



City of Hesperia



HAZARD MITIGATION PLAN

2017 PLAN UPDATE



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Section 1. Introduction

1.1 Purpose of the Plan

The intent of hazard mitigation is to reduce and/or eliminate loss of life and property. Hazard mitigation is defined by FEMA as “any action taken to reduce or eliminate the long-term risk to human life and property from natural hazards.” A “hazard” is defined by FEMA as “any event or condition with the potential to cause fatalities, injuries, property damage, infrastructure damage, agricultural loss, environmental damage, business interruption, or other loss.”

The purpose of the Hazard Mitigation Plan (HMP) is to demonstrate the plan for reducing and/or eliminating risk in Hesperia. The HMP process encourages communities to develop goals and projects that will reduce risk and build a more disaster resilient community by analyzing potential hazards.

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 restoring of things to pre-disaster conditions sometimes result in feeding the disaster cycle; damage, reconstruction, and repeated damage. Mitigation is one of the primary phases of emergency management specifically dedicated to breaking the cycle of damage. Hazard mitigation is distinguished from other disaster management functions by measures that make city development and the natural environment safer and more disaster resilient. Mitigation generally involves alteration of physical environments, significantly reducing risks and vulnerability to hazards by altering the built environment so that life and property losses can be avoided or reduced.

Mitigation also makes it easier and less expensive to respond to and recover from disasters.

Also with an approved (and adopted) HMP, Hesperia is eligible for federal disaster mitigation funds/grants (Hazard Mitigation Grant Program, Pre-Disaster Mitigation, and Flood Management Assistance) aimed to reduce and/or eliminate risk.

The HMP update is a “living document” that should be reviewed, monitored, and updated to reflect changing conditions and new information. As required, the HMP must be updated every five (5) years to remain in compliance with regulations and Federal mitigation grant conditions. In that spirit, this Hazard Mitigation Plan (HMP) is an update of the 2012 City of Hesperia Hazard Mitigation Plan Update approved by FEMA on May 1, 2012. This HMP presents updated information regarding hazards being faced by the City of Hesperia. This HMP will also reference the goals and policies in the safety element of the 2010 City of Hesperia General Plan.

1.2 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, identifies and prioritizes mitigation actions, encourages the development of local mitigation and provides technical support for those efforts. This mitigation plan serves to meet those requirements.

Senate Bill No. 379 will, upon the next revision of a local hazard mitigation plan on or after January 1, 2017, or, if the local jurisdiction has not adopted a local hazard mitigation plan, beginning on or before January 1, 2022, require the safety element to be reviewed and updated as necessary to address climate adaptation and resiliency strategies applicable to that city or county.



1.3 Community Profile

1.3.1 Physical Setting

The City of Hesperia has a population of 94,133 persons and covers 74.77 square miles. Basic services provided to the citizens of Hesperia include Law Enforcement, Fire Protection, Building and Safety Services, Library, and Human Services (social services). One Interstate, one highway, and two railroad lines cross the City, providing vital transportation links from Southern California to the remainder of the United States.

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.

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 City of Hesperia has an elevation range of 2,820 feet – 4,260 feet above sea level.



Figure 1-1 Hesperia City Limits Map



Source: City of Hesperia GIS Department, 2016



1.3.2 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 in 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.

1.3.3 Climate

The High Desert's climate vastly differs from other areas in Southern California, as there is a broad range of temperature fluctuations between the summer and winter 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:

	Minimum	Mean	Max
January	31°	45°	60°
April	42°	59°	75°
July	61°	80°	99°
October	45°	63°	81°

Hesperia residents also enjoy an average of 283 days of sunny or partly sunny days.

1.3.4 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.

1.3.5 Demographics

In 1980, Hesperia was a small, unincorporated community 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 36 years, the population has increased to approximately 94,133 people and anticipated growth is expected to reach 103,000 by 2021

Today Hesperia's population is approximately 99,413, which is about 4.4% of the total population of San Bernardino County as of 2015 (The Buxton Co.). Hesperia has an average of four persons per household with approximately 27,411 housing units, 64.2% owner occupied and 35.7% renter occupied.

According to The Buxton Co. 2015, 58.9% of the City's residents are white, 5.7% are black or African American, 1.2% is American Indian & Alaskan Native, 2.5% are Asian, Native Hawaiian & Other Pacific Islander, with 26.3% of the population classified as Other Races. Of those 5.1% are two or more races and 52.9% are Hispanic (2015 Demographics The Buxton Co.).

Hesperia's households have an average income of \$61,225. Hesperia has the second highest Median Household Income in the Victor Valley at \$46,311; Victorville leads at \$47,697, Apple Valley at \$45,866 and Adelanto at \$38,433. 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 second greatest percentage (64.2%) of owner occupied homes is in Hesperia, which ranks above the percentage (62.6%) 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 over 40 minutes a day. However, the largest percentage of the residents (31.3%) spends 10 to 24 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 (2016 High Desert Workforce Report).

1.3.6 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.

Approximately 30% of High Desert's population—115,808—are active workers. More than 82,251 residents—71%—of the High Desert workers leave for job opportunities in the greater Inland Empire, Los Angeles and as far as San Diego.

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, Seventh Avenue, Peach Avenue and I Avenue.

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, Barstow, Helendale, Lucerne Valley, Phelan, San Bernardino and Wrightwood.

Passenger rail services are provided by Amtrak with a terminal located in Victorville. The BNSF Railway main line runs north and south, through the Cajon Pass, along Hesperia Road through Hesperia; with an east and west branch line for freight terminating at the Mitsubishi plant located in Lucerne Valley. Hesperia's G Avenue industry track runs from the BNSF Railway branch line north to just south of Lemon Avenue. 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 largest of the three includes a 2,500-acre world-class aviation and air cargo facility serving domestic and international needs.

1.3.7 Medical Care

Hesperia has access to three 24-hour medical centers. Both air and ground ambulance service is available twenty-four hours a day. The medical facility closest to Hesperia is Desert Valley Hospital located at Second Avenue and Bear Valley Road in Victorville.

Hospitals in the high desert include:

- Desert Valley Hospital
- St. Mary Medical Center
- Victor Valley Global Medical Center

1.3.8 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 was organized as an independent County Water District in 1975 pursuant to Section 30000 et seq. of the California Water Code and, in 1990, became a subsidiary district of the City of Hesperia. 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 93,226 persons, averaging 11.3 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.

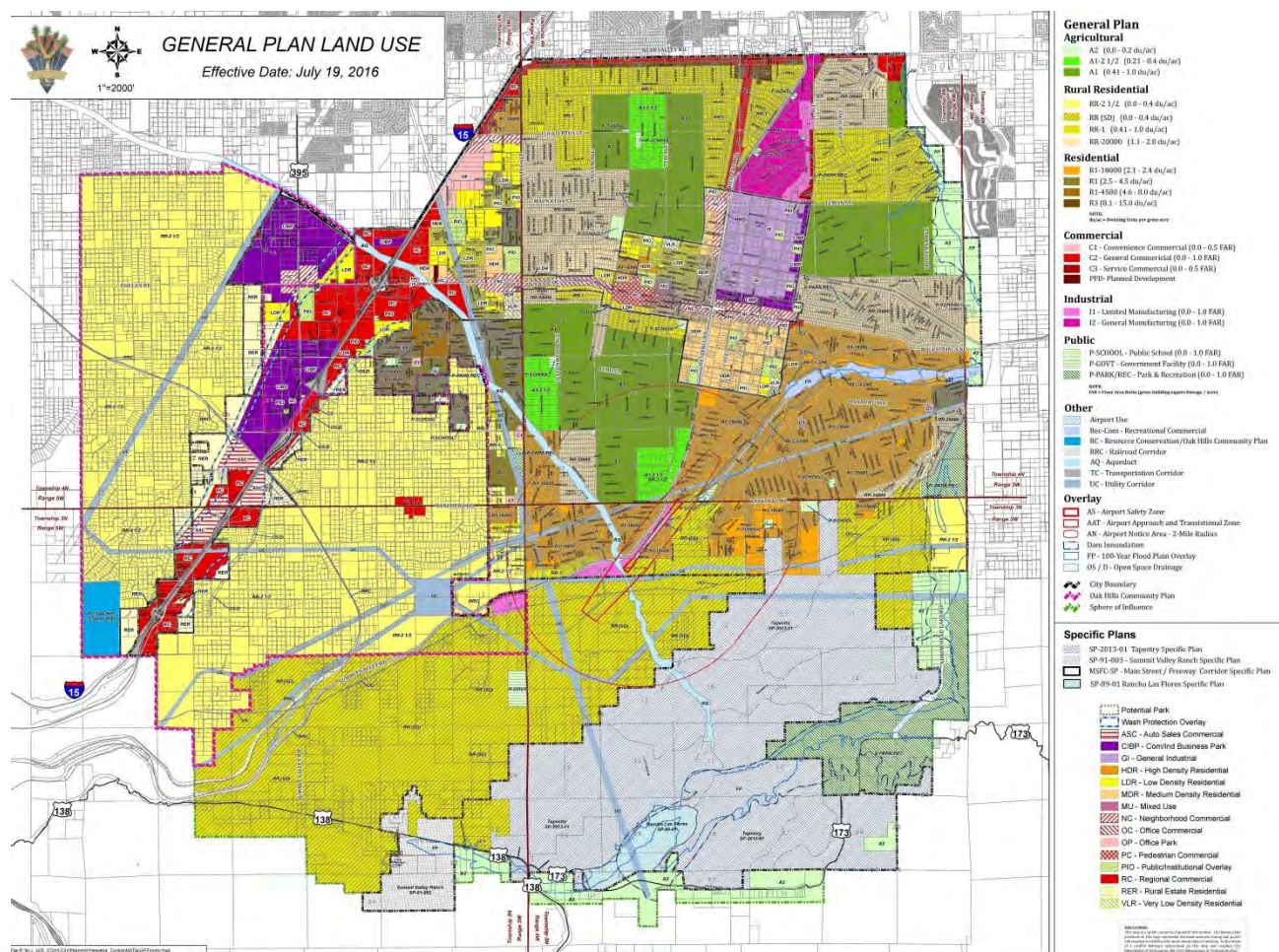
The City's designated hazardous waste site is Hesperia Fire Station located at 17443 Lemon Avenue.

Cable television is provided by Charter Communications located at 12180 Ridgcrest Road #102 in Victorville.

1.3.9 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.

Figure 1-2 Hesperia General Plan Land Use Map





The land use map identifies the preferred distribution and extent of residential, commercial, industrial, public and open space uses.

RR-SD (Rural Residential-Special Development) permits 0.0-0.4 dwelling units per acre for subdivisions without a Specific Plan. Rural and large animal uses are permitted.

RR-2 ½ (Rural Residential-2 ½) permits 0.0-0.4 dwelling units per acre for subdivisions as well as equestrian and other large animal uses.

RR-1 (Rural Residential-1) permits one acre minimum lot sizes intended for detached single family residential uses and large animal keeping.

RR-20000 (Rural Residential-20,000) permits a minimum lot size of 20,000 square feet intended for single family residential uses with some large animal keeping.

R1-18000 (Single-Family Residence-18,000) permits a single-family residence with a minimum lot size of 18,000 square feet that do not keep large animals.

R1 (Single-Family Residence) permits a minimum 7,200 square foot lot sizes to 18,000 square foot lots in a more suburban setting.

R1-4500 (Single-Family Residence-4,500) permits a minimum 4,000 square foot lot sizes to less than 7,200 square foot lots in a more suburban setting.

R3 (Multiple Family Residence) permits 8.1-15.0 dwelling units per acre intended for multiple family uses such as townhouses, condominiums, or apartments.

A2 (General Agricultural) permits one dwelling unit per five acres intended for commercial agricultural operations, livestock keeping, and rural residential uses.

A1-2 ½ (Limited Agricultural – 2 ½) permits a minimum 2½-acre lot size containing a single-family dwelling along with rural residential uses and livestock keeping.

A1 (Limited Agricultural) permits a minimum one-acre lot size within existing single-family residential neighborhoods along with agricultural uses and livestock keeping.

Commercial designations are designed to permit a wide variety of neighborhood, general office, and retail uses. Commercial designations are intended to serve local neighborhood needs as well as regional and highway commercial needs.

C1 (Neighborhood Commercial) is intended to permit convenience-type goods and services for the daily (short-term) needs of surrounding residential neighborhoods.

C2 (General Commercial) is intended for goods and services of a general nature as well as professional offices that will meet both the resident's short and long-term needs.

C3 (Service Commercial) uses include business-to-business retail and wholesale sales and services. C3 serves as a buffer mostly between residential uses and industrial uses.

Industrial districts are appropriate for areas with adequate sanitation, water, transportation, drainage, utilities, and public services available to meet development needs. The industrial designations are not intended for general commercial uses.



I-1 (Limited Industrial) is intended to include lighter industrial uses, wholesale or retail sale of industrial supplies, transportation equipment, building equipment and materials, and indoor manufacturing uses.

I-2 (General Industrial) is intended to permit the establishment of manufacturing and related uses such as manufacturing, warehousing, and fabrication uses.

Public designations are intended to identify land occupied with public facilities or uses including community facilities, schools, parks, libraries, utility easements and substations, water and sewage facilities, emergency services, fire stations, and municipal buildings.

P-School (Public-School) is intended to identify properties occupied by school districts.

P-GOVT (Public-Government) is intended to identify properties occupied government agencies such as City Hall, administrative offices, fire stations, or police stations.

P-Park/Rec (Public –Park/Recreation) is intended to encompass properties owned by the Hesperia Recreation and Park District such as parks and recreational facilities.

Resource Conservation is land found only in the Oak Hills Community Plan area, within the City's sphere of influence. Land use regulations can be found in this Plan.

RC (Resource Conservation) is intended to encourage limited rural development that maximizes preservation of open space, watershed, and wildlife habitat areas.

Recreation Commercial is intended to provide for recreational uses within some of the City's natural drainage courses and other similar areas

REC-COM (Recreational-Commercial) is intended to provide for areas of recreational opportunities within the Antelope Valley wash such as golf courses, ball fields, fairgrounds, and shooting ranges. Structures are not allowed in areas of the Flood way.

Land Use Overlays within the General Plan are intended to identify parcels that may be affected by natural or man-made hazards and that require special attention prior to development.

OS/D (Open Space/Drainage) is intended to protect, enhance, or maintain land for natural or cultural resources, recreation, sensitive environments, and natural hazards.

FP (100-Year Floodplain Overlay) is consistent with the boundaries of the Federal Emergency Management Agencies (FEMA's) 100-year floodplain boundaries, which all structures shall raise pad elevations one foot or more above the base flood elevation and shall not increase flood levels during the base flood discharge.

DI (Dam Inundation Overlay) is intended to identify the potential area of flooding caused by a seismic activity, or failure of the Mojave Forks and the Cedar Springs Dams.

AS (Airport Safety Zone) is immediately around the runway, is an Object Free Area (no structures or vehicles).

AAT (Airport Approach and Transitional Zone) may be subject to height and lot size limitations as described in the Hesperia Airport Comprehensive Land Use Plan.

AN (Airport Notice Area) may be subject to some noise impacts and low-flying aircraft.



Oak Hills Community Plan Area is expected to remain a fairly low residential density area due to existing parcel sizes, infrastructure, and community interest. Many of these lots were created through sectional subdivisions and lack legal and physical access.

Main Street and Freeway Corridor Specific Plan includes all City freeway frontages and commercial and industrial areas parallel to the freeway corridor. The Specific Plan contains the majority of the commercially designated areas within the City.

MAIN STREET AND FREEWAY CORRIDOR SPECIFIC PLAN LAND USES

Land Use	Acres
Auto Sales Commercial (ASC)	471.19
Commercial/Industrial Business Park (CIBP)	1674.28
General Industrial (GI)	838.98
High Density Residential (HDR)	55.79
Low Density Residential (LDR)	1560.59
Medium Density Residential (MDR)	1097.24
Mixed Use (MU)	38.07
Neighborhood Commercial (NC)	728.44
Office Commercial (OC)	78.13
Office Park (OP)	224.60
Pedestrian Commercial (PC)	132.59
Public/Institutional Overlay (PIO)	432.24
Regional Commercial (RC)	2117.86
Rural Estate Residential (RER)	1086.06
Very Low Density Residential (VLR)	100.71
TOTAL	10636.77

Table 1-1: Land Use by Acre
Source: City of Hesperia Planning Department, 2016

1.3.10 Development Trends

The City of Hesperia offers exceptional development opportunities to new or expanding businesses. The City's immediate market area population currently exceeds 94,000 residents, and with strong growth projected to occur for several more decades, Hesperia will remain a highly desirable location for new investments. Local government is business friendly and fiscally sound.

Hesperia is comprised of rural, suburban, agricultural, commercial, and industrial land uses. The area between Maple Avenue and the eastern City boundary mainly consists of rural residential or agricultural uses except for the area adjacent to Main Street, the industrial core, and the downtown area. The downtown core of the City is located northwest and southeast of the intersection of Hesperia Road and Main Street. The area west of Hesperia Road was subdivided in the late 1800's and contains many duplexes and triplexes on small lots. The City has begun to see construction of new single-family residences on infill lots in this part of the City.

The area west of Maple Avenue within the City is where the majority of new development is occurring. Big-box retailers are building near Interstate 15 and small-lot subdivisions are approved intended for families looking for more affordable housing in a suburban setting. The new construction of commercial and industrial developments will support the creation of industry, a local job base and sales-tax producing businesses. Hesperia has significant amounts of vacant land designated for development, most of which is along Interstate 15 and the industrial area north of Main Street and east of Santa Fe Avenue near the BNSF rail line line.



Since the 2012 City of Hesperia Hazard Mitigation Plan was adopted, there has been new commercial and single family residential development in hazard areas of the City. However, these changes did not impact the City's vulnerability to these or other hazards. The table below shows the number of building permits in each hazard area. While there were 4 single family residential units constructed in the 100-YR floodplain, these structures were built to the standards established by the National Flood Insurance Program (NFIP) and the City's Municipal Code provisions for flood hazard reduction (Title 8: Safety, Chapter 8.28: Flood Hazard Protection and Regulations). These regulations are explained in detail in Section 4.2.1 of this plan. Single family (and 1 multifamily) residential units and some commercial structures were constructed in high wildfire risk areas, but these structures were also built to meet or exceed the 2016 California Building Standards Code and the most recent California Fire Code (reviewed by the San Bernardino County Fire Department for compliance). These standards are explained in detail in Section 4.3.1 of this plan. To ensure homes built in landslide hazard areas did not impact vulnerability, the structures were built to meet the standards of the 2016 California Building Standards Code which includes Section 3417: Earthquake Evaluation and Design for Retrofit of Existing Buildings. These standards are described in detail in Section 4.4.1 of this plan.

Permit Type	Total Count	Flood Hazard (100-YR)	Wildfire Hazard (High)	Landslide Hazard
2012	7	-	1	-
Commercial	6			
Multi-Family Dwelling	1		1	
2013	31	-	13	1
Commercial	7		2	
Single Family Residential	24		11	1
2014	74	1	34	1
Commercial	7		1	
Single Family Residential	67	1	33	1
2015	94	1	50	1
Commercial	5		1	
Single Family Residential	89	1	49	1
2016	121	-	50	3
Commercial	6		2	
Single Family Residential	115		48	3
2017	112	2	64	2
Commercial	3		1	
Single Family Residential	109	2	63	2
Grand Total	439	4	212	8

The City of Hesperia has a General Plan which serves as a blueprint for establishing long-range development policies. The General Plan provides a basis for private development proposals and public projects to remain consistent with existing city, regional and state policies. The General Plan is designed to help the city address issues related to land use, circulation (traffic), housing, open space, conservation, noise, and safety. The Land Use portion of the plan helps guide the City in determining the location of future development(s), to include possible future annexations. In addition to the General Plan, Hesperia has other plans that guide development in specific areas of the city, including The Main Street and Freeway Corridor Specific Plan was adopted in 2008 to facilitate and encourage development and improvements especially along the freeway and Main Street. Both plans integrate strategies to support state priorities consistent with AB 32 and SB 375. These plans help to shape future development and dictate the City's Sphere of Influence. Find out more about the General Plan here:

<http://www.cityofhesperia.us/409/Hesperia-General-Plan>



A specific plan is tool for systematically implementing the General Plan within a portion of the Planning Area. A specific plan is a hybrid document that combines General Plan policy statements with development regulations. It is often used to address the development requirements for a single project, such as urban infill or a new growth area.

The Tapestry Specific Plan has replaced the Rancho Las Flores Specific Plan, located within City boundaries, southeast of the majority of the developed City. The Tapestry site is approximately 9,365 acres and is intended to contain approximately 16,196 dwelling units at build-out, which will significantly increase the population of the City. Currently, almost the entire area is undeveloped. The purpose of the Specific Plan is to provide a framework that describes the Tapestry master plan and provides a guide to the future development of the community. It is a tool for developers, property owners, citizens, consultants, city staff and decision makers. The Specific Plan sets forth the overall vision, goals, objectives, design guidelines and development standards for Tapestry. It is regulatory in nature and serves as the zoning ordinance specific to the unique characteristics of the site. It also addresses the administrative framework needed to implement the plan. The intent for the Tapestry Specific Plan is to enhance the quality of life for its residents and the citizens of Hesperia by providing a comprehensive master plan. This approach is preferred over piecemeal development of smaller individual parcels of land.

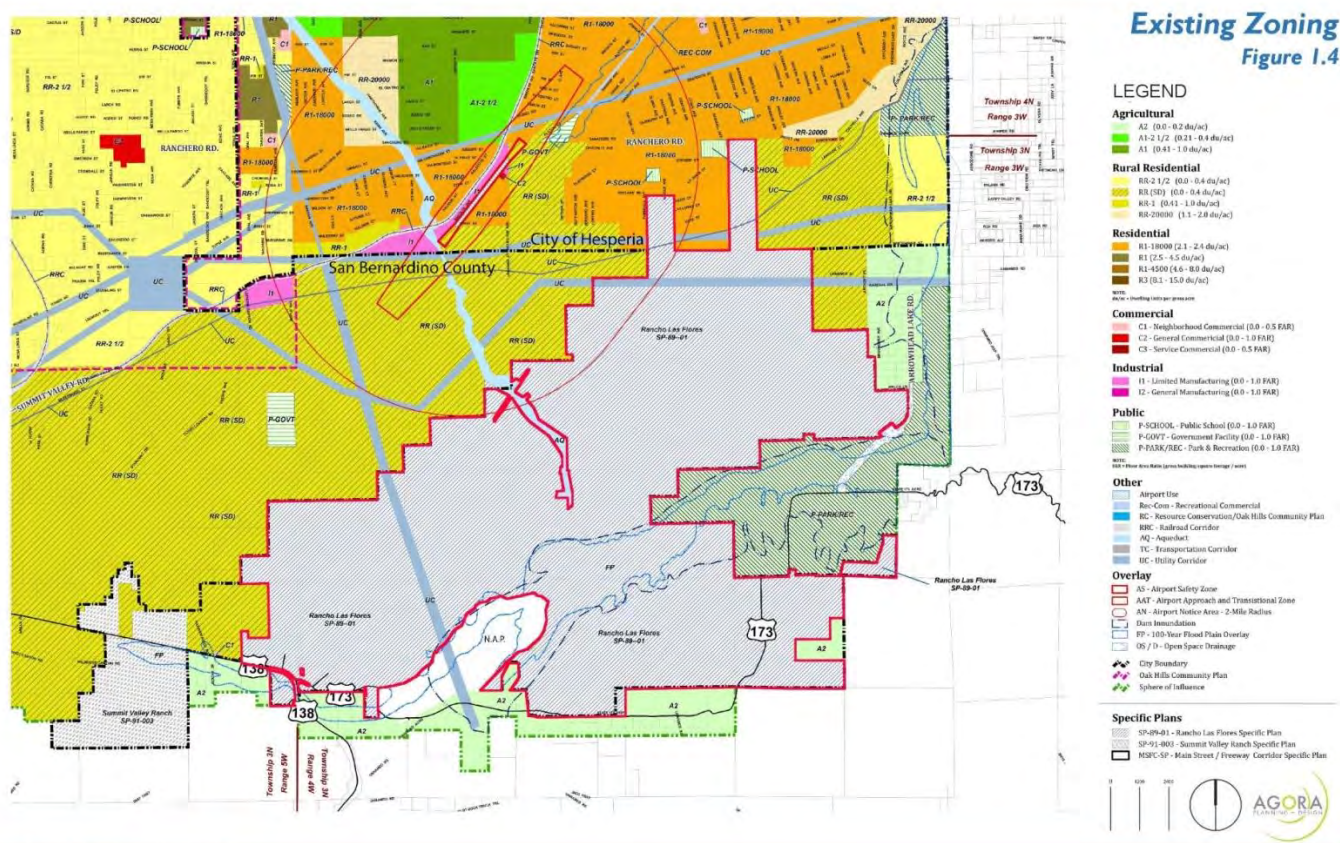


Figure 1-3 Tapestry Specific Plan Map, July 2015



The Main Street and Freeway Corridor Specific Plan area consists of two corridors, Interstate-15 and Main Street, approximately 18 miles in length and with a total area of over 16 square miles. The purpose of this Specific Plan is to establish a development framework for the Main Street and Freeway corridors. This Specific Plan is intended to facilitate and encourage development and improvements along these two corridors to help realize the community's vision for the area. It is a tool for developers, property owners, City staff and decision makers. New construction or rehabilitation on private property will be regulated through the land use policies, development standards and design guidelines in this Specific Plan.

This updated Local Hazard Mitigation Plan also reflects the City of Hesperia's effort to comply with sustainable development and recognizes Climate Action Strategies adopted at the state and regional levels in California. The City adopted its own Climate Action Plan in 2010. All future development projects will be constructed to current design standards and building codes, and are not expected to contribute to community vulnerability from natural or technological hazards.

While all of these development trends may not be recognized over the next five years, all future development that will take place is planned to occur in accordance with the General Plan Land Use Zones and will consider all potential hazards identified within this plan. Additionally, all development will be in compliance with all Fire, Flood, and Seismic codes of the County and State at the time of development.



Section 2. Plan Adoption

2.1 Adoption by Local Governing Body

Pursuant to the mitigation planning regulations, the City of Hesperia Plan will be submitted to Cal OES for review and approval. Cal OES will conduct a formal review of the Plan in accordance with the Code of Federal Regulations and will notify the City that the Plan will be eligible for final approval pending its adoption by the City of Hesperia.

The Hesperia City Council adopted the Plan on Month Day, 2017. A Resolution of the City Council of the City of Hesperia, California, adopting the updated Hazard Mitigation Plan as required by the Disaster Mitigation Act of 2000 (Resolution No. 2017-xx) is included in this Plan (located in Appendix A). The City forwarded adopting documentation to Cal OES on Month Day, 2017 and subsequently received final approval from Cal OES (letter dated Month Day, 2017).

2.2 Promulgation Authority

The Promulgator Authority for the adoption of the Hazard Mitigation Plan by the City of Hesperia is:

Paul R. Russ	Mayor
Russ Blewett	Mayor Pro Tem
Bill Holland	Council Member
Larry Bird	Council Member
Rebekah Swanson	Council Member

2.3 Primary Point of Contact

The Point of Contact for information regarding this HMP is:

Rachel Molina, Assistant to the City Manager
City of Hesperia
9700 Seventh Avenue, Hesperia, CA 92345
(760) 947-1020 (Office) (760) 947-2881 (Fax)
rmolina@cityofhesperia.us



Section 3. Planning Process

This section describes each stage of the planning process used to develop the 2017 HMP. The 2016-17 HMP planning process provides a framework for document development and follows the FEMA recommended steps. The 2017 HMP follows a prescribed series of planning steps which includes organizing resources, assessing risk, developing the mitigation plan, drafting the plan, reviewing and revising the plan, and adopting and submitting the plan for approval. Each is described in this section.

3.1 Preparing for the Plan

Planning creates a way to solicit and consider input from diverse interests. Involving stakeholders is essential to building community-wide support for the plan. In addition to emergency managers, the planning process involves other government agencies (e.g., zoning, floodplain management, public works, community, economic development, businesses, civic groups, environmental groups, and schools).

Using the updated Mitigation Plan Review Crosswalk as a guide, the City of Hesperia adopted a comprehensive approach to develop an update to its Hazard Mitigation 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 with internet surveys published on the City's website, 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 1 – 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 2012 Plan update 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 Hesperia Hazard Mitigation Plan (2012) 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 2017 Plan update. In addition, the Planning Team agreed that a more specific approach would provide that benefit and promote improved quality of life.



3.1.1 Building the Planning Team

To complete these objectives, the City compiled a qualified team with various expertise, including public safety, engineering and public works, water infrastructure, and emergency response agencies to participate in, and guide the development of the City's comprehensive Hazard Mitigation Plan. In addition, Hesperia solicited public involvement throughout the planning process, including the release of a public survey through the City's website, allowing the public to comment during the drafting stage, and making the draft Plan available to allow the public to comment on its content.

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.

Leadership, management and oversight for the plan development process were provided through the City's Planning Team. The Planning Team was led by the Assistant to the City Manager. Team members were selected based on current emergency management responsibilities and familiarity with prior mitigation planning and programs. The Planning Team met regularly 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 Project Management Team listed below in Table 3-1:

Name	Title/Involvement	Phone	Email
Rachel Molina	Assistant to the City Manager	(760)947-1020	rmolina@Cityofhesperia.us
April Antonio	Administrative Analyst	(760)947-1006	aantonio@Cityofhesperia.us
Dave Reno	Principal Planner Previous Team Member	(760)947-1253	dreno@Cityofhesperia.us
Mike Thornton	City Engineer	(760)947-1451	mthornton@Cityofhesperia.us
Matt Caughey	Engineering Technician	(760)947-1438	mcaughey@cityofhesperia.us

Table 3-1: Project Management Team



3.1.2 Planning Committee

Name	Title/Involvement	Phone	Email
Mark Faherty	Public Works Manager	(760)947-1427	mfaherty@cityofhesperia.us
Jeremy Martinez	Hesperia Police Department; Administrative Sergeant	(760)947-1541	jmartinez@sbcasd.org
Mike Ward	Fire Prevention Supervisor; Hesperia Fire Department	(760)995-8196	mward@sbcfire.org

Table 3-2: Planning Committee Members

3.1.3 Planning Team / Committee Meetings (City of Hesperia, City Hall)

Name	Topic Description	Date/Time
Internal Project Kick-Off Meeting	Welcome & introductions Mitigation Planning Defines Background Local Hazard Mitigation Planning Process Overall Objectives Project Schedule Today's Accomplishments Next steps	August 2, 2016 10:00am – 11:30am
Planning Committee Meeting #1	Welcome & introductions Project overview HMP process & components Project timeline Questions & answers Resources Public outreach strategy Next steps	August 18, 2016 10:00am – 1:00pm
Planning Committee Meeting #2	Hazard overview & draft risk assessment outcomes Community asset inventory review Review of vulnerability assessment Group analysis, risk factor development	October 11, 2016 2:00pm – 5:00pm
Planning Committee Meeting #3	Identify draft problem statements Goals and objectives exercise (intro) Finalize goals & objectives Develop capabilities	November 16, 2016 2:00pm – 4:30pm
Planning Committee Meeting #4	Discuss and review draft mitigation Address any notated changes Provide notes, comments, and changes to Team Manager for documents updates Outline plan to finalize document for final draft	March 30, 2017 10:00am – 12:30pm

Table 3-3: Planning Committee Meetings



3.2 Coordination with Other External 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:

- California Department of Transportation (Caltrans)
- California Governor's Office of Emergency Services (Cal OES)
- City of Victorville
- Community Members
- Federal Emergency Management Agency (FEMA)
- Hesperia Unified School District
- Hesperia Recreation and Park District
- Local Consultants
- Local Non-Profit Agencies (American Red Cross, United Way)
- Local Utility Companies
- Local Waste hauler
- Medical Sector (local clinics)
- Public and Private Business Sectors
- San Bernardino County (OES, Dept. of Public Health, Animal Control)
- Town of Apple Valley
- 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 noted in Table 4. San Bernardino County Fire OES hired a contractor (Dynamic Planning) to support the County, Cities and Towns, and Special Districts to update the local Hazard Mitigation Plans and the San Bernardino County Operational Area Multi-Jurisdictional Multi-Hazard Mitigation Plan. The Dynamic Planning Team, 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.



3.2.1 External Agency Meetings

Name	Topic Description	Date/Time
Stakeholder Kick-Off Meeting #1	Hazard Mitigation definition & Background Project Overview Tasks & Accomplishments Next Steps	June 23, 2016 2:00pm – 4:00pm
Stakeholder Update Meeting #2	Project Updates • Milestones / Tempo / Schedule • Templates / Risk Assessments • Hazard Profiles / Outreach Material • California Planning Regulation Updates Risk Assessment • Section 4 Template • Data Acquisition / Edits	October 26, 2016 2:00pm – 4:00pm
Stakeholder Update Meeting #3	Project Updates • Website updates • Milestones / Tempo / Schedule • Section 4 Template Risk Assessment • Review & validate vulnerability assessment information. • How to insert the provided maps, tables and charts Next Steps • Section 5: Community Capabilities Assessment Template • Section 6: Mitigation Strategy Template	December 15, 2016 10:00am – 11:00am
HMP Neighboring Community Meeting	Goals and objectives review Local Hazard Mitigation Planning Process Planning of Stakeholder meeting Organization of resources	January 26, 2017 8:30am – 10:00am
Stakeholder Update Meeting #4	Project Updates • Schedule • Reminder to update flood information • Updates to template since original 1/5/17 release • Integrating the risk assessment into the capabilities assessment and mitigation strategy Community Capabilities Assessment • Capabilities on a local, regional, state and federal level (e.g. potential programs/grants) • Budget highlights Mitigation Strategy (Section 6) • Importance of problem statements for every profiled hazard ◦ Determining mitigation goals, objectives and projects for each hazard • FEMA's 6 broad categories of mitigation alternatives • Prioritizing mitigation actions Next Steps • Draft admin plan for review • Push plan out for public review	February 14, 2017 1:30pm – 2:45pm



Stakeholder Update Meeting #5	Project Updates Future Implementation (Section 7 Review) Plan Review and Submittal • Draft Plan Review / Checklists • Public Involvement vs. Review • Consultant Document Review • Submitting your plan to FEMA Upcoming FEMA Hazard Mitigation Training	March 28, 2017 10:00am – 11:30pm
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Table 3-4: External Agency Meetings

3.3 Public Involvement /Outreach

The City of Hesperia undertook a number of initiatives to inform the public of this effort to solicit their input.

3.3.1 Public Meetings/Participation

Date/Time	Meeting Description	Location
December 5, 2016 – February 7, 2017	<i>Survey Monkey Questionnaire</i>	<i>City of Hesperia Website</i>
January 9, 2017 3:00pm – 4:30pm	<i>Stakeholder Meeting</i>	<i>Police Community Room 15840 Smoke Tree Street</i>

Table 3-5: Public Meetings/Participation

City staff provided literature handouts pertaining to mitigation strategies and emergency and disaster preparedness along with PowerPoint slides and sign-in sheets which can be found in appendix B.

3.3.2 Press Releases

A Press Release explaining the Hazard Mitigation Plan Update Process with links to the HMP webpages and participation survey was released by the City's Public Information Officer on behalf of the City on December 12, 2016. The Press Release was also posted on the City's website. A copy of the press release can be found in Appendix B.

3.3.3 Mitigation Survey

The Planning Team developed a web-based hazard mitigation survey to identify and plan for future disasters. The survey was designed to help the Planning Team determine the level of knowledge local citizens already have about potential disasters and assess areas of vulnerability to various types of disasters. The survey was available to the public for two months. Citizens have provided input about their concerns about each hazard, what they are doing to prepare for and to mitigate high-risk hazards and what activities the City should engage to prepare for, mitigate, and respond to the highest risk hazards. A copy of the survey questions and results summary can be found in Appendix B.

3.3.4 Web Posting

The Press Release and survey mentioned above were posted on the City of Hesperia's website, Facebook and Twitter pages.

The public was invited to submit comments on the Hazard Mitigation Plan Update, attend the stakeholder meeting scheduled for January 9, 2017.



3.3.5 Camp at Home Campaign

"Camp at Home" is an emergency preparedness plan to help keep residents out of harms ways after an earthquake. Staying at home after an earthquake allows emergency services and first responders the ability to address the most greatly impacted neighborhoods without additional unnecessary concerns, such as traffic congestion and sightseers. This campaign aims to educate residents in creating an outside living environment to provide for their entire family the basic essentials to live for up to seven days if a safe and controlled area exists on your own property. This information can be accessed through the City's website, Facebook, and Twitter pages, information pamphlets available at City Hall and local community events, and by contacting staff and requesting a PDF version.

3.3.6 CERT Team

The City of Hesperia initiated a community-wide response program for Community Emergency Response Team (CERT) training. CERT educates people about disaster preparedness and trains citizens to be self-sufficient following a major disaster. CERT includes 20 hours of training in basic disaster response skills, including: Disaster Preparedness, Fire Suppression, Medical Operations, Light Search and Rescue; and Disaster Psychology. By the end of the training, people are knowledgeable on life saving skills with emphasis on decision making, rescuer safety and doing the greatest good for the greatest number. The City of Hesperia CERT team consists of 110 registered members.

3.3.7 Public Meeting Process

The City continues to hold many public meetings and provides notice of these meetings through posted Agendas and through the City's web site (cityofhesperia.us). Prior to Council adoption of the final Hazard Mitigation Plan, the item will be placed on the agenda for a public hearing and posted for public review on the City's web site. The Planning Team will determine how any public comment, if offered, would be included in the draft plan prior to final adoption.

3.4 Assess the Hazard

Data collection and document review are important first steps in the identification and screening of hazards. The Planning Team identified new or emerging hazards, obtained updated hazard maps, hazard probability research studies and reports, reviewed data from new or updated local plans (i.e. safety element of the General Plan, threat assessments, disaster planning scenarios, community wildfire protection plans, etc.) and obtained information about emergencies or disasters that have occurred since the 2012 Hazard Mitigation Plan to provide insights into which parts of the risk assessment warrants updates.

The first step in this process was to identify which natural hazards are present in the community, augmenting the 2012 Hazard Mitigation Plan as necessary. The intent of screening of hazards is to help prioritize which hazard creates the greatest concern in the community. 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 then placed in the appropriate/corresponding box/cell.

The table below is an example of how the hazards were ranked. In this example the "Red" boxes represent the higher priority hazards; and the "Yellow" and "Green" boxes represent additional levels of priority. The definition of "High", "Medium", and "Low" probability and impacts are as follows:

**Probability**

High- Highly Likely/Likely

Medium- Possible

Low- Unlikely

Impact

High- Catastrophic/Critical

Medium- Limited

Low- Negligible

After all hazards had been analyzed, the Planning Team then determined which Probability and Impact category (i.e., High Impact; High Probability, Medium Impact) the community will focus on over the next five years.

2017 HAZARD ASSESSMENT MATRIX				
		Impact		
		High	Medium	Low
Probability	High			
	Medium			
	Low			

Table 3-6: Blank Hazard Assessment Matrix

After identifying the “higher” priority hazards in the community, each of the “high” priority hazards were profiled. The hazard profiling include the incorporation of all new information, material, and reports to better help the Planning Team and the community understand the hazard.

Additionally, for each of the profiled hazards, the Planning Team will then analyze the community's exposure to each hazard (inventory of assets) and the potential impact under scenario events. The Planning Team will use HAZUS to produce this information.

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.

3.6 Review and Propose Mitigation Measures

The Mitigation measures are 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.

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: Guidelines 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: Recent Advances in Soil Liquefaction Engineering (or the most current version).
- 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 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. 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 the 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.

3.7 Draft the Hazard Mitigation Plan

The Hazard Mitigation Plan Update was drafted by the Planning Team. As indicated previously, the Planning Team used the 2012 HMP as a starting point but revised it to reflect updated information. The Planning Team also used the FEMA Guidance and materials provided to aide in the Planning Team's understanding of the level of detail and type of information that is expected in each section.

The development of actions and projects to meet 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 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 3.6 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 effects 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 effects of natural hazards.

While some Planning Team members are responsible for the updating select sections, all members are responsible for reviewing and commenting on the entire HMP. The Planning Team Project Manager was responsible for version control and distribution of the final HMP for review.

Once the HMP update was drafted, the Planning Team provided opportunities for the public to review and comment on the plan. After the public comment period was closed, the Planning Team finalized the plan and forwarded to Cal EMA and FEMA for approval.

3.8 Adopt the Plan

After the public review, the draft plan will be submitted to Cal EMA/FEMA for review and approval. FEMA will provide the City with an "Approval Pending Adoption" letter if the updated Hazard Mitigation Plan update meets all federal requirements. Upon receipt of this letter, the final plan will be submitted to the Hesperia City Council. Once adopted, the final Resolution will be submitted to FEMA for incorporation into the updated Local Hazard Mitigation Plan. A copy of the adopted Resolution will be included in Appendix A.

The City of Hesperia's adoption of the Hazard Mitigation Plan is only the beginning of this effort. The Planning Team will monitor implementation progress, evaluate the effectiveness of the actions, and periodically recommend action items. Progress of the implementation of the Plan and the recommended action/mitigation strategies will be assessed annually. The Plan will be submitted and updated to FEMA every five years, which is required by FEMA in order to remain eligible for post-disaster mitigation funding.



Section 4. Risk Assessment

The goal of mitigation is to reduce and/or eliminate 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 an assessment of the risk.

This Risk Assessment Section evaluates 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 City could be affected by a hazard, and the impact on City assets. Our Risk Assessment approach consists of four components:

- **Hazard identification** – Identification and screening of hazards
- **Hazard profile** – Review of historic occurrences and assessment of the potential for future events
- **Asset inventory** – Identification of exposed buildings, infrastructure and population
- **Vulnerability assessment** – Determination of potential losses or impacts to buildings, infrastructure and population

4.1 Hazard Identification

4.1.1 Hazard Screening Criteria

Per FEMA Guidance, the first step in developing the Risk Assessment is identifying the hazards. The City's HMP Planning Team reviewed a number of previously prepared hazard mitigation plans and other relevant documents to determine the universe of natural hazards that have the potential to affect the City. by reviewing data from the City's 2010 General Plan in the Safety Element, 2012 Hesperia Hazard Mitigation Plan, 2016 San Bernardino County Hazard Mitigation Plan, the 2013 CA State Hazard Mitigation Plan and the 2017 Hazard maps provided by Dynamic Planning and Science, 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 2012 Hesperia Hazard Mitigation Plan to provide valuable insights into which parts of the risk assessment required updates.

Thirteen different hazards were identified based on a thorough document review. This review was used to develop a preliminary hazards list providing a framework for City HMP Planning Team members to evaluate which hazards were truly relevant to the City and which ones are not. For example, severe thunderstorms and infestation were hazards considered to be of little relevance to the City, while earthquake, flooding, and wildfire were indicated in almost all hazard documentation.

After the Planning Team identified all potential hazards, the next step was to screen all the hazards. 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.

Identified hazards from the 2017 HMP are:

- Earthquake
- Dam Failure
- Flooding
- Wildfires
- Drought
- Extreme Heat
- High Winds



- Infestation
- Lightning
- Severe thunderstorms
- Hazardous Materials
- Terrorism
- Climate Change

The hazard data was analyzed in view of how it impacts public safety, health, buildings, transportation, infrastructure, critical facilities and the economy. The discussion of the problem and vulnerability assessment for each hazard is presented in the sections for each hazard.

The identification of each hazard was based upon the following sources:

1. Historic Occurrence of the Hazard - Assessment is based on frequency, magnitude and potential impact of the hazard.
2. Mitigation Potential for the Hazard - These criteria considers if there are mitigation or counter measures possible to prevent or alleviate the risk.
3. Expert Opinion - Evaluation of threats includes a literature review and the expertise of the Planning Team.
4. Published Data and Information - Assessment is based on data and/or information from credible publications or websites (i.e., U.S. Geological Survey, California Geological Survey, National Weather Service - National Climatic Data Center, or academic publications).

4.1.2 Hazard Prioritization

The intent of assessing the hazards is to help prioritize which hazard(s) create the greatest concern(s) in the City. The Planning Team implemented a qualitative ranking system for the HMP update process; a nonnumeric rating (High, Medium, or Low) was determined for both the 1) probability and 2) expected impact from each screened hazard.

Using the hazard rankings from the 2012 HMP, information on hazard occurrences during the last five years, and available data on specific hazard probabilities, the Planning Team assessed each hazard. A discussion of each hazard is provided below.

Rankings used for the hazard screening were defined as follows:

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

The following definitions of “High,” “Medium,” and “Low” probability and impacts were used. (NOTE: these categories were also utilized in the 2012 HMP process):

Probability:

- **High:** Highly Likely/Likely. There may or may not have been historic occurrences of the hazard in the community or region but experts feel that it is *likely* that the hazard will occur in the community.
- **Medium:** Possible. There may or may not have been a historic occurrence of the hazard in the community or region but experts feel that it is *possible* that the hazard could occur in the community. Citizens may feel that there is a likelihood of occurrence.



- **Low:** Unlikely. There have been no historic occurrences of the hazard in the community or region and both experts and citizens agree that it is highly *unlikely* that the hazard will occur in the community.

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. "Red" boxes represent the higher priority hazards; and the "Yellow" and "Green" 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.

The results of the screening process described above are presented as a hazard assessment matrix in the table below. The matrix illustrates the nature and potential of threats from natural disasters to the City of Hesperia. The Planning Team reviewed the probability and impact for each screened hazard and the potential for implementing mitigation measures to reduce the risk. The results were reviewed and modified during stakeholder meetings and a prioritized ranking of the hazards was developed. As shown in the table below, there are three hazards that were given a high priority: earthquake, flooding, wildfires. Even though climate change was given a low rating, we are still required to profile the hazard.

2017 HAZARD ASSESSMENT MATRIX				
		Impact		
		High	Medium	Low
Probability	High	Earthquake/Geo hazards Flooding Wildfire	High Winds	Extreme Heat Drought
	Medium		Severe Thunderstorms Hazardous Materials	
	Low	Dam Failure		Climate Change Infestation Terrorism Lightning

Table 4-1: Hazard Assessment Matrix



4.2 Flood Hazard Profile

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).



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. Inundation due to a 100-year flood (a flood that has a 1 percent probability of being equaled or exceeded 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.

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 already made substantial improvements to the City's drainage infrastructure, including several new storm drains and the Ranchero Road Grade Separation Project. This project significantly improved east-west travel across the City, and elevated 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 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.

4.2.1 Regulatory Environment

The regulatory environment for flood control at the local, state and federal level is complex, difficult to navigate, and varies based upon flood control structure, location of water bodies and local participation



in state and federal programs. This section focuses on the regulations that the City uses to regulate development within the floodplain. This section also highlights some of the new requirements from the State of California, as well as the National Flood Insurance Program (NFIP).

4.2.1.1 Local

StormReady

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.

Building Codes

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 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.

Grading

Grading permits are issued by the City Engineer, depending upon the volume of grading; and grading plan review, inspection of grading projects for compliance with all applicable codes and regulations, and enforcement of mandated State and Federal Codes, as well as County adopted California Building Standard Codes is performed by the City. In an effort to provide means for controlling soil erosion, sedimentation, increased rates of water runoff, and related environmental damage, the City requires a grading permit prior to any grading, filling, excavation, or clearing of vegetation which is not determined exempt. The City also requires mitigation of any increase in runoff generated from new development to remain on site.



4.2.1.2 National Flood Insurance Program (NFIP)

The NFIP makes federally backed flood insurance available to homeowners, renters, and business owners in participating communities. As a participating member of the NFIP, Hesperia is dedicated to protecting more than 297 homes with policies currently in force, according to the CRS Status and Information Table. Like most communities participating in NFIP, FEMA has prepared a detailed Flood Insurance Study (FIS) for areas of San Bernardino County, including the City of Hesperia. The study presents water surface elevations for floods of various magnitudes, including the 1-percent annual chance of flood (the 100-year flood) and the 0.2-percent annual chance of flood (the 500-year flood). Base flood elevations and the boundaries of the 100- and 500-year floodplains are shown on FIRMs. More information on location and geographic extent of the Flood Insurance Rate Maps (FIRMs) are provided in this section.

The City of Hesperia entered the regular phase of the NFIP on October 19, 1989. As a participant in the NFIP, the City of Hesperia is dedicated to regulating development in the FEMA regulated floodplain areas in accordance with NFIP criteria. Before a permit to build in a floodplain area is issued, the City ensures that two basic criteria are met:

- All new buildings and developments undergoing substantial improvements must, at a minimum, be elevated to protect against damage by the 100-year flood.
- New floodplain developments must not aggravate existing flood problems or increase damage to other properties.

Structures permitted or built in the County/City before the NFIP regulatory requirements were incorporated into the City's ordinances (before the effective date of the City's FIRM) are called "pre-FIRM" structures. For the City of Hesperia, pre-FIRM structures are those permitted or built before September 29, 1989.

Extensive FEMA NFIP databases are used to track claims for every participating community including Hesperia. NFIP insurance data provided by FEMA indicates that as of September 02, 2016, there were 297 policies in the City, resulting in \$71,933,700 of insurance in force; this amounts to \$231,162 in total premiums. Of the 297 policies, only 147 are for structures located within the 1% annual chance flood zones, while the remaining 150 policies are for structures located outside of the FEMA identified floodplain.

As of November 30, 2016 there have been 12 closed paid losses totaling \$256,150.09. Of the closed paid losses there has been 1 substantial damage claim. Substantial damage" means damage of any origin sustained by a structure whereby the cost of restoring the structure to its before damaged condition would equal or exceed 50 percent of the market value of the structure before the damage occurred.

Based on this analysis of insurance coverage, the City has significant assets at risk to the 100-year flood. Of the 312 improved parcels within the 100-year floodplain, only 142 (45.5%) of those parcels maintain flood insurance¹. These uninsured structures located in mapped floodplain areas are especially vulnerable.

Currently, the City contains 1 RL properties under their jurisdictional umbrella. The City does not contain any Severe Repetitive Loss structure.

The RL property that experienced flooding in the southeast portion of the City was due to overbank flooding in localized areas. Every loss claim is seasonal in nature as all loss claims have been in December, January or February. Some mitigation on these properties has been conducted and the City is currently tracking mitigation actions through standardized forms as required by FEMA.

¹ An improved property owner may not carry flood insurance for a number of reasons; not everyone is required to carry flood insurance. Structures carrying federally-backed mortgages that are in a SFHA are required to carry flood insurance in Hesperia. Owners who have completed the terms of the mortgage or who purchased their property outright may not choose to carry flood insurance and instead bear the costs of recovery on their own.



A property does not have to be currently carrying a flood insurance policy to be considered a RL or SRL property. Often homes in communities are not carrying flood insurance but are still on the community's repetitive loss list. The "repetitive loss" designation follows a property from owner to owner; from insurance policy to no insurance policy, and even after the property has been mitigated. Having an insurance policy and making claims that fall into the repetitive loss criteria will put a property on the RL list. Even after the policy on a property has lapsed or been terminated, the property will remain on Hesperia's RL list.

The Privacy Act of 1974 (5 U.S.C. 522a) restricts the release of certain types of data to the public. Flood insurance policy and claims data are included in the list of restricted information. FEMA can only release such data to state and local governments, and only if the data are used for floodplain management, mitigation, or research purposes. Therefore, this plan does not identify the repetitive loss properties or include claims data for any individual property. For more information on California Regulation and the NFIP, please see California's Department of Water Resources Quick Guide here: <http://www.water.ca.gov/floodmgmt/lrafm/fmb/docs/CAQG-screen.pdf>

4.2.2 Past Occurrences

Date	Type
August 13, 2004	Monsoon thunderstorms - Flooding
October 20, 2004	Heavy Record Rainfall with flooding
December 28, 2004	Heavy Winter Rains – Flooding
December 31, 2004	Heavy Rain – Flooding
January 7, 2005	Heavy Winter Storm
February 18, 2005	Heavy Rain - Flooding
July 24, 2005	Thunderstorms – Flooding
July 30, 2005	Thunderstorms – Flash Flooding
July 31, 2005	Thunderstorms – Flash Flooding
September 9, 2005	Thunderstorms – Flash Flooding
July 7, 2006	Thunderstorms-Flooding
October 13, 2006	Thunderstorms and Flooding
November 30, 2007	Heavy Rains
August 14, 2008	August Thunderstorms
January 18, 2010	January 2010 Winter Storm
February 5, 2010	February 2010 Winter Storm
February 2014	February 2014 Winter Storm
August 7, 2015	Heavy Rain - Flooding
January 2017	Heavy Rain - Flooding

Source: FEMA and Cal EMA's databases

Table 4-2: Past Flood Occurrences

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.

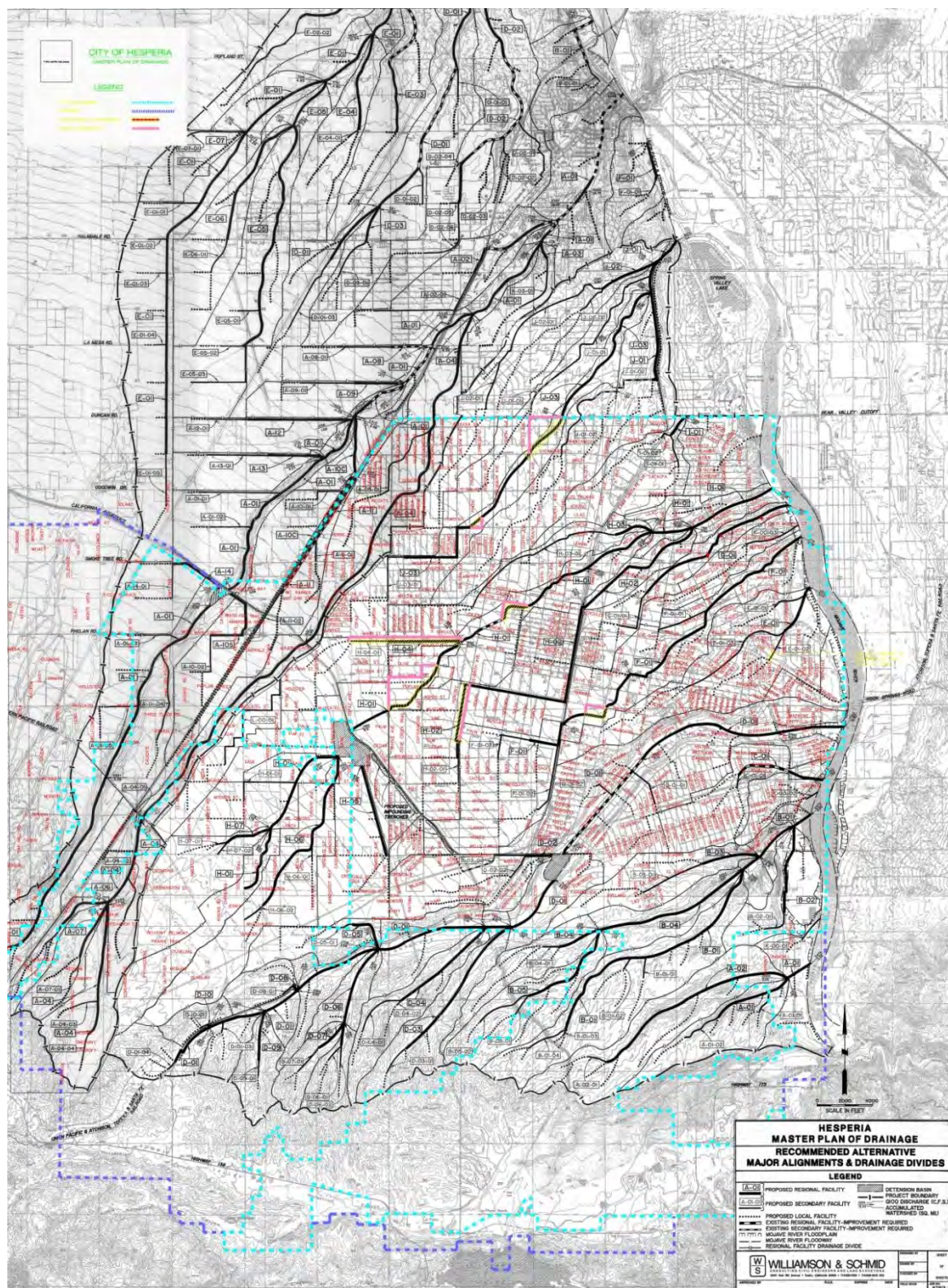


Figure 4-1: Master Plan of Drainage Map; May 1996



4.2.3 Location/ Geographic Extent

A majority of the flood risk within Hesperia is specifically subject to inundation as a result of heavy rainfall and resulting stream and drainage canal overflows. The extent of flooding associated with a 1-percent annual probability of occurrence (the base flood or 100-year flood) is used as the regulatory boundary by many agencies, and helps identify the location and extent of flooding in areas across the city. This area is also referred to as the SFHA, and is a convenient tool for assessing vulnerability and risk in flood-prone communities.

Figure 4-1, Master Plan of Drainage, shows flood corridors within city limits. The Master Plan Flood Plain Mapping is consistent with a previous study of the floodplain by the U.S. Army Corps of Engineers.

Figure 4-2 shows 100-year and 500-year floodplain zones, which are estimated inundation areas based on a flood that has a 1-percent (100-year) and 2-percent (500-year) chance of occurring in any given year. Hesperia contains over 34,419 acres of identified flood hazard areas. Table 4-3 provides the total area for both the 100-year and 500-yr. flood hazard areas.

Important to note: San Bernardino County does not have California Department of Water Resources (DWR) State Awareness Zones identified.

Flood Hazard Type	Sum of Acres	Sum of Square Miles
100-Year Flood	1,121	1.75
100-Year, Floodway	258	0.40
500-Year Flood	34,040	53.19
Total	35,419	55.34

Table 4-3: City of Hesperia 2016 Special Flood Hazard Area

Source: FEMA Published DFIRM Data

4.2.4 Magnitude/ Severity

In urban areas like Hesperia, flood problems are intensified because new homes and other structures, and new streets, driveways, parking lots, and other paved areas decrease the amount of open land available to absorb rainfall and runoff, thus increasing the volume of water that must be carried away by waterways.

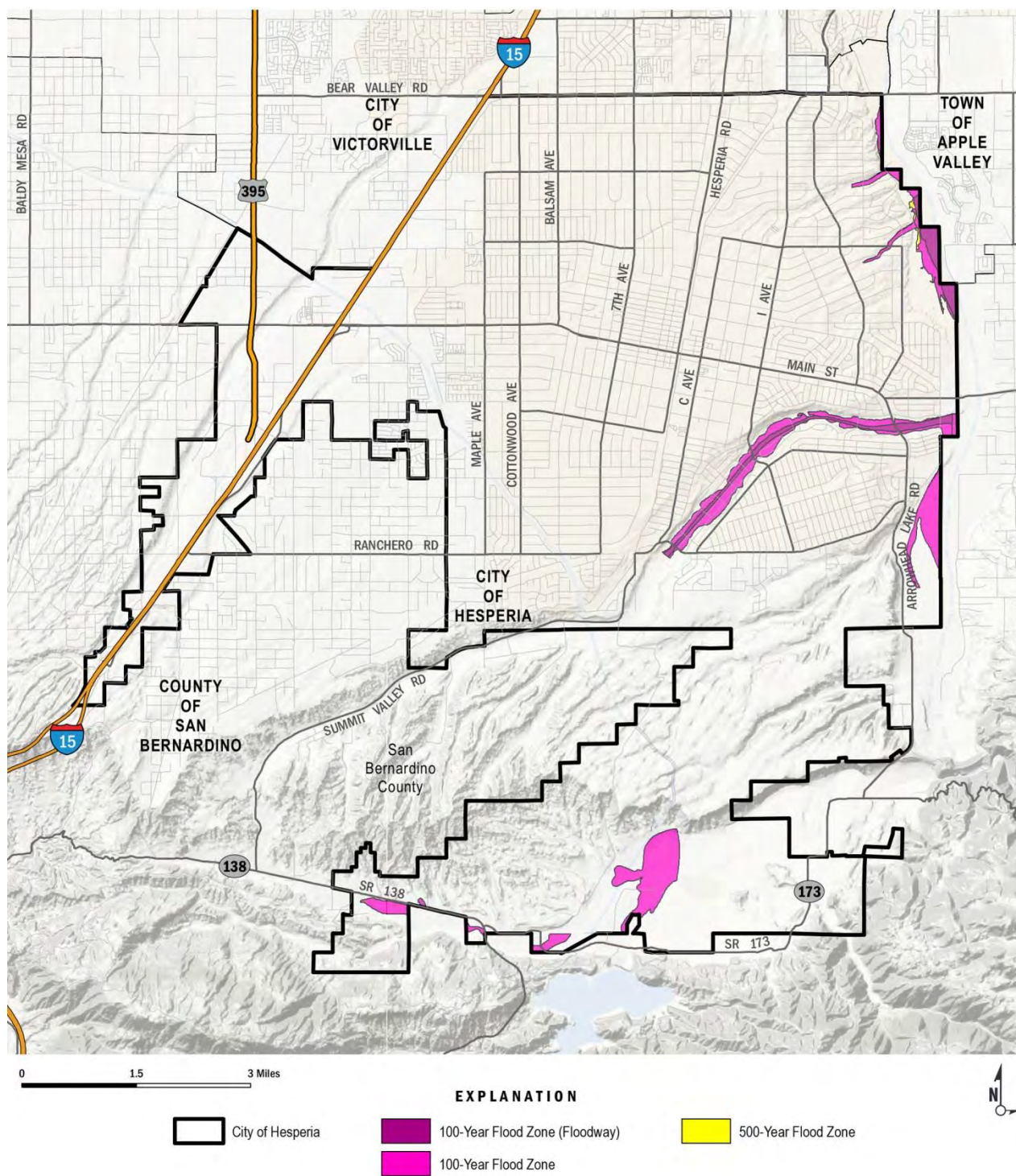
4.2.5 Frequency/ Probability of Future Occurrences

The FIRM maps not only identify the flood hazard zones for insurance and floodplain management purposes, but also provide a statement of probability of future occurrence.

A 500-year flood has a 0.2-percent chance of occurring in any given year; a 100-year flood has a 1-percent chance, a 50-year flood has a 2-percent chance, and a 10-year flood has a 10-percent chance of occurrence. Although the recurrence interval represents the long-term average period between floods of specific magnitude, significant floods could occur at shorter intervals or even within the same year. The FIRM maps typically identify components of the 500-year and 100-year floodplains.



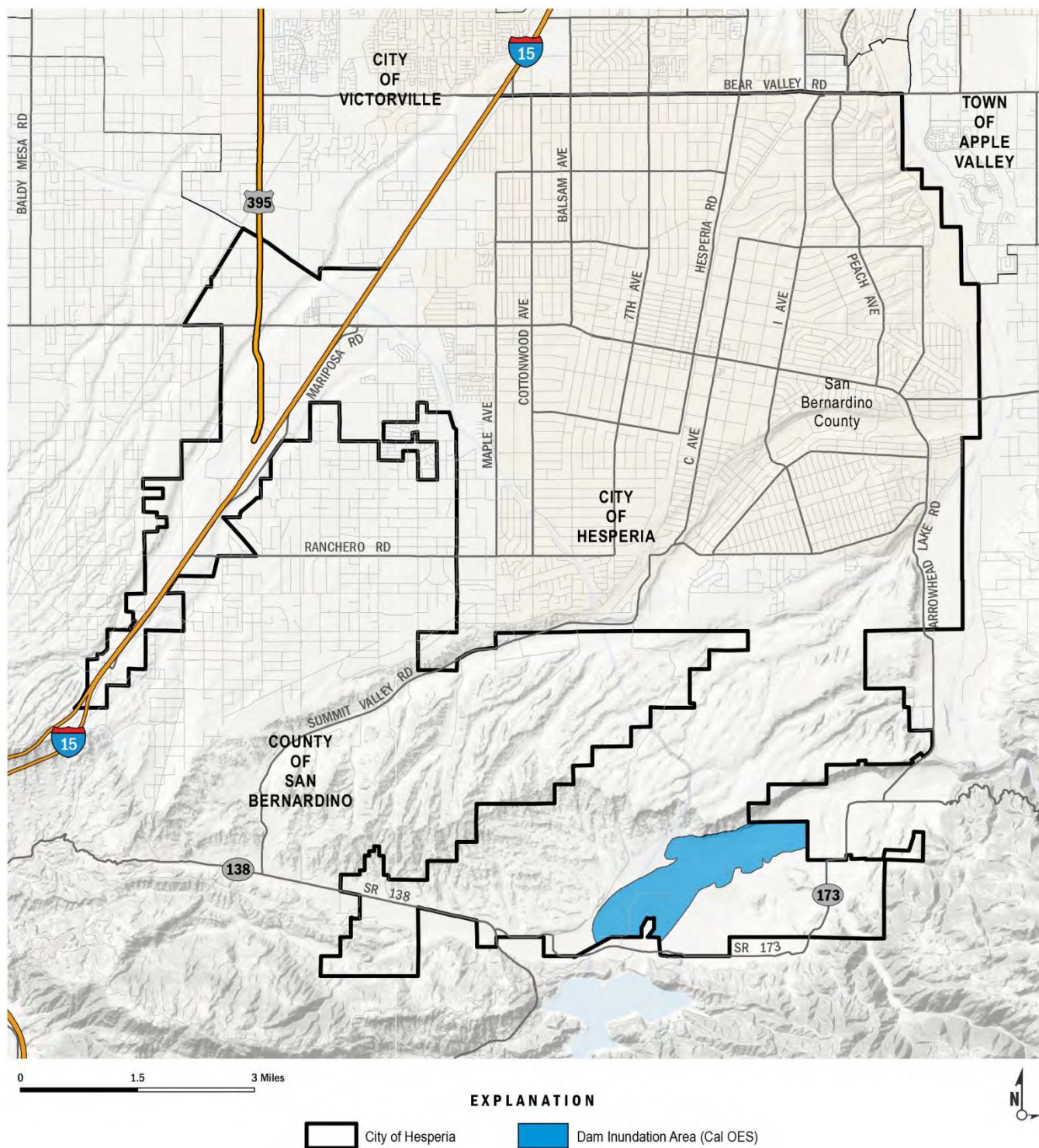
Figure 4-2 Hesperia 100-yr & 500-yr Flood Hazard Map



Source: FEMA, 2016



Figure 4-3 Dam Failure Inundation Map



Source: FEMA, 2016



4.3 Wildfire Hazard Profile

As defined in the California Fire Protection (CAL FIRE) 2010 Strategic Fire Plan, a wildfire event is an unwanted wildland fire including unauthorized human-caused fires, escaped wildfire use events, escaped prescribed wildfire projects, and all other wildfires.



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.

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.

Dozens of small vegetation fires, typically less than one acre in size, are reported in Hesperia annually. 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.

4.3.1 Regulatory Environment

Wildfire regulatory requirements are mandated by the State of California and the City of Hesperia. 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.

4.3.1.1 State

Wildfire State Responsibility Area (SRA) Fire Safe Regulations outline basic wildland fire protection standards for local jurisdictions. SRA Fire Safe Regulations (if policed) can decrease the risk of wildfire events in the wildland interface. SRA Fire Safe Regulations do not supersede local regulations, which equal or exceed minimum state regulations. The State statute for wildfire protection is Public Resources Code, Section 4290. Requirements in the code include information on the following (CA Fire Alliance n.d.):

1. Road Standards for Fire Equipment Access
2. Standards for Signs Identifying Streets, Roads and Buildings
3. Minimum Private Water Supply Reserves for Emergency Fire Use
4. Fuel Breaks and Greenbelts



California State law requires that the fact a property is located in a very high fire hazard severity zone, areas identified on Figure 4-7, 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.

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.

4.3.1.2 Local

The City of Hesperia is located in a Local Responsibility Area. Fire prevention and suppression services in Hesperia are provided on a contract basis by the San Bernardino County Fire Department. The San Bernardino Fire-fighting resources in Hesperia include three fire stations (302, 304, and 305). 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 for vegetation fires in the City during the 2013 to 2015 years was approximately eight minutes and thirty-four 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.

If needed, Apple 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.

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 the Tapestry Project.

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 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.

Reverse 911

The City has executed an agreement with Emergency Communications Network that allows for rapid reverse 911 capability to inform residents and community members during a disaster or crisis via phone calls, emails, text messages, mobile app alerts and other various media outreach.

Building Codes

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 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.

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

Insurance Services Office

The Insurance Services Office (ISO) ranks a community's fire protection needs and services, rating varies from Class 1 being the best to Class 10 the worst. 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). Hesperia currently has a Class 03/3X ISO rating in the developed portions of the City and a rating of Class 03/3X in the outlying 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.

CERT Teams

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.

NIMS Emergency Training

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.

4.3.2 Past Occurrences

Wildfire events are of major concern to the City of Hesperia. Cal FIRE maintains a database of wildfire perimeters. Table 4-4 gives the dates and fire names of the historical wildfires that have



burned within Hesperia city limits. Figure 4-8 shows where those historical burn areas in the City have occurred. 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. In the past sixteen years there have been 17 significant wildland fires within Hesperia. These fires are listed in Table 4-4, and several of the more damaging fires are discussed below.

Table 4-4 Wildfire Occurrences 1999-2016

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 - September 9, 1999	Lucerne and Apple Valleys, east 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, 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 of Victorville	This brush fire burned 10 acres. No structures were damaged.
October 25-November 14, 2003	Six miles south of Hesperia to seven miles north of Lake Arrowhead	The Old Fire was started by an arsonist consuming 91,200 acres before it was fully contained. 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 were evacuated. 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 fell 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 was damaged slightly, 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.
November 5, 2012	Devore/Cajon Pass	The Devore Fire burned 350 acres along Interstate 15 in the San Bernardino National Forest.
May 5, 2014	Ranchero Road Bridge Fire	The fire began Monday afternoon when a blowtorch being used to cut metal reinforcing bars ignited support timbers. The new bridge was under construction at the time.
April 1, 2015	River Bottom Fire in Apple Valley	The county regional park was conducting a controlled burn that grew out of control when the winds shifted. Only a shed and a vehicle were destroyed in the fire. 185 total acres were burned.
August 7 th – 16 th , 2016	Pilot Rock & Hwy 138, southeast of Hesperia	The Pilot Fire started at about 12:10 pm near the Miller Canyon OHV area off of Highway 138. 8,110 total acres burned, with no structures destroyed or injuries reported. Schools were closed due to poor air quality.
August 16 th – 23 rd , 2016	Cajon Pass along Old Cajon Blvd. north of Kenwood Ave. west of I-15	The Blue Cut Fire started on August 16, 2016 at 10:36 AM. The fire quickly spotted across Cajon Creek and grew into a large wildland fire. The Blue Cut Fire burned 36,274 acres, destroying an estimated 105 single family residences and 216 outbuildings, including the historic Summit Inn. In addition, 3 single family residences and 5 other structures were damaged.

Source: CAL FIRE

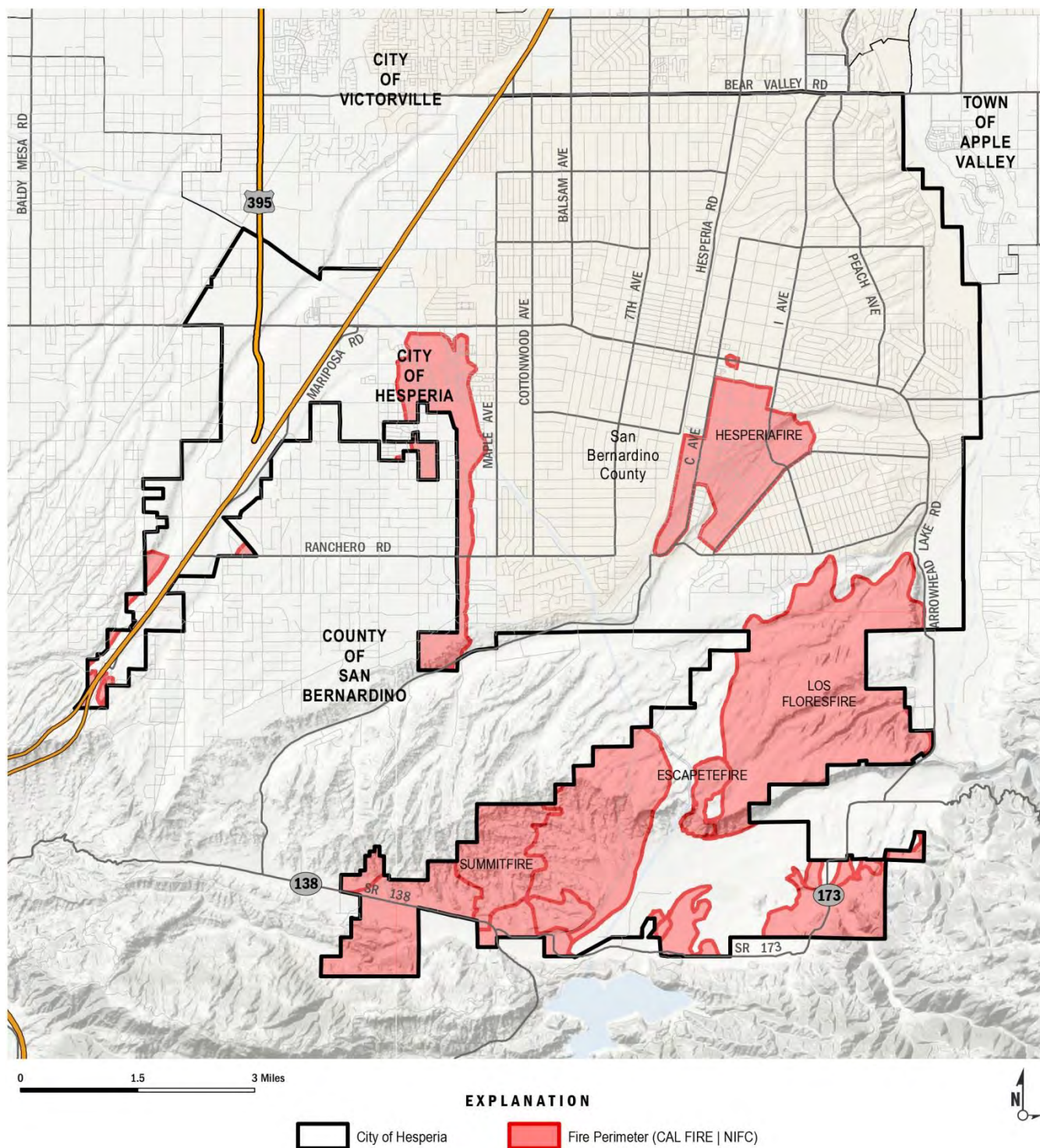
In addition to the data from CAL FIRE, the Planning team noted details on major fires to occur in or near the City, some are mentioned because they affected major roadways that provide either access in and out of the City, or had an impact on the air quality.

Lake Fire: In 2015 The Lake Fire burned 31,359 acres and was the cause of 6 minor firefighter injuries and 1 residence and 3 outbuildings were destroyed.

North Fire/Pines Fire: In 2015 these fires burned a total of 4,250 acres, destroying 7 homes, 16 outbuildings and 44 vehicles in the community of Baldy Mesa. No injuries were reported.



Figure 4-4: Wildfire History Map 2016



Source: Cal Fire; 2016



4.3.3 Location/Geographic Extent

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 predominate vegetation assemblages in this area include, desert shrub, creosote brush shrub and succulent shrub. Other important vegetation types include Joshua Trees (Figure 4-5), woodland, shade-scale scrub, black brush scrub and desert scrub-steppe. About one-third of the desert floor in the Mojave section is devoid of vegetation (Figure 4-6), limiting amount of surface fuel loads available to burn.



Figure 4-5: Undeveloped area showing vegetation common to the area.

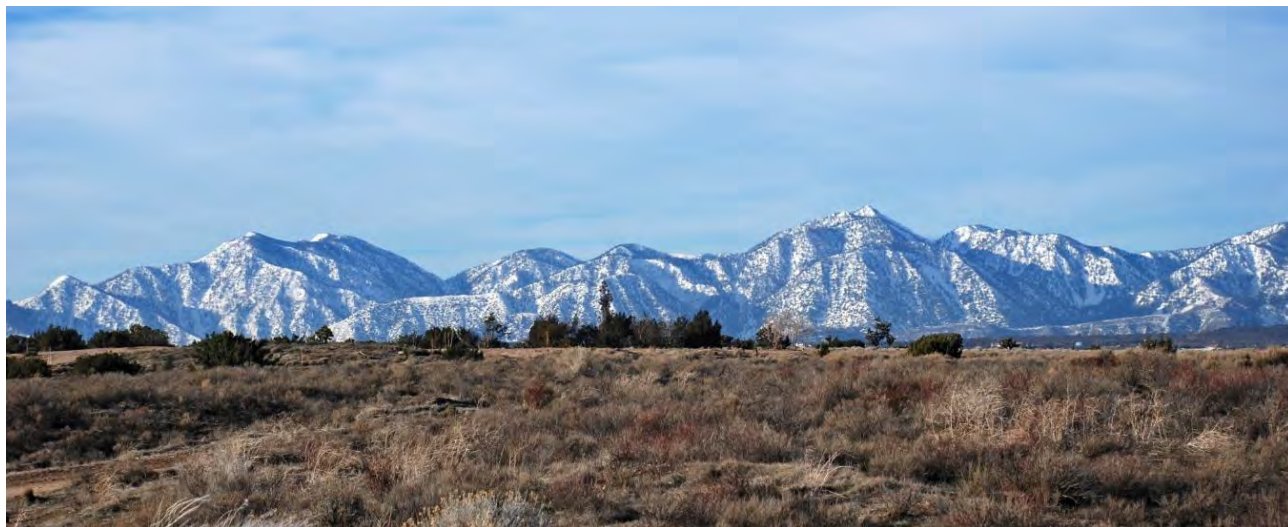


Figure 4-6: Typical Fuel Loads in Hesperia

Using information from the California Department of Forestry (CAL FIRE) Figure 4-4 Wildfire History Map, illustrates the areas at risk to a wildfire event. The area with the highest risk of wildfire is in the southern portion of the City.

4.3.4 Magnitude/Severity

The magnitude and severity of a wildfire event is measured by calculating the number of acres burned in a specific wildfire event. CAL FIRE adopted Fire Hazard Severity Zone maps for LRA in June 2008. The Fire Severity Zones for Hesperia identify areas of Very High, High, and Moderate fire hazard severity throughout the County and are mapped in Figure 4-7.

Fire Severity Zones are used in determining additional protective measures required when building new structures or remodeling older structures within the particular zone. Additional measures must be taken on the property around a structure in the higher ranked fire Severity Zones.

Fire hazard mapping is a way to measure the physical fire behavior to predict the damage a fire is likely to cause. Fire hazard measurement includes vegetative fuels, probability of speed at which a wildfire moves the amount of heat the fire produces, and most importantly, the burning fire brands that the fire sends ahead of the flaming front.

The model used to develop the information in accounts for topography, especially the steepness of the slopes (fires burn faster as they burn up-slope.). Weather (temperature, humidity, and wind) also has a significant influence on fire behavior. The areas depicted as moderate and high in are of particular concern and potential fire risk in these are constantly increasing as human development, and the wildland urban interface areas expand.

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.



4.3.5 Frequency/Probability of Future Occurrences

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.

Hesperia is predominantly dry due to the rain-shadow effect caused by the Peninsular Ranges. Average annual precipitation in Hesperia is 5 to 6 inches, with nearly 70 percent of this precipitation measured in the winter months, between December and March. Approximately 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.

In San Bernardino County, wildfire season commences in the summer when temperatures are high, humidity is low, and conditions remain dry. The season continues into the fall, when the City experiences high velocity, very dry winds.

Long-term variations in rainfall rates have also been noted in this region, with alternating periods of high rainfall and drought. 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 total rainfall a two week period of approximately 8.6 inches. A statewide drought beginning in 2011 has caused the state to be the driest it's been since record keeping began back in 1895 (California 2016). This has caused extremely dry conditions in Hesperia creating plentiful fuel sources for wildfires.

CAL FIRE adopted Fire Hazard Severity Zone maps for LRA in June 2008. Fire hazard mapping is a way to measure the physical fire behavior to predict the damage a fire is likely to cause. Fire hazard measurement includes vegetative fuels, probability of speed at which a wildfire moves the amount of heat the fire produces, and most importantly, the burning fire brands that the fire sends ahead of the flaming front.

The model used to develop the information in accounts for topography, especially the steepness of the slopes (fires burn faster as they burn up-slope.). Weather (temperature, humidity, and wind) also has a significant influence on fire behavior. The areas depicted as moderate, high and very high risk are of particular concern and potential fire risk in these are constantly increasing as human development, and the wildland urban interface areas expand.

Figure 4-7 shows the very high, high and moderate LRA Fire Hazard Severity Zones in and around the City of Hesperia. The risk categories are defined as follows:



- **Very High:** probability of a fire is 1% per year or greater
- **High:** probability of a fire is 0.33% - 1% per year
- **Moderate:** probability of a fire is less than 0.33% per year

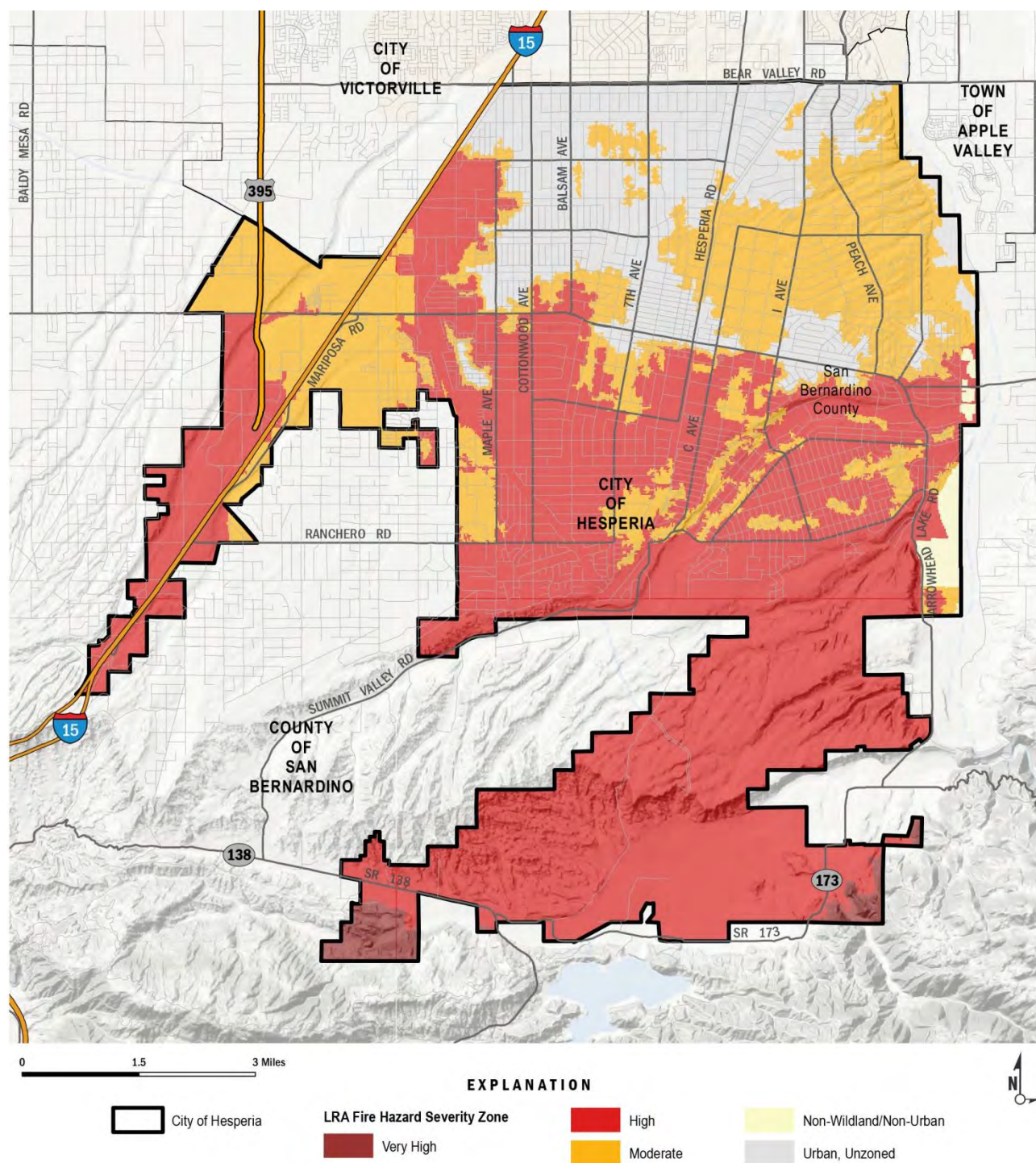
USGS LANDFIRE (Landscape Fire and Resource Management Planning Tools), is a shared program between the wildland fire management programs of the U.S. Department of Agriculture Forest Service and U.S. Department of the Interior, providing landscape scale geo-spatial products to support cross-boundary planning, management, and operations. Historical fire regimes, intervals, and vegetation conditions are mapped using the Vegetation Dynamics Development Tool (VDDT). This USGS data supports fire and landscape management planning goals in the National Cohesive Wildland Fire Management Strategy, the Federal Wildland Fire Management Policy, and the Healthy Forests Restoration Act.

As part of the USGS Landfire data sets, the Mean Fire Return Interval (MFRI) layer quantifies the average period between fires under the presumed historical fire regime. MFRI is intended to describe one component of historical fire regime characteristics in the context of the broader historical time period represented by the LANDFIRE Biophysical Settings (BPS) layer and BPS Model documentation.

MFRI is derived from the vegetation and disturbance dynamics model VDDT (Vegetation Dynamics Development Tool) (LF_1.0.0 CONUS only used the vegetation and disturbance dynamics model LANDSUM). This layer is created by linking the BpS Group attribute in the BpS layer with the Refresh Model Tracker (RMT) data and assigning the MFRI attribute. This geospatial product should display a reasonable approximation of MFRI, as documented in the RMT. See Figure 4-8 for predicted fire return interval for the jurisdictional area.



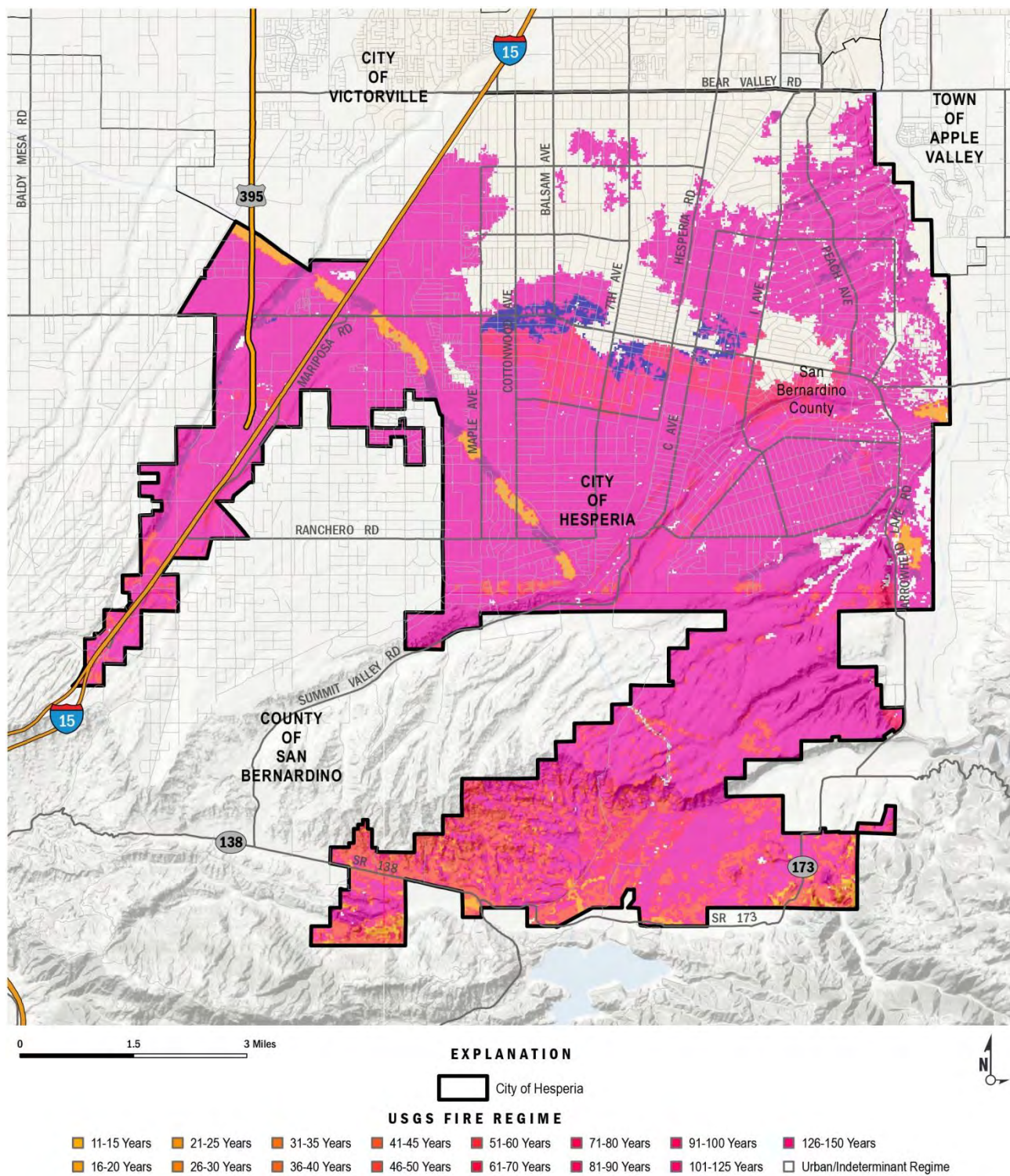
Figure 4-7 Wildfire Hazard Severity Zones 2016



Source: Cal Fire; 2016



Figure 4-8: Wildfire Return Interval Map 2016



Source: U.S. Geological Survey ; 2016



4.4 Earthquake/Geologic Hazard Profile

An earthquake is both the sudden slip on an active fault and the resulting shaking and radiated seismic energy caused by the slip (USGS 2009). The majority of major active faults in the Hesperia area are strike-slip faults. For this type of fault, during an earthquake event, one side of a fault line slides past the other. The rupture from this type of fault extends almost vertically into the ground.



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.

Earthquakes are a significant concern to the City. The area around Hesperia is seismically active since it is situated on the boundary between two tectonic plates. Earthquakes can cause serious structural damage to buildings, overlying aqueducts, transportation facilities, utilities, and can lead to loss of life. In addition, earthquakes can cause collateral emergencies including dam and levee failures, fires, and landslides. Seismic shaking is by far the single greatest cause of damage from an earthquake in Hesperia, followed by liquefaction.

Liquefaction is a geologic process that occurs when loosely packed sandy or silty materials saturated with water are shaken hard enough to lose strength and stiffness causing 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 behave like a liquid or semi-viscous substance and are responsible for tremendous damage in an earthquake. 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. For example, it can cause buildings to collapse, pipes to leak, and roads to buckle.

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.

4.4.1 Regulatory Environment

Numerous building and zoning codes exist at a state and local level to decrease the impact of an earthquake event and resulting liquefaction on residents and infrastructure. Building and zoning codes include the Alquist-Priolo Earthquake Fault Zoning Act of 1972, Seismic Hazards Mapping Act of 1990, 2013 California Standards Building Code (CSBC), and the City of Hesperia General Plan. To protect lives and infrastructure in the City, the following building and zoning codes are used.

4.4.1.1 State

The 1971 San Fernando Earthquake resulted in the destruction of numerous structures built across its path. This led to passage of the Alquist-Priolo Earthquake Fault Zoning Act. This Act prohibits the construction of buildings for human occupancy across active faults in the State of California. Similarly, extensive damage caused by ground failures during the 1989 Loma Prieta Earthquake focused attention on decreasing the impacts of landslides and liquefaction. This led to the creation of the Seismic Hazards Mapping Act. This Act increases construction standards at locations where ground failures are probable during earthquakes.



Active faults in San Bernardino County have been included under the Alquist-Priolo Geologic Hazards Zones Act and Seismic Hazards Mapping Act.

4.4.1.2 Local

The 2016 California Building Standards Code (also known as Title 24) became effective for the City on January 1st, 2017. Title 24 includes CBC Section 3417: Earthquake Evaluation and Design for Retrofit of Existing Buildings which can be viewed at <https://www.documents.dgs.ca.gov/bsc/2015TriCycle/Pre-Cycle-2015/CBC-CEBC/BSC-0X-15-ET-Pt10-Agenda-4d.pdf>.

The 2016 CSBC is based on the International Building Codes (IBC), which is widely used throughout the United States. CSBC was modified for California's conditions to include more detailed and stringent building requirements. The City's Building Department utilizes the 2016 CSBC to regulate the infrastructure in the City. This includes unreinforced masonry (URM) buildings. For new buildings, the City includes earthquake safety provisions, with enhancements for essential services buildings, hospitals, and public schools.

4.4.2 Past Occurrences

The HMP Planning Team noted the following regional and local events for the seismic activity in Hesperia. Table 4-5 shows earthquakes greater than 4.0 that were felt within the City within the last 10 years. None caused notable damage in Hesperia

Table 4-5: Earthquakes from 2005-2015 > 4.0 felt in Hesperia

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, 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
January 15, 2014	Fontana	4.4
July 5, 2014	Running Springs	4.6
July 25, 2015	Fontana	4.2
December 30, 2015	San Bernardino	4.4

Source: U.S. Geological Survey Database

There are hundreds more small ($M < 4.0$) earthquakes that were felt in Hesperia during this same time frame. Those with a magnitude of below 4.0 are not listed.

4.4.3 Location/Geographic Extent

The risk of seismic hazards to residents of Hesperia is based on the approximate location of earthquake faults within and outside the region. This map includes Alquist-Priolo Geologic Hazards Zones Act created under the Seismic Hazards Mapping Act and the USGS Quaternary Fault and Fold Database of the United States. The USGS database contains information on faults and associated folds in the California that are believed to be sources of $M > 6$ earthquakes during the Quaternary (the past 2.6 million years). Figure 4-9



shows fault zones in or near the City. Per the California Department of Conservation's Earthquake Fault Zone Maps, Hesperia is near the following active fault zones or regulatory fault zones managed by the Department of Conservation.

Historical and geological records show that Southern California has a long history of seismic events. Southern California is probably best known for the San Andreas Fault, a 400-mile long fault running from the Mexican border to a point offshore, west of San Francisco. Geologic studies show that over the past 1,400 to 1,500 years, large earthquakes have occurred at about 130-year intervals on the southern San Andreas Fault. As the last large earthquake on the southern San Andreas occurred in 1857, that section of the fault is considered a likely location for an earthquake within the next few decades.

But San Andreas is only one of dozens of known earthquake faults that crisscross Southern California. Beyond the known faults, there are a potentially large number of "blind" faults that underlie the surface of Southern California. One such blind fault was involved in the Whittier Narrows earthquake in October 1987.

Although the most famous of the faults, the San Andreas, is capable of producing an earthquake with a magnitude of 8+ on the Richter scale, some of the "lesser" faults have the potential to inflict greater damage on the urban core of the Los Angeles Basin and nearby cities.

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.



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 4 ± 2 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 $280(\pm 70)$ and $490(\pm 70)$ 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, an 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 Frontal 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.

Liquefaction

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. 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.

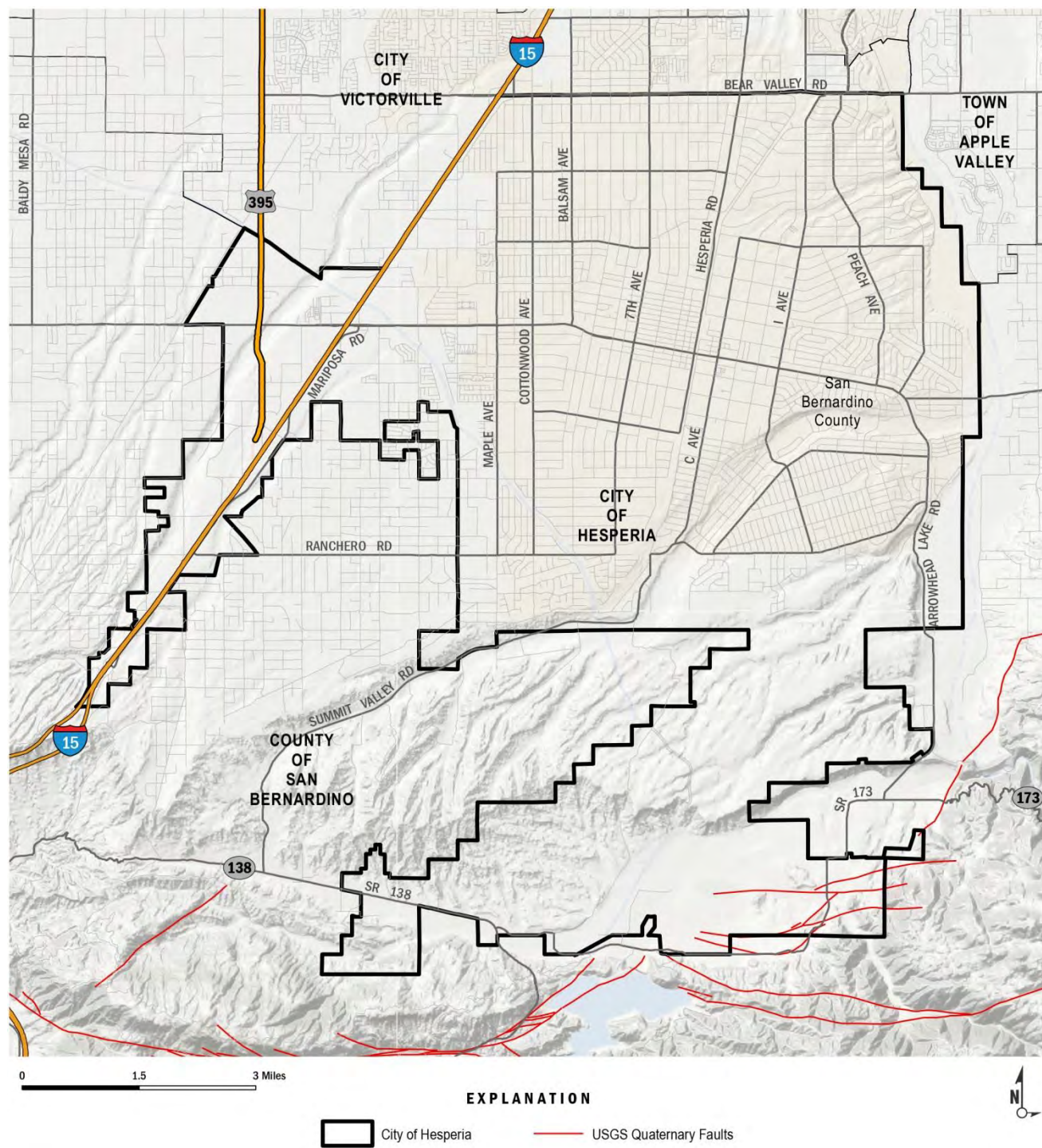
Seismically induced slope failure is a common secondary effect of seismic shaking. Although, most of Hesperia is on relatively level to gently sloping terrain, some natural slopes in the City that may be vulnerable to this hazard.

The hazards of side hill fill deformation, ridge top fissuring and shattering and seicheing 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 Lake 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.

$$*0.2 \text{ gravitational constant} = 1.3346 \times 10^{-11} \text{ m}^3 \text{ kg}^{-1} \text{ s}^{-2}$$



Figure 4-9: Active Faults Map 2016



Source: Department of Conservation & USGS; 2016



4.4.4 Magnitude/Severity

The most common method for measuring earthquakes is magnitude, which measures the strength of an earthquake. Although the Richter scale is known as the measurement for magnitude, the majority of scientists currently use either the Mw Scale or Modified Mercalli Intensity (MMI) Scale. The effects of an earthquake in a particular location are measured by intensity. Earthquake intensity decreases with increasing distance from the epicenter of the earthquake.

The magnitude of an earthquake is related to the total area of the fault that ruptured, as well as the amount of offset (displacement) across the fault. As shown in Table 4-6, there are seven earthquake magnitude classes, ranging from great to micro. A magnitude class of great can cause tremendous damage to infrastructure in Hesperia, compared to a micro class, which results in minor damage to infrastructure.

Table 4-6: Moment Magnitude Scale

Earthquake Magnitude Classes		
Magnitude Class	Magnitude Range (M = Magnitude)	Description
Great	$M > 8$	Tremendous damage
Major	$7 \leq M < 7.9$	Widespread heavy damage
Strong	$6 \leq M < 6.9$	Severe damage
Moderate	$5 \leq M < 5.9$	Considerable damage
Light	$4 \leq M < 4.9$	Moderate damage
Minor	$3 \leq M < 3.9$	Rarely causes damage.
Micro	$M < 3$	Minor damage

Source: Earthquake.usgs.gov/learn/topics/measure.php

The MMI Scale measures earthquake intensity as shown in Table 4-7. The MMI Scale has 12 intensity levels. Each level is defined by a group of observable earthquake effects, such as ground shaking and/or damage to infrastructure. Levels I through VI describe what people see and feel during a small to moderate earthquake. Levels VII through XII describe damage to infrastructure during a moderate to catastrophic earthquake.



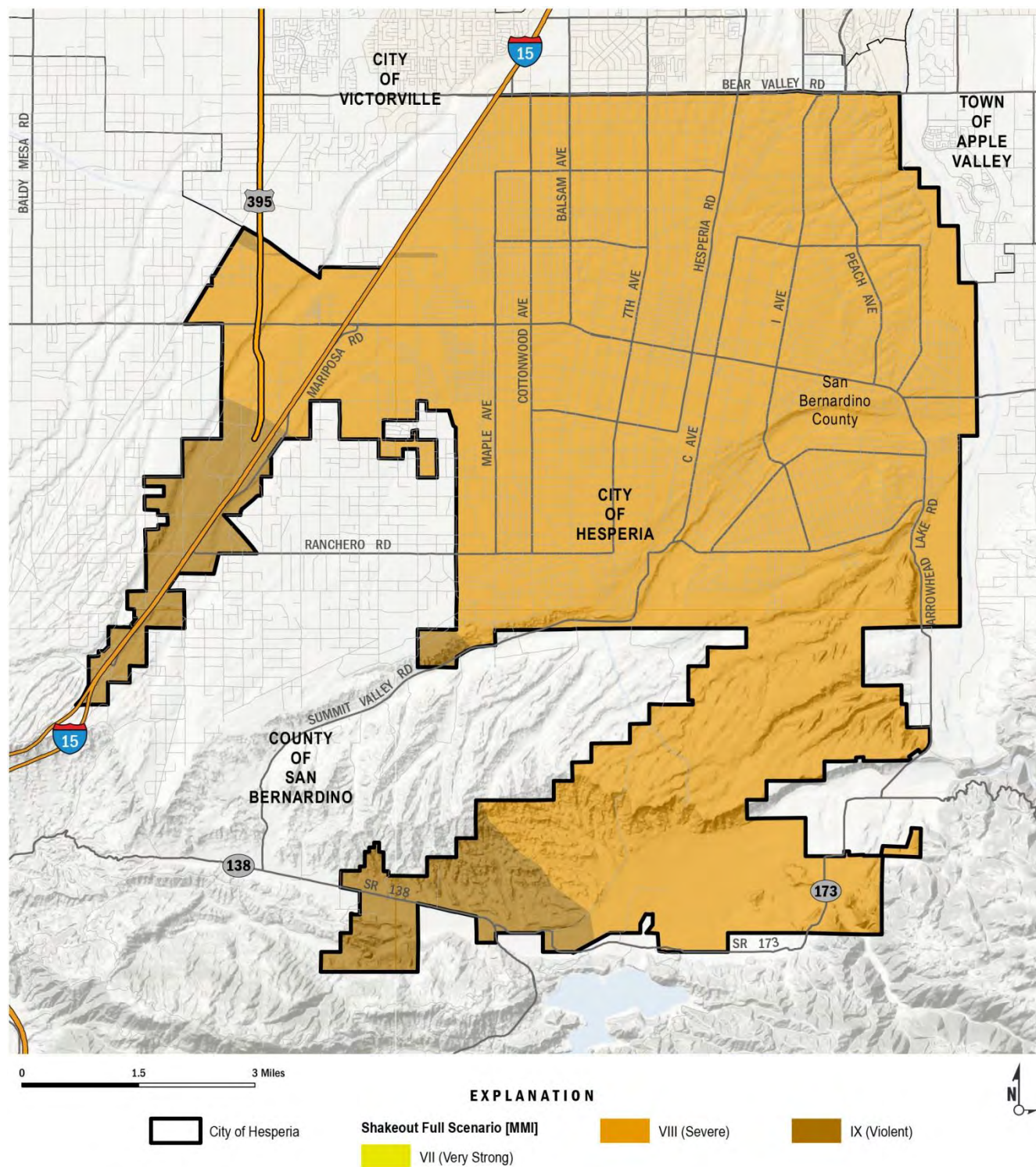
Table 4-7: Modified Mercalli Intensity Scale

Earthquake Magnitude and Intensity		
Magnitude (M _w)	Intensity (Modified Mercalli Scale)	Description
1.0 – 3.0	I	I. Not felt except by very few people under especially favorable conditions.
3.0 – 3.9	II – III	II. Felt by a few people, especially those on upper floors of buildings. Suspended objects may swing.
		III. Felt quite noticeably indoors. Many do not recognize it as an earthquake. Standing motorcars may rock slightly.
4.0 – 4.9	IV – V	IV. Felt by many who are indoors; felt by a few outdoors. At night, some awakened. Dishes, windows and doors rattle.
		V. Felt by nearly everyone; many awakened. Some dishes and windows broken; some cracked plaster; unstable objects overturned.
5.0 – 5.9	VI – VII	VI. Felt by everyone; many frightened and run outdoors. Some heavy furniture moved; some fallen plaster or damaged chimneys.
		VII. Most people alarmed and run outside. Damage negligible in well-constructed buildings; considerable damage in poorly constructed buildings.
6.0 – 6.9	VII – IX	VIII. Damage slight in special designed structures; considerable in ordinary buildings; great in poorly built structures. Heavy furniture overturned. Chimneys, monuments, etc. may topple.
		IX. Damage considerable in specially designed structures. Buildings shift from foundations and collapse. Ground cracked. Underground pipes broken.
7.0 and Higher	VIII and Higher	X. Some well-built wooden structures destroyed. Most masonry structures destroyed. Ground badly cracked. Landslides on steep slopes.
		XI. Few, if any, masonry structures remain standing. Railroad rails bent; bridges destroyed. Broad fissure in ground.
		XII. Virtually total destruction. Waves seen on ground. Objects thrown into the air.

Source: <https://earthquake.usgs.gov/learn/topics/mercalli.php>



Figure 4-10: Great Shakeout Scenario MMI Classes 2016



Source: U.S. Geological Survey; 2016



Table 4-8: Estimated Horizontal Peak Ground Accelerations and Seismic Intensities in Hesperia

Fault Name	Distance to Hesperia miles	Magnitude of MMax	PGA (g) from MMax	MMI from MMax
North Frontal Fault (West)	2 – 14.5	7.2	0.58 – 0.23	X – IX
San Andreas (Whole Southern)	4 – 16.5	8.0	0.49 – 0.34	X – IX
San Andreas (San Bernardino – Coachella)	4 – 16.5	7.7	0.47 – 0.29	X – IX
San Andreas (1857 Rupture or Cholame – Mojave)	7 - 17.5	7.8	0.46 – 0.3	X – IX
San Andreas (San Bernardino)	5.5 – 16.5	7.5	0.45 – 0.26	IX
Cleghorn	3 – 12	6.5	0.42 – 0.18	X – VIII
San Andreas (Mojave)	7 – 17.5	7.4	0.42 – 0.23	X – IX
Cucamonga	9 - 19	6.9	0.35 – 0.16	IX – VIII
Helendale – South Lockhart	13 – 24	7.3	0.27 – 0.16	IX – VIII
San Jacinto (San Bernardino)	9 – 20	6.7	0.26 – 0.12	IX – VII
Sierra Madre	20 – 29	7.2	0.18 – 0.12	VIII – VII
Lenwood – Lockhart Old Women Springs	28 – 39	7.5	0.15 – 0.10	VIII – VII
San Jacinto	23 – 31.5	6.9	0.11 – 0.08	VII

Source: City of Hesperia 2012 HMP

4.4.5 Frequency / Probability of Future Occurrences

While earthquakes occur less frequently than other primary natural hazard events, they have accounted for the greatest combined losses (deaths, injuries, and damage costs) in disasters since 1950 in California and have the greatest catastrophic disaster potential (Cal EMA 2010).

The USGS estimates that the probability of an earthquake occurring over the next 30 Years in the Southern California with a magnitude of 6.7 or greater is 93 percent. Table 4-9 from the USGS lists Average repeat time between earthquakes in the Southern California region together with the likelihood of having one or more such earthquakes in the next 30 years (starting from 2014). "Readiness" indicates the factor by which likelihoods are currently elevated, or lower, because of the length of time since the most recent large earthquakes. The values from the USGS include aftershocks. It is important to note that actual repeat times will exhibit a high degree of variability, and will almost never exactly equal the average listed in the table.

Table 4-9: Southern California Region Earthquake Probability

Magnitude (< or =)	Average repeat time (yrs.)	30-year likelihood of one or more events	Readiness
5	.7	100%	1.0
6	2.3	100%	1.0
6.7	12	93%	1.0
7	25	75%	1.1
7.5	87	36%	1.2
8	522	7%	1.3

Source: USGS UCERF3: A New Earthquake Forecast for California's Complex Fault System FS 2015-3309



Uniform California Earthquake Forecasts (UCERF) estimated the likelihood that California will experience a magnitude 8 or larger earthquake in the next 30 years has increased from about 4.7% in 2007 (UCERF2²) to about 7.0% for the thirty-year duration starting in 2014 (UCERF3³). Several of the major Southern California faults have a high probability of experiencing a Magnitude 6.7 or greater earthquake within the next 30 years (Figure 4-11); 59% probability of a M6.7 or greater on the Southern San Andreas Fault, 31% probability on the San Jacinto Fault, and 11% probability on the Elsinore Fault. These probabilities were determined by the USGS and CGS in a 2008 study (2007 Working Group on California Earthquake Probabilities, 2008, The Uniform California Earthquake Rupture Forecast, Version 2 (UCERF 2): U.S. Geological Survey Open-File Report 2007-1437 and California Geological Survey Special Report 203 [<http://pubs.usgs.gov/of/2007/1437/>]).

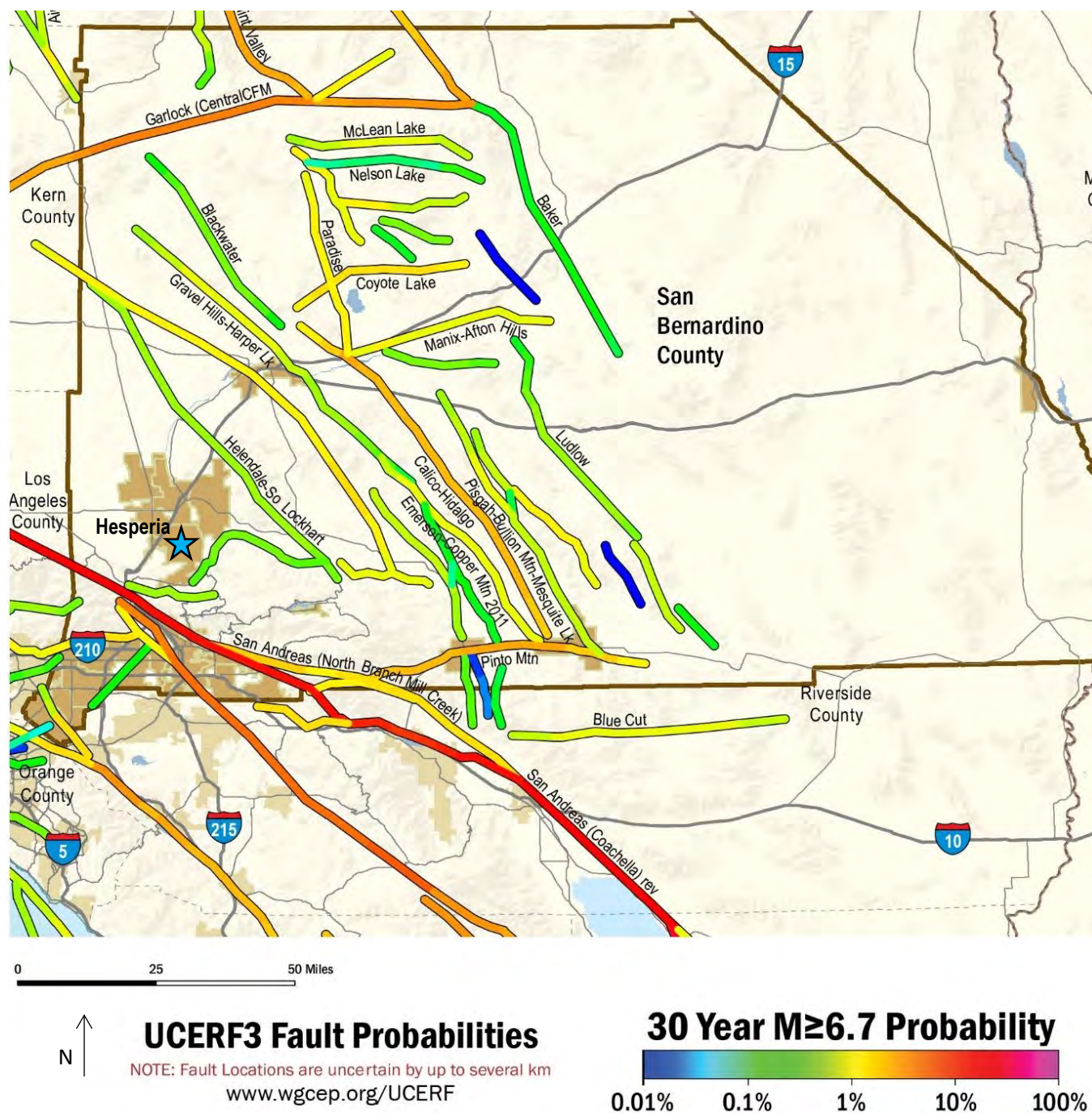
Figure 4-11 shows the locations of major faults in Southern California in relation to San Bernardino County region. These faults are the Southern San Andreas, the San Jacinto, the Elsinore, and the Garlock Faults. There are also many smaller faults within San Bernardino County capable of producing significant earthquakes. However, these four faults are considered by the United States Geological Survey (USGS) and the California Geological Survey (CGS) to be the most dangerous in the County. (California Geological Survey Special Publication 42, Interim Revision 2007, "Fault-Rupture Hazard Zones in California" - Alquist-Priolo Earthquake Fault Zoning Act).

² USERF2 = 2008 California Earthquake Probabilities. In April 2008, scientists and engineers released a new earthquake forecast for the State of California called the UCERF. Compiled by USGS, [Southern California Earthquake Center \(SCEC\)](#), and the [California Geological Survey](#) (CGS), with support from the [California Earthquake Authority](#), it updates the earthquake forecast made for the greater San Francisco Bay Area by the [2002 Working Group for California Earthquake Probabilities](#).

³ UCERF3 = 2014 California Earthquake Probabilities. UCERF3 is the first type of model, representing the latest earthquake-rupture forecast for California. It was developed and reviewed by dozens of leading scientific experts from the fields of seismology, geology, geodesy, paleoseismology, earthquake physics, and earthquake engineering. As such, it represents the best available science with respect to authoritative estimates of the magnitude, location, and likelihood of potentially damaging earthquakes throughout the state (further background on these models, especially with respect to ingredients, can be found in U.S. Geological Survey Fact Sheet 2008-3027, <http://pubs.usgs.gov/fs/2008/3027/>)



Figure 4-11: UCERF3 Fault Probabilities 2014

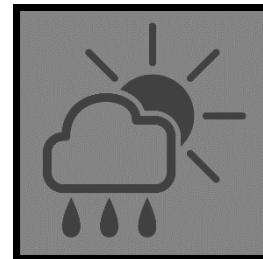




4.5 Climate Change

Climate change refers to any distinct change in measures of climate lasting for a long period of time, more specifically major changes in temperature, rainfall, snow, or wind patterns. Climate change may be limited to a specific region, or may occur across the whole Earth. Climate change may result from:

- Natural factors (e.g., changes in the Sun's energy or slow changes in the Earth's orbit around the Sun);
- Natural processes within the climate system (e.g., changes in ocean circulation); and
- Human activities that change the atmosphere's make-up (e.g., burning fossil fuels) and the land surface (e.g., cutting down forests, planting trees, building developments in cities and suburbs, etc.).



The effects of climate change are varied: warmer and more varied weather patterns, melting ice caps, and poor air quality, for example. As a result, climate change impacts a number of natural hazards.

The 2013 State of California Multi-Hazard Mitigation Plan stated that climate change is already affecting California. Sea levels have risen by as much as seven inches along the California coast over the last century, increasing erosion and pressure on the state's infrastructure, water supplies, and natural resources. The State has also seen increased average temperatures, more extreme hot days, fewer cold nights, a lengthening of the growing season, shifts in the water cycle with less winter precipitation falling as snow, and both snowmelt and rainwater running off sooner in the year. In addition to changes in average temperatures, sea level, and precipitation patterns, the intensity of extreme weather events is also changing.

4.5.1 Regulatory Environment

California's response to climate change is directed by Legislation and Regulations and by other Mandates such as executive orders.

4.5.1.1 2010 City of Hesperia Climate Action Plan

The Climate Action Plan (CAP) is the City's primary strategy for ensuring that the buildout of the General Plan Update will not conflict with the implementation of Assembly Bill 32 – the Global Warming Solutions Act of 2006 and its goal of reducing California's greenhouse gas emissions to 1990 levels by the year 2020. The CAP provides strategies and implementation actions that will reduce community related and City operations-related greenhouse gas emissions by amounts that are consistent with AB 32 goals. The CAP is a companion document to the General Plan Update and implements the General Plan's greenhouse gas reduction policies.

The CAP strategy is primarily based upon the land use, transportation, and conservation policies that are part of the General Plan Update, recent specific plans, and major development plans in the City. The concept is that design, density, and pattern of land uses impact the amount people drive and the options available for using less polluting and energy-consuming modes of transportation such as walking, bicycling, and transit. The plans also promote energy efficiency in buildings, government operations, and through more efficient water use. Implementation of these plans helps to ensure that the City will be developed in ways that produces fewer greenhouse gas emissions.



4.5.1.2 The Sustainable Communities and Climate Protection Act of 2008

The Sustainable Communities and Climate Protection Act of 2008 (Sustainable Communities Act, SB 375, Chapter 728, Statutes of 2008) looks to reduce GHG emissions through coordinated transportation and land use planning with the goal of more sustainable communities. Regional targets are established for GHG emissions reductions from passenger vehicle use by the sustainable communities strategy (SCS) established by each metropolitan planning organization (MPO). The SCS is an integral part of the regional transportation plan (RTP) and contains land use, housing, and transportation strategies to meet GHG reductions targets. In San Bernardino County, the South Coast Air Quality Management District facilitates compliance with the federal Clean Air Act and implements the state's air quality program.

The Office of Planning and Research's General Plan Guidelines and SB 375 builds upon Assembly Bill 162 (flood protection) and Senate Bill 1241 (fire protection) and supports Safeguarding California implementation.

SB 375 also supports Assembly Bill 2140 which requires that a City/County General Plan contains a safety element in addition to a Hazard Mitigation Plan. AB 2140 also requires a vulnerability assessment, adaptation goals, policies and objectives, and a set of feasible implementation measures.

4.5.1.3 2015 Hesperia Water District Urban Water Management Plan

In short, this Plan is a management tool, providing a framework for action, but not functioning as a detailed project development or action. Water management in California is not a matter of certainty, and planning projections may change in response to a number of factors. It is important that this Plan be viewed as a long-term, general planning document, rather than as an exact blueprint for supply and demand management; it is an effort to generally answer a series of planning questions including:

- What are the existing and potential sources of supply and what is the reasonable probable yield from them?
- What is the probable demand, given a reasonable set of assumptions about growth and implementation of good water management practices?
- How well do supply and demand figures match up, assuming that the various probable supplies will be pursued by the implementing agency?
- How will droughts, outages, and emergencies be addressed, and how will water conservation practices be implemented?

4.5.1.4 California Adaptation Planning Guide (APG)

The State of California has been taking action to address climate change for over 20 years, focusing on both greenhouse gas emissions reduction and adaptation. The California Adaptation Planning Guide (APG) continues the state's effort by providing guidance and support for communities addressing the unavoidable consequences of climate change.

Based on upon specific factors, 11 Climate impact regions were identified. Some of the regions were based on specific factors particularly relevant to the region. As illustrated in Figure 4-12 San Bernardino County is located in the Desert Region.



Figure 4-12: Climate Impact Regions



The Desert is a heavily urbanized inland region (4.3+ million people) made up of sprawling suburban development in the west near the South Coast region and vast stretches of open, largely federally owned desert land to the east. Prominent cities within the desert portion include Palm Springs (44,500+) and El Centro (42,500+). The region's character is defined largely by the San Gabriel Mountains, San Geronio Mountains, San Jacinto Mountains, and smaller inland mountains reaching through the desert to the Colorado River, which borders the region on the east. Communities in the Desert region should consider evaluating the following climate change impacts:

- Reduced water supply
- Increased temperature
- Reduced precipitation
- Diminished snowpack
- Wildfire risk
- Public health and social vulnerability
- Stress on special-status species



4.5.2 Past Occurrences

Climate change has never been directly responsible for any declared disasters. Past flooding, wildfire, levee failure, and drought disasters may have been exacerbated by climate change, but it is impossible to make direct connections to individual disasters. In addition, unlike earthquake and floods that occur over a finite time period, climate change is an on-going hazard, the effects of which some are already experiencing. Other effects may not be seriously experienced for decades, or may be avoided altogether by mitigation actions taken today.

According to the California State Hazard Mitigation Plan (SHMP), the worst single heat wave event in California occurred in Southern California in 1955, when an eight-day heat wave resulted in 946 deaths. The July 2006 heat wave in California caused approximately 140 deaths over a 13-day period.

4.5.3 Location/Geographic Extent

The effects of climate change are not limited by geographical borders. San Bernardino County, the State of California, the United States, and the rest of the world are all at risk to climate change. As such, the entire County is at risk to the effects of climate change.

Figure 4-13 and Figure 4-14 provide Cal Adapt⁴ modeled decadal July high temperature averages for 2010 and 2090. These figures provide current decade-long July temperature averages and possible annual high heating trends for the remaining portion of the century. The data presented in the figures represent a "projection" of potential future climate scenarios, they are not predictions. These figures illustrate how the climate may change based on a variety of different potential social and economic factors. The visualizations are comprised of average values from Coupled Climate model 2.1 (GFDL), Community Climate System Model Version 3 (CCSM3), Coupled Global Climate Model Version 3 (CNRM) and Parallel Climate Model 1 (PCM1). During the next few decades, scenarios project average temperature to rise between 1° and 2.3°F; however, the projected temperature increases begin to diverge at mid-century so that, by the end of the century, the temperature increases projected in the higher emissions scenario (A2) are approximately twice as high as those projected in the lower emissions scenario (B1). Customizable maps can be viewed at <http://cal-adapt.org/temperature/decadal/>

⁴ Cal-Adapt has been funded to provide access to data and information that has been produced by the State's scientific and research community. The data available in this site offer a view of how climate change might affect California at the local level.



Figure 4-13: July Decadal Average High Temperature Map; Cal-Adapt 2010

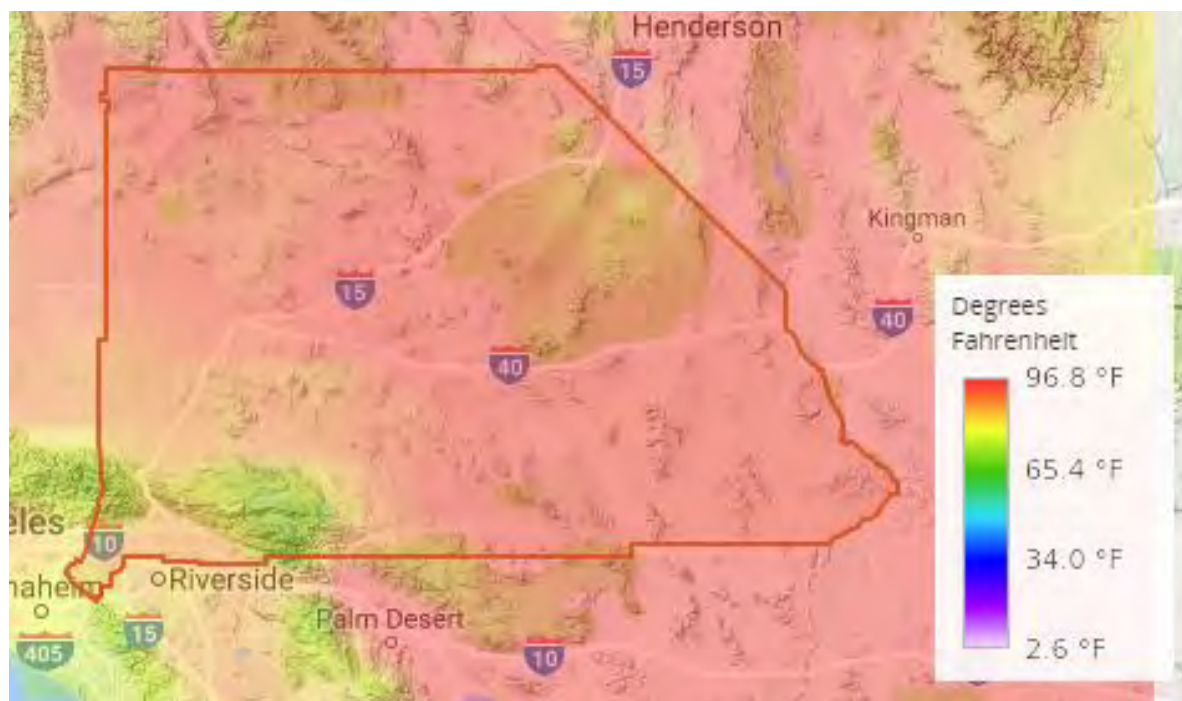


Figure 4-14: July Decadal Average High Temperature Map; Cal-Adapt 2090



4.5.4 Magnitude/Severity

The California Adaptation Planning Guide has calculated projections for changes in temperature, precipitation, heat waves, snowpack and wildfire risk in the desert area, as shown in Table 4-10. Hotter, drier conditions are expected to exist in the desert area, increasing the risk for other natural hazards.

Table 4-10: Summary of Cal-Adapt Climate Projections for the Desert Region

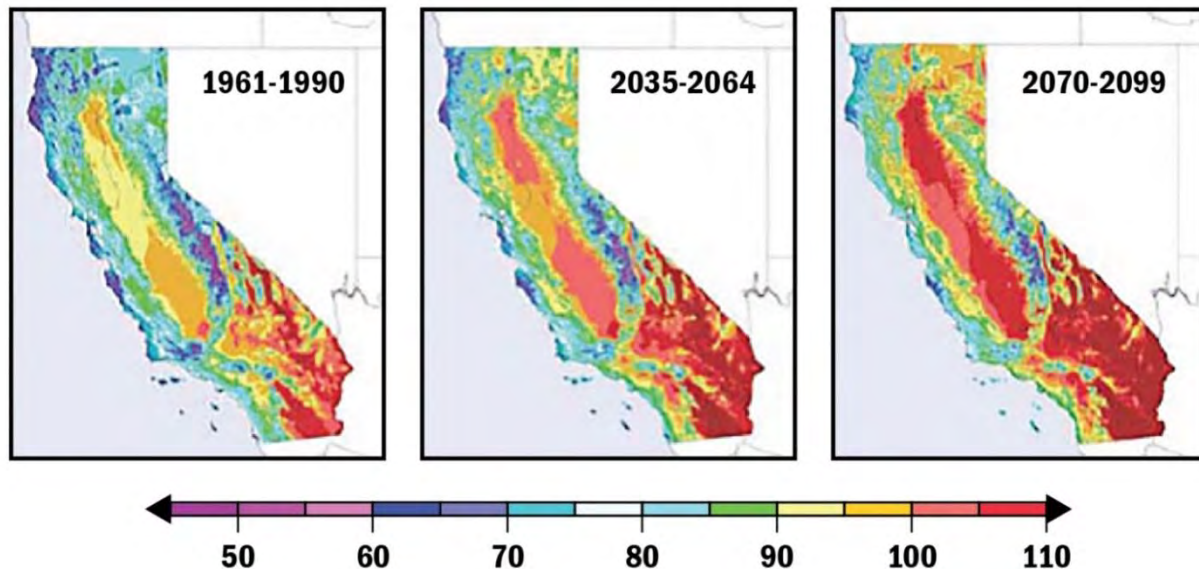
Effect	Ranges
Temperature Change, 1990-2100	January increase in average temperatures: 2°F to 4°F by 2050 and 5°F to 8°F by 2100 July increase in average temperatures: 3°F to 5°F by 2050 and 6°F to 9°F by 2100 (Modeled high temperatures; high carbon emissions scenario)
Precipitation	Generally, annual rainfall will decrease in the most populous areas. Wetter areas like the western part of Riverside and southwestern San Bernardino counties will experience a 2 to 4 inch decline by 2050 and 3.5 to 6 inch decline by the end of the century. Big Bear is expected to lose around 8 inches per year by 2090. Southern Imperial County will have a small decline of about 0.5 inches. The eastern, desert portion of the region will see little to no change in annual rainfall. (CCSM3 climate model; high carbon emissions scenario)
Heat Wave	Heat waves are defined by five consecutive days over temperatures in the 100s over most of the region. Three to five more heat waves will be experienced by 2050, increasing to 12 to 16 in the western parts of the region to more than 18 to 20 in the eastern parts of the region.
Snowpack	March snowpack in the Big Bear area will diminish from the 2.5- inch level of 2010 to 1.4 inches in 2030 and almost zero by 2090. (CCSM3 climate model; high emissions scenario)
Wildfire Risk	Most areas are projected to have the same or slightly increased likelihood of wildfire risk. The major exceptions are the Mecca San Geronimo and San Jacinto Mountains, where wildfire will be 1.5 and 2.0 times more likely. (GFDL model, high carbon emissions scenario)

Source: [Public Interest Energy Research, 2011. Cal-Adapt. Retrieved from <http://cal-adapt.org>]

The California Climate Adaptation Strategy (CAS), citing a California Energy Commission study, states that “over the past 15 years, heat waves have claimed more lives in California than all other declared disaster events combined.” This study shows that California is getting warmer, leading to an increased frequency, magnitude, and duration of heat waves. These factors may lead to increased mortality from excessive heat, as shown in Figure 4-15.



Figure 4-15: California Historical and Projected Temperature Increases - 1961 to 2099



Source: Dan Cayan; California Climate Adaptation Strategy

4.5.5 Frequency/Probability of Future Occurrences

Climate change is one of the few natural hazards where the probability of occurrence is influenced by human action. In addition, unlike earthquake and floods that occur over a finite time period, climate change is an on-going hazard. The 2009 Climate Adaptation Strategy (CAS) delineated how climate change may impact and exacerbate natural hazards in the future, including wildfires, extreme heat, floods, and drought.

- Climate change is expected to lead to increases in the frequency, intensity, and duration of extreme heat events and heat waves in Hesperia and the rest of California, which are likely to increase the risk of mortality and morbidity due to heat-related illness and exacerbation of existing chronic health conditions. Those most at risk and vulnerable to climate-related illness are the elderly, individuals with chronic conditions such as heart and lung disease, diabetes, and mental illnesses, infants, the socially or economically disadvantaged, and those who work outdoors.
- The Desert region relies on water from the Colorado River and the State Water Project. Both of these sources begin with mountain snowpack. Climate change will result in drastically reduced supply from these sources. Declining snowpack in the San Gabriel Mountains, San Geronio Mountains, and San Jacinto Mountains will lead to permanently diminished local water supply.
- Higher temperatures will melt the snowpack earlier and drive the snowline higher, resulting in less snowpack to supply water to California users.
- Droughts are likely to become more frequent and persistent in the 21st century.
- Intense rainfall events, periodically ones with larger than historical runoff, will continue to affect California with more frequent and/or more extensive flooding.
- Storms and snowmelt may coincide and produce higher winter runoff. Together, these changes will increase the probability of dam and levee failures.
- Warmer weather, reduced snowpack, and earlier snowmelt can be expected to increase wildfire risk through fuel hazards and ignition risks. These changes can also increase plant moisture stress and insect populations, both of which affect forest health and reduce forest resilience to wildfires. An increase in wildfire intensity and extent will increase public safety risks, property damage, fire suppression and emergency response costs to government, watershed and water quality.



4.6 Vulnerability Assessment

The information in this section provides an explicit representation of what a community stands to lose in a disaster. This is useful for City Staff and other decision makers who will need to balance the costs of mitigation against the potential harm to residents and damage to property. It provides comparable measurements of community natural hazard exposure* and assists in determining which hazards and/or what parts of the City to focus on making resilient to disaster first. Based upon possible assets at risk, hazard mitigation resources can be directed where need be, in-part, by a vulnerability assessment and information presented in this section.

The vulnerability assessment is developed by developing quantitative and qualitative information for each hazard. Through an exposure analysis, quantitative data is developed for each hazard. An exposure analysis provides quantities of people and assets at risk to particular hazards. Qualitative data has been developed and presented in this section for hazards without measurable data. Qualitative data provides information beyond quantities of people and assets at risk, but rather a description of how the hazard could affect the region around the City of Vacaville.

****The hazard exposure analysis has been developed with best available data and follows methodology described in the FEMA How to Guide #2 (Publication No. 386-2) "Understanding Your Risks—Identifying Hazards and Estimating Losses".***

4.6.1 Methodology

A vulnerability assessment was conducted for each of the identified priority hazards. Geospatial data is essential in determining population and assets exposed to particular hazards. Geospatial analysis can be conducted if a natural hazard has a particular spatial footprint that can be overlaid against the locations of people and assets. In Hesperia, wildfire, flood, dam failure, and earthquakes have known geographic extents and corresponding spatial information about each hazard.

Several sources of data are necessary to conduct a vulnerability analysis. Figure 4-16 provides an exhibit of the data inputs and outputs used to create the vulnerability analysis results presented in this section. U.S. Census data is the primary source in determining natural hazard exposure to residents. Census data has been used to determine the population at risk, which is generally referred to as population exposure. Population exposure is provided for wildfire, flooding, dam failure and earthquake as potential hazards later in this section.

Together with the U.S. Census data, asset data was used to provide a snapshot of how City assets are affected by natural hazards. For purposes of this vulnerability analysis, asset data includes parcels and critical infrastructure within the City boundaries. Critical infrastructure is described as assets that are essential for people and a community to function. Critical infrastructure includes utilities such as, city-owned facilities, bridges, schools, and other community facilities that provide essential services to residents.

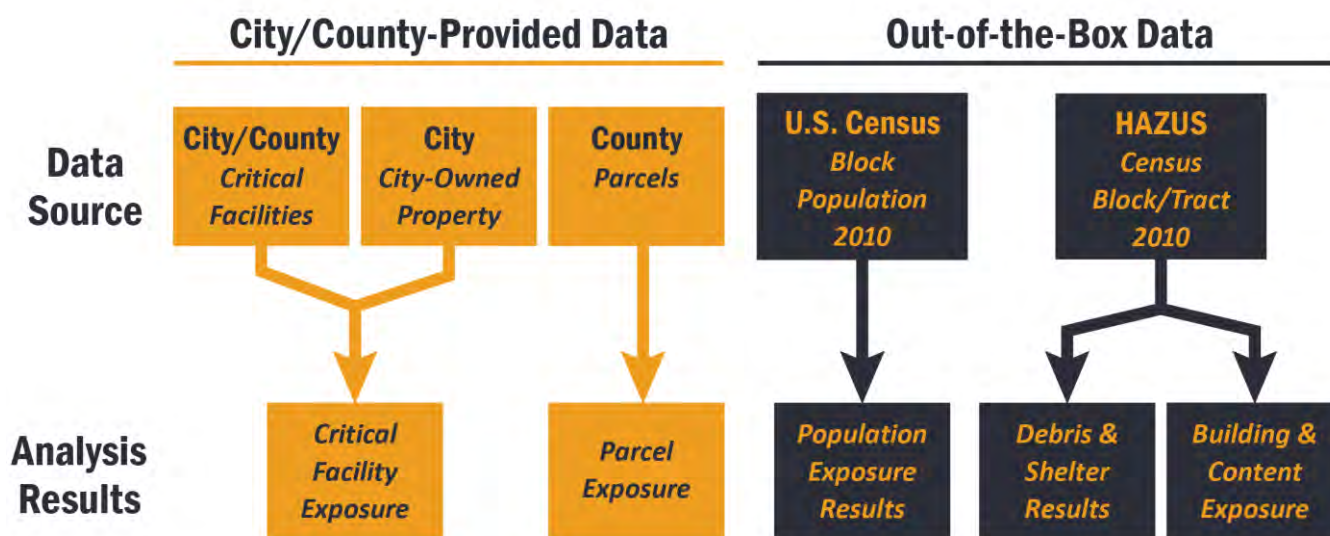
Critical facilities data was developed from a variety of sources including City owned and maintained data, state and federal government datasets, and private industry datasets. A critical infrastructure spatial

* Elements at risk; Risk inventory; Exposure encompasses all elements, processes, and subjects that might be affected by a hazardous event. Consequently, exposure is the presence of social, economic, environmental or cultural assets in areas that may be impacted by a hazard.



database was developed to translate critical facilities information into georeferenced⁵ points. Critical facility points are intersected with the spatial hazard layers to develop a list of “at risk” critical facilities. The City critical facilities that intersect with natural hazards are referred to as facilities with hazard “exposure”. Exposure results are presented later in this section.

Figure 4-16: Data Source and Methodology



Source: mitigatehazards.com

Lastly, FEMA's Hazus-MH MR5 (Hazus) software was implemented to conduct detailed loss estimation for flood and earthquake. Hazus is a nationally applicable standardized methodology that contains models for estimating potential losses from earthquakes, floods, and hurricanes. HAZUS uses Geographic Information Systems (GIS) technology to estimate physical, economic, and social impacts of disasters. For purposes of this planning effort, Hazus was used to graphically illustrate the limits of identified high-risk locations due to possible earthquakes and floods.

4.6.2 Population and Asset Exposure

To describe vulnerability for each hazard, it is important to understand the “total” population and “total” assets at risk. The exposure for each hazard described in this section will refer to the percent of total population or percent of total assets. This provides the possible significance or vulnerability to people and assets for the natural hazard event and the estimated damage and losses expected during a “worst case scenario” event for each hazard. The sections below provide a description of the total population, critical facilities, and parcel exposure inputs.

⁵ To georeference something means to define its existence in physical space. That is, establishing its location in terms of map projections or coordinate systems. The term is used both when establishing the relation between raster or vector images and coordinates, and when determining the spatial location of other geographical features.



4.6.2.1 Population Exposure

To develop hazard-specific vulnerability assessments, population near natural hazard risks should be determined to understand the total “at risk” population. We can understand how geographically defined hazards may affect the City by analyzing the extent of the hazard in relation to the location of population. For purposes of the vulnerability assessment approximately 93,778 (100%) of the City's population is exposed to one or more hazards within or near the City boundaries. Each natural hazard scenario affects the City's residents differently depending on the location of the hazard and the population density of where the hazard could occur. Vulnerability assessment sections presented later in this section summarize the population exposure for each natural hazard.

4.6.2.2 Vulnerable Populations

The severity of a disaster depends on both the physical nature of the extreme event and the socioeconomic nature of the populations affected by the event. Important socioeconomic factors tend to influence disaster severity. A core concept in a vulnerability analysis is that different people, even within the same region, have a different vulnerability to natural hazards.

4.6.2.2.1 Income and Housing Condition

Income or wealth is one of the most important factors in natural hazard vulnerability. This economic factor affects vulnerability of low income populations in several ways. Lower income populations are less able to afford housing and other infrastructure that can withstand extreme events. Low income populations are less able to purchase resources needed for disaster response and are less likely to have insurance policies that can contribute to recovery efforts. Lower income elderly populations are less likely to have access to medical care due to financial hardship. Because of these and other factors, when disaster strikes, low income residences are far more likely to be injured or left without food and shelter during and after natural disasters.

Figure 4-17 shows the median household income distribution for the City in 2012, using Census 2010 geographies. The “median” is the value that divides the distribution of household income into two equal parts (e.g., the middle). The average median household income in the City between 2011 and 2015 was \$44,874, in the United States during the same period the median house household income was \$53,889.

4.6.2.2.2 Age

Children and the elderly tend to be more vulnerable during an extreme natural disaster. They have less physical strength to survive disasters and are often more susceptible to certain diseases. The elderly often also have declining vision and hearing and often miss reports of upcoming natural hazard events. Children, especially young children, have the inability to provide for themselves. In many cases, both children and the elderly depend on others to care for them during day to day life.

Finally, both children and the elderly have fewer financial resources and are frequently dependent on others for survival. In order for these populations to remain resilient before and after a natural hazard event, it may be necessary to augment city residents with resources provided by the City, state and federal emergency management agencies and organizations. See Figure 4-18 and Figure 4-19 for location of vulnerable population by age within the City.



Figure 4-17: Median Household Income Distribution Map

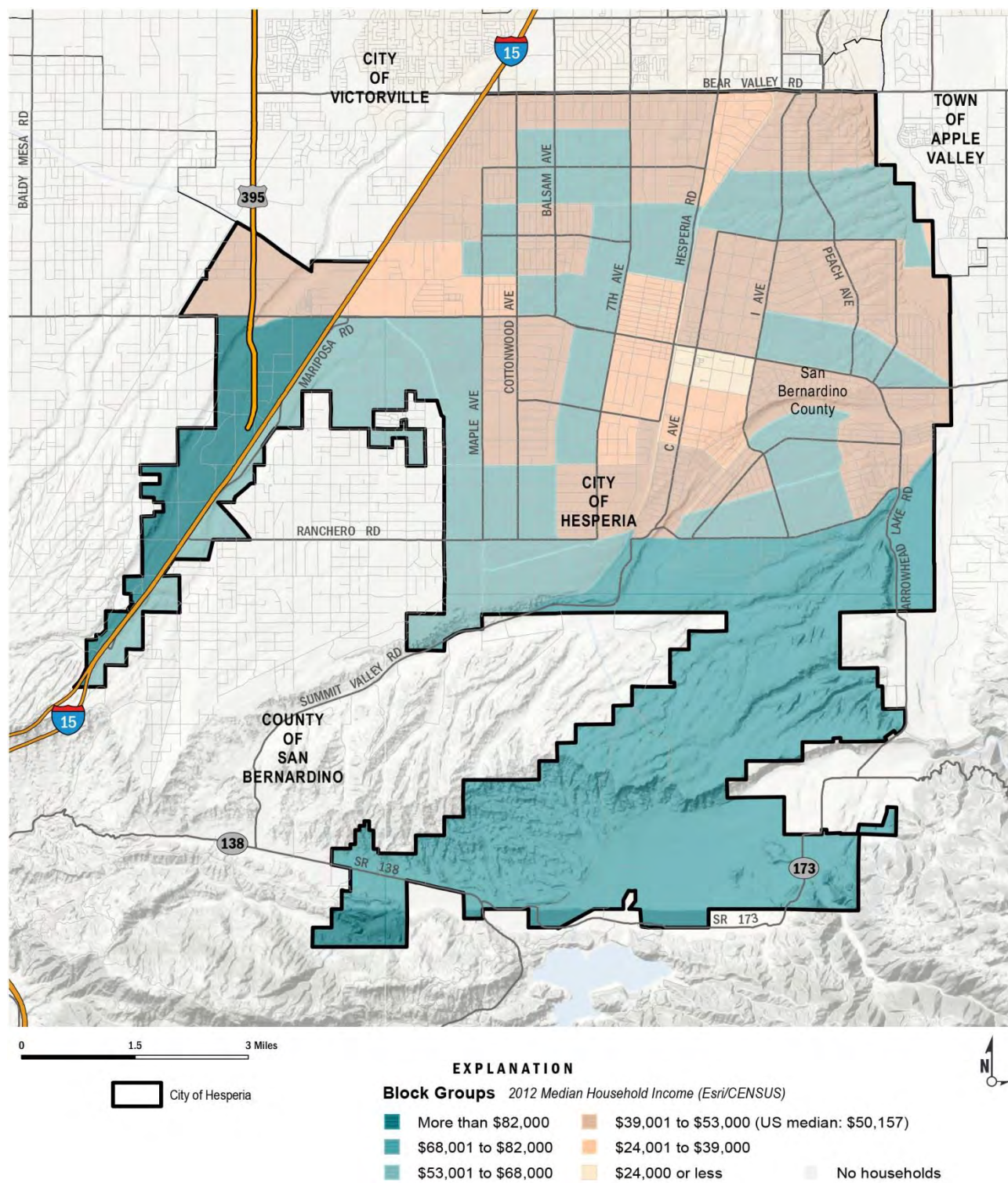




Figure 4-18: Population Under 18

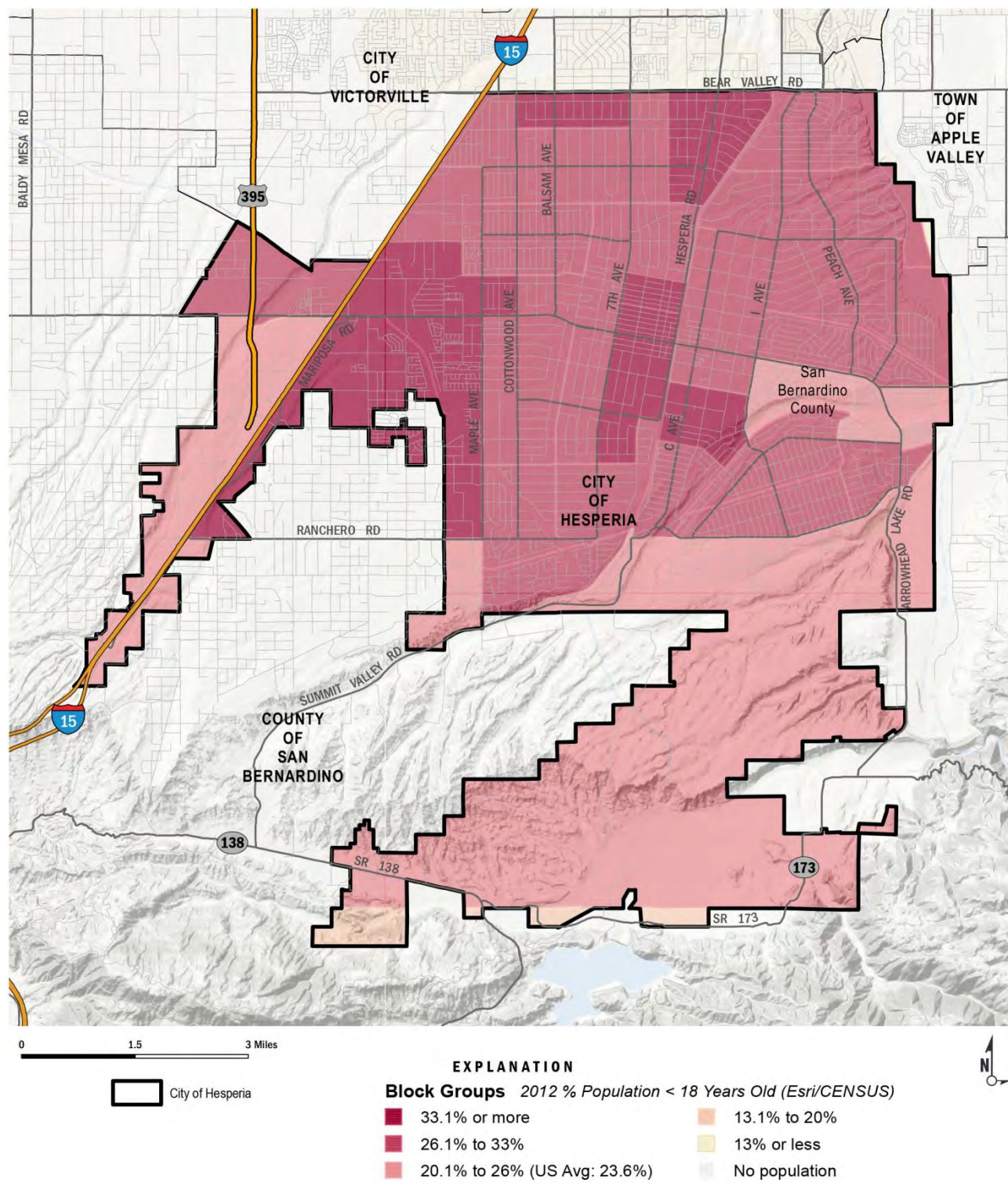
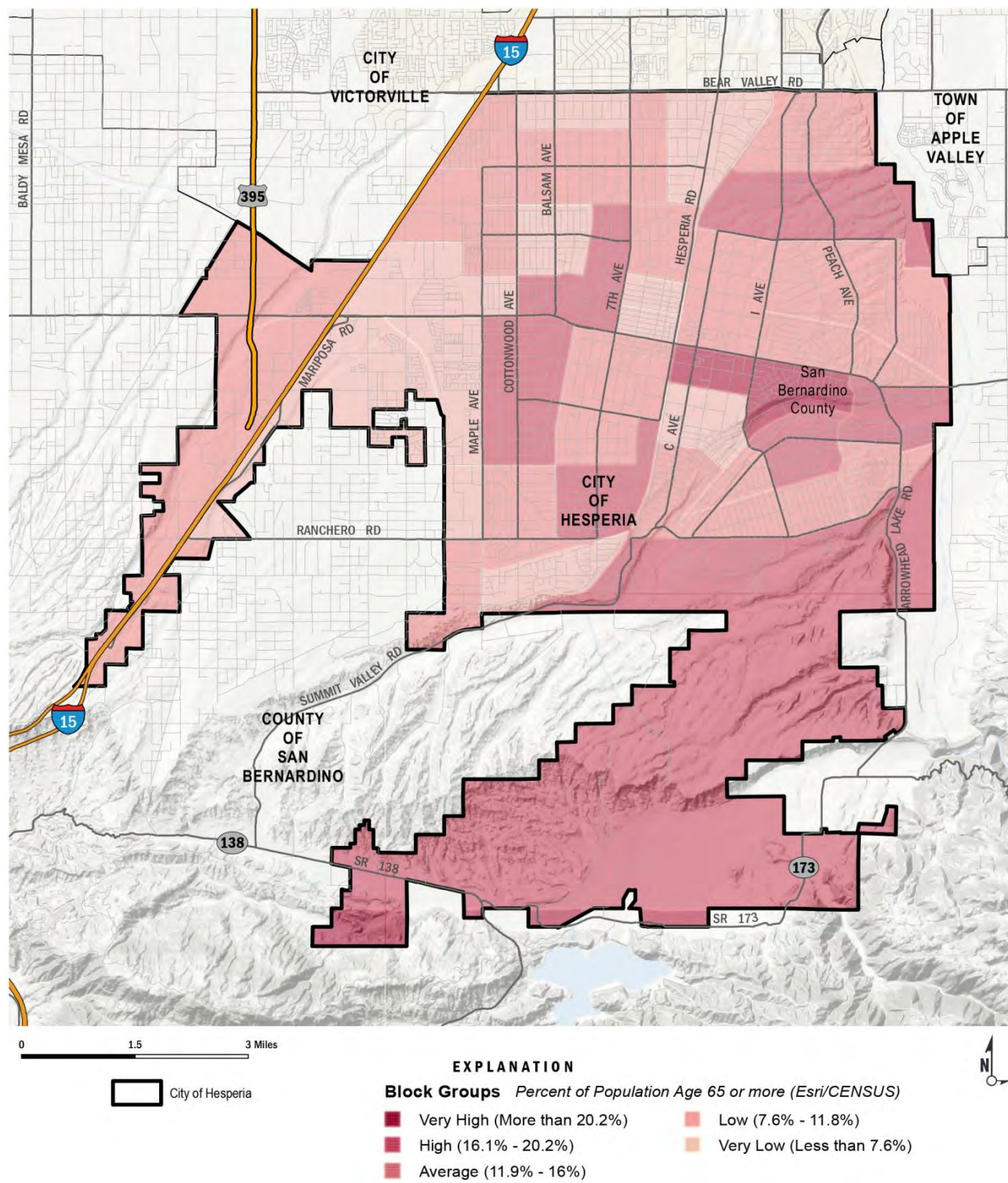




Figure 4-19: Population Over 65; 2012





4.6.3 Hazus-MH Inputs

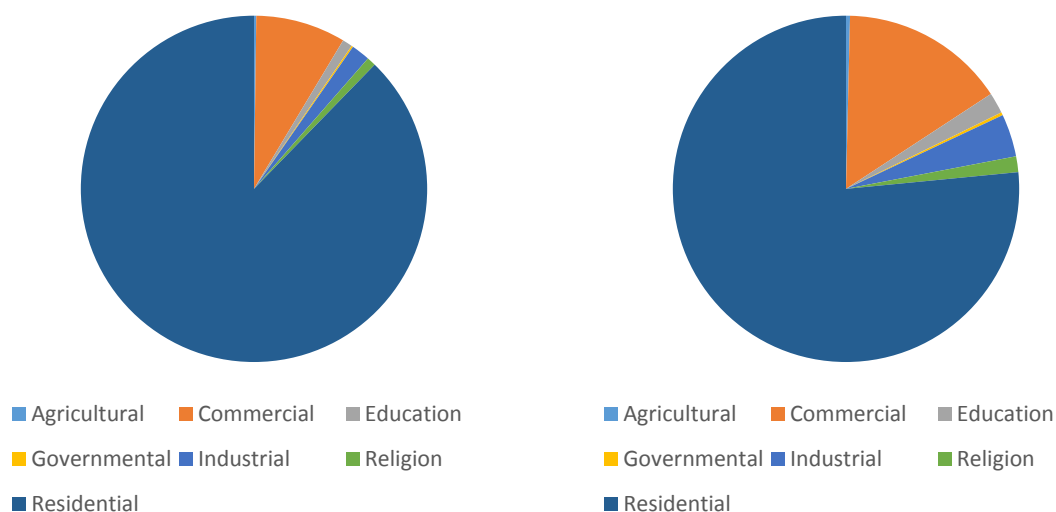
FEMA's loss estimation software, Hazus 3.2, was used in 2016 to analyze the City's building risk to flood and earthquake hazards. Hazus contains a database of economic, demographic, building stock, transportation facilities, local geology, and other information that can be used for several steps in the risk assessment process. Hazus software operates on structure square footage, structure replacement, and content replacement costs aggregated to the census block and tract levels depending on type of hazard analysis. Table 4-11 and Figure 4-20 provides value data for building categories at the census block and census tract levels. Census block and census tracts are used to provide input information for the Hazus analysis presented in this report.

Note: The Hazus software utilizes different census level information inputs to develop loss estimates depending on the hazard module. The flood module uses census block information while the earthquake module uses census tract information. It is important to understand the total values of each as estimated damage to the community is presented on a percent of total value basis.

Table 4-11: Hazus Census Block 2016 Input Values (Total Community)

Building Type	Building Replacement Costs (\$000)	Building Replacement Cost (%)	Content Replacement Cost (\$000)	Content Replacement Cost (%)	Total Value (\$000)
Agricultural	\$27,832	50.0%	\$27,832	50.0%	\$55,664
Commercial	\$1,090,475	48.7%	\$1,146,977	51.3%	\$2,237,452
Education	\$121,144	45.4%	\$145,542	54.6%	\$266,686
Governmental	\$19,342	48.5%	\$20,554	51.5%	\$39,896
Industrial	\$226,741	43.3%	\$296,872	56.7%	\$523,613
Religion	\$109,521	50.0%	\$109,521	50.0%	\$219,042
Residential	\$11,399,426	66.7%	\$5,700,938	33.3%	\$17,100,364
Total	\$12,994,481	64%	\$7,448,236	36%	\$20,442,717

Figure 4-20: 2016 Census Block Building and Content Exposure Values





4.6.3.1 Parcel Exposure

The total count and value of parcels within the City of Hesperia which could be exposed to a hazard event is referred to as parcel exposure in this plan. A standardized hazard overlay was conducted to develop hazard exposure results for improved city parcels presented later in this section. The spatial overlay method identifies improvement value⁶, land value, total assessed value, building replacement costs and content replacement costs for a hazard's geographic extents. In the event of a disaster, it is generally the value of the infrastructure or improvements to the land that is of concern or at risk. Generally, the land itself is not a total loss and structures can be rebuilt. The San Bernardino County Assessor's data is pivotal to developing parcel values exposed to each hazard. Replacement cost is the value of both material, labor, and design time to reconstruct a residential building. It is important to note that replacement cost is different than assessed market value for taxation purposes and is not related to housing market conditions. The City parcel information is summed and provided in Table 4-12.

Table 4-12: 2016 Parcel Counts and Value (IN THOUSANDS)

Improved Parcel Count	Improvement Value Exposure (\$000)	Land Value Exposure (\$000)	Total Exposure (\$000)
25,246	\$4,267,303,963	\$1,139,528,794	\$5,406,832,757

4.6.3.2 Critical Facilities

Critical facilities are of particular concern when conducting hazard mitigation planning. Critical facilities are defined as essential services, and if damaged, would result in severe consequences to the health, safety, and welfare of the public.

An inventory of critical facilities within the City was used to develop a comprehensive inventory of facility points and lifelines. Critical facility points include fire stations, buildings containing hazardous materials (HAZMAT), schools, transportation, utilities, and government buildings. Lifelines include transportation routes only. A current representation of the critical facilities and lifelines are provided in Table 4-13 and Table 4-14. Some critical facility information has been omitted from documentation due to national security purposes. The Hesperia City Managers Department manages and maintains a complete list of critical facilities.

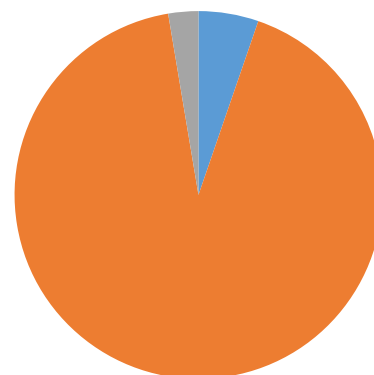
Table 4-13: Critical Facility Points; 2016

Infrastructure Type	Feature Count
Essential Facility	38
EOC	1
Fire Station	3
Police Station	1
School	33
High Potential Loss	663
Child Care Center	48
Foster Family Agency	2

⁶ A long-term asset which indicates the cost of the constructed improvements to land, such as buildings, driveways, walkways, lighting, and parking lots.



Adult Residential Care	6
Home Care Organization	1
Elder Residential Care	3
Dam	1
HAZMAT	78
EPA FRS Facility	406
FCC ASR	10
Electric Power Facility	13
Natural Gas Facility	3
Potable Water Facility	92
Transportation and Lifeline	12
Airport	1
Runway	1
Bus Facility	1
Highway Bridge	8
Railway Bridge	3
Grand Total	713



- Essential Facility
- High Potential Loss
- Transportation and Lifeline

Source: City of Hesperia Planning Department; 2016



Table 4-14: Linear Utilities; 2016

Infrastructure Type	Total Linear Mileage
Transportation and Lifeline	889
Railway	13
Roads	876
Interstate Highway	18
State / County Highway	9
Primary Highway	9
Local Road, Major	207
Local Road	438
Other Minor Road	95
Vehicular Trail	67
Cul-de-Sac / Traffic Circle	19
Ramp	5
Service Road	11
Grand Total	889

Source: City of Hesperia Planning Department; 2016



4.6.4 Hazard Specific Vulnerability

The Disaster Mitigation Act regulations require that the City of Hesperia evaluate the risks associated with each of the hazards identified in the planning process. This section summarizes the possible impacts and quantifies, where data permits, the City's vulnerability to each of the priority hazards identified in the hazard profiles. The hazards evaluated as part of this vulnerability assessment include:



Flooding



Earthquake



Wildfire



Climate Change

An estimate of the vulnerability of the City to each identified hazard, in addition to the estimate of risk of future occurrence, is provided in each of the hazard-specific sections that follow. Vulnerability is measured in general, qualitative terms and is a summary of the potential impact based on past occurrences, geographic extent, and damage and casualty potential. It is categorized into the following classifications:

- **Low**—Minimal potential impact. The occurrence and potential cost of damage to life and property is minimal.
- **Medium**—Moderate potential impact. This ranking carries a moderate threat level to the general population and/or built environment. Here the potential damage is more isolated and less costly than a more widespread disaster.
- **High**—Widespread potential impact. This ranking carries a high threat to the general population and/or built environment. The potential for damage is widespread. Hazards in this category may have occurred in the past.
- **Extremely High**—Very widespread with catastrophic impact.

Vulnerability can be quantified in those instances where there is a known, identified hazard area, such as a mapped floodplain. In these instances, the numbers and types of buildings subject to the identified hazard can be inventoried and their values tabulated. Other information can be collected in regard to the hazard area, such as the location of critical community facilities, historic structures, and valued natural resources. Together, this information conveys the vulnerability of that area to a hazard.

4.6.4.1 Flooding

Flooding is a significant problem in Hesperia as described in the flood hazard profile. Historically, the operational area has been subject to flooding during periods of heavy rainfall, falling primarily between the months of October through April, which causes streams and drainage canals to become overwhelmed and overflow their banks and/or inundate storm drainage systems. Occasionally, overbank flows in Hesperia have resulted in flooding of residential properties, road blockages, and traffic disruptions. In urbanizing areas, the increase in paved areas associated with new development decrease





the amount of open land available to absorb rainfall and runoff, thus increasing the volume of water that must be carried away from by waterways. Flooding has damaged or destroyed commercial and residential structures; flooded bridges and streets, and caused stream channels and flood control works to erode.

4.6.4.1.1 Population at Flood Risk

Of greatest concern in the event of a flood is the potential for loss of life. Using 2012 population data aggregated by census blocks, an estimate was made of the population exposed to the 100- and 500-year floodplain. To account for census blocks that were partially within the floodplain, a weighted average was employed to calculate the proportion of the population within the floodplain. The results of the population overlay are shown in Figure 4-21. More than 1,100 residents live near or within the 100-year floodplain and approximately 2 residents live within the 500-year floodplain.

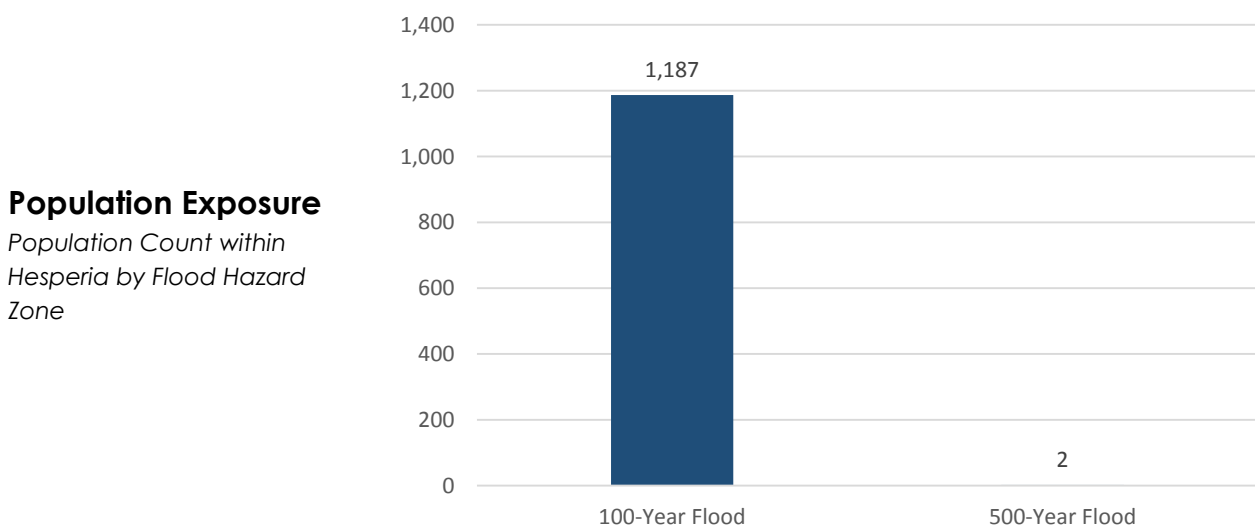


Figure 4-21: Population Exposed to NFIP Flood Zones; 2016

4.6.4.1.2 Residential Parcel Value with Flood Risk

The County's parcel layer was used as the basis for the inventory of improved residential parcels within the FEMA NFIP flood zones. In some cases, a parcel will be within in multiple flood zones. GIS was used to create centroids, or points, to represent the center of each parcel polygon – this is assumed to be the location of the structure for analysis purposes. The centroids were then overlaid with the floodplain layer to determine the flood risk for each structure. The flood zone in which the centroid was located was assigned to the entire parcel. This methodology assumed that every parcel with a square footage value greater than zero was developed in some way. Only improved parcels greater than \$20,000 were analyzed. Table 4-15 shows the count of at-risk parcels and their improvement and land exposure values.



Table 4-15: Parcels Exposed to NFIP Flood Zones; 2016

Flood Hazard Zone	Improved Parcel Count	Improvement Value Exposure (\$000)	Land Value Exposure (\$000)	Total Exposure (\$000)
100-Year Flood	312	\$39,012	\$9,168	\$48,180
500-Year Flood	1	\$231	\$149	\$380
Grand Total	313	\$39,243	\$9,317	\$48,560

Notes:

1-The table above does not display loss estimation results; the table exhibits total value at risk based upon the hazard overlay.
 2- Parcel information is for Residential Parcel Improvements only. The Solano County assessor's roles only provide spatial information on residential improvements which include building square footages. Estimated content exposure is half of building exposure for residential parcels. For commercial and industrial parcels, content exposure would be 100-150% of building value.

While there are several limitations to this methodology, it does allow for potential loss estimation. It should be noted that the analysis may include structures in the floodplain that are elevated at or above the level of the base flood elevation, which will likely decrease potential flood damage to these structures. Also, it is important to remember that the County Assessor's values are well below actual market values; thus, the actual value of assets at risk may be significantly higher than those included herein.

4.6.4.1.3 Critical Facilities Exposure

Critical facilities data were overlain with flood hazard data to determine the type and number of facilities within the 100-and 500-year floodplain. Flooding poses numerous risks to critical facilities and infrastructure:

- Roads or railroads that are blocked or damaged can prevent access throughout the area and can isolate residents and emergency service providers needing to reach vulnerable populations or to make repairs.
- Bridges washed out or blocked by floods or debris from floods also can cause isolation.
- Creek or river floodwaters can back up drainage systems causing localized flooding.
- Floodwaters can get into drinking water supplies causing contamination.
- Sewer systems can be backed up causing waste to spill into homes, neighborhoods, rivers, and streams.
- Underground utilities can also be damaged.

Table 4-16 and Table 4-17 provides an inventory of critical facilities in the floodplain for Hesperia and provides the locations of lifelines relative to the floodplain in the areas of the City. With a total of 52 high potential loss structures located in either the 100-yr flood zone, the impact to the community could be devastating if these critical facilities were damaged or destroyed during a flood event.

Table 4-16: Critical Facility Exposed to NFIP Flood Zones; 2016

Infrastructure Type	100 Year Flood Zone	500 Year Flood Zone	Feature Count
Essential Facility	0	0	0
EOC	0	0	0
Fire Station	0	0	0
Hospital	0	0	0



Police Station	0	0	0
School	0	0	0
High Potential Loss	52	0	52
Child Care Center	0	0	0
Vulnerable Population-Flood Zone	52	0	52
Foster Family Agency	0	0	0
Adult Residential Care	0	0	0
Home Care Organization	0	0	0
Elder Residential Care	0	0	0
Communication Facility	0	0	0
Dam	0	0	0
Waste Water Facility	0	0	0
HAZMAT	0	0	0
EPA FRS Facility	0	0	0
FCC ASR	0	0	0
Transportation and Lifeline	0	0	0
Airport	0	0	0
Runway	0	0	0
Bus Facility	0	0	0
Highway Bridge	0	0	0
Railway Bridge	0	0	0
Grand Total	52	-	52

Table 4-17: Lifeline Exposure to NFIP Flood Zones; 2016

Facility Type	100 Year	500 Year Flood Zone	Total Mileage
Transportation and Lifeline	7	0	7
Railway	0	0	0
Roads	7	0	7
Interstate Highway	0	0	0
State / County Highway	1	0	1
Primary Highway	0	0	0
Local Road, Major	0	0	0
Local Road	6	0	6
Other Minor Road	0	0	0
Vehicular Trail	0	0	0
Cul-de-Sac / Traffic Circle	0	0	0
Ramp	0	0	0
Grand Total	7	0	7



4.6.4.1.4 Loss Estimation Results

The Hazus analysis was used to assess the risk from and vulnerability to flooding within Hesperia. Hazus buildings data is aggregated to the census block level, known as the general building stock (GBS), which has a level of accuracy acceptable for hazard mitigation planning purposes. The following sections describe risk to and vulnerability of the GBS within the City's mapped regulatory floodplain. The total value of exposed buildings and content within the City's planning area was generated using Hazus and is previously summarized in *Table 4-11*.

Hazus calculates losses to structures from flooding by considering the depth of flooding and type of structure. Using historical flood insurance claim data, the software estimates the percentage of damage to structures and their contents by applying established depth-damage curves. Damage estimates are then translated to estimated dollar losses. The results are summarized in *Table 4-18* and *Table 4-19*. An estimated \$3,205,000 of damage could occur in the City's regulatory floodplain if all flooding sources experienced a 100-year flood event. An all-encompassing event (all tributaries flooding to the NFIP 100-year flood-zone) is estimated to cause losses of .1 percent of the total GBS within the City boundaries. An estimated \$0 of damage could occur if all flooding sources experienced a 500-year flood event, representing zero percent of the total GBS within the City boundaries.

While there are several limitations to the FEMA Hazus model, it does allow for potential loss estimation. It should be noted that the analysis may include structures in the floodplain that are elevated at or above the level of the base flood elevation, which will likely mitigate flood damage. Also, it is important to remember that the replacement costs are well below actual market values, thus, the actual value of assets at risk may be significantly higher than those included herein.

Table 4-18: Flood Loss Estimation (Based on Depth) in NFIP Flood Zones; 2016

Flood Hazard Zone	Building Loss (\$000)	Building Loss (% of Total Value)	Content Loss (\$000)	Content Loss (% of Total Value)	Total Estimated Loss (\$000)	Total Estimated Loss (% of Total Value)
100-Year	\$2,069	0.0%	\$1,132	0.0%	\$3,205	0.1%
500-Year	\$ -	0.0%	\$ -	0.0%	\$ -	0.0%

1- Hazus Census Block Building Stock Value (\$000):

2- Building Replacement Costs = \$2,069,000

3- Content Replacement Cost = \$1,132,000

4- Total Value = \$3,205,000



Table 4-19: Flood Loss Estimation (Based on Depth) in NFIP Flood Zones by Occupancy Type; 2016

Building Type	Building Replacement Costs (\$000)	Building Replacement Cost (% of Total Value)	Content Replacement Cost (\$000)	Content Replacement Cost (% of Total Value)	Total Estimated Loss (\$000)	Total Loss Estimation (% of Total Value)	Total Value (\$000)
Agricultural	\$ -	0.0%	\$ -	0.0%	\$ -	0%	\$4,220.00
Commercial	\$12	0.0%	\$38	.01%	\$50	.01%	\$643,664.00
Educational	\$ -	0.0%	\$ -	0.0%	\$ -	0%	\$46,892.00
Government	\$ -	0.0%	\$ -	0.0%	\$ -	0%	11,905.00
Industrial	\$7	0.0%	\$10	.01%	\$18	.01%	186,936.00
Religious	\$ -	0.0%	\$ -	0.0%	\$ -	0%	61,250.00
Residential	\$2,050	.06%	\$1,084	.03%	\$3,137	.08%	3,726,124.00
Grand Total	\$2,069	0.04%	\$1,132	.02%	\$3,205	.07%	4,680,991

*Note: *from Table 4-11 Hazus Census Block Input Values*

1- Hazus Census Block Building Stock Value (\$000):

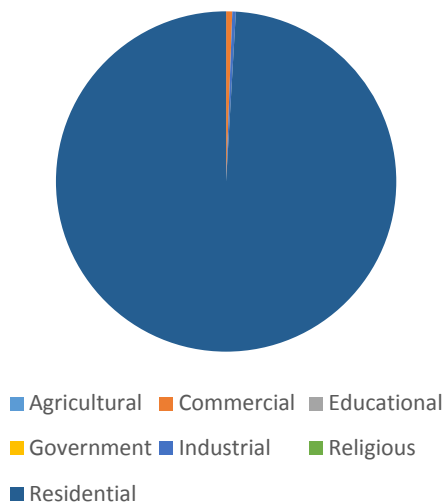
2- Building Replacement Costs = \$2,069

3- Content Replacement Cost = \$1,132

4- Total Value = \$4,680,991

100 YR Flood Hazard

Estimated Building Loss by Occupancy Type



100 YR Flood Hazard

Estimated Content Loss by Occupancy Type

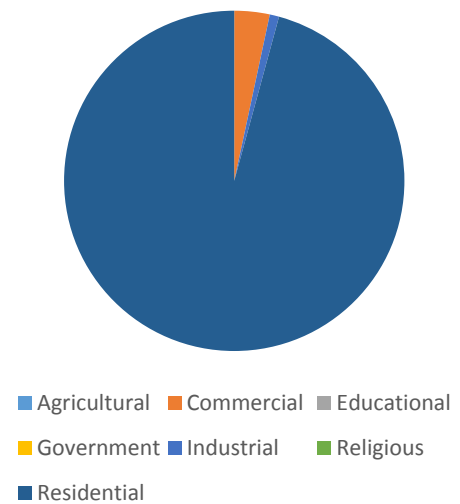
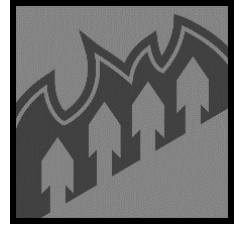


Figure 4-22: Total Building and Content Loss by Occupancy Type; 2016



4.6.4.2 Wildfire

Risk to the City from wildfire is of significant concern. High fuel loads in the hills, along with geographical and topographical features, create the potential for both natural and human-caused fires that can result in loss of life and property. These factors, combined with natural weather conditions common to the area, including periods of drought, high temperatures, low relative humidity, and periodic winds, can result in frequent and sometimes catastrophic fires. During the May to October fire season the dry vegetation and hot and sometimes windy weather, combined with continued growth in the WUI areas, results in an increase in the number of ignitions. Any fire, once ignited, has the potential to quickly become large and out-of-control.



Community Vulnerability Rating: High, Widespread potential impact

Potential losses from wildfire include human life, structures and other improvements, natural and cultural resources, quality and quantity of water supplies, cropland, timber, and recreational opportunities. Short and long-term economic losses could also result due to loss of business and other economic drivers associated with Hesperia's summer season activities. Smoke and air pollution from wildfires can be a severe health hazard. In addition, catastrophic wildfire can create favorable conditions for other hazards such as flooding, landslides, and erosion during the rainy season.

Generally, there are three major factors that sustain wildfires and predict a given area's potential vulnerability to burn. These factors are fuel, topography, and weather.

- **Fuel** – Fuel is the material that feeds a fire and is a key factor in wildfire behavior. Fuel is generally classified by type and volume. Fuel sources are diverse and include everything from dead tree leaves, twigs, and branches, to dead standing trees, live trees, brush, and cured grasses. Manmade structures are also considered a fuel source, such as homes and other associated combustibles. The type of prevalent fuel directly influences the behavior of wildfire. Fuel is the only factor that is under human control. Future developments of the Tapestry Project in the southern region of the City currently possess the highest vulnerability to wildfire.
- **Topography** – An area's terrain and slope affect its susceptibility to wildfire spread. Both fire intensity and rate of spread increase as slope increases due to the tendency of heat from a fire to rise via convection. The arrangement of vegetation throughout a hillside can also contribute to increased fire activity on slopes.
- **Weather** – Weather components such as temperature, relative humidity, wind, and lightning also affect the potential for wildfire. High temperatures and low relative humidity dry out fuels that feed wildfires, creating a situation where fuel will ignite more readily and burn more intensely. Thus, during periods of drought the threat of wildfire increases. Wind is the most treacherous weather factor. The greater the wind, the faster a fire can spread and the more intense it can be. Wind shifts, in addition to wind speed, can occur suddenly due to temperature changes or the interaction of wind with topographical features such as slopes or steep hillsides. As part of a weather system, lightning also ignites wildfires, often in difficult to reach terrain for firefighters.

Factors contributing to the high, widespread wildfire risk in Hesperia include:



- Narrow and often one-lane and/or dead-end roads complicating evacuation and emergency response.
- Nature and frequency of ignitions; and increasing population density leading to more ignitions.
- Slope of the foothills.
- Residential development along the foothills.

4.6.4.2.1 Population at Risk

Wildfire risk is of greatest concern to populations residing in the moderate and high wildfire hazard zones. Hesperia 2012 census block data was used to estimate populations within the hazard zones. More than 37,000 residents live within the high fire hazard area and nearly 26,000 residents live within the moderate hazard area⁷.

Population Exposure

Population Count by Wildfire Hazard Zone

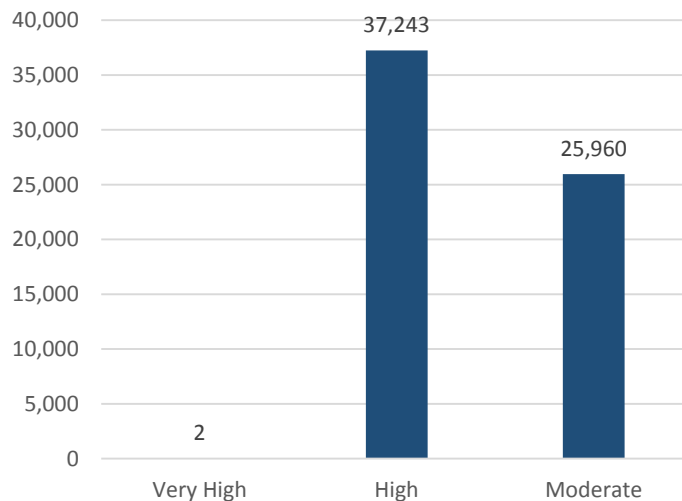


Figure 4-23: Population at risk from Wildfire Hazards; 2016

4.6.4.2.2 Residential Parcel Value at Risk

The County's parcel layer was used as the basis for the inventory of improved residential parcels. In some cases, a parcel will be within multiple fire threat zones. GIS was used to create centroids, or points, to represent the center of each parcel polygon – this is assumed to be the location of the structure for analysis purposes. The centroids were then overlaid with the fire threat layer to determine the risk for each structure. The fire threat zone in which the centroid was located was assigned to the entire parcel. This methodology assumed that every parcel with a square footage value greater than zero was developed in some way. Only improved parcels were analyzed. Table 4-23 exhibits portions of Hesperia that have significant assets at risk to wildfire in the Moderate and High fire severity zones.

⁷ High and moderate Fire Hazard Severity Zones as defined by the California Department of Forestry and Fire Protection (CAL FIRE).



Table 4-20: Residential Buildings and Content at Risk from Wildfire; 2016

Fire Hazard Severity Zone	Improved Parcel Count	Improvement Value Exposure (\$000)	Land Value Exposure (\$000)	Total Exposure (\$000)
Very High	1	\$23	\$89	\$112
High	10,475	\$1,579,147	\$379,852	\$1,958,999
Moderate	7,299	\$1,659,288	\$491,911	\$2,151,199
Non-Wildland/Non-Urban	1	\$58	\$25	\$82
Urban Unzoned	7,470	\$1,028,789	\$267,652	\$1,296,441
Total	25,246	\$4,267,304	\$1,139,529	\$5,406,833

4.6.4.2.3 Critical Facilities at Risk

Critical facilities data were overlain with fire hazard severity zone data to determine the type and number of facilities within each risk classification. *Table 4-21* and *Table 4-22* lists the critical facilities in the High and Moderate wildfire hazard zones for Hesperia.

Table 4-21: Critical Facility Exposure to Wildfire; 2016

Infrastructure Type	Moderate	High	Feature Count
Essential Facility	35		35
EOC	0	0	0
Fire Station	0	0	0
Hospital	0	0	0
Police Station	0	0	0
School	35	0	35
High Potential Loss	145	0	145
Child Care	0	0	0
Flood Zone	62	0	62
Foster/Home Care	1	0	1
Adult Residential Care	7	0	7
Mobile Home Park	15	0	15
RV Park	0	0	0
Senior Care	4	0	4
Communication Facility	0	0	0
Dam	0	0	0
Electric Power Facility	0	0	0
Natural Gas Facility	0	0	0
Potable Water Facility	0	0	0
Waste Water Facility	0	0	0
HAZMAT	38	0	38
Major Employer	18	0	18
Historic Cultural Resource	0	0	0



Infrastructure Type	Moderate	High	Feature Count
Transportation and Lifeline	0	0	0
Airport	0	0	0
Runway	0	0	0
Bus Facility	0	0	0
Highway Bridge	0	0	0
Railway Bridge	0	0	0
Grand Total	180	0	180

Table 4-22: Lifelines with Wildfire Risk; 2016

Facility Type	Moderate	High	Total Mileage
Transportation and Lifeline	182	288	470
Railway	6	6	12
Roads	176	282	458
Interstate Highway	5	11	16
State / County Highway	25	42	67
Primary Highway	2	2	4
Local Road, Major	6	31	37
Local Road	129	182	311
Other Minor Road	6	11	17
Vehicular Trail	0	0	0
Cul-de-Sac / Traffic Circle	0	0	0
Ramp	2	3	5
Service Road	0	0	0
Grand Total	182	288	470

4.6.4.3 Earthquake

Major Impacts from earthquakes are primarily the probable number of casualties and damage to infrastructure occurring from ground movement along a particular fault (USGS 2009). The degree of infrastructure damage depends on the magnitude, focal depth, distance from fault, duration of shaking, type of surface deposits, presence of high groundwater, topography, and the design, type, and quality of infrastructure construction.



Community Vulnerability: Medium, Moderate potential impact.

To analyze the risk to Hesperia residents, the Great Shakeout scenario was chosen modeled by the California Integrated Seismic Network (CISN). The 2008 Great Southern California ShakeOut was based on a potential magnitude 7.8 earthquake on the southern San Andreas Fault— approximately 5,000 times



larger than the magnitude 5.4 earthquake that shook southern California on July 29, 2008. Such an earthquake will cause unprecedented damage to Southern California—greatly dwarfing the massive damage that occurred in Northridge's 6.7-magnitude earthquake in 1994. The hazard foot print for this scenario was used to develop exposure results for population, critical facilities, and single family residential parcel values. FEMA Hazus analyses was used to conducted loss estimation for both scenarios and include building and content loss estimation results based on peak ground acceleration, peak ground velocity, and peak spectral acceleration modeled for the 7.8 earthquake on the San Andreas Fault.

Building codes provide one of the best methods of addressing natural hazards. When properly designed and constructed according to code, the average building can withstand many of the impacts of natural hazards. Hazard protection standards for all new and improved or repaired buildings can be incorporated into the local building code to reduce future flood losses. It is important to note that the City of Hesperia has adopted California's 2016 Building Code standards.

Manufactured or mobile homes are often not regulated by local building codes. They do have to meet construction standards set by the U.S. Department of Housing and Urban Development that apply uniformly across the country. However local jurisdictions may regulate the location of these structures and their on-site installation.

Important to note: Building codes provide one of the best methods of addressing natural hazards. When properly designed, and constructed per code, the average building can withstand many of the impacts of natural hazards. Hazard protection standards for all new and improved or repaired buildings can be incorporated into the local building code to reduce future flood losses.

4.6.4.3.1 Population at Risk

According to the 2015 US Census, the population of City is 92,755. Though rural residential construction is not particularly vulnerable to earthquakes, the chosen earthquake scenarios will directly or indirectly expose the entire population of Hesperia to ground shaking. Depending on the time of day (the population differs based on employment opportunities) and exact location of the modeled epicenter, the earthquake scenarios could be experienced differently. Figure 4-24 exhibit the population totals in each modeled earthquake severity zone. Population location is based upon information taken during the 2010 U.S. Census.



Population Exposure

Population Count for Great Shakeout Scenario

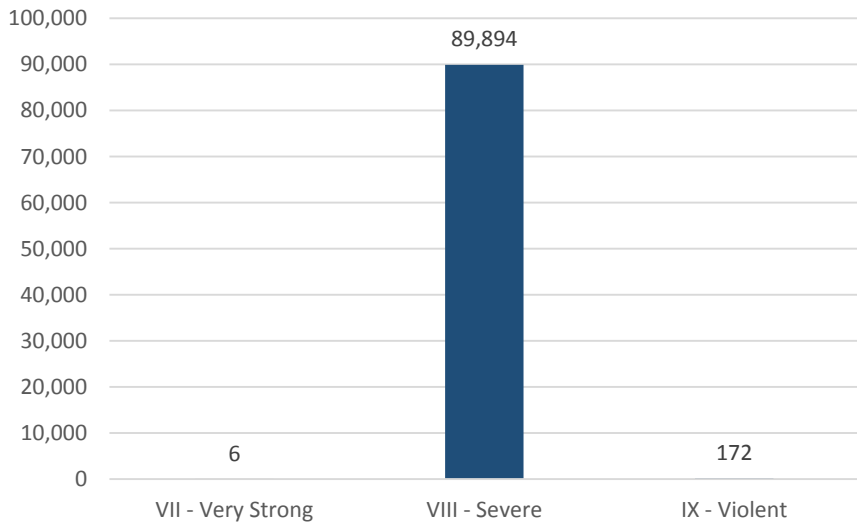


Figure 4-24: Population Exposure to The Great Shakeout EQ Shake Severity Zone; 2016

4.6.4.3.2 Residential Parcel Value at Risk

The County's parcel layer was used as the basis for the inventory of improved residential parcels. GIS was used to create centroids, or points, to represent the center of each parcel polygon – this is assumed to be the location of the structure for analysis purposes. The centroids were then overlaid with the shake severity zones to determine the at-risk structures. Only improved parcels greater than \$20,000 were analyzed. The analysis indicates residential parcels the chosen scenario will experience similar, but different shaking patterns. The type and year of construction will greatly influence damage for structures subject to similar shaking. Table 4-23 shows the count of at-risk structures and their associated improvement and land exposure values.

Table 4-23: Residential Parcel Value Exposure from Southern California Great Shakeout; 2016

Shake Severity Zone	Improved Parcel Count	Improvement Value Exposure (\$000)	Land Value Exposure (\$000)	Total Exposure (\$000)
VII - Very Strong	1	\$97	\$18	\$115
VIII - Severe	25,181	\$4,242,455	\$1,129,288	\$5,371,743
IX - Violent	64	\$24,752	\$10,223	\$34,975
Total	25,246	\$4,267,304	\$1,139,529	\$5,406,833

4.6.4.3.3 Critical Facilities at Risk

Earthquakes pose numerous risks to critical facilities and infrastructure. Seismic risks, or losses, that are likely to result from exposure to seismic hazards include:

- Casualties (fatalities and injuries).



- Utility outages.
- Economic losses for repair and replacement of critical facilities, roads, buildings, etc.
- Indirect economic losses such as income lost during downtime resulting from damage to private property or public infrastructure.

Roads or railroads that are blocked or damaged can prevent access throughout the area and can isolate residents and emergency service providers needing to reach vulnerable populations or to make repairs.

Linear utilities and transportation routes are vulnerable to rupture and damage during and after a significant earthquake event. The cascading impact of a single failure can have affects across multiple systems and utility sectors. Degrading infrastructure systems and future large earthquakes with epicenters near critical regional infrastructure could result in system outages that last weeks for the most reliable systems, and multiple months for others.

Table 4-24 provides an inventory of critical facility locations (points only) with earthquake exposure to the Great Shakeout Scenario. The building codes have been amended to include provisions for seismic safety at various bench marks years. Depending on “year built”, each critical facility presented in the tables may have varying damage potential.

Table 4-24: Critical Facilities with EQ Risk Southern California Great Shakeout; 2016

Infrastructure Type	Very Strong Shake Zone (VII)	Strong Shake Zone (VI)	Total Feature Count
Essential Facility	32	-	32
EOC	-	-	-
Fire Station	-	-	-
Hospital	-	-	-
Police Station	-	-	-
School	32	-	32
High Potential Loss	539	7	546
Dam	-	-	-
Economic Element-Major Employer	61	4	65
Hazmat	263	3	266
Historic/Cultural Resource-Historic	6	-	6
Utility-Communication Facility	-	-	-
Utility-Electric Power Facility	-	-	-
Utility-Natural Gas Facility	-	-	-
Utility-Potable Water Facility	1	-	1
Utility-Waste Water Facility	-	-	-
Vulnerable Population-Adult Residential Care	24	-	24
Vulnerable Population-Child Care	-	-	-
Vulnerable Population-Flood Zone	120	-	120
Vulnerable Population-Foster/Home Care	16	-	16



Infrastructure Type	Very Strong Shake Zone (VII)	Strong Shake Zone (VI)	Total Feature Count
Vulnerable Population-Mobile Home Park	32	-	32
Vulnerable Population-RV Park	4	-	4
Vulnerable Population-Senior Care	12	-	12
Transportation and Lifeline	-	-	-
Airport	-	-	-
Runway	-	-	-
Bus Facility	-	-	-
Highway Bridge	-	-	-
Railway Bridge	-	-	-
Grand Total	-	-	-

HazMat Fixed Facilities

Although earthquakes are low probability events, they produce hazardous materials (HazMat) threats at very high levels when they do occur. Depending on the year built and construction of each facility containing HazMat, earthquake initiated hazardous material releases (EIHR) potential will vary. HazMat contained within masonry or concrete structures built before certain benchmark years reflecting code improvements may be of particular vulnerability.

Transportation

Earthquake events can significantly impact bridges which often provide the only access to some neighborhoods. Since soft soil regions generally follow floodplain boundaries, bridges that cross water courses are considered vulnerable. Since most of the City bridges provide access across water courses, most are at least somewhat vulnerable to earthquakes. Key factors in the degree of vulnerability are the bridge's age and type of construction which indicate the standards to which the bridge was built. Special attention will be paid to the multiple bridges that cross interstates. Interstates would serve as major emergency response and evacuation routes.

Utilities

Linear utilities and transportation infrastructure would likely suffer considerable damage in the event of an earthquake. Due to the amount of infrastructure and sensitivity of utility data, linear utilities are difficult to analyze without further investigation of individual system components. *Table 4-25* provides the best available linear data and it should be assumed that these systems are exposed to breakage and failure.

Table 4-25: Lifelines with EQ Risk 2016; Southern California Great Shakeout Scenario

Facility Type	Severe	Violent	Total Mileage
Transportation and Lifeline	577	42	619
Railway	15	1	16
Roads	562	41	603



Interstate Highway	8	9	17
State / County Highway	84	8	92
Primary Highway	3	0	4
Local Road, Major	36	9	45
Local Road	410	10	421
Other Minor Road	18	0	18
Vehicular Trail	0	0	0
Cul-de-Sac / Traffic Circle	0	0	0
Ramp	3	3	6
Service Road	0	0	0
Grand Total	577	42	619

Natural Gas Utilities

The U.S. Department of Transportation (DOT) Pipeline and Hazardous Materials Safety Administration (PHMSA) defines natural gas pipelines under two categories, "Transmission" and "Distribution." Transmission pipelines are primarily used to receive gas from suppliers and move it to distribution load centers or to storage facilities.

High Pressure Distribution lines are used to deliver gas to Hesperia customers. These pipelines operate at pressures above 60 psi and deliver gas in smaller volumes to the lower pressure distribution system. (SoCalGas Gas Transmission and High Pressure Distribution Pipeline Interactive Map, n.d.)

Several common characteristics of earthquakes and their impacts on natural gas safety are:

1. Earthquake ground shaking will generally lead to substantially more instances of building damage than fire ignitions.
2. Ground motions that are sufficient enough to damage buildings are the most likely to impact utility and customer gas systems and create a potential for gas-related fire ignitions.
3. The number of post-earthquake fire ignitions related to natural gas can be expected to be 20% to 50% of the total post-earthquake fire ignitions.
4. The consequences of post-earthquake fire ignitions for residential gas customers are largely financial. A fire ignition only becomes a life safety concern when inhabitants are unable to exit the building following earthquakes. Experience in past earthquakes indicates that egress from earthquake damaged single-family homes is generally possible because of the limited structure height, low numbers of occupants, and multiple direct escape paths through doors and windows.
5. The potential life safety dangers from post-earthquake fires are considerably more serious in seismically vulnerable apartment or condominium buildings since they provide a greater chance for damaging the structure and trapping the occupants.

Southern California Gas Company (SoCal Gas), Hesperia's natural gas utility, is responsible for designing, constructing, maintaining, and operating the natural gas system safely and efficiently. This includes all the facilities used in the delivery of gas to any customer up to and including the point of delivery to the customers' gas piping system. SoCal Gas provides seismic safety through compliance with existing regulations, coordinating their emergency planning with local governments, and incorporating earthquake-resistant design considerations into their maintenance activities and new construction.



Gas customers and Hesperia residents are responsible for using gas safely on their property and within their buildings and other facilities. Customers meet this responsibility by maintaining their gas appliances in good working condition, assuring that only qualified individuals are engaged to modify or maintain their gas service and facility piping, and knowing what to do before and after earthquakes to maintain the safe operation of their natural gas service.

The following conditions, when combined, pose the greatest risk for severe post-earthquake fire damage:

1. Buildings are unoccupied and individuals are not present to mitigate damage to gas systems or control small fires.
2. High building density or dense, fire-prone vegetation.
3. High wind and low humidity weather conditions.
4. Damage to water systems that severely limits firefighting capabilities.
5. Reduced responsiveness of firefighting resulting from impaired communications, numerous requests for assistance, direct damage to fire stations, restricted access because of traffic congestion and damaged roadways, and delays in mutual aid from neighboring fire districts.

4.6.4.3.4 Loss Estimation Results

The Hazus Level 2 analysis was used to assess the risk from and vulnerability to earthquake shaking within Hesperia. Hazus buildings data is aggregated to the census tract level for earthquake models, known as the general building stock (GBS), which has a level of accuracy acceptable for planning purposes. Where possible the GBS was enhanced using GIS data from the County as described previously. The following sections describe risk to and vulnerability of the GBS within the City. Hazus calculates losses to structures from earthquake shaking by considering the amount of ground displacement and type of structure. The software estimates the percentage of damage to structures and their contents by applying established building fragility curves. Damage estimates are then translated to estimated dollar losses.

For each Great Shakeout Scenario ground shaking data (shakemaps) were acquired from CISEN and imported into Hazus. The shakemap data consist of peak ground velocity, peak ground acceleration, peak spectral acceleration at 0.3 seconds, and peak spectral acceleration at 1.0 seconds. The earthquake module operates on census tracts that often include population and structures in the incorporated cities and the unincorporated area within a single tract. Due to this fact the results include census tracts that have a substantial portion of land within the incorporated area (loss estimates for some tracts will include structures in incorporated cities).

The results are summarized in *Table 4-26* for the Great Shakeout Scenario. It is important to understand that the Hazus earthquake module uses the census tract as its enumeration unit rather than the more detailed census block. The loss estimation values for earthquakes are much higher than those of the flooding and dam failure due to this fact. The portions of incorporated areas included within boundary census tracts elevate the values due to the inclusion of additional GBS. Though the difference between census tracts and census blocks are extremely disparate, the most important summary information is the percent of loss estimation against the total value. Reading from *Table 4-26*, residential building and content loss estimation from the Great Shakeout Scenario is nearly \$17 billion dollars and 5.5 percent of the total value of the residential buildings. In Great Shakeout Scenario, residential damage will be the greatest. While there are several limitations to the FEMA Hazus model, it does allow for potential loss estimation. It is



important to remember that the replacement costs are well below actual market values, thus, the actual value of assets at risk may be significantly higher than those included herein.

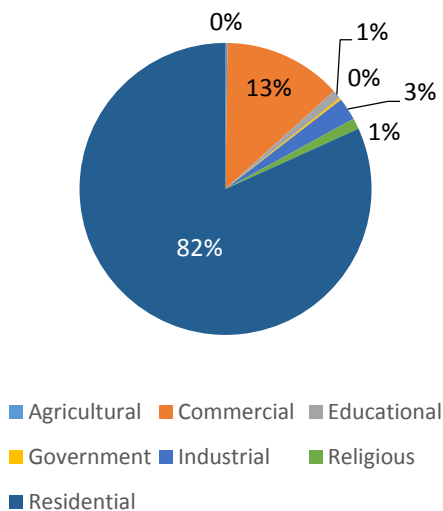
Table 4-26: Estimated Building and Content Loss Great Shakeout Scenario EQ; 2016

Building Type	Building Replacement Costs (\$000)	Building Replacement Cost (% of Total Value)	Content Replacement Cost (\$000)	Content Replacement Cost (% of Total Value)	Total Estimated Loss (\$000)	Total Loss Estimation (% of Total Value)	Total Value (\$000)
Agricultural	\$1,956	3.5%	\$681	1.2%	\$2,638	4.7%	\$55,664.00
Commercial	\$123,567	5.5%	\$35,824	1.6%	\$159,391	7.1%	\$2,237,452.00
Educational	\$9,327	3.5%	\$3,284	1.2%	\$12,611	4.7%	\$266,686.00
Government	\$2,237	5.6%	\$639	1.6%	\$2,876	7.2%	\$39,896.00
Industrial	\$23,425	4.5%	\$9,956	1.9%	\$33,381	6.4%	\$523,613.00
Religious	\$11,436	5.2%	\$3,478	1.6%	\$14,914	6.8%	\$219,042.00
Residential	\$771,135	4.5%	\$163,181	1.0%	\$934,317	5.5%	\$17,100,364.00
Grand Total	\$943,085	4.6%	\$217,043	1.1%	\$1,160,128	5.7%	\$20,442,717

Figure 4-25: Estimated Building Loss and Content Damage by Occupancy Type; 2016

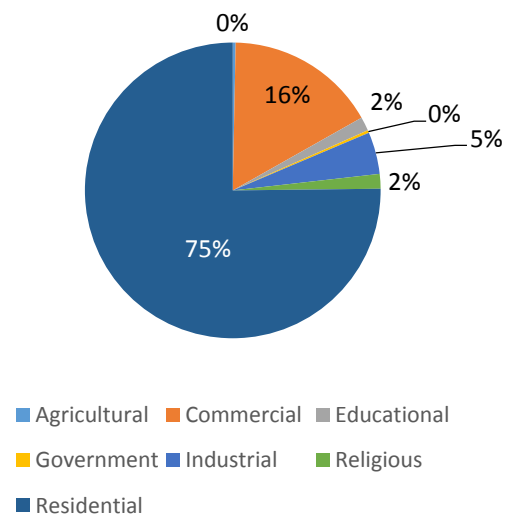
Great Shakeout Scenario EQ

Estimated Building Loss by Occupancy Type



Great Shakeout Scenario EQ

Estimated Content Damage by Occupancy Type



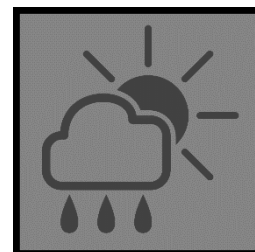


4.6.4.4 Climate Change

4.6.4.4.1 Population at Risk

The effects of climate change are not limited or defined by geographical borders. Every resident of Hesperia is at risk to the impacts of climate change.

Vulnerable populations should receive special attention when assessing the community's vulnerability to climate change. For example, care and sheltering during extreme heat conditions must be provided for vulnerable populations such as the elderly. The City center has the largest concentration of people age 65 or older. According to information provided by FEMA, extreme heat is defined as temperatures that hover 10 degrees or more above the average high temperature for the region and last for several weeks. Heat kills by taxing the human body beyond its abilities. In a normal year, about 175 Americans succumb to the demands of summer heat. According to the National Weather Service (NWS), among natural hazards, only the cold of winter—not lightning, hurricanes, tornados, floods, or earthquakes—takes a greater toll. In the 40-year period from 1936 through 1975, nearly 20,000 people were killed in the United States by the effects of heat and solar radiation. In the heat wave of 1980, more than 1,250 people died.



Since climate change can exacerbate other hazards, consideration should also be given to populations living in high hazard wildfire and flood zones. Drought caused by climate change will also affect the entire population. Agricultural yields will suffer and drier vegetation creates more fuel for wildfires.

4.6.4.4.2 Critical Facilities at Risk

The location of infrastructure, its current condition and its susceptibility to climate impacts are important factors to consider when accessing the vulnerability of critical facilities to climate change.

Infrastructure provides the resources and services critical to community function. Roads, rail, water (pipes, canals, and dams), waste (sewer, storm, and solid waste), electricity, gas, and communication systems are all needed for community function. Climate change increases the likelihood of both delays and failures of infrastructure. Delays and failures can result from climate-exacerbated hazards such as flooding, fire, or landslide, as well as increased demand, load, or stress on infrastructure systems that can result from climate change (e.g., heat impacts on roadway durability). Temporary delays or outages can result in inconvenience and economic loss, while larger failures can lead to disastrous economic and social effects. (California Adaptation Planning Guide n.d.)

Three to five more heat waves will be experienced by 2050, increasing to 12-16 in the western parts of the region to more than 120 in the eastern parts of the region. The age and construction method of essential facilities, transportation systems, lifeline utility systems, high potential loss facilities and hazardous material facilities will determine how they stand up to the effects of climate change such as extreme heat days.

4.6.4.4.3 Loss Estimation Results

Climate Change can potentially affect critical infrastructure in a variety of ways.

- **Temperature and heat waves:** Heat can stress infrastructure, altering maintenance needs, particularly for roadways.
- **Precipitation, intense rainstorms, and flooding:** Increased frequency of flooding could be seen throughout the City, especially in areas already identified as high risk.
- **Snowpack:** Melting snow in Wrightwood could cause increased flooding, erosion and landslides.
- **Wildfire:** Dry vegetation as a result of high heat can increase the risk of wildfire.



Section 5. Mitigation Strategy

The intent of the mitigation strategy is to provide the City of Hesperia with a guidebook to future hazard mitigation administration. The mitigation strategy is intended to reduce vulnerabilities outlined in the previous section with a prescription of policies and physical projects. This will help City staff to achieve compatibility with existing planning mechanisms, and ensures that mitigation activities provide specific roles and resources for implementation success.

5.1 Planning Process for Setting Hazard Mitigation Goals and Objectives

The mitigation strategy represents the key outcomes of the Hesperia HMP planning process. The hazard mitigation planning process conducted by the Planning Committee is a typical problem-solving methodology:

- Estimate the impacts the problem could cause (See Section 4.12 *Vulnerability Assessment*);
- Describe the problem (See Section 5.2, *Identifying the Problem*);
- Assess what safeguards and resources exist that could potentially lessen those impacts (See Section, 5.3 *Capabilities Assessment*);
- Develop Goals and Objectives with current capabilities to address the problems (See Section 6.3 *Mitigation Goals, Objectives, and Projects*)
- Using this information, determine what can be done, and select those actions that are appropriate for the community (See Section 6.4.3, *Goal, Objective and Mitigation Action Matrix*).

5.2 Identifying the Problem

As part of the mitigation actions identification process, the HMP Planning Committee identified issues and/or weaknesses as a result of the risk assessment and vulnerability analysis. By combining common issues and weaknesses developed by the Planning Committee, the realm of resources needed for mitigating each can be understood. Community issues and weaknesses are presented by individual hazards in Table 5-1 through Table 5-4.

Table 5-1: Earthquake Hazard Problem Statements

Problem Description	Problem Type	Action No.
1. Damage to City water supply in the event of an earthquake may present a water supply issue.	Infrastructure	EQ 1.4
2. Potential damage to I-15 overpasses would impede travel.	Infrastructure	EQ 1.1
3. Protecting utility service such as natural gas from earthquake damage.	Infrastructure	EQ 1.1
4. Public facility infrastructure i.e. fire stations with earthquake damage risk.	Infrastructure	EQ 1.1
5. Structural adequacy of city buildings / facilities?	Infrastructure	EQ 1.1
6. Content damage in City buildings.	Infrastructure	EQ 1.1
7. It is unknown if Unreinforced Masonry (URM) buildings exist within City boundaries.	Infrastructure	EQ 1.3
8. The majority of residents live in the severe shake zone in the Great Shakeout Scenario.	Vulnerable Population	EQ 1.2



Table 5-2: Wildfire Hazard Problem Statements

Problem Description	Problem Type	Action No.
1. Residents along the City's southern half are in the High fire hazard severity zone.	Vulnerable Populations	WF 1.3
2. City open spaces / vegetative fuels backing up to resident's property/ homes.	Vulnerable Populations	WF 1.1, WF 1.3
3. Lack of public notice to areas of extreme fire danger (clear brush etc.)?	Public Education	WF 1.1

Table 5-3: Flood Hazard Problem Statements

Problem Description	Problem Type	Action No.
1. Several streets are rendered impassable during heavy rain storms, trapping residents.	Infrastructure	FL 1.1
2. The portion of the City bordering the Mojave River is located in the 100-year flood zone.	Vulnerable Populations	FL 1.2
3. Debris/sediment buildup on roadways after rain/flooding	Maintenance	FL 1.1, 1.3

Table 5-4: Climate Change Hazard Problem Statements

Problem Description	Problem Type	Action No.
1. Other natural disasters such as drought, severe weather, flood, and wildfire occurrence intervals can change. I.e. Increased wildfire risk due to a drier climate, in dry years, variability and the frequency/severity of hazard events i.e. El Nino Events in wet years.	Natural Hazards	CC 1.1

5.3 Capabilities Assessment

The City of Hesperia strives to protect and maintain the health, safety and welfare of the community on a day-to-day basis, and takes extra measures to reduce the impacts of natural or technological hazards. The City can use a variety of different tools, assets, and authorities to effectively prepare for, mitigate against, respond to and recover from emergencies and disasters. These include voluntary and mandatory measures; individual and community efforts; private and public actions; and preventive as well as responsive approaches. Example mitigation activities include educating citizens, enforcing building and development codes, constructing capital improvement projects, adopting plans, establishing incentive programs, and improving emergency preparedness and response.

The capabilities available to the City of Hesperia fall into the following broad categories: Agencies and People, Plans, Codes and Regulations, Mitigation Programs and Financial Resources. Identifying and documenting these capabilities provides the basis for developing future mitigation opportunities and how they can be implemented within existing City programs.



5.3.1 Local Planning and Regulatory Mitigation Capabilities

The information in Table 5-5 is used to construct mitigation actions aligned with existing planning and regulatory capabilities of the City. Planning and regulatory tools typically used by local jurisdictions to implement hazard mitigation activities are building codes, zoning regulations, floodplain management policies, and other municipal planning documents.

Table 5-5: Planning and Regulatory Mitigation Capabilities Summary

Hazard	Plan/Program/Regulation	Responsible Agency	Comments
Multi-Hazard	Hesperia / California Building Code 2016 Edition	Building Dept.	The City has adopted the California Building Code 2016 Edition, Volumes 1 and 2. The California Building codes protect buildings to the extent possible from natural occurring hazards. The City will continue to adopt any changes in the California building codes to stay current on future hazard risks.
Multi-Hazard	City of Hesperia General Plan Safety Element	Community Development Dept.	The General Plan was updated in 2010 and addresses the continuing change, growth, and development of the City of Hesperia over the next two decades and provides a public policy framework for the future of the city. The City will develop and adopt a new general plan in 2030 to remain current with the changing population and safety standards.
Multi-Hazard	City of Hesperia Emergency Operations Plan	Community Development Dept.	The City EOP provides a framework for coordinated response and recovery activities during an emergency. The City EOP is intended to be invoked whenever the City must respond to an unforeseen incident or planned event, the size or complexity of which is beyond that normally handled by routine operations. The City will update the EOP every 5 years after the new HMP is approved, this will allow for the incorporation of current hazard mitigation information, procedures, and regulations.
Wildfire	San Bernardino County Fire Hazard Abatement (FHA) Program	San Bernardino County Land Use Services and City Community Development Dept.	The FHA enforces the fire hazard requirements outlined in San Bernardino County Code Section 23.0301–23.0319. The primary function of the Fire Hazard Abatement Program is to reduce the risk of fires within communities by pro-actively establishing defensible space and reduction/removal of flammable materials on properties. Two times a year notices go out for abatement. Ability to lien abate through county. The City will continue to follow the County's Regulations and program.
Flood	National Flood Insurance Program (NFIP)	Public Works Dept.	NFIP makes federally backed flood insurance available to homeowners, renters, and business owners in participating communities. The City will continue to participate in the NFIP program and will make changes accordingly.
Flood	Hesperia 2015 Urban Water Management Plan (UWMP)	Hesperia Water District	It provides managers and the public with a broad perspective on a number of water supply issues. Helps to define water delivery and water security. The City will continue to follow the 2015 UWMP until the new 2020 UWMP is released in 3 years. At that time the 2020 plan will be incorporated into or updates.



Hazard	Plan/Program/Regulation	Responsible Agency	Comments
Climate Change	City of Hesperia Climate Action Plan	Planning	Outline a course of action for the City government and the community of Hesperia to reduce per capita greenhouse gas emissions 29 percent below business as usual by 2020 and adapt to effects of climate change. In 2020 the Climate Action will be reevaluated and updated based on current population and California emissions standards. This new plan will be included in the HMP updates.

5.3.2 Administrative and Technical Capabilities

The following table 5-6 provides a summary of administrative and technical capabilities organized by staff and department. It is important to understand current administrative and technical capabilities before developing mitigation activities.

Table 5-6: Administrative and Technical Capabilities by Staff & Department

Staff/Personnel Resources	Dept. / Agency	Comments
Planners (with land use / land development knowledge)	City of Hesperia Planning Dept.	Develops and maintains the General Plan, including the Safety Element. Develops area plans based on the General Plan, to provide more detailed guidance for the development of more specific areas. Reviews private development projects and proposed capital improvements projects and other physical projects involving property for consistency and conformity with the General Plan. Anticipates and acts on the need for new plans, policies, and Code changes. Applies the approved plans, policies, code provisions, and other regulations to proposed land uses
Planners or engineers (with natural and/or human caused hazards knowledge)	Public Works Dept., Community Development Dept.	Hiring and training an additional planner/engineer with natural/human caused hazards knowledge to improve current capabilities.
Engineers or professionals trained in building and/or infrastructure construction practices (includes building inspectors)	Public Works Dept. Utilities Dept. Community Development Dept.	Oversees the effective, efficient, fair, and safe enforcement of the California Building Code. Hiring and training an additional engineer with natural/human caused hazards knowledge to improve current capabilities.
Floodplain Management	Development Services Public Works Dept.	Reviews and ensures that new development proposals do not increase flood risk, and that new developments are not located below the 100-year flood level. In addition to planning and managing flood risk reduction projects throughout the City.
Land / Building surveyors	N/A	City contracts survey services.
Grant writers or fiscal staff to handle large/complex grants	City Manager's Office Economic Development Dept.	Numerous types of federal, state, local, and private grants have been administered by City staff.



Staff/Personnel Resources	Dept. / Agency	Comments
Construction Equipment	City of Hesperia Public Works Dept.	Public Works owns and maintains large pieces of equipment available for construction, moving and removal of earthen material. Gaining new/additional equipment would help in the event of a disaster.
Emergency Management Personnel	City of Hesperia Police Dept. San Bernardino County Fire Dept. City of Hesperia Emergency Operations Center	State Office of Emergency Services Access Mobile Emergency Personnel Gaining a full time Emergency Services Employee again would help to maintain and expand our mitigation programs and disaster preparedness
Care and Sheltering	Victorville, CA ; San Bernardino County Fair Grounds Regional Red Cross Office 17199 Yuma Street Suite #2, Victorville, CA 92395)	Care and sheltering during extreme heat conditions, will provide sheltering and support services for fire victims. Contracting with local venues for use of their facilities during a disaster would expand our housing capabilities for displaced residents and animals.
Weather Surveying	National Oceanic and Atmospheric Administration	The Public Information Office is responsible for relaying severe weather warnings. Also incorporate the regular use of the California Integrated Seismic Network as a secondary notification for earthquake warnings and information.

5.3.3 Fiscal Capabilities

This section identifies the financial tools or resources that the City could potentially use to help fund mitigation activities. Fiscal capabilities include City-specific as well as state and federal resources.

5.3.3.1 Local Fiscal Resources

Table 5-7 provides a summary of local fiscal resources. As indicated in Table 5-8 through 5-11, there are several governmental funds and revenue raising activities that can be allocated for hazard mitigation. The local Fiscal Resources are updated every fiscal year. Each year allocation of funds for hazard mitigation will be adjusted based on the current year's population growth, location, and future hazard risks.

Table 5-7: Local Fiscal Resources

Financial Resources	Dept. / Agency	Comments
Permitting Fees	Development Services, Planning and Building & Safety/Community Development Department	Building permit fees, building plan check fees and business license fees to provide inspection services to ensure structures are being built in compliance with existing CA building code. No dedicated line items for hazard mitigation.
General Fund Revenue	Hesperia City Council/Finance Dept.	No dedicated line items for hazard mitigation. Budget is just balanced meeting mandated reserves and operating costs.
Utility Funds	Hesperia City Council/Hesperia Water District	The Water District is increasing by 29% or \$5.8 million, which is primarily due to receiving \$1.5 million from the Proposition 84 Drought Relief Grant and \$4.7 million from the Proposition 1 Grant.



Fire District	Hesperia Fire Dept./Hesperia City Council	The Fire District Fund for FY 2016-2017 is \$11,135,807, and is expected to increase 3% to the following FY to allow for increased mitigation measures.
Capital Improvements Program	Hesperia City Council / Hesperia Public Works	The Capital Improvement Program for FY 2016-2017 is \$20,494,114. No dedicated line items for hazard
State and County Community Development Dept. Block Grants (CDBG)	California Dept. of Housing and Community Development Dept. (HCD)	Programs Include: Housing Rehabilitation First-time Homebuyers C.I.P. Neighborhood Stabilization Program (NSP) Approximately \$984,021 allocated by HUD for 2016/17. No dedicated line items for hazard mitigation

Source: Hesperia's Annual Financial Report, fiscal year 16/17

5.3.3.2 County Wildfire Mitigation Programs

San Bernardino County has one of the most comprehensive set of programs to mitigate the potential for catastrophic wildfires in the Nation. There is no other jurisdiction that has the comprehensive, multi-agency cooperation and coordination as is found in San Bernardino County. While the following programs can be used by the City of Hesperia to develop and perform mitigation actions, they are the County of San Bernardino's programs, so the City is unable to determine how that entity will expand and improve it at this time.

Table 5-8: County Wildfire Mitigation Programs

Hazard	Program	Responsible Agency	Comments
Wildfire	MAST	Multiple	The mission of the MAST is to facilitate a coordinated effort by cities, county, state, federal, and non-profit agencies to provide for protection from wildfire. For more information see County OES website or hazard mitigation plan.
Wildfire	Cal Fire	Cal Fire	Cal Fire provides programs to increase fire safety in high fire hazard severity zones. For more information see County OES website or hazard mitigation plan.
Wildfire	County Fire Hazard Abatement	Fire District	Fire Hazard Abatement works to reduce the potential for an individual's property to be the source of fire and structural ignitability. For more information see County OES website or hazard mitigation plan.
Wildfire	Contractor Certification	City of Big Bear Lake Fire Department	This program trains and certifies landscape contractors to provide a qualified workforce to conduct fuels reduction activities on individual properties. For more information see County OES website or hazard mitigation plan.
Wildfire	Southern California Edison (SCE)	Southern California Edison (SCE)	SCE removes dead trees near power lines to reduce fire hazards. For more information see County OES website or hazard mitigation plan.



Hazard	Program	Responsible Agency	Comments
Wildfire	Wood Shake Roof Replacement	County	<i>This code requires that all Wood Shake Roofs in the Fire Safety Overlay, as defined in the Development Code, ongoing effort. For more information see County OES website or hazard mitigation plan.</i>
Wildfire	Inland Empire Fire Safe Alliance	Inland Empire Fire Safe Alliance	<i>The Alliance was created to act as a forum for all Fire Safe Councils in San Bernardino County. For more information see County OES website or hazard mitigation plan.</i>
Wildfire	Community Wildfire Protection Plans (CWPP)	Fire District	<i>CWPPs are designed to provide a means for a community to have input into and actively participate in the planning, strategy, goals, and objectives of creating a fire safe community. For more information see County OES website or hazard mitigation plan.</i>
Wildfire	Organized Group Volunteer Activities	Fire District	<i>There are several volunteer citizen groups throughout the County that are capable of providing significant resources that are not provided by traditional governmental agency services. For more information see County OES website or hazard mitigation plan.</i>

5.3.3.3 County Flood Mitigation Programs

The chart below details flood mitigation programs that were established by San Bernardino County Flood Control District to protect life and property. These programs are typically designed to mitigate flood hazards to life and property, and critical infrastructure. Also, these programs can be used as a public education and information capability for Hesperia. While the following programs can be used by the City of Hesperia to develop and perform mitigation actions, they are the County of San Bernardino's programs, so the City is unable to determine how that entity will expand and improve it at this time.

Table 5-9: County Flood Mitigation Programs

Hazard	Program	Responsible Agency	Comments
Flood	Flood Area Safety Taskforce (FAST)	Flood Control District	<i>The FAST Organization stresses liaison with the communities, provides for community education and information, and places emphases on community and city partnerships. For more information see County OES website or hazard mitigation plan.</i>
Flood	Alluvial Fan Task Force	Alluvial Fan Task Force	<i>The Task Force reviews the state of knowledge regarding alluvial fan floodplains, determine future research needs, and, if appropriate, develop recommendations relating to alluvial fan floodplain management, with an emphasis on alluvial fan floodplains that are being considered for development. For more information see County OES website or hazard mitigation plan.</i>
Flood	StormReady	Flood Control District	<i>San Bernardino County is a StormReady County. For more information see County OES website or hazard mitigation plan.</i>



5.3.3.4 County Public Education and Alert Programs

While the following programs can be used by the City of Hesperia to develop and perform mitigation actions, they are the County of San Bernardino's programs, so the City is unable to determine how that entity will expand and improve it at this time.

Table 5-10: County Public Education and Alert Programs

Hazard	Program	Responsible Agency	Comments
Multi-Hazard	CERT	SB County Fire District	The Community Emergency Response Team (CERT) Program educates people about disaster preparedness and trains them in basic response skills. For more information on the CERT program see County OES website or HMP.
Multi-Hazard	California Disaster Corps	SB County Fire District	The Disaster Corps is a first-in-the-nation effort to professionalize, standardize and coordinate highly trained disaster volunteers statewide. This program initiative was built collaboratively in partnership with California Volunteers from the ground up through public-private partnerships and with a wide range of subject matter experts. For more information see County OES website or HMP.
Multi-Hazard	TENS	SB County Fire District	Telephone Emergency Notification Systems (TENS) 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 that require evacuations. To that end the Board of Supervisors dedicated General Fund money in 2003 to the implementation of an automated phone dialing system that calls telephones in specific geographic areas of concern. All areas of San Bernardino County have all been preprogrammed so that during an emergency, the specific target group can be notified as quickly as possible. For more information see County OES website or HMP.
Multi-Hazard	ECS	SB County Fire District	The Emergency Communications Service (ECS) is a volunteer group providing front-line communications, technical and logistical support to the San Bernardino County Fire Department and Office of Emergency Services. Their primary mission is to support County Fire, County Government and other local agencies in time of disaster. In addition, ECS has provided telecommunications and event support to other County departments including Public Health, Behavioral Health, Public Works, Pre-School Services, Sheriff's Search and Rescue and other County Departments. For more information see County OES website or hazard mitigation plan.
Multi-Hazard	AM Radio	SB County Fire District	Community Based AM Radio Transmitters The Fire Safe Councils discovered the existence of very inexpensive but very effective community based AM radio transmitters. The transmitters are very effective for providing information and updates to a community that is either preparing for a community emergency or just had one. As a delivery modality they are extremely reliable because in most all emergencies the AM radio in your car is likely to be operational particularly when the electricity is out in your house.
Multi-Hazard	IPAWS	SB County Fire District	During an emergency, alert and warning officials need to provide the public with life-saving information quickly. The Integrated Public Alert and Warning System (IPAWS) is a modernization and integration of the nation's alert and warning infrastructure and will save time when time matters most, protecting life and property. Federal, State, Territorial, Tribal, and local alerting authorities can use IPAWS and integrate local systems that use Common Alerting Protocol (CAP) standards with the IPAWS infrastructure. IPAWS provides public safety officials with an effective way to alert and warn the public about serious emergencies using the Emergency Alert System (EAS), Wireless Emergency Alerts (WEA), the National Oceanic and Atmospheric Administration (NOAA) Weather Radio, and other



Hazard	Program	Responsible Agency	Comments
			public alerting systems from a single interface.

5.3.3.5 State and Federal Fiscal Resources

While the following programs/grants can be used by the City of Hesperia to develop and perform mitigation actions, they are the State of California/federal programs, so the City is unable to determine how that entity will expand and improve it at this time.

Table 5-11: Potential Funding Programs/Grants from State and Federal Agencies

Agency / Grant Name	Potential Programs/Grants
California DWR Proposition 50/84: Integrated Regional Water Management (IRWM) Program.	DWR has a number of IRWM grant program funding opportunities. Current IRWM grant programs include planning, implementation, and stormwater flood management. http://www.water.ca.gov/irwm/grants/index.cfm Proposition 84, the Safe Drinking Water, Water Quality, and Supply, Flood Control, River and Coastal Protection Bond Act, which provides \$1,000,000,000 (P.R.C. §75001-75130) for IRWM Planning and Implementation. CA Dept. of Water Resources' Flood Emergency Response Projects are posted on the webpage at: http://www.water.ca.gov/floodmgmt/hafoo/fob/floodER/
California Housing and Community Development (HCD) Emergency Solutions Grant (ESG) Program	To fund projects that serve homeless individuals and families with supportive services, emergency shelter/transitional housing, assisting persons at risk of becoming homeless with homelessness prevention assistance, and providing permanent housing to the homeless population. The Homeless Emergency Assistance and Rapid Transition to Housing (HEARTH) Act of 2009 places new emphasis on assisting people to quickly regain stability in permanent housing after experiencing a housing crisis and/or homelessness. http://www.hcd.ca.gov/fa/esg/index.html
CalTrans Division of Local Assistance / Safe Routes to School Program	California Dept. of Transportation. Federal funding administered via Caltrans. Local 10% match is the minimum requirement. http://www.dot.ca.gov/hq/LocalPrograms/saferoutes/saferoutes.htm
California State Office of Historic Preservation (OHP) / Statewide Historic Preservation Plan	Local Government; OHP's Local Government Unit (LGU) offers guidance and assistance to city and county governments to preserve historic properties including damage from natural hazards.
U.S. Dept. of Energy / Energy Efficiency and Conservation Block Grant Program	Provides funding for weatherization of structures and development of building codes/ordinances to ensure energy efficiency and restoration of older homes. http://www1.eere.energy.gov/wip/eeecbg.html
Dept. of Homeland Security (DHS) / FEMA Grants	http://www.fema.gov/grants



Agency / Grant Name	Potential Programs/Grants
Office for Victims of Crime: Antiterrorism and Emergency Assistance Program (AEAP)	The Office for Victims of Crime supports communities responding to terrorist attacks and cases of mass violence. The AEAP Assistance Programs include crisis response, consequence management, criminal justice support, crime victim compensation and training and technical assistance. https://www.ovc.gov/AEAP/
U.S. Department of State Office of Antiterrorism Assistance (ATA): Antiterrorism Assistance Program	The ATA program trains civilian security and law enforcement personnel from friendly governments in police procedures that deal with terrorism. Since its inception in 1983, the program has trained and assisted over 84,000 foreign security and law enforcement officials from 154 countries. http://www.state.gov/m/ds/terrorism/c8583.htm
California Emergency Management Agency (Cal EMA) / Proposition 1B Grants Programs	The Highway Safety, Traffic Reduction, Air Quality and Port Security Bond Act of 2006, approved by the voters as Proposition 1B at the November 7, 2006 general election, authorizes the issuance of nineteen billion nine hundred twenty-five million dollars (\$19,925,000,000) in general obligation bonds for specified purposes, including grants for transit system safety, security, and disaster response projects. http://www.calema.ca.gov/EMS-HS-HazMat/Pages/Emergency-Management-Homeland-Security-and-Hazard-Mitigation-Grant-Programs.aspx
California Proposition 1: The Water Bond (AB 1471)	Authorize \$7.545 billion in general obligation bonds for state water supply infrastructure projects, such as public water system improvements, surface and groundwater storage, drinking water protection, water recycling and advanced water treatment technology, water supply management and conveyance, wastewater treatment, drought relief, emergency water supplies, and ecosystem and watershed protection and restoration. The State Water Resources Control Board (State Water Board) will administer Proposition 1 funds for five programs. The estimated implementation schedule for each is outlined in Five Categories: ▪ Small Community Wastewater ▪ Water Recycling ▪ Drinking Water ▪ Stormwater ▪ Groundwater Sustainability http://www.waterboards.ca.gov/water_issues/programs/grants_loans/proposition1.shtml
Assistance to Firefighters Grant Program (AFG); Fire Prevention and Safety (FP&S)	The primary goal of the FP&S Grants is to enhance the safety of the public and firefighters with respect to fire and fire-related hazards. The Grant Programs Directorate administers the FP&S Grants as part of the AFG Program. FP&S Grants are offered to support projects in two activity areas: 1). Fire Prevention and Safety (FP&S) Activity Activities designed to reach high-risk target groups and mitigate the incidence of death and injuries caused by fire and fire-related hazards. 2). Research and Development (R&D) Activity To learn more about how to prepare to apply for a project under this activity, please see the FP&S Research and Development Grant Application Get Ready Guide.



Agency / Grant Name	Potential Programs/Grants
	https://www.fema.gov/fire-prevention-safety-grants

5.4 The Budget in Brief

General Fund Sources

The City of Hesperia has a General Fund Budget of \$29,875,509 for FY 2016-2017. The combined Capital Improvement Program for FY 2016-2017 is \$20,494,114.

Revenue is anticipated to increase by 8% (\$6.0 million) overall. With that, the General Fund is increasing by 5% or \$1.2 million, which is due to increased Sales and Use Tax, Vehicle License Fee, and Development-Related Revenue, as more than 150 building permits are planned to be received during FY 2016-17.

The Hesperia Water District, which comprises 32% of the overall revenue budget, is increasing by 29% or \$5.8 million, which is primarily due to receiving \$1.5 million from the Proposition 84 Drought Relief Grant and \$4.7 million from the Proposition 1 Grant that must be used on the Reclaimed Water Distribution System project. It should be noted that Water Sales is expected to decrease from budget to budget by 7% and is due to water conservation; however, it is anticipated that water consumption will increase by 5% over the FY 2015-16 Revised.

The following provides a brief description of the City's top general revenue sources along with the general assumptions used in preparing revenue projections.

Positions, Salaries, and Benefits

In total, the FY 2016-17 budgeted salaries and benefits are expected to increase by 1%, or \$0.2 million, over the FY 2015-16 Budget. The FY 2016-17 Budget includes the unfreezing of merit step increases, as well as providing a cost of living adjustment (COLA) of 3.9%. These cost increases are partially offset by the restructuring of positions.

The FY 2016-17 Budget includes a net of 2.86 full-time equivalent (FTE) non-safety position eliminations, which equates to the reduction of seven (7.00 FTE) full-time positions, which is offset by nine part-time positions (4.14 FTE).

Secured Property Tax

Property owners pay a basic tax of 1% of their property's valuation to the County annually. The City's General Fund receives approximately 1.5 cents of every property tax dollar out of this 1% tax levy. The FY 2016-17 Budget of \$0.6 million is 5% less than the FY 2015-16 Budget, however a 6% increase over the 2015-16 Revised and 4% more than the FY 2013-14 Actual. This increase can be attributed to the nearly 21% growth in assessed valuation since FY 2012-13. This revenue source is estimated to be 2.3% of General Fund.

Sales and Use Tax

Sales Tax is currently 8.00% on various taxable items in San Bernardino County. The City's share is 1.00% of the 8.00%, with 6.25% going to the State, 0.50% to Measure I, and 0.25% applied to Local Transportation funding. The combined FY 2016-17 Budget estimate for Sales and Use Tax revenues is \$8.3 million, for a



decrease of \$0.4 million from the FY 2015-16 Revised Budget. The \$8.3 million of the 2016-17 Budget reflects a 3% decrease from the FY 2015-16 Budget estimate. This decrease is due to an anticipated loss of fuel tax.

Franchise Fees

The City imposes fees on refuse hauling; gas and electric utilities; and cable television companies operating in the City for the use and wear and tear of the City's right-of-ways. The fees range from two to ten percent (2% - 10%) of gross receipts. The FY 2016-17 Budget estimates revenue of \$3.5 million, which is a 7% increase over the FY 2015-16 Revised and 9% over the FY 2015-16 Budget, primarily because of the return of the Article 19 franchise revenue of \$135,202 and an increase for the utility franchises. This revenue source is 13% of the General Fund FY 2016-17 Budget, showing a slight increase from being 12.5% of the FY 2015-16 Budget and 11.9% of the FY 2013-14 Actual General Fund Budget.

Vehicle License Fee (VLF)

The growth of the City's Triple Flip-Vehicle License Fees has been tied to the City's growth of assessed valuation since the first two years of the State's 'Triple Flip' Program which began in FY 2004-05. This revenue grew substantially through the FY 2008-09 Actual as the City's increase in assessed valuation reflected the dynamic growth of the housing boom. However, the assessed valuation moved substantially lower from FY 2009-10 through FY 2012-13 as revenue shrunk at the same pace. Assessed values began to recover starting in FY 2013-14 with a 4.3% increase for FY 2013-14, a 5.5% increase for FY 2014-15 and a 7.8% increase for FY 2015-16. The County Assessor will notify on July 1, 2016, through a press release, what the FY 2016-17 assessed valuation change is. However, it is anticipated to be a 6% increase, based on a study prepared for the Mojave Water Agency. The combined FY 2016-17 Budget for VLF and VLF Swap Triple Flip revenues estimate is \$7.5 million, an increase of approximately \$0.4 million, or 5.4%, from the 2015-16 Revised Budget. The \$7.5 million is \$0.5 million or 8% more, than the FY 2015-16 Budget, and \$1.3 million, or 21% higher, than the FY 2013-14 Actual

Development Related Fees

Overall, Development related revenues, excluding Business License revenue, are projected to gain 12% over the FY 2015-16 Budget and 3% from the FY 2015-16 Revised. Development related revenues comprise 5.8% of the General Fund FY 2016-17 Budget estimates, but was 5.0% in FY 2013-14. Total Development Revenues represent a 22% increase from FY 2013-14 Actual revenues.

Business License

This revenue is received by each business operating within the City. Revenue is projected to be consistent with the FY 2015-16 Revised but increase 10% over the FY 2015-16 Budget. It also exceeds FY 2013-14 Actual by 12%, which can be construed as a reflection of the local economy continuing to improve from the recession. As of June 30, 2015, there were approximately 3,812 active licenses in the City of which 2,896 were renewals from FY 2013-14. Through March 31, 2016, there are 4,041 active business licenses. This represents a 229 license, or 6% increase, over June 30, 2015.

Transient Occupancy Tax (TOT)

The City's municipal code authorizes the application of a 10% tax to the cost of hotel rooms within the City. This is intended to offset the cost of governmental services (streets and public safety) that the transient population use while temporarily staying in the City. It is expected that the revenue amounts will remain unchanged, reflecting a plateau in revenue as well as hotel occupancy. The FY 2016-17 Budget estimates revenue of \$1.2 million, the same amount as FY 2015-16 Revised and FY 2015-16 Budget. This revenue is 4.5% of the General Fund's FY 2016-17 Budget, an increase from the 4.1% in FY 2013-14.



Severe Repetitive Loss (SRL)

According to the National Flood Insurance Program, the City of Hesperia has zero repetitive loss properties within its jurisdiction.

Community Development Block Grants

Overall, this group of 12 funds is projecting a 44% decline in FY 2016-17 from the FY 2015-16 Budget, mainly due to a decrease in expected CDBG/HOME funds revenue. This revenue comprises 81% of the group's total FY 16-17 Budget with the AB3229 Supplemental Law fund is at 26% of the total. Other City Related Funds make up about 10% of the total revenues while non-streets Developer Impact Funds include the remaining 3%.

- **CDBG/HOME** - These grants are received from U.S. Department of Housing and Urban Development (HUD) and the State, for the purpose of improving areas of the City and providing housing assistance for low income families. The FY 2016-17 Budget is 23% higher than the FY 2015-16 Revised and 25% lower than the FY 2015-16 Budget. This is primarily due to not anticipating sale/program income for selling the Intergenerational Center (\$0.7 million) and the land under the County Government Center (\$0.4 million) in FY 2016-17. However, if any sale/reimbursement happens in FY 2016-17 and the transaction results in program income, the item will be presented to the Council during the fiscal year.
- **Stabilization Program (NSP)** - This is a grant received from Housing and Urban Development (HUD) Neighborhood Stabilization Program (NSP), for the purpose of buying, rehabilitating, and reselling abandoned/foreclosed homes within the City. The FY 2016-17 Budget is 87% lower than the FY 2015-16 Revised and 92% less than the FY 2015-16 Budget primarily due to the large decline in the anticipated property sales in the upcoming fiscal year.

Other City Related Funds

The City of Hesperia participates in an extensive list of federal and state grant programs, each designed to supplement the City's budget and allow flexibility to increase infrastructure and opportunity capabilities allowing for more efficient use of tax dollars.

The six funds in this group include: the County High Desert Government Center, the Redevelopment Administration fund, the AB3229 Supplemental Law Enforcement grant fund, the Environmental Programs grant fund, the Reimbursable Grants fund, the Disaster Preparedness grant fund, and the City Debt Service fund. Each of these funds has restrictions limiting how its money can be spent. The largest fund in this revenue group is the Environmental Programs Grant fund, with revenues of \$0.2 million.



Section 6. Mitigation Goals, Objectives and Actions

6.1 Mitigation Overview

The intent of the mitigation strategy is to provide Hesperia with a guidebook to future hazard mitigation administration. The mitigation strategy is intended to reduce vulnerabilities outlined in the previous section with a prescription of policies and physical projects. This will help City staff to achieve compatibility with existing planning mechanisms, and ensures that mitigation activities provide specific roles and resources for implementation success.

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 specifically for the four high risk hazards facing the City that were extensively examined in the risk assessment section: earthquake, flood, wildfire, and climate adaptation.

6.2 Mitigation 5-Year Progress Report

The following identifies the complete, deferred, and on-going actions or activities from the previously approved 2012 plan.

Mitigation Action	Complete	Deferred	On-going	Comments
Ranchero Road Undercrossing Phase I & II	x			Completed February 2015 - This project created an underpass beneath the Burlington Northern Santa Fe's (BNSF) railway's right-of-way at Ranchero Road and a new alignment through the Antelope Valley Wash between Santa Fe East and Danbury.
Paving Mesquite – Maple to Escondido	x			This project resulted in the paving of Mesquite Road from Maple Avenue to Escondido Avenue.
H-01 Drainage Facility Section 1 Maple Avenue to Main Street	x			Alignment of a major drainage facility to convey storm flow through the H-01 Drain Line designated in the City's Master Plan of Drainage. Identification of right-of-way and easements required for the alignment of the storm drain to allow channelization of the storm water run-off through residential neighborhoods protecting existing homes from flooding.



H-01 Drainage Facility Section 2 Main Street to Fourth Avenue	×			Constructed 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. The project included 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.
A-04 Drainage Facility – Mojave Street to Mesa Avenue Construction		×		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.
Fire Station 305 Construction	×			
New Police Station	×			
Fire Station 301 Property Acquisition and construction		×		
Rock Springs Road Reconstruction Project	×			Reconstruction and widening of Rock Springs Road from Main Street to the City limits just east of Glendale Avenue. The roadway has two travel lanes in each direction, a continuous center turn median and a Class II bicycle lane. Minor storm drain work was completed to address a historic sump condition.
Juniper/Smoke Tree/Eighth Avenue Project	×			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.
Aqueduct Crossing Improvements – widen Bridge at Main Street	×			The City's Master Plan 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. As a result, the bridge was widened to accommodate the configuration.
Widen Seventh Avenue – Main to Willow Streets	×			Reconstruction and widening of Seventh Avenue from two to four lanes from Main Street to Willow Street, 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.

Table 6-1 - Mitigation Five-Year Progress Report

6.3 Mitigation Goals, Objectives, and Projects

The 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 pre and post-disaster planning.

Objectives: 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.

- 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.

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.



Programs

Emergency Communications Network - CodeRED

- 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. CodeRED 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 CodeRED 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 and specific geographic areas as quickly as possible.

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 that 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.

6.3.3 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 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.
- 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.
- The County of San Bernardino Fire Prevention Division 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 one's 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.

- 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.

6.3.4 Flood

Goal: 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 plains, 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

- 1. Master Plan Drainage Facility H-01, Bandicoot Basin – the 920 ac-ft basin will attenuate flood waters – reducing peak flow rates nearly 50% - and accumulates sediments loads while conversing local storm water runoff. The project will include excavation of a basin together with inlet/outlet facilities and an emergency spillway.
- 2. Master Plan Drainage Facility A-04, Escondido Basin – the 330 ac-ft basin will attenuate flood waters – reducing peak flow rates nearly 80% - and accumulates sediments loads while conversing local storm water runoff. The project will include excavation of a basin together with inlet/outlet facilities and an emergency spillway.
- 3. Master Plan Drainage Facility H-01, Walnut Basin – the 37 ac-ft basin will attenuate flood waters and accumulates sediments loads while conversing local storm water runoff. The project will include excavation of a basin together with inlet/outlet facilities and an emergency spillway connecting to already improved downstream storm drain system.
- 4. Master Plan Drainage Facility C-01, Temecula Basin – the 39 ac-ft. multiple basin project will attenuate flood waters and accumulates sediments loads while conversing local storm water runoff. The project will include excavation of a basin together with inlet/outlet facilities and an emergency overflow facility connecting to already improved downstream storm drain system.

6.3.5 Climate Change

Goal: Develop, promote and implement policies and measures to reduce air pollution and limit Greenhouse Gas Emissions.

Objectives: Meet greenhouse gas (GHG) reductions targets set forth by the Clean Air Act.

- A. Coordinate with the Regional Councils of Government in developing appropriate regional climate action policies.
- B. In conjunction with regional councils of government, prepare and implement a city climate action plan.
- C. Coordinate with neighboring cities and public jurisdictions in the preservation of air quality resources.



- D. Promote the utilization of alternative energy resources such as wind and solar in new development.
- E. Promote the utilization of environmentally sensitive construction materials to limit impacts on the ozone, global climate change and mineral resources.
- F. Preserve land resources for the utilization of energy resources, including wind and solar energy resources.
- G. Promote energy conservation through site layout, building design, natural light and efficient mechanical and electrical products in development.
- H. Continue the existing recycling program and utilization of the material recovery facility program while exploring additional methods of reducing waste.
- I. Promote sustainable principles in development that conserves such natural resources as air quality and energy resources.
- J. Implement measures to reduce fugitive dust from unpaved areas, parking lots, and construction sites.
- K. Implement measures to reduce exhaust emissions from construction equipment.
- L. Work with the Mojave Desert Air Quality Management District, San Bernardino Association of Governments, San Bernardino County and neighboring jurisdictions to implement the federal ozone and PM10 non-attainment plans and meet federal state air quality standards and reduce overall emissions from mobile and stationary sources.
- M. Limit new sensitive receptor land uses in proximity to significant sources of air pollution.
- N. Minimize exposure of sensitive receptor land uses and sites to health risks related to air pollution.
- O. Review discretionary land use applications for residential uses for potential objectionable odor impacts in proximity to potential significant sources of odors.

6.3.6 Considering Mitigation Alternatives

The HMP Planning Committee participated in the development and review of mitigation actions with a wide range of alternatives. To narrow mitigation alternatives for inclusion, FEMA's six broad categories of mitigation alternatives were used. Each FEMA category is described below. The HMP Planning Committee developed several mitigation alternatives for implementation under each mitigation category.

Prevention (PRV):

Preventative activities are intended to keep hazard problems from getting worse, and are typically administered through government programs or regulatory actions that influence the way land is developed and buildings are built. They are particularly effective in reducing a community's future vulnerability, especially in areas where development has not occurred or capital improvements have not been substantial. Examples of preventative activities include:

- Planning and zoning ordinances
- Building codes
- Open space preservation
- Floodplain regulations
- Stormwater management regulations
- Drainage system maintenance
- Capital improvements programming
- Riverine/fault zone setbacks

PRV Alternatives:

Evaluate the City's regulations that manage flood risk and consider additional standards to help prevent flood problems from increasing. These include:



- Changes in zoning ordinance to designate special land uses for flood-prone areas
- Enhanced subdivision regulations
- Enhanced stormwater regulations to reduce stormwater runoff, especially for new development
- Other additional higher standards in the flood management code

Consider additional policies and regulations to enhance the preservation of open space in flood-prone and wild land fire high risk areas.

Property Protection (PPRO):

Property protection measures involve the modification of existing buildings and structures to help them better withstand the forces of a hazard, or removal of the structures from hazardous locations. Examples include:

- Building elevation
- Critical facilities protection
- Retrofitting (e.g., wind proofing, flood proofing, seismic design techniques, etc.)
- Insurance

PPRO Alternatives:

Establish a program to evaluate RL and flood-prone properties for implementation of property protection measures.

Consider promoting and supporting voluntary property protection measures through several activities, ranging from financial incentives to full funding.

Promote flood insurance for flood-prone properties with a focus on the SFHA and properties with historical flooding areas.

Evaluate publically owned facilities and critical facilities for property protection measures, including flood insurance.

Public Education and Awareness (PE&A):

Public education and awareness activities are used to advise residents, elected officials, business owners, potential property buyers, and visitors about hazards, hazardous areas, and mitigation techniques they can use to protect themselves and their property. Examples of measures to educate and inform the public include:

- Outreach projects including neighborhood and community outreach
- Speaker series / demonstration events
- Hazard mapping
- Real estate disclosures
- Materials library
- School children educational programs
- Hazard expositions



PE&A Alternatives:

Enhance the City's Public Information Program to include both the public and private sectors. An education and outreach measure to ensure the community understands their role in protecting themselves in a disaster event.

- Safety precautions for all types of hazards, but especially floods, earthquakes, wildfires, and drought
- Knowing where emergency evacuation routes and shelters are located
- Family and emergency preparedness measures
- Mitigation measures for residents at the home

Enhance public outreach program to include all hazards. Appropriate ways to spread information are:

- Websites and social media
- Mailings to residents, in water bill
- Newsletter (Hesperia Horizon)
- Displays, particularly at special events
- Handouts, flyers and other materials, which can be distributed at special events and at presentations

Natural Resource Protection (NRP):

Natural resource protection activities reduce the impact of natural hazards by preserving or restoring natural areas and their protective functions. Such areas include floodplains, steep slopes, and open land. Parks, recreation, or conservation agencies and organizations often implement these protective measures. Examples include:

- Floodplain protection
- Watershed management
- Vegetation Management (e.g., fire resistant landscaping, fuel brakes, etc.)
- Erosion and sediment control
- Habitat preservation and restoration

NRP Alternatives:

Enhance public education and outreach efforts to inform the public about our community recycling programs, community clean-up day, and energy saving tips and upgrades.

Inform the public and local businesses how important it is to use drought tolerant landscaping.

Keep promoting water conservation policy's in effect to keep water usage low.

Emergency Services (ES):

Although not typically considered a "mitigation" technique, emergency service measures do minimize the impact of a hazard event on people and property. These commonly are actions taken immediately prior to, during, or in response to a hazard event. Examples include:

- Warning Systems



- Construction of evacuation routes
- Sandbag staging for flood protection
- Installing temporary shutters on buildings for wind protection

ES Alternatives:

- Maintain StormReady certification
- Provide alert and notification to residents through social media for flood risk
- Evacuate and shelter populations displaced due to flooding
- Training for City Staff

Structural Projects (SP):

Structural mitigation projects are intended to lessen the impact of a hazard by modifying the environmental natural progression of the hazard event through construction. They are usually designed by engineers and managed or maintained by public works staff. Examples include:

- Stormwater diversions / detention / retention infrastructure
- Utility upgrades
- Seismic Retrofits
- New construction standards

SP Alternatives

The City has previously constructed flood control and drainage facilities that move storm and flood waters more efficiently and reduced potential for flooding. The City should identify and prioritize additional projects in the City.

The City should continue to implement regional drainage improvement projects to reduce stormwater runoff and the potential for flooding along local drainages.

6.4 Mitigation Priorities

To guide the City of Hesperia in its Hazard Mitigation planning for the years 2017-2022, the City has established the following four goals. These goals are retained from the Safety Element of the Hesperia General Plan, and the 2012 Hesperia Hazard Mitigation Plan.

1. Minimize injury, loss of life, property damage and economic and social disruption caused by seismic shaking and other earthquakes-induced hazards, for example geological hazards such as slope instability, compressible and collapsible soils and subsidence.
2. Minimize injury, loss of life, property damage and economic and social disruption caused by flooding and inundation hazards.
3. Reduce the risk of death, injury, property damage and economic loss due to vegetation and structure fires.
4. Reduce the potential for hazardous materials contamination in the City.

6.4.1 Public Input for Mitigation Prioritization

Public input is an essential step in validating the prioritization of mitigation actions. Valuable information was gathered regarding the perception of hazard threats to residents through a community survey. A summary of the results can be found in Appendix B.



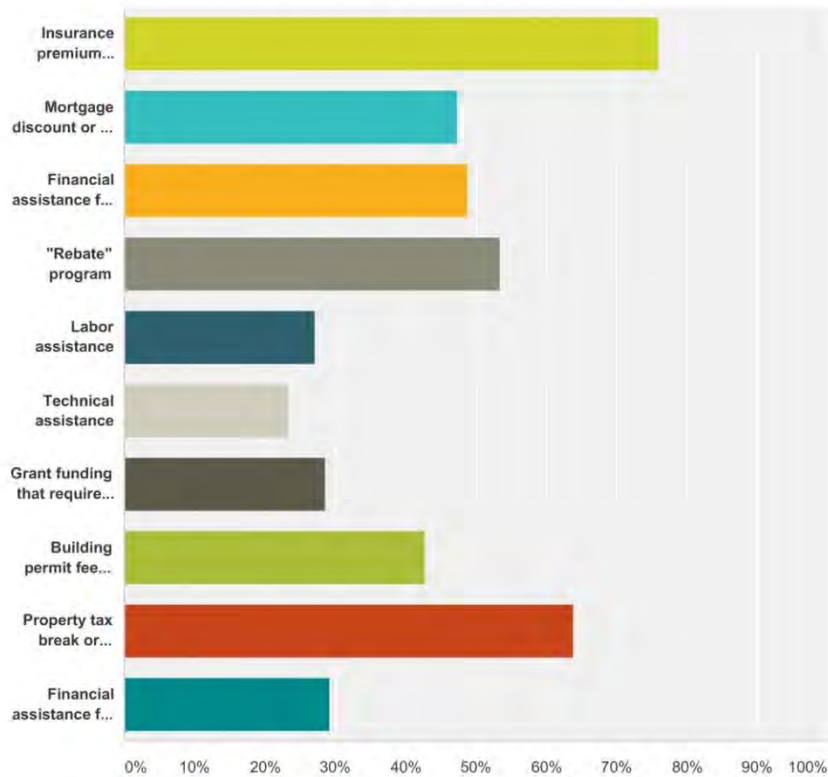
The community survey found that 55.64% of respondents had experienced wildfire within the past 20 years within the City of Hesperia, and 42.86% had experienced flooding. When asked which hazards would be very likely to cause damage to buildings or harm residents in the City, respondents believed earthquake, wildfire, and severe winds were the most likely to occur.

The survey also investigated the incentives needed to convince residents to perform mitigation actions around their homes. The majority of those surveyed (21.8%) said they weren't sure how much they'd be willing to spend at one time to protect their home or business from natural hazards, and the same 21.8% said they'd be willing to spend less than \$250. As seen in Figure below the top incentives that would encourage the survey participants to protect their home against natural hazards were insurance premium discounts, property tax breaks or incentives, and a "rebate" program. This community feedback was taken into consideration when prioritizing mitigation actions.



Q11 Which of the following incentives would encourage you to protect your home against natural hazards?

Answered: 133 Skipped: 0



Answer Choices	Responses
Insurance premium discount	75.94% 101
Mortgage discount or Low Interest Loan	47.37% 63
Financial assistance for property upgrades or equipment	48.87% 65
"Rebate" program	53.38% 71
Labor assistance	27.07% 36
Technical assistance	23.31% 31
Grant funding that requires "cost share"	28.57% 38
Building permit fee reduction or waiver	42.86% 57
Property tax break or incentive	63.91% 85
Financial assistance for equipment	29.32% 39
Total Respondents: 133	

Figure 6-1: Hazard Incentive Hesperia Survey Results; 2016



6.4.2 Prioritization Process

Multiple factors were considered to establish the mitigation priorities included in this plan. The Planning Team utilized the 2012 rankings 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.

The action plan must be prioritized according to a benefit/cost analysis of the proposed projects and their associated costs. The benefits of proposed projects were weighed against estimated costs as part of the project prioritization process. The benefit/cost analysis was not of the detailed variety required by FEMA for project grant eligibility under the Hazard Mitigation Grant Program (HMGP) and Pre-Disaster Mitigation (PDM) grant program. A less formal approach was used because some projects may not be implemented for up to 10 years, and associated costs and benefits could change dramatically in that time. Therefore, a review of the apparent benefits versus the apparent cost of each project was performed. Parameters were established for assigning subjective ratings (high, medium, and low) to the costs and benefits of these projects.

Based off the previous goals, objectives, and actions from the 2012 HMP, two mitigation actions were no longer relevant due to funding and property acquisition. These two actions were removed completely for the 2017 HMP. One all hazard mitigation action and one climate change mitigation action was added for the 2017 HMP, as these were not a priority for the previous HMP. All other mitigation actions from the previous HMP were considered to meet the primary criteria and either had not been completed or are ongoing actions, and as a result remained in the current HMP.

Cost ratings were defined as follows:

- High - Existing funding will not cover the cost of the project; implementation would require new revenue through an alternative source (for example, bonds, grants, and fee increases).
- Medium - The project could be implemented with existing funding but would require a re-apportionment of the budget or a budget amendment, or the cost of the project would have to be spread over multiple years.
- Low - The project could be funded under the existing budget. The project is part of or can be part of an ongoing existing program.

Benefit ratings were defined as follows:

- High - Project will provide an immediate reduction of risk exposure for life and property.
- Medium - Project will have a long-term impact on the reduction of risk exposure for life and property, or project will provide an immediate reduction in the risk exposure for property.
- Low - Long-term benefits of the project are difficult to quantify in the short term.

The Planning Team discussed alternative mitigation strategies during workshops, provided their preferences and 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.



After the list of potential actions had been developed the planning committee determined which potential mitigation actions should be included in the 2016 HMP. For this process, projects that met the Hazard Mitigation Assistance (HMA) program guidelines were selected as a priority because these projects have the greatest chance of leading to development and prevention of HMA funding delays.

6.4.3 Goal, Objective, and Mitigation Action Matrix

Based upon the risk assessment, the City's capabilities and public input, Table 6-2 shows primary objectives and corresponding mitigation actions selected for further implementation and development during the next planning cycle. Mitigation actions selected for table 6-4 are all considered priority projects by the HMP Planning Committee, which provides details for each mitigation action with mitigation action descriptions, FEMA mitigation category, responsible party, and timeframe. Implementation Action Plans for each action number highlighted in Table 6-2 are shown in further detail in Section 7 (Implementation).

Table 6-2: Goal, Objective, and Mitigation Action Prioritization Matrix; 2016

Hazard	RF Factor	Action No.	Action Description
Earthquake	3.1	EQ 1.1	Upgrade and improve essential facilities to withstand anticipated ground shaking within the city.
Earthquake	3.1	EQ 1.2	Improve public education programs and practices to residents for earthquake risk.
Earthquake	3.1	EQ 1.3	Improve earthquake risk evaluation for infrastructure and mobile homes.
Earthquake	3.1	EQ 1.4	Above ground water storage tank retrofitting.
Flooding	2.5	FL 1.1	Identify project candidates and sources of funding to improve drainage conveyance, and/or mitigate peak flow in local tributaries.
Flooding	2.5	FL 1.2	Provide alert and notification to residents for flood risk.
Flooding	2.5	FL 1.3	Extra Public Works staff after flooding to clear/repair roadways.
Wildfire	2.5	WF 1.1	Increase fuel management and fuel reduction in open space, creeks, around critical facilities, and urban / wildland areas.
Wildfire	2.5	WF 1.2	Maintain and improve fire protection facilities for all development.
Wildfire	2.5	WF 1.3	Improve and enforce weed abatement policies throughout city.
Climate Change	1.9	CC 1.1	Continue working with the Mojave Desert Air Quality Management to meet GHG reductions targets.

Table 6-3: Hazard Prioritization / Risk Factor Worksheet Results; 2016

Natural Hazards	Probability (1-4)	Impact (1-4)	Spatial Extent (1-4)	Warning Time (1-4)	Duration (1-4)	RF Factor Total = (Add Factors 1-5)
Earthquake	3	3	4	4	1	3.1
Wildfire	3	2	2	3	3	2.5
Flood	3	2	3	2	2	2.5
Climate Change	1	1	4	1	4	1.9

Table 6-4: 2017 – 2022 Prioritized Mitigation Strategy

Action No.	Mitigation Action	Description	Lead Dept.	Cost/ Benefit	Timeline	Potential Funding Source
AH 1.1	<i>Upgrade the City's Emergency Communication Network.</i>	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. This system has been pre-programmed to allow the City to carry critical information for the safety of the public and has the capability to notify specific target groups quickly.	City Mgrs. Office	Med.	1 year	Federal Grants/Staff time
EQ 1.1	<i>Upgrade and improve essential facilities to withstand anticipated ground shaking within the city.</i>	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 shaking	Development Services	Low	1-5 years	Block Grants
EQ 1.2	<i>Improve public education programs and practices to residents for earthquake risk.</i>	Provide CERT training to the community to educate residents about disaster preparedness and train them in basic response skills, such as fire safety, light search and rescue, and disaster medical operations.	City Mgrs. Office	High	2 years	Federal Grants/Staff time
EQ 1.3	<i>Improve earthquake risk evaluation for infrastructure and mobile homes</i>	Develop and sponsor projects and programs to brace new or relocated mobile homes to resist earthquakes.	Development Services	Low	2 years	Block Grants/Staff time
EQ 1.4	<i>Above ground water storage tank retrofitting</i>	Evaluate above ground water storage tanks to assess their potential inundation hazard in the event of catastrophic failure and those not seismically retrofitted will be fitted with shut-off valves, flexible fittings and/or other seismic safeguards as appropriate in accordance with the most recent water tank design guidelines.	Public Works & Hesperia Water District	High	2-5 years	General Fund/Staff time
FL 1.1	<i>Identify project candidates and sources of funding to improve drainage conveyance, and/or mitigate peak flow in local tributaries.</i>	Another regional flood management is major construction of master plan storm facilities including construction of attenuation basins. The City has commenced planning and design for 4 projects: Bandicoot Basin, Escondido Basin, Temecula Basin, and Walnut Basin. The projects are identified in the City's Drainage Master Plan as H-01, A-04, and C-01 projects.	Development Services	Low	5-10 years	Federal Grants
FL 1.2	<i>Provide alert and notification to residents for flood risk</i>	Continue to meet the requirements of the San Diego NWS in order to be recognized as a StormReady City.	PIO & Fire Dept.	High	1 year	General Fund/Staff time
WF 1.1	<i>Increase fuel management and fuel reduction in open space, creeks, around critical facilities, and urban / wildland areas.</i>	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 <i>fuel reduction in open space, creeks, around critical facilities, and urban / wildland areas.</i>	Fire Dept.	High	2 years	Staff time/Municipal Bonds

WF 1.2	<i>Maintain and improve fire protection facilities for all development</i>	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.	Fire Dept.	Low	3-5 years	Federal Grants
WF 1.3	<i>Improve and enforce weed abatement policies throughout the city.</i>	Develop and sponsor an enhanced public education program based on targeted needs that encourages the public to take responsibility for wildfire protection.	Code Enforcement	Low	1 year	Staff time
CC 1.1	Continue working with the Mojave Desert AQM to meet GHG reductions targets.	The City of Hesperia Climate Action Plan addresses the environmental effects of climate change and greenhouse gas reduction in the City	Hesperia	Med.	5-10 years	Municipal Bonds



Section 7. Plan Maintenance

7.1 Monitoring, Evaluating and Updating the HMP

As a living document it is important that this plan becomes a tool in Hesperia's resources to ensure reductions in possible damage from a natural hazard event. This section discusses plan adoption, implementation, monitoring, evaluating, and updating the HMP. Plan implementation and maintenance procedures will ensure that the HMP remains relevant and continues to address the changing environment in the City. This section describes the incorporation of the HMP into existing City planning mechanisms, and how the city staff will continue to engage the public.

7.1.1 Plan Adoption

To comply with DMA 2000, the City Council has officially adopted the 2017 City of Hesperia HMP. The adoption of the 2017 HMP recognizes the City's commitment to reducing the impacts of natural hazards within the city limits. A copy of the 2017 HMP adoption resolution is included in Appendix A.

7.1.2 Implementation

Over time, Implementation Strategies will become more detailed and the City's mitigation planners will work to provide more detail for priority mitigation actions. In conjunction with the progress report processes outlined in Section 7.1.5 implementation strategy worksheets provided in Appendix C will be extremely useful as a plan of record tool for updates. Each implementation strategy worksheet provides individual steps and resources needed to complete each mitigation action. The following provides several options to consider when developing implementation strategies in the future:

- Use processes that already exist; initial strategy is to take advantage of tools and procedures identified in the capability assessment in Section 5.3. By using planning mechanisms already in use and familiar to City departments and organizations, it will give the planning implementation phase a strong initial boost, especially if a mitigation strategy calls for expanding existing programs, or creating new programs or processes at a later date.
- Updated work plans, policies, or procedures; hazard mitigation concepts and activities can help integrate the 2017 HMP into daily operations. These changes can include how major development projects and subdivision reviews are addressed in hazard prone areas or ensure that hazard mitigation concerns are considered in the approval of major capital improvement projects.
- Job descriptions; working with department or agency heads to revise job descriptions of government staff to include mitigation-related duties could further institutionalize hazard mitigation. This change would not necessarily result in great financial expenditures or programmatic changes.

7.1.3 Future Participation

The City of Hesperia HMP Planning Committee, established for this update, will become a permanent advisory body to administer and coordinate the implementation and maintenance of the 2017 HMP. The City Manager's Department will lead the 2017 HMP plan development and updates and all associated HMP maintenance requirements. On an annual basis, the HMP Planning Committee will report to the Hesperia City Council and the public on the status of plan implementation and mitigation opportunities in the City. Other duties include reviewing and promoting mitigation opportunities, informing and soliciting input from the public and developing grant applications for hazard mitigation assistance.



7.1.4 Schedule

Monitoring the progress of the mitigation actions will be on-going throughout the five-year period between the adoption of the 2017 LHMP and the next update effort. The HMP Planning Committee will meet on an annual basis to monitor the status of the implementation of mitigation actions and develop updates as necessary.

The HMP Planning Committee should meet two months prior to the City budget process to prepare an evaluation report on the success and failures of the 2017 LHMP and provide formal budget request for approval by the City at a later date.

The HMP will be updated every five years, as required by DMA 2000. The formal update process will begin at least one year prior to the expiration of the 2017 HMP. However, should a significant disaster occur within the City, the HMP Planning Committee will reconvene within 30 days of the disaster to review and update the HMP as appropriate. The City Council will adopt written updates to the HMP as a DMA 2000 requirement.

7.1.5 Process

The HMP Planning Committee will coordinate with responsible agencies/organizations identified for each mitigation action. These responsible agencies/organizations will monitor and evaluate the progress made on the implementation of mitigation actions and report to the HMP Planning Committee on an annual basis. Working with the HMP Planning Committee, these responsible agencies/organizations will be asked to assess the effectiveness of the mitigation actions and modify the mitigation actions as appropriate. A HMP Mitigation Action Progress Report worksheet, provided in Appendix C was developed as part of this HMP to assist mitigation project managers in reporting on the status and assessing the effectiveness of the mitigation actions.

Information culled from the mitigation leads or "champions" will be used to monitor mitigation actions and annual evaluation of the HMP. The following questions will be considered as criteria for evaluating the effectiveness of the HMP:

- Has the nature or magnitude of hazards affecting the City changed?
- Are there new hazards that have the potential to impact the City?
- Do the identified goals and actions address current and expected conditions?
- Have mitigation actions been implemented or completed?
- Has the implementation of identified mitigation actions resulted in expected outcomes?
- Are current resources adequate to implement the HMP?
- Should additional local resources be committed to address identified hazards?

An Annual HMP Review Questionnaire worksheet, provided in Appendix C, has been developed as part of this HMP to provide guidance to the HMP Planning Committee on what should be included in the evaluation. Future updates to the HMP will account for any new hazard vulnerabilities, special circumstances, or new information that becomes available. Issues that arise during monitoring and evaluating the HMP, which require changes to the risk assessment, mitigation strategy and other components of the HMP, will be incorporated into the next update of the 2017 LHMP in 2022. The questions identified above would remain valid during the preparation of the 2022 update.



7.2 Incorporation into Existing Planning Mechanisms

An important implementation mechanism is to incorporate the recommendation and underlying principles of the HMP into community planning and development such as capital improvement budgeting, building and zoning codes, general plans and regional plans. Mitigation is most successful when it is incorporated within the day-to-day functions and priorities of the jurisdiction attempting to implement risk reducing actions. The City of Hesperia has not yet had an opportunity to integrate the 2012 HMP into planning documents, planning policies, or code updates. The City's General Plan was updated in 2010 and will not be updated again until 2030. The City's Emergency Operations Plan was updated in 2012, and the Climate Action plan has not been updated since July 2010.

The integration of a variety of City departments on the HMP Planning Committee provides an opportunity for constant and pervasive efforts to network, identify, and highlight mitigation activities and opportunities at all levels of government. This collaborative effort is also important to monitor funding opportunities which can be leveraged to implement the mitigation actions. HMP mitigation planners will actively incorporate information from the 2017 HMP into the following planning documents, codes and ordinances:

- **City of Hesperia General Plan:** The 2017 HMP will provide information that can be incorporated into the Land Use, Open Space, Conservation, and Safety Elements during the next general plan update. Specific risk and vulnerability information from the City of Hesperia HMP will assist to identify areas where development may be at risk to potential hazards.
- **City Building / Development Codes and Zoning Ordinances:** The 2017 HMP will provide information to enable the City to make decisions on appropriate building/development codes and ordinances. Appropriate building codes and ordinances can increase the City's resilience against natural disasters.
- **Hesperia Water District Urban Water Management Plan (UWMP):** The 2017 HMP highlights areas of concern regarding climate change and the added pressure it will place on the City's water supply. Suitable mitigation actions from the HMP can be included in the UWMP.

7.3 Continued Public Involvement

During the five-year update cycle (2017-2022), City staff will involve the public using public workshops and meetings. Information on upcoming public events related to the HMP or solicitation for comments will be announced via Facebook, Twitter, and on the City website (<http://www.cityofhesperia.us/1310/How-can-I-get-involved>). An electronic copy of the current HMP document will be accessible through the City website, with a hard copy available for review at the City of Hesperia City Clerk's Office. The HMP Planning Committee will, as much as practicable, incorporate the following concepts into its public outreach strategy to ensure continued public involvement in the HMP planning process:

- Collaborate with San Bernardino County on hazard mitigation efforts;
- Create story ideas for media outlets, such as Facebook, Twitter, and the Hesperia Horizon Newsletter;
- Distribute emails and postcards/mailers to City residents about hazard mitigation updates;
- Post meeting announcements on the City's website, social media accounts, and community calendar;
- Educate and collaborate with insurance companies;
- Continue using public notification/training programs such as: CERT, the Great Shakeout, Emergency Communications Network – CodeRED, and remain a StormReady community;
- Piggy back on other existing local community meetings, i.e., Town of Apple Valley, City of Victorville, etc.;
- Continue to use the City website as a distribution point of hazard mitigation information.



7.4 2017 HMP Mitigation Action Implementation Plans

Mitigation Action Implementation Plan	
Action: FL 1.1	
Implementing Agencies	
Lead Agency (ies):	City of Hesperia
Roles and Responsibilities:	Project delivery and ongoing operation and Maintenance
Support Agency (ies):	San Bernardino County Flood Control
Roles and Responsibilities:	None
Preliminary Identified Tasks:	
1. Planning, design, and regulatory permitting	
2. Construction	
3. Operation and Maintenance	
Implementation Costs	
Estimated Capital Costs:	\$28 million
Estimated Maintenance Costs:	\$35,000
Implementation Resources	
Financial Resources (Funding):	Grants, drainage DIF and General Fund
Technical Assistance Resources:	City Engineering / Public Works
Required Equipment, Vehicles, and Supplies	
Office Supplies	N/A
Vehicles	Public Works equipment
Implementation Timeframe	
Estimated Mitigation Action Start Date:	1/1/17
Estimated Mitigation Action Completion Date:	1/1/22



Appendix A City Adoption Resolution

City Resolution to be inserted here....



City Resolution to be inserted here....



Appendix B Planning Process Documentation

B.1 Planning Committee Meetings Documentation

B.2 Public Stakeholder Meeting Documentation

B.3 Survey

B.4 Website



B.1 Planning Committee Meetings Documentation

Meeting Agenda:

Hazard Mitigation Plan (HMP) 2016-2017 Update
Internal Project Management Kick-Off Meeting
Thursday, August 2, 2016, 10:00 a.m. – 11:30 p.m.
City of Hesperia, City Hall

- **Welcome and Introductions**
 - Team Roster, Org Chart and POCs
 - Project Reporting
- **Project Overview / Scope and Milestones**
 - Mitigation Defined
 - Planning Process
 - SOW / Major Project Components
 - Objectives
- **Project Timeline / Schedule**
 - Meeting Tempo
- **Outreach Strategy**
 - Planning Committee
 - Outreach Planning
 - Website
- **Risk Assessment Prep**
 - Data Acquisition
- **Next Steps**
- **Wrap Up**



Sign-in:

Hazard Mitigation Plan (HMP) 2016-2017 Update
Internal Project Management Kick-Off Meeting
Thursday, August 2, 2016, 10:00 a.m. – 11:30 p.m.
City of Hesperia, City Hall

Sign- In

Internal Project Kick-Off Meeting – August 2, 2016 – 10:00am – 11:30am

City of Hesperia – 2017 Hazard Mitigation Plan Update
Hesperia City Hall – 9700 Seventh Avenue, Hesperia, CA 92345



Name	Title	Email
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City of Hesperia 2017 Hazard Mitigation Plan



City of Hesperia
Internal Kick-off meeting
August 2, 2016

Agenda



- Welcome and introductions
- Mitigation Planning Defined
- Background
- Local Hazard Mitigation Planning Process
- Overall Objectives
- Project Schedule
- Today's Accomplishments
- Next Steps



Hazard Mitigation Defined

- What is Hazard Mitigation?
 - Hazard Mitigation is sustained action taken to reduce or eliminate long-term risk to life and property resulting from natural hazards.
- What is a Hazard Mitigation Plan?
 - Recognition of potential hazards and actions to curb possible effects.
 - Includes Hazard Identification and Risk Assessment (HIRA)
 - Solidifies Mitigation Strategy
 - Provides Planning Process documentation for State and Feds
- Why Have a Mitigation Plan?
 - Results in saved lives, reduces injuries, reduced property damages, and protection for the environment
 - Ensures staff and public consensus toward common goal
 - Focuses efforts and limited resources
 - Must have "approved plan" for Hazard Mitigation Program Grant access.
 - Augment local capital improvement funding
 - California is disaster prone



Background

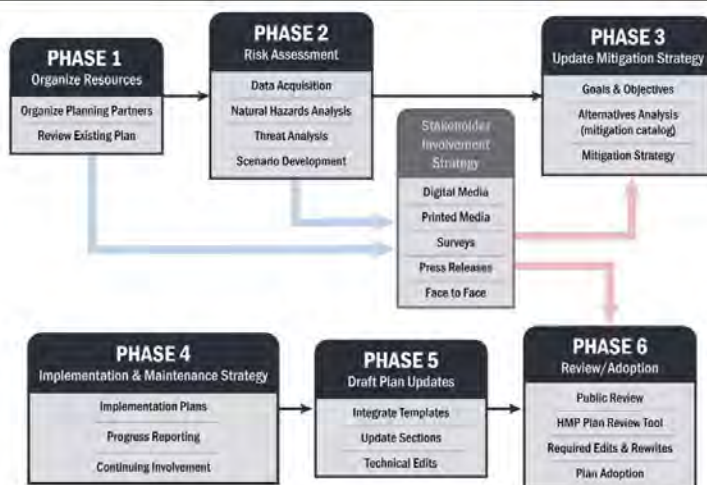


- Disaster Mitigation Act (DMA) 2000 (Public Law 106-390) provides the legal basis for FEMA mitigation Planning requirements for State, local and Indian Tribal governments as a condition of mitigation grant assistance.
- FEMA requires an update every 5 years
- City of Hesperia's third mitigation plan, second update
- Current planning effort backed by Hazard Mitigation Grant Program (HMGP), through the California Governor's Office of Emergency Services (OES)

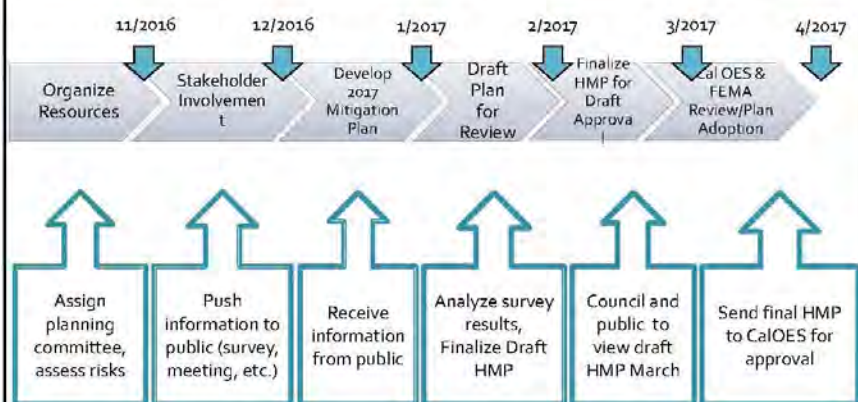




HMP Planning Process - 6 Phases



Schedule





Planning Process



- Task 1: Project Management
 - Maintain a critical path method schedule
 - Monthly progress reports & meeting documentation
- Task 2: Planning, Resource Assessment & Outreach
 - Stakeholder organization & meeting facilitation
 - Develop & implement public outreach strategy
 - Present at two planning commission meetings
- Task 3: Community Capabilities & Risk Assessment
 - Resource & Infrastructure inventory
 - NFIP program review
 - Develop hazard profiles
 - Repetitive loss structure review
 - Hazus level 2 risk assessment
 - City parcel based exposure
 - Population exposure analysis
 - Data visualization and mapping

Planning Process Cont.



- Task 4: Develop Mitigation Actions & Strategy
 - Mitigation goals and policy review
 - Develop overall implementation strategy
 - Develop mitigation implementation plans
- Task 5: Prepare Draft Hazard Mitigation Plan
 - Develop administrative draft / planning process documentation
 - Socialize and circulate plan to public
 - Finalize and submit update plan to Cal OES and FEMA
 - Plan adoption support



Goals / Primary Objectives



- **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.

Today's Accomplishments



- Establish HMP Planning Committee
- Discuss current and past mitigation plan documents/projects
- Gather intel on critical documents / studies / data required for HMP development
- Begin brainstorming City-specific enhancements for public outreach strategy
- Confirm date and location for Stakeholder meeting
- Establish City Council / Planning Commission meetings to present periodic HMP updates and material.
- Set date for Planning Committee Meeting #1



Next Steps



- Outreach
 - Prepare mail list for proposed planning committee members
 - Prepare planning committee meeting location
 - Create Mitigation Plan webpages
 - Develop outreach printed material
- Risk Assessment
 - Develop information on local hazards based upon passed profiles and County of San Bernardino HMP
 - Develop building / parcel inventory
 - Develop critical infrastructure inventory & linear points
 - Define repetitive loss areas

Questions?

Rachel Molina
Assistant to the City Manager
rmolina@cityofhesperia.us



Meeting Minutes:

Hazard Mitigation Plan 2016-17 Update

Internal Project Team Kick-Off Meeting

Thursday August 2, 2016 10:00am – 11:30pm

City of Hesperia, City Hall

Present:

Rachel Molina

Matt Caughey

Dave Reno

April Antonio

Project Summary:

The Hazard Mitigation Plan (HMP) addresses the major natural hazards within the boundaries of the City of Hesperia. Natural disasters cause death and injuries and significant damage to our communities, businesses, public infrastructure, and environment. Impacts of these damages result in the displacement of people and tremendous costs due to response and recovery dollars, economic loss and burden. The City of Hesperia HMP is an effort undertaken by the City Staff to mitigate the effects of natural hazards and return to "the norm" earlier with lessened impacts.

Hazard mitigation planning is the process through which hazards are identified, likely impacts determined, mitigation goals set, and appropriate mitigation strategies determined, prioritized, and implemented. While natural disasters cannot be prevented from occurring, the effects of natural disasters can be reduced or eliminated through a well-organized public education and awareness effort, preparedness activities and mitigation actions.

Meeting Summary:

This meeting was the formal kick-off with City Staff to develop the 2017 HMP for the City of Hesperia. The meeting was convened to inform key City Staff of Planning process and organize resources for future plan development activities. It was facilitated by Rachel Molina and April Antonio, City of Hesperia City Managers Office. Mrs. Molina opened the meeting and introduced the background and history of the project to date. Participants introduced themselves and their agency/position. Mrs. Molina led discussions on definitions of hazard mitigation, the HMP process and components, and project timelines. Mrs. Molina discussed planning resources and the public outreach process and HMP advertisement opportunities with City Staff.

The group discusses likely Planning Committee make-up:



- City Public Works Manager
- San Bernardino County Fire Department Captain for Hesperia
- City Water Department Supervisor
- Local Cal OES representative

The group discussed likely Stakeholders:

- City of Hesperia CERT members
- City of Hesperia Citizens Academy members
- Advance Disposal – City Trash service provider
- Edison Electric – City Electric provider
- Southwest Gas – City Natural provider
- VVTA – City Public Transportation provider
- Hesperia Unified School District
- Residents who live within the City limits
- Hesperia Business owners
- City of Hesperia Chamber of Commerce

The Planning Committee will be the core group leading the HMP effort and will meet at least via conference call regularly (exact recurrence not decided upon). The Stakeholder group will be critical to the success of the process and quality of the HMP. This group will be convened to provide input at major milestones through workshops, and will be given drafts for review and comment.

Action Items:

- Develop / Finalize Outreach Information for Planning Committee Invite
- Finalize Planning Committee List
- Obtain new County Assessor's Data
- Coordinate development of Website for Project information and events
- Develop printed media for outreach efforts (Poster / Flyers)
- Coordinate material updates for next meeting



Meeting Agenda:

Hazard Mitigation Plan (HMP) 2016-2017 Update

Planning Committee Meeting #1

Tuesday, August 18, 2016, 10:00 a.m. – 1:00 p.m.

City of Hesperia, City Hall

- **Part I**

- Welcome and Introductions
- Mitigation Planning Defined
- Background
- Local Hazard Mitigation Planning Process
- Overall Objectives
- Project Schedule

- **Part II**

- Hazard Identification and Risk Assessment (HIRA) process
- Local Hazard Initial Review
- Critical Infrastructure / Essential Facility Review
- Hazus Earthquake Scenario Development
- Next Steps
- Wrap UP



Sign-in:

Hazard Mitigation Plan (HMP) 2016-2017 Update

Planning Committee Meeting #1

Thursday, August 18, 2016, 10:00 a.m. – 1:00 p.m.

City of Hesperia, City Hall

Sign- In

Planning Committee Meeting #1 – August 18, 2017 (10:00am-1:00pm)

City of Hesperia – 2017 Hazard Mitigation Plan Update
Hesperia City Hall – 9700 Seventh Avenue, Hesperia, CA 92345



Name	Title	Email
April Antonio	Administrative Aide	aantonio@cityofhesperia.us
Matt Caughey	Engineering Tech.	mcaughey@cityofhesperia.us
Rene Rino	Prinncipal Planner	DRRINO@CITYOFHESPERIA.US
Rachel Molina	Assistant to the City Manager	Rmolina@cityofhesperia.us



City of Hesperia 2017 Hazard Mitigation Plan



City of Hesperia – Meeting #1
Planning Committee
August 18, 2016

Agenda



- Part 1
 - Welcome and introductions
 - Mitigation Planning Defined
 - Background
 - Local Hazard Mitigation Planning Process
 - Overall Objectives
 - Project Schedule
- Part 2
 - Hazard Identification and Risk Assessment
 - Local Hazard Initial Review
 - Critical infrastructure / essential facility review
 - Next Steps



Part 1



- Welcome and introductions
- Mitigation Planning Defined
- Background
- Local Hazard Mitigation Planning Process
- Overall Objectives
- Project Schedule

Hazard Mitigation Defined

- What is Hazard Mitigation?
 - Hazard Mitigation is sustained action taken to reduce or eliminate long-term risk to life and property resulting from natural hazards.
- What is a Hazard Mitigation Plan?
 - Recognition of potential hazards and actions to curb possible effects.
 - Includes Hazard Identification and Risk Assessment (HIRA)
 - Solidifies Mitigation Strategy
 - Provides Planning Process documentation for State and Feds
- Why Have a Mitigation Plan?
 - Results in saved lives, reduces injuries, reduced property damages, and protection for the environment
 - Ensures staff and public consensus toward common goal
 - Focuses efforts and limited resources
 - Must have "approved plan" for Hazard Mitigation Program Grant access.
 - Augment local capital improvement funding
 - California is disaster prone





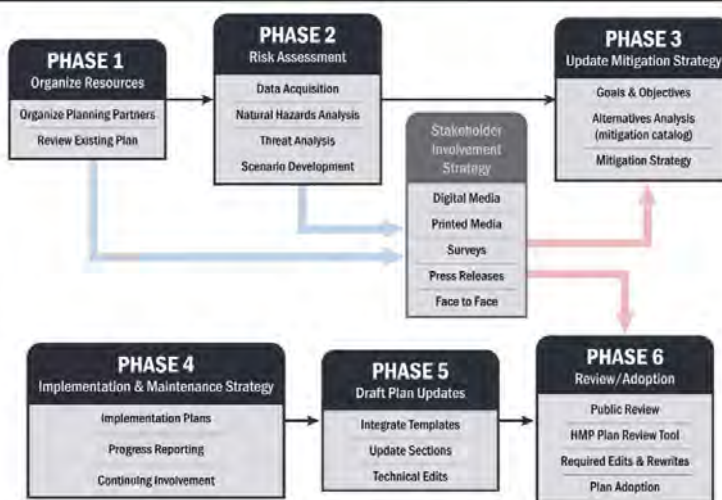
Background



- Disaster Mitigation Act (DMA) 2000 (Public Law 106-390) provides the legal basis for FEMA mitigation Planning requirements for State, local and Indian Tribal governments as a condition of mitigation grant assistance.
- FEMA requires an update every 5 years
- City of Hesperia's third mitigation plan, second update
- Current planning effort backed by Hazard Mitigation Grant Program (HMGP), through the California Governor's Office of Emergency Services (OES)



HMP Planning Process - 6 Phases





Schedule



Planning Process

- Task 1: Project Management
 - Maintain a critical path method schedule
 - Monthly progress reports & meeting documentation
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 - City parcel based exposure
 - Population exposure analysis
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Planning Process Cont.



- Task 4: Develop Mitigation Actions & Strategy
 - Mitigation goals and policy review
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- Task 5: Prepare Draft Hazard Mitigation Plan
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Goals / Primary Objectives



- **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.
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- **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.



Planning Committee Meetings



- 2-3 hours in length
- Facilitated and structured
- Information from meetings used to customize plan
- This is a required component in the update/planning process

Planning Committee Meeting #1	Welcome & introductions Project overview HMP process & components Project timeline Questions & answers Resources Public outreach strategy Next steps
Planning Committee Meeting #2	Hazard overview & draft risk assessment outcomes Community asset inventory review Review of vulnerability assessment Group analysis, risk factor development
Planning Committee Meeting #3	Identify draft problem statements Goals and objectives exercise (intro) Finalize goals & objectives Develop capabilities
Planning Committee Meeting #4	Review and prioritize draft mitigation plan Develop implementation plans Address any notated changes Outline plan to finalize document for final draft

Next Steps



- Outreach
 - Prep for open house
 - Prepare for Planning Committee Meeting #2
 - Finalize and post content on webpages
 - Finalize outreach material
 - Finalize questions for online survey and make live
- Risk Assessment
 - Finalize information on local hazards
 - Develop building / parcel inventory



Today's Accomplishments



- Discuss current and past mitigation plan documents/projects
- Gather intel on critical documents / studies / data required for HMP development
- Begin brainstorming City-specific enhancements for public outreach strategy
- Confirm date and location for Stakeholder meeting
- Establish City Council / Planning Commission meetings to present periodic HMP updates and material.
- Set date for Planning Committee Meeting #2

Questions?

Rachel Molina
Assistant to the City Manager
rmolina@cityofhesperia.us



Meeting Minutes:

Hazard Mitigation Plan 2016-17 Update

Planning Committee Meeting #1

Thursday August 18, 2016 10:00am – 1:00pm

City of Hesperia, City Hall

Present:

Rachel Molina

Matt Caughey

Dave Reno

April Antonio

Project Summary:

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The group discussed likely Stakeholders:

- City of Hesperia CERT members
- City of Hesperia Citizens Academy members
- Advance Disposal – City Trash service provider
- Edison Electric – City Electric provider
- Southwest Gas – City Natural provider
- VVTA – City Public Transportation provider
- Hesperia Unified School District
- Residents who live within the City limits
- Hesperia Business owners
- City of Hesperia Chamber of Commerce

The Planning Committee will be the core group leading the HMP effort and will meet at least via conference call regularly (exact recurrence not decided upon). The Stakeholder group will be critical to the success of the process and quality of the HMP. This group will be convened to provide input at major milestones through workshops, and will be given drafts for review and comment.

Action Items:

- Organize and schedule Planning Committee meeting #2
- Coordinate development of Website for Project information and events
- Develop printed media for outreach efforts (Poster / Flyers)
- Coordinate material updates for next meeting



Meeting Agenda:

Hazard Mitigation Plan (HMP) 2016-2017 Update

Planning Committee Meeting #2

Tuesday, October 11, 2016, 2:00 p.m. – 5:00 p.m.

City of Hesperia, City Hall

- **Part I**

- Hazard Matrix review
- Hazard overview
- Draft Risk Assessment Outcomes
- Community Asset Inventory Review
- Review of Vulnerability assessment

- **Part II**

- Risk Factor Development
- Problem Statements Exercise

**Sign-in:**

Hazard Mitigation Plan (HMP) 2016-2017 Update

Planning Committee Meeting #2

Thursday, October 11, 2016, 2:00 p.m. – 5:00 p.m.

City of Hesperia, City Hall

Sign- In**Planning Committee Meeting #2 – October 11, 2016 (2:00pm-5:00pm)**

City of Hesperia – 2017 Hazard Mitigation Plan Update
 Hesperia City Hall – 9700 Seventh Avenue, Hesperia, CA 92345

Name	Title	Email
Rachel Molina	Assistant to the City Manager	Rmolina@cityofhesperia.us
Math Caughey	Engineering Tech.	mcaughey@cityofhesperia.us
MARK FAHERTY	PUBLIC WORKS MANAGER	mfaherty@cityofhesperia.us
April Antonio	Administrative Analyst	aantonio@cityofhesperia.us
JEREMY MARTINEZ	ADMIN. SERGEANT	JMARTINEZ@SBCSD.ORG
MICHAEL THORNTON	CONTRACT CIVIL ENGINEER	mthornton@cityofhesperia.us
DR. P. RENO	PRINCIPAL PLANNING	DRPENO@CITYOFHESPERIA.US



City of Hesperia 2017 Hazard Mitigation Plan



City of Hesperia – Meeting #2
Planning Committee
October 11, 2016

Agenda



- Part 1
 - Hazard Matrix review
 - Hazard overview
 - Draft Risk Assessment Outcomes
 - Community Asset Inventory Review
 - Review of Vulnerability assessment
- Part 2
 - Risk Factor Development
 - Problem Statements Exercise



Part 1



- Hazard overview
- Draft Risk Assessment Outcomes
- Community Asset Inventory Review
- Review of Vulnerability assessment

2012 Hazard Matrix



2012 HAZARD ASSESSMENT MATRIX				
Probability	Impact			
	High	Medium	Low	
	Wildfire Earthquake/ Geologic Hazards	Severe Thunderstorms Hazardous Materials	Extreme Heat Drought	
	Flash Flooding	Winter Storm High Winds	Infestation Dam Failure	
	Low	Lightning	Terrorism	



2017 Hazard Matrix



2017 HAZARD ASSESSMENT MATRIX				
Probability		Impact		
		High	Medium	Low
	High	Earthquake/Geo hazards Flooding Wildfire	High Winds	Extreme Heat Drought
	Medium		Severe Thunderstorms Hazardous Materials	
	Low	Dam Failure		Climate Change Infestation Terrorism Lightning

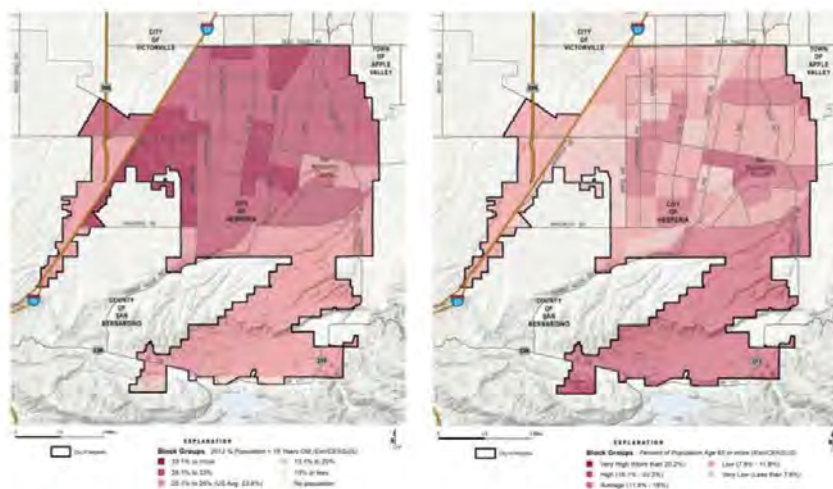
Vulnerable Populations



- Census Bureau Estimated Data (2015):
- Population: 92,755
- 33.8% of the population is under 18 years of age or younger
- 10% of the population is 65 years of age or older
- 27,411 total households
- 25.2% households are living in poverty in 2015



Population Block Groups



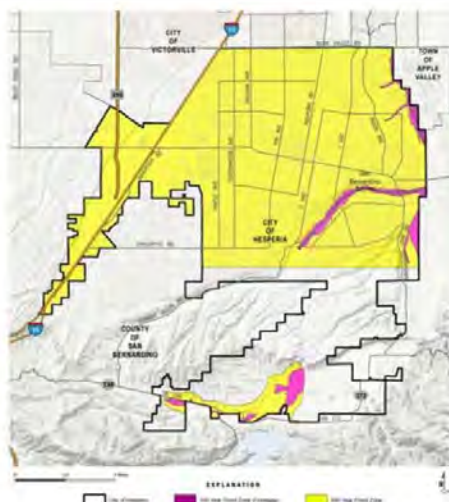
Income and Housing Data



- 2015 U.S. Census Income Data:
- Housing units: 28,919
- Average persons per household: 3.2
- Median income for a household in the City: \$ 46,331
- Estimate median home value: \$216,000
- Home Ownership rate: 66%



Flood Hazard Map



Flood Exposure Analysis



Table 4-x: Parcels Exposed to NFIP Flood Zones

Flood Hazard Zone	Improved Parcel Count	Improvement Value Exposure (\$000)	Land Value Exposure (\$000)	Total Exposure (\$000)
100-Year Flood	312	\$39,012	\$9,168	\$48,180
500-Year Flood	24,492	\$4,160,902	\$1,107,805	\$5,268,707
Grand Total	24,804	\$4,199,914	\$1,116,973	\$5,316,887

Table 4-x: Flood Loss Estimation (Based on Depth) in NFIP Flood Zones by Occupancy Type

Building Type	Building Replacement Costs (\$000)	Building Replacement Cost (% of Total Value)	Content Replacement Cost (\$000)	Content Replacement Cost (% of Total Value)	Total Estimated Loss (\$000)	Total Loss Estimation (% of Total Value)
Agricultural	\$2,110	50.0%	\$2,110	50.0%	\$4,220	0%
Commercial	\$313,390	48.7%	\$330,274	51.3%	\$643,664	14%
Educational	\$23,446	50.0%	\$23,446	50.0%	\$46,892	1%
Government	\$5,640	47.4%	\$6,265	52.6%	\$11,905	0%
Industrial	\$79,040	42.3%	\$107,896	57.7%	\$186,936	4%
Religious	\$30,625	50.0%	\$30,625	50.0%	\$61,250	1%
Residential	\$2,483,190	66.7%	\$1,242,185	33.3%	\$3,725,375	80%
Grand Total	\$2,938,190	0.04%	\$1,742,801	37%	\$4,680,991	100%

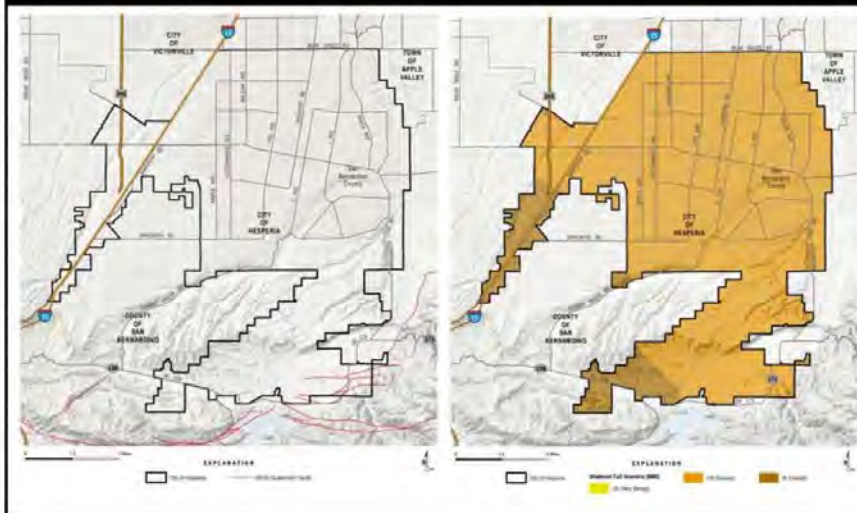


Earthquake Hazard Map



The risk of seismic hazards to residents of Hesperia is based on the approximate location of earthquake faults within and outside the region. This map includes Alquist-Priolo Geologic Hazards Zones Act created under the Seismic Hazards Mapping Act and the USGS Quaternary Fault and Fold Database of the United States. The USGS database contains information on faults and associated folds in the California that are believed to be sources of M>6 earthquakes during the Quaternary (the past 2.6 million years). Per the California Department of Conservation's Earthquake Fault Zone Maps, Hesperia is near the following active fault zones or regulatory fault zones managed by the Department of Conservation.

Earthquake Hazard Maps





Earthquake Exposure Analysis



Table 4-x: Residential Parcel Value Exposure from Southern California Great Shakeout

Shake Severity Zone	Improved Parcel Count	Improvement Value Exposure (\$000)	Land Value Exposure (\$000)	Total Exposure (\$000)
VII - Very Strong	1	\$97	\$18	\$115
VIII - Severe	25,181	\$4,242,455	\$1,129,288	\$5,371,743
IX - Violent	64	\$24,752	\$10,223	\$34,975
Total	25,246	\$4,267,304	\$1,139,529	\$5,406,833

Table 4-y: Estimated Building and Content Loss Great Shake Out Scenario EQ

Building Type	Building Replacement Costs (\$000)	Building Replacement Cost (% of Total Value)	Content Replacement Cost (\$000)	Content Replacement Cost (% of Total Value)	Total Estimated Loss (\$000)	Total Loss Estimation (% of Total Value)
Agricultural	\$27,832	50.0%	\$27,832	50.0%	\$55,664	0%
Commercial	\$1,090,475	48.7%	\$1,146,977	51.3%	\$2,237,452	11%
Educational	\$121,144	45.4%	\$145,542	54.6%	\$266,686	1%
Government	\$19,342	48.5%	\$20,554	51.5%	\$39,896	0%
Industrial	\$226,741	43.3%	\$296,872	56.7%	\$523,613	3%
Religious	\$109,521	50.0%	\$109,521	50.0%	\$219,042	1%
Residential	\$11,399,426	66.7%	\$5,700,938	33.3%	\$17,100,364	84%
Grand Total	\$12,994,481	64%	\$7,448,236	36%	\$20,442,717	

Wildfire Exposure Analysis

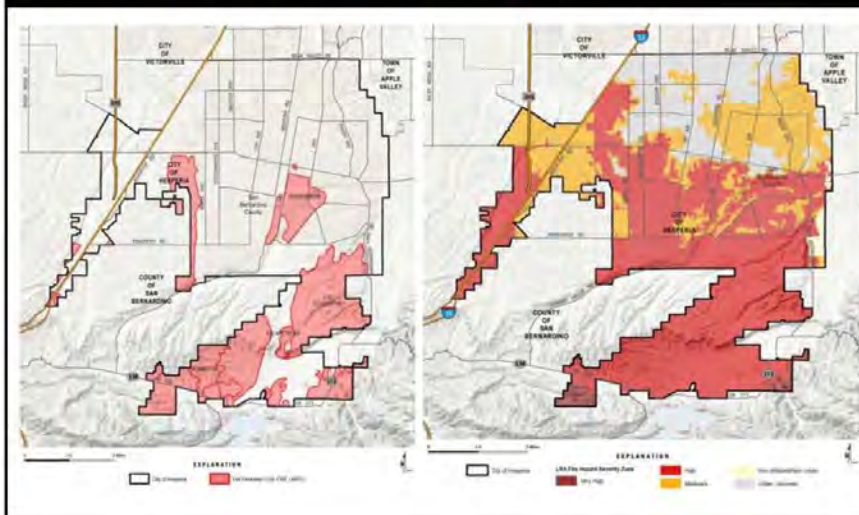


Table 4-x: Residential Buildings and Content at Risk from Wildfire

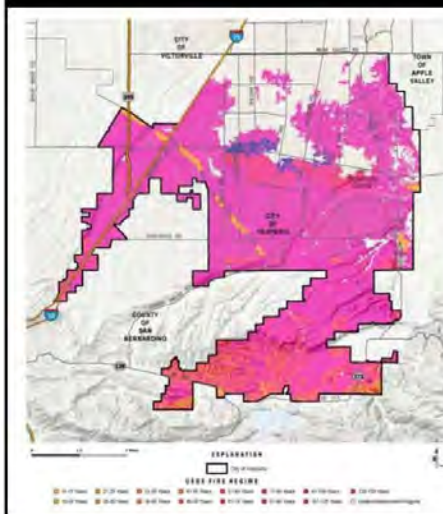
Fire Hazard Severity Zone	Improved Parcel Count	Improvement Value Exposure (\$000)	Land Value Exposure (\$000)	Total Exposure (\$000)
Very High	1	\$23	\$89	\$112
High	19,475	\$1,579,147	\$279,852	\$1,858,999
Moderate	7,299	\$1,659,288	\$491,911	\$2,151,199
Non-Wildland/Non-Urban	1	\$58	\$25	\$82
Urban Unzoned	7,470	\$1,028,789	\$267,652	\$1,296,441
Total	25,246	\$4,267,304	\$1,139,529	\$5,406,833



Wildfire Hazard Maps



Wildfire Hazard Map



- 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 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.



Dam Failure



Table 4-1: Parcel Values at Risk from Dam Inundation

Dam Inundation Zone	Improved Parcel Count	Improvement Value Exposure (\$000)	Land Value Exposure (\$000)	Total Exposure (\$000)
CalEMA Dam Inundation Zone	1	\$245	\$44	\$289

Critical Facilities at risk to dam inundation are on file with the City and for national security purposes can only be accessed through City of Hesperia Public Works Department. As a general note, low-lying areas are vulnerable to dam inundation, especially transportation routes. This includes all roads, railroads, and bridges in the flow path of water. The most vulnerable critical facilities are those in poor condition that would have difficulty withstanding a large surge of water. Utilities such as overhead power lines and communication lines could also be vulnerable. Loss of these utilities could create additional compounding issues for emergency management officials attempting to conduct evacuation and response actions. Currently there are no critical facilities that would be endangered by the result of dam inundation.

Dam Failure Hazard Map



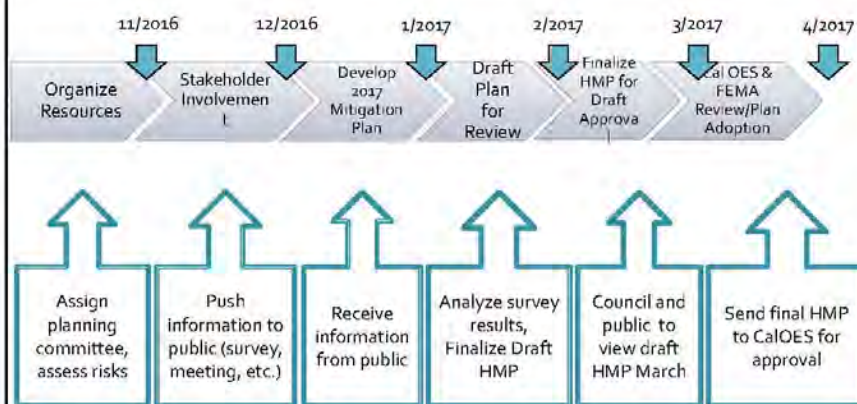


Part II



- Risk Factor Development
- Problem Statements Exercise

Schedule





Next Steps



- Finalize Risk Assessment
- Finalize Hazard Profiles
- Review Mitigation Actions from the 2012 Plan
- Finalize NFIP Program Review

Today's Accomplishments



- Validate Critical / essential facilities exposure
- Create a Hazard Matrix for the 2017 HMP
- Develop risk factors for each of the profiled hazards
- Develop problem statements for each of the profiled hazards



Meeting Agenda:

Hazard Mitigation Plan (HMP) 2016-2017 Update

Planning Committee Meeting #3

Wednesday, November 16, 2016, 2:00 p.m. – 4:30 p.m.

City of Hesperia, City Hall

- **Part I**

- Identify draft problem statements
- Goals and Objectives exercise
- Finalize goals and objectives
- Develop Capabilities assessment & Problem statement crosswalk

- **Part II**

- Mitigation action review
- Mitigation reporting

Note:

No PowerPoint presentation was used for this meeting. This meeting was held in a group brainstorming format with individual copies of pertinent documents distributed at the start of the meeting. This led to a group discussion throughout the meeting, with individual's notes presented to the Team Manager at the end of the session.



Sign-in:

Hazard Mitigation Plan (HMP) 2016-2017 Update

Planning Committee Meeting #3

Thursday, November 16, 2016, 2:00 p.m. – 4:30 p.m.

City of Hesperia, City Hall

Sign- In

Planning Committee Meeting #3 – November 16, 2016 (2:00pm-4:30pm)



City of Hesperia – 2017 Hazard Mitigation Plan Update
Hesperia City Hall – 9700 Seventh Avenue, Hesperia, CA 92345

Name	Title	Email
Rachel Molina	Assistant to the City Manager	Rmolina@cityofhesperia.us
Michael Tiberton	Contract City Engineer	mtiberton@cityofhesperia.us
Mark Faherty	Public Works Manager	mfaherty@cityofhesperia.us
April Antonio	Administrative Analyst	aantonio@cityofhesperia.us
JEREMY MARTINEZ	ADMIN. SERGENT	JMARTINEZ@SBCSD.ORG
Matt Caughey	Engineering Tech	mcaughey@cityofhesperia.us
Paul Reno	Prince Reno	PR320@CITYOFHESPERIA.US



Meeting Agenda:

Hazard Mitigation Plan (HMP) 2016-2017 Update

Planning Committee Meeting #4

Thursday, March 30, 2017, 10:00AM – 12:30PM

City of Hesperia, City Hall

Meeting Objectives:

- *Discuss and review draft mitigation*
- *Address any notated changes*
- *Provide notes, comments, and changes to Team Manager for documents updates*
- *Outline plan to finalize document for final draft*

Note:

No PowerPoint presentation was use for this meeting. This meeting was held in a group session. All changes, additions, and corrections were noted by the group members and discussed with the project manager who will then make the changes to the document. This session was to make changes to the draft document in preparation for the final document to be sent to CalOES/FEMA.



Sign-in:

Hazard Mitigation Plan (HMP) 2016-2017 Update

Planning Committee Meeting #4

Thursday, March 30, 2017, 10:00 a.m. – 12:30 p.m.

City of Hesperia, City Hall

Sign- In

Planning Committee Meeting #4—March 30, 2017, 10:00 a.m.—12:30p.m.

City of Hesperia – 2017 Hazard Mitigation Plan Update
Hesperia City Hall – 9700 Seventh Avenue, Hesperia, CA 92345



Name	Title	Email
Rachel Molina	Assistant to the City Manager	Rmolina@cityofhesperia.us
Matt Caughey	Engineering Tech.	mcaughey@cityofhesperia.us
April Antonio	Administrative Analyst	aantonio@cityofhesperia.us
Micahna Thornton	Contract Civil Engineer	mtThornton@cityofhesperia.us
Paula Rino	PR Manager	PRino@cityofhesperia.us



B.2 Public Stakeholder Meeting

Facebook & Twitter Posts Inviting Stakeholders:



City of Hesperia ✓
@cityofhesperia

- Home
- About
- Posts
- Photos
- Likes
- Videos
- Events

Create a Page

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City of Hesperia
January 9 at 7:01am ·

Concerned about disaster preparedness? Join us today at the Police Department Community Room for the Hazard Mitigation Planning meeting at 3pm and help us prepare for future disasters in #Hesperia. goo.gl/9zs03h



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**City of Hesperia**
Page Liked · January 7 · 🌐

Let your voice be heard! Join us on Monday at the Police Department Community Room for the Hazard Mitigation Planning meeting at 3pm and help us prepare for future disasters in #Hesperia. [ooo.ai/5zs03h](#)

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City of Hesperia @CityofHesperia · Jan 9

Let your voice be heard! Join us today for Hazard Mitigation Planning & help [#Hesperia](#) prepare for future disasters goo.gl/9zs03h



2



1



City of Hesperia @CityofHesperia · Jan 4

We want to know what you think about disaster preparedness! Residents invited to join us for hazard meeting on 1/9 !
goo.gl/9zs03h



2



2



City of Hesperia Website Meeting Notice:

www.cityofhesperia.us/Calendar.aspx?EID=9148/month=1&year=2017&day=9&calType=0

Calendar

View all calendars is the default. Choose Select a Calendar to view a specific calendar.

Select the arrows on either side of the current month to change the month.

List Week Month

Find a Facility Notify Me

Search calendar by: Start date End date Search Select a Calendar

Event Details

Return to Previous View Map

Hazard Mitigation Plan Stakeholder Meeting

Monday, January 9, 2017

The City welcomes participation and input in the update of the hazard mitigation plan. Interested parties can attend the HMP stakeholder meeting on Monday, January 9th 2017, from 3:00 p.m. – 4:00 p.m. in the Police Community Room located at 15840 Smoke Tree Street, Hesperia, CA 92345. No RSVP required. Stakeholders can also weigh-in by completing a short survey designed to gather input about locations in Hesperia that may be vulnerable to natural disasters; the survey can be found by visiting the link below. Survey results will help to identify and coordinate projects focused on reducing the risk of injury or damage to property from future hazard events (e.g. wildfires, floods, earthquakes). For full information on the City's Hazard Mitigation Plan, visit www.cityofhesperia.us/hazard.

Date: January 9, 2017
Time: 3:00 PM - 4:00 PM
Address: Police Community Room
15840 Smoke Tree Street
Hesperia, CA 92345
Contact: 760-947-1018
Email: [Email](#)
Link: [Survey](#)



www.cityofhesperia.us/1310/How-can-I-get-involved

Hesperia CALIFORNIA

Search...

You Are Here: Home > Your Government > City Manager > City Departments > Departments A - E > Community Relations > Emergency Preparedness > Hazard Mitigation > How can I get involved?

How can I get involved?



[Take our quick Survey](#)

Upcoming Events

- Attend our Stakeholder Meeting January 9th from 3:00 - 4:00pm in the Police Community Room, located at 15840 Smoke Tree Street, in Hesperia across from City Hall
 - No RSVP required, all Hesperia stakeholders are welcome



Press Release:



City of Hesperia

Gateway to the Inland Desert

Media Alert

February 3, 2017

For immediate release

Rachel Molina, Public Information Officer
760-947-1020

YOU ARE INVITED TO MAKE AN IMPACT

Hesperia, California –The City of Hesperia is in the process of updating the five-year Hazard Mitigation Plan (HMP) and is inviting participation from the community. The HMP, approved by CalOES and FEMA, identifies hazards and mitigation potential within the City and will serve as a blueprint for reducing property damage and saving lives as a result of future natural disasters. In addition to preparedness, this plan is necessary to ensure that the City of Hesperia is eligible to receive federal grants and/or aid related to a natural disaster.

The City welcomes participation and input in the update of the hazard mitigation plan. Interested parties can attend the HMP stakeholder meeting on Monday, January 9th 2017, from 3:00 p.m. – 4:00 p.m. in the Police Community Room located at 15840 Smoke Tree Street, Hesperia, CA 92345. Stakeholders can also weigh-in by completing a short survey designed to gather input about locations in Hesperia that may be vulnerable to natural disasters; the survey can be found by visiting <https://www.surveymonkey.com/r/mitigationplan>. Survey results will help to identify and coordinate projects focused on reducing the risk of injury or damage to property from future hazard events (e.g. wildfires, floods, earthquakes).

For more information, please contact rmolina@cityofhesperia.us.

###

Paul Rios, Mayor
Rosa Blewett, Mayor Pro Tem
Terry Bird III, Council Member
Bill Highland, Council Member
Rebecca Swanson, Council Member

Shirley Benson, City Manager

5700 Seventh Avenue
Hesperia, CA 92345
760-947-1000
TD 760-947-1119

www.cityofhesperia.us



Email Invite #1:

The City of Hesperia is in the process of updating the Hazard Mitigation Plan (HMP) and we invite you to participate. The HMP will serve as a blueprint for reducing property damage and saving lives from the effects of future natural disasters in the City. You are receiving this because you or your agency has been identified as a key participant at the "Stakeholder Group" level. If interested, we welcome you (or other interested parties) to assist the HMP Project Management Team to update our natural hazard mitigation documents for Hesperia.

The meeting will be **Monday, January 9, 2017 from 3:00 – 4:00 p.m.** in the Police Community Room located at 15840 Smoke Tree Street, Hesperia, CA 92345 (RSVP is welcome but not required).

For more information about the HMP process visit <http://www.cityofhesperia.us/1307/Hazard-Mitigation>.

If you are unable to be present at this meeting but still wish to participate in the planning process, please take our survey at <https://www.surveymonkey.com/r/mitigationplan>.

If you have any questions, please contact me at (760)947-1020 or rmolina@cityofhesperia.us.

Thank you for your time,

Rachel Molina

Recipient list (edited for privacy purposes):

- | | |
|------------------------------------|------------------------------|
| • Emergency Services Officer | Town of Apple Valley |
| • Emergency Services Assistant | Town of Apple Valley |
| • Emergency Services Coordinator | City of Victorville |
| • Superintendent | Hesperia USD |
| • Battalion Chief | SB County Fire Dept. |
| • Public & Media Relations Officer | SB County Sheriff's Dept. |
| • Public Works Supervisor | City of Hesperia |
| • Principal Planner | City of Hesperia |
| • General Manager | Hesperia Park & Rec. |
| • Assistant Engineer | City of Hesperia |
| • Director, Advocacy | St. Mary Hospital |
| • President | High Desert Comm. Foundation |
| • Senior Manager, ED | BNSF Railway |
| • Community Relations Specialist | Advance Disposal |
| • Energy Analyst | Southwest Gas Co. |



- ED Consultant
 - Emergency Services Officer
 - Superintendent/President
 - Owner
 - President/CEO
 - Board of Directors
 - Events Coordinator
 - Animal Services Manager
 - Executive Director
 - Program Representative
 - Program Manager
 - Coordinator
- So. Cal. Edison
 - Cal OES
 - VVC
 - Golden Corral Buffet
 - Hesperia Chamber
 - Hesperia Chamber
 - High Desert Event Center
 - Animal Control
 - VVTA
 - 4-H
 - SB County Animal Control
 - Red Cross
- Over 110 Registered CERT Team members
 - 59 Registered Citizens Academy Members

Email Invite #2:

City of Hesperia Draft 2017 HMP Update

April Antonio

Sent: Thu 4/20/2017 10:17 AM

To: 'jramos@applevalley.org'; 'dwellborn@victorvilleca.gov'; 'david.mclaughlin@hesperiausd.org'; 'L_woods@hesperiaparks.com'; 'terri.roberts@swgas.com'; 'michael.curley@sce.com'; 'LuisaG@AdvanceDisposal.com'; 'erin.fox@redcross.org'; 'Holly.Shiralipour@ca.usda.gov'; 'kevin.mahany@stjoe.org'; 'GBeck@dph.sbcounty.gov'; 'dperez@dph.sbcounty.gov'; 'cindy.serrano@oes.sbcounty.gov'; 'Linda.Bingham@dot.ca.gov'

Cc: Rachel Molina - Assistant to the City Manager

Message | Planning Commission Agenda 4-13-17.pdf (879 KB)

As some of you may know Hesperia has been updating their Hazard Mitigation Plan for the 2017 update. The draft plan is complete and we would like to include you in the review process. We expect to have a final draft sent to CalOES and FEMA in early May. If you have any questions, comments, or concerns please contact me so we may discuss further. Thank you for your time, you can click on the link below for a complete PDF of the Draft 2017 Hesperia HMP Update.

<http://www.cityofhesperia.us/DocumentCenter/View/14177>

April Antonio

Administrative Analyst, City Manager's Office

City of Hesperia – 9700 Seventh Avenue, Hesperia, CA 92345

(760) 947-1006 | www.cityofhesperia.us

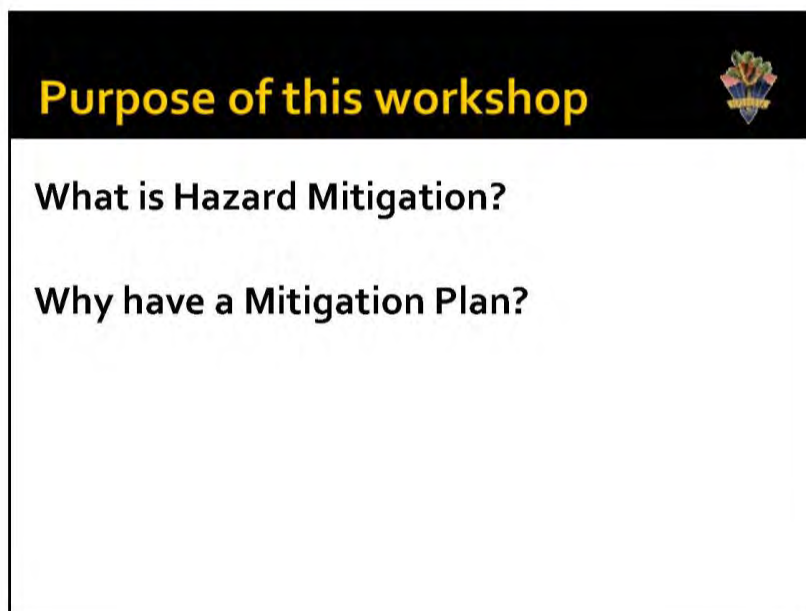
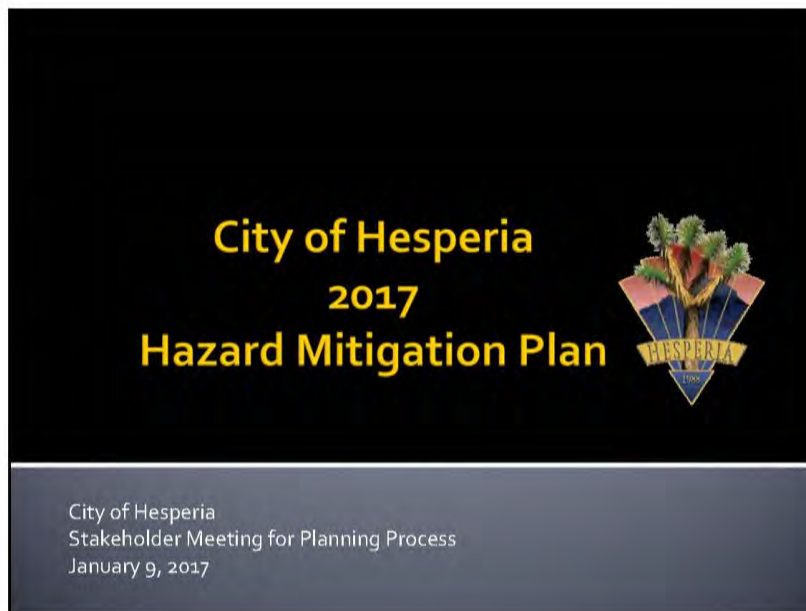


Recipient list

• Joseph	Ramos	Emergency Services Officer	Town of Apple Valley
• Dana	Wellborn	Emergency Services Coordinator	City of Victorville
• David	McLaughlin	Superintendent	Hesperia USD
• Lindsay	Woods	General Manager	Hesperia Park & Rec.
• Terri	Roberts	Energy Analyst	Southwest Gas Co.
• Michael	Curley	ED Consultant	So. Cal. Edison
• Luisa	Gonzalez	Community Relations Specialist	Advance Disposal
• Erin	Fox	Coordinator	Red Cross
• Holly	Shiralipour	District Conservationist	USDA-NRCS
• Kevin	Mahany	Director, Advocacy	St. Mary Hospital
• Greg	Beck	Program Manager	SB County Animal Control
• Daniel	Perez	Chief of Disease Control	SB County Public Health
• Cindy	Serrano	Asst. Emergency Services Manager	SB County OES
• Linda	Bingham	External Affairs Manager	Caltrans
• Mando	Avila	Administrative Sergeant	Hesperia Police Department



PowerPoint:





Mitigation Techniques

- Prevention – Keep hazard risk from getting worse
- Property Protection – Modify existing development subject to hazard risk
- Public Education & Awareness – Inform people about potential hazards and mitigation actions
- Natural Resource Protection – Identify the benefits of the indigenous and natural functions of the area to take advantage of the protection it provides, reduce effects of hazards & improve quality of environment
- Emergency Services – Actions taken to ensure continuity of emergency services
- Structural Projects – Manmade structures or improvements to control hazards.



Primary Objectives

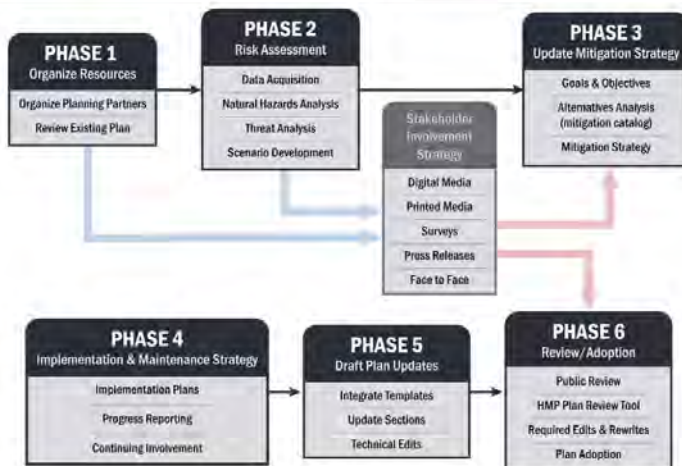


- Setting the expectations and define mitigation planning and actions
- Mitigate the identified risk
- Create umbrella planning process with a set prescribed phases and tasks to follow if needed
- Develop a useful document

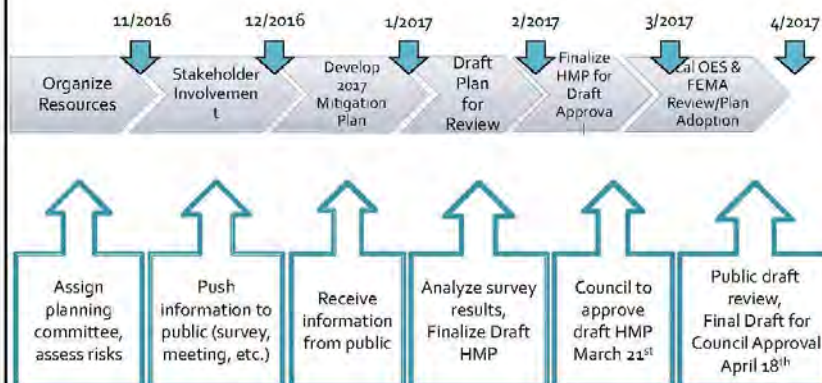




HMP Planning Process - 6 Phases



Schedule





Stakeholder Involvement



- Take Survey <https://www.surveymonkey.com/r/mitigationplan>
- Attend Stakeholder meeting January 9, 2017
- Visit Mitigation webpage for more information
<http://www.cityofhesperia.us/1307/Hazard-Mitigation>
- HMP draft review - planning commission meeting March 9, 2017
- HMP draft approval – City Council meeting March 21, 2017
- Final HMP Council approval
April 18, 2017



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.



2012 Hazard Assessment



2012 HAZARD ASSESSMENT MATRIX				
		Impact		
		High	Medium	Low
Probability	High	Wildfire Earthquake/ Geologic Hazards	Severe Thunderstorms Hazardous Materials	Extreme Heat Drought
	Medium	Flash Flooding	Winter Storm High Winds	Infestation Dam Failure
	Low		Lightning	Terrorism

2017 Hazard Assessment



Earthquake/Geologic Hazard

Flash Flooding

Severe Thunderstorms

Hazardous Materials

Extreme Heat

Drought

Climate Change

Wildfire

Winter Storm

High Winds

Infestation

Dam Failure

Lightning

Terrorism

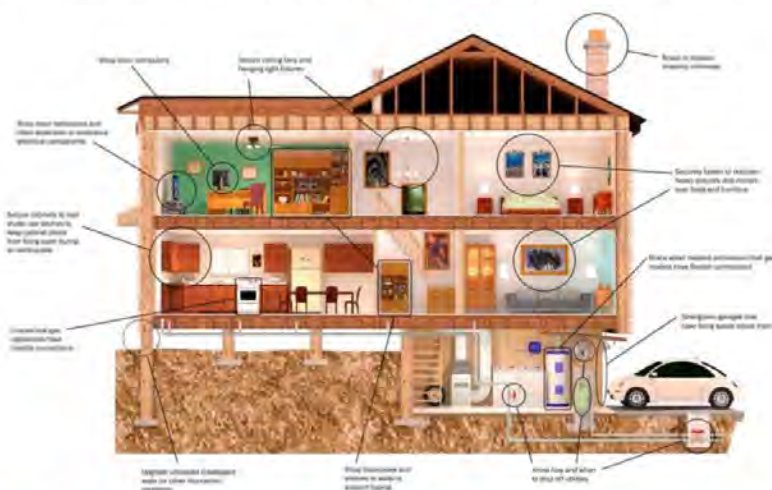


Previously Completed Projects



- Ranchero Road Undercrossing
- Paving Mesquite (Maple to Escondido)
- Widen Seventh Avenue (Main to Willow)
- Aqueduct Crossing Improvement (Widen Bridge at Main)
- Juniper/Smoke Tree/Eighth Avenue Project
- Rock Springs Road Reconstruction Project
- H-01 Drainage Facility (Section 2 Main to Fourth)
- H-01 Drainage Facility (Section 1 Maple to Main) Design and Right-of-Way Identification
- Fire Station 305 Construction
- New Police Station

Earthquake Home Hazard Hunt





Before a Flood — Make a Plan

Floods can happen anywhere it rains.



BUY FLOOD INSURANCE

Learn your flood risk and find an agent near you with the One-Step Flood Risk Profile at FloodSmart.gov. Typically, it takes 30 days for a new flood insurance policy to take effect, so get or renew your policy now.



KNOW YOUR STUFF

Thoroughly document your belongings to support a flood insurance claim. Visit knowyourstuff.org to create your home inventory.



MAKE A PLAN

Create and share a family emergency plan. Make sure it includes evacuation routes from home, work, and school. Assemble a safety kit with drinking water, canned food, first aid supplies, blankets, a radio, and a flashlight. Learn more at ready.gov/floods.





Questions?

Rachel Molina
Assistant to the City Manager
rmolina@cityofhesperia.us



Informational Flyer on Flooding:



PROTECT YOUR HOME

Flooding is the most common and costly natural disaster in the United States. Unfortunately, not everyone is aware of their flood risk and how to prepare for a flood.

This checklist provides useful information on how to financially prepare before a flood event. Help us spread the word to protect what matters, and be FloodSmart by sharing this checklist on your social platforms.

- ☐ Review your current insurance policies to see if coverage is provided for flood damage to your home and its contents.
- ☐ Most homeowners insurance does not cover flood damage, so be sure to purchase flood insurance to cover both your property and contents.
- ☐ Recover more quickly and easily by following these three steps when filing your flood insurance claim: notify your insurer to start the claims process, document the damage, and complete a proof of loss to support your claim. Learn more at FloodSmart.gov/floodsmart/pages/preparation_recovery/file_your_claim.jsp.
- ☐ To find an agent who sells flood insurance in your area, use the Agent Locator at FloodSmart.gov/floodsmart/pages/choose_your_policy/agent_locator.jsp or call 800-427-2419.
- ☐ Ensure that medical and financial records—including your insurance policy—are in a waterproof container and store additional copies in a separate secure location.
- ☐ Create a contact card small enough to put in a wallet with important names and numbers to use in case of an emergency.
- ☐ Establish a disaster procedure and family communications plan to share with your family members at Ready.gov/make-a-plan.
- ☐ Visit FloodSmart.gov/floodsmart/pages/partner/flooding_community.jsp to identify ways to make your community more aware of the flood risks in your area.
- ☐ Visit FloodSmart.gov/floodsmart/pages/partner/spread_the_word.jsp to spread the word and share this checklist on your social networks.
- ☐ Tune in to local media and community messaging about potential disasters.
- ☐ Share your flood stories with us at info@femafloodsmart.com.
- ☐ Visit FloodSmart.gov for more resources and information.





PROTECT YOUR BUSINESS

Flooding is the most common and costly natural disaster in the United States. Unfortunately, businesses are not immune to the destruction caused by major storms and flood events. Challenges for business owners affected by flooding are vast. You must not only prepare your staff to safely respond to a flood emergency, but also ensure that your facility and product inventory are secure in order to rebuild and reopen once the storm has passed.

Preparing before, during, and after a flood is vital for a business. Use this checklist to protect your business and staff.

- ☐ Review your current insurance policies to see if coverage is provided for flood damage to the building and its contents. Contents coverage typically is optional, so be sure to purchase flood insurance to cover your contents.
- ☐ If you have a building lease, review it to see if the building's flood insurance policy covers structural elements in your space. Most commercial insurance does not cover flood damage.
- ☐ Review equipment lease and rental agreements to determine if you are responsible for flood damage.
- ☐ Ensure that important business files are backed up on a server away from your building so they aren't lost if electronics and paper files are destroyed by water.
- ☐ Keep detailed records of all items in the building, including serial numbers, costs, and dates of purchase. Store those records on a remote server or in another place you can access after a flood to aid in the claims process.
- ☐ Visit [Ready.gov/business/implementation/crisis](https://www.ready.gov/business/implementation/crisis) to establish a disaster procedure and emergency communications plan to share with your employees.
- ☐ Create a contact card small enough to put in a wallet with important names and numbers to use in case of an emergency. Set up a phone or text message tree.
- ☐ To know your region and learn more about flood-related disasters most likely to affect your business, use the Flood Risk Scenarios at [FloodSmart.gov/floodsmart/pages/flooding_flood_risks/flood_scenarios.jsp](https://www.floodsmart.gov/floodsmart/pages/flooding_flood_risks/flood_scenarios.jsp).
- ☐ Use the Agent Locator to find an agent who sells flood insurance in your area at [FloodSmart.gov/floodsmart/pages/choose_your_policy/agent_locator.jsp](https://www.floodsmart.gov/floodsmart/pages/choose_your_policy/agent_locator.jsp).
- ☐ Visit [FloodSmart.gov/floodsmart/pages/partner/spread_the_word.jsp](https://www.floodsmart.gov/floodsmart/pages/partner/spread_the_word.jsp) to spread the word and share this checklist on your social networks.
- ☐ Tune in to local media and community messaging about potential disasters.
- ☐ Visit [FloodSmart.gov](https://www.floodsmart.gov) for more resources and information.



FEMA





Informational Flyer on Earthquakes:

Be Red Cross Ready

Earthquake Safety Checklist

An earthquake is a sudden, rapid shaking of the earth caused by the breaking and shifting of rock beneath the earth's surface. Earthquakes strike suddenly, without warning, and they can occur at any time of the year, day or night. Forty-five states and territories in the United States are at moderate to very high risk of earthquakes, and they are located in every region of the country.

Are you at increased risk from earthquakes?

- Contact your local emergency management office, local American Red Cross chapter, state geological survey or department of natural resources.
- Mobile homes and homes not attached to their foundations are at particular risk during an earthquake.
- Buildings with foundations resting on landfill and other unstable soils are at increased risk of damage.

Did you know?

Doorways are no stronger than any other part of the structure. During an earthquake, get under a sturdy piece of furniture and hold on. This will provide some protection from falling objects that can injure you during an earthquake.

How can I prepare?



- ☐ Become aware of fire evacuation and earthquake plans for all of the buildings you occupy regularly.
- ☐ Pick safe places in each room of your home, workplace and/or school. A safe place could be under a piece of furniture or against an interior wall away from windows, bookcases or tall furniture that could fall on you.
- ☐ Practice drop, cover and hold on in each safe place. If you do not have sturdy furniture to hold on to, sit on the floor next to an interior wall and cover your head and neck with your arms.
- ☐ Keep a flashlight and sturdy shoes by each person's bed.
- ☐ Make sure your home is securely anchored to its foundation.
- ☐ Bolt and brace water heaters and gas appliances to wall studs.
- ☐ Bolt bookcases, china cabinets and other tall furniture to wall studs.
- ☐ Hang heavy items, such as pictures and mirrors, away from beds, couches and anywhere people sleep or sit.
- ☐ Brace overhead light fixtures.
- ☐ Install strong latches or bolts on cabinets. Large or heavy items should be closest to the floor.
- ☐ Learn how to shut off the gas valves in your home and keep a wrench handy for that purpose.
- ☐ Learn about your area's seismic building standards and land use codes before you begin new construction.
- ☐ Keep and maintain an emergency supplies kit in an easy-to-access location.

What should I do during an earthquake?



If you are inside when the shaking starts ...

- ☐ Drop, cover and hold on. Move as little as possible.
- ☐ If you are in bed, stay there, curl up and hold on. Protect your head with a pillow.
- ☐ Stay away from windows to avoid being injured by shattered glass.
- ☐ Stay indoors until the shaking stops and you are sure it is safe to exit. If you must leave the building after the shaking stops, use stairs rather than an elevator in case there are aftershocks, power outages or other damage.
- ☐ Be aware that fire alarms and sprinkler systems frequently go off in buildings during an earthquake, even if there is no fire.

If you are outside when the shaking starts ...

- ☐ Find a clear spot and drop to the ground. Stay there until the shaking stops (away from buildings, power lines, trees, streetlights).
- ☐ If you are in a vehicle, pull over to a clear location and stop. Avoid bridges, overpasses and power lines if possible. Stay inside with your seatbelt fastened until the shaking stops. Then, drive carefully, avoiding bridges and ramps that may have been damaged.
- ☐ If a power line falls on your vehicle, do not get out. Wait for assistance.
- ☐ If you are in a mountainous area or near unstable slopes or cliffs, be alert for falling rocks and other debris. Landslides are often triggered by earthquakes.

What do I do after an earthquake?



- ☐ After an earthquake, the disaster may continue. Expect and prepare for potential aftershocks, landslides or even a tsunami. Tsunamis are often generated by earthquakes.
- ☐ Each time you feel an aftershock, drop, cover and hold on. Aftershocks frequently occur minutes, days, weeks and even months following an earthquake.
- ☐ Check yourself for injuries and get first aid, if necessary, before helping injured or trapped persons.
- ☐ Put on long pants, a long-sleeved shirt, sturdy shoes and work gloves to protect against injury from broken objects.
- ☐ Look quickly for damage in and around your home and get everyone out if your home is unsafe.
- ☐ Listen to a portable, battery-operated or hand-crank radio for updated emergency information and instructions.
- ☐ Check the telephones in your home or workplace to see if you can get a dial tone. Make brief calls to report life-threatening emergencies.
- ☐ Look for and extinguish small fires. Fire is the most common hazard after an earthquake.
- ☐ Clean up spilled medications, bleach, gasoline or other flammable liquids immediately.
- ☐ Open closet and cabinet doors carefully as contents may have shifted.
- ☐ Help people who require special assistance, such as infants, children and the elderly or disabled.
- ☐ Watch out for fallen power lines or broken gas lines and stay out of damaged areas.
- ☐ Keep animals under your direct control.
- ☐ Stay out of damaged buildings.
- ☐ If you were away from home, return only when authorities say it is safe to do so. Use extreme caution and examine walls, floors, doors, staircases and windows to check for damage.
- ☐ Be careful when driving after an earthquake and anticipate traffic light outages.

Let Your Family Know You're Safe

If your community experiences an earthquake, or any disaster, register on the American Red Cross Safe and Well Web site available through RedCross.org to let your family and friends know about your welfare. If you don't have Internet access, call 1-866-GET-INFO to register yourself and your family.



For more information on disaster and emergency preparedness, visit RedCross.org.

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Should I Buy Earthquake Insurance?

The questions below can help you decide whether or not to buy earthquake insurance for you and your family.

1. **Can I afford earthquake insurance?**

Use the Premium Calculator at www.earthquakeauthority.com to estimate your premium

2. **Do I live where earthquakes are common?**

You may need to do some research about nearby fault lines and the type of soil in your area. Search for fault lines on the U.S. Geological Survey website at www.earthquake.USGS.gov.

3. **Do I have a high-risk house?**

A house is likely to have more damage if it is older, or built of brick or masonry, or has more than one story.

4. **Can I afford NOT to have earthquake insurance?**

After a big earthquake, could you afford to repair or rebuild your home? Can you afford to keep paying your mortgage and taxes while you rebuild?

5. **Won't the government help me after a big earthquake?**

Maybe. The main form of federal disaster relief is the low-interest loan. You must show that you can repay the loan. Grants from the Federal Emergency Management Agency (FEMA) for emergency home repairs and temporary rent assistance are only for those who do not qualify for loans.

6. **I can't afford earthquake insurance. Are there other ways I can protect my home?**

Yes. There are many things you can do to protect your home and reduce the damage caused by earthquakes. Whether you buy earthquake insurance or not, you should do what you can to protect your home, your belongings, and your family.

- Retrofit as much as you can.
- Secure breakable items with museum putty.
- Put latches on china cabinets.
- Bolt tall furniture, like bookcases and armoires, to the studs in the walls.
- Tie down computers and TVs.
- Look in your local hardware store for latches, putty, computer straps, and other devices to help you protect your belongings.
- For more tips on protecting your home, go to www.earthquakeauthority.com.

7. **Do not wait until after the earthquake.**

Waiting until after an earthquake to buy insurance is not a good idea. It doesn't protect you from the damage you have already had. Also, after an earthquake, insurance companies often do not sell earthquake coverage for a certain period. And when they start to sell it again, the premiums may be higher.

OUTSIDE



1 Design/Construction

- (For new Wildland Urban Interface Construction or Remodels)
- Use ignition resistant construction (effective January 1, 2008) for roofs/roof assemblies, gutters, vents, decks, exterior walls, exterior windows.
- Enclose the underside of eaves, balconies and above ground decks with fire resistant materials
- Show your 100 feet Defensible Space on plot plan
- Build your home away from ridge tops, canyons and areas between high points of a ridge
- Consider installing residential sprinklers
- Make sure that electric service lines, fuse boxes and circuit breaker panels are installed and maintained per code
- Contact qualified individuals to perform electrical maintenance and repairs

2 Access

- Make sure that your street name sign is visibly posted at each street intersection
- Post your house address so it is easily visible from the street, especially at night
- Address numbers should be at least 3 inches tall and on a contrasting background
- Identify at least two exit routes from your neighborhood
- Clear flammable vegetation at least 10 feet from roads and five feet from driveways
- Cut back overhanging tree branches above access roads
- Construct roads that allow two-way traffic
- Make sure dead-end roads, and long drive ways have turn-around areas wide enough for emergency vehicles
- Design bridges to carry heavy emergency vehicles
- Post clear road signs to show traffic restrictions such as dead-end roads, and weight and height limitations

3 Roof

- Install a fire resistant roof. Contact your local fire department for current roofing requirements
- Remove dead leaves and needles from your roof and gutters
- Remove dead branches overhanging your roof and keep branches 10 feet from your chimney
- Cover your chimney outlet and stovepipe with a nonflammable screen of 1/2 inch or smaller mesh

4 Landscape

- Create a Defensible Space of 100 feet around your home. It is required by law
- Create a "LEAN, CLEAN and GREEN ZONE" by removing all flammable vegetation within 30 feet immediately surrounding your home
- Then create a "REDUCED FUEL ZONE" in the remaining 70 feet or to your property line. You have two options in this area:
- A.** Create horizontal and vertical spacing between plants. The amount of space will depend on how steep your property is and the size of your plants.
- B.** Large trees do not have to be removed as long as all of the plants beneath them are removed.
- Remove lower tree branches at least six feet from the ground
- Landscape with fire resistant plants
- Maintain all plants with regular water, and keep dead branches, leaves and needles removed.
- When clearing vegetation, use care when operating equipment such as lawnmowers. One small spark may start a fire; a string trimmer is much safer.

5 Yard

- Stack woodpiles at least 30 feet from all structures and remove vegetation within 10 feet of woodpiles
- Above ground Liquefied Petroleum Gas (LP-gas) containers (500 or less water gallons) shall be located a minimum of 10 feet with respect to buildings, public ways, and lot lines of adjoining property that can be built upon. -CFC 384.3
- Remove all stacks of construction materials, pine needles, leaves and other debris from your yard
- Contact your local fire department to see if debris burning is allowed in your area and obtain a burning permit and follow all local air quality restrictions

6 Emergency Water Supply

- Maintain an emergency water supply that meets fire department standards through one of the following:
 - a community water/hydrant system
 - a cooperative emergency storage tank with neighbors
 - a minimum storage supply of 2,500 gallon on your property (like a pond or pool)
- Clearly mark all emergency water sources
- Create easy firefighter access to your closest emergency water source
- If your water comes from a well, consider an emergency generator to operate the pump during a power failure

March 2009

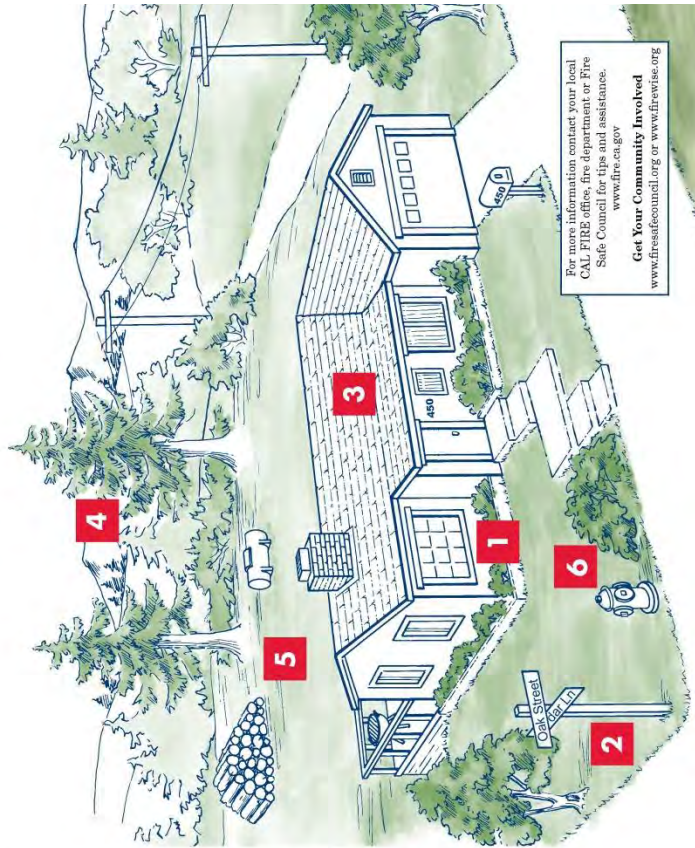
Informational Flyer on Wildfire:



www.fire.ca.gov

Homeowners Checklist

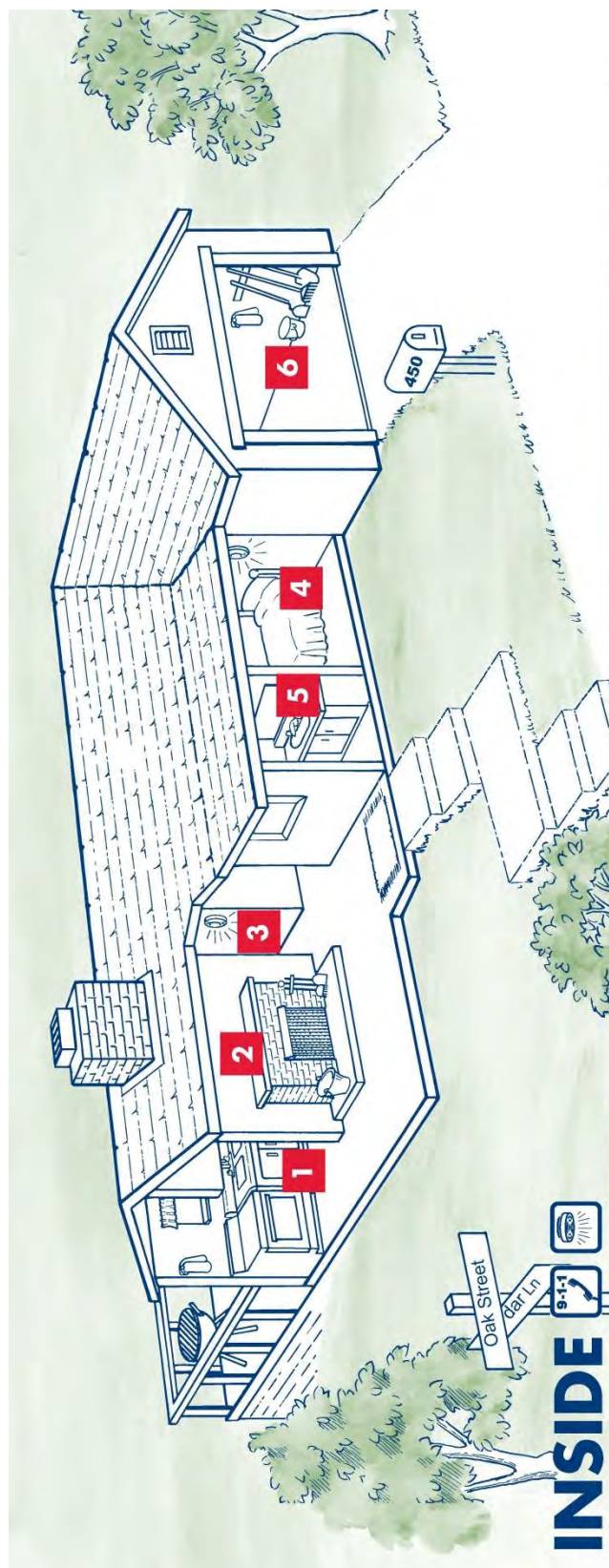
How To Make Your Home Fire Safe



For more information contact your local CAL FIRE office, fire department or Fire Safe Council for tips and assistance.
www.fire.ca.gov

Get Your Community Involved
www.fire-safe.org or www.firewise.org





1 Kitchen

- ☐ Keep a working fire extinguisher in the kitchen
- ☐ Maintain electric and gas stoves in good operating condition
- ☐ Keep baking soda on hand to extinguish stovetop grease fires
- ☐ Turn the handles of pots and pans away from the front of the stove
- ☐ Install curtains and towel holders away from stoveburners
- ☐ Store matches and lighters out of reach of children
- ☐ Make sure that electrical outlets are designed to handle appliance loads

2 Living Room

- ☐ Install a screen in front of fireplace or wood stove
- ☐ Store the ashes from your fireplace (and barbecue) in a metal container and dispose of only when cold
- ☐ Clean fireplace chimneys and flues at least once a year

3 Hallway

- ☐ Install smoke detectors between living and sleeping areas
- ☐ Test smoke detectors monthly and replace batteries twice a year, when clocks are changed in the spring and fall
- ☐ Replace electrical cords that do not work properly, have loose connections, or are frayed

4 Bedroom

- ☐ If you sleep with the door closed, install a smoke detector in the bedroom
- ☐ Turn off electric blankets and other electrical appliances when not in use
- ☐ Do not smoke in bed
- ☐ If you have security bars on your windows or doors, be sure they have an approved quick release mechanism and your family can get out in the event of a fire

5 Bathroom

- ☐ Disconnect appliances such as curling irons and hair dryers when done, store in a safe location until cool
- ☐ Keep items such as towels away from wall and floor heaters

6 Garage

- ☐ Mount a working fire extinguisher in the garage
- ☐ Have tools such as a shovel, hoe, rake and bucket available for use in a wildfire emergency
- ☐ Install a solid door with self-closing hinges between living areas and the garage
- ☐ Dispose of oily rags in Underwriters Laboratories approved metal containers
- ☐ Store all combustibles away from ignition sources such as water heaters
- ☐ Disconnect electrical tools and appliances when not in use
- ☐ Allow hot tools such as glue guns and soldering irons to cool before storing
- ☐ Properly store flammable liquids in approved containers and away from ignition sources such as pilot lights

* Disaster Preparedness

- ☐ Maintain at least a three-day supply of drinking water, and food that does not need refrigeration and generally does not need cooking
- ☐ Maintain a portable radio, flashlight, emergency cooking equipment, lanterns and batteries
- ☐ Outdoor cooking appliances such as barbecues should never be taken indoors for use as heaters
- ☐ Maintain first aid supplies to treat the injured until help arrives
- ☐ Keep a list of valuables to take with you in an emergency; if possible, store these valuables together
- ☐ For safety, securely attach all water heaters and furniture such as cabinets and bookshelves to walls
- ☐ Have a contingency plan to enable family members to contact each other. Establish a family/friend phone tree
- ☐ Designate an emergency meeting place outside your home
- ☐ Practice emergency exit drills in the house (EDITH) regularly
- ☐ Make sure that all family members understand how to STOP, DROP AND ROLL if their clothes should catch fire



Public Participation Worksheet & Results:

2017 HAZARD ASSESSMENT MATRIX				
		Impact		
		High	Medium	Low
Probability	High			
	Medium			
	Low			

Please write each hazard listed to the right, into the matrix where you feel it belongs. This will help to develop an updated matrix for the 2017 Hazard Mitigation Plan.

Earthquake/Geologic Hazard

Flash Flooding
Severe Thunderstorms
Hazardous Materials
Extreme Heat
Drought
Climate Change

Wildfire
Winter Storm
High Winds
Infestation
Dam Failure
Lightning
Terrorism

Blank worksheets were handed out to attendees of the stakeholder meeting to get feedback on their opinion of the probability and impact of disasters in the City of Hesperia. They were directed to place each hazard in the corresponding box they felt was accurate. Once finished we tallied the data from all respondents and highlighted the highest ranking hazard within the box.

The results showed a very similar matrix to the one the Planning Committee put together for the 2017 Hazard Mitigation Plan. The results were a good way to compare what the internal team thought vs. what the public stakeholders thought. To see everyone was on the same page gave the Planning Committee reassurance that they were on the right track to protect the City and its fellow residents.



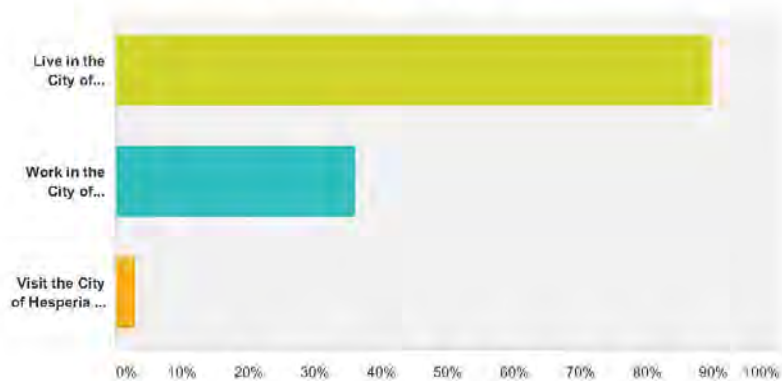
2017 HAZARD ASSESSMENT MATRIX				
		Impact		
		High	Medium	Low
Probability	High	Earthquake/Geo hazards (19) Flooding (8) Wildfire (12) Winter Storms Severe Thunderstorm (2) Drought (4) Extreme Heat	Extreme Heat (3) Drought (3) High Winds (7) Hazardous Materials (5) Terrorism (3) Severe Thunderstorms (5) Wildfire (5) Flooding (3) Winter Storm (2)	Lightning (2) Extreme Heat (8) Drought (8) Climate Change (4) Winter Storms Terrorism High Winds (2)
	Medium	Flooding (7) Hazardous Materials (3) Winter Storms (2) High Winds (2) Wildfire (4) Terrorism Thunderstorms (2) Earthquake/Geo Hazards Lightning	Winter Storm (6) Lightning (3) Severe Thunderstorms (6) Drought (3) Hazardous Materials (6) Extreme Heat (3) High Winds (5) Climate Change (2) Dam Failure Flooding (2) Terrorism	Severe Thunderstorms Winter Storm (2) High Winds (3) Infestation (4) Lightning Terrorism (3) Dam Failure (2) Drought Climate Change (3) Extreme Heat Flooding
	Low	Terrorism (3) Dam Failure (5) Climate Change (2) Winter Storm Lightning Extreme Heat (2) Severe Thunderstorm (3)	Hazardous Materials (4) Winter Storm (3) Dam Failure (4) Infestation (3) Lightning (4) Terrorism (2) High Winds	Climate Change (8) Infestation (9) Dam Failure (4) Terrorism (6) Extreme Heat (2) Lightning (7) Winter Storm (2)



B.3 Survey

Q1 Do you...(Check all that apply).

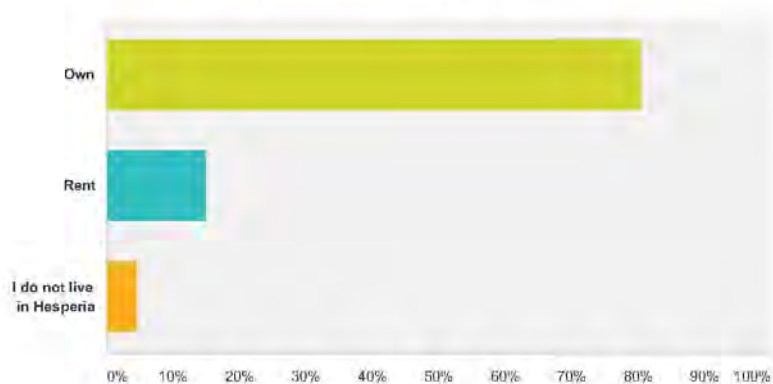
Answered: 133 Skipped: 0



Answer Choices	Responses
Live in the City of Hesperia	89.47% 119
Work in the City of Hesperia	36.09% 48
Visit the City of Hesperia but live and work elsewhere	3.01% 4
Total Respondents: 133	

Q2 Do you own or rent your home?

Answered: 133 Skipped: 0

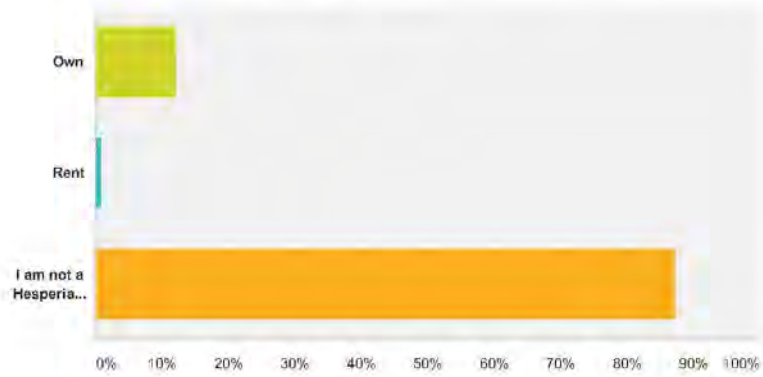


Answer Choices	Responses
Own	80.45% 107
Rent	15.04% 20
I do not live in Hesperia	4.51% 6
Total	133



Q3 Do you own or rent your business?

Answered: 133 Skipped: 0

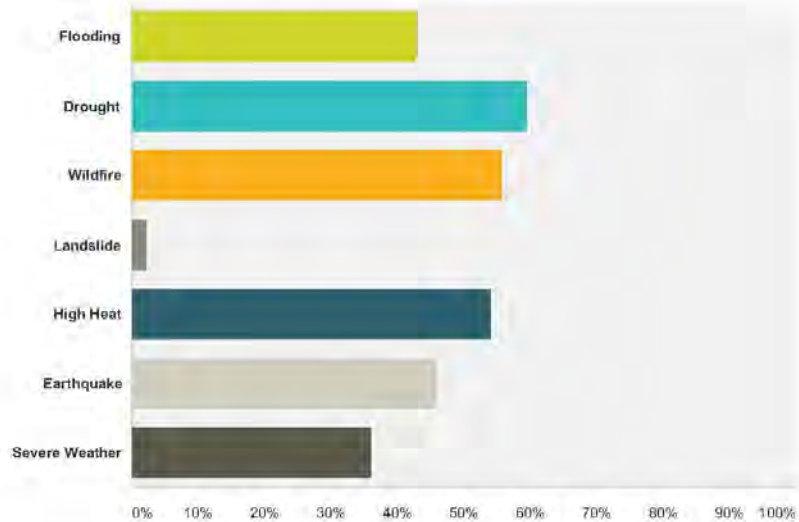


Answer Choices	Responses	
Own	12.03%	16
Rent	0.75%	1
I am not a Hesperia business owner	87.22%	116
Total		133



Q4 Which of the following types of natural disasters have you or someone in your household experienced in the past 20 years within the City of Hesperia?

Answered: 133 Skipped: 0

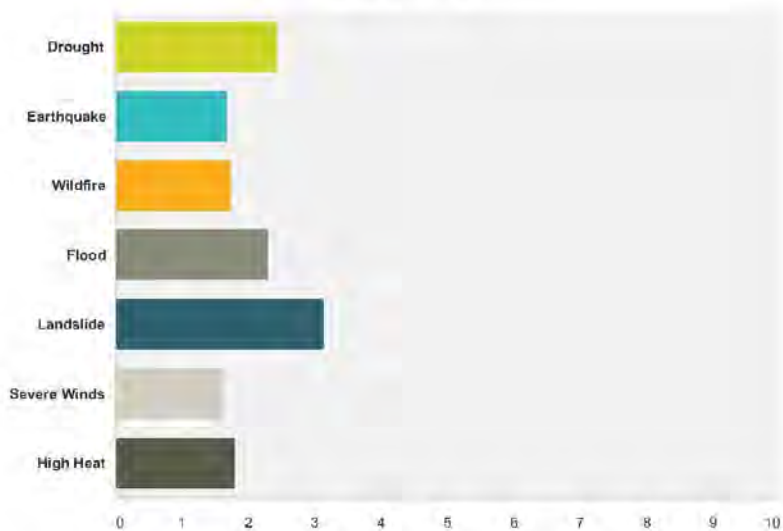


Answer Choices	Responses
Flooding	42.86% 57
Drought	59.40% 79
Wildfire	55.64% 74
Landslide	2.26% 3
High Heat	54.14% 72
Earthquake	45.86% 61
Severe Weather	36.09% 48
Total Respondents: 133	



Q5 What do you believe is the likelihood that these natural hazards will cause damage to buildings or harm residents to the City of Hesperia? Please check ONE response for each hazard.

Answered: 133 Skipped: 0

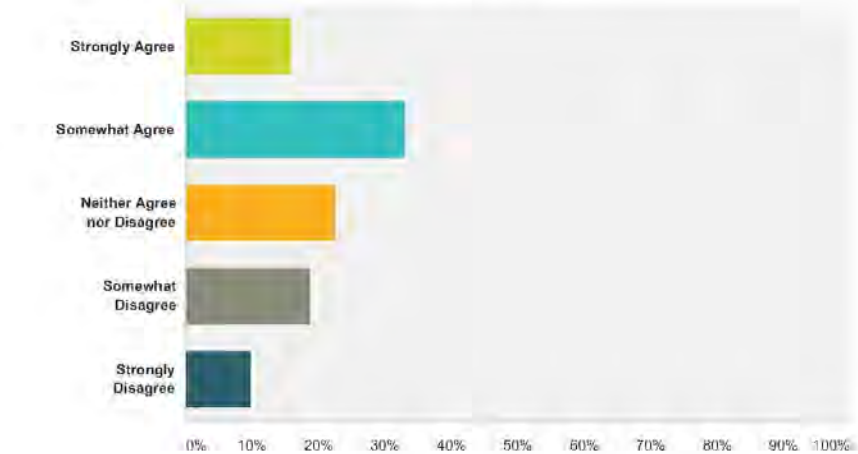


	Very likely	Likely	Somewhat Likely	Not Likely at all	Total	Weighted Average
Drought	26.32% 35	27.07% 36	24.06% 32	22.56% 30	133	2.43
Earthquake	53.38% 71	30.83% 41	10.53% 14	5.26% 7	133	1.68
Wildfire	50.38% 67	29.32% 39	16.54% 22	3.76% 5	133	1.74
Flood	30.08% 40	22.56% 30	34.59% 46	12.78% 17	133	2.30
Landslide	6.02% 8	10.53% 14	47.37% 63	36.09% 48	133	3.14
Severe Winds	54.89% 73	30.08% 40	14.29% 19	0.75% 1	133	1.61
High Heat	49.62% 66	26.32% 35	18.80% 25	5.26% 7	133	1.80



Q6 Please indicate how you feel about the following statement: Information about the risks from natural hazards is readily available and easy to locate.

Answered: 133 Skipped: 0

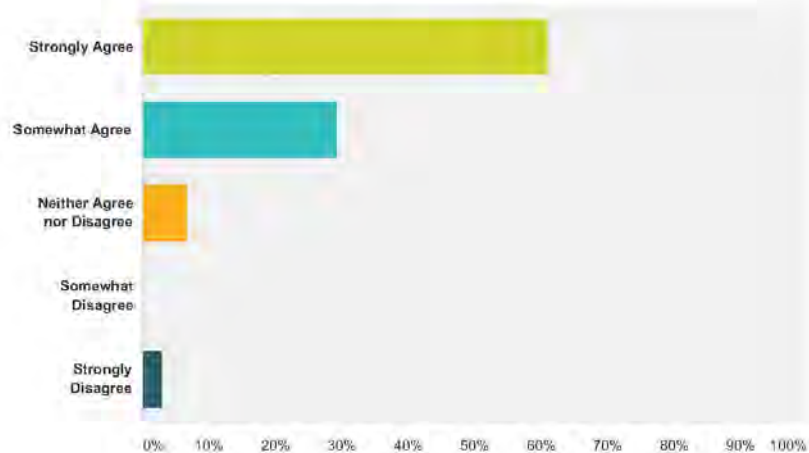


Answer Choices	Responses	
Strongly Agree	15.79%	21
Somewhat Agree	33.08%	44
Neither Agree nor Disagree	22.56%	30
Somewhat Disagree	18.80%	25
Strongly Disagree	9.77%	13
Total		133



Q7 Please indicate how you feel about the following statement: It is my responsibility to educate myself and take actions that will reduce my exposure to the risks from natural hazards.

Answered: 133 Skipped: 0

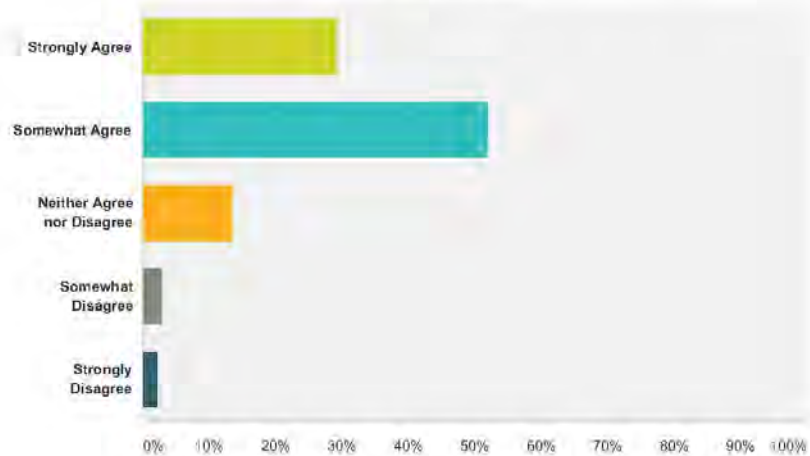


Answer Choices	Responses	
Strongly Agree	60.90%	81
Somewhat Agree	29.32%	39
Neither Agree nor Disagree	6.77%	9
Somewhat Disagree	0.00%	0
Strongly Disagree	3.01%	4
Total		133



Q8 Please indicate how you feel about the following statement: It is the responsibility of government (local, state and federal) to provide education and programs that promote citizen actions that will reduce exposure to the risks from natural hazards.

Answered: 133 Skipped: 0

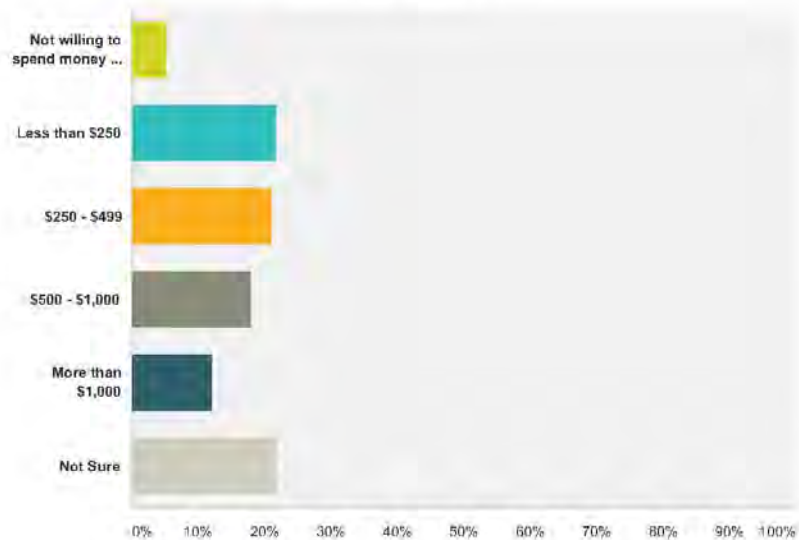


Answer Choices	Responses	
Strongly Agree	29.32%	39
Somewhat Agree	51.88%	69
Neither Agree nor Disagree	13.53%	18
Somewhat Disagree	3.01%	4
Strongly Disagree	2.26%	3
Total		133



Q9 How much money would you be willing to spend at one time to protect your home or business from natural hazards? (For example, by flood proofing your home, performing seismic upgrades, or doing dry weed abatement for fire risk). The answers will help City staff to find applicable hazard mitigation grant programs requiring local funding match.

Answers: 123 Skipped: 0

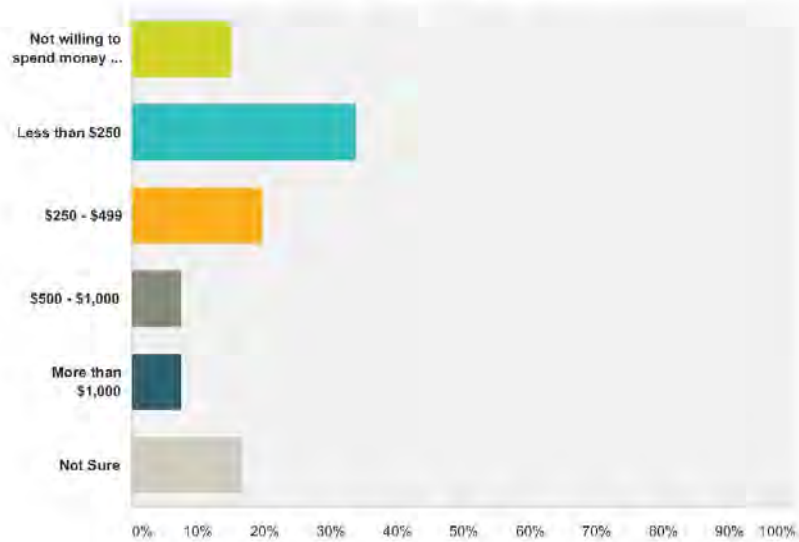


Answer Choices	Responses	
Not willing to spend money on this	5.26%	7
Less than \$250	21.80%	29
\$250 - \$499	21.05%	28
\$500 - \$1,000	18.05%	24
More than \$1,000	12.03%	16
Not Sure	21.80%	29
Total		133



Q10 How much money would you be willing to spend each year to protect your home or business from natural hazards in the form of flood and/or earthquake insurance? The answers will help City staff to find applicable hazard mitigation grant programs requiring local funding match.

Answered: 133 Skipped: 0

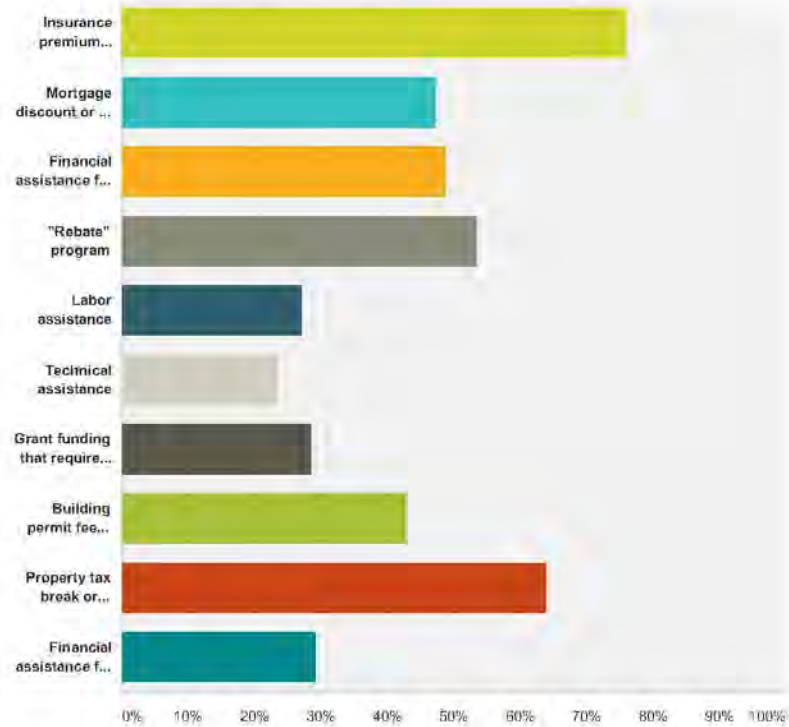


Answer Choices	Responses
Not willing to spend money on this	15.04% 20
Less than \$250	33.83% 45
\$250 - \$499	19.55% 26
\$500 - \$1,000	7.52% 10
More than \$1,000	7.52% 10
Not Sure	16.54% 22
Total	133



Q11 Which of the following incentives would encourage you to protect your home against natural hazards? (Check all that apply)

Answers: 133 Skipped: 0

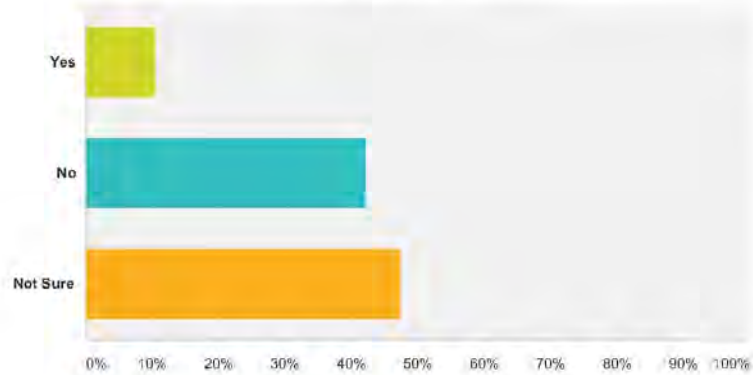


Answer Choices	Responses
Insurance premium discount	75.94% 101
Mortgage discount or Low Interest Loan	47.37% 63
Financial assistance for property upgrades or equipment	48.87% 65
'Rebate' program	53.38% 71
Labor assistance	27.07% 36
Technical assistance	23.31% 31
Grant funding that requires "cost share"	28.57% 38
Building permit fee reduction or waiver	42.86% 57
Property tax break or incentive	63.91% 85
Financial assistance for equipment	29.32% 39
Total Respondents: 133	



Q12 Is your home or business located in or near a FEMA designated floodplain?

Answered: 133 Skipped: 0

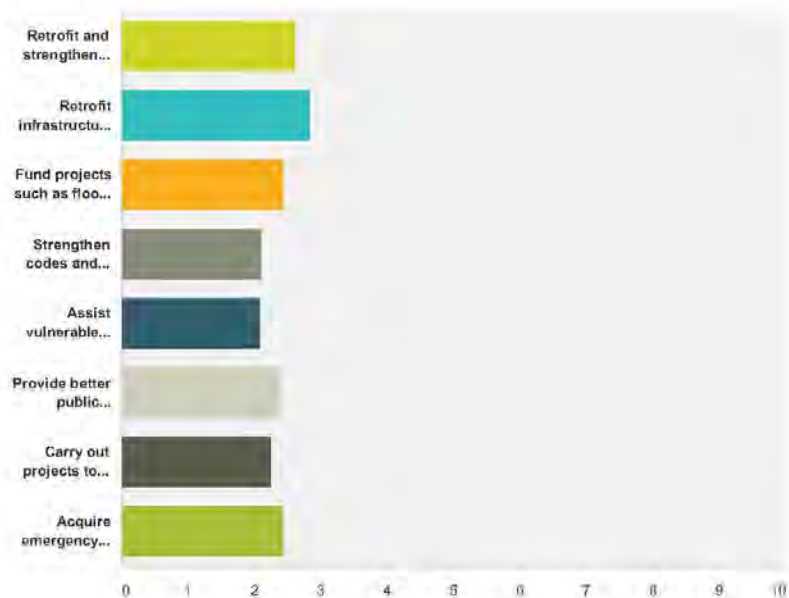


Answer Choices	Responses	
Yes	10.53%	14
No	42.11%	56
Not Sure	47.37%	63
Total		133



Q13 What protection methods do you believe the City, County, State or Federal agencies should be using in order to reduce damage and disruption from hazard events within the City of Hesperia? This information will assess community beliefs on developing hazard mitigation programs and strategies.

Answered: 133 Skipped: 0

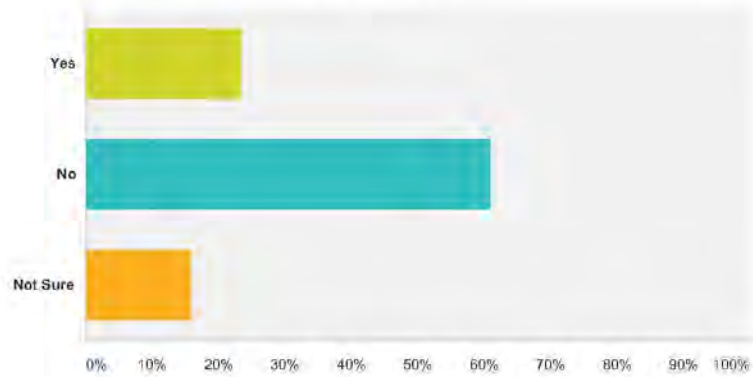


	High Priority	Medium Priority	Low Priority	Total	Weighted Average
Retrofit and strengthen essential facilities such as police and fire facilities, schools and hospitals..	69.92% 93	22.56% 30	7.52% 10	133	2.62
Retrofit infrastructure such as roads, bridges, drainage facilities, water supply, waste water and power supply facilities.	83.46% 111	16.54% 22	0.00% 0	133	2.83
Fund projects such as flood walls, drainage improvements, fuel breaks, and bank stabilization projects.	52.63% 70	39.10% 52	8.27% 11	133	2.44
Strengthen codes and regulations to include higher standards in hazard areas.	28.57% 38	53.38% 71	18.05% 24	133	2.14
Assist vulnerable property owners with securing funding for mitigation / property protection.	31.58% 42	44.36% 59	24.06% 32	133	2.08
Provide better public information about risk, and the exposure to hazards within Hesperia.	50.38% 67	38.35% 51	11.28% 15	133	2.39
Carry out projects to restore the natural environments capacity to absorb the impacts from natural hazards.	42.86% 57	40.60% 54	16.54% 22	133	2.26
Acquire emergency generators for essential government facilities and buildings identified as shelters.	55.64% 74	33.08% 44	11.28% 15	133	2.44



Q14 Do you have flood insurance?

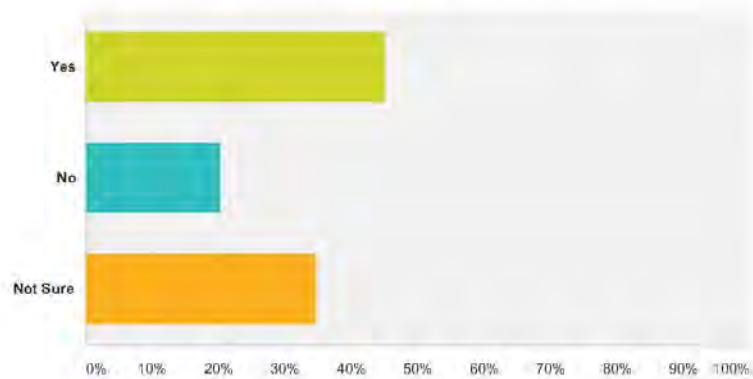
Answered: 133 Skipped: 0



Answer Choices	Responses	
Yes	23.31%	31
No	60.90%	81
Not Sure	15.79%	21
Total		133

Q15 Is your home or business located near an earthquake fault?

Answered: 133 Skipped: 0

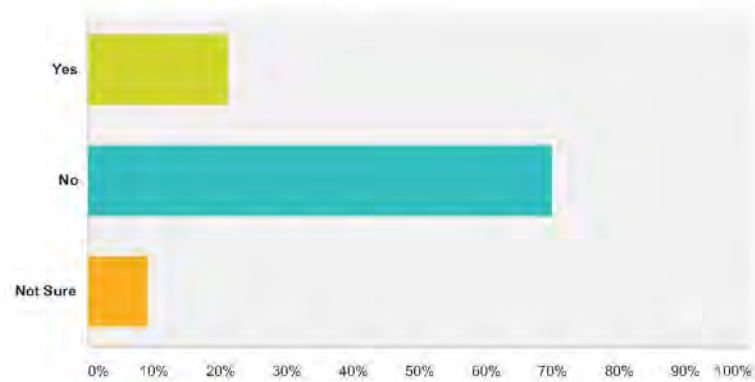


Answer Choices	Responses	
Yes	45.11%	60
No	20.30%	27
Not Sure	34.59%	46
Total		133



Q16 Do you have earthquake insurance?

Answered: 133 Skipped: 0

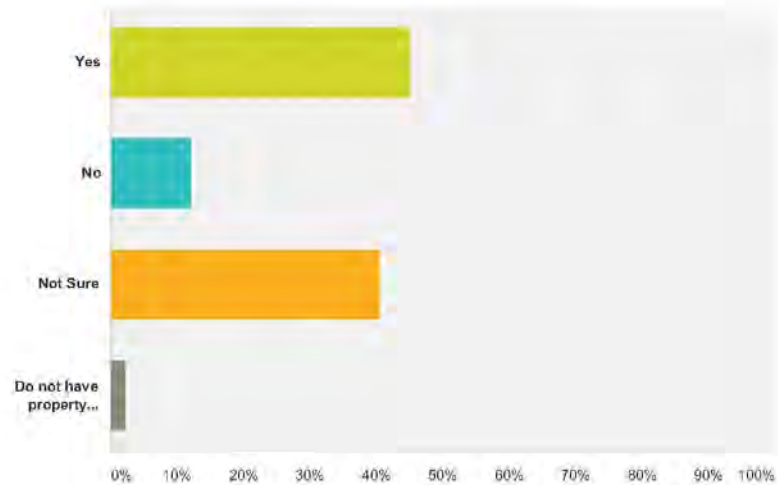


Answer Choices	Responses	
Yes	21.05%	28
No	69.92%	93
Not Sure	9.02%	12
Total		133



Q17 To the best of your knowledge, does your homeowner's, renter's, or general insurance policy provide coverage for damage from natural hazards?

Answered: 133 Skipped: 0

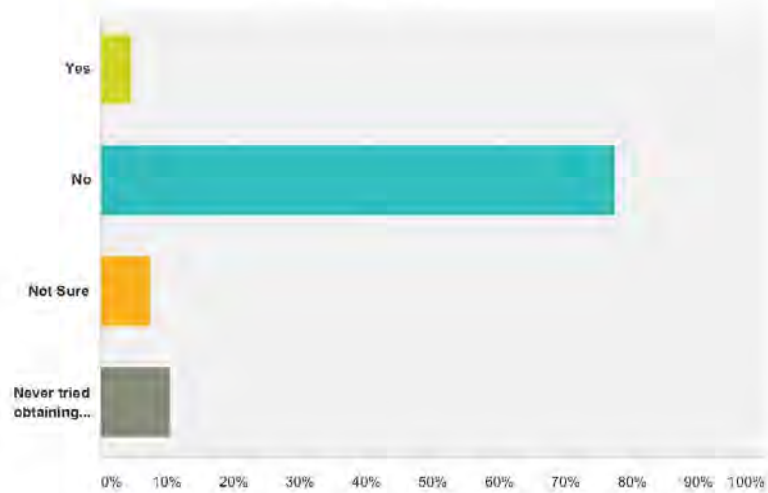


Answer Choices	Responses	
Yes	45.11%	60
No	12.03%	16
Not Sure	40.60%	54
Do not have property insurance	2.26%	3
Total		133



Q18 Have you ever had problems obtaining homeowner's or renter's insurance due to risks from natural hazards?

Answered: 133 Skipped: 0

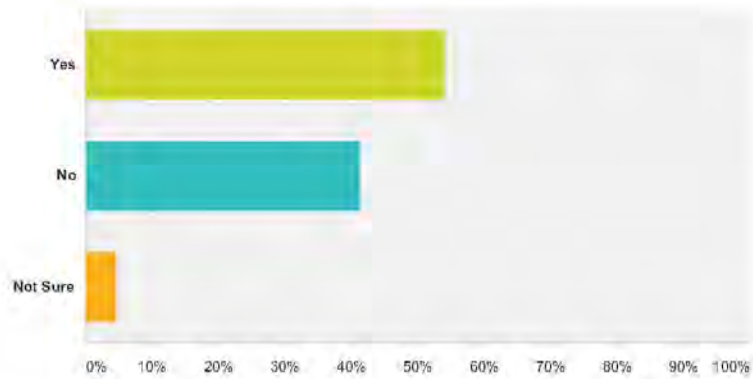


Answer Choices	Responses	
Yes	4.51%	6
No	77.44%	103
Not Sure	7.52%	10
Never tried obtaining hazard insurance	10.53%	14
Total		133



Q19 When you moved into your home, did you consider the impact a natural hazard event could have on your home?

Answered: 133 Skipped: 0

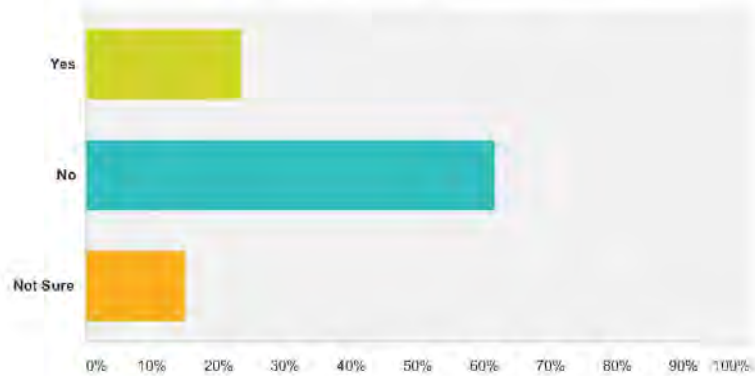


Answer Choices	Responses	
Yes	54.14%	72
No	41.35%	55
Not Sure	4.51%	6
Total		133



Q20 Was the presence of a natural hazard risk zone (for example, wild fire area or flood zone) disclosed to you by a real estate agent, seller or landlord before you purchased or moved into your home?

Answered: 133 Skipped: 0

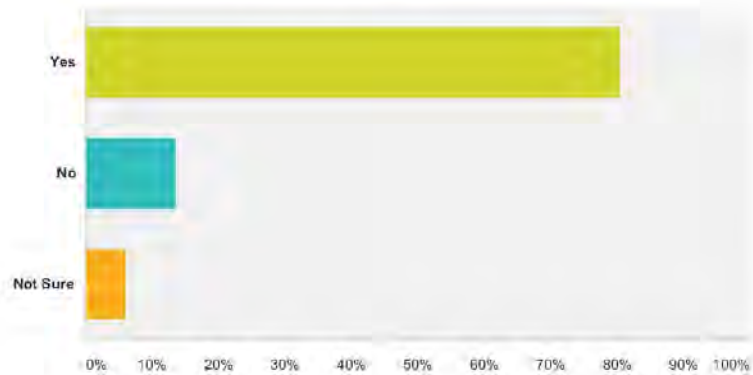


Answer Choices	Responses	
Yes	23.31%	31
No	61.65%	82
Not Sure	15.04%	20
Total		133



Q21 Would natural hazard real estate disclosures or risk information influence your decision on where to buy or rent a home?

Answered: 133 Skipped: 0



Answer Choices	Responses	
Yes	80.45%	107
No	13.53%	18
Not Sure	6.02%	8
Total		133





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Planning Team

Risk Assessment

Draft Plan

What is Hazard Mitigation?

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What is Hazard Mitigation?

The term Hazard Mitigation describes actions that communities can take to help reduce or eliminate long-term risks caused by natural disasters. Natural Hazards in Hesperia can include earthquake, flooding, wildfire, drought and extreme heat and cold. During the planning process, prioritization will be given to the hazards within the City that are most likely to occur.

Hazard mitigation planning and projects can create a safer City by reducing loss of life and property damage associated with future disasters.

As we plan for new development and improvements to existing infrastructure, mitigation can and should be an important component of the planning effort. That extra resiliency will help citizens bounce back from that worst case flood, fire or storm more quickly.

Mitigation activities can be developed before a disaster occurs, however after a disaster, hazard mitigation assessment and planning is an essential activity to prevent disaster amnesia. Oftentimes after disasters, repairs and reconstruction are completed in such a way as to simply restore damaged property to pre-disaster conditions. These efforts may "get things back the norm", but the replication of pre-disaster conditions may result in a repetitive cycle of damage and reconstruction. Hazard mitigation planning in Hesperia can break this repetitive cycle by producing less vulnerable conditions through post-disaster repairs and disaster-smart reconstruction.

With inflation and the cost of materials on the rise, constant reconstruction is a continued strain on already stressed City budgets. Hazard mitigation planning and related grant funding break the expensive cycle of damage and reconstruction by taking a long-term view of better community and land-use planning, of which citizen action is central and necessary.

What Are the Benefits?

- Reduces the loss of life, property, essential services, critical facilities and economic hardship.
- Reduces short-term and long-term recovery and reconstruction costs.
- Increases cooperation and communication within the community through the planning process.
- Increases potential for state and federal funding for pre-disaster and recovery projects within the City.

What Types of Mitigation Techniques Can Be Utilized?

- Prevention – Keep hazard risk from getting worse.
- Property Protection – Modify existing development subject to hazard risk.
- Public Education & Awareness – Inform people about potential hazards and mitigation actions.
- Natural Resource Protection – Identify the benefits of the indigenous and natural functions of the area to take advantage of the protection it provides, reduce effects of hazards & improve quality of environment.
- Emergency Services – Actions taken to ensure continuity of emergency services.
- Structural Projects – Manmade structures or improvements to control hazards.

Common mitigation actions developed by communities include the following:

- Retrofitting of structures & design of new construction, such as flood-proofing a home or building.
- Enforcement of building codes, floodplain management codes and environmental regulations.
- Public safety measures such as continual maintenance of roadways, culverts and drainage ditches.
- Acquisition of structures, such as purchasing buildings located in a floodplain.
- Acquisition of hazard prone lands in their undeveloped state to ensure they remain so.
- Protecting critical facilities and infrastructure from future hazard events.
- Mitigation, disaster recovery and Continuity of Operations (COOP) planning.
- Development and distribution of outreach materials related to hazard mitigation.
- Deployment of warning systems.

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About the Project | City of Hesperia

www.cityofhesperia.us/1309/About-the-Project

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About the Project

What is the Purpose?

The purpose of the current planning process is to update the City's existing hazard mitigation plan (HMP) last updated in 2012. The HMP will be updated by using the most current information and data, conducting a thorough vulnerability analysis, and revising community priorities and subsequent mitigation actions.

What is a Hazard Mitigation Plan?

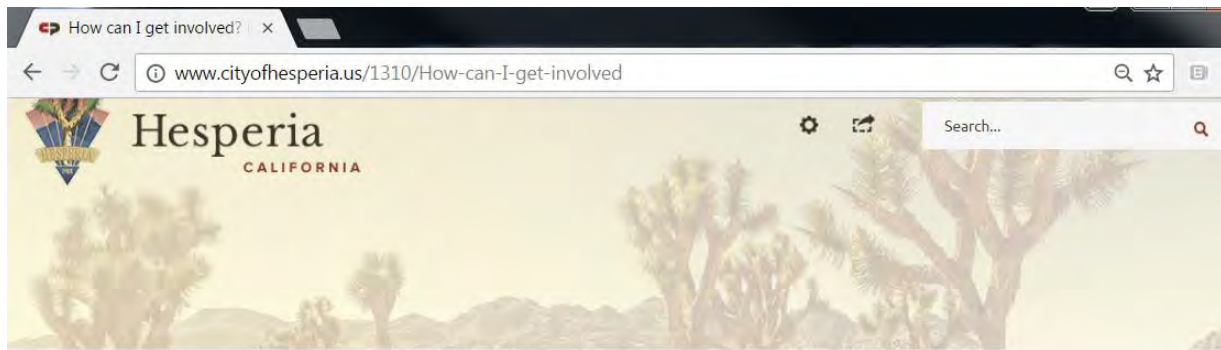
The plan is an official statement of the City's hazards, vulnerability analysis, and mitigation strategy. The result of a collaborative multi-agency and citizen planning process. As a living document, it guides implementation activities to achieve the greatest reduction of vulnerability, which results in saved lives, reduced injuries, reduced property damages and protection for the environment.

Objectives:

- Provide the public opportunities throughout the plan development and drafting process to provide input, taking special care to make the plan and outcome relevant to the impacted community.
- Update the risk assessment using the most recent disaster data and information.
- Update hazard mitigation goals, objectives and actions as they relate to reducing loss of life and property from natural and human-made hazards.
- Obtain state and federal approval of the updated plan.

Why have a Multi-Hazard Mitigation Plan?

To ensure public consensus through a planning process on mitigation actions that best suit the community. Allows communities to focus efforts and limited resources on the most highly desirable mitigation projects. The City must have a State and federally approved plan to apply for and receive mitigation grants. These grants can augment local mitigation activities already underway and future planned activities too. Ultimately, these actions reduce vulnerability and communities are able to recover more quickly from disasters.



What is Hazard Mitigation?

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How can I get involved?



[Take our quick Survey](#)

Upcoming Events

- Attend our Stakeholder Meeting January 9th from 3:00 - 4:00pm in the Police Community Room, located at 15840 Smoke Tree Street, in Hesperia across from City Hall
 - No RSVP required, all Hesperia stakeholders are welcome



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How is the Multi-Hazard Mitigation Plan Update Process Completed?

Local officials develop and adopt mitigation plans to meet the requirements of the [Stafford Act](#). The [Multi-Hazard Mitigation Planning Guidance](#) provides the official guidance on these requirements and procedures for approval of hazard mitigation plans. The six core phases below show the process to complete a mitigation plan.

PHASE 1: Organize Resources

Relevant studies, plans, and reports are collected along with communications resources that allow the public to be involved throughout the planning process. A HMP Planning Team is "built" that consists of local emergency management, planning staff, residents, business, property owners, and tenants in the floodplain and other known hazard areas, as well as other stakeholders in the community (such as business leaders, civic groups, academia, non-profit organizations, major employers and other interested parties).

PHASE 2: Assess Risks

Location and geographic extent of natural and human-made hazards that can affect the City along with their impacts and future probability is identified. Scientific and anecdotal evidence of past events is collected and evaluated the losses the community has sustained and hazards are ranked high to low.

PHASE 3: Update the Mitigation Strategy

City capabilities in emergency management, the National Flood Insurance Program (NFIP), planning and regulatory authority, administrative and technical knowledge, finances, and politics are assessed. Based upon capabilities and the risk assessment a prescription of hazard mitigation activities will be explained and developed. During this phase existing goals, objectives, and actions are evaluated and updated as needed. The HMP Planning Team defines appropriate mitigation techniques, and chooses and prioritizes mitigation actions and projects in the Mitigation Action Plan.

PHASE 4: Implementation and Maintenance Strategy Development

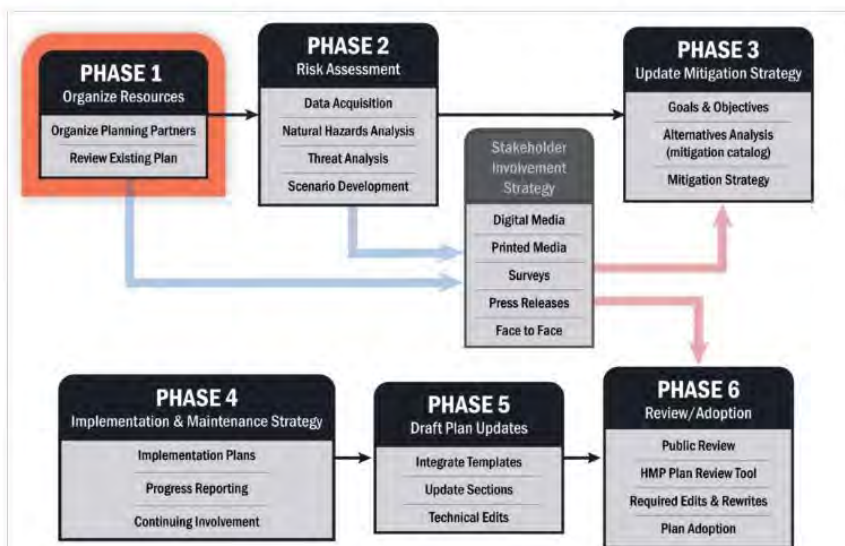
The HMP is a living document that must be regularly reviewed, updated, and maintained. A schedule including responsible parties or agencies involved with monitoring, evaluating, and updating the plan during its five-year cycle is prepared. A process for integrating the updated Mitigation Strategy into existing plans and reports should be outlined and a plan for continued public outreach and participation must also be determined.

PHASE 5: Draft the Plan (Cal OES Submittal)

Once the Risk Assessment and mitigation strategy is updated, the HMP Planning Team will update all information, data, and associated narratives into an Administrative Draft HMP and will prepare all sections in accordance with DMA 2000, FEMA's 44 CFR Part 201 and 206, and any new HMP Guidance from Cal OES hazard mitigation reviewers.

PHASE 6: Plan Review and Adoption

The Draft HMP Update is made available for public comment then submitted to the California Emergency Management Agency and the Federal Emergency Management Agency for review and approval. Once the HMP Update has been determined to meet all state and federal requirements and receives official approval it will be adopted by the City.





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Planning Team

The planning team consists of City project managers and a HMP Planning Committee. The HMP Planning Committee consists of local emergency managers, health officials, fire department staff, planning staff, as well as other stakeholders in the community. In addition to interested residents, the following agencies and departments are involved or supporting HMP Update process:

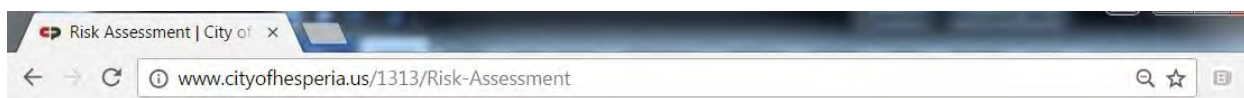
- City Managers Office
- City Planning Division
- City Engineering Division
- City Public Works Division
- San Bernardino County Fire
- San Bernardino County Sheriff

Planning Committee

In addition to stakeholder input, a HMP Planning Committee comprised of staff from City Manager's Office, Planning and Engineering Divisions are used to guide the process and ensure the mitigation plan meets the goals of the City, State and Federal Hazard Mitigation Plan requirements. The Planning Committee:

- Attends/actively participates in a series of structured coordination meetings
- Assists in the collection of valuable local information and other requested data
- Makes decisions on plan process and content
- Identifies mitigation actions for the HMP
- Reviews/provides comments on plan drafts
- Coordinates/participates in public input process





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Risk Assessment

In accordance with FEMA requirements, risk assessment planning process identifies the natural hazards affecting the City and assesses the vulnerability from the identified hazards. Results from this phase in the planning process will form the foundation for the subsequent mitigation actions for reducing risk and potential losses in the City.

Hazard Identification

The risk assessment begins with the identification of hazards which could potentially affect the City. During the plan update process we re-establish information about prevalent natural hazards and prepare a preliminary list of hazards based upon the City's HMP, stakeholder input, and other documentation. The preliminary hazard list of for HMP update includes:

- Earthquake
- Flooding
- Wildfire
- Drought
- Dam Failure
- Extreme Heat
- Terrorism

Large regional incidents have affected the City; most recently the Blue Cut Fire.

The fire, fueled by winds that reached 20-30 mph, quickly spread, burning more than 36,274 acres in total. Flames destroyed 105 homes and 216 minor structures. Mandatory evacuations were ordered affecting 82,000 residents across several neighborhoods. Two firefighters were injured and briefly hospitalized for minor injuries after becoming trapped while protecting homes in Swarthout Canyon. The fire burned for eight days before full containment was reached.

Hazard Profiling

The HMP Planning Committee worked with the City departments and other jurisdictions to re-establish profiles for the updated Hazard Mitigation Plan. Hazard profiles provide a standardized method to explain each hazard in terms of:

- Definition
- Regulations / Policies
- Location/Extent
- Magnitude/Severity
- Probability of Future Occurrences

During the hazard profiling process we review and assess existing plans, studies, other technical reports, and create hazard maps with newly acquired data and share them with stakeholders and the public to determine if the hazards identified are still valid. The project management team will update the hazard profiles to reflect any new hazard events since the 2012 HMP and provide information in a FEMA preferred / required hazard profile format.





Draft Plan | City of Hesperia

www.cityofhesperia.us/1314/Draft-Plan

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Once the Risk Assessment and mitigation strategy are updated, the HMP Planning Team will update all information, data, and associated narratives into an Administrative Draft HMP and will prepare all sections in accordance with DMA 2000, FEMA's 44 CFR Part 201 and 206, and any new HMP Guidance from Cal OES hazard mitigation reviewers. Plan Sections will include:

Bullet Point Sections:

- Intro
- Community Profile
 - Geography/Environment
 - Community Facts
 - Population and Demographics
 - Land Use/Development Trends
- What's New
- Planning Process
- Risk Assessment
- Mitigation Strategy
- Plan Maintenance

To assist the City with future plan maintenance and implementation activities the HMP Project Managers will review monitoring, evaluation, and updating activities undertaken since the approval of the 2012 HMP and incorporate this information into section of the document called "What's New".

The HMP Planning Process Section will be updated to include the review and analysis of the previous 2012 HMP, the HMP Planning Committee and public involvement results, and review/incorporation of previous studies, plans, technical documents, distribution list of HMP recipients etc.

The Risk Assessment and Mitigation Strategy sections will be updated to include new analysis, updated mitigation measures that reflect current problems and the City's capabilities to address those problems.

The Plan Maintenance Section will include new maintenance procedures for scheduled monitoring, evaluating, and updating the HMP based upon stakeholder engagement and defined reporting roles.

The plan will also include easy to use forms the HMP Planning Committee can use to document their annual meetings, review the HMP each year, and documents changes made to mitigation actions, and/ or public outreach completed.

Appendices will include all documentation compiled to support the planning process throughout. Once all sections are completed, The HMP Planning Team will compile the plan into an Administrative Draft HMP and submit to the HMP Planning Committee for review. After the two-week City Review Period, the HMP Planning Team will incorporate any comments to prepare the Public Review Draft.

Plan Review and Revision

Once the Public Review Draft is completed, it will be available for public review and comment on the City's Hazard Mitigation page and hard copies available upon request through the City Clerks Office.

After the public review and comment period, the Planning Team will compile all comments received on the Public Review Draft for inclusion as an Appendix item and revise the HMP, as necessary. The HMP Planning Team will finalize the HMP and complete the new FEMA Plan Review Tool Reference Document and submit the plan to Cal OES for State review and approval. Once approved at the State level, Cal OES will provide the submittal to FEMA Region IX requesting federal approval.

Important to Note: *The state and federal approval process could take more than 60 Days depending on availability of review staff.*

Plan Adoption and Submittal

Once Cal OES and FEMA approval is received, the HMP Project Management Team will prepare the final HMP for review by the City and will complete any resulting revisions required and prepare the Final HMP adoption. After HMP adoption, the City will compile supporting documentation (e.g., official resolution) as part of the Final Draft to be distributed to Planning Committee members, as well as all required local, state, and federal agencies.



Appendix C Plan Maintenance

C.1 Blank Mitigation Action Implementation Plan Form

C.2 Blank Mitigation Action Reporting Forms

C.3 Blank Annual HMP Review Questionnaires



C.1 Blank Mitigation Action Implementation Plan Form

Action x.x.x	
Implementing Agencies	
Lead Agency (ies):	
Roles and Responsibilities:	
Support Agency (ies):	
Roles and Responsibilities:	
Preliminary Identified Tasks:	
1.	
2.	
3.	
Implementation Costs	
Estimated Capital Costs:	
Estimated Maintenance Costs:	
Implementation Resources	
Financial Resources (Funding):	
Technical Assistance Resources:	
Required Equipment, Vehicles, and Supplies	
Office Supplies	
Vehicles	
Implementation Timeframe	
Estimated Mitigation Action Start Date:	
Estimated Mitigation Action Completion Date:	



C.2 Blank Mitigation Action Reporting Form

Your jurisdiction may wish to use these mitigation actions reporting forms on an annual, semiannual, or quarterly basis.

Progress Report Period: _____ to _____
(date) (date)

Project Title: _____ Project ID# _____

Responsible

Agency: _____

Address: _____

City: _____

Contact

Person: _____

Phone#: _____ Email address: _____

List Supporting Agencies and

Contacts: _____

Total Project

Cost: _____

Funding

Source: _____

Anticipated Cost

Overrun/Underrun: _____

Date of Project Approval: _____ Start date of the project: _____

Anticipated completion date:

Description of the Project (include a description of each phase, if applicable, and the time frame for completing each

phase): _____



<i>Milestones</i>	<i>Completed (✓)</i>	<i>Projected Date of Completion</i>

MHMP Goal Addressed: _____

Indicator of Success: _____

Project Status:

☐ *Project on schedule* ☐ *Cost unchanged*

☐ *Project completed* ☐ *Cost overrun**

☐ *Project delayed**

**explain* _____

☐ *Project cancelled**

**explain* _____

Summary of progress on project for this report:

A. What was accomplished during this reporting period?

B. What successes have you encountered, if any?

C. What obstacles, problems, or delays have you encountered, if any?

D. How was each problem resolved?

E. Based on the past experiences (successes and obstacles), what changes, if any, need to be made to ensure completion?

Next Steps: *What are the next step(s) to be accomplished over the next reporting period?*



C.2 Blank Annual HMP Review Questionnaire

Plan Section	Questions	Yes	No	Comments
Planning Process	Have there been staffing changes that would warrant inviting different members to the planning team?			
	Are there procedures that can be done more efficiently?			
	Are there any representatives of essential organizations who have not fully participated in the planning and implementation of actions? If so, can someone else from this organization commit to the implementation team?			
	Has the committee undertaken any public outreach activities regarding the HMP or implementation of mitigation actions?			
Hazard Profiles	Has a natural and/or human-caused disaster occurred in this reporting period?			
	Are there natural and/or human-caused hazards that have not been addressed in this HMP and should be?			
	Are additional maps/data or new hazards studies available? If so, what have they revealed?			
Vulnerability Analysis	Do any new critical facilities or infrastructure need to be added to the asset lists?			
	How will the vulnerability analysis be affected by additional maps/data or new hazard studies?			
	Have there been changes in development patterns that could influence the effects of hazards or create additional risks?			
	Has the vulnerability analysis changed as a result of the implementation of mitigation actions?			
Mitigation Strategy	Are there different or additional resources (financial, technical, and human) that are now available for mitigation planning?			
	Is the goal still applicable?			
	Should new mitigation actions be added to the Mitigation Action Plan?			
	During implementation of the mitigation actions, what has proven effective? What has proven not effective?			
	Do existing mitigation actions listed in the Mitigation Action Plan need to be reprioritized deleted, or revised?			
	Are the mitigation actions listed in the Mitigation Action Plan appropriate for available resources?			
Planning Mechanisms	Has the Litigation Action plan been incorporated into existing planning mechanisms?			
	Has the Mitigation Action plan incorporated existing plan mechanisms?			