wildfire Occurrences

According to the California Department of Forestry and Fire Protection (Cal Fire) several larger (greater than 300 acres) historical wildfires between 1930 and 2008 have occurred in the City, its Sphere of Influence and the areas to the south, (See Plate 4-1). Those wild land areas that have not burned in more than 30 years are at higher risk of burning again in the near future, due to the high density and continuity of the fuel load. Many smaller wildfires in the City are not captured by the Cal Fire database. Some of the most recent fires both large and small have affected the City and adjacent areas are described below, in Table 3. Although not all of these fires occurred in the City, some are mentioned because they affected major roadways that provide either access in and out of the City, or had an impact on the air quality.

Some Historical Wildfires Reported In and Around the City of Hesperia

Date	Location	Description
July 6, 1999	11 miles south of Hesperia	The fire burned 2,576 acres, destroyed one mobile home and two sheds. Residents from Summit Valley and Oak Hills were forced to evacuate. Highway 138 was closed. There was $100 K in property damage.
August 28 to September 9, 1999	Lucerne and Apple Valleys, east and south of Hesperia	This fire consumed 63,486 acres starting three miles south of Lucerne Valley and extending to within four miles northwest of Fawnskin. Thirteen firefighters sustained minor injuries. Property damage was estimated at $11.7 million.
May 11, 2001	Mojave River Bed, Apple Valley	This fire started on the riverbed and burned 25 acres. One nearby school was evacuated. One firefighter was treated for heat exhaustion. There was no structure damage.
June 19, 2001	Cajon Pass	The Baldy Fire started near the intersection of Interstate 5 and Highway 138. 125 acres were burned forcing the closure of both roads and the Union Pacific rail tracks.
July 22, 2002	Hesperia	Strong winds and extremely dry conditions fanned a house fire in Hesperia. Five outbuildings were destroyed for an estimated $55 K in property damages.
June 15, 2003	Hesperia	A brush fire burned 80 acres. One firefighter was injured when a boulder rolled down the hill and broke his leg.
July 27, 2003	Hesperia	This brush fire burned 10 acres.
September 17, 2003	Hesperia	A brush fire consumed 40 acres and briefly threatened several homes in Oak Hills.
October 1, 2003	Mojave Riverbed, three miles east to southeast of Victorville	This brush fire burned 10 acres. No structures were damaged.

October 25 to November 14, 2003	Six miles south of Hesperia to seven miles north of Lake Arrowhead	The Old Fire was started by an arsonist on October 25 consuming 91,200 acres before it was fully contained on November 5. The fire destroyed 993 homes and damaged another 35, 10 commercial buildings, 1,460 power poles, 220 electrical transformers and several miles of highway and utility infrastructure. Six deaths and 12 injuries were directly attributed to the fire. An estimated 80,000 people from the San Bernardino Mountain areas were evacuated the first day, causing a 28-mile traffic jam on Highway 18. Over the next few days, the communities of Silverwood Lake, south Hesperia, Oak Hills, Summit Valley, Telephone Canyon and Las Flores were evacuated. On the second day, the fire merged with the Grand Prix fire. On the third day, the fire burned through the Cajon Pass and onto the foothills towards Hesperia. Rain, sleet and snow that feel between November 11 and 13 slowed fire growth. The fire caused an estimated $975 million in property damage; the cost of firefighting the fire was more than $42.3 million.
September 7, 2004	Cajon Pass to Baldy Mesa	The Runway Fire was started by a car accident and eventually burned 1,700 acres of brush in the San Bernardino National Forest. The fire forced the closure of seven miles of Highway 138. One home in Baldy Mesa was damaged slightly by the heat, causing about $1,000 in property damage.
April 1, 2007	Hesperia	This fire burned more than 1,400 acres and forced the evacuation of more than 500 residents. Damage was limited to the roof of one residential structure and the destruction of one outbuilding.

Table 5 - Some Historical Wildfires Reported In and Around the City of Hesperia

4.2.3 Earthquake/Geologic Hazards

An earthquake is a sudden, rapid shaking of the Earth caused by the breaking and shifting of rock beneath the Earth's surface. For hundreds of millions of years, the forces of plate tectonic have shaped the Earth and the huge plates that form the Earth's surface move slowly over, under and past each other. Sometimes the movement is gradual at other times the plates are locked together, unable to release the accumulating energy. When this accumulated energy grows strong enough, the plates break free causing the ground to shake.

Ground shaking from earthquakes can collapse buildings and bridges; disrupt gas, electric and phone service; and sometimes trigger landslides, avalanches, flash floods, fires and huge destructive ocean waves, tsunamis. Buildings with foundations resting on unconsolidated landfill and other unstable soil and trailers and homes not tied to their foundations are at risk because they can be shaken off their mountings during an earthquake. When an earthquake occurs in a populated area, it may cause deaths, injuries and extensive property damage.

Earthquakes can strike suddenly and without warning. Earthquakes can occur at any time of year and at any time of the day or night. On a yearly basis, 70 to 75 damaging earthquakes occur throughout the world. Estimates of losses from a future earthquake in the United States approach $200,000,000,000.

Table 3 shows earthquakes greater than 4.0 that were felt within the City within the last five years. None caused notable damage in San Bernardino County.

EARTHQUAKES 2005 - 2010		
Date	Name	Magnitude
June 12, 2005	Anza	5.2
June 16, 2005	Yucaipa	4.9
July 29, 2008	Chino Hills	5.4
December 6, 2008	Ludlow	5.1
January 9, 9/2009	San Bernardino	4.5
March 16, 2010	Chino Hills	4.4
April 4, 2010	El Mayor-Cucapah Earthquake	7.2
June 15, 2010	El Centro	5.7
July 7, 2010	Borrego Springs	5.4

Table 6 - Earthquakes - 2005 - 2010 City of Hesperia

Figure 6 identifies the locations of the four major faults in Southern California in relation to the City.

These faults are:

- Southern San Andreas
- San Jacinto
- Elsinore
- Garlock

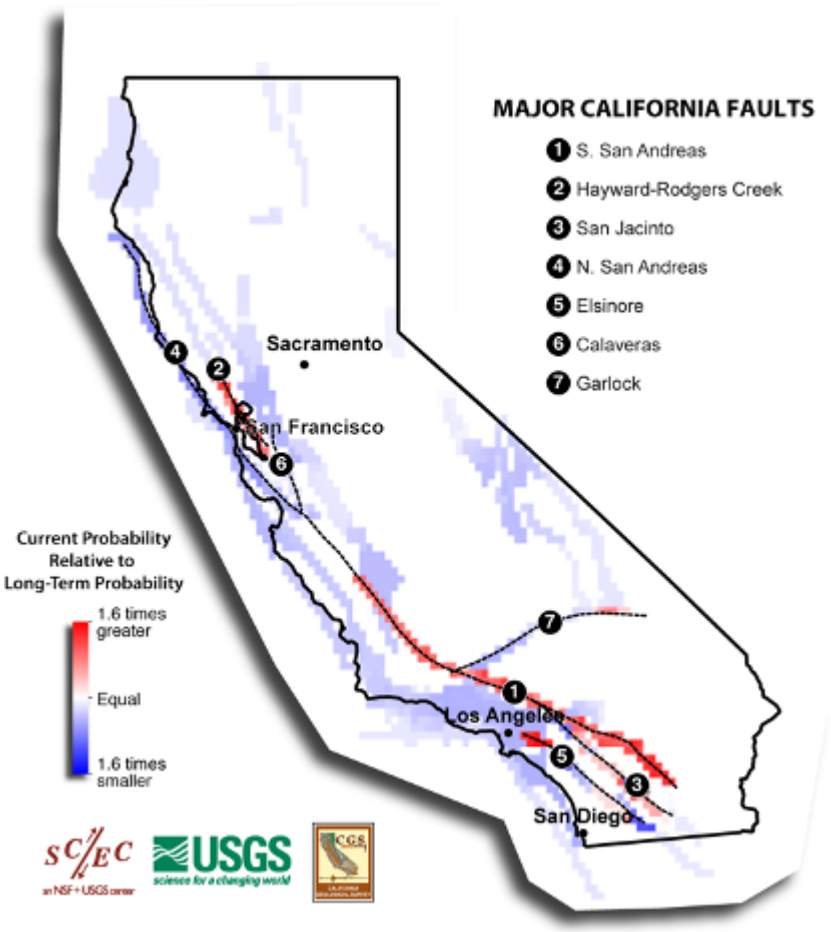


Figure 13 – Major California Faults

Other geologic hazards include liquefaction and landslides. Both occur during and after earthquakes.

Three of the seven major faults shown in Figure 6 are faults in Southern California that are expected to have a M 6.7 or greater earthquake within the next 30 years see Figure 7. These probabilities were determined in a 2008 study by the United States Geological Society (USGS) and California Geological Survey (CGS) Special Publication 42, Interim Revision 2007, "Fault-Rupture Hazard Zones in California - Alquist-Priolo Earthquake Fault Zoning Act".

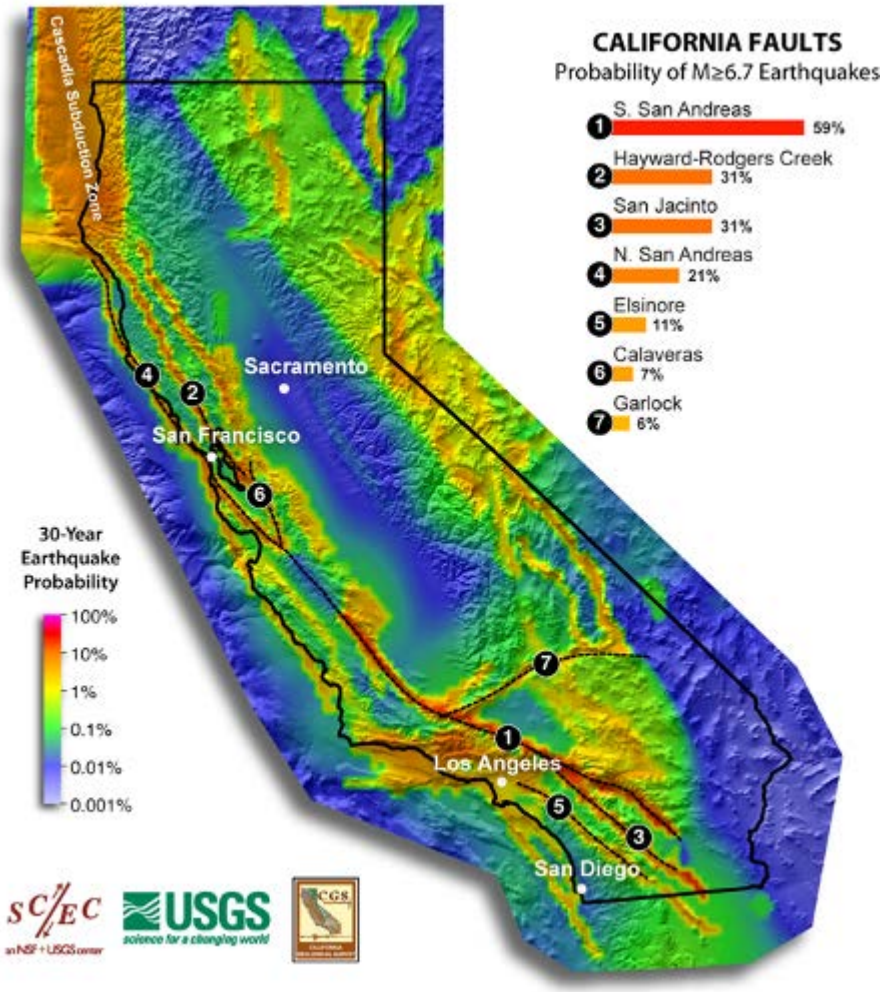


Figure 14 – California Faults

Figure 8 illustrates highest concentrations of combined population density and social vulnerability in Southern California, the San Francisco Bay area and the Central Valley areas in relation to San Bernardino County. The map also shows that a significant portion of the residents of San Bernardino County are susceptible to a catastrophic earthquake. (California 2010 Seismic Hazards Zonation Program (SHMP) Section 5).

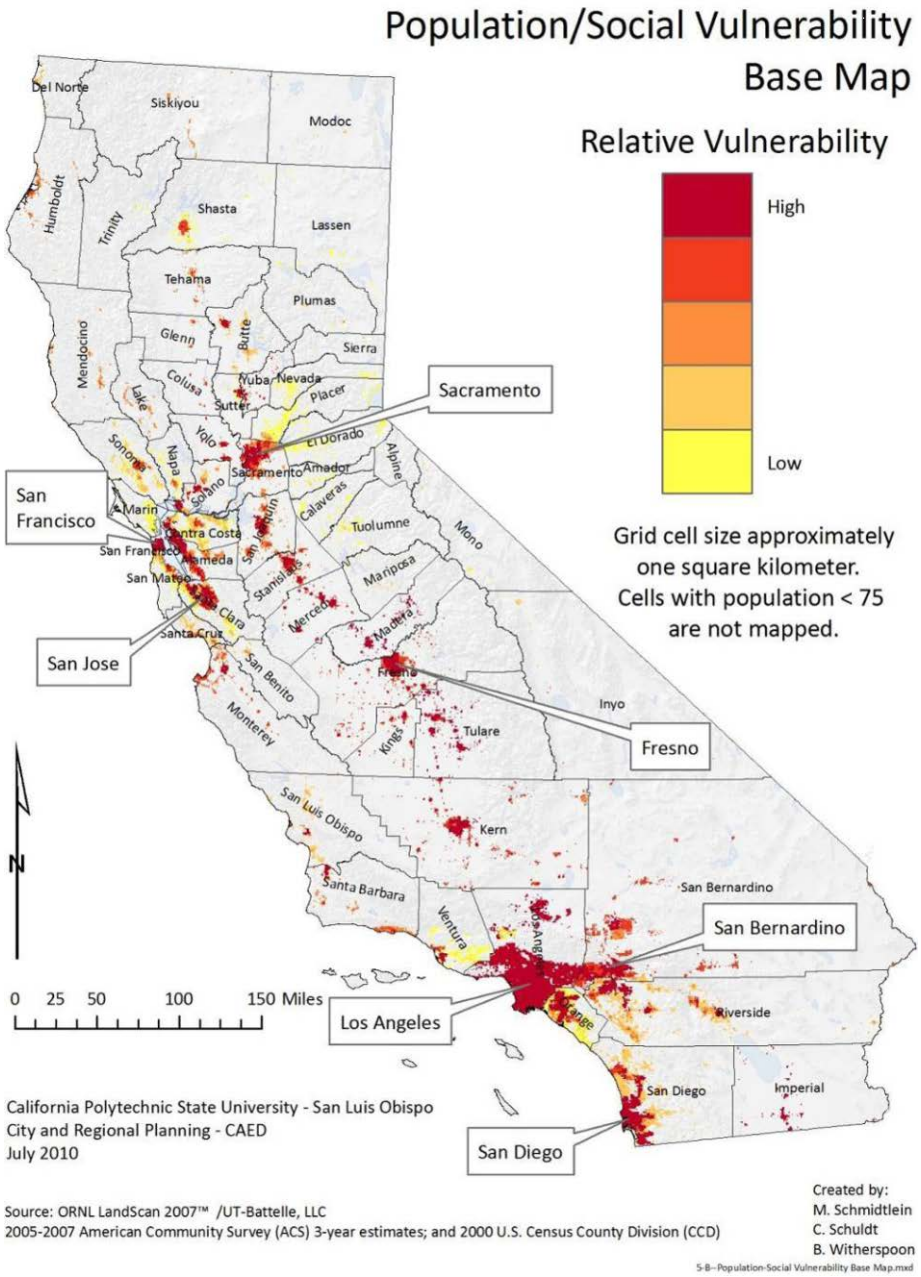


Figure 15 - Population/Social Vulnerability Base Map

The probabilities of a catastrophic earthquake with a M 6.7 occurring in San Bernardino County within the next 30 years are calculated by the USGS, CGS and the Southern California Earthquake Center (SCEC) to be 99%. See Figure 9.

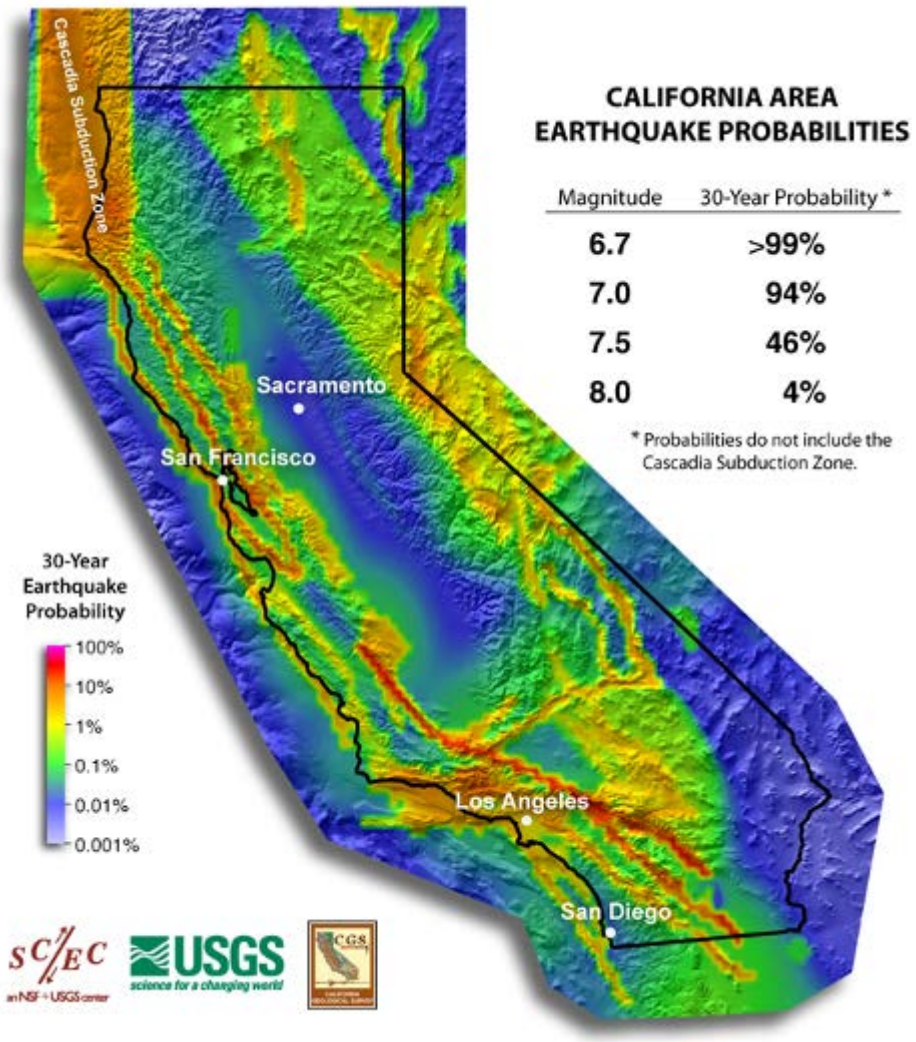
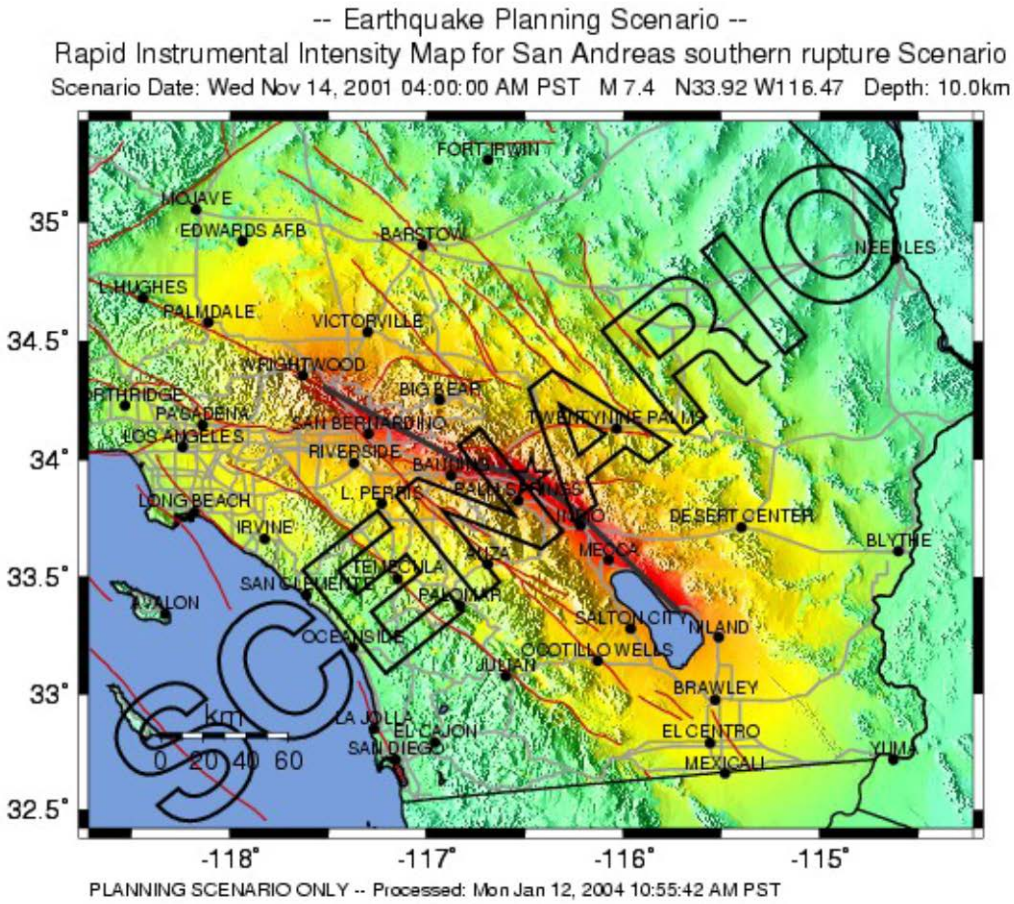


Figure 16 - California Area Earthquake Probabilities By Magnitude By Probability



PERCEIVED SHAKING	Not felt	Weak	Light	Moderate	Strong	Very strong	Severe	Violent	Extreme
POTENTIAL DAMAGE	none	none	none	Very light	Light	Moderate	Moderate/Heavy	Heavy	Very Heavy
PEAK ACC.(%g)	<.17	.17-1.4	1.4-3.9	3.9-9.2	9.2-18	18-34	34-65	65-124	>124
PEAK VEL.(cm/s)	<0.1	0.1-1.1	1.1-3.4	3.4-8.1	8.1-16	16-31	31-60	60-116	>116
INSTRUMENTAL INTENSITY	I	II-III	IV	V	VI	VII	VIII	IX	X+

Source: http://earthquake.usgs.gov/eqcenter/shakemap/sc/shake/SAF_south7.4_se/download/intensity.jpg

Figure 17: Shake Map for a Hypothetical Magnitude 7.4 Earthquake on the Southern San Andreas Fault

Liquefaction is a geologic process that causes various types of ground failure. It typically occurs in loose, saturated sediments primarily of sandy composition, in the presence of ground accelerations over 0.2g (Borchardt and Kennedy, 1979; Tinsley and Fumal, 1985). When liquefaction occurs, the sediments involved have a total or substantial loss of shear strength and behave like a liquid or semi-viscous substance. Liquefaction can cause structural distress or failure due to ground settlement, a loss of bearing capacity in the foundation soils and the buoyant rise of buried structures. The excess hydrostatic pressure generated by ground shaking can result in the formation of sand boils or mud spouts and/or seepage of water through ground cracks.

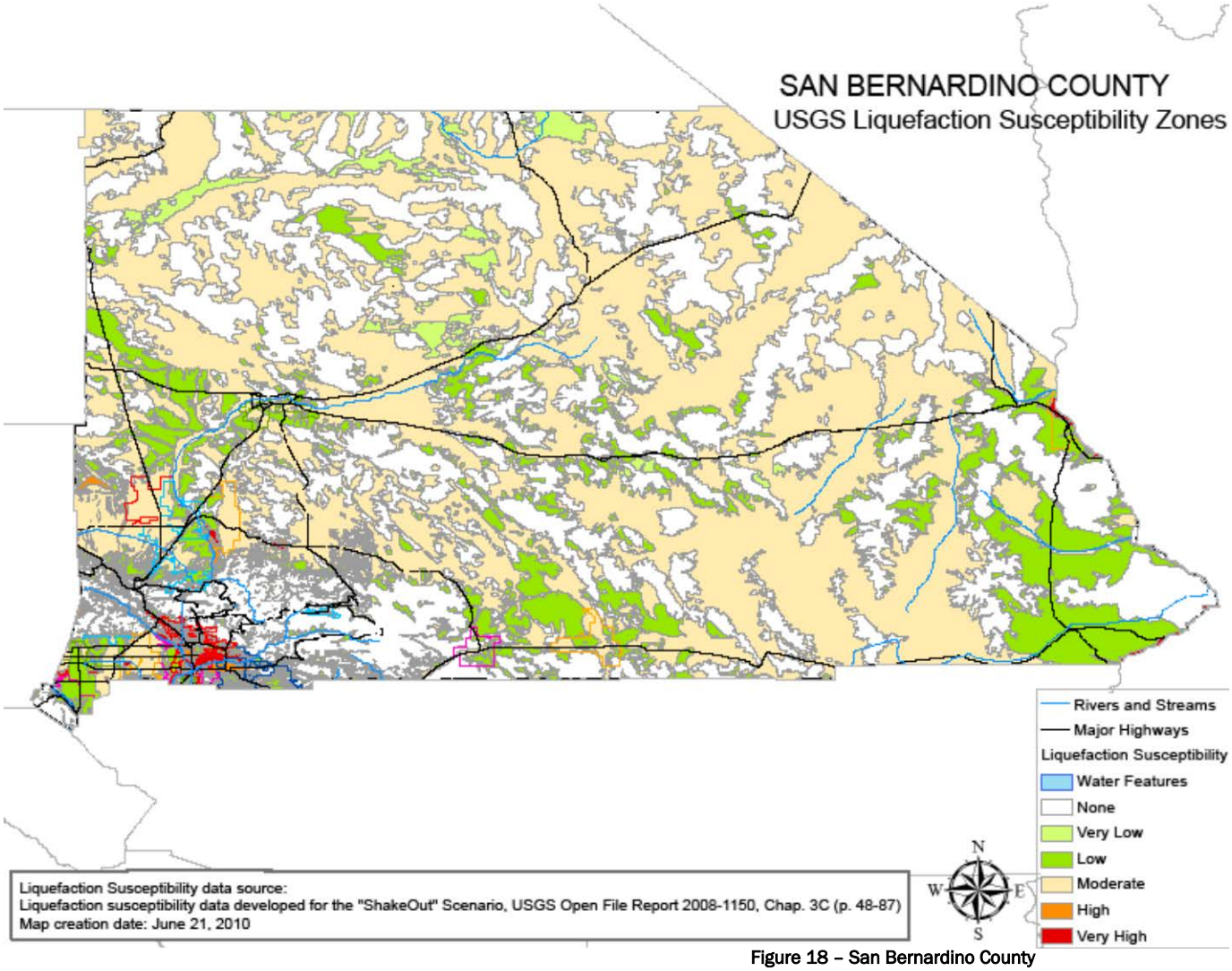


Figure 18 – San Bernardino County
USGS Liquefaction Susceptibility Zones

Should a M 7.8 earthquake strike along the San Andreas Fault HAZUS-MH Program predicts that Citywide there would be catastrophic building damage and economic loss. See Section 4.3 Inventory Assets, Table 9 - Direct Economic Loss, Casualties and Building Damage by General Building Type in section 4.3.3 below for details on loss. This same table also lists losses the City may incur from two smaller (M 6.7) highly likely earthquakes on either the San Jacinto fault or Chino Hills fault.

4.2.4 Flood

Floods are the most common and widespread of all natural disasters—except fire. Most communities in the United States have experienced some kind of flooding, after spring rains, heavy thunderstorms, or winter snow thaws.

Similarly, to earthquakes, floods are natural and recurrent events that generally do not pose a hazard when they occur in an underdeveloped area; it is only when the floods interact with the built environment, typically in the form of structures built on the floodplain, where the floodwaters are obstructed. Unfortunately, as development in floodplains has increased, the average annual losses due to flooding have steadily increased.

Like most of Southern California, Hesperia is subject to unpredictable seasonal rainfall. Every few years, the region is subjected to periods of intense and sustained precipitation. Most of the flooding occurs in the numerous washes, natural drainage courses, drainage easements and floodways. The construction of the Mojave Forks Dam in 1971 greatly reduced the impact of flooding along the Mojave River, although a few parcels adjacent to the river are still at risk. Most of Hesperia is located on alluvial fans, relatively flat to sloping areas covered with sediment deposited by shallow, intermittent streams that spread out away from their source in the mountains to the south. The historical and geological records show that alluvial fan flooding is predictable and floodwaters can travel at dangerously high speeds, be highly erosive and can carry large amounts of sediment and other debris. These characteristics make it difficult to assess the flood risk and develop reliable mitigations for alluvial fans.

According to the National Flood Insurance Program, the City of Hesperia has one repetitive loss property within its jurisdiction. This repetitive loss property is residential and is located on Alston. The City of Hesperia has installed a ***** storm drain to mitigate this issue. There should be no further claims for flood damages to this property due to the ***improvements.

StormReady

The City of Hesperia was recognized as a “StormReady” Community on August 17, 2005. In order to be acknowledged as a StormReady City, the City had to coordinate with the San Diego National Weather Service Office, the office responsible for the City of Hesperia. The StormReady Program requires the City establish storm guidelines demonstrating the ability to properly prepare for, respond to flooding and flash flooding incidents that may threaten the City and its residents.

Severe Weather Events 2004 to 2010

Severe Weather Events 2004-2010		
Number	Date	Type
1.	August 13, 2004	Monsoon thunderstorms - Flooding
2.	October 20, 2004	Heavy Record Rainfall with flooding
3.	December 28, 2004	Heavy Winter Rains – Flooding
4.	December 31, 2004	Heavy Rain – Flooding
5.	January 7, 2005	Heavy Winter Storm
6.	February 18, 2005	Heavy Rain - Flooding
7.	July 24, 2005	Thunderstorms – Flooding
8.	July 30, 2005	Thunderstorms – Flash Flooding
9.	July 31, 2005	Thunderstorms – Flash Flooding
10.	September 9, 2005	Thunderstorms – Flash Flooding
11.	July 7, 2006	Thunderstorms-Flooding
12.	October 13, 2006	Thunderstorms and Flooding
13.	November 30, 2007	Heavy Rains
14.	August 14, 2008	August Thunderstorms
15.	January 18, 2010	January 2010 Winter Storm
16.	February 5, 2010	February 2010 Winter Storm

Table 7 – Severe Weather Events 2004-2010

Major Storms

The 2004-05 rainy seasons had already turned out to be one for the records. With the three prior storms, two in October and one at the end of December, the ground was already saturated prior to the January 7 – 11 event, which was only the first of a series of additional storms to hit the City.

During the 2010 Severe Winter Storm event January through February 2010, the City experienced its annual 5.5 percent rainfall in a three day period, the total rainfall for the two week period was approximately 8.6 inches. This storm resulted in $2.5 million dollars in storm related damages.

4.2.5 Other Hazards

The remainder of identified natural hazards for the City are:

- Dam Failure

- Flooding
- Technology Hazards
    - Hazardous Materials
- Human Hazards
    - Terrorism

The remaining hazards are not discussed further in this HMP, they are part of the City's 2010 General Plan and are further addressed in the City Building Codes and Ordinance.

4.3 Inventory Assets

4.3.1 Population

Hesperia's current population of more than 84,000 residents is expected to double by the year 2025.

4.3.2 Buildings

Table 7 identifies replacement values for structures and content by type and the number of each type of building in the City. This information is from the FEMA project "General Building Stock and Essential Facilities Update", completed in 2009. The project located and incorporated data for all buildings and structures I the City of Hesperia including essential facilities. The data was used to produce predictions for earthquakes and flooding using FEMA's HAZUS-MH Program. This program produces loss estimates for earthquakes and floods of varying size and magnitude for any given area of the United States.

Building Inventory Information by General Occupancy	Building Replacement Value ($1,000)	Contents Replacement Value ($1,000)	Building Square Footage (1,000 Sq. Ft.)	Building Count
Residential	$3,918,861	$1,959,371	38,384	23,061
Commercial	$397,761	$413,938	4,292	460
Industrial	$77,355	$116,037	1,025	85
Other	$271,631	$144,156	1,799	553
TOTAL	**$4,665,608**	**$2,633,502**	**45,501**	**24,159**

Selected Building Inventory Data by General Building Type	Building Replacement Value ($1,000)	Building Replacement Value (%)	Estimated Building Count	% of Building Count
Concrete	$109,542	2.3%	114	0%
Manufactured Housing	$32,335	0.7%	793	3%
Precast Concrete	$87,834	1.9%	95	0%
Reinforced Masonry	$242,548	5.2%	387	2%
Steel	$45,770	1.0%	61	0%
Unreinforced Masonry	$7,572	0.2%	8	0%
Wood Frame (Other)	$472,717	10.1%	592	2%
Wood Frame (Single-family)	$3,667,290	78.6%	22,108	92%
TOTAL	**$4,665,608**		**24,159**	

Table 8 – Inventory Assets

4.3.3 Critical Facilities

The Hesperia Police Department (County of San Bernardino Sheriff's Department) maintains a list of all structures, facilities and schools within the City with contact numbers.

General List of City Critical Facilities and Their Critical Rank

Name	Facility Type	Critical Rank
City Facilities	Government Facilities	Critical
Fire Stations	Fire Stations	Critical
Sheriff/Police Stations	Police Stations	Critical
Radio/Communication Towers	Other	Critical
Schools	Other	High
Water Pump Stations	Water and Sewer	High

Table 9 - General List of City Critical Facilities and Their Critical Rank

Utility Agencies

The utilities and transportation infrastructure is another significant concern for the City. Various laws, ordinances, regulations, standards and guidelines have been established to ensure property and thorough mitigation measures to decrease the effects of hazards.

The following are two of the major utility agencies:

Southern California Edison (SCE)

SCE has undertaken an all-hazards approach to planning for an emergency event. SCE has developed an Emergency Response and Recovery Plan to provide a safe and reliable electrical service. SCE also has a long-standing relationship with the City and is an active member of several local, state and federal organizations. According to SCE, they have acted to mitigate the impacts of hazards on their electrical systems.

Southwest Gas Corporation (SWG)

SWG also coordinates with the City and maintains a nature gas high-pressure system that consists of approximately 100 miles of underground pipelines. The system also includes some above ground facilities. The total replacement cost for the entire system is approximately $40,000,000. SWG conducts annual training for the first responders within their service territories to teach the proper methods of responding to and working with natural gas leaks. Staff from SWG serves on local emergency management committees within their service territory.

The Essential Facilities Damage Table – Table 9 identifies what may happen to essential facilities in the City for three different scenario earthquakes.

		Earthquake Scenario		
	FACILITY TYPE	M 7.8 ShakeOut Scenario (including Liquefaction)	M 6.7 San Jacinto Fault (including Liquefaction)	M 6.7 Chino Hills Fault (including Liquefaction)
EOCs	City of Hesperia			
	Total Number of Buildings	1		
	Damage:			
	# Buildings with >50% Probability of Moderate or Greater Damage	0	0	0
	# Buildings with >50% Probability of Complete Damage	0	0	0
	Functionality:			
	Functionality < 50 % on Day 1	1	0	0
	Functionality 50 - 75% on Day 1	0	0	0
	Functionality >75% Day 1	0	1	1
Schools	Hesperia Unified School District			
	Total Number of Buildings	517		
	Damage:			
	# Buildings with >50% Probability of Moderate or Greater Damage	1	0	0
	# Buildings with >50% Probability of Complete Damage	0	0	0
	Functionality:			
	Functionality < 50 % on Day 1	210	0	0
	Functionality 50 - 75% on Day 1	297	1	0
	Functionality >75% Day 1	10	516	517

Table 10 - Essential Facilities Status - Earthquake Scenarios

4.4 Vulnerability Assessment

4.4.1 Methodology

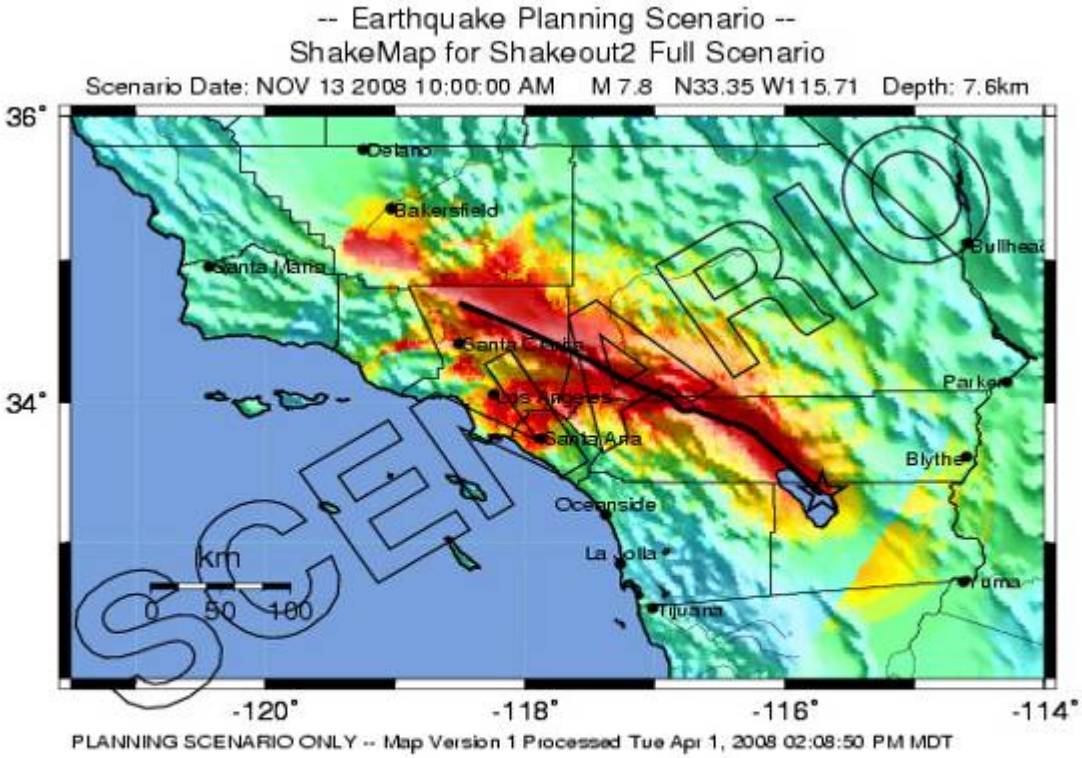
This section serves to identify each hazard confronting the City and its vulnerabilities to that hazard. Methodology identified risks included in the 2005 HMP were reviewed. Frequency of occurrence and magnitude of each type of event for the five years since the 2005 were added to the databases. These databases of frequency and severity were considered in the review process to determine if the rankings of the 2005 risks and vulnerabilities should be changed.

4.4.2 Results for Earthquakes

A. Population – approximately 2.21 percent of the City's population is vulnerable.
B. Critical Facilities
    a. Approximately ten percent of the City's critical facilities are vulnerable
    b. The specific critical facilities in the City are, bridges, highways and infrastructure that has not built or retrofitted with sufficient strength to overcome the force of the earthquake.

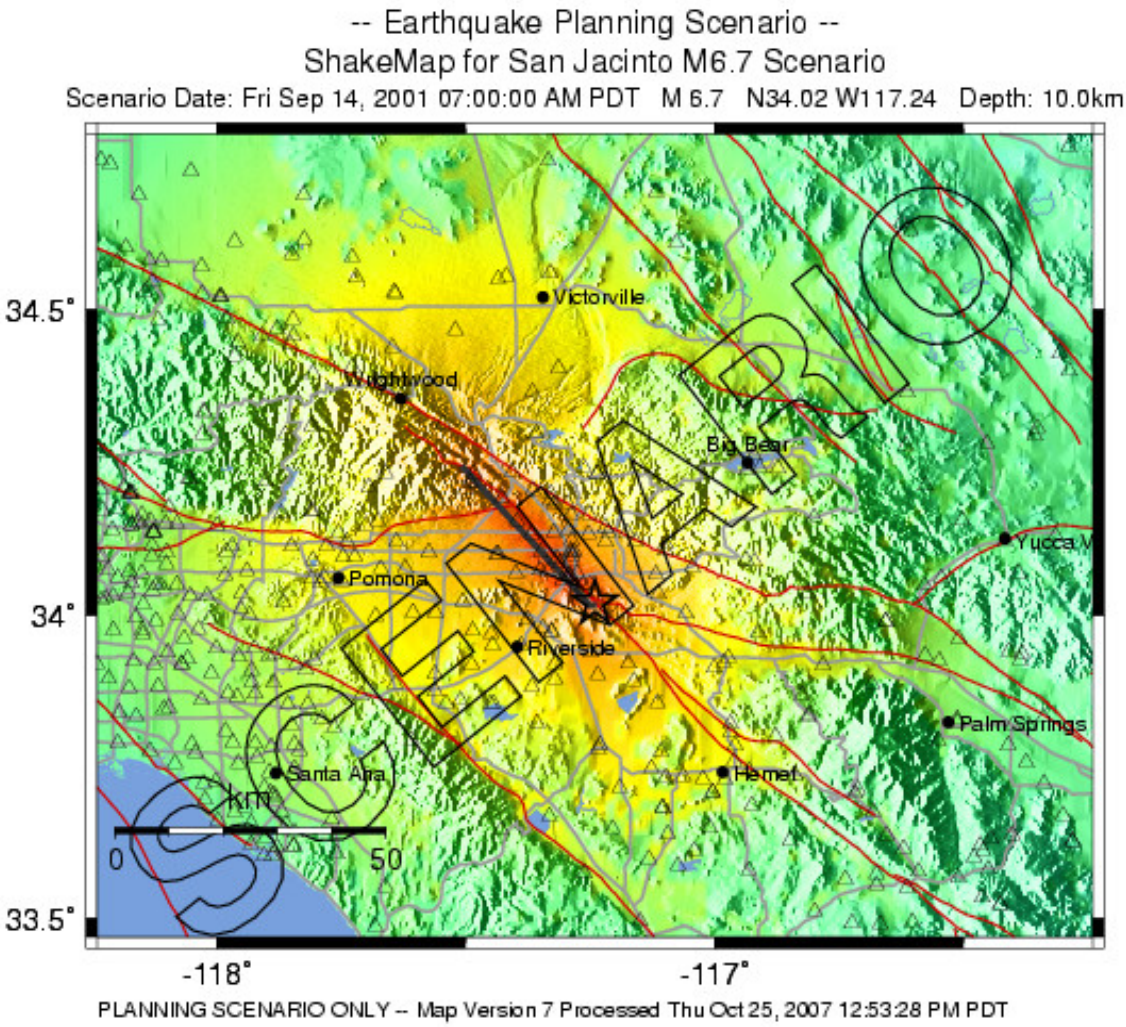
Below are shake maps for the three scenario earthquakes generated for the 2010-Multi-Jurisdictional Multi-Hazard Mitigation Plan. The three scenarios are:

- M 7.8 Southern San Andreas Fault – Figure 11
- M 6.7 San Jacinto Fault – Figure 12
- M 6.7 Chino Hills Fault – Figure 13



PERCEIVED SHAKING	Not felt	Weak	Light	Moderate	Strong	Very strong	Severe	Violent	Extreme
POTENTIAL DAMAGE	none	none	none	Very light	Light	Moderate	Moderate/Heavy	Heavy	Very Heavy
PEAK ACC.(%g)	<.17	.17-1.4	1.4-3.9	3.9-9.2	9.2-18	18-34	34-65	65-124	>124
PEAK VEL.(cm/s)	<0.1	0.1-1.1	1.1-3.4	3.4-8.1	8.1-16	16-31	31-60	60-116	>116
INSTRUMENTAL INTENSITY	I	II-III	IV	V	VI	VII	VIII	IX	X+

Figure 19 - Scenario 1: M 7.8 Earthquake - Southern San Andreas Fault



PERCEIVED SHAKING	Not felt	Weak	Light	Moderate	Strong	Very strong	Severe	Violent	Extreme
POTENTIAL DAMAGE	none	none	none	Very light	Light	Moderate	Moderate/Heavy	Heavy	Very Heavy
PEAK ACC.(%g)	<.17	.17-1.4	1.4-3.9	3.9-9.2	9.2-18	18-34	34-65	65-124	>124
PEAK VEL.(cm/s)	<0.1	0.1-1.1	1.1-3.4	3.4-8.1	8.1-16	16-31	31-60	60-116	>116
INSTRUMENTAL INTENSITY	I	II-III	IV	V	VI	VII	VIII	IX	X+

Figure 20 - Scenario 2: M 6.7 Earthquake San Jacinto Fault

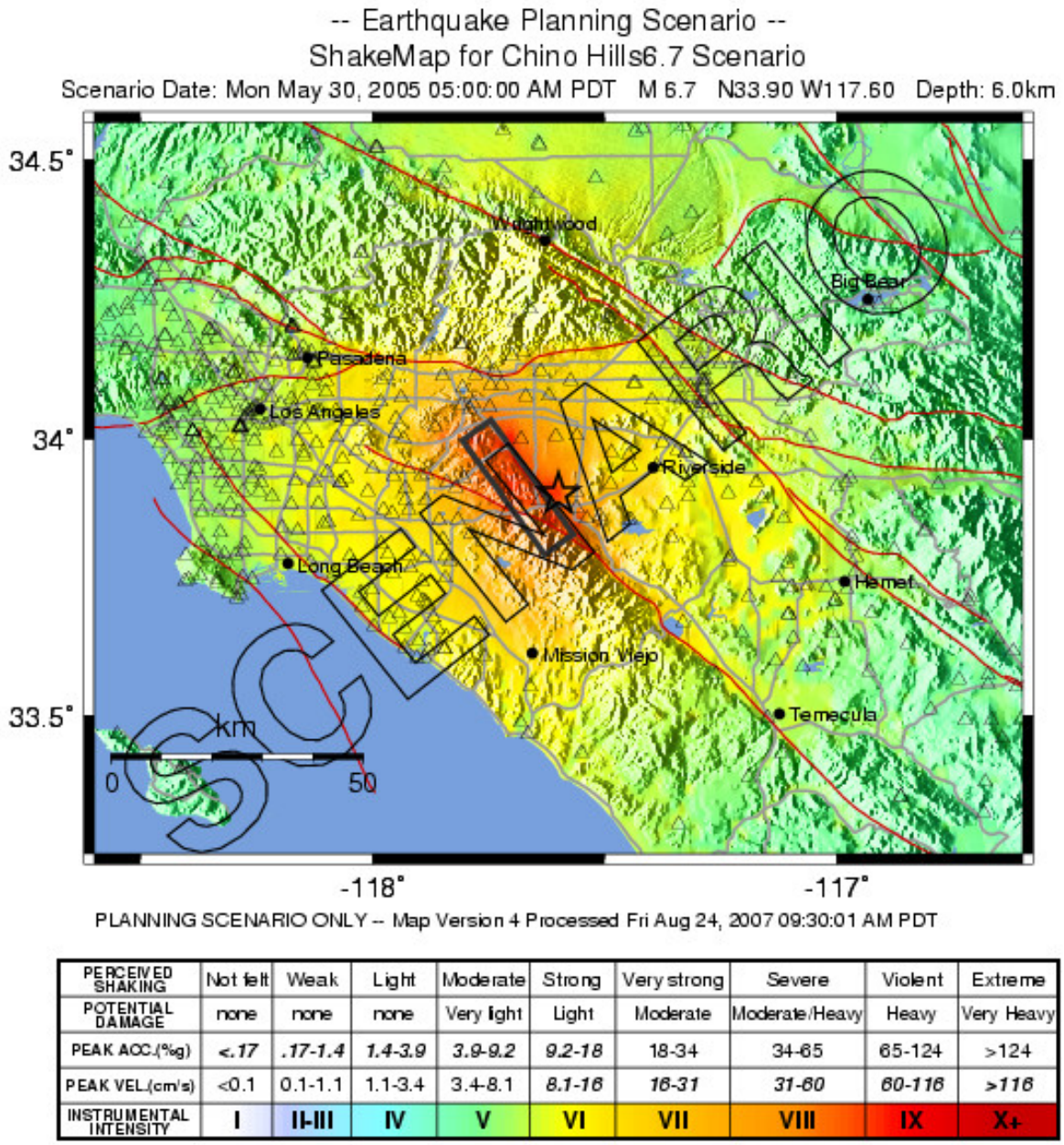


Figure 21 - Scenario 3: M 6.7 Earthquake Chino Hills Fault

Table 9 summarizes Direct Economic Loss, Casualties and Building Damage by General Building Type for the three earthquake scenarios. The statistics were derived from HAZUS using the 2009 updated data.

		Earthquake Scenario		
		M 7.8 ShakeOut Scenario (including Liquefaction)	M 6.7 San Jacinto Fault (including Liquefaction)	M 6.7 Chino Hills Fault (including Liquefaction)
Direct Economic Losses for Buildings ($1,000)				
	Total Building Exposure Value	4,665,608		
Capital Stock Losses	Cost of Structural Damage	23,121	1,841	155
	Cost of Non-Structural Damage	114,628	12,977	1,855
	Total Building Damage (Str. + Non-Str.)	137,749	14,818	2,010
	Building Loss Ratio %	3.0%	0.3%	0.0%
	Cost of Contents Damage	39,766	5,350	905
	Inventory Loss	506	91	20
Income Losses	Relocation Loss	12,023	421	30
	Capital-Related Loss	1,414	52	5
	Rental Income Loss	4,617	227	21
	Wage Losses	2,541	91	8
	Total Direct Economic Loss	**198,616**	**21,051**	**2,998**
	% Of Countywide Loss	0.9%	0.4%	0.1%
Casualties				
Day Casualties	**Casualties - 2 pm**			
	Fatalities	0	0	0
	Trauma injuries	0	0	0
	Other (non-trauma) hospitalized injuries	0	0	0
	Total hospitalized injuries	**0**	**0**	0
	Injuries requiring Emergency Department Visits	36	2	0
	Injuries treated on an Outpatient basis	71	4	0
	Total injuries	**107**	**6**	0
	Hospital visits requiring EMS transport	2	0	0
Night Casualties	**Casualties - 2 am**			
	Fatalities	0	0	0
	Trauma injuries	0	0	0
	Other (non-trauma) hospitalized injuries	0	0	0
	Total hospitalized injuries	**0**	**0**	**0**
	Injuries requiring Emergency Department Visits	73	4	0
	Injuries treated on an Outpatient basis	145	9	1
	Total injuries	**218**	**13**	**1**
	Hospital visits requiring EMS transport	3	0	0

Shelter				
Shelter	Number of Displaced Households	308	5	0
	Number of People Requiring Short-term Shelter	124	2	0
Debris (thousands of tons)				
Debris	Brick, Wood & Other (Light) Debris	26	2	< 1
	Concrete & Steel (Heavy) Debris	15	0	< 1
	Total Debris	**41**	**2**	**< 1**
Building Damage Count by General Building Type				
Concrete	None	49	107	113
	Slight	41	7	1
	Moderate	21	1	0
	Extensive	2	0	0
	Complete	0	0	0
	TOTAL	**114**	**114**	**114**
Manuf. Housing	None	2	308	662
	Slight	18	306	115
	Moderate	166	176	16
	Extensive	434	3	0
	Complete	173	0	0
	TOTAL	**793**	**793**	**793**
Precast Concrete	None	40	85	94
	Slight	39	9	1
	Moderate	16	1	0
	Extensive	0	0	0
	Complete	0	0	0
	TOTAL	**95**	**95**	**95**
Reinforced Masonry	None	192	367	386
	Slight	133	19	1
	Moderate	58	2	0
	Extensive	6	0	0
	Complete	0	0	0
	TOTAL	**387**	**387**	**387**
Steel	None	21	54	60
	Slight	24	6	1
	Moderate	14	1	0
	Extensive	1	0	0
	Complete	0	0	0
	TOTAL	**61**	**61**	**61**

Unreinforced Masonry	None	1	6	8
	Slight	1	2	1
	Moderate	3	1	0
	Extensive	2	0	0
	Complete	1	0	0
	TOTAL	**8**	**8**	**8**
Building Damage Count by General Building Type (Continued)				
Wood Frame (Other)	None	279	558	590
	Slight	248	34	2
	Moderate	62	1	0
	Extensive	3	0	0
	Complete	0	0	0
	TOTAL	**592**	**592**	**592**
Wood Frame (Single-family)	None	11,044	20,680	22,005
	Slight	10,023	1,411	102
	Moderate	1,013	17	1
	Extensive	27	0	0
	Complete	0	0	0
	TOTAL	**22,108**	**22,108**	**22,108**
ALL BUILDING TYPES	None	11,627	22,162	23,917
	Slight	10,528	1,795	225
	Moderate	1,353	198	17
	Extensive	477	3	0
	Complete	174	0	0
	TOTAL	**24,159**	**24,159**	**24,159**

Table 11 – Direct Economic Loss, Casualties and Building Damage

4.4.3 Results for Wildfire

A. Population – approximately 0.03 percent of the City's population is vulnerable.
B. Critical Facilities – all critical facilities have been protected from wildfire by building with non-combustible products and maintaining a protective space, there is little damage anticipated to these facilities.

Name	Number of
City Facilities	3
Fire Stations	5
Sheriff/Police Stations	1
Radio/Communication Towers	41
Schools – Public and Private	117
Water Pump Stations	19
Total	186

Table 12 - Critical Facilities By Number within Wildfire Hazard Area

Programs

The City shall continue to require that all new habitable structures be designed in accordance with the most recent California Fire Code with local amendments adopted by the City, including the use of fire sprinklers in residential structures.

The City will continue to conduct regular inspections of parcels throughout the City, and will direct property owners to bring their property into compliance with fire inspection standards. This includes enforcing the weed abatement and notification program, to reduce the potential for vegetation fires to occur in vacant or poorly maintained lots and encouraging homeowners to follow fire-safe practices, including maintaining a fire-safe landscape and keeping combustibles (such as fire wood) a safe distance away from all structures.

Select City staff will coordinate with the San Bernardino County Fire Department and train in NIMS-compliant emergency response procedures to provide assistance as needed during emergencies. This includes conducting emergency response exercises, including mock earthquake-induced fire-scenario exercises, to evaluate and improve, as needed, the City's ability to respond to the multiple ignitions that an earthquake is likely to generate.

In conformance with Assembly Bill 2140 (2006) the City will adopt its HMP as an addendum to the Safety Element of the General Plan. The HMP will be updated every five years, per the requirements of the Federal Disaster Mitigation Act of 2000.

The City, in cooperation with the San Bernardino County Fire Department, will evaluate public notification systems (such as a reverse 911 system) that can be used to warn residents of an approaching wildfire and to provide evacuation instructions.

The City will encourage owners of non-sprinklered high occupancy structures to retrofit their buildings to include internal sprinklers.

The City, in cooperation with the San Bernardino County Fire Department, will ensure, to the maximum extent possible, that fire services, such as firefighting equipment and personnel, infrastructure and response times, are adequate for all sections of the City. To that end, the City will continue to regularly evaluate specific fire hazard areas and adopt reasonable safety standards, such as adequacy of nearby water supplies, fire-retardant roofing materials, fire-equipment accessible routes, clarity of addresses, street signage and street maintenance.

The City, in cooperation with the San Bernardino County Fire Department, will ensure that the Hesperia Water District conducts annual fire flow tests and addresses any deficiencies found as soon as possible.

The City, in cooperation with the San Bernardino County Fire Department, will develop and hold regular training exercises that involve residents as much as possible, such as through the CERT program, to empower individuals and neighborhoods to be self-reliant in the aftermath of a natural or manmade disaster.

The City will adopt the most recent version of the Wild land-Urban Interface Code and Chapter 7A of the California Building Code for use in the City where the Insurance Services Offices (ISO) number exceeds 5 (greater than 5).

4.4.4 Results for Dam Inundation

A. Population – approximately 0.08 percent of the City's population is vulnerable.
B. Critical Facilities – there are no critical facilities that would be endangered by the Mojave River.

Dam Inundation Zones for the City are shown in Plate 3-2. Data is compiled from plans and information provided by the City's 2010 General Plan.

Dam Inundation Zones are subject to flooding should a dam upstream break during an earthquake or as the result of flooding.

4.4.5 Results for Flash Flooding

A. Population – approximately 0.73 percent of the City's population is vulnerable.
B. Critical Facilities – approximately ten percent of the City's are vulnerable. The specific critical facilities vulnerable are: roadways and the northwest quadrant of town.

The 2004-05 rainy seasons had already turned out to be one for the records. With the three prior storms, two in October and one at the end of December, the ground

was already saturated prior to the January 7 – 11 event, which was only the first of a series of additional storms to hit the City.

During the 2010 Severe Winter Storm event January through February 2010, the City experienced its annual 5.5 percent rainfall in a three day period, the total rainfall for the two week period was approximately 8.6 inches. This storm resulted in $2.5 million dollars in storm related damages.

Programs

The City shall continue enforcing the City's Municipal Code provisions for flood hazard reduction (Title 8: Safety, Chapter 8.28: Flood Hazard Protection and Regulations). This code, which applies to new construction and existing projects undergoing substantial improvements, provides constructions standards that address the major causes of flood damage and includes provisions for anchoring, placement of utilities, raising floor elevations, using flood resistant construction materials and other methods to reduce flood damage.

The City will require that new discretionary development proposals include, as a condition of approval, hydrological studies prepared by a State-certified engineer with expertise in this area, that assess the impact that the new development will have on the flooding potential of existing development down-gradient. The studies shall provide mitigation measures to reduce this impact to an acceptable level. Single-family residences on existing lots should be exempted.

The City shall continue participation in the National Flood Insurance Program and require that all owners of properties located within the 100-year floodplain (Zones A and AE) and repeat-flood properties in Zone X purchase and keep flood insurance for those properties.

The City will continue to participate in the Storm Ready Program with the National Weather Service, including the monitoring of precipitation and snow levels on the mountains to the south, providing storm watches and warnings in real-time and issuing evacuation notices for affected neighborhoods in a timely manner, such as with a reverse a citizen notification or similar system.

The City will not permit any new facilities that use or store hazardous materials in quantities that would place them in the State's TRI or SQG databases located in the flood zone), unless all standards of elevation, anchoring and flood proofing have been implemented to the satisfaction of the City's Building Department and the San Bernardino County Fire Department. The hazardous materials shall be stored in watertight containers that are not capable of floating or similar flood-proof receptacles or tanks.

The City will require all essential and critical facilities in or within 200 feet of Flood Zones A, AE and X, or the dam inundation pathways, to develop disaster response

and evacuation plans that address the actions that will be taken in the event of flooding or inundation due to catastrophic failure of a dam.

The City will regulate development in drainages, especially in Flood Zones A and AE, pursuant to FEMA regulations.

Section 5 Community Capability Assessment

5.1 Agencies and People

The agencies involved in developing the 2010 updated Hazard Mitigation Plan for the City of Hesperia included representatives from the following departments:

- City Manager's Office
- Community Development Department
    - Building and Safety Division
    - Planning Division
- Development Services Department
    - Engineering
    - Public Works/Water
    - Public Works/Streets
- Economic Development Department

Additional agencies involved in the development of this plan included:

- San Bernardino County Fire Department
    - Office of Emergency Services
- San Bernardino Sheriff's Department
- Cal EMA
- Hesperia Recreation and Parks District
- Hesperia School District

5.2 Existing Plans

<u>Existing City of Hesperia Plans and Documents:</u>

- Hesperia General Plan 2010 available online at http://www.Cityofhesperia.us/DocumentView.aspx?DID=1293
- City of Hesperia Emergency Operations Plan. Update under review by Cal EMA.
- Technical Background Report to the Safety Element of the General Plan for the City of Hesperia, San Bernardino County, California.

Information in the documents mentioned above is included in the 2010 updated Hazard Mitigation Plan. In turn, information contained in the 2010 updated Hazard Mitigation Plan will be used in other plans to enhance planning development.

Section 65358 of the California Government Code requires that mandatory elements of the jurisdiction's General Plan be amended no more than four times during a single calendar year. The seven mandatory elements of the 2010 General Plan are the:

- Land Use Element
- Circulation Element
- Housing Element
- Open Space Element
- Noise Element
- Conservation Element
- Safety Element

The Land Use Element of the Hesperia General Plan describes the general location, type and intensity of development and identifies the distribution of land uses throughout the City. Land uses such as residential, commercial, industrial, open space and public uses are planned to meet the needs of residents, support economical/fiscal goals and provide for the orderly development of the City.

The Safety Element of the Hesperia General Plan seeks to protect life and property from impacts associated with natural and manmade disasters. To that end, the Safety Element:

- Identifies the potential hazards that can significantly impact the City.
- Provides policies that if implemented, minimize the potential risks to residents, workers and visitors.
- Provides policies that if implemented, can reduce the losses to property resulting from a given disaster.
- Identifies procedures the City can use to respond to emergency situations.
- Investing in public safety helps make the community more sustainable, viable and prosperous.

The purpose of the Safety Element in the General Plan is to create a community that is minimally at risk from natural and manmade hazards and also responds quickly, effectively and efficiently to such hazards. This involves the design, development and maintenance of neighborhoods, commercial areas and industrial districts as safe places to live, shop, work and interact. It also involves the development and maintenance of essential facilities that remain fully functional following a disaster. The Safety Element identifies a variety of disaster preparedness, response and recovery systems that can be used to reduce loss of life, injury, damage to private property, infrastructure, economic losses and social dislocation and in the process, promote the sustainability of the City of Hesperia.

5.2.1 Seismic and Geologic Hazards

Hesperia lies across the boundary of two very distinct geomorphic provinces, each having a unique landscape that reflects the geologic, seismic and climatic processes that have affected this region in the last few million years. The very southern edge of the City encroaches into the Transverse Ranges Province, a region whose characteristic features are a series of east-west trending ranges that include the San Gabriel and San Bernardino Mountains. The ranges are called “transverse” because

they lie at an oblique angle to the prominent northwesterly grain of the Southern California landscape, a trend that is aligned with the San Andreas Fault. The Transverse Ranges are being intensely compressed by active tectonic forces; therefore, they are some of the fastest rising and fastest eroding mountains in the world. The rocks that form these mountains have been sheared and fractured under the strain of tectonic movement.

The greater part of Hesperia lies north of the mountains within the Mojave Desert Province, an arid region of overlapping alluvial fans, desert plains, dry lakebeds and scattered mountain ranges. Hesperia is underlain by the informally named Victorville Fan, which is composed of sediments ranging in age from early Pleistocene to Holocene, which is approximately one million years to less than 10,000 years old that were shed primarily from the San Gabriel Mountains. Their composition reflects that of the rocks eroded by the various streams that enter the valley from the south. Deposition is still ongoing, with the younger alluvium filling drainage channels and the Mojave River floodplain.

Faults in the Mojave Desert Province have a predominant northwesterly trend; however, some faults aligned with the Transverse Ranges are present. The east-west trending Garlock Fault defines the northern boundary of the province, whereas the northwest-trending San Andreas Fault roughly defines its western boundary. Hesperia is near the San Andreas Fault and other seismically active earthquake sources including the North Frontal, Cleghorn, Helendale and San Jacinto Faults. All these faults have the potential to generate moderate to large earthquakes that will shake Hesperia.

The following 2010 Hesperia General Plan Goals and Implementation Policies aim to reduce the effects of earthquakes and geologic hazards in the City:

Goal: SF-1 – Minimize injury, loss of life, property damage, economic and social disruption caused by seismic shaking and other earthquake-induced hazards such as slope instability, compressible and collapsible soils and subsidence.

Implementation Policy SF-1.1 – Require that all new habitable structures be designed and built in accordance with the most recent California Building Code adopted by the City, including the provisions regarding lateral forces and grading.

Implementation Policy: SF-1.2 - Require all discretionary development proposals, as well as capital improvement projects in the City to conduct, as a condition of approval, geotechnical and engineering geological investigations, prepared by State-certified professionals. Following the most recent guidelines by the California Geological Survey and similar organizations that address, at a minimum, the site-specific seismic and geologic hazards identified in the Technical Background Report. These reports shall provide mitigation measures to reduce those hazards identified at a site to an acceptable level. Recent reports completed for adjacent projects may be used if they meet the standards described above and the project proponents

receives approval from the City's Building Department to rely on previously obtained data from an adjacent lot.

Implementation Policy: SF-1.3 - City Staff or City representatives will conduct routine inspection of grading operations to ensure site safety and compliance with approved plans and specifications.

Implementation Policy: SF-1.4 - City Staff that review geotechnical, geological, structural and grading operations shall possess the necessary professional credentials and certifications within their area of expertise.

Implementation Policy: SF-1.5 - Liquefaction assessment studies shall be conducted as a condition of approval on all projects proposed in areas identified as potentially susceptible to liquefaction as identified in the City's Technical Background Report. The studies shall be conducted in accordance with the California Geological Survey's Special Publication 117: Guidelines for Evaluating and Mitigating Seismic Hazards in California (2008 or more recent version) and the Earthquake Engineering Research Center's Report No. EERC-2003-06 (or more recent version): Recent Advances in Soil Liquefaction Engineering.

Implementation Policy: SF-1.6 - If and when the California Geological Survey issues a Seismic Hazards Zonation Map that includes the City of Hesperia, the Planning and Building departments will adopt this map as a replacement for the Seismic Hazards Map in Technical Background Report. Similarly, if new or revised Alquist-Priolo Earthquake Fault Zone maps that include the City or its Sphere are issued, these maps will be adopted and enforced in conformance with the requirements of the Alquist-Priolo Earthquake Fault Zone Act.

Implementation Policy: SF-1.7 - If a critical facility is proposed across the trace of any of the secondary faults mapped within the City or its Sphere, the City's Building Department shall require, as a condition of approval, that geological studies to assess the location and recent of activity of the fault be conducted. These studies shall be conducted at the level of detail required by the California Geological Survey for fault studies in Alquist-Priolo Earthquake Fault Zones (following the guidelines in California Geological Survey's Note 49). Critical facilities include fire and police stations; City communication centers; hospitals, schools, pre-schools, nursing homes and other limited-mobility or high-occupancy populations; electrical substations and towers, water reservoirs, high-pressure or large-diameter pipelines and bridges or other key transportation structures.

Implementation Policy: SF-1.8 - The City's Building Department will encourage owners of potentially hazardous buildings, including pre-1952 wood-frame structures, concrete tilt-ups, pre-1971 reinforced masonry, soft-story structures and the one unreinforced masonry building located in the City, to assess the seismic vulnerability of their structures and conduct seismic retrofitting as necessary to improve the buildings' resistance to seismic shaking.

Implementation Policy: SF-1.9 - The City shall develop and make available to all residents and businesses literature on hazard prevention and disaster response, including information on how to earthquake-proof residences and places of business and information on what to do before, during and after an earthquake. Reminders should be issued periodically to encourage the review and renewal of earthquake preparedness kits and other emergency preparedness materials and procedures.

Implementation Policy: SF-1.10 - The Public Works Department will encourage the City's utility service providers to continue upgrading their facilities and infrastructure in Hesperia, to improve their survivability in the event of an earthquake in the area.

The City's aboveground water storage tanks will be evaluated to assess their potential inundation hazard in the event of catastrophic failure and those not yet seismically retrofitted will be fitted with shut-off valves, flexible fittings and/or other seismic safeguards as appropriate and in accordance with the most recent water tank design guidelines.

5.2.2 Flooding

Like most of Southern California, Hesperia is subject to unpredictable seasonal rainfall. Every few years, the region is subjected to periods of intense and sustained precipitation. Most of the flooding occurs in the numerous washes, natural drainage courses, drainage easements and floodways. Construction of the Mojave Forks Dam in 1971 greatly reduced the impact of flooding along the Mojave River, although a few parcels adjacent to the river are still at risk. Most of Hesperia is located on alluvial fans, relatively flat to sloping areas covered with sediment deposited by shallow, intermittent streams that spread out away from their source in the mountains to the south. The historical and geological records show that alluvial fan flooding is predictable and floodwaters can travel at dangerously high speeds, be highly erosive and can carry large amounts of sediment and other debris in a relatively short period of time. These characteristics make it difficult to assess the flood risk and develop reliable mitigations for alluvial fans.

Goal: SF-2 Minimize injury, loss of life, property damage, economic and social disruption caused by flooding and inundation hazards.

Implementation Policy: SF-2.1 - The City shall continue enforcing the City's Municipal Code provisions for flood hazard reduction (Title 8: Safety, Chapter 8.28: Flood Hazard Protection and Regulations). This code, which applies to new construction and existing projects undergoing substantial improvements, provides construction standards that address the major causes of flood damage and includes provisions for anchoring, placement of utilities, raising floor elevations, using flood-resistant construction materials and other methods to reduce flood damage.

Implementation Policy: SF-2.2 - The City will require that new discretionary development proposals include, as a condition of approval, hydrological studies prepared by a State certified engineer with expertise in this area. These studies shall

assess the impact that the new development will have on the flooding potential of existing development and down-gradient. The studies shall provide mitigation measures to reduce the impact to an acceptable level. Single-family residences on existing lots shall be exempt.

Implementation Policy: SF-2.3 - The City shall continue participation in the National Flood Insurance Program (NIFP) and require that all owners of properties located within the 100-year floodplain and repeat-flood properties in purchase and keep flood insurance.

Implementation Policy: SF-2.4 - The City will continue to participate in the StormReady Program with the National Weather Service. The StormReady Program is designed to monitor precipitation and snow levels on the mountains to the south, provide storm watches and warnings in real-time and issue evacuation notices for affected neighborhoods in a timely manner to the City who can notify the effected residents using its reverse 9-1-1 system, Connect CTY.

Implementation Policy: SF-2.5 - The City will not permit any new facilities that use or store hazardous materials in quantities that would place them in the State's TRI or SQG databases to be located in the flood zone. Unless all standards of elevation, anchoring and flood proofing have been implemented to the satisfaction of the City's Building and Safety Department and the San Bernardino County Fire Department. The hazardous materials shall be stored in watertight containers that are not capable of floating.

Implementation Policy: SF-2.6 - The City will require all essential and critical facilities (including but not limited to essential City offices and buildings, medical facilities, schools, child care centers and nursing homes) in or within 200 feet of Flood Zones or dam inundation pathways.

All essential and critical facilities must develop disaster response and evacuation plans that address the actions that will be taken in the event of flooding or inundation due to catastrophic dam failure.

Implementation Policy: SF-2.7 - The City will regulate development in drainage facilities pursuant to FEMA regulations.

Implementation Policy: SF-2.8 - The City will continue to maintain and improve where needed, the storm drain systems, with an emphasis on those areas of the City that flood repeatedly. This will entail the maintenance and scheduled cleaning storm drains and other flood-control structures in low-lying areas.

Implementation Policy: SF-2.9 - The City will identify repetitive flood properties in the City and develop feasible mitigation options for these sites. Funding to implement the mitigation measures may be available through FEMA's Hazard Mitigation Grant and Flood Mitigation Assistance Programs and their Pre-disaster Mitigation Program.

Implementation Policy: SF-2.10 - The City will encourage the development of areas located in floodplains as parks, nature trails, equestrian parks, golf courses, or other types of recreational facilities that can withstand periodic inundation and offer incentives to developers to retain these areas as open space.

5.2.3 Wildfires

As result of fluctuating annual precipitation for the Mojave region there is a significant variation in the frequency and extent of wildfires in the area. Several historical wildfires have occurred primarily in the southern part of Hesperia and its sphere between 1930 and 2010. The very high fire hazard severity zones under the jurisdiction of the City are shown on Exhibit SF-2. In the City's Sphere of Influence, the California Department of Forestry and Fire Protection (CDF or CalFire) has mapped fire hazard zones that are under the jurisdiction of either state or federal agencies, these zones are shown on Exhibit SF-3.

Annually, there are dozens of small vegetation fires, typically less than one acre in size, are reported in Hesperia. Experience and research have shown that vegetation management of fuel sources is an effective means of reducing wildfire hazards. Property owners are encouraged to follow maintenance guidelines aimed at reducing the amount of vegetation fuel. If high weeds, plant material and other prohibited items are present on a property, the Fire Marshal has authority to give the property owner of record a notice to abate the hazard. If the owner does not comply within 30 days of receipt of the order, the City has the authority to abate the hazard and charge the property owner for the cost. Vegetation treatments include thinning or removing vegetation within a given distance from habitable structures in order to create a defensible space. A fuel modification zone is identified as a ribbon of land surrounding a development designed to diminish the intensity of a wildfire as it approaches the structures.

Goal: SF-3: Reduce the risk of death, injury, property damage and economic loss due to vegetation and structure fires.

Implementation Policy: SF-3.1 - The City shall continue to require that all new habitable structures be designed in accordance with the most recent California Building and Fire Codes with any local amendments adopted by the City.

Implementation Policy SF-3.2 - The City will continue to conduct regular inspections of parcels throughout the City and will instruct property owners to bring their property into compliance with fire inspection standards. The inspection will include enforcing the weed abatement and notification program, in an effort to reduce the potential for vegetation fire. Assigned inspectors will focus on vacant or poorly maintained lots and encourage homeowners to follow fire-safe practices, including maintaining a fire-safe landscape and keeping combustibles (such as fire wood) a safe distance away from all structures.

Implementation Policy: SF-3.3 - Select City staff will coordinate with the San Bernardino County Fire Department and train in NIMS-compliant emergency response procedures to provide assistance as needed during emergency situations. This includes conducting emergency response exercises, including mock earthquake induced fire-scenario exercises, to evaluate and improve, as needed, the City's ability to respond to the multiple ignitions that an earthquake is likely to generate.

Implementation Policy: SF-3.4 - In conformance with Assembly Bill 2140 (2006) the City will adopt its Hazard Mitigation Plan (HMP) as an addendum to the Safety Element of the General Plan. In addition, the HMP needs to be updated every five years, per the requirements of the Federal Disaster Mitigation Act of 2000.

Implementation Policy: SF-3.5 – The City, in cooperation with the San Bernardino County Fire Department will evaluate citizen notification systems that can be used to warn residents of an approaching wildfire and provide evacuation instructions.

Implementation Policy: SF-3.6 - The City will encourage owners of non-sprinkler high-occupancy structures to retrofit their buildings to include automatic fire sprinklers.

Implementation Policy: SF-3.7 - The City, in cooperation with the San Bernardino County Fire Department, will ensure, to the maximum extent possible, that fire services, such as firefighting equipment and personnel, infrastructure and response times, are adequate for all sections of the City. The City shall continue to utilize the San Bernardino County Fire Department "Community Safety Division Standards" and the latest adopted addition of the California Building and Fire Codes.

Implementation Policy: SF-3.8 - The City, in cooperation with the San Bernardino County Fire Department, will ensure that the Hesperia Water District conducts annual fire flow tests and addresses any deficiencies found as soon as possible.

Implementation Policy: SF-3.9 - The City, in cooperation with the San Bernardino County Fire Department, will develop and hold regular training exercises that involve residents as much as possible, such as through the City's Community Emergency Response Team (CERT) program, to empower individuals and neighborhoods to be self-reliant in the aftermath of a natural or man-made disaster.

Implementation Policy: SF-10 - The City will adopt the most recent version of the Wildland-Urban Interface Code and Chapter 7A of the California Building Code for use in the City where the Insurance Services Offices (ISO) number exceeds five.

5.2.4 Hazardous Materials

Hazardous materials are used every day in industrial, commercial, medical and residential applications. The primary concern associated with a hazardous materials release is the short-and/or long-term affect to the public with exposure to these substances. Compared to other cities in Southern California, Hesperia has a relatively low number of sites that generate, use or store hazardous materials.

According to the Environmental Protection Agency (EPA), there are no Superfund sites in Hesperia, although there is one Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLIS) site it is not on the National Priority List. There are three facilities in Hesperia listed in the most recent Toxics Release Inventory (TRI) within Victorville which is within a half mile of Hesperia city limits. There are approximately 46-registered small-quantity and two large-quantity generators of hazardous materials sites located in Hesperia. The CERCLIS site, TRI facilities and large-quantity generators of hazardous materials in or near Hesperia are shown on Exhibit SF-2.

There are two registered transporters of hazardous waste in Hesperia; several more are registered in Hesperia's neighboring cities; Victorville and Apple Valley. Transport vehicles, Burlington-Northern Santa Fe and Union Pacific railroad lines transport hazardous materials through the City via Interstate 15 and rail lines, which are designated as prescribed routes for all types of non-radioactive hazardous materials, radioactive materials and toxic inhalation hazard materials. All transport vehicles and rail lines carrying hazardous materials are required to have placards that indicate, at a glance, the chemical carried, if it is corrosive, flammable and/or explosive. The transport vehicle/train operators are required to carry detailed Material Safety Data Sheets (MSDS) for each of the substances onboard. The MSDS Sheets are designed to help emergency response personnel assess the situation immediately upon arrival at the scene of an accident and take appropriate precautionary and mitigation measures. The California Highway Patrol (CHP) is in charge of spills that occur in or along freeways, Caltrans and local sheriff and fire departments are responsible for providing additional enforcement and routing assistance.

The following goal and implementation policies are aimed at reducing the hazard of hazardous materials in Hesperia.

Goal: SF-4 Reduce the potential for hazardous materials contamination in Hesperia.

Implementation Policy: SF-4.1 - The City, in cooperation with the San Bernardino County Fire Department, Hazardous Materials Division, will continue to enforce disclosure laws. These laws require all users, generators and transporters of hazardous materials and wastes to clearly identify materials that they store, use or transport, notify the appropriate City, County, State and Federal agencies of any changes in quantity or type of materials.

Implementation Policy: SF-4.2 - The City, in cooperation with the San Bernardino County Fire Department, will ensure that they are equipped to respond safely and effectively to a hazardous materials incidents in the City.

Implementation Policy: SF-4.3 - The City will identify roadways that hazardous materials are routinely transported. If critical facilities, such as schools, medical facilities, childcare centers or other facilities with special evacuation needs are

located along these routes, the City, cooperatively with these facilities, will identify emergency response plans that will be implemented in the event of a roadway accident involving the release of hazardous materials.

Implementation Policy: SF-4.4 - The City will continue to reduce or eliminate the use of hazardous materials by using non-toxic, safer alternatives that do not pose a threat to the environment, or buying and using only the smallest amount of a hazardous substance to get the intended job done. The City will encourage residents and businesses in the City to do the same.

Implementation Policy: SF-4.5 - Proposed new facilities that involve the production, use, storage, transport or disposal of hazardous materials will not be allowed within the 100-year floodplain, or near existing land uses that may be adversely impacted by such activities. Conversely, new sensitive facilities, schools, childcare centers, nursing homes, etc., will not be located near existing sites that use, store, or generate hazardous materials without prior review and authorization by the Planning Department.

Implementation Policy: SF-4.6 - The City will continue to support the operation of programs and recycling centers that accept hazardous substances, such as paint, paint thinner, used waste oil, etc.

The City will coordinate with San Bernardino County Fire Department the operation of the City's designated hazardous waste drop-off facility, located at 17443 Lemon Street, Hesperia, CA 92345.

Implementation Policy: SF-4.7 - The City will work with the Hesperia Water District to monitor the potential presence of perchlorate in well water. If perchlorate is and continues to be detected at measurable concentrations, programs to find and eradicate and clean up the will be evaluated and implemented as appropriate.

5.3 Regulations, Codes, Policies and Ordinances

The City has adopted codes and regulations to govern development, construction and land use activities. They include construction standards, site requirements, use limitations, study requirements and mitigation requirements which help directly or indirectly minimize the exposure of people and property to loss or injury resulting from disasters. As such, they are an effective tool and capability which the City may continue to use to reduce the amount of damage or harm arising from disasters.

This plan provides an opportunity to review existing regulations to determine if they are effective or whether they need to be revised in certain areas to more adequately prevent loss or injury from disasters.

The following titles of the City of Hesperia Code include regulations and ordinances on the following issues and topics related to hazard mitigation:

- Community Zone Plan.
- Erosion Management Ordinance.
- Established Building Codes.
- Floodplain Management.
- Floodplain Management Ordinances.
- Floodplain Management Plan.
- General Plan 2010 Update.
- Land Use Plan.
- Local Electric Utilities: Various electrical companies supplying the western electrical.
- Local Natural Gas Utilities: Southwest Gas.
- Local Sewage Treatment Utilities: Victor Valley Waste Water Reclamation Authority.
- Local Telephone Utilities: Verizon.
- Local Water Utilities: Hesperia Water District.
- National Flood Insurance Program Community.
- Storm Water Management Ordinances.
- Subdivision Management Ordinances.
- The Uniform Building and Fire Codes are adopted by ordinance.
- Zoning Management Ordinances.

5.4 Mitigation Programs

Previous mitigation projects have included weed abatement programs throughout the City, with emphasis on the southern interface areas. Flooding conditions in the City have been improved with the development of roadway curbs and gutters, improved culvert installation and maintenance programs.

Capital Improvement Projects (CIP)

Project Title: Ranchero Road Undercrossing

Project Number: 7046 – Phase I and II

Project Description and Location:

This project involves the installation of a new underpass beneath the Burlington Northern Santa Fe's (BNSF) railway's right-of-way at Ranchero Road. The project will also include a new alignment through the Antelope Valley Wash between Santa Fe East and Danbury, with the project limits between Seventh Avenue and Danbury. The BNSF Railroad bisects the City of Hesperia from north to south, with the only street that crosses the railroad being Main Street. This east-west corridor serves the entire City and is under capacity to meet existing traffic needs. The current traffic volume across the Main Street Bridge is 39,000 vehicles per day and the projected volume in 2015, based on the Victor Valley Comprehensive Transportation Plan, is 69,000 vehicles per day. Most motorists experience gridlock in the early morning and late

evening peak hours in the area of Main Street crossing the BNSF Railway. Accidents on either side of, or on the Main Street Bridge, have resulted in total closure of Main Street between Third Street and C Avenue, which not only affect the motoring public, but also severely restrict fire and police response times throughout the City.

Existing Situation and Work Completed Through Fiscal Year 2008-2009:

David Evans and Associates (DEA) were retained to finalize plans and specifications to meet the BNSF Railway and City standards and Lilburn Corporation was engaged to prepare the environmental clearances. The California Environmental Quality Act (CEQA) document was completed and adopted in September 2006. The Federal National Environmental Policy Act (NEPA) document was finalized to Caltrans' satisfaction in February 2008 and was cleared by the Federal Highway Administration (FHWA) for public review in March. The NEPA document was completed in August 2008, allowing right-of-way acquisition to begin. Due to the inability of the San Bernardino County Real Estate division to commit to the project, DEA was engaged to subcontract property acquisition. Authorization to proceed was granted by Caltrans and by September 2009, it is expected that 40-50 percent of the right-of-way will be acquired. The application to the Public Utilities Commission was submitted and approved in June 2009. Regulatory permits from the Army Corps of Engineers, Lahontan and County Flood Control have been applied for, as has the application to the BNSF railway for construction scheduling.

Project Schedule for 2009-10 Budget:

Right-of-way acquisition will continue in summer 2009. Permits from all regulatory agencies (Army Corps of Engineers, Lahontan and County Flood Control) should be obtained by September 2009. The project will be bid for construction in winter 2010 (contingent on right-of-way acquisition being completed), with construction commencing in Spring 2011.

Project Title: Paving Mesquite – Maple to Escondido

Project Number: 7056

Project Description and Location:

This project involved the paving of Mesquite Road from Maple Avenue to Escondido Avenue and was administered by the County; however, the City participated with that portion of work located within the City limits (between Maple Avenue and Topaz Avenue). Prior to 2006, the road was unpaved and heavily traveled by parents using the road for access to the Mesquite Trails School.

Project Status:

This project is complete.

Project Title: Widen Seventh Avenue – Main Street to Willow Street

Project Number: 7085 – Phase I

Project Description and Location:

This project involves the reconstruction and widening of Seventh Avenue from two to four lanes from Main Street to Willow Street. The project also includes the installation of major drainage facilities from Main Street to Willow Street to convey storm flows under Seventh Avenue, installation of concrete curb and gutters and the relocation of overhead lines to underground conduits. Seventh Avenue is a designated secondary arterial highway on the City's Circulation Master Plan. This road is a major north-south arterial used by many motorists and extends through the City of Victorville (also designated as an arterial highway). Traffic on Seventh Avenue has increased since the completion of the Civic Center Plaza and Branch Library in September 2006. The existing road condition had deteriorated.

This project is complete.

Project Title: Aqueduct Crossing Improvements – Widen Bridge at Main Street

- Phase 1 Design and Right-of-Way Identification
- Phase 2 Right-of-Way Acquisition and Construction

Project Number: 7096

Project Description and Location:

The bridge along Main Street which crosses the California Aqueduct currently has the capacity for only four lanes, two in each direction. The City's Master Plan of arterial highways identifies Main Street as a major arterial roadway, which has a total of six lanes, three in each direction from Interstate 15 to 11th Avenue. In addition, two new large scale retail developments proposed along this corridor in the near-term will impact Main Street with additional traffic. As a result, the bridge will have to be widened to accommodate the ultimate configuration of Main Street. The widening project has many potential issues; the chief issue being interaction with the Department of Water Resources (DWR). Other issues involve a potential retro-fit of the existing bridge structure to meet the new State seismic requirements, potential environmental issues and involvement of Caltrans given its proximity to Interstate 15. The first phase of the project will include preliminary design and the issues associated with that design, including right-of-way and outside agency coordination. Complete cost estimates and a proposed schedule will also result from this project phase. Phase 2 will involve acquisition of the necessary right-of-way and construction. Existing Situation and Work Completed through Fiscal Year 2008-2009: The consultant firm to carry out Phase 1 (design and right-of-way identification and project management) was engaged in February 2008 and was subsequently awarded in October. Commencement of the work began in May 2008. Coordination with DWR

began with two meetings that occurred in summer 2008. Preliminary design has been completed and design work was started in January 2009.

This project is complete.

Project Title: Juniper/Smoke Tree/Eighth Avenue Project

Project Number: 7107

Project Description and Location:

In connection with the proposed Downtown Park (Project 6515), the City completed street improvements for the perimeter of the park on the north, south and east sides. Paving on Eight Avenue was replaced by complete improvements for its use as a connection to parking and the plaza between the park and City Hall. The onsite storm drain from the new park connected to a storm drain constructed within Smoke Tree Street. Smoke Tree and Juniper Streets were improved between Seventh and Ninth Avenues with curb and gutter on both sides of the streets.

The project is complete.

Project Title: Rock Springs Road Reconstruction Project

Project Number: 7111

Project Description and Location:

This project involved the complete reconstruction and widening of Rock Springs Road from Main Street to the City limits just east of Glendale Avenue. The roadway was being reconstructed with two travel lanes in each direction, a continuous center turn median and a Class II bicycle lane. Some minor storm drain work was also completed to address a historic sump condition. The award of the Proposition 1B Local Street and Road funds approved by the voters last year allowed the City to identify this project as a viable construction project that could be completed in the short timeframe required under the terms of the funding. This project linked the new signal being constructed at the intersection of Rock Springs Road and Main Street, as well as the Main Street widening project which was completed in 2008. Funding was approved by the State in September 2007.

This project is complete.

Project Title: H-01 Drainage Facility – Section 2 Main Street to Fourth Avenue

Project Number: 7087

Project Description and Location:

This project involves the construction of approximately 10,000 feet of major drainage facilities to convey storm flow through the H-01 Line designated on the City's Master Plan of Drainage from Main Street to Fourth Avenue. The project would include a concrete culvert crossing at Main Street, the installation of large diameter storm drain and catch basins that would end north of the intersection of Mojave Street and Fourth Avenue.

The project is complete.

Project Title: H-01 Drainage Facility – Section 1 (Maple Avenue to Main Street) Design and Right-of-Way Identification

Project Number: 7090

Project Description and Location:

This project involves the design and alignment selection of a major drainage facility to convey storm flow though the H-01 Drain Line designated in the City's Master Plan of Drainage from Maple Avenue to Main Street. The project would include the identification of right-of-way and easements required for the alignment of the storm drain. It is not anticipated that any right-of-way would be purchased in this fiscal year, as environmental clearance would be required prior to right-of-way acquisition. The H-01 line is a major natural drainage wash that conveys storm flow from a large tributary area on the west side of the City. This tributary area includes a portion of the high density residential area west of Maple Avenue. The City is currently constructing the portion of the H-01 storm drain line from Main Street north to Fourth Avenue. The design of the drain line south of Main Street would allow the channelization of the storm water run-off through residential neighborhoods and protect many existing homes from flooding.

Existing Situation and Work Completed Through Fiscal Year 2008-2009:

This project is complete.

Project Title: A-04 Drainage Facility – Mojave Street to Mesa Avenue Construction

Project Number: 7092

This project is another regional storm drain to construct a major storm drain facility through a new residential tract. Tract 17291 being built by Frontier Homes as "Barcelona Heights", includes a ¼ mile segment to adequately convey the storm flows, identified in the City's Master Plan of Drainage (MPD) as the A-04 drain line, safely through their tract. Working in conjunction with the developer, City Staff was able to identify an alignment for this facility that could be placed underground through a landscaped paseo and connect existing and future park facilities. To mitigate their drainage and park requirements for the tract, the developer purchased a ten acre site for the construction of a park and retention basin. These will be two

separate facilities. This portion of the A-04 drain line will be designed by the developer's engineer and then bid and awarded as a City contract. Since the City is utilizing public funds, there are prevailing wage requirements and the project must be awarded to the lowest responsible bidder. The City is working with the developer to schedule the storm drain work concurrently with the construction of the other tract work. This storm drain facility will include a conduit crossing under Mojave Street approximately ¼ mile east of Topaz. This conduit will discharge into a four acre retention basin, which will deposit clean storm water into a large conduit proceeding north along Tamarisk Avenue. This project will conclude at Mesa Avenue and discharge into the historical natural drainage course. As development occurs to the north and south of this facility, the City anticipates working with the developers in much the same manner to construct more reaches of the A-04 drain line.

The design of a portion of the facility was completed in March 2007 and the culvert crossings at Mojave Street and Tamarisk Avenue were constructed by the developer in Fiscal Year 2007-08. No work was done in FY 2008-09 due to development slowdown/stoppage.

Project Schedule for 2009-10 Budget:

No additional work is planned at this time. Because this facility was prioritized due to development activity, the balance of the project will be scheduled once the housing market improves and additional development is planned in the vicinity of the project limits. Once begun, construction is anticipated to take approximately six months to complete.

Project Title: Fire Station 305 Construction

Project Number: 6518

Project Description and Location:

This project is the next phase of addressing the City's master-planned fire service needs that began in Project 6514. In order to meet the City's needs within the developing I-15 freeway corridor, as well as provide space for the San Bernardino County Fire Department, the County and City are jointly participating in the development of Station 305, to be located on the west side of Interstate 15, east of Caliente Road and south of Joshua Street

This project is complete.

Project Title: New Police Station

Property Identification, Acquisition, Design and Construction

Project Number: 6516

Project Description and Location:

The City's rapid growth has necessitated the need to augment the City's police force. Because of this increase in the number of police officers and support staff serving our citizens, the City has identified the need to construct a new police station. The existing police station is technologically outdated and the size of the facility on Santa Fe Avenue is inadequate for the needs of the City's existing and future police force. The City Council formed the Public Safety Ad Hoc Committee to guide this new police station project effort. One of the primary goals of this project is to re-locate the police station to a more centralized site within the City in order to better serve our citizens.

This project is complete.

Project Title: Fire Station 301 Construction/Property Acquisition

Project Number: 6517

Project Description and Location:

This project is the next phase of addressing the City's master-planned fire service needs that began in Project 6514. Existing Station 301, located on the west side of Eleventh Avenue, south of Main Street (9430 Eleventh Avenue) contains approximately 3,700 square feet of building space. In order to fulfill the City's Public Safety Needs Report requirements, the facility needs to be expanded/reconstructed to 12,000 square feet.

In FY 2006-07, the City sent a Request for Qualifications to architectural firms to provide architectural and construction support services. Wolff/Lang/Christopher (WLC) Architects was selected as the firm most qualified to meeting the needs of the City. WLC Architects was engaged in November 2006 to prepare the necessary construction and architectural plans. By March 2007, the Public Safety Ad Hoc Committee had reached consensus on the floor plan and building elevations. City staff has completed the process of acquiring the necessary property south of the current facility. WLC Architects prepared working drawings and completed design work in February 2009. The Planning Commission approved the facility design in April 2007. Bidding of the project was scheduled for March 2009, but was delayed due to Notice of Funding from the Federal American Recovery and Reinvestment Act (Economic Stimulus Plan) which was signed into law in February 2009. The City pursued funding from this law in order to reduce the financial cost to the DIF and RDA funds.

Project Schedule for Fiscal Year 2009-10 Budget:

The ARRA application will be submitted in July 2009. Notice of Award should be known by September 2009. If awarded funds, the project will be advertised for bid in winter 2010 and should start construction in Spring 2010. Construction will be carried out and the project will be completed in Fiscal Year 2010-11.

County Fire Hazard Abatement

The County of San Bernardino Fire Prevention Division is located in the newly constructed County Building directly across the street from City Hall and is responsible for Fire Hazard Abatement (FHA). On a mission of public education and fire prevention FHA works to reduce the potential for an individual's property to be the source of fire and structural ignitability. Failing to maintain ones private property in a fire safe condition was considered to be an individual property rights issue. Now, when a person leaves the vegetation on their property in such a state of disrepair, it is seen as a fire threat and is considered a threat to their neighbor's property rights. To ensure compliance, FHA issues notices of violation to properties that have dry vegetation and flammable green vegetation. If the property owner doesn't comply with the notice, FHA obtains a warrant to go onto the property and abate the fire hazard. FHA staff dedicates a substantial amount of time working to educate non-compliant citizens as to what a significant threat they impose on their neighbors. The goal of the FHA team is to get complete compliance through behavior modification.

Connect-CTY

During an emergency, public safety can be a direct function of the speed and accuracy of the dissemination of information. This is particularly important during emergencies requiring evacuations. Connect-CTY is a wireless, web based mass notification system that is designed to meet the needs of counties and municipalities, for fast, efficient telephone and email notifications to their citizens. The City's Connect-CTY system has been pre-programmed to allow the City to carry critical information for the safety of the public and during an emergency event and has the capability to notify specific target groups as quickly as possible.

Community Emergency Response Teams (CERT)

The CERT program educates and trains people in disaster preparedness by teaching basic response skills, such as fire safety, light search and rescue and disaster medical operations. Following a catastrophic event, many public safety resources will be unavailable and/or overwhelmed. Utilizing their CERT training, CERT members can assist themselves, their families and others in the neighborhood or workplace until professional first responders arrive.

StormReady

The City of Hesperia was recognized as a "StormReady" Community by the National Weather Service (NWS) on August 17, 2005. In order to be considered by the NWS as a StormReady Community, the City had to establish and maintain storm guidelines demonstrating the ability to properly prepare for, respond to all flooding and flash flooding incidents that threaten the City and its residents.

5.4 Fiscal Resources

The City of Hesperia has a General Fund Budget of $22,744,922 for Fiscal Year 2010/11. The Redevelopment Agency has a budget of $62,734,850 for Fiscal Year 2010/11. The combined Capital Improvement Program for Fiscal Year 2010/11 is $51,725,934.

Section 6 Mitigation Strategies

6.1 Overview

The City of Hesperia's mitigation strategy is derived from the in-depth review of the existing vulnerabilities and capabilities described in previous sections of this plan, combined with a vision for creating a disaster resistant and sustainable community for the future. This vision is based on informed assumptions and recognizes both mitigation challenges and opportunities demonstrated by the goals and objectives outlined below. Each of the mitigation measures identified under each objective includes an implementation plan. The measures were individually evaluated during discussions of mitigation alternatives and conclusions and used as input when priorities were decided. All priorities are based on consensus of the Planning Team.

Mitigation measures are categorized generally for all hazards and identified specifically for the high risks hazards facing the City. Each mitigation measure identified were extensively examined in the risk assessment section: fires, earthquakes and floods.

6.2 Mitigation Five-Year Progress Report

The following identifies the completed, deleted, or deferred actions or activities from the previously approved 2005 plan.

Mitigation Action	Completed	Deleted	Deferred	On going	Comments
Ranchero Road			X		Construction commencing in Spring 2011.
Grant Application for 1998 flood damage	X				
Dam failure				X	On-going mitigation projects to mitigate the dam failure hazard.
Flash Flooding H-01 Drainage Facility Section 2 Main Street to Fourth Avenue	X				

A-04 Drainage Facility – Mojave Street to Mesa Avenue Construction				X	No additional work is planned at this time. Because this facility was prioritized due to development activity, the balance of the project will be scheduled once the housing market improves and additional development is planned in the vicinity of the project limits. Once begun, construction is anticipated to take approximately six months to complete.
Severe Thunderstorm				X	On-going mitigation projects to mitigate severe thunderstorm hazard.
Wildfires				X	On-going mitigation projects to mitigate wildfire hazard.
Technology Hazards Hazardous Materials				X	On-going mitigation projects to mitigate hazardous materials hazard.
Terrorism				X	On-going mitigation projects to mitigate terrorism hazard.

Table 13 - Mitigation Five-Year Progress Report

6.3 Mitigation Goals, Objectives and Projects

The 2005 Mitigation Goals included overall goals established by the City (contained within the City's General Plan) to guide the establishment and priorities of specific goals, objectives and mitigation measures for each high risk hazard. In reviewing and updating the mitigation goals and actions, it was the Planning Team's consensus that the following goals remain in this HMP update. (The City's 2010 General Plan is on file at City Hall, 9700 Seventh Avenue, Hesperia, CA 92345 and is available for inspection during normal business hours. The General Plan is also available online at www.cityofhesperia.us).

6.3.1 Emergency Preparedness Goals

Goal 1: Support and expand disaster response programs and initiate a program for post-disaster planning.

Objectives: Policies

A. The City will encourage involvement in emergency preparedness programs currently in place in the region, as well as emergency preparedness education in the schools and in the media.

B. Establish comprehensive procedures for post-disaster planning in affected areas.

C. Because emergency preparedness is crucial to the protection of the public in case of disaster, the following actions shall be implemented.

    1. Coordinate with the County of San Bernardino Office of Emergency Services and maintain and update the Emergency Operations Plan for use by the City to protect the citizens of Hesperia.
    2. Coordinate with public and private agencies and initiate coordination in residential areas through Neighborhood Watch, homeowners associations and neighborhood groups.
    3. Provide for the needs of dependent and immobile populations in emergency response and recovery operations through identification and prioritization of rescue needs.
    4. Require disaster plans and provisions in the design, location and management of all public facilities.
    5. Plan, design and use public facilities according to the requirements of the Emergency Operations Plan.

Since the City's ultimate post-disaster survival will depend not only on the effectiveness of hazard mitigation and disaster response programs, but also on how quickly and how well the City is rebuilt after a major disaster, the City shall initiate a program for post-disaster planning. All options, from redevelopment to opportunities for upgrading, will be included. Any measures as revised street and traffic patterns, parking, architectural and landscape design, general use compatibility and building code improvements will be addressed.

A. Establish a standing committee for disaster recovery to plan for a disaster by providing contingency planning for the rapid and effective reconstruction of affected areas. The committee will include representatives of Planning, Engineering, Public Works, Building and Safety, Economic Development and liaisons to local utilities and any state and federal entities.

B. Develop guidelines through the committee for the exercise of emergency authorizes for such purposes as the following:

    1. Rapid designation of redevelopment areas through pre-preparation of emergency ordinances.
    2. Possible revision of land use, circulation and parking requirements and establishment of other programs for improving the community environment.
    3. Adaption and implementation of special programs for disaster recovery.
    4. Funding of disaster recovery measures.
    5. Moratorium on reconstruction in any high-hazard areas where damage could reoccur.
    6. Upgrading of the building code.

7. Designation of sites for temporary housing, such as, travel trailers and pre-fabricated construction for residents who may become homeless in the disaster. This post disaster effort will be in cooperation with the Disaster Housing Program of FEMA.

6.3.2 Earthquake

Goal 1: Minimize injury, loss of life, property damage and economic and social disruption caused by seismic shaking and other earthquake-induced hazards such as slope instability, compressible and collapsible soils and subsidence.

Objectives: To protect life and property from impacts associated with seismic related disasters and to identify the potential hazards that can significantly impact the City.

A. Require that all new habitable structures be designed and built in accordance with the most recent California Building Code adopted by the City, including the provisions regarding lateral forces and grading.
B. Require all discretionary development proposals, as well as capital improvement projects in the City to conduct, as a condition of approval, geotechnical and engineering geological investigations, prepared by State-certified professionals. Approval of these projects will follow the most recent guidelines by the California Geological Survey and similar organizations that address, site-specific seismic and geologic hazards identified in the Technical Background Report. These reports shall provide mitigation measures to reduce those hazards identified at a site to an acceptable level. Recent reports completed for adjacent projects may be used if they meet the standards described above and the project proponents receives approval from the City's Building Department to rely on previously obtained data from an adjacent lot.
C. City Staff or assigned representatives will conduct routine inspection of grading operations to ensure site safety and compliance with approved plans and specifications.
D. City Staff assigned responsibility to review geotechnical, geological, structural and grading operations, submitted by development applicants shall have the necessary professional credentials and certifications to conduct these reviews.
E. Liquefaction assessment studies shall be conducted as a condition of approval for all projects proposed in areas identified as potentially susceptible to liquefaction identified in the Technical Background Report. The studies shall be conducted in accordance with the California Geological Survey's Special Publication 117: Guidelines for Evaluating and Mitigating Seismic Hazards in California (2008 or more recent version) and the Earthquake Engineering Research Center's Report No. EERC-2003-06 (or more recent version): Recent Advances in Soil Liquefaction Engineering.

F. If and when the California Geological Survey issues a Seismic Hazards Zonation Map the includes the City, the Planning and Building Departments will adopt this map as a replacement for the Seismic Hazards Map that is currently part of the Technical Background Report. Similarly, if new or revised Alquist-Priolo Earthquake Fault Zone maps that include the City or its Sphere are issued, these maps will be adopted and enforced in conformance with the requirements of the Alquist-Priolo Earthquake Fault Zone Act.
G. If a critical facility is proposed across the trace of any of the secondary faults mapped within the City or its Sphere, the City's Building Department shall require, as a condition of approval, that geological studies to assess the location and recent activity of the fault be conducted. These studies shall be conducted at the level of detail required by the California Geological Survey for fault studies in Alquist-Priolo earthquake fault zones (following the guidelines in California Geological Survey's Note 49). Critical facilities include fire and police stations; City communication centers; hospitals, schools, pre-schools, nursing homes and other limited-mobility or high-occupancy populations; electrical substations and towers, water reservoirs, high-pressure or large-diameter pipelines and bridges or other key transportation structures.
H. The City's Building Department will encourage owners of potentially hazardous buildings, including pre-1952 wood-frame structures, concrete tilt-ups, pre-1971 reinforced masonry, soft-story structures and the one unreinforced masonry building, to assess the seismic vulnerability of their structures and conduct seismic retrofitting as necessary to improve the buildings' resistance to seismic shaking.
I. The City shall develop and make available to all residents and businesses literature on hazard prevention and disaster response, including information on how to earthquake-proof residences and places of business and information on what to do before, during and after an earthquake. Reminders should be issued periodically to encourage the review and renewal of earthquake preparedness kits and other emergency preparedness materials and procedures.
J. The Public Works Department will encourage the City's utility service providers to continue upgrading their facilities and infrastructure in Hesperia, to improve their survivability in the event of an earthquake. The aboveground water storage tanks will be evaluated to assess their potential inundation hazard in the event of catastrophic failure and those not yet seismically retrofitted will be fitted with shut-off valves, flexible fittings and/or other seismic safeguards as appropriate and in accordance with the most recent water tank design guidelines.

Projects

Mobile Home Seismic Retrofit Program

- Develop and sponsor projects and programs to brace new or relocated mobile homes to resist earthquakes.

General Earthquake Mitigation Projects

- Provide CERT training to the community to educate residents about disaster preparedness basic response skills, such as fire safety, light search and rescue and disaster medical operations.

- Develop earthquake mitigation public outreach educational programs.

- Retrofit water storage tanks with shut-off valves, flexible fittings and/or other seismic safeguards as appropriate with the most recent water tank design guidelines.

6.3.2 Wildfire

Goal 1: Reduce the risk of death, injury, property damage and economic loss due to vegetation and structure fires.

Objectives: Because an integrated approach is needed to coordinate the City's present and future needs in fire protection services in response to fire hazards and risks and to serve as a basis for program budgeting, identification and implementation of optimum cost-effective solutions, the City shall:

A. The City shall continue to require that all new habitable structures be designed in accordance with the most recent California Building and Fire Codes with local amendments adopted by the City.
B. The City will continue to conduct regular inspections of parcels throughout the City and if needed, direct property owners to bring their property into compliance with fire inspection standards. This includes enforcing the weed abatement and notification program, to reduce the potential for vegetation fires. Encourage homeowners to follow fire-safe practices, including maintaining a fire-safe landscape and keeping combustibles (such as fire wood) a safe distance away from all structures.
C. City staff will coordinate with the San Bernardino County Fire Department and train in National Information Information Management (NIMS) compliant emergency response procedures to provide assistance as needed during emergency situations. This includes conducting emergency response exercises, including mock earthquake induced fire-scenario exercises, to evaluate and improve, as needed, the City's ability to respond to the multiple ignitions that an earthquake is likely to generate.
D. In conformance with Assembly Bill 2140 (2006) the City will adopt its Hazard Mitigation Plan (HMP) as an addendum to the Safety Element of the General Plan. In addition, the HMP needs to be updated every five years, per the requirements of the Federal Disaster Mitigation Act of 2000.

E. The City, in cooperation with the San Bernardino County Fire Department, will evaluate citizen notification systems that can be used to warn residents of an approaching wildfire and to provide evacuation instructions.

F. The City will encourage owners of non-sprinklered high-occupancy structures to retrofit their buildings to include automatic fire sprinklers.
G. The City, in cooperation with the San Bernardino County Fire Department, will ensure, to the maximum extent possible, that fire services, such as firefighting equipment and personnel, infrastructure and response times, are adequate for all sections of the City.
H. The City shall continue to utilize the San Bernardino County Fire Department "Community Safety Division Standards" and the latest adopted addition of the California Building and Fire Codes.
I. The City, in cooperation with the San Bernardino County Fire Department, will ensure that the Hesperia Water District conducts annual fire flow tests and addresses any deficiencies found as soon as possible.
J. The City, in cooperation with the San Bernardino County Fire Department, will develop and hold regular training exercises that involve residents as much as possible, such as through the City's CERT program, to empower individuals and neighborhoods to be self-reliant in the aftermath of a natural or man-made disaster.
K. The City will adopt the most recent version of the Wildland-Urban Interface Code and Chapter 7A of the California Building Code for use in the City where the Insurance Services Offices (ISO) number exceeds 5 (greater than 5).

Projects

- Partner with County of San Bernardino Fire Department to design, develop and construct mitigation programs and facilities that provide training opportunities in support of multi-hazard/multi-jurisdictional emergency incidents.

- Expand/reconstruct existing Fire Station 301 located on the west side of Eleventh Avenue from 3,700 square feet to 12,000 square feet to meet the City's public safety needs.

- Provide adequate fire protection facilities and services in accordance with standards of the City and the County of San Bernardino Fire Department for all development, existing and proposed.

- Develop and sponsor an enhanced public education program based on targeted needs that encourages the public to take responsibility for wildfire protection.

6.3.3 Flood

Goal 1: Minimize injury, loss of life, property damage and economic and social disruption caused by flooding and inundation hazards.

Objectives: Because the City has entered into an agreement to participate in the National Flood Insurance Program which provides flood insurance within designated flood plans, the following actions shall be implemented:

A. The City shall continue enforcing the City's Municipal Code provisions for flood hazard reduction (Title 8: Safety, Chapter 8.28: Flood Hazard Protection and Regulations). This code, which applies to new construction and existing projects undergoing substantial improvements, provides construction standards that address the major causes of flood damage and includes provisions for anchoring, placement of utilities, raising floor elevations, using flood-resistant construction materials and other methods to reduce flood damage.
B. The City will require that new discretionary development proposals include, as a condition of approval, hydrological studies be prepared by a State certified engineer with expertise in this area, that assess the impact the new development will have on the flooding potential of existing development down-gradient. The studies shall provide mitigation measures to reduce this impact to an acceptable level.
C. The City shall continue its participation in the National Flood Insurance Program and require that all owners of properties located within the 100-year floodplain and repeat-flood properties purchase and keep flood insurance for those properties.
D. The City will continue to participate in the StormReady Program with the NWS, including monitoring the precipitation and snow levels on the mountains to the south, providing storm watches and warnings in real-time and issuing evacuation notices for affected neighborhoods.
E. The City will not permit any new facilities that use or store hazardous materials in quantities that would place them in the State's TRI or SQG databases to be located in the flood zone. Unless all standards of elevation, anchoring and flood proofing have been implemented to the satisfaction of the City's Building Department and the San Bernardino County Fire Department. Any storage of hazardous materials shall be stored in watertight containers that are not capable of floating or similar flood-proof receptacles or tanks.
F. The City will require all essential and critical facilities, including but not limited to essential City offices and buildings, medical facilities, schools, child care centers and nursing homes in or within 200 feet of Flood Zones, or the dam inundation pathways develop disaster response and evacuation plans that address the actions that will be taken in the event of flooding or inundation due to catastrophic failure of a dam.
G. The City will regulate development in drainages pursuant to FEMA regulations.

H. The City will continue to maintain and improve where needed, the storm drain systems, with an emphasis on those areas of the City that flood repeatedly. This entails maintaining and regularly cleaning the storm drains and other flood-control structures in low-lying areas.
I. The City will identify repetitive flood properties in the City and develop feasible mitigation options for these sites. Funding to implement the mitigation measures may be available through FEMA's Hazard Mitigation Grant and Flood Mitigation Assistance Programs and their Pre-disaster Mitigation Program.
J. The City will encourage the development of areas in the floodplains as parks, nature trails, equestrian parks, golf courses, or other types of recreational facilities that can withstand periodic inundation and will offer developer's incentives to retain these areas as open space.

Projects

A-04 Drainage Facility – Mojave Street to Mesa Avenue Construction

- This project is another regional storm drain to construct a major storm drain facility through a new residential tract. Tract 17291 being built by Frontier Homes as "Barcelona Heights", includes a ¼ mile segment to adequately convey the storm flows, identified in the City's Master Plan of Drainage (MPD) as the A-04 drain line, safely through their tract.

StormReady

- Continue to meet the requirements of the San Diego NWS in order to be recognized as a StormReady Community.

6.4 Mitigation Priorities

During the development of the risk assessment for the City of Hesperia, the Planning Team proposed and discussed alternative mitigation goals, objectives and specific mitigation measures that the City should undertake to reduce the risk from the three high risk hazards that could affect the City.

Multiple factors were considered to establish the mitigation priorities included in this plan. The Planning Team utilized the 2005 rankings through the CPRI developed by Visual Risk Technologies and the last five-year disaster related occurrences to develop the Hazard Assessment Matrix identified in Section 4.1.2 to help assess mitigation priorities and determined that the highest priority rankings would be assigned to those mitigation measures that met three primary criteria:

1. Greatest potential for protecting life and property.
2. Greatest potential for maintaining critical City functions and operability following a disaster.
3. Achievability in terms of community support and cost effectiveness.

All rankings were determined by the consensus of the Planning Team. As described in the previous section on hazard and risk assessment, clearly earthquakes have the potential to affect the largest number of people, critical facilities and buildings and to cause the greatest economic losses. This fact, combined with the relatively high probability of an earthquake occurrence in the next several decades, makes increasing disaster resistance and readiness to earthquakes a high priority. Given the extreme importance of maintaining critical government functions in times of disaster and the large number of the population who depend and rely on government services and infrastructure, those mitigation measures that improve government disaster resistance, readiness, or recovery capacity are generally given higher priority than mitigation of privately owned buildings in which the loss or damage affects relatively few.

Earthquake, flooding and wildfire mitigation actions are identified and assigned a priority according to their importance, cost, funding availability, to what degree project planning has been completed and the anticipated time to implement the measures.

Using the above rationale for establishing mitigation priorities, each mitigation measure is assigned a priority ranking as follows:

- High – Projects that will be the primary focus of implementation over the next five years.
- Medium – Projects that may be implemented over the next five years.
- Low – Projects that will not be implemented over the next five years unless conditions change (new program/funding source).

The Planning Team discussed alternative mitigation strategies and mitigation measures during workshops, provided their preferences and also suggested additional mitigation measures that the City should consider. National literature and sources were researched to identify best practices measures for each hazard considered by the City. The Planning Team reviewed the list of possible objectives and mitigation measures, made a final selection and then prioritized the individual mitigation measures considered most appropriate for the City of Hesperia.

6.5 Implementation Strategy

An implementation strategy is the key to any successful planning effort. The implementation strategy identifies who has lead responsibility for the action, the estimated timeframe for completion and potential funding sources(s) to support implementation and the priority ranking, defined as follows.

- Lead Agency – City of Hesperia and/or other agency assigned lead responsibility.
- Timeframe – short-term (less than two years); long-term (more than two years).

- Funding source(s) – potential internal and external funding source(s).
- Priority Ranking – high, medium or low.

Action	Lead Agency	Hazard	Funding Source	Timeline	Priority Ranking
The City's Building and Safety Department will encourage owners of potentially hazardous buildings, including pre-1952 wood frame structures, concrete tilt-ups, pre-1970 reinforced masonry, soft-story structures and the one unreinforced masonry building located in the city, to assess the seismic vulnerability of their structures and conduct seismic retrofitting as necessary to improve the buildings; resistance to seismic shaking.	Hesperia	Earthquake	PDM HMPG	Long term	Low
Develop and sponsor projects and programs to brace new or relocated mobile homes to resist earthquakes.	Hesperia	Earthquake	PDM HMGP	Long term	Low
Provide CERT training to the community to educate residents about disaster preparedness and train them is basic response skills, such as fire safety, light search and rescue and disaster medical operations.	Hesperia	Earthquake	HMGP EMPG	Long term	High
The aboveground water storage tanks will be evaluated to assess their potential inundation hazard in the event of catastrophic failure and those not yet seismically retrofitted will be fitted with shut-off valves, flexible fittings and/or other seismic safeguards as appropriate and in accordance with the most recent water tank design guidelines.	Hesperia	Earthquake	PDM HMPG	Long term	High

Partner with the County of San Bernardino Fire Department to design, develop and construct mitigation programs and facilities that provide training opportunities in support of multi-hazard/multi-jurisdictional emergency incidents.	Hesperia	Wildfire	HMGP EMPG	Long term	High
Expand/reconstruct existing Fire Station 301, located on the west side of Eleventh Avenue from 3,700 square feet to 12,000 square feet to meet the City's public safety needs.	Hesperia	Wildfire	ARRA Economic Stimulus Plan		
Provide adequate fire protection facilities and services in accordance with standards of the City and the County of San Bernardino Fire Department for all development; existing and proposed.	Hesperia	Wildfire	?	Long term	Low
Develop and sponsor an enhanced public education program based on targeted needs that encourages the public to take responsibility for wildfire protection.	Hesperia	Wildfire	PDM HMPG	Long term	Low
Another regional storm drain to construct a major storm drain facility through a new residential tract. Tract 17291 being built by Frontier Homes as "Barcelona Heights", includes a ¼ mile segment to adequately convey the storm flows, identified in the City's Master Plan of Drainage (MPD) as the !-04 drain line, safety through the tract.	Hesperia	Flood	Storm Drainage Development Impact Fee	Long Term	Low
Continue to meet the requirements of the San Diego NWS in order to be recognized as a StormReady Community	Hesperia	Flood	HMPG	Long Term	High

Table 15 – Implementation Strategy

Section 7 Plan Maintenance

7.1 Monitoring, Evaluating and Updating the Plan

The City of Hesperia Hazard Mitigation Plan was last updated on December 7, 2010. This timeframe allows the City to meet eligibility requirements for the 2012 Pre-Disaster Mitigation Grant opportunity.

The inclusion of the Hazard Mitigation Plan into other existing City plans will continue to be a collaborative process that involves multiple stakeholders from associated agencies and departments. Since the Hazard Mitigation Plan is a living document that reflects ongoing hazard mitigation activities, the process of monitoring, evaluating and updating will be critical to the effectiveness of hazard mitigation within the City. To facilitate the hazard mitigation planning process, the Hazard Mitigation Plan will be reviewed annually and revisions will be provided to FEMA in a five-year cycle as required. Finally, the Hazard Mitigation Plan will be re-adopted into the Safety Element of the City of Hesperia's 2010 General Plan.

The City of Hesperia will review the plan at least annually and update project status and other Plan elements as necessary. Departments tasked with projects track the status of the projects through the entire life cycle from conception to completion. Each year proposed projects are reviewed during the budget development and selected projects are submitted for funding to the appropriate funding source.

7.2 Implementation through Existing Programs

The 2010 Hazard Mitigation Plan update process was followed by the inclusion of mitigation measures in the Safety Element of the City of Hesperia 2010 General Plan. The City of Hesperia addresses statewide planning goals and legislative requirements through its General Plan, Capital Improvement Projects and the City Building and Safety Codes. The Hazard Mitigation Plan will implement a series of recommendation, many of which are closely related to the goals and objectives of existing planning programs. The City of Hesperia will have the opportunity to implement recommended mitigation action items through existing programs and procedures.

The Hazard Mitigation Plan goals and actions will be incorporated into various general operations of government. For example, much of the information from the Hazard Mitigation Plan will be included in the City of Hesperia's Emergency Operation Plan. As any future City plans are developed, the Hazard Mitigation Plan will be a great asset in any plan development effort. As noted earlier, much of the information contained in this Hazard Mitigation Plan is from the City's 2010 General Plan Update and is already part of the planning process.

7.3 Continued Public Involvement

A critical part of maintaining an effective and relevant Hazard Mitigation Plan is ongoing public review and comment. Consequently, the City is dedicated to the direct involvement of its citizens in providing feedback and comments on the plan on a continued basis.

The public will continue to be appraised of Local Hazard Mitigation Plan actions through the City's website, http://www.Cityofhesperia.us and through the local media. All proposed changes to the plan will be subject to citizen review prior to City Council action. The City will follow its standard public input process, consistent with the process used in the initial plan development, which is described in Section 3 of this Plan.

Appendix A

Figure 1	Physical Setting
Figure 2	City Limits Map
Figure 3	Seismic Hazard Zones Map
Figure 4	Fault Map
Figure 5	California Area Earthquake Probabilities Map
Figure 6	Slope Distribution Map
Figure 7	Dam Inundation Map
Figure 8	Federal Emergency Management Agency (FEMA) Map
Figure 9	High Fire Hazard Areas Map
Figure 10	Hazardous Materials Site Map
Figure 11	Underdeveloped slopes along the Mojave River and Hesperia Lake Park showing vegetation common to the area
Figure 12	Typical fuel loads in Hesperia consisting of scattered tree stands and scrubland separated by areas barren of vegetation
Figure 13	Major Earthquake Faults
Figure 14	California Faults
Figure 15	Population/Social Vulnerability Base Map
Figure 16	California Area Earthquake Probability
Figure 17	Shake Map for a Hypothetical Magnitude 7.4 Earthquake on the Southern San Andreas Fault
Figure 18	San Bernardino County USGS Liquefaction Susceptibility Zones
Figure 19	Scenario 1: M 7.8 Earthquake - Southern San Andreas Fault
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Appendix B

Table 1	Stakeholder Meetings
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