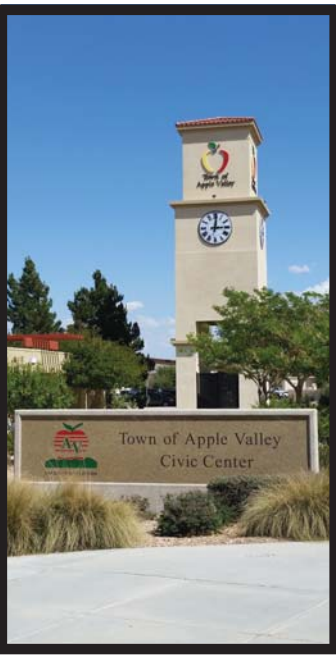
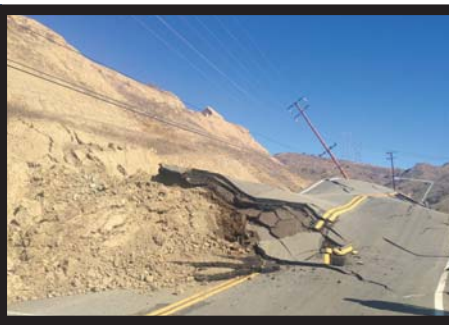
Town of Apple Valley

Town of Apple Valley

LOCAL HAZARD MITIGATION PLAN

2017 PLAN UPDATE





This Hazard Mitigation Plan was created by the Town of Apple Valley's Office of Emergency Preparedness. This document can be viewed at www.ReadyAppleValley.org. For additional information regarding the creation of this document call 760-240-7000.

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Section 1. Introduction

Natural disasters cause death and injuries, as well as significant damage to our communities, businesses, public infrastructure, and environment. The impacts of these damages result in the displacement of people and tremendous costs due to response and recovery dollars, economic loss, and burden. The Town of Apple Valley (Apple Valley) Local Hazard Mitigation Plan (LHMP) is an effort undertaken by the Town to mitigate the effects of natural hazards and return to "the norm" sooner, with fewer impacts to people and infrastructure.

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.

After disasters, repairs and reconstruction are often completed in such a way as to simply restore to pre-disaster conditions. Such efforts expedite a return to normalcy; however, the replication of pre-disaster conditions results in a cycle of damage, reconstruction, and repeated damage. Hazard mitigation ensures that such cycles are broken and that post-disaster repairs and reconstruction result in increased resiliency for Apple Valley residents, business owners and city officials.

1.1 Your Jurisdiction

The Town of Apple Valley is located in the heart of the Victor Valley in the County of San Bernardino. In a region known as the High Desert. Apple Valley is strategically located 35 minutes north of the Inland Empire, along Interstate 15. The Town has 78 square miles in its incorporated boundaries, and a sphere of influence encompassing 200 square miles. 2015 census data list Apple Valley with a population of 71,107 residents.

1.2 Purpose of the Plan

Each year in the United States, natural disasters take the lives of hundreds of people and injure thousands more, as well as destroy or severely damage existing buildings, structures, infrastructure, and other facilities. Nationwide, taxpayers pay billions of dollars annually to help communities, organizations, businesses, and individuals recover from disasters. Many disasters cause extreme burden to city governments and small communities throughout California.

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 the Town of Apple Valley. 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.

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 San Bernardino County,

Town of Apple Valley 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, Apple Valley will become 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.

1.3 Authority

In 2000, FEMA adopted revisions to the Code of Federal Regulations. This revision is known as the "Disaster Mitigation Act (DMA)." DMA 2000, Section 322 (a-d) requires that local governments, as a condition of receiving federal disaster mitigation funds, have a Hazard Mitigation Plan (HMP) that describes the process for assessing hazards, risks and vulnerabilities, identifying and prioritizing mitigation actions, and engaging/soliciting input from the community (public), key stakeholders, and adjacent jurisdictions/agencies.

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.

1.4 Community Profile

This section is to provide a broad perspective, brief history and describes the makeup and development of the community.

1.4.1 Physical Setting

The Town of Apple Valley is located in the Mojave Desert of the County of San Bernardino, at an elevation of 3,000 feet. In a region known as the High Desert, Apple Valley consists of 78 square miles in its incorporated boundaries and a sphere of influence encompassing 200 square miles. The Town borders Interstate 15 to the north, Joshua Road to the east, the foothills of the San Bernardino Mountains to the south, and the Mojave River to the west.

Apple Valley is primarily desert-rural and consists of a typical mountain-and-basin topography with sparse vegetation. The natural geographic vulnerabilities are: Mojave River, San Bernardino Mountains, Dry Lake Bed, and the Desert Knolls area (generally an area with a slope greater than 15%).

Apple Valley experiences an average of 350 days of sunshine per year with summer temperatures ranging from 40 degrees Fahrenheit (F) to 110 degrees F., and winter temperatures dipping down to low 20 degrees F. to a high of 70 degrees F. Prevailing winds range from 5-20 knots/hour from the south/southwest to the northeast.

The Mojave River rises in the San Bernardino Mountains at the Lake Silverwood and Mojave River Forks Reservoirs. The River runs in a northerly direction the entire length of the Town's western boundary. Due to the porous soil and rapid evaporation, the River is primarily dry in the area adjacent to Apple Valley. A flow of water is present during major rains

and upon release of water from Lake Silverwood (contained by the Cedar Springs Dam and Mojave Dam).

The Town of Apple Valley also contains a 1,870 acre dry lake bed area. This area and the area along the Mojave River is part of the 100 Year Flood Area (Flood Zone A).

Figure 1-1: Regional Setting

Source: www.applevalley.org 2015

1.4.2 History

The Town of Apple Valley was incorporated in 1988; however, its history goes back much further. Local historians have found signs of Serrano Indian camps along the Mojave River in Apple Valley. They were already there when Father Francisco Garces arrived in 1776, as he established the Spanish missions throughout California. In the late 1800s, the Paiute Indians also migrated to this area. The Mojave River Trail hosted trappers, gold prospectors, pack mules and Mormon wagon trains—over 13,000 people passed through the area between 1849 and 1859. It was in 1860 that the first cabin was built in Apple Valley by Silas Cox, and the first road was cut the following year.

There are many stories as to how Apple Valley acquired its name. According to the late Mary Hampton, local historian, the name arose from the abundance of apple orchards that existed there in the 1920s. Some say the name "Apple Valley" originated from The Appleton Land Company that was based in this area in the early 1900s. Ursula Poates, one of the first settlers in the area, is credited with saying, "There were some apples being raised along the river in those early days, but

not by the ton, so I just cut it down and called it Apple Valley!" By 1920, apples were being grown by the ton at award-winning orchards. Unfortunately, with the Great Depression and the cost of pumping water for irrigation, the orchards died off in the 1930s.

With a pleasant climate and lots of land, many types of ranches were built in the area. They touted the dry desert air as a cure for ailments of all sorts, including tuberculosis and asthma. Other ranches provided a haven for shell-shock victims of World War I, while still others developed into guest ranches. People would come to Apple Valley to enjoy the western lifestyle where they could ride horses, attend rodeos and just get away from the big city.

The modern founders of Apple Valley were Newton T. Bass and B.J. "Bud" Westlund, who were partners in the oil and gas industry in Long Beach, CA. Westlund and Bass formed the Apple Valley Ranchos Land Co. in 1946 and marketed the area as a destination resort and quality residential community - "The Golden Land of Apple Valley". They built the Apple Valley Inn and Hilltop House, and invited famous celebrities of Hollywood to come visit. Within ten years there were banks, churches and a school, along with a golf course, hospital and 180 businesses.

1.4.3 Climate

The climate of Apple Valley is characterized by hot dry summers, mild winters and little rainfall. In summer, temperatures often reach above 100 degrees Fahrenheit (F). Winter temperatures are usually mildly cold but sometimes fall below 30ºF.

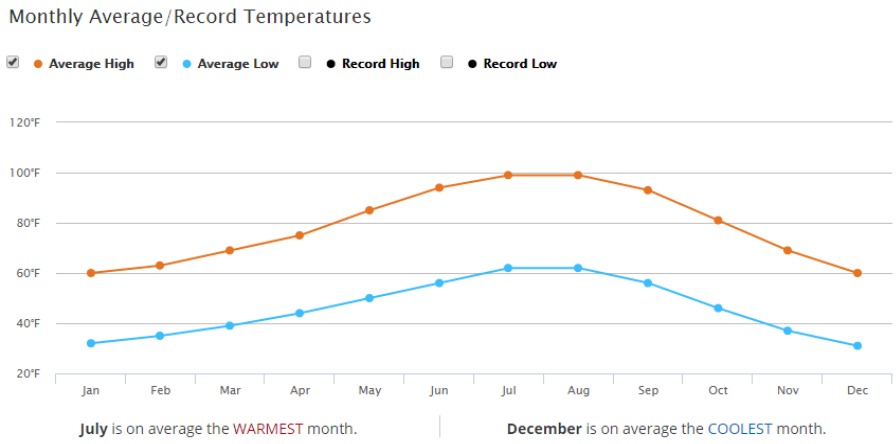

Figure 1-2: Weather.com/2016

Precipitation generally occurs in mid to late winter months (December to February). Average total annual precipitation for the area averages 6.2 inches (in), with most rainfall occurring in November to March (Weather.com 2016).

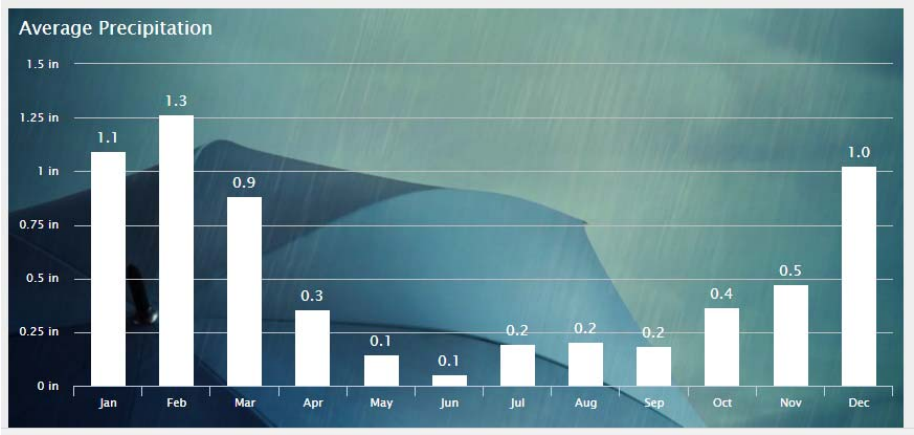

Figure 1-3: Weather.com/2016

1.4.4 Demographics

San Bernardino County has been designated as a Coastal County within the State of California. The number of Americans residing in a coastal county passed the 159 million mark in 2010, making the coastal population larger than the entire U.S. population in 1950. Today, more than half of the U.S. population lives in a coastal area (as defined by the National Oceanic and Atmospheric Administration - NOAA), even though the 673 coastal counties constitute only about one fourth of the country's landmass.

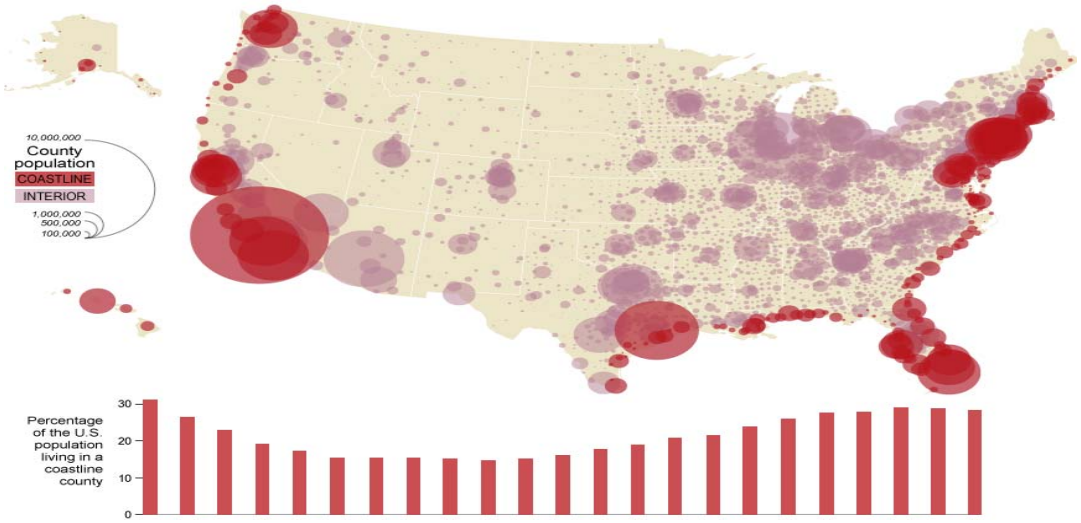

Figure 1-4: U.S. Census Bureau

As indicated by the map prepared by the U. S. Census Bureau, San Bernardino County is designated as a Coastal County within the State of California. Particular data exists demonstrating the effects of various types of risks within the county. It is important to use this information as a source point for evaluating the various risks that prevail not only in San Bernardino County, but the Town of Apple Valley.

The growth in population of coastal areas illustrates the importance of emergency planning and preparedness for areas that are more susceptible to inclement weather conditions. The U.S. Census Bureau's official population estimates, along with annually updated socioeconomic data from the new American Community Survey, provide a detailed look at the nation's growing coastal population. Emergency planners and community leaders can better assess the needs of coastal populations using census data.

In 2010, the Town of Apple Valley had a population of 69,135 and that population has increased to 71,107 in 2015, with a median age of 37.5 and an average household size of 2.90.

Table 1-1: ESRI 2015; Opportunity High Desert 2015 Brochure

Demographic Overview	
Current population (2015):	71,107
Current regional population (2015) :	443,000
Avg. Household Size (2015) :	2.90
Median Age (2015):	37.5
Home Ownership (2015):	61%
Total Households (2015):	24,332
*** Regional population estimate is based on a total of Victorville, Hesperia, Apple Valley, and Adelanto populations; unincorporated areas are not included in this estimate.**	

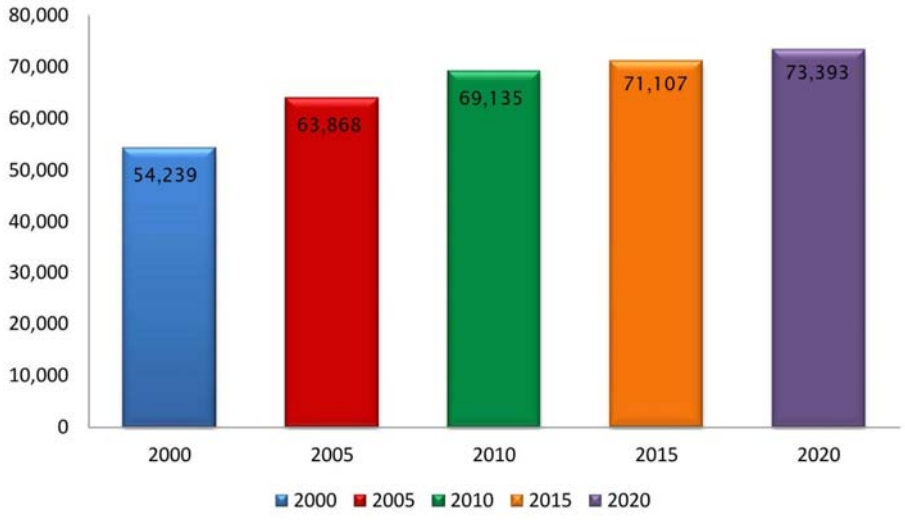

Figure 1-5: Historic and Projected Population Estimates

Source: *Demographics Town of Apple Valley 2015*

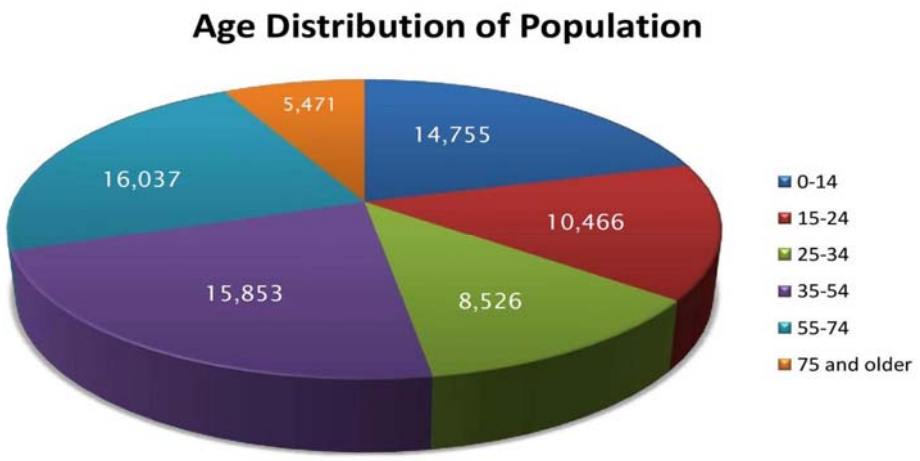

Figure 1-6: Demographics Town of Apple Valley 2015

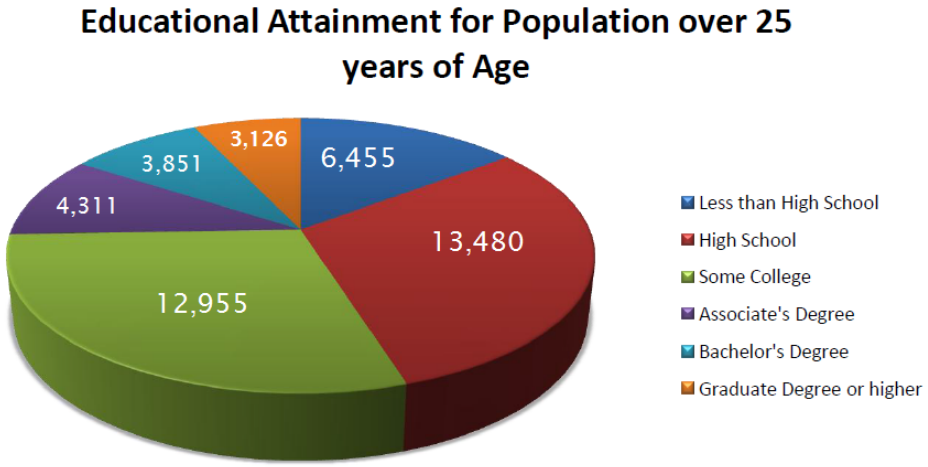

Figure 1-7: Demographics Town of Apple Valley 2015

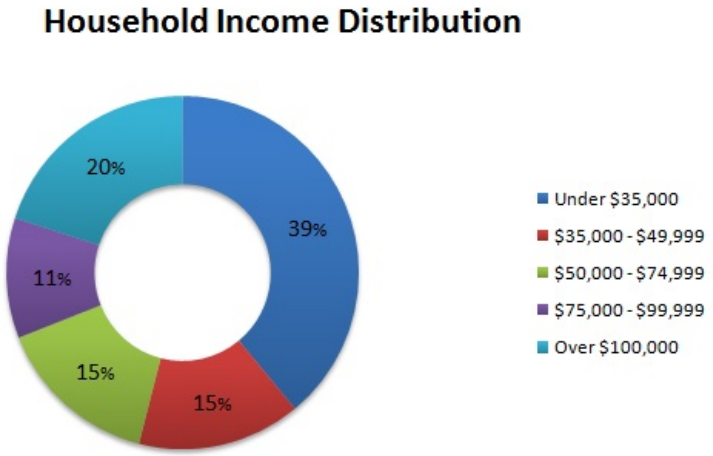

Figure 1-8: Demographics Town of Apple Valley 2015

Table 1-2: Income Level

Per Capita (2015)	Median Household (2015)	Average Household (2015)
$21,614	$45,554	$62,760

Source: U.S. Census Bureau, Census 2010 Summary File 1; ESRI forecasts for 2015

1.4.5 Existing Land Use

The land use types in Apple Valley are all related to a single, over-arching concept: that Apple Valley's quality of life is tied to its rural character, and that this character is to be preserved and protected for the long term health of the community. In Apple Valley "rural" means space -- unscarred mountains and vistas of desert valleys, neighborhoods of large lots where keeping horses is allowed, an extensive multi-use trail system, and landscaping consistent with the desert environment. The land use designations established in this General Plan are provided below.

Very Low Density Residential (R-VLD; 1 dwelling unit per 5 or more gross acres): This land use designation allows detached single family homes on lots of at least five gross acres. Multi-use trails should be integrated into all new projects in this designation, as appropriate. Also permitted are agricultural and ranching activities, animal keeping (both personal use and commercial) and home occupations. May be appropriate for bed and breakfast and similar uses, and animal-keeping or agricultural-related commercial enterprises, such as feed stores, commercial stables and similar uses with approval of a conditional use permit.

Low Density Residential (R-LD; 1 dwelling unit per 2.5 to 5 gross acres): This land use designation allows detached single family homes on lots of two and a half to five gross acres. This designation provides for the rural and suburban environment. Multi-use trails should be integrated into all new projects in this designation, as appropriate. Also permitted are agricultural and ranching activities, animal keeping (both personal use and commercial) and home occupations. May

be appropriate for bed and breakfast and similar uses, with approval of a conditional use permit.

Estate Residential (R-E; 1 dwelling unit per 1 to 2.5 gross acres): This land use designation allows detached single family homes on lots of one to two and a half gross acres. Access on local roads in new subdivisions within this designation should be paved. Multi-use trails should be integrated into all new projects in this designation, as appropriate. Animal keeping for personal use, ranching activities and home occupations are appropriate land uses in this designation. May be appropriate for bed and breakfast and similar uses, with approval of a conditional use permit.

Estate Residential ¾ (R-E 3/4; 1 dwelling unit per 0.75 to 1.0 net acre): This land use designation is specifically designed for animal keeping. Multi-use trails should be integrated into all new projects in this designation, as appropriate. Animal keeping for personal use, ranching activities and home occupations are appropriate land uses in this designation. Centralized stables, corrals, show rings and similar facilities, available to all residents of a development project are encouraged. May be appropriate for bed and breakfast and similar uses, with approval of a conditional use permit.

Single Family Residential (R-SF; 1 dwelling unit per 0.4 to 0.9 net acre): Lots in this designation must be a minimum of 18,000 square feet net, and may range to 39,200 square feet. This designation is intended to be composed of planned subdivisions with all utilities and public services. Animal keeping is permitted on lots zoned Equestrian Residential in the Development Code. Multi-use trails should be integrated into all new projects in this designation, as appropriate.

Medium Density Residential (R-M; 4 to 20 dwelling units per net acre): This designation is intended to promote a wide range of higher density residential units, including: single family attached; and multi-family units, including condominiums, townhomes and apartments. Projects restricted to senior citizens (age 55 and older) and providing various levels of care are also appropriate in this designation. Single family detached units are only permitted on lots of 18,000 square feet or greater in the Mountain Vista Estates area, as defined in General Plan Program 2.G.1. On all other lands designated Medium Density Residential within Town limits, single family detached units are prohibited. This land use designation should be a buffer between less intense residential designations and commercial or industrial designations, or major roadways. Future projects should be located in close proximity to commercial services, public transit and schools.

Mobile Home Park (MHP; 5-15 units per acre): This designation is applied to mobile home parks that existed upon adoption of this General Plan. New mobile home parks would be required to file a General Plan Amendment and Change of Zone to assign this designation to the project. This designation applies to mobile home parks and mobile home subdivisions. Home occupations and recreational facilities and amenities associated with the mobile home use are also appropriate in this designation.

Mixed Use (M-U): The land use designation has been created to allow for the development of projects that include residential and retail and office commercial development in an integrated, master planned project. Residential development should occur over commercial development, or within a commercial complex (i.e. residential building abutting a commercial building). Residential development must occur at a density of 4 to 30 units per acre. Mixed Use projects are encouraged in The Village, on major roadways, and in close proximity to employment centers, such as the North Apple Valley Industrial Specific Plan area. Projects that propose residential parcels adjacent to commercial parcels, and do not truly integrate the land uses, will not qualify for this designation. The minimum size for a Mixed Use project is 1 acre.

Office Professional (O-P): This designation allows professional offices, and is intended to act as a buffer between General Commercial and residential land uses. This designation encourages high quality professional services with only ancillary retail commercial components. There is no minimum size for project sites in this designation, but assemblage of smaller parcels is encouraged.

General Commercial (C-G): This designation allows a broad range of retail uses, as well as office and service land uses. Typical uses will serve the needs of the Town's residents and businesses, in a shopping center setting. General retail stores, including all types of consumer goods, furniture and appliance sales, auto repair and sales are permitted in this designation. Restaurants, both sit-down and fast food, gasoline service stations and general office (secondary to retail uses) are also permitted in this designation. There is no minimum size for project sites in this designation, but assemblage of smaller parcels is encouraged.

Service Commercial (C-S): This designation is assigned to lands in The Village, and is intended as a transition designation allowing commercial and industrial land uses on a smaller scale. Its location in an established area of Town necessitates flexibility in development standards, due to existing development and infrastructure constraints. Land uses in this designation include vehicle sales and service; lumber, home repair and building supply, general retail, warehousing and manufacturing uses completely contained within an enclosed structure. There is no minimum size for project sites in this designation, but assemblage of smaller parcels is encouraged.

Regional Commercial (C-R): This land use category allows retail uses that serve not only the residents and businesses of Apple Valley, but also of the surrounding region. Permitted uses in this designation include auto malls, regional malls, business parks, factory stores and outlets, entertainment commercial, hotels and motels, restaurants, institutional and public uses. The minimum size for a Regional Commercial project site is 10 acres.

Planned Industrial (I-P): This land use designation allows high quality, non-polluting industrial land uses, either as free-standing uses or as part of master planned industrial parks. Uses permitted include warehousing, light manufacturing, research and development and administrative facilities. The minimum size for a Planned Industrial project site is 5 acres.

Public Facility (PF): This land use designation is assigned to public and quasi-public land uses, including Town Hall and other Town facilities, fire stations, schools, facilities of the County, State and federal government, water and sewer district, and utility substations and facilities. There is no minimum size in this land use designation.

Open Space (OS): This land use designation is applied to natural and active open space areas, including the knolls, Bell and Fairview Mountains, the Mojave River, lands owned by Town, County, State and federal agencies for the purposes of recreation or conservation, and golf courses, parks or other recreational facilities.

Mineral Resources (MR): This land use designation is applied to lands in active mining operations. One such operation exists in Town at the present time, located near Interstate 15. This land use designation allows mining operations permitted by the State for lands with significant deposits of concrete aggregate.

Specific Plan: This designation is applied to lands on which a specific plan has been approved by the Town Council. The Specific Plan must conform to State law, and include maps and text that establish the land use designations; standards and guidelines for development; infrastructure requirements; and phasing for the specific plan area.

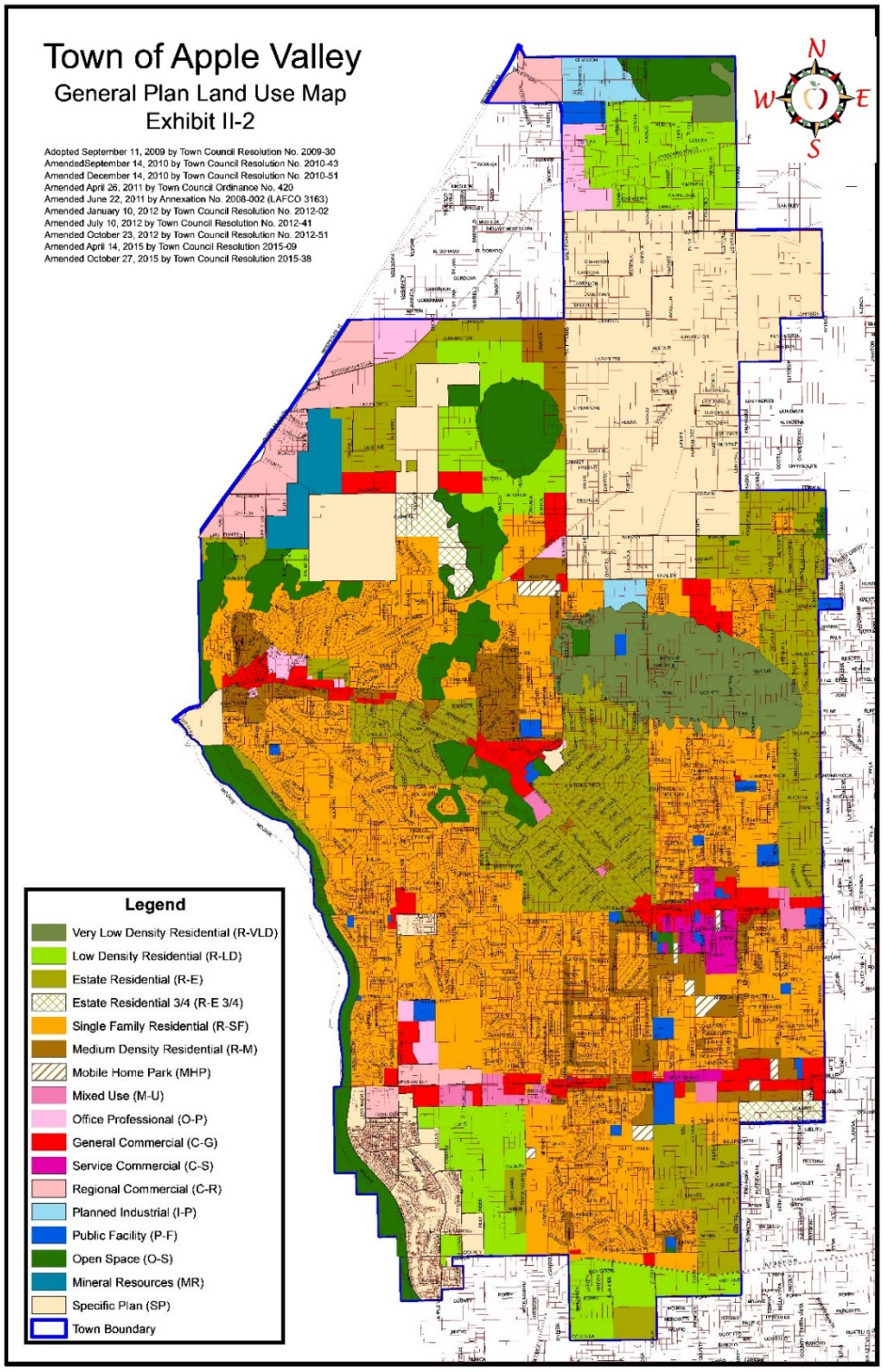

Figure 1-9: 2015 Land Use Map, Exhibit II-2

Source: Town of Apple Valley General Plan

1.5 Build Out Statistics

The Town consists of a total of 50,532 acres, of which 46,948.3 acres were within the Town limits prior to the addition of the two annexation areas. 3,583.2 acres were added as part of Annexations 2008-001 and 2008-002. The acreage, by land use designation, is shown in Table 1-3 & 1-4, below.

Table 1-3: Statistical Summary of Land Uses (2008 Town Limits)

Land Use Designation	Developed Acres	Vacant Acres	Total Acres
Residential Land Uses			
Very Low Density Residential (1 du/5 or more gross ac)	212.0	1,749.5	1,961.5
Low Density Residential (1 du/2.5 - 5 gross ac)	450.7	3,071.7	3,522.4
Estate Residential (1du/1 – 2.5 gross ac)	3,308.2	3,308.0	6,616.3
Estate Residential ¾ (1 du/0.75 – 1 ac)	26.1	449.6	475.7
Single family Residential (1 du/0.4-0.9 ac)	8,811.2	3,770.7	12,581.9
Medium Density Residential (4- 20 du/ac)	826.2	1,057.0	1,883.1
Mobile Home Park (5-15 du/ac)	178.5	1.5	180.0
Mixed Use	90.8	229.7	320.5
Specific Plan	1,359.0	5,653.7	7,012.7
Total Residential Uses	**15,262.7**	**19,291.5**	**34,554.2**
Commercial Land Uses			
Mixed Use[1]	90.8	229.7	320.5
General Commercial	480.3	1,066.5	1,546.8
Regional Commercial	99.6	1,203.3	1,303.0
Service Commercial	152.4	179.2	331.6
Office Professional	64.7	546.7	611.3
Specific Plan/Commercial[1]	1,359.0	5,653.7	7,012.7
Specific Plan/Industrial[1]	1,359.0	5,653.7	7,012.7

Land Use Designation	Developed Acres	Vacant Acres	Total Acres
Total Industrial Uses[1]	**21.4**	**623.9**	**645.3**
Other Land Uses			
Public Facility	330.2	132.0	462.2
Open Space	291.2	2,796.4	3,087.5
Mineral Resources	129.4	323.2	452.5
Street Rights-of-Way	2,771.1	1,182.8	3,953.9
Total Other Land Uses	**3,521.8**	**4,434.4**	**7,956.2**
Grand Total	**19,602.8**	**27,345.5**	**46,948.3**

Source: Apple Valley General Plan 2009

Table 1-4: Statistical Summary of Land Uses (Annexation No. 2008-001 and No. 2008-002)

General Plan Land Use Designation	Developed Acres	Vacant Acres	Total Acres
Residential Land Uses			
Estate Residential (1du/1 – 2.5 gross ac)	55.7	722.3	778.0
Medium Density Residential (4- 20 du/ac)	41.5	177.3	218.7
Mixed Use (4-30 du/ac)	0.0	94.8	94.9
Total Residential Uses	**97.2**	**994.4**	**1,091.6**
Commercial Land Uses			
Mixed Use[1]	0.0	94.9	94.9
General Commercial	12.3	50.5	62.8
Regional Commercial	7.2	435.7	442.9
Office Professional	0.0	183.1	183.1
Total Commercial Uses	**19.5**	**669.3**	**688.8**

General Plan Land Use Designation	Developed Acres	Vacant Acres	Total Acres
Industrial Land Uses			
Planned Industrial	64.3	1,538.5	1,602.8
Other Land Uses			
Public Facility	0.0	5.1	5.1
Street Rights-of-Way	43.8	151.1	194.9
Grand Total All Land Uses	**224.8**	**3,358.4**	**3,583.2**

Source: Apple Valley General Plan 2009

The build out potential of these lands is shown categorically in Table 1-5, Residential Land Use Designation Build Out Summary; Table 1-6, Commercial and Industrial Land Use Designation Build Out Summary; and Table 1-7, Other Land Use Designation Build Out Summary.

Table 1-5: Residential Land Use Designation Build Out Summary

	Town Limits						Annexation Areas					
Designation	**AC Dev.**	**AC Vacant**	**AC Total**	**Exist. Units**	**Future Units**	**Total Units**	**AC Dev**	**AC Vacant**	**AC Total**	**Exist. Units**	**Future Units**	**Total Units**
Very Low Density Residential (1 du/5 or more gross ac)	212.0	1,749.5	1,961.5		350	350	--	--	--	--	--	--
Low Density Residential (1 du/2.5 - 5 gross ac)	450.7	3,071.7	3,522.4		1,229	1,229	--	--	--	--	--	--
Estate Residential (1du/1 – 2.5 gross ac)	3,308.2	3,308.0	6,616.3	20,107	3,308	23,415	55.7	722.3	778.0	--	722	722
Estate Residential ¾ (1 du/0.75 – 1 ac)	26.1	449.6	475.7		599	599	--	--	--	--	--	--
Single family Residential (1 du/0.4-0.9 ac)	8,811.2	3,770.7	12,581.9		5,656	5,656	--	--	--	--	--	--
Medium Density Residential (4- 20 du/ac)	826.2	1,057.0	1,883.1	3,775	15,854	19,629	41.4	177.3	218.7	--	2,659	2,659
Mobile Home Park (5-15 du/ac)	178.5	1.5	180.0	1,043	23	1,066	--	--	--	--	--	--
Mixed Use	90.8	229.7	320.5		2,068	2,068	0.00	94.8	94.8	--	854	854
Specific Plan	1,068.6	5,959.0	7,027.6		2,629	2,629	--	--	--	--	--	--
Residential Total	**15,262.7**	**19,291.5**	**34,554.2**	**24,925**	**31,716**	**56,641**	**97.2**	**994.4**	**1,091.6**	**--**	**4,236**	**4,236**

Source: Apple Valley General Plan 2009

Table 1-6: Commercial and Industrial Land Use Designation Build Out Summary

	Town Limits				Annexation Areas			
Designation	**Acres Dev.**	**Acres Vacant**	**Acres Total**	**Total Potential SF**	**Acres Dev.**	**Acres Vacant**	**Acres Total**	**Total Potential SF**
Mixed Use[1]	90.8	229.7	320.5	1,541,035	0.0	94.9	94.9	636,612
General Commercial	480.3	1,066.5	1,546.8	14,823,253	12.3	50.5	62.8	601,824
Regional Commercial	99.6	1,203.3	1,303.0	12,486,485	7.2	435.7	442.9	4,244,469
Service Commercial	152.4	179.2	331.6	3,177,665	0.0	183.1	183.1	1,754,639
Office Professional	64.7	546.7	611.3	5,858,606	0.0	94.9	94.9	636,612
Specific Plan[1]	1,359.0	5,653.7	7,012.7	6,663,010	--	--	--	--
Commercial Sub Total	**887.7**	**3,225.4**	**4,113.2**	**44,550,054**	**19.5**	**669.3**	**688.8**	**7,874,156**
Planned Industrial	21.4	623.9	645.3	6,183,941	64.3	1,538.5	1,602.8	15,359,953
Specific Plan[1]	1,359.0	5,653.7	7,012.7	36,938,445	--	--	--	--
Industrial Sub Total	**21.4**	**623.9**	**645.3**	**43,122,386**	**64.3**	**1,538.5**	**1,602.8**	**15,359,953**
Grand Total Com. & Indust.	**909.1**	**3,849.4**	**4,758.5**	**87,672,440**	**83.9**	**2,302.7**	**2,386.5**	**23,234,109**

Source: Apple Valley General Plan 2009

Table 1-7: Other Land Use Designation Build Out Summary

	Town Limits			Annexation Areas		
Designation	**Acres Dev.**	**Acres Vacant**	**Acres Total**	**Acres Dev.**	**Acres Vacant**	**Acres Total**
Public Facility	330.2	132.0	462.2	0.00	5.1	5.1
Open Space	291.2	2,796.4	3,087.5	--	--	--
Mineral Resources	129.4	323.2	452.5	--	--	--
Street Rights-of-Way	2,771.1	1,182.8	3,953.9	43.8	151.1	194.9
Grand Total Other Uses	**3,521.8**	**4,434.4**	**7,956.2**	**43.8**	**156.2**	**200.0**

Source: Apple Valley General Plan 2009

1.6 Build Out Potential and Population

As indicated in above, the Land Use Map creates a potential for up to 60,877 housing units. Based on 2008 average household size, these units could support a build out population of 185,858 people.

The Land Use Map further establishes 4,791.3 acres of commercial land, which has a potential to generate 51,685,423 square feet of commercial space. There is also a potential for 58,629,920 square feet of industrial space, mostly to be located in the North Apple Valley Industrial Specific Plan area. This Land Use Element also provides 3,068.5 acres of Open Space, and 481.2 acres of Public Facilities, which include schools, parks, fire stations and government buildings.

1.7 Development Trends

After a lengthy and competitive site selection process, Apple Valley successfully attracted a major industrial project, a 1.35 million square foot distribution center, to the North Apple Valley Industrial Specific Plan. In June 2015, the Town Council approved an Owner Participation Agreement to invest $1.2 million dollars into the construction of off-site regional street improvements. The distribution center will occupy 106 acres near Navajo Road and La Fayette Street, north of Apple Valley Airport. The $115 million project will bring 400 to 500 permanent jobs to the community and is expected to break ground in 2017 with another 300 construction jobs estimated during the 18-month build.

Apple Valley Choice Energy (AVCE), launched in 2017, is Apple Valley's, locally-operated, locally-controlled electrical power provider. We anticipate rate savings of 1% to 5% for our citizens. We've partnered with SCE to deliver greener, more affordable power to electricity customers. AVCE procures electricity while SCE delivers that energy to doorsteps, maintains and repairs the infrastructure that carries it, and provides convenient customer services including billing. The Town Council has approved an implementation plan for AVCE that has been approved by the California Public Utilities Commission.

The Apple Valley Planning Commission approved Apple Valley Gateway, a 10-acre, 80,480 square foot commercial project at the northeast corner of Interstate 15 and Dale Evans Parkway. Belco Development, of Murrieta, is proposing to construct an 84-room, 43,000 square foot, three-story hotel, a 3,500 square-foot restaurant, a 10,261 square foot retail building, and six separate buildings, totaling 23,719 square feet that includes three drive-through restaurants, two gasoline stations, one with a drive-through, and a retail building with a drive-through. The approved parcel map subdivides 8.7-acres into eight parcels ranging in size from 0.61-acres to 2.6-acres. The project area contains two existing parcels totaling 9.9-acres located at the northeast corner of Interstate 15, Dale Evans Parkway and bisected by Willow Springs Road.

The County Board of Supervisors recently approved a 249-acre project to be rezoned from agricultural to residential within the Town's sphere of influence. The Lewis Operating Company's Deep Creek Project extends from Deep Creek Road and Mockingbird Road, and is divided by Ocotillo Way. This project will require improvements along these three roadways, as well as Rock Springs Road, to help mitigate traffic and the risk of washout. Construction for Rock Springs Road improvements is set to begin in 2018.

The Yucca Loma Bridge was recently completed in May 2017. Major improvements to Yucca Loma Road were also included in the bridge opening such as widening, bike lanes and major storm drain infrastructure from Apple Valley Road to the bridge, as well as traffic signals at the Fire Station and Havasu Road.

The $37-million-dollar Yucca Loma Bridge project alleviates congestion along east/west regional arterials including Bear Valley Road and allows residents to travel to and from Apple Valley, Victorville and Spring Valley Lake with more ease. This phase of the corridor will connect to Ridgecrest Road and includes bikeways and barrier-protected sidewalks across the bridge. The project will also pave the way for The Fountains at Quail Ridge, a 346,500 square foot mixed-use commercial center at the northeast corner of Yucca Loma Road and Apple Valley Road.

The Victor Valley Wastewater Reclamation Authority is constructing a sub-regional water reclamation plant at Brewster Park. More than 20 years in the making, this water reclamation plant will produce a million gallons a day of non-potable, recycled water that can be used to keep Apple Valley's parks and golf course green. The plant is expected to be completed by late 2017.

While all 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 Town, County and State at the time of development.

Section 2. Plan Adoption

2.1 Adoption by local governing body

A (draft) Resolution of the Town Council of the Town of Apple Valley, California, adopting the Local Hazard Mitigation Plan as required by the Disaster Mitigation Act of 2000 is included in this Plan (located before the Table of Contents). Upon receipt of an "approvable pending adoption" status from FEMA, the Town will formally adopt the Resolution and forward adopting documentation to FEMA.

2.2 Promulgation Authority

Art Bishop, Mayor

Description of involvement: Mayor Bishop represents the elected body governing the Town of Apple Valley and will sign as the official final approving authority.

Contact Information:

Town of Apple Valley
14955 Dale Evans Parkway,
Apple Valley, CA 92307
760-240-7000
abishop@applevalley.org

Doug Robertson, Town Manager

Description of Involvement: Doug Robertson represents the staff of the Town of Apple Valley and authorized the development and approval process.

Contact Information:

Town of Apple Valley
14955 Dale Evans Parkway,
Apple Valley, CA 92307
760-240-7000
drobertson@applevalley.org

The Apple Valley Town Council will review the Hazard Mitigation Plan prior to its approval.

2.3 Primary Point of Contact

Joseph Ramos, **Emergency Services Officer**

Town of Apple Valley
14955 Dale Evans Parkway
Apple Valley, CA 92307
760-240-7000 ext. 7890
jramos@applevalley.org

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Section 3. Planning Process

The planning process for the Town's Hazard Mitigation Plan included the creation of a Planning Team representing various agencies and organizations whose input was vital to the plan. The Planning Team reviewed, analyzed, revised, and updated each Section within this Plan as required. Pursuant to Section 4(F) of the Crosswalk, the process used to review and analyze each Section is included within that Section.

3.1 Preparing for the Plan

Hazard Mitigation Planning is a process State, Tribal, and local governments use to identify risks and vulnerabilities associated with natural disasters, and to develop long-term strategies for protecting people and property from future hazard events. 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, and economic development, businesses, civic groups, environmental groups, and schools.

San Bernardino County Fire OES hired a contractor (Dynamic Planning + Science) to offer support to the Cities/Towns, and Special Districts to update the 55 local HMP's. The DPS Team offers experienced, field-tested Hazard Mitigation and planning professionals who have developed similar comprehensive HMPs. This support includes providing technical expertise, resource material and tools to ensure that the updates are in compliance with federal requirements of the program. The tools, resource material, and other project related information are being maintained on a project portal (https:www.mitigatehazards.com) to ensure the consistent information is available to all participants.

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 Town's website, public comments received during community-wide events, discussions during quarterly Disaster Council meetings 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 Town initiated its Plan Update by meeting the requirements of Title 44, Code of Federal Regulations, Part 201 (44 CFR 201.6) through the initial implementation of the 2011 Local Hazard Mitigation Plan.

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 Apple Valley Hazard Mitigation Plan (2011) 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 Town 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 Town's comprehensive Hazard Mitigation Plan. In addition, Apple Valley solicited public involvement throughout the planning process, including public invitation to all planning meetings, the release of a public survey through the Town'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:

- Why the update is necessary and how the update will build on the existing approved mitigation plan.
- The process and data deficiencies/limitations that will be addressed.
- 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.
- The opportunities provided for public participation, modified as necessary, based on previous experience.
- The contribution from other stakeholders.
- The new/additional research conducted and data included in the plan.
- The modified risk assessment based on latest best available data.
- The prioritized mitigation action plan.
- The progress made in local mitigation efforts.
- 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 Town's Planning Team. The Planning Team was led by the Emergency Services Officer. 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 Town of Apple Valley.

This HMP was compiled and authored under the direction of the Project Planning Team listed below in Table 3-1.

3.1.2 Planning Team

This Hazard Mitigation Planning team included members of various agencies, and organizations who were familiar with mitigation planning and have some type of emergency management responsibilities within their organizations.

Table 3-1: Planning team

Name	Organization
Patrick Carroll	TOAV Building Official
Pam Cupp	TOAV GIS
Dawn Harrison	CERT Commander
Sid Hultquist	AV Fire Chief
Lori Lamson	TOAV Planning/Comm Dev.
Kathie Martin	TOAV PIO
Brad Miller	TOAV Engineer
Carol Miller	TOAV Planner
Brett Morgan	TOAV Senior Construction Inspector
Joseph Ramos	TOAV Emergency Management
Greg Snyder	TOAV Public Works
Rich Unferdorfer	Captain, Apple Valley Fire Protection District
Ralph Wright	TOAV Parks/Rec Manager

3.1.2 Planning team meetings

Table 3-2: Planning team meetings

Date	Item	Location
06/23/2016	SBC Kickoff Meeting	SBC - OES
08/02/2016	Planning Team Meeting Kick Off	TOAV
10/18/2016	Planning Team Meeting #1	TOAV
2/21/2017	Planning Team Meeting #2	TOAV
3/23/2017	Planning Team Meeting #3	TOAV
4/28/2017	Planning Team Meeting #4	TOAV

3.2 Coordination with other Jurisdictions, Agencies, and Organizations

The Town of Apple Valley Planning Team consulted members from adjacent jurisdictions as well as the County of San Bernardino. Email invites were provided to each neighboring jurisdiction/agency starting with the kick-off meeting in August 2016 (See Appendix B.2).

Table 3-3: Coordination with other Jurisdictions, Agencies, and Organizations

Agency	Representative	Title/Position
Apple Valley Unified School District	Janet Gould	Risk Manager
American Red Cross	Don Gordon	Disaster Program Manager
Cal Office of Emergency Services		HMP Division
City of Hesperia	Rachel Molina	Assistant to City Manager
City of Victorville	Dana Welborn	Emergency Services Officer
County of San Bernardino	Miles Wagner	Emergency Services Officer
Disaster Service Workers	Mark Yosten	ECS
FEMA		Region IX HMP Division
Liberty Utilities (Water)	Kevin Phillips	Manager
National Weather Service	Alex Tardy	Manager-Meteorologist
St. Joseph/St. Mary Medical (Hospital)	Shannon Welsh	Executive Director
Southern California Edison	Bob Stiens	Gov. Affairs Rep.
Southwest Gas Company	Bill Hensley	Executive Officer
Victor Valley Transit Authority	Christine Plasting	Senior Procurement Specialist

In addition, the Town of Apple Valley participated in the San Bernardino County Fire Department Office of Emergency Services (OES) Stakeholder meetings noted in Table 3-4. 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 County's HMP. 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, resource material and tools to help ensure that the updates are in compliance with federal requirements of the program.

Table 3-4: Stakeholder meetings

Date	Item	Location
06/23/2016	Stakeholders Kickoff Meeting #1	SBC OES
10/26/2016	Stakeholders Update Meeting #2	SBC OES
12/15/2016	Stakeholders Update Meeting #3	SBC OES
2/14/2017	Stakeholders Update Meeting #4	Virtual Meeting
3/28/2017	Stakeholders Update Meeting #5	SBC OES

3.3 Public Involvement/Outreach

The Town of Apple Valley undertook a number of methods to inform the public of the effort to solicit their input on the Hazard Mitigation Plan and efforts of the town involving mitigation and emergency preparedness. On an ongoing basis, the Town of Apple Valley participates in public events and meetings to inform and solicit feedback regarding emergency preparedness and mitigation from the public.

Public outreach efforts included an invitation to the kick-off meeting via media alerts (See Appendix B.2). Also the creation of a survey for all Apple Valley residents including those who work but do not live in Apple Valley. A total of 123 citizens participated in the survey. Other public outreach efforts included discussion on items on the agenda during CERT bi-monthly meetings, quarterly Disaster Council meetings and at one Town Council meeting.

The following is a list of public meetings and events that have taken place during the drafting stage:

Table 3-5: Public meetings and events

Date	Item	Location
8/2/2016	Planning Kick Off Meeting	TOAV
8/4/2016	CERT meeting	Station #336
9/29/2016 to 2/5/2017	On-line Survey	On line
10/6/2016	CERT meeting	Station #336
10/18/2016	Disaster Council meeting	Conference Center
1/10/2017	Disaster Council meeting	Conference Center
2/2/2017	CERT meeting	Station #336
3/28/2017	Town Council meeting	Council Chambers
4/6/2017	CERT meeting	Station #336
4/11/2017	Disaster Council meeting	Conference Center
6/1/2017	CERT meeting	Station #336
7/11/2017	Disaster Council meeting	Conference Center

3.3.1 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 Town 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 the Appendix C.2.

3.3.2 Web Posting

The survey mentioned above was posted on the Town of Apple Valley's website and Facebook page. The public was invited to submit comments on the Hazard Mitigation Plan Update, attend the stakeholder meetings notated in Table 3-5.

3.3.3 Public Meeting Process

The Town continues to hold many public meetings and provides notice of these meetings through posted Agendas and through the Town's web site (www.applevalley.org). 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 Town's web site. The Planning Team will determine how public comments, 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 2011 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 2011 Hazard Mitigation Plan as necessary. The intent of screening of hazards is to help prioritize which hazard creates the greatest concern in the community. This step had the planning team review a total of sixteen hazards via the FEMA Hazard Summary Sheet (See Appendix D.1, D.2). The Hazard Summary Sheet was used to summarize hazard description information and identify which hazards are most significant to the Town. We considered those hazards that ranked medium to high into Step 2. We also included Climate Change since it is a requirement. The summary sheet includes classifications for location and maximum probable extent.

The second step had the planning team review a total of six hazards- *wildfire, flood, earthquake, erosion, flooding and climate change*. These six hazards were put through Dynamic Planning + Science Risk Factor (RF) Approach. The RF approach combines historical data, local knowledge, and consensus opinions to produce numerical values that allow identified hazards to be ranked against one another. These criteria are used to evaluate hazards and identify the highest risk hazard in the project region. Additional information regarding these steps are discussed in further detail in Section 4.1. The final results agreed upon by the Planning Team can be found in Appendix D.4.

Table 3-6: RF Approach

Rank	Natural Hazards	Probability (1-4)	Factor1 = (Probability Index * .30)	Impact (1-4)	Factor2 = (Impact Index * .30)	Spatial Extent (1-4)	Factor3 = (Spatial Extent Index * .20)	Warning Time (1-4)	Factor4 = (Warning Time Index * .10)	Duration (1-4)	Factor5 = (Probability Index * .10)	RF Factor Total = (Add Factors 1-5)
1	Hazard 1		0		0		0		0		0	0
2	Hazard 2		0		0		0		0		0	0
3	Hazard 3		0		0		0		0		0	0
4	Hazard 4		0		0		0		0		0	0
5	Hazard 5		0		0		0		0		0	0
6	Hazard 6		0		0		0		0		0	0

3.5 Goal Setting

Project and community hazard mitigation goals and objectives for the Town of Apple Valley were set by the Planning Team to guide the development of the Plan using FEMA National Mitigation Strategies and Goals to substantially increase public awareness of natural hazard risks so that the public demands safer communities in which to live and work; and to significantly reduce the risk of loss of life, injuries, economic costs, and destruction of natural and cultural resources that result from natural hazards.

As part of this process, the Planning Team also reviewed the County of San Bernardino's Operational MJHMP, the State of California MJHMP, Floodplain Management Plans, and adjacent local jurisdiction MJHMPs to ensure the Goals and Objectives were comprehensive and compatible.

3.6 Review and Propose Mitigation Measures

A wide variety of mitigation measures that can be identified to help reduce the impact of the hazards or the severity of damage from hazards was examined. The projects were identified to help ensure the implementation of the Planning Team's goals and objectives. The following categories were used in the review of possible mitigation measures:

1. Public Information and Education- Outreach projects and technical assistance.
2. Preventive Activities- Zoning, building codes, storm water ordinances
3. Structural Projects- Detention basins, reservoirs, road and bridge improvements
4. Property Protection- Acquisition, retrofitting
5. Emergency Services- Warning, sandbagging, road signs/closures, evacuation
6. Natural Resource Protection: Wetlands, protection, best management practices.

Once the projects were identified, the Planning Team utilized the STAPLEE methodology to assess and prioritize the projects.

STAPLEE stands for the following:

- **Social:** Social criteria are based on the idea that community consensus is a necessary precondition for successful implementation of mitigation measures (i.e., measures should be supported and accepted by the entire community). This also means that measures should not affect adversely a particular segment of the population or a particular neighborhood, or adversely impact local cultural values or resources.
- **Technical:** Technical criteria address the technical feasibility of the proposed measures, in terms of effectiveness, secondary impacts, and the technical capabilities of the community to implement and sustain these measures.
- **Administrative:** Administrative criteria address the administrative capabilities required to implement each mitigation measure. For example, does the City have the necessary organization, staff, and funding sources to implement and sustain the mitigation process?

- **Political:** Political criteria consider the need for political support for mitigation measures. This means that all stakeholders in the political process, especially political organizations and institutions both inside and outside of the community, should support the measure.
- **Legal:** Legal criteria are used to determine the appropriate legal authority necessary to implement each mitigation measure and whether such an authority can be delegated. The mitigation measure is examined from the standpoint of current statutes, codes, ordinances, and other regulations, as well as the possible legal ramifications of the measure's implementation.
- **Economic:** Economic criteria address the cost-effectiveness of the proposed measure and its economic impact on the community. It is only reasonable to expect that the benefits of implementation will exceed the costs incurred. Economic considerations also consider the economic impact on the community's future development.
- **Environmental:** Environmental criteria have become an important consideration in examining mitigation options. Although most mitigation measures are usually beneficial for the environment, some measures may have adverse effects, which must be considered and addressed.

Next the planning team performed a cost/benefit analysis to help prioritize each of the mitigation projects.

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 2011 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 excepted in each section.

The development of actions and projects to meet the goals and objectives identified in the HMP is based on the Town'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 Town's mitigation strategy.

Following the identification of goals and objectives, the mitigation planning regulation 44 CFR 201 requires the Town to identify, analyze and prioritize alternative actions by hazard types. Federal guidance for the HMP recommends that the Town 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.

The Town 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 Town is required to review any changes of approved HMP to determine whether goals were met or if they remain consistent with current conditions.

While some Planning Team members were responsible for 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 OES and FEMA for approval.

3.8 Adopt the Plan

After the public review, the draft plan will be submitted to Cal OES/FEMA for review and approval. FEMA will provide the Town with an "Approval Pending Adoption" letter if the Hazard Mitigation Plan update meets all federal requirements. Upon receipt of this letter, the final plan will be submitted to the Apple Valley Town Council for consideration and adoption. Once adopted, the final Resolution will be submitted to FEMA for incorporation into the Hazard Mitigation Plan.

The Town of Apple Valley's adoption of the Hazard Mitigation Plan is only the beginning of this effort. Town offices, other agencies, and private partners will implement the Hazard Mitigation Plan activities. 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 pre and post-disaster mitigation funding.

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Section 4. Risk Assessment

The risk assessment is the process of measuring the potential impact to life, property and economic impact resulting from natural hazards. The intent of the Risk Assessment is to identify, as much as practicable given existing/available data, the qualitative and quantitative vulnerabilities of a community. The results of the risk assessment allow for a better understanding of the impacts of natural hazards to the community and provides a foundation in which to develop and prioritize mitigation actions to reduce damage from natural disasters through increased preparedness and response times and better allocation of resources to areas of greatest vulnerability.

This Risk Assessment Section evaluates the potential loss from a hazard event by assessing the vulnerability of buildings, infrastructure, and population. It identifies the characteristics and potential consequences of hazards, how much of the Town of Apple Valley could be affected by a hazard, and the impact on Town area assets. The Risk Assessment approach consists of three (3) components:

- Hazard Identification – Identification and screening of hazards (Section 4.1)
- Hazard Profiles – Review of historic occurrences and assessment of the potential for future events (Section 4.2)
- Vulnerability Assessment – Determination of potential losses or impacts to buildings, infrastructure and population (Section 4.3)

4.1 Hazard Identification

Per FEMA Guidance, the first step in developing the Risk Assessment is identifying the hazards. The Town'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 Town and the nearby region.

The planning team used the below Table 4-1 which provides a list of hazards identified in the 2010 San Bernardino County Multijurisdictional Hazard Mitigation Plan Update, the County of San Bernardino 2007 General Plan Safety Element, Apple Valley's 2011 Hazard Mitigation Plan and the 2013 CA State Hazard Mitigation Plan. This table was used to develop a preliminary list of fifteen hazards for the Town's HMP Planning Team to evaluate which hazards were truly relevant to the Town and which ones are not. For example, expansive soils was considered to be of little relevance, while earthquake, flooding, and wildfire were indicated in almost all hazard documentation.

Table 4-1: SBC & TOAV Hazard Identification

Hazards	*2010 San Bernardino County Multijurisdictional Hazard Mitigation Plan Update*	*County of San Bernardino 2007 General Plan Safety Element*	*Apple Valley 2011 Hazard Mitigation PLan*	*2013 CA State Hazard Mitigation Plan*
Climate Change				■
Dam Inundation				■
Drought	■			■
Earthquake/ Geologic Hazards	■	■	■	■
Erosion				■
Expansive Soils				■
Extreme Cold				■
Extreme Heat	■			■
Flood	■	■	■	■
Hazardous Waste		■		■
High Winds/ Straight Line Winds	■	■		
Lightning	■			
Terrorism				■
Wildfire	■	■	■	■
Winter Storm (Heavy Snowfall)				■

In addition to a document review, previous hazard occurrences were used to identify hazards for this plan. Previous hazard occurrences provide a historical view of hazards that have affected the Town in the past, and thus provide a window into the potential hazards that can affect our community in the future. Information about federal and state disaster declarations in San Bernardino County (declarations are declared by County) was compiled from FEMA and Cal EMA's databases, as shown in Table 4-2. Though not a complete snapshot of hazard incidences in the County (since not all hazard events are federally or state declared), Table 4-2 provided the Town's HMP Planning Team with solidified accounts of the types and extent of disasters that have affected the County dating back to 1965 when flooding affected entire regions of San Bernardino County.

As indicated in the below table large regional incidents have affected San Bernardino County, including the California Wildfires of 1999. Most recently, disasters for terrorist attacks (2015), flood (2011) and severe storms (2010) were declared in San Bernardino County. The disaster declarations in Table 4-2, provide a baseline for consideration in the hazard prioritization process.

Table 4-2: Federal and State Declared Disasters

Disaster Number	Declaration Date	Disaster Type	Incident Type	Title
Federal Declarations				
Major Disaster Declarations				
1952	1/26/2011	DR	Flood	Severe Winter Storms, Flooding, and Debris and Mud Flows
1884	3/8/2010	DR	Severe Storm(s)	Severe Winter Storms, Flooding, and Debris and Mud Flows
1731	10/24/2007	DR	Fire	Wildfires, Flooding, Mud Flows, and Debris Flows
1689	3/13/2007	DR	Freezing	Severe Freeze
1585	4/14/2005	DR	Severe Storm(s)	Severe Storms, Flooding, Landslides, and Mud and Debris Flows
1577	2/4/2005	DR	Severe Storm(s)	Severe Storms, Flooding, Debris Flows, and Mudslides
1498	10/27/2003	DR	Fire	Wildfires, Flooding, Mudflow and Debris Flow Directly Related
1203	2/9/1998	DR	Severe Storm(s)	Severe Winter Storms and Flooding
1046	3/12/1995	DR	Severe Storm(s)	Severe Winter Storms, Flooding Landslides, Mud Flow
1044	1/10/1995	DR	Severe Storm(s)	Severe Winter Storms, Flooding, Landslides, Mud Flows
1005	10/28/1993	DR	Fire	Fires, Mud/Landslides, Flooding, Soil Erosion
979	2/3/1993	DR	Flood	Severe Winter Storm, Mud & Land Slides, & Flooding
947	7/2/1992	DR	Earthquake	Earthquake & Aftershocks
935	2/25/1992	DR	Flood	Rain/Snow/Wind Storms, Flooding, Mudslides
894	2/11/1991	DR	Freezing	Severe Freeze
872	6/30/1990	DR	Fire	Fires
690	9/22/1983	DR	Flood	Flash Flooding
687	7/1/1983	DR	Flood	Flooding
677	2/9/1983	DR	Coastal Storm	Coastal Storms, Floods, Slides & Tornadoes
635	11/27/1980	DR	Fire	Brush & Timber Fires
615	2/21/1980	DR	Flood	Severe Storms, Mudslides & Flooding
547	2/15/1978	DR	Flood	Coastal Storms, Mudslides & Flooding
521	9/21/1976	DR	Flood	Flooding, Tropical Storm Kathleen
295	9/29/1970	DR	Fire	Forest & Brush Fires
253	1/26/1969	DR	Flood	Severe Storms & Flooding
223	1/2/1967	DR	Flood	Severe Storms & Flooding
211	12/7/1965	DR	Flood	Heavy Rains & Flooding
145	2/25/1963	DR	Flood	California Severe Storms, Heavy Rains, & Flooding
47	12/23/1955	DR	Flood	California Flood
15	2/5/1954	DR	Flood	California Flood & Erosion

Disaster Number	Declaration Date	Disaster Type	Incident Type	Title
Fire Management Assistance Declarations				
5147	8/16/2016	FM	Fire	Blue Cut Fire
5144	8/7/2016	FM	Fire	Pilot Fire
5089	7/17/2015	FM	Fire	North Fire/ Pine Fire
2955	9/2/2011	FM	Fire	Hill Fire
2841	10/4/2009	FM	Fire	Sheep Fire
2836	9/1/2009	FM	Fire	Pendleton Fire
2833	8/31/2009	FM	Fire	Oak Glen Fire
2792	11/15/2008	FM	Fire	Freeway Fire Complex
3279	10/23/2007	EM	Fire	Wildfires
2738	10/22/2007	FM	Fire	Grass Valley Fire
2728	9/15/2007	FM	Fire	Butler 2 Fire
2653	7/12/2006	FM	Fire	Sawtooth Fire Complex
3248	9/13/2005	EM	Hurricane	Hurricane Katrina Evacuation
2503	10/25/2003	FM	Fire	Old Fire
2501	10/23/2003	FM	Fire	Ca-Grand Prix Fire-10-23-2003
2497	9/6/2003	FM	Fire	Ca-Bridge Fire-09-05-2003
2491	8/19/2003	FM	Fire	Ca-Locust Wildfire-08-19-2003
2464	9/24/2002	FM	Fire	Williams Canyon Fire (Mt. Baldy)
2433	6/17/2002	FM	Fire	Louisiana Fire (Cajon Pass)
2425	6/17/2002	FM	Fire	California Blue Cut Fire (Cajon Pass/ Oak Hills)
Emergency Declarations				
3279	10/23/2007	EM	Fire	Wildfires
3248	9/13/2005	EM	Hurricane	Hurricane Katrina Evacuation
3140	9/1/1999	EM	Fire	Ca-Wildfires-08/25/1999
CAL OES/ State Emergency And Disaster Proclamations/ Executive Orders				
Other Disasters				
2464	9/24/2002	FS	Fire	Williams Fire
2433	6/27/2002	FS	Fire	Louisiana Fire
State Declarations				
5147	8/16/2016	FM	Fire	Blue Cut Fire
CDAA	12/18/2015	CDAA	Terrorist Attack	Waterman Incident Mass Shooting
None	8/5/2014	None	Severe Storm(s)	August Severe Weather - Dir. Concurrence
None	1/17/2014	None	Drought	California Drought
None	12/1/2011	None	Winds	December High Wind Event – Rancho Cucamonga
1952	1/21/2011	DR	Flood	Severe Winter Storms, Flooding, and Debris and Mud Flows
None	11/20/2010	None	Water	Golden State Water Company (GSWC) Contamination
1884	3/8/2010	DR	Severe Storm(s)	Severe Winter Storms, Flooding, and Debris and Mud Flows

Disaster Number	Declaration Date	Disaster Type	Incident Type	Title
2841	10/4/2009	FM	Fire	Sheep Fire
2836	9/1/2009	FM	Fire	Pendleton Fire
2833	8/31/2009	FM	Fire	Oak Glen Fire
2792	11/17/2008	FM	Fire	Freeway Fire Complex - (Ex. Ord. S-15-08 11/18/08)
None	10/15/2008	None	Fire	October Fire events (Foxborough, San Antonio, San Bernardino)
None	10/15/2008	None	Winds	San Bernardino Wind Event - (Ex. Ord. S-11-08 10/16/08)
1731	10/24/2007	DR	Fire	Wildfires, Flooding, Mud Flows, and Debris Flows
3279	10/23/2007	EM	Fire	Wildfires
2738	10/22/2007	FM	Fire	Grass Valley Fire
2728	9/15/2007	FM	Fire	Butler 2 Fire
None	7/27/2007	None	Severe Storm(s)	Severe Weather/Flooding (City of Needles)- Dir. Concurrence
1689	3/13/2007	DR	Freezing	Severe Freeze
2653	7/12/2006	FM	Fire	Sawtooth Fire Complex
3248	9/13/2005	EM	Hurricane	Hurricane Katrina Evacuation
1585	4/14/2005	DR	Severe Storm(s)	Severe Storms, Flooding, Landslides, and Mud/Debris Flows
1577	2/4/2005	DR	Severe Storm(s)	Severe Storms, Flooding, Debris Flows, and Mudslides
2503	10/25/2003	FM	Fire	Old Fire
2501	10/23/2003	FM	Fire	Ca-Grand Prix Fire-10-23-2003
CDAA 2003-02	8/22/2003	CDAA	Flood	Summer Floods (Yucca Valley/Lower Desert)
None	3/7/2003	None	Fire Danger	Bark Beetle Infestation (San Bernardino Mountains)
None	1/17/2001	None	Energy	Statewide Energy Emergency
3140	9/1/1999	EM	Fire	Ca-Wildfires-08/25/1999
1203	2/9/1998	DR	Severe Storm(s)	Severe Winter Storms and Flooding
1044	1/10/1995	DR	Severe Storm(s)	Severe Winter Storms, Flooding, Landslides, Mud Flows
1005	10/28/1993	DR	Fire	Fires, Mud/Landslides, Flooding, Soil Erosion
979	2/3/1993	DR	Flood	Severe Winter Storm, Mud & Land Slides, & Flooding
947	7/2/1992	DR	Earthquake	Earthquake & Aftershocks
935	2/19/1992	DR	Flood	California Snow Storms, Flooding, & Mudslides
894	1/11/1991	DR	Freeze	California Severe Freeze
145	2/14/1963		Severe Storms	California Severe Storms, Heavy Rains, & Flooding
47	12/22/1955		Flood	California Flood
15	2/5/1954		Flood	California Flood & Erosion

Disaster Number	Declaration Date	Disaster Type	Incident Type	Title
County Declarations				
5147	8/16/2016	FM	Fire	Blue Cut Fire
5144	8/9/2016	FM	Fire	Pilot Fire
CDAA	12/15/2015	CDAA	Terrorist Attack	Waterman Incident Mass Shooting
None	6/25/2015	None	Fire	Lake Fire
None	8/5/2014	None	Severe Storm(s)	August Severe Weather - Dir. Concurrence
None	8/5/2014	None	Drought	California Drought
None	4/30/2014	None	Fire	Etiwanda Fire
2955	9/3/2011	FM	Fire	Hill Fire
1952	1/21/2011	DR	Flood	Severe Winter Storms, Flooding, and Debris and Mud Flows
None	11/20/2010	None	Water	Golden State Water Company (GSWC) Contamination
1884	1/21/2010	DR	Severe Storm(s)	Severe Winter Storms, Flooding, and Debris and Mud Flows
2841	10/4/2009	FM	Fire	Sheep Fire
2836	9/1/2009	FM	Fire	Pendleton Fire
2833	9/1//2009	FM	Fire	Oak Glen Fire
2792	11/16/2008	FM	Fire	Freeway Fire Complex - (Ex. Ord. S-15-08 11/18/08)
None	10/14/2008	None	Fire	October Fire events (Foxborough, San Antonio, San Bernardino)
None	10/14/2008	None	Wind	San Bernardino Wind Event
1731	10/24/2007	DR	Fire	Wildfires, Flooding, Mud Flows, and Debris Flows
3279	10/22/2007	EM	Fire	Wildfires
2738	10/22/2007	FM	Fire	Grass Valley Fire
2728	9/14/2007	FM	Fire	Butler 2 Fire
None	8/8/2007	None	Water Shortage	Lucerne Valley Water Crisis
1689	1/17/2007	DR	Freezing	Severe Freeze
2653	7/11/2006	FM	Fire	Sawtooth Fire Complex
None	9/30/2005	None	Fire	Thurman Fire (San Bernardino Mountains)
3248	9/8/2005	EM	Hurricane	Hurricane Katrina Evacuation
1585	10/26/2004	DR	Severe Storm(s)	Severe Storms, Flooding, Landslides, and Mud and Debris Flows
1577	10/26/2004	DR	Severe Storm(s)	Severe Storms, Flooding, Debris Flows, and Mudslides
None	10/26/2004	None	Severe Storm(s)	Winter Storms (10/21 & 10/28/04)
None	6/29/2004	None	Water Shortage	Acute Water Shortage (Wrightwood 07, 08, & 09/04)
2503	10/21/2003	FM	Fire	Old Fire
2501	10/21/2003	FM	Fire	Ca-Grand Prix Fire-10-23-2003

Disaster Number	Declaration Date	Disaster Type	Incident Type	Title
CDAA 2003-02	8/22/2003	CDAA	Flood	Summer Floods (Yucca Valley/Lower Desert)
None	9/24/2002	None	Infestation	Bark Beetle Infestation (San Bernardino Mountains)
3140	9/1/1999	EM	Fire	Ca-Wildfires-08/25/1999
None	7/12/1999	None	Flood	County Flood July 99 (Forest Falls, Apple Valley, and Big Bear)
1203	2/24/1998	DR	Severe Storm(s)	Severe Winter Storms and Flooding
None	3/19/1997	None	EQ	Earthquake (Barstow/Calico RP)
None	2/1/1996	None	Hazmat	Cajon Pass Train Derailment/Hazmat Incident
1044	1/6/1995	DR	Severe Storm(s)	Severe Winter Storms, Flooding, Landslides, Mud Flows
None	6/26/1994	None	Heat/Fire Danger	Severe Heat & Wildland Fire Threat
979	1/8/1993	DR	Flood	Severe Winter Storm, Mud & Land Slides, & Flooding
947	6/28/1992	DR	Earthquake	Earthquake & Aftershocks
935	2/18/1992	DR	Flood	Rain/Snow/Wind Storms, Flooding, Mudslides
894	1/14/1991	DR	Freezing	Severe Freeze
872	6/28/1990	DR	Fire	Fires
None	3/13/1990		Earthquake	Upland Earthquake
None	10/31/1988		Fire	Texas Fire (Watershed Damage)
None	9/3/1987		Fire	Wildland Fires
None	7/13/1984		Weather	Unstable Weather Conditions (City of Big Bear Lake, CSD, Co. Flood Control, Victor Valley Waste Water Authority, Juniper Riviera County Water District)
687	7/1/1983	DR	Flood	Flooding
677	3/7/1983	DR	Coastal Storm	Coastal Storms, Floods, Slides & Tornadoes
635	11/5/1980	DR	Fire	Brush & Timber Fires
615	1/15/1980	DR	Flood	Severe Storms, Mudslides & Flooding
None	9/29/1979		Gasoline Shortage	Gasoline Shortage Emergency
None	6/28/1979		Water Shortage	Water Shortage (Lake Gregory)
None	7/21/1960		Fire	Major and Widespread Fires

4.2 Hazard Prioritization

The Town of Apple Valley HMP Planning Team used a two-step process to derive at our final four hazards to profile.

The first step had the planning team review a total of sixteen hazards via the FEMA Hazard Summary Sheet (See Appendix D.1, D.2). The Hazard Summary Sheet was used to summarize hazard description information and identify which hazards are most significant to the Town. We considered those hazards that ranked medium to high into step two. We also included Climate Change since it is a new requirement. The summary sheet includes classifications for location and maximum probable extent.

The second step had the planning team review a total of six hazards- *wildfire, flood, earthquake, erosion, flooding and climate change*. These six hazards were put through Dynamic Planning + Science Risk Factor (RF) Approach (See Appendix D.3, D.4). The RF approach combines historical data, local knowledge, and consensus opinions to produce numerical values that allow identified hazards to be ranked against one another. These criteria are used to evaluate hazards and identify the highest risk hazard in the project region.

The RF approach produces numerical values that allow identified hazards to be ranked against one another (the higher the RF value, the greater the hazard risk). RF values are obtained by assigning varying degrees of risk to five categories for each hazard: probability, impact, spatial extent, warning time, and duration. Each degree of risk is assigned a value ranging from 1 to 4 and a weighing factor for each category should be agreed upon by the planning committee.

The following values were derived for each hazard from the planning team: Earthquake-3.6, Wildfire-2.3, Flooding-2.25, Extreme Heat-1.9, Climate Change-1.7, and Erosion-1.4. Due to limited resources the planning team agreed to focus on the top three hazards which ranked within moderate to high risk (2.0-4.0). Climate change was included as a requirement per FEMA for 2017. See Figure 4-1 for final results.

LHMP RISK FACTOR EXCEL WORKSHEET

HAZARD PRIORITIZATION /

MITIGATE HAZARDS

Rank	Natural Hazards	Probability (1-4)	Factor1 = (Probability Index * .30)	Impact (1-4)	Factor2 = (Impact Index * .30)	Spatial Extent (1-4)	Factor3 = (Spatial Extent Index * .20)	Warning Time (1-4)	Factor4 = (Warning Time Index * .10)	Duration (1-4)	Factor5 = (Probability Index * .10)	RF Factor Total = (Add Factors 1-5)
1	Climate Change	1	0.3	1	0.3	3	0.6	1	0.1	4	0.4	**1.7**
2	Earthquake	3	0.9	4	1.2	4	0.8	4	0.4	3	0.3	**3.6**
3	Erosion	1.5	0.45	1	0.3	1	0.2	3	0.3	1.5	0.15	**1.4**
4	Extreme Heat	2.5	0.75	1	0.3	2.5	0.5	1	0.1	2.5	0.25	**1.9**
5	Flooding	2	0.6	2	0.6	2	0.4	4	0.4	2.5	0.25	**2.25**
6	Wildfire	2	0.6	2	0.6	2	0.4	4	0.4	3	0.3	**2.3**

The RF approach combines historical data, local knowledge, and consensus opinions to produce numerical values that allow identified hazards to be ranked against one another. These criteria were used to evaluate hazards and identify the highest risk hazard in the Lawndale region.
The RF approach produces numerical values that allow identified hazards to be ranked against one another (the higher the RF value, the greater the hazard risk). RF values are obtained by assigning varying degrees of risk to five categories for each hazard: probability, impact, spatial extent, warning time, and duration. Each degree of risk is assigned a value ranging from 1 to 4 and a weighing factor for each category was agreed upon by the MPC.

Calculated Field

Figure 4-1: RF Final Worksheet as Agreed Upon by Planning Team

4.3 Hazards Profiles

The planning team initially identified six hazards to be included on the RF Approach Worksheet, some of these hazards were ultimately ranked low risk/low impact or could potentially be secondary to higher ranked hazards. As a result, it was the consensus of the Planning Team to focus on the three hazards that scored High and Moderate Risk in the RF Approach Worksheet (See Figure 4-1): ***Earthquake, Flooding***, and ***Wildfires***. ***Climate Change*** is included as a requirement per FEMA for 2017. These four hazards will be identified in detail starting with 4.3 and beyond. The following natural hazards were reviewed and analyzed by the Planning Team but due to their limited risk and inclusion on other hazards they will not be included as one of the hazards identified with mitigation strategies:

1. Dam Failure ranked low by the planning team in the initial Hazard Summary and may be secondary to earthquakes, therefore dam failure was not included as a primary hazard. A dam is defined as a barrier constructed across a watercourse for the purpose of storage, control, or diversion of water. Dams typically are constructed of earth, rock, concrete, or mine tailings. A dam failure is the collapse, breach, or other failure resulting in downstream flooding or a severe natural occurrence, such as an earthquake.

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

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

   Description:

   Two major dams -- Cedar Springs Dam and Mojave Dam -- could have a significant impact on the Town of Apple Valley in the event of dam failure. Both are located in the San Bernardino National Forest in the upper portion of the Mojave River Basin, southwest of Apple Valley. The Cedar Springs Dam and the Mojave Dam are both managed and operated by the State Department of Water Resources. See Table 4-3 for detailed information on both dams.

Table 4-3: Local Dam Data

	Cedar Springs Dam	Mojave Dam
DWR Number	1-063	9000-021
National ID	CA00049	CA10021
Dam Type	Rock	Earth
Crest Length	2,235 ft.	2,200 ft.
Height (measured above the dam crest)	236 ft.	204 ft.
Crest Width	42 ft.	20 ft.
Total Freeboard	23 ft.	21 ft.
Reservoir	Lake Silverwood	Mojave River Forks
Reservoir Storage Capacity	78,000 acre-ft.	89,700 acre-ft.
Reservoir Drainage Area	34.0 sq. miles	70.3 sq. miles

Fortunately, neither the Cedar Springs Dam nor the Mojave Dam have experienced dam failure. For Apple Valley to be affected by flood waters due to dam failure, both of these dams would need to fail simultaneously or the failure of the Cedar Springs Dam would need to occur at a time when rising flood waters were already a problem at the Mojave Dam.

Failure of these dams during a catastrophic event, such as a severe earthquake, is considered to be an unlikely event. Both dams have performed well in past earthquakes due to the type and method of construction.

2. Drought and Water Shortage ranked as a low hazard but provided for discussion based on the recent drought that the state of California is in and the amount of rain that has been produced in the early months of 2017.

A drought is a period of drier-than-normal conditions that results in water-related problems. Precipitation (rain or snow) falls in uneven patterns across the country. When no rain or only a small amount of rain falls, soils can dry out and plants can die. If dry weather persists and water supply problems develop, the dry period can become a drought. Droughts differ from typical emergency events such as floods or forest fires, in that they occur slowly over a multiyear period.

California has faced numerous challenges in recent years, including a nearly decade-long drought on the Colorado River, snowpacks that are below normal, and court-mandated reductions in the amount of water available for delivery by the State Water Project. Drought impacts increase with the length of a drought, as carry-over supplies in reservoirs are depleted and water levels in groundwater basins decline. Climate change, population growth, and the increasing instability of the water supplies in the delta formed by the confluence of the Sacramento and San Joaquin rivers threaten to exacerbate the crisis. Drought will also be discussed in our required hazard of climate change.

Extreme Heat initially ranked as a medium hazard by the planning group but once we put it through the Risk Factor Worksheet it scored a 1.9 which would drop it to Low Risk. Temperatures that hover 10 degrees or more above the average high temperature for the region and last for several weeks are defined as extreme heat. Temperatures in Apple Valley often reach 10 degrees above average however they rarely last more than a few days. Heat will also be discussed in our required hazard of climate change.

3. Erosion initially ranked as a low to medium hazard by the planning team but once we put it through the Risk Factor Worksheet it scored a 1.4 which would drop it to Low Risk. Since the Town of Apple Valley is located in an area of extreme topographic relief between the valley and the surrounding mountains and is therefore subject to erosion, runoff, and sedimentation. Key factors affecting these processes include climate, topography, soil and rock types.

Natural erosion may be accelerated by human activities such as agricultural or land development, as well as grading that may involve altering natural drainage patterns. Grading and construction activities such as soil compaction, and cut and fill slopes also increase the potential for erosion, and sedimentation. The increase in impermeable surfaces associated with development may impact conditions downstream of development, increasing the potential for flooding and sedimentation.

The planning team viewed erosion as secondary to flooding and with limited history of erosion occurring in Apple Valley the planning team did not include it as a primary hazard.

4. High Winds initially ranked as a low to medium hazard by the planning team. Although high winds and gusts are common to Apple Valley, the plannning team did not include it on the Risk Factor Worksheet because the disruption of services and spatial extent to our community is extremely minimal. When it has occurred the impacts are isolated with only infrequent reports of personal property damage due to property not being secured properly. If disruption of services occur, services are normally restored within a few hours.

High winds can result from thunderstorm inflow and outflow, or downburst winds when the storm cloud collapses, and can result from strong frontal systems, gradient winds (high or low pressure systems), or foehn winds, such as the Santa Ana's. High winds are speeds reaching 50 miles per hour or greater, either sustaining or gusting.

4.4 Flood Hazard Profile

Floods are the second most common and widespread of all natural disasters faced by the region and cities and towns like Apple Valley. Most communities in the United States have experienced some kind of flooding during or after spring rains, heavy thunderstorms, winter snow thaws, or summer thunderstorms.

A flood, as defined by FEMA's National Flood Insurance Program (NFIP) is: "A general and temporary condition of partial or complete inundation of two or more acres of normally dry land area or of two or more properties (at least one of which is the policyholder's property) from:

- Overflow of inland or tidal waters, or
- Unusual and rapid accumulation or runoff of surface waters from any source, or
- Mudflow, or
- 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."

Floods can be slow or fast rising but generally develop over a period of hours or days. Mitigation includes any activities that prevent an emergency, reduce the chance of an emergency happening, or lessen the damaging effects of unavoidable emergencies. Investing in mitigation measures now, such as: engaging in floodplain management activities, constructing barriers such as levees, and purchasing flood insurance will help reduce the amount of structural damage and financial loss from other types of property damage should a flood or flash flood occur.

The standard for flooding is the 1% annual chance flood, commonly called the 100-year flood, the benchmark used by the FEMA to establish a standard of flood control in communities throughout the country. The 1% annual chance flood is also referred to as the base flood.

The 1% annual chance flood is the flood that has a 1% chance of being equaled or exceeded in any given year and it could occur more than once in a relatively short period of time. By comparison, the 10% flood (10-year flood) means that there is a 10% chance for a flood of its size to occur in any given year.

While not considered a "high risk area", the Town does have areas that are considered "flood potential". The most crucial areas pertaining to flooding are the dry lake bed (consisting of limited residential) and Desert Knolls. Flooding is expected to occur within the general location of these risk areas, and not expected to threaten or endanger the safety or well being of the entire community. It is noted that flooding in the risk areas can occur rapidly depending on the heaviness and severity of rainfall and run-off. However, since the installation of dry wells in low-lying areas, severe flooding occurrences have become less frequent.

Since incorporation in 1988, the Emergency Operations Center has activated more often due to flooding than any other type disaster. The Town's emergency responders continue to rely on the National Weather Service for weather advisories, storm watch conditions, and storm warnings.

4.4.1 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, Town of Apple Valley is dedicated to protecting more than 363 homes with policies currently in force. Like most communities participating in NFIP, FEMA has prepared a detailed Flood Insurance Study (FIS) for areas of San Bernardino County, including the Town of Apple Valley. 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 (Flood Insurance Rate Maps). More information on location and geographic extent of the FIRMs see Figure 4-2.

The Town of Apple Valley entered the regular phase of the NFIP on March 3, 1996. As a participant in the NFIP, the Town of Apple Valley 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, Apple Valley 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 Town of Apple Valley ordinances (before the effective date of the Town of Apple Valley's FIRM) are called "pre-FIRM" structures. For Apple Valley, pre-FIRM structures are those permitted or built before March 3, 1996.

Extensive FEMA NFIP databases are used to track claims for every participating community including Apple Valley. NFIP insurance data provided by FEMA indicates that as of November 30, 2016 there were ***363*** policies in the Town of Apple Valley, resulting in ***$95,511,700*** of insurance in force; this amounts to ***$229,603*** in total premiums. Of the ***363*** policies, only ***115*** are for structures located within the 1% annual chance flood zones, while the remaining ***248*** policies are for structures located outside of the FEMA identified floodplain.

There have been ***17*** closed paid losses totaling ***$437,469***. Of the closed 17 paid losses there has been ***1*** substantial damage claims. Substantial damage means damage of any origin sustained by a structure whereby the cost of restoring the structure to it's 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 Town of Apple Valley has significant assets at risk to the 100-year flood. Currently, Town of Apple Valley contains ***3*** RL properties under their jurisdictional umbrella. The total dollar amount of claims paid to date by the NFIP is ***$437,471***. The Town of Apple Valley also contains ***1*** Severe Repetitive Loss structure.

The RL property that experienced flooding in the Town of Apple Valley 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 have been conducted and the Town of Apple Valley is currently tracking mitigation actions through standardized forms as required by FEMA. Of the 1 repetitive loss properties, 1 has been mitigated.

4.4.2 Past Flood Occurrences

Historical Events: The following describes the significant historical events associated with this hazard:

1. January; 1/24/2017
   A series of three consecutive rainstorms brought snow to local low mountains, swift water rescues, flooded roads and school closures. Close to .75 inches of rain fell between all three storms. A swift water rescue occurred in the Mojave River Bottom on the Victorville side. Public works had to close several streets due to flooding. Sandbags were offered to residents as needed.

   Source: Town of Apple Valley records; Daily Press newspaper

2. February; 2/28/2014
   A strong storm cell hit the high desert on February 28, 2014 causing several traffic accidents along highways and roadways. Isolated flooding occurred on roadways. Sandbags were provided to residents in need.

   Source: Town of Apple Valley records; Daily Press newspaper

3. Series of Rainstorms; 1/22/10 (FEMA-1844-DR)

   A series of severe rainstorms occurred in southern California on or about January 17, 2010 to February 6, 2010. A local declaration was issued by the Town Manager on January 21, 2010 (Resolution #2010-08). Governor Schwarzenegger proclaimed a State of Emergency for San Bernardino County on January 22, 2010, and President Bush declared a major for public assistance. The local Emergency Operations Center was activated to a level 1.

   The series of rainstorms caused 0.43 inches of rainfall in Apple Valley over one 24-hour period. About 6,000 sandbags were issued throughout the week. A Sewer Lift Station suffered major damage to the facility, sewer pipes, and manhole. Other work throughout the community included:

   - Debris removal
   - Sandbagging and road closures
   - Remove/replace asphalt and curbing
   - Repair severe road edge erosion
   - Base fill, grade, and recompact

   Source: Town of Apple Valley records; Daily Press newspaper

   Hazard: Flooding
   Deaths: 0
   Injuries: 0
   Displaced People: unknown

4. Series of Rainstorms; 1/8/2005 (FEMA-1577-DR)

A series of severe rainstorms occurred in southern California on or about December 27, 2004 to January 11, 2005. A local declaration was issued by the Town Manager on January 21, 2005 (Resolution #2005-06), and ratified by the Town Council on January 25, 2005 (Resolution #2005-07). Governor Schwarzenegger proclaimed a State of Emergency for San Bernardino County on January 15, 2005, and President Bush declared a major disaster on February 4, 2005 for public assistance. The local Emergency Operations Center was not activated.

The series of rainstorms caused 0.43 inches of rainfall in Apple Valley over one 24-hour period. About 3,000 sandbags were issued throughout the week. The rainstorms caused the release of up to 5,500 CFS of water from Silverwood Lake reservoir over a 3-4 day period. At one point the water in the Mojave River measured at 6-feet, and caused minor damage to rear yard properties along the west side of Riverside Drive. Sewer Lift Station 3-A suffered major damage (approximately $500,000) to the facility, sewer pipes, and manhole. Other work throughout the community included:

- Debris removal
- Sandbagging and road closures
- Remove/replace asphalt and curbing
- Repair severe road edge erosion
- Base fill, grade, and recompact

Source: Town of Apple Valley records; Daily Press newspaper

Hazard: Flooding
Deaths: 0
Injuries: 0
Displaced People: 0

5. 7/11/1999 (NDAA 99-04; OES #99-04-010)

On or about 4:00 p.m. on July 11, 1999, local flooding due to heavy rains occurred at various locations throughout the community. Resolution #99-27 confirming existence of a local emergency was signed by the Mayor. The Emergency Operations Center was partially activated.

Flooding led to multiple road closures, including the major arterial of Highway 18 and Tao Road. Approximately 29 other areas of road damage were noted. Water and mud damage destroyed three apartment units forcing the evacuation of residents. Apple Valley Fire Protection District conducted numerous rescues from stranded motorists. Apple Valley Chamber of Commerce went door-to-door to businesses in the Desert Knolls area (hardest hit area) to assist as necessary with storm damage. Approximately 14 businesses suffered moderate damage, as well as 34 single family residences.

Activities included:

- Sandbagging and road closures
- Remove/replace asphalt and curbing
- Repair severe road edge erosion
- Base fill, grade, and recompact

Source: Town of Apple Valley records; Daily Press newspaper

Hazard: Flash Flooding
Deaths: 0
Injuries: Unknown
Displaced People: Unknown

6. El Nino Conditions; 2/23/1998 (FEMA-1203-DR; NDAA-OES #98-01-285)

On or about 10:00 p.m. on February 23, 1998, local flooding due to heavy rains occurred at various locations. Resolution #98-13 confirming existence of a local emergency was issued, and the Emergency Operations Center was activated.

A total of 2.87-inches of rain poured on the High Desert in a 24-hour period. It was thought to be the third wettest month in Apple Valley since 1938 as the rain total for the month was 5.03-inches! Major damage occurred to 6 businesses and 21 apartment units and minor damage to another 35 apartment units, for a total of $8.9 million in damages.

Activities included:

- Sandbagging and road closures
- Debris removal; barricade placement
- Road shoulder erosion protection
- Repair to concrete casing for sewer line crossing at the wash
- Clean manholes and repair potholes
- Remove/replace asphalt

Source: Town of Apple Valley records, Daily Press Newspaper, Apple Valley News

Hazard: Flash Flooding
Deaths: 0
Injuries: 0
Displaced People: Unknown

7. 1/12/1993

On or about midnight on January 12, 1993, local flooding due to heavy rains occurred at various locations throughout the community. Resolution #93-05 confirming existence of a local emergency was signed by the Mayor.

The rainstorm dumped nearly 9-inches of rain in two days, with a constant rain lasting 11 days. The conditions worsened when there was a release of water from the Lake Silverwood reservoir.

Activities included:

- Sandbagging and road closures
- Debris removal
- Rescue of two rafters in the Mojave River (AVFPD)

- Construction of embankment to redirect flow of the Mojave River (San Bernardino County Flood Control)

Source: Town of Apple Valley records and Daily Press Newspaper

Hazard: Flash Flooding
Deaths: 0
Injuries: Unknown
Displaced People: Unknown

8. 12/7/1992

On or about 8:00 a.m. on December 7, 1992, local flooding due to heavy rains occurred at various locations throughout the community. Town of Apple Valley Resolution #92-80 confirming existence of a local emergency was signed by the Mayor. In fact, all four cities in the High Desert proclaimed a local emergency. A total of 2.4-inches of rain poured down in the High Desert in an 18-hour period. It was thought to be the most rain to drop in the High Desert in the past ten years.

Activities included:

- Evacuation of residents (6 apartment units)
- Sandbagging and road closures
- Debris removal

Source: Town of Apple Valley records; Daily Press Newspaper

Hazard: Flash Flooding
Deaths: 0
Injuries: 0
Displaced People: Unknown

9. El Nino Conditions; 2/12/1992

On or about 7:30 p.m. on February 12, 1992, local flooding due to heavy rains occurred at various locations throughout the community. A resolution proclaiming existence of a local emergency was signed by the Assistant Director of Emergency Services and the Deputy Town Manager.

Activities included:

- Sandbagging and road closures
- Debris removal
- Barricade placement and placement of cold mix asphalt into potholes
- Remove/replace asphalt, repaint stop bars/legends; replace striping
- Asphalt overlay and asphalt berms

Source: Town of Apple Valley records and Daily Press Newspaper

Hazard: Flash Flooding

Deaths: 0
Injuries: Unknown
Displaced People: Unknown

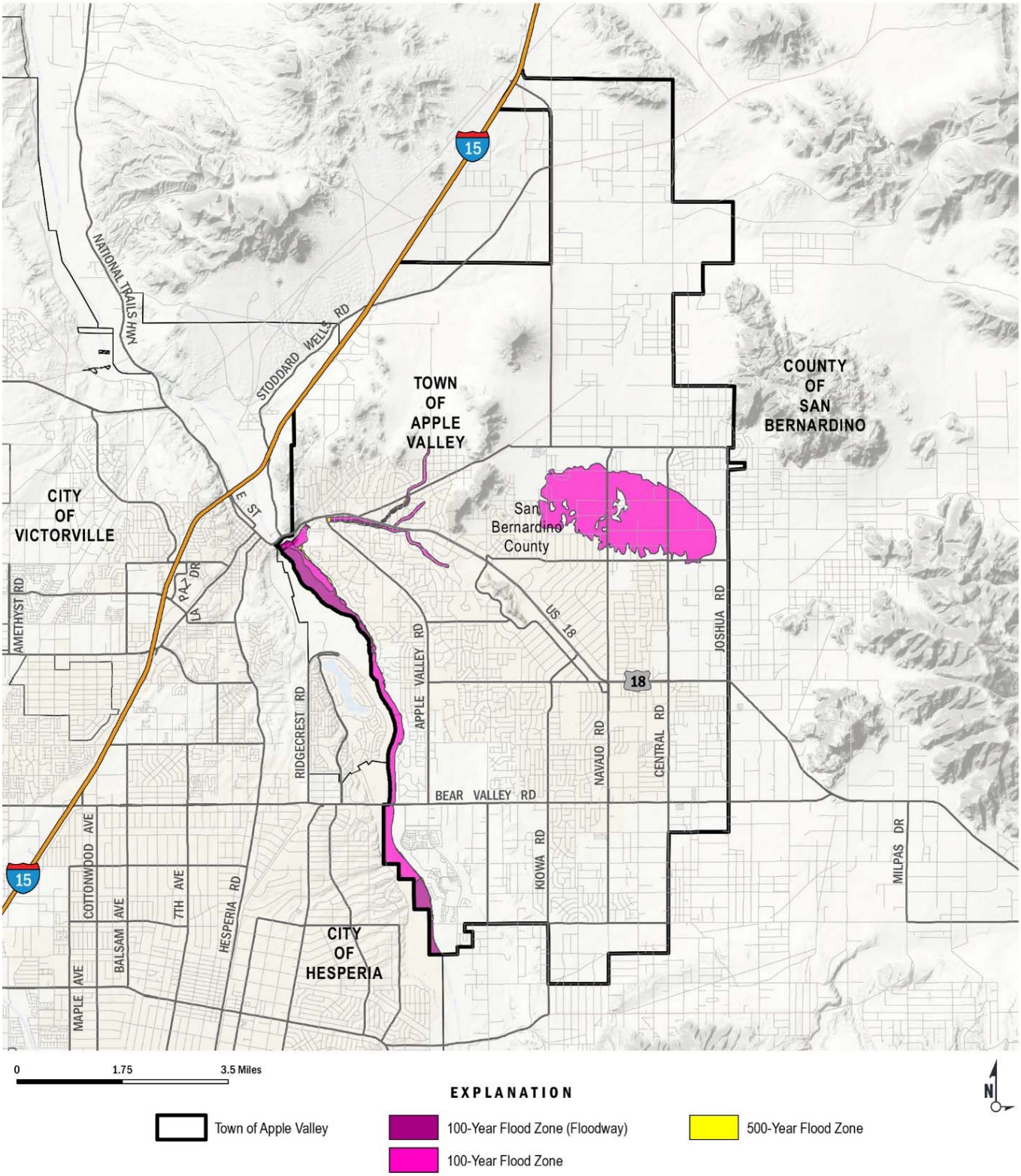


Figure 4-2: 100/500 Flood Zone Map

4.4.3 Location/ Geographic Extent

A majority of the flood risk within the Town of Apple Valley 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 Town of Apple Valley. This area is also referred to as the SFHA, and is a convenient tool for assessing vulnerability and risk in flood-prone communities.

Figure 4-2 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. Town of Apple Valley contains over 2,859 acres of identified flood hazard areas. Table 4-4 provides the total area for both the 100-year and 500-yr. flood hazard areas.

Table 4-4: Special Flood Hazard Area for Apple Valley

Flood Hazard Type	Sum of Acres	Sum of Square Miles
100-Year Flood	2,454	3.83
100-Year, Floodway	357	0.56
500-Year Flood	48	.07
500-Year, Protected by Levee	-	-
Total	**2,859**	**4.47**

4.4.4 Magnitude/ Severity

In urban areas like Apple Valley, flood problems are typically intensified as new homes and other structures are built. 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. However, in the absence of flood water conveyance systems, the Town's development code requires flood mitigation in the form of onsite detention, retention, and infiltration.

Unfortunately the Town does not have exact data or resources to obtain data on the strength of the flooding hazard such as flood depth grids, duration and speed of onset. However, what we can show 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 4-18. More than 1400 residents live near or within the 100-year floodplain and approximately 1500 residents live within the 500-year floodplain.

4.4.4.1 Flash Flooding (From San Bernardino County Operational Area Plan)

Flash flooding tends to occur in the summer and early fall because of the monsoon rains and is typified by increased humidity and high summer temperatures.

The desert area contains many mountain ranges that are steep and experience summer thunder storms causing flash floods in many dry washes on the desert floor. The water collects in dry lake beds throughout the desert area. Environmental permit processing has delayed or prohibited work in the washes to provide flow lines to many bridges on county highways.

Many highways do not have bridges but convey water across the road with dip crossings. Flash flooding causes road and bridge wash outs and erosion of earthen channels and basins when they occur near these facilities. Cities and towns often experience street closures for several days due to sediment transport and road damage. Because of the sheet flow character of the desert, many private properties experience erosion and sediment deposits.

The urban valley also can experience flash flooding in its narrow canyons and within the many unimproved creeks and interim channels feeding the Santa Ana River. The valley floor in many areas is very flat so even minor rain events can produce flooding of roads and private property. In coordination with local jurisdictions, the County of San Bernardino Flood Control District has prepared Master Drainage plans for many cities and towns to provide a plan for reducing flooding due to minor storms. Maps can be found on the County's Department of Public Works website here:

http://cms.sbcounty.gov/dpw/FloodControl/Planning/MPD.aspx

However, local resources are not sufficient to cover the cost of the construction of the drainage systems. The densely populated (75% of the county population) urban valley region contains the headwaters of the Santa Ana River. The San Gabriel and San Bernardino Mountains border the North side of the valley are steep reaching 5,000 feet with alluvial fans which are developed and densely populated.

4.4.5 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.

4.5 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.

4.5.1 Regulatory Environment

Wildfire regulatory requirements are mandated by the State of California and the Town of Apple Valley.

4.5.1.1 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):

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

4.5.1.2 Local

The Apple Valley Fire Protection District provides fire protection services to the Town of Apple Valley and the vicinity. It is an independent District whose western boundary is the Mojave River, and extends east as far as the dry lakes toward Lucerne Valley. It serves the Town and unincorporated areas of San Bernardino County, with a total service area of over 206 square miles. District staff includes paid, professional personnel and support staff.

The Fire Protection District maintains a mutual aid agreement with Victorville, San Bernardino County Fire Department, and the Bureau of Land Management. This agreement allows for fire departments within the region to actively support one another regardless of geographic or General Plan V-41jurisdictional boundaries. A joint dispatch center serving the mutual aid agencies is located in Victorville. There are currently a total of 43 paid staff in the Fire Protection District.

4.5.2 Past Occurrences

Wildfire events are of major concern to the Town of Apple Valley. Cal FIRE maintains a database of wildfire perimeters. Table 4-5 gives the dates and fire names of the historical wildfires that have burned within or near Town of Apple Valley limits. In the past five years there have been six significant wildland fires in or near to the Town of Apple Valley. These fires are listed in Table 4-5, and several of the more damaging fires are discussed below.

Table 4-5: Wildfire Occurrences 2011-2016

Year	Fire Name	Acres
6/1/2011	Roundup	144
6/9/2011	Bowen	295
7/3/2011	Deep	119
3/31/2015	River Bottom	185
8/7/2016	Pilot	8,110
8/16/2016	Blue Cut	36,274
Total		**45,127**

Source: Cal Fire

River Bottom Fire: On March 31, 2015 a fire erupted within Mojave Narrows Regional Park and quickly spread towards homes in Apple Valley off Riverside Drive. A few outbuildings and vehicles were lost but no homes. The fire was contained by the next day. American Red Cross opened a shelter for those evacuated at Sitting Bull Academy.

Pilot Fire: The Pilot Fire started at about 12:10 pm on Sunday August 7, 2016 near the Miller Canyon OHV area off of Highway 138. The Pilot Fire burned 8110 acres and was declared controlled on August 16, 2016 as a result of significant rainfall. AVUSD was closed for a few days due to air quality.

Blue Cut: The Blue Cut Fire started on August 16, 2016 at 10:36 AM in the Cajon Pass along Old Cajon Blvd. north of Kenwood Avenue west of Interstate 15. The fire quickly spotted across Cajon Creek and grew into a large wildland fire. During the course of the fire fight, railroad lines, local roads, highway 138 and Interstate 15 were closed along with a large evacuation area that included Lytle Creek, Wrightwood, Summit Valley, Baldy Mesa, Phelan and Oak Hills.

At the peak of the battle to control this blaze there were 2,684 personnel actively involved in the fight to contain the Blue Cut Fire. These personnel have come from all over the nation to help with this firefight. The Blue Cut Fire burned 36,274 acres, destroying an estimated 105 single family residences and 216 outbuildings. In addition, 3 single family residences and 5 other structures were damaged. Apple Valley took in over 480 small animals due to the Blue Cut fire. The Town had nearly $65,000 in reimbursable expenses related to small animal sheltering.

4.5.3 Location/Geographic Extent

Wildfires present a significant threat in the unincorporated area of Apple Valley, particularly in the summer months when temperatures are high and precipitation is rare. The period between June and September is typically considered "fire season".

The area known as the Marianas in the southern foothill area of Apple Valley is a fire hazard area due to the abundance of brush and mountainous terrain, which makes it difficult to gain access to fight fire. This area is primarily in the unincorporated region of Apple Valley with homes scattered throughout the vegetation.

The Mojave Riverbed is the second significant threat of wildland fire in the Apple Valley area. Because of its significant slope to the bottom of the riverbed and the soft soil, it is difficult to gain access to this area to fight fire. The Mojave River is the Town's western boundary with residential properties along Riverside Drive. Schools are located on the southernmost and northernmost ends of the natural extension of Riverside Drive.

4.5.4 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 are identified as Very High, High, and Moderate fire hazard severity throughout the County and are mapped for Apple Valley in Figure 4-3. According to LRA Apple Valley has nothing higher than moderate fire hazard severity.

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.

4.5.5 Frequency/Probability of Future Occurrences

In San Bernardino County, wildfire season commences in late Spring when temperatures begin to rise, humidity is low, and drier conditions persist. The season continues into the Fall, when the County experiences high velocity, very dry winds coming out of the desert. 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 unincorporated areas of the County creating plentiful fuel sources for wildfires.

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.

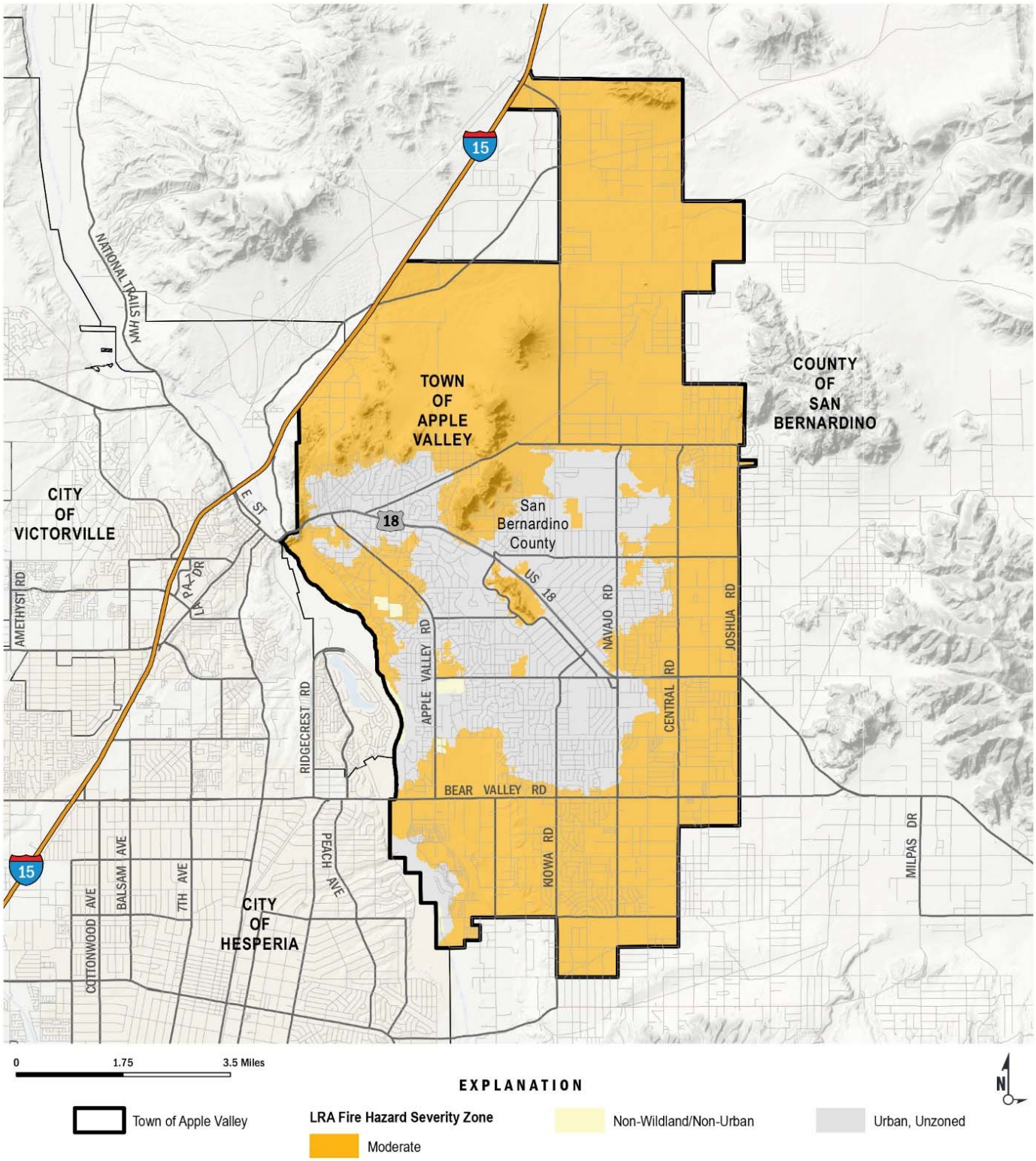


Figure 4-3: Wildfire Hazard Severity Zones

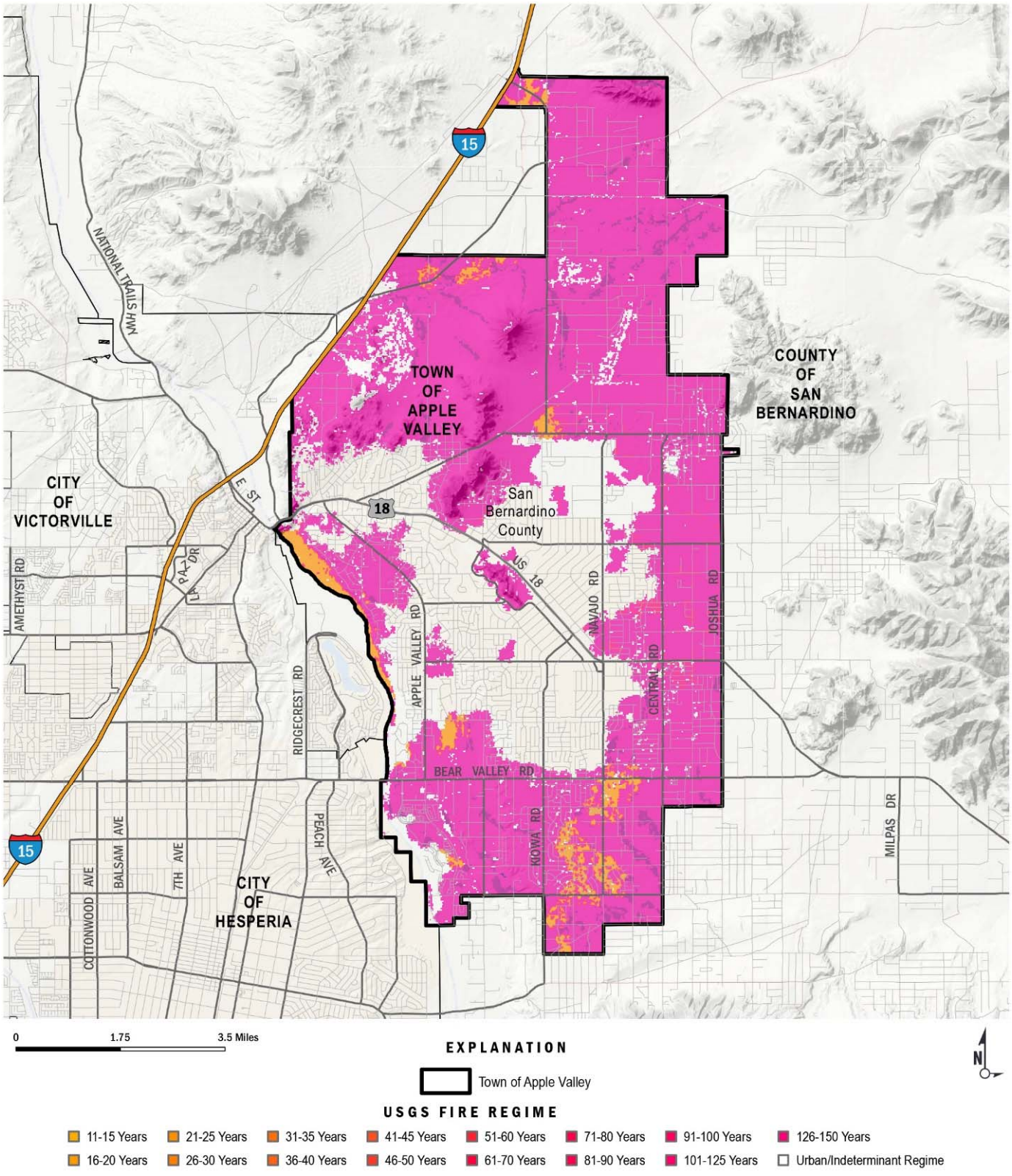


Figure 4-4: Wildfire Return Interval Map

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 4-4 for predicted fire return interval for the jurisdictional area.

For more information on the USGS wildfire mapping tools visit: http://www.landfire.gov/fireregime.php

4.6 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, 2016). The majority of major active faults in the Apple Valley 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 are a significant concern to Apple Valley. The area around Apple Valley is seismically active since it is situated on the boundary between two tectonic plates. Describe seismic activity and faults for the region. 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 Apple Valley, followed by liquefaction.

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

4.6.1 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 Town of Apple Valley's General Plan. To protect lives and infrastructure in the Town of Apple Valley, the following building and zoning codes are used.

4.6.1.1 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.

4.6.1.2 Local

The 2013 California Building Standards Code (also known as Title 24) became effective for the County on January 1st, 2014. Title 24 includes CBC Section 3417: Earthquake Evaluation and Design for Retrofit of Existing Buildings which can be viewed at http://www.documents.dgs.ca.gov/bsc/2015TriCycle/Pre-Cycle-2015/CBC-CEBC/BSC-0X-15-ET-Pt10-Agenda-4d.pdf.

The 2013 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 Town of Apple Valley, Building and Safety Department utilizes the 2013 CSBC to regulate the infrastructure in the Town of Apple Valley.

This includes unreinforced masonry (URM) buildings. For new buildings, Town of Apple Valley includes earthquake safety provisions, with enhancements for essential services buildings, hospitals, and public schools.

4.6.1.3 General Plan Geologic Hazard Reduction Policies

The Town of Apple Valley's General Plan includes the following policies for lowering the impacts of earthquakes on infrastructure:

- The Town shall begin and maintain an information database including maps and other information that describe and illustrate seismic and other geotechnical hazards that occur within and in proximity to the Town boundaries.
- In areas identified as being susceptible to slope instability, development shall be avoided unless adequately engineered to eliminate geotechnical hazards.
- The Town shall require that future development avoid disturbing unique rock outcroppings within the Town boundary and Sphere of Influence.
- The Town shall actively support and participate in local and regional efforts at groundwater conservation and recharge, in order to minimize the potential impacts of subsidence due to extraction of groundwater.
- In areas identified as being susceptible to rockfall, landslide, liquefaction and/or other associated hazards as depicted in the General Plan EIR, development shall be required to prepare detailed technical analysis, which shall include mitigation measures intended to reduce potential hazards below levels of significance.
- Development in areas susceptible to collapsible or expansive soils as shown in soils mapping in the General Plan EIR shall be required to conduct soil sampling and laboratory testing and to implement mitigation measures that reduce potential hazards below levels of significance.
- The Town shall coordinate and cooperate with public and quasi-public agencies to ensure that major utility systems and roadways have continued functionality in the event of a major earthquake.
- To minimize the potential for localized collapse of soils, new septic tank leach fields, seepage pits, drainage facilities, and heavily irrigated areas shall be located away from structural foundations and supports.

4.6.2 Past Occurrences

The HMP Planning Team noted the following regional and local events for the seismic activity in Apple Valley. Table 4-6 shows earthquakes greater than Magnitude 4.0 that have been felt within or near Apple Valley area in the last five years.

Table 4-6: Earthquakes: 2011-2016 San Bernardino County

Date	Name
1/15/2014	Fontana 4.4
7/5/2014	Running Springs 4.6
6/11/2014	Barstow 4.0
7/25/2015	Fontana 4.2
9/16/15	Big Bear Lake 4.0
12/30/2015	Muscoy 4.4
1/6/2016	Banning 4.4
2/20/2016	Lucerne Valley 4.3

There are hundreds more small (M<4.0) earthquakes that have occurred within San Bernardino County during this same time frame. Those with a magnitude of below 4.0 are not listed.

4.6.3 Location/Geographic Extent

Historical and geological records show that Southern California has a long history of seismic events. The risk of seismic hazards to residents of Apple Valley 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 California that are believed to be sources of M>6 earthquakes during the Quaternary (the past 2.6 million years).

Figure 4-5 shows fault zones nearest to Apple Valley. Per the California Department of Conservation's Earthquake Fault Zone Maps, Apple Valley is near the following active fault zones or regulatory fault zones managed by the Department of Conservation. Some of these fault lines along with probability of occurrence are shown in Figure 4-7.

4.6.3.1 North Frontal Fault

The North Frontal fault is closest to and therefore has the potential to generate the strongest seismic shaking in the area. The North Frontal fault is a partially blind reverse fault zone comprised of several fault splays; it trends south along the eastern flank of the San Bernardino Mountains, and has a combined total length of approximately 40 miles. Several of the fault splays interact with other faults that traverse the region. The most significant fault with which the North Frontal relates is the Helendale fault, which offsets and divides the North Frontal into two main segments, referred to as the East and West segments. The West segment is approximately 22 miles long, and is less than 0.5 miles from Apple Valley at the closest point.

The North Frontal fault is considered an active fault, based on its having moved within the last 10,000 years. However, it has not been studied in detail, and while it is has been attributed a slip rate of approximately 0.5 mm per year, the parameters of this fault are not well understood. It is thought that movement on this fault causes an average uplift rate of the San Bernardino Mountains of about 1 mm per year. The West segment of the North Frontal fault zone is considered capable of generating a maximum magnitude 7.2 earthquake, based on its length. Such an earthquake on this fault would generate peak ground accelerations in the planning area of between about 1.1g and 0.4g, which converts to Modified Mercalli intensities as high as XI. Based on rupture of the East segment of the North Frontal fault zone in a 6.7 earthquake, ground shaking of about 0.26g to 0.14g would be felt in the planning area. This converts to Modified Mercalli intensities in the IX to VIII range.

4.6.3.2 Helendale Fault

There are several right-lateral strike-slip faults within what is known as the Eastern California Shear Zone, of which the Helendale fault is the westernmost. Approximately 9 to 23% of the total movement along the North American/Pacific plate boundary motion occurs along this zone. The Helendale fault itself is 56 miles long, but it also seems to form a continuous fault with the South Lockhart fault to the north. The southern end of the Helendale fault apparently offsets the North Frontal fault, as discussed above, forming the East and West segments. The Helendale fault extends to the northeast of the planning area, outside of Apple Valley's northeastern corporate limits and within the Sphere of Influence. The Helendale fault has an annual slip rate calculated at 0.8 mm/year; it has a recurrence interval for large surface-rupturing events of 3,000 to 5,000 years. Based on currently available data, the California Geological Survey estimates that a

maximum earthquake of magnitude 7.3 along the combined Helendale-South Lockhart faults would generate horizontal peak ground accelerations in Apple Valley of between 0.75g and 0.3g, with Modified Mercalli Intensities of between XI and IX.

4.6.3.3 San Andreas Fault

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.

The San Andreas Fault zone is located approximately 23 miles southwest of Apple Valley. The longest fault in the State of California, it extends approximately 750 miles from Cape Mendocino in northern California to the Salton Sea in southern California. The San Andreas, a right-lateral transform fault, is regarded as a "Master Fault" that controls the seismic hazard for central and southern California. The magnitude 8.0 Fort Tejon earthquake, which occurred in 1857, is the last major earthquake to have occurred on the southern San Andreas. As previously discussed, at least one other fault occurs closer to Apple Valley and has the potential to cause stronger ground

shaking, and therefore more damage, than the San Andreas Fault. Nonetheless, the San Andreas Fault is considered to have a high probability of causing an earthquake in the near future and should therefore be considered in all seismic hazard assessment studies in southern California given its.

The Fort Tejon earthquake in 1857 ruptured the Cholame, Carrizo, and Mojave segments of the San Andreas fault, and displacements occurred along of as much as 27 feet of the rupture zone. It is estimated that peak ground accelerations in Apple Valley as a result of the 1857 earthquake may have been as high as 0.38g. Another similar earthquake that ruptured the entire southern San Andreas Fault, with its epicenter along the section of fault closest to Apple Valley, could generate even higher peak ground accelerations in Apple Valley, estimated at between 0.48g and 0.25g.

4.6.3.4 Lenwood – Lockhart – Old Woman Springs Faults

Another of the Eastern California Shear Zone faults is the Lenwood fault, a right-lateral strike slip fault approximately 47 miles long. It has a slip rate of about 0.8 mm/year. Based on trenching studies, this fault has ruptured at least three times and these ruptures have occurred as recently as approximately 200 to 400 years ago. Other ruptures are estimated as occurring between 5,000 and 6,000 years ago, and 8,300 years ago. Therefore a recurrence between major surface ruptures is estimated at between 4,000 to 5,000 years. Prior to the 1992 Landers earthquake the yearly slip rate on this fault had been recorded but not verified.

The Lockhart fault is approximately 44 miles long and is north of the Lenwood fault. The North Lockhart fault, a segment that evidences no activity within the last 11,000 years, is approximately 6 miles. The Lockhart fault is estimated to have an interval of between 3,000 and 5,000 years for major surface-rupture.

The Old Woman Springs segment is about 6 miles long and is the main trace in a complex fault system where the Eastern segment of the North Frontal Fault Zone and the Lenwood fault intersect. It is considered an active fault.

The Lenwood and Lockhart faults essentially form a continuous, 90-miles long system. While there is no evidence that both of these faults have ruptured together in the past, such an event may be possible, as evidenced by rupture of five separate fault segments during the Landers earthquake. The technical background study assumes a scenario wherein the Lenwood

and Lockhart faults, together with the Old Woman Springs fault, rupture together in a magnitude 7.5 maximum earthquake. Such an event would generate peak ground accelerations in Apple Valley of about 0.42g to 0.19g, with Modified Mercalli Intensities in the IX to VIII range. A smaller magnitude event involving rupture along only one of these faults ruptures would cause lesser ground motions in Apple Valley than those reported above.

4.6.3.5 Cleghorn Fault

The Cleghorn fault, also known as the Silverwood Lake fault due to its extension across the lake, is approximately 19-miles long. Studies suggest that the fault zone has had about 650 feet of motion in the last 50,000 to 100,000 years, which results in a slip rate of 2 to 4 mm/year. A magnitude 6.5 earthquake on this fault is considered capable of generating horizontal peak ground accelerations in the Apple Valley area of between about 0.33g and 0.11g, with Modified Mercalli Intensities in the IX to VII range.

4.6.3.6 Cucamonga Fault

The Cucamonga fault zone is approximately 16-miles long. As one element of the Transverse Ranges family of thrust faults, it runs along the southern front of the San Gabriel Mountains from San Antonio Canyon eastward to the Lytle Creek area. It has a slip rate of between approximately 5.0 and 2.0 mm/year with an estimated average recurrence interval of 625 years. The Cucamonga fault is thought capable of generating a maximum magnitude 6.9 earthquake, based on length, and such a scenario would result in peak horizontal ground acceleration in the Apple Valley area of between about 0.28g and 0.15g, with Modified Mercalli intensities in the IX to VIII range.

4.6.3.7 Landers (or Kickapoo) Fault

The group of faults that ruptured during the 1992 Landers earthquake, including the Homestead Valley, Kickapoo, and Johnson Valley faults, and segments of the Burnt Mountain and Eureka Peak faults, are known as the Landers fault. The Landers fault now refers to the Kickapoo fault. These faults are part of the Eastern Mojave Shear Zone and were discovered after they ruptured the surface during the 1992 Landers earthquake. It is estimated that intervals between major ruptures is in the thousands of years, The 1992 earthquake resulted in substantial lateral displacement along some of these faults, for instance nearly 9.5 feet in the case of the Kickapoo fault. Individually, these faults could rupture in smaller earthquakes. Their combined lengths allowed for the magnitude 7.3 earthquake that shook southern California on June 28, 1992.

Ground shaking in the Apple Valley area due to a Landers-type earthquake on these faults would cause horizontal ground accelerations of between 0.27g and 0.14g, with Modified Mercalli intensities in the IX to VIII range.

4.6.3.8 Sierra Madre Fault

The Sierra Madre fault zone or complex is approximately 47 miles long and extends along the base of the San Gabriel Mountains from the San Fernando Valley to San Antonio Canyon; from there it continues southeastward as the Cucamonga fault. The estimated slip rate of the Sierra Madre fault is estimated to be approximately 0.6 mm/year with a recurrence interval of about 8,000 years. Recent studies suggest that the last rupture event on the eastern segments of the fault occurred about 8,000 years ago, therefore, the Sierra Madre fault may be near the end of its cycle, and therefore it has potential generate an earthquake in the not too distant future. The Sierra Madre fault is estimated to be capable of producing a magnitude 7.2 earthquake, resulting in peak horizontal ground accelerations in Apple Valley of between about 0.21g and 0.14g.

4.6.3.9 Gravel Hills – Harper Lake Fault

This fault zone is between 31 and 44 miles long, depending on how many fault segments are included and is considered active. The estimated annual slip rate on this fault zone is 0.9 mm/year; the recurrence interval between earthquakes is about 3,500 years. The combined fault segments are estimated to be capable of generating 7.1 magnitude earthquake, which would generate peak horizontal ground accelerations in the Apple Valley area of between 0.20g and 0.11g, with Modified Mercalli intensities in the VIII to VII range.

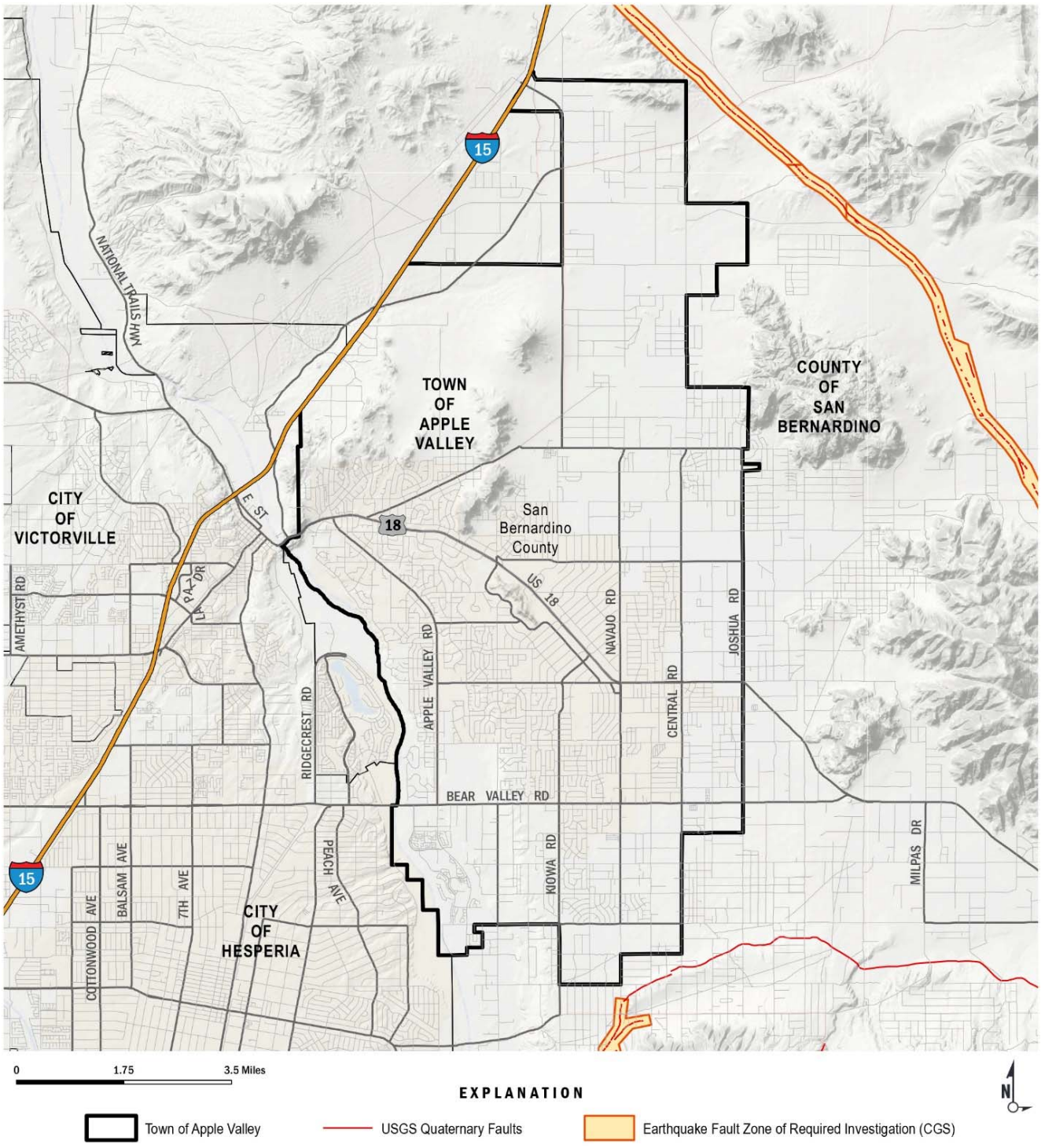


Figure 4-5: Active Fault Map

Source: Department of Conservation & USGS

4.6.4 Magnitude/Severity

Classification of seismic events is based on their magnitude and intensity. The intensity of ground shaking is determined by several factors, such as the earthquake's magnitude, the distance from the epicenter, and the geologic composition of local soils and rocks. Seismic intensity is most commonly measured by the Modified Mercalli Intensity (MMI) scale, which includes twelve levels of damage. The MMI is derived from actual observations of damage to structures and human reactions to earthquakes. Based on this scale, an earthquake tremor at Level I earthquake tremor is generally not felt and is considered unlikely to result in damage, whereas a Level XII earthquake results in total destruction. Earthquake intensities may result in damage such as partial or complete collapse of masonry structures, severe damage to complete destruction of underground pipelines, rock and landslides, and massive damage or destruction of bridges, overpasses and other improvements.

Figure 4-6 shows MMI classes for Apple Valley based on the Great Shakeout Scenario of a magnitude 7.8 earthquake along the southern San Andreas Fault.

Earthquake magnitude is measured by the Richter Scale on a continuum of one to nine, with each level-of-magnitude increase representing a tenfold increase in the amplitude of the waves on a seismogram. The most notable historic earthquake in the Apple Valley region was the Landers earthquake of 1992, which had a magnitude of 7.3 on the Richter Scale. The Landers earthquake, so named for its epicenter near the small desert community of Landers, also ruptured five other separate faults.

The largest earthquake likely to occur on a fault or fault segment within a specified period of time is considered the Maximum Probable Earthquake (MPE). The MPE is useful during emergency and engineering planning. It provides a means to assess the potential seismic risk within a region, is referenced to establish safe construction and design parameters, and facilitates the preparation of policies and programs that are responsive to the potential impacts of an earthquake.

Defined as the largest earthquake a fault is estimated to be capable of generating, the Maximum Credible Earthquake (MCE) also provides a useful gauge for emergency and engineering planning efforts. In the Apple Valley area, the North Frontal fault (West) is expected to generate a magnitude 7.2 earthquake with a Peak Ground Acceleration (PGA) ranging from 1.13g to 0.38g, which is equivalent to a Level XI to X on the Modified Mercalli Intensity Scale (MMI). Table 4-7 shows a list of faults that could generate significant impacts within Apple Valley and the surrounding area.

Table 4-7: Seismic Intensities

Table IV-1
Estimated Horizontal Peak Ground Accelerations and Seismic Intensities in the Apple Valley Area

Fault Name	Distance to Apple Valley (km)	Distance to Apple Valley (mi)	Magnitude of M_{max} *	PGA (g) from M_{max}	MMI from M_{max}
North Frontal Fault (West)	<0.5 – 16.2	0.5 – 26.1	7.2	1.13 – 0.38	XI - X
Helendale – South Lockhart	<0.5 – 13.9	0.5 – 22.4	7.3	0.75 – 0.33	XI - IX
San Andreas (Whole Southern)	14.4 – 31.4	23.1 – 50.6	8.0	0.48 – 0.25	X - IX
Lenwood – Lockhart – Old Woman Springs	12.1 – 28.7	19.4 – 46.2	7.5	0.42 – 0.19	IX - VIII
San Andreas (San Bernardino – Coachella)	14.4 – 31.4	23.1 – 50.6	7.7	0.41 – 0.20	X - VIII
San Andreas (1857 Rupture or Cholame – Mojave)	16.9 – 33.2	27.2 – 53.5	7.8	0.38 – 0.20	IX - VIII
San Andreas (San Bernardino)	14.4 – 31.4	23.1 – 50.6	7.5	0.36 – 0.17	IX – VIII
Cleghorn	8.1 – 24.4	13.1 – 39.2	6.5	0.33 – 0.11	IX - VII
San Andreas (Mojave)	16.9 – 32.2	27.2 – 53.5	7.4	0.30 – 0.15	IX - VIII
Cucamonga	18 – 34.4	29 – 55.3	6.9	0.28 – 0.15	IX - VIII
Landers	17.3 – 34.5	27.9 – 55.6	7.3	0.27 – 0.14	IX - VIII
North Frontal (East)	17.3 – 32.2	27.9 – 51.9	6.7	0.26 – 0.14	IX – VIII
Sierra Madre	29.6 – 45.1	47.7 – 72.6	7.2	0.21 – 0.14	VIII
Gravel Hills – Harper Lake	20.8 – 37.5	33.5 – 60.3	7.1	0.20 – 0.11	VIII - VII
Calico – Hidalgo	29.1 – 43.6	43.1 – 70.2	7.3	0.18 – 0.11	VIII - VII
San Jacinto (San Bernardino)	18.6 – 35.7	29.9 – 57.4	6.7	0.17 – 0.09	VIII - VII
Johnson Valley (Northern)	19.9 – 32.4	32 – 52.1	6.7	0.16 – 0.10	VIII – VII
Puente Hills Blind Thrust	42.7 – 58.9	68.7 – 94.8	7.1	0.14 – 0.10	VIII - VII
Blackwater	30 – 45.2	46.8 – 72.8	7.1	0.14 – 0.09	VIII - VII
San Jacinto (San Jacinto Valley)	26.2 – 42.8	42.2 – 68.8	6.9	0.14 – 0.09	VIII - VII
Pinto Mountain	31.5 – 48.8	50.7 – 78.5	7.2	0.14- 0.09	VIII - VII
Pisgah – Bullion Mtn. – Mesquite Lake	35.5 – 51.4	57.1 – 82.7	7.3	0.13 – 0.09	VIII - VII
Emerson South – Copper Mtn.	29 – 40.6	46.7 – 65.3	7.0	0.13 – 0.09	VIII - VII

Abbreviations: mi – miles; km – kilometer; M_{max} – maximum magnitude earthquake; PGA – peak ground acceleration as a percentage of "g", which is the acceleration of gravity; MMI – Modified Mercalli Intensity.
Source: Technical Background Report to the Safety Element for the Town of Apple Valley, prepared by Earth Consultants International, 2007.

Potential adverse effects from earthquakes may be substantial and range from property damage, to the loss of public services and facilities, to loss of life. Apple Valley and the surrounding area are most susceptible to severe impacts associated with strong ground shaking.

Strong ground shaking can cause other geologic hazards, including landslides, ground lurching, structural damage or destruction, and liquefaction, which can further disrupt affected areas through fire, the interruption of essential services or damage to facilities and infrastructure, such as water, sewer, gas, electric, transportation, communications, drainage, as well as release of hazardous materials. Dam or water tank failure brought about by seismic activity can result in flood inundation.

There are no faults mapped by the State of California within the Town's corporate limits or within either of the proposed annexation areas; however two faults occur within portions of the Town's Sphere of Influence (Figure 4-6).

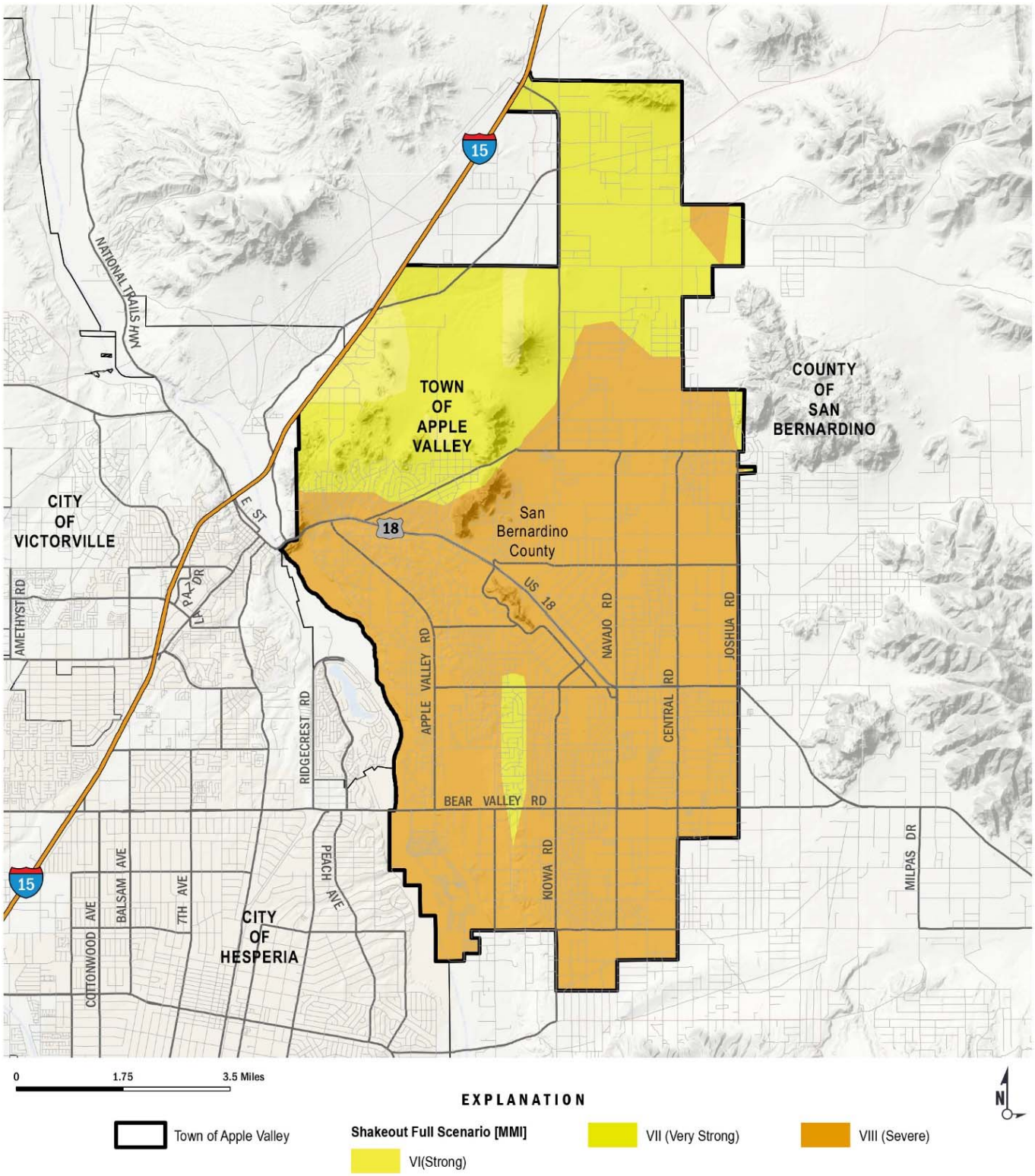


Figure 4-6: Great Shakeout Scenario MMI Classes

4.6.5 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 4-8 from the USGS lists Average 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 4-8: Southern California Region Earthquake Probability

Magnitude (greater than or equal to)	Average repeat time (years)	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 (UCERF2 [1]) to about 7.0% for the thirty-year duration starting in 2014 (UCERF3 [2]). 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 4-7); 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

[1] 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.

[2] 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/)

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 4-7 shows the locations of major faults in California, including the four (4) 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).

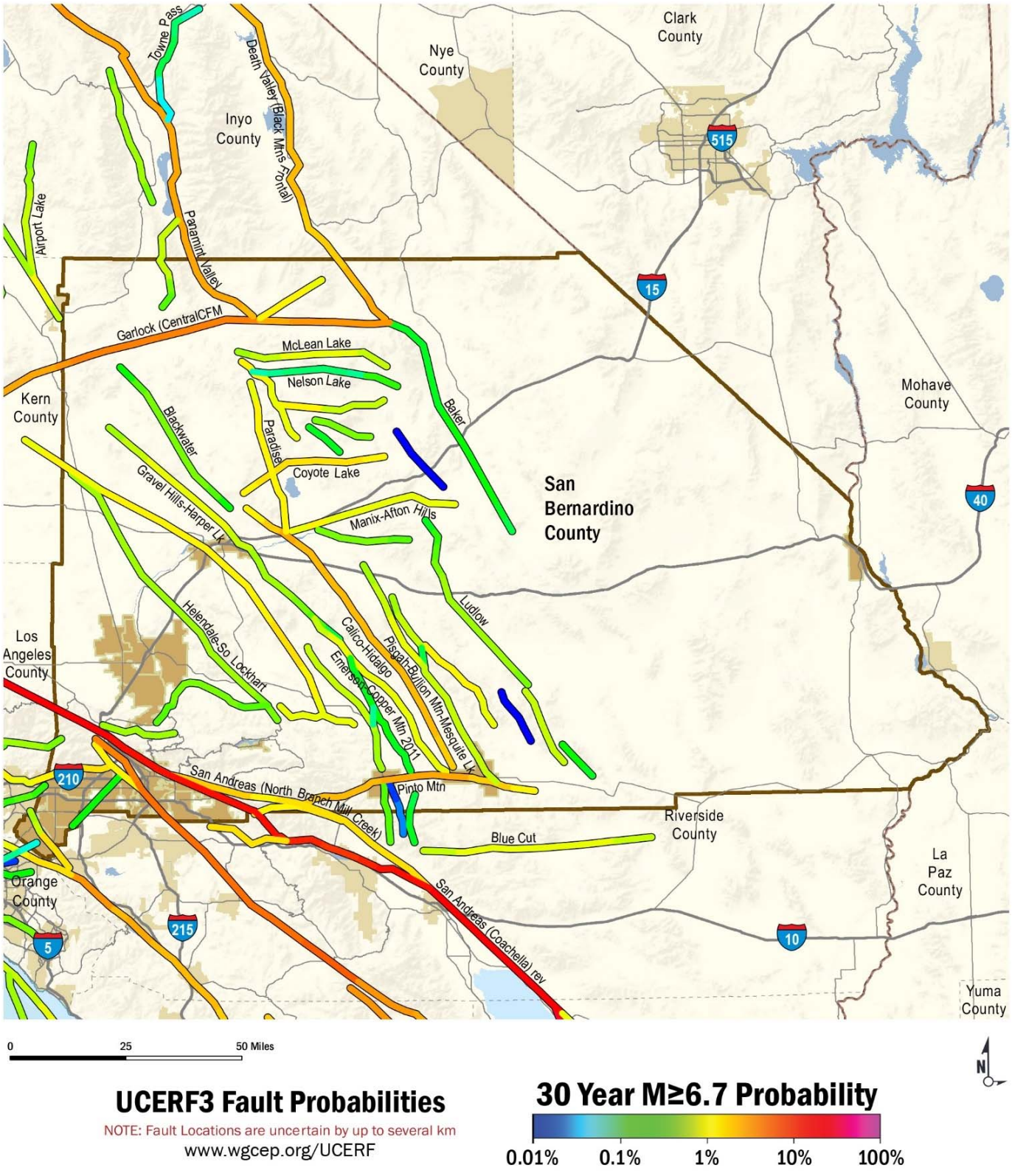


Figure 4-7: UCERF 3 Fault Probabilities

4.7 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);
- 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.

4.7.1 Regulatory Environment

4.7.1.1 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.

4.7.1.2 Town of Apple Valley Climate Action Plan (CAP)

This Climate Action Plan includes general information about greenhouse gases and climate change, assumptions and data used to determine the 2005 inventory and baseline, the 2020 forecast under business as usual conditions, and the proposed reduction measures that will enable the Town to achieve the targeted reduction level, thereby doing its part to limit greenhouse gas emissions statewide that contribute to climate change.

To review the full text document, please click on the following link:

http://www.applevalley.org/services/planning-division/climate-action-plan

4.7.1.3 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 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 4-8 San Bernardino County is located in the Desert Region.

4.7.1.4 Apple Valley Choice Energy

Apple Valley is addressing issues relating to Climate Change through the implementation of Apple Valley Choice Energy (AVCE). This program, started April of 2017, allows residents within Apple Valley to receive energy with a higher "renewable" content than what is currently provided by the franchised utility (SCE). The minimum renewable energy content for AVCE customers is 35%. In addition, the program provides an alternate selection of 50% renewable energy content for those who choose to "opt-up" to that plan. AVCE's minimum 35% renewable energy content already exceeds the California state mandate of 33% renewable energy content that will be required in the year 2020.

The renewable energy content is derived from solar, wind, hydro and geothermal sources primarily within California. Apple Valley Choice Energy plans to offer customers of AVCE a 100% renewable energy option in future years that will further reduce the overall impacts of Greenhouse Gases affecting Climate Change as a result of burning fossil fuels.

In addition to supplying renewable energy, AVCE actively promotes Net Energy Metering (NEM) for customers with rooftop solar by offering a premium by-back rate that is nearly double the rate that they would receive from SCE. AVCE will also offer future incentives to Town residents and businesses for improvements that contribute to energy efficiency as well as develop programs to encourage implementation of energy conservation measures. The Town also participates in the High Desert Regional Partnership with the other cities in the High Desert to promote energy efficiency on a regional basis.

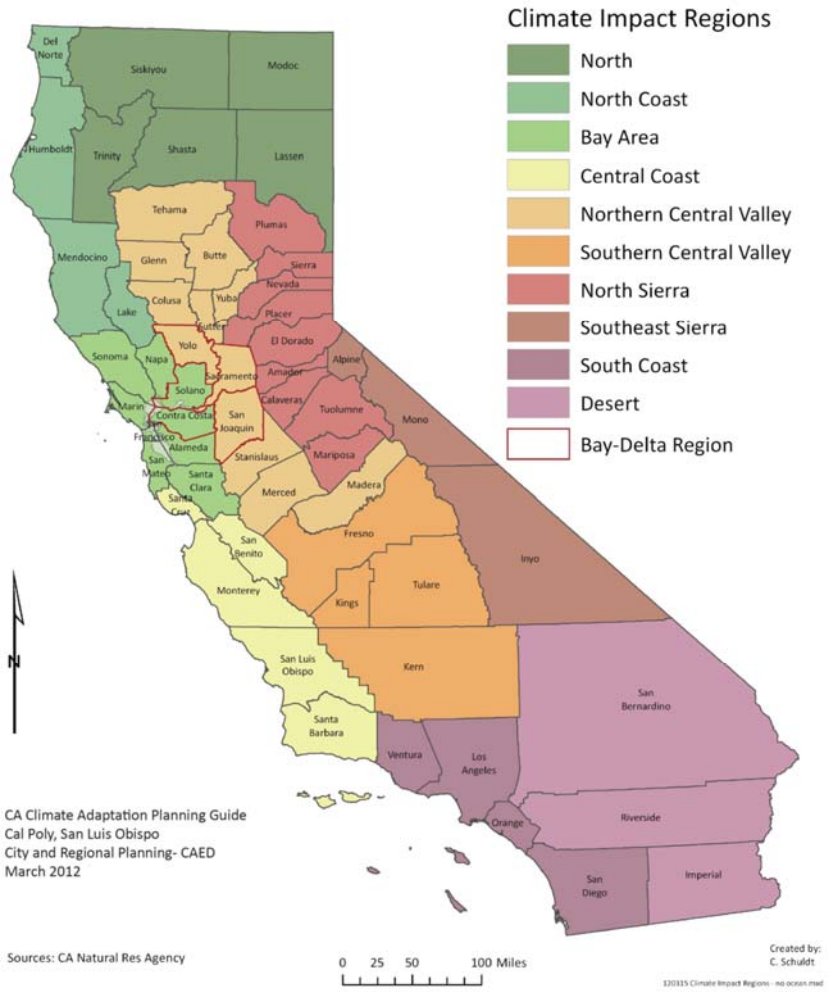


Figure 4-8: Climate Impact Regions

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 Gorgonio 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

4.7.2 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 people deaths over a 13-day period.

4.7.3 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 4-9 and Figure 4-10 provide Cal Adapt[3] 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/

[3] 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.

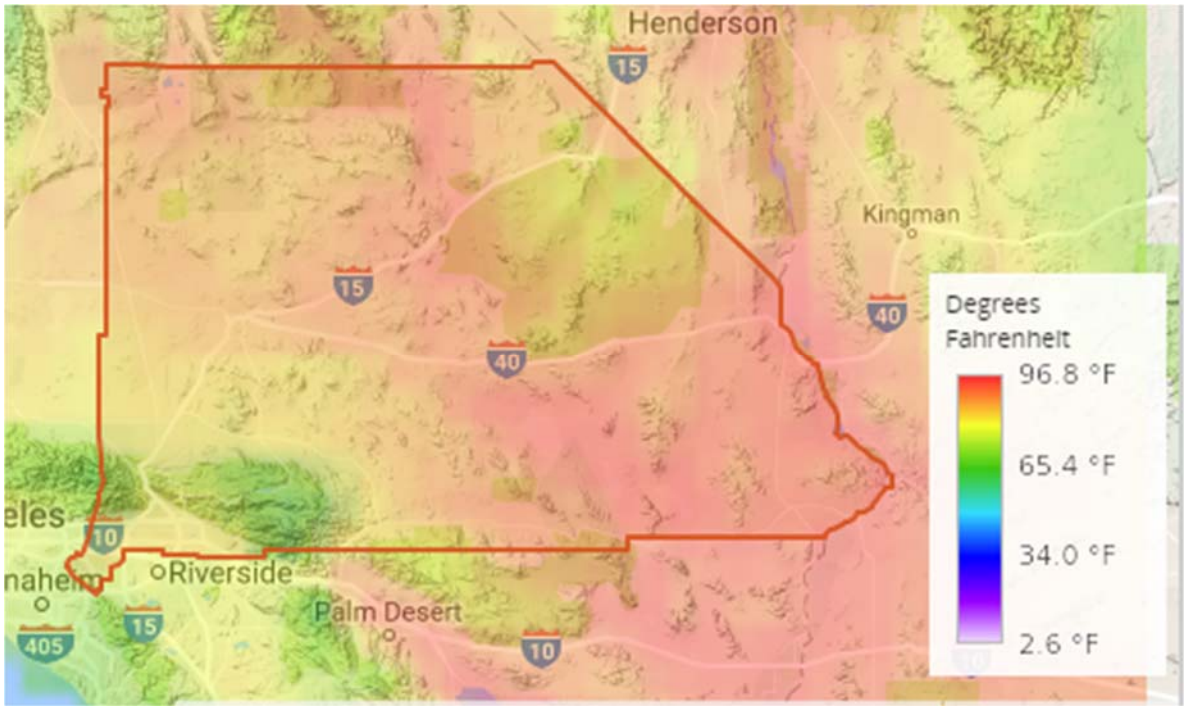


Figure 4-9: Climate Impact Regions: July Decadal Average High Temperature Map; 2010

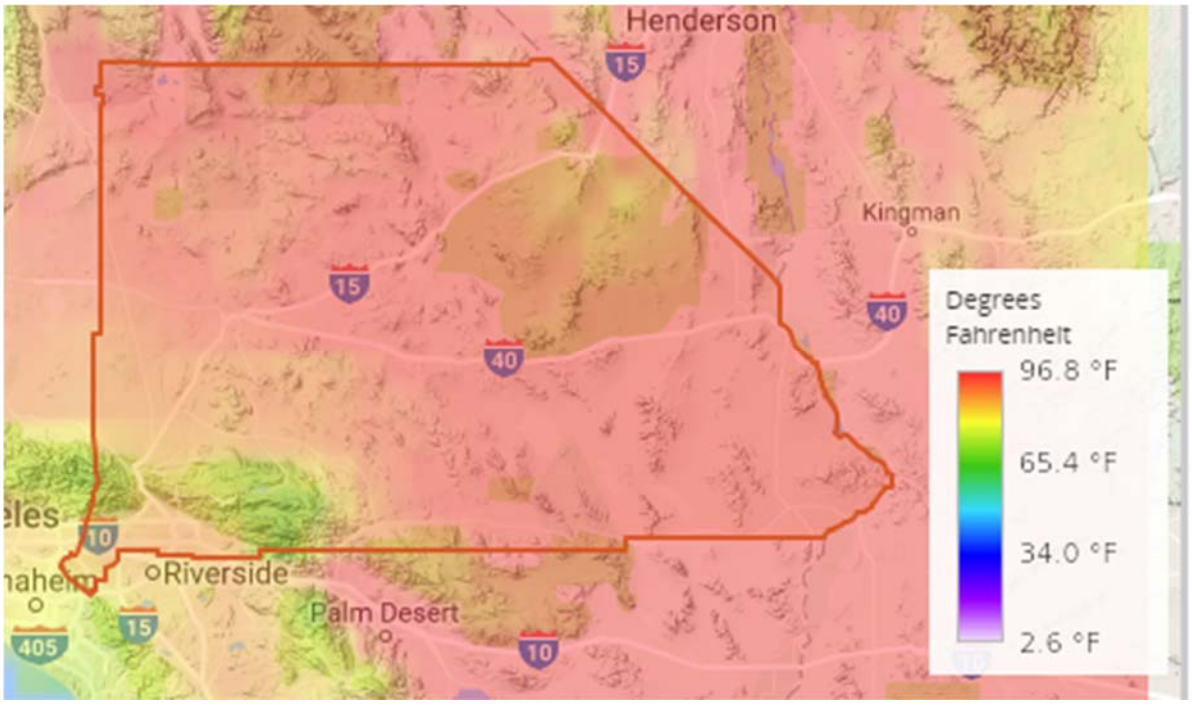


Figure 4-10: Climate Impact Regions: July Decadal Average High Temperature Map; 2090

4.7.4 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 4-9. Hotter, drier conditions are expected to exist in the desert area, increasing the risk for other natural hazards.

Table 4-9: 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 Gorgonio 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 4-11.

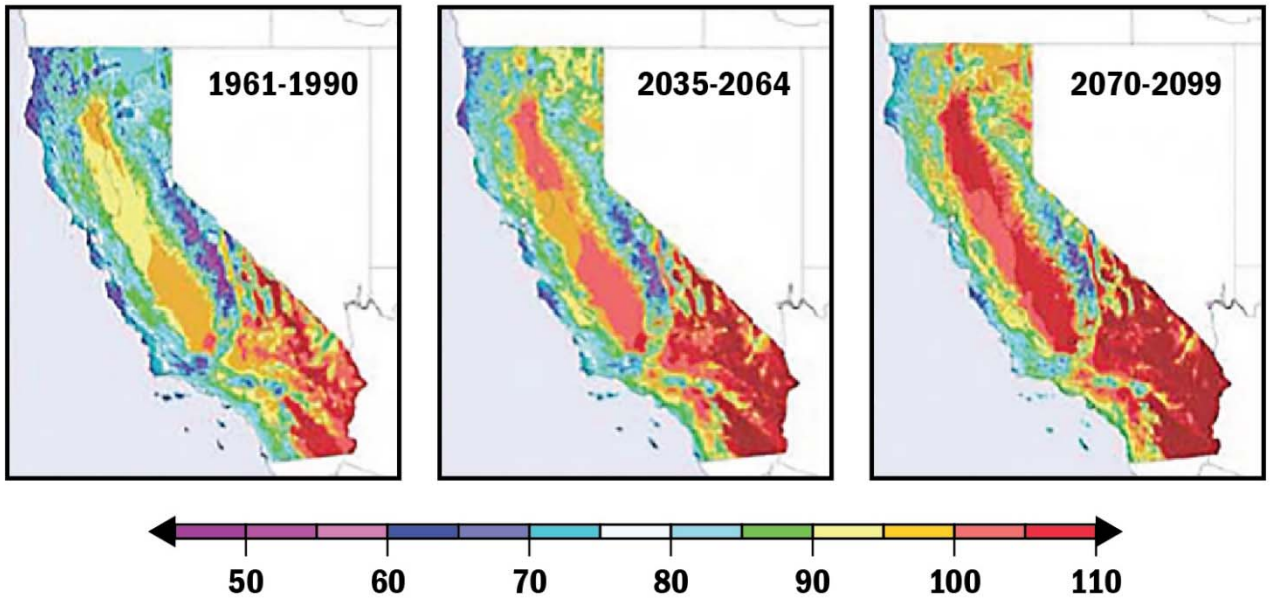


Figure 4-11: California Historical and Projected Temperature Increases - 1961 to 2099

Source: Dan Cayan; California Climate Adaptation Strategy

4.7.5 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, drought, and levee failure:

- Climate change is expected to lead to increases in the frequency, intensity, and duration of extreme heat events and heat waves in San Bernardino County 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 Gorgonio 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 in the San Bernardino County Flood Control District.
- 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 impacts, vegetation conversions and habitat fragmentation.

4.8 Vulnerability Assessment

The hazard exposure analysis has been developed with best available data and follows methodology described in the FEMA publication Understanding Your Risks—Identifying Hazards and Estimating Losses. There are other intangible losses that could result from a natural hazard event, such as losses of historic or cultural integrity or damage to the environment that are difficult to quantify. Other costs, including response and recovery costs, are often unrecoverable and are not addressed in this document.

4.8.1 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 the Town of Apple Valley, wildfire, flood, 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 4-12 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, and earthquakes as potential hazards later in this section.

Together with the U.S. Census data, asset data was used to provide a snapshot of how Town assets are affected by natural hazards. For purposes of this vulnerability analysis, asset data includes parcels and critical infrastructure within the Town of Apple Valley boundaries. Critical infrastructure is described as assets that are essential for people and a community to function. Critical infrastructure includes such as utilities, Apple Valley 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 Apple Valley owned and maintained data, state and federal government datasets, and private industry datasets. A critical infrastructure spatial database was developed

to translate critical facilities information into georeferenced[4] points. Critical facility points are intersected with the spatial hazard layers to develop a list of "at risk" critical facilities. The Town of Apple Valley critical facilities that intersect with natural hazards are referred to as facilities with hazard "exposure". Exposure results are presented later in this section.

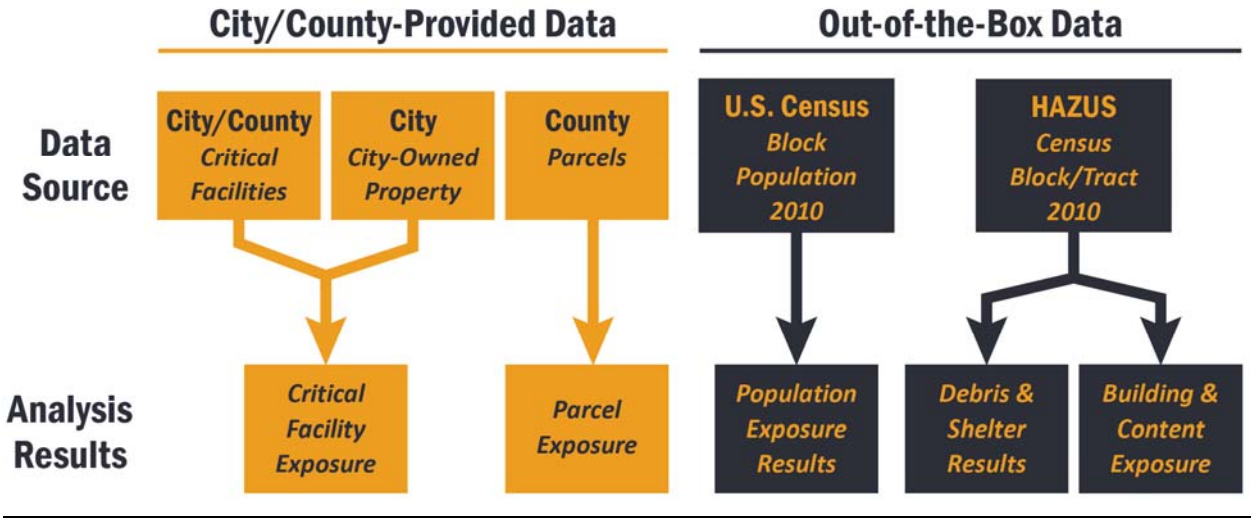


Figure 4-12: Data Source and Methodology

Lastly, FEMA's Hazus 3.2 (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.

The vulnerability and potential impacts from priority hazards that do not have specific mapped areas nor the data to support additional vulnerability analyses are discussed in more general terms following the discussion on wildfire, flooding, dam failure and earthquake hazards.

4.8.2 Population and Assets

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. Sections below provide a description of the total population, critical facilities, and parcel exposure inputs.

[4] 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.

4.8.2.1 Population

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 Town of Apple Valley by analyzing the extent of the hazard in relation to the location of population. For purposes of the vulnerability assessment approximately 100% of the Town of Apple Valley's population is exposed to one or more hazards within or near Apple Valley boundaries. Each natural hazard scenario affects the Town of Apple Valley 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.

4.8.2.2 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.

4.8.2.2.1 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 4-13 shows the median household income distribution for the Town of Apple Valley in 2012. 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 Town of Apple Valley between 2010 and 2014 was $45,554. In the United States during the same period the median house household income was $50,157. The map in Figure 4-13 shows 2012 household income estimates using Census 2010 geographies.

4.8.2.2.2 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 4-14 and Figure 4-15 for location of vulnerable population by age within the Town of Apple Valley.

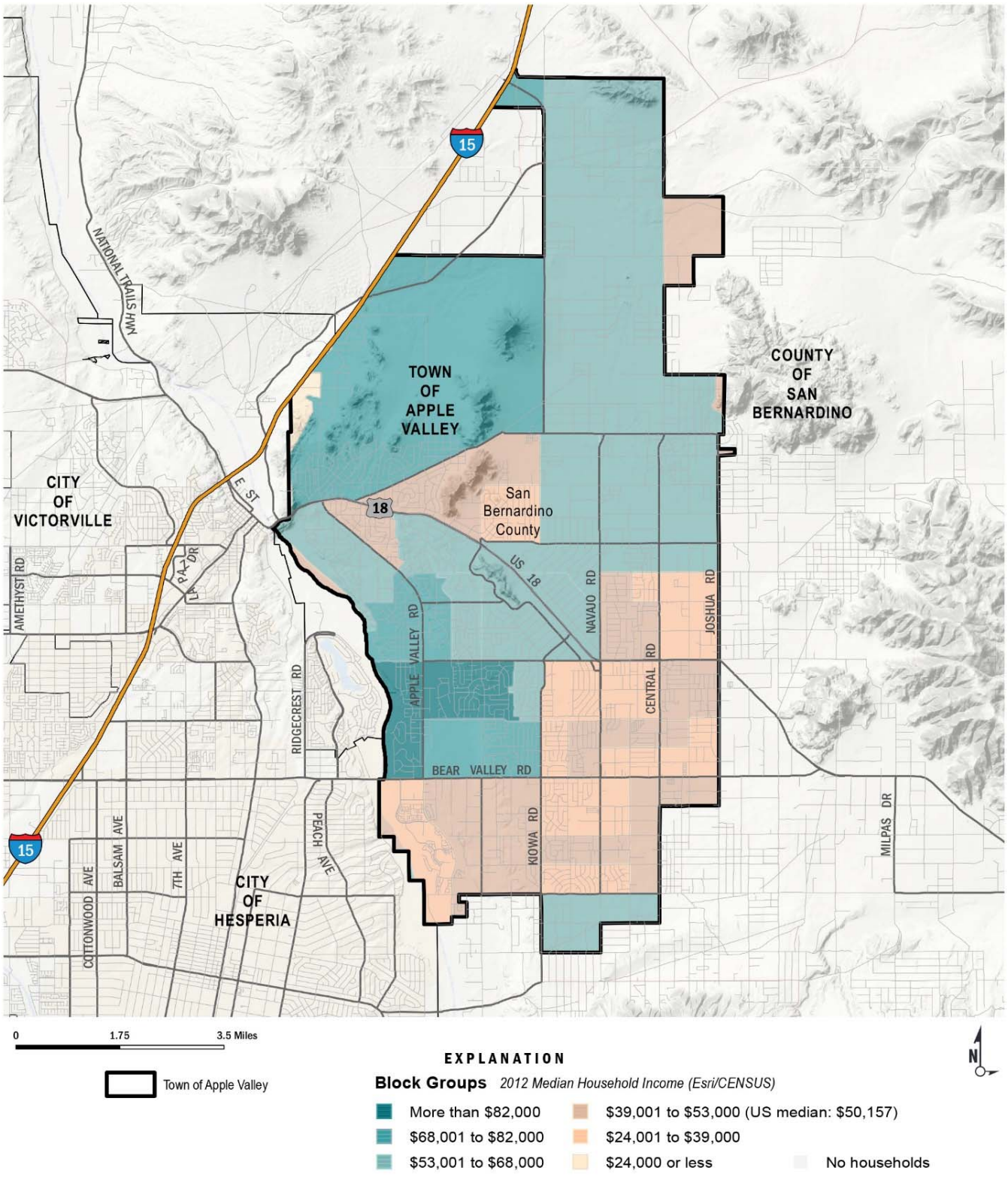


Figure 4-13: Median Household Income Distribution Map

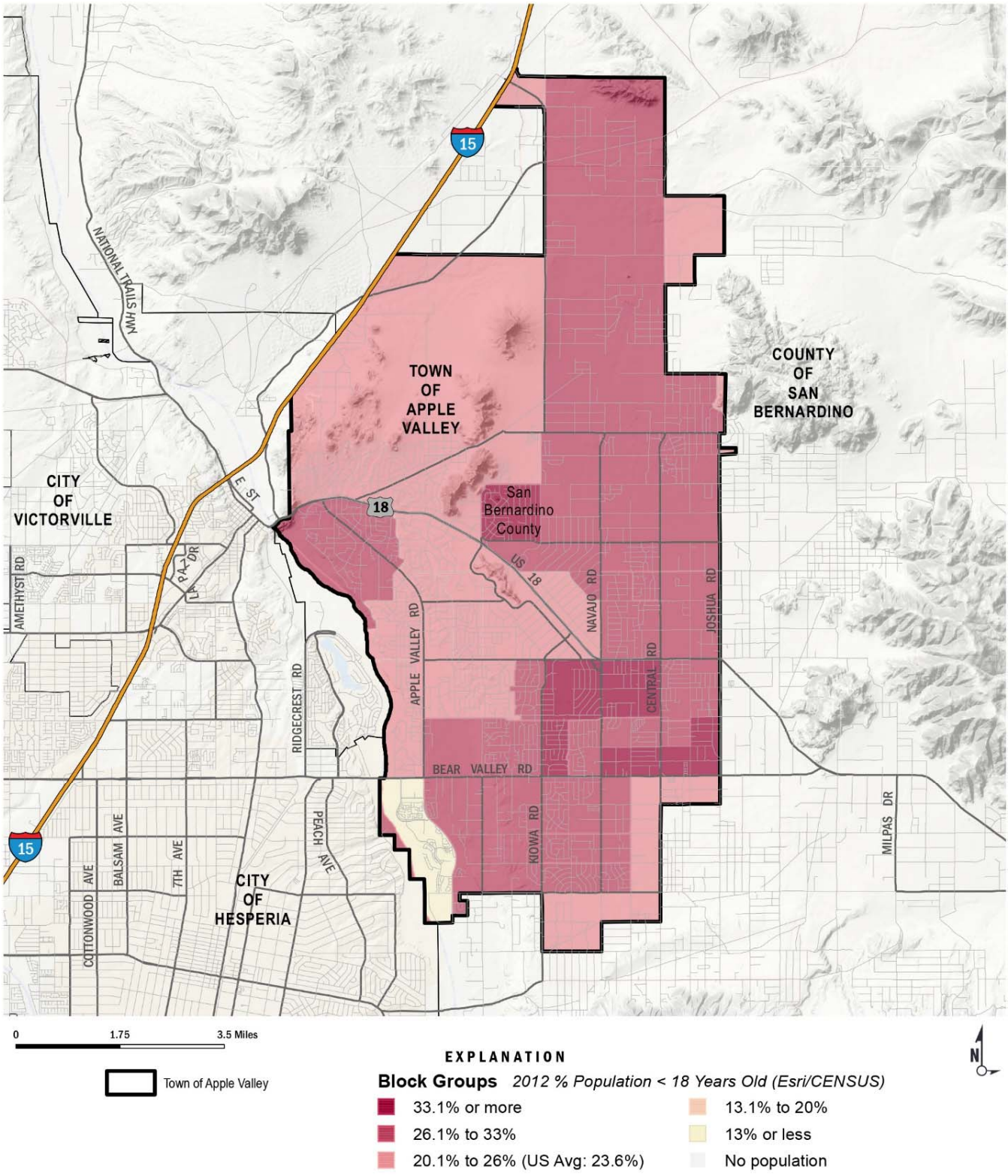


Figure 4-14: Population under 18

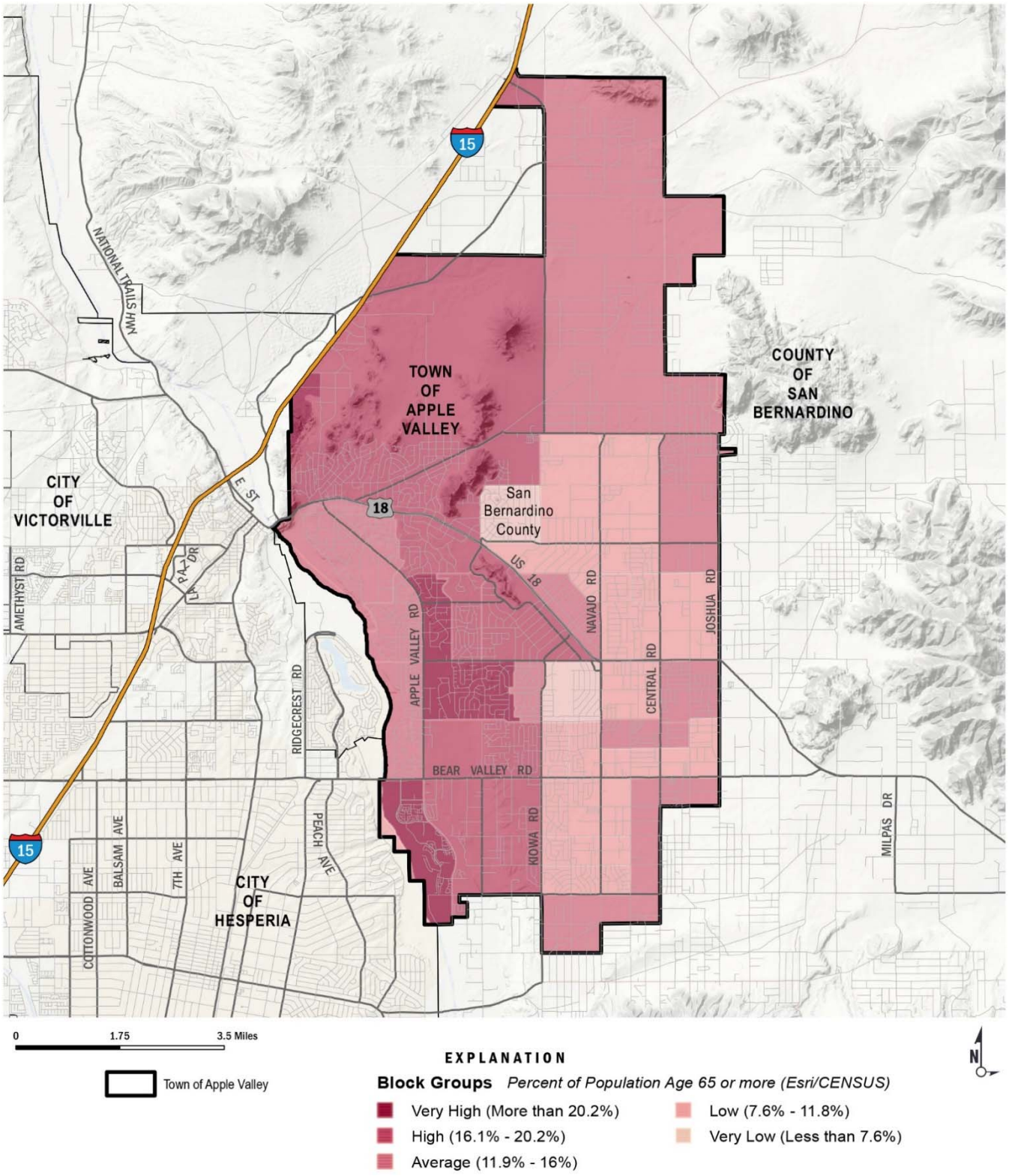


Figure 4-15: Population Over 65

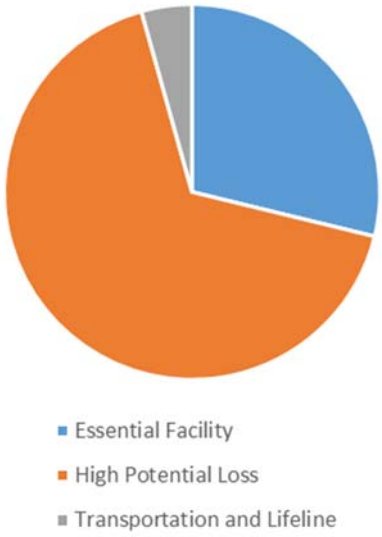
4.8.3 Critical Facilities

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 based on data from the County and other publicly sourced information were 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 4-10. Some critical facility information has been omitted from documentation due to national security purposes. The Emergency Preparedness Department manages and maintains a complete list of critical facilities.

Table 4-10: Critical Facility Points

Infrastructure Type	Total Feature Count
Essential Facility	53
EOC	1
Fire Station	6
Government Facility	4
Hospital	1
Police Station	1
School	26
High Potential Loss	137
Hazmat	43
Utility-Communication Facility	8
Utility-Potable Water Facility	2
Utility-Waste Water Facility	8
Vulnerable Pop.-Adult Residential Care	21
Vulnerable Pop.-Child Care	21
Vulnerable Pop.-Foster/Home Care	3
Vulnerable Pop. -Mobile Home Park	12
Vulnerable Pop.-RV Park	2
Vulnerable Population-Senior Care	17
Transportation and Lifeline	4
Highway Bridge	3
Airport Facility	1
Grand Total	**194**



4.8.4 HAZUS- MH Inputs

FEMA's loss estimation software, Hazus 3.2, was used to analyze the Town of Apple Valley'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. Figure 4-16 and Figure 4-17 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.

The project team used these newly updated DFIRM data into HAZUS to assess potential losses in the mapped 100-year (with and without levee protection) and 500-year flood zones. The Town of Apple Valley's results are provided in Table 4-13.

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 track 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.

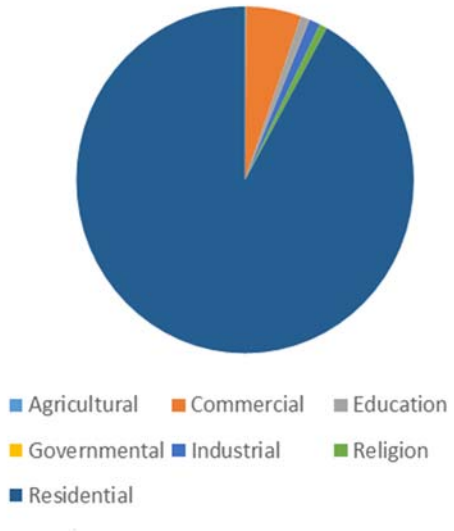
Also building losses are those losses associated with damage to the fixed elements of a structure, such as the foundation, walls, or floors. Content losses are those losses associated with damage to structural elements not permanently fixed within a structure, such as furniture, appliances, and personal possessions.

Table 4-111: Entire Town of Apple Valley Hazus Flood Census Block Input Values

Building Type	Building Replacement Costs ($000)	Building Replacement Cost (%)	Content Replacement Cost ($000)	Content Replacement Cost (%)	Total Value ($000)	Total Value (%)
Agricultural	3,257	50.0%	3,257	50.0%	6,514	0%
Commercial	190,685	48.1%	205,597	51.9%	396,282	7%
Education	30,063	50.0%	30,063	50.0%	60,126	1%
Governmental	1,342	50.0%	1,342	50.0%	2,684	0%
Industrial	38,559	45.6%	45,947	54.4%	84,506	2%
Religion	26,262	50.0%	26,262	50.0%	52,524	1%
Residential	3,313,104	66.7%	1,656,837	33.3%	4,969,941	89%
Total	**$3,603,272**	**65%**	**$1,969,305**	**35%**	**$5,572,577**	

Total Building Input Values by Occupancy

Census Block Level



Total Content Input Values by Occupancy

Census Block Level

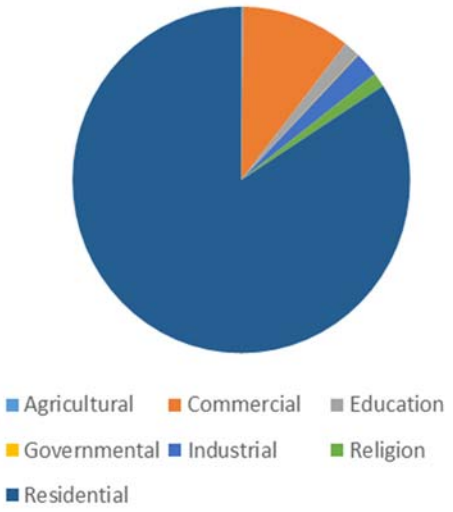


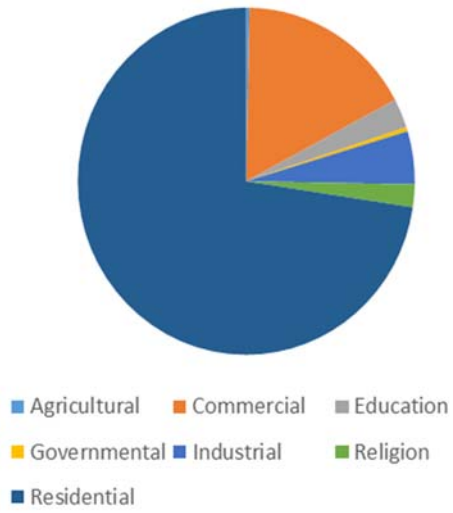
Figure 4-16: Census Block Building and Content Exposure Values-Flood

Table 4-122: Entire Town of Apple Valley Hazus Earthquake Census Tract Input Values

Building Type	Building Replacement Costs ($000)	Building Replacement Cost (%)	Content Replacement Cost ($000)	Content Replacement Cost (%)	Total Value ($000)	Total Value (%)
Agricultural	16,945	50.0%	16,945	50.0%	33,890	0%
Commercial	871,378	48.4%	930,061	51.6%	1,801,439	12%
Education	127,653	46.0%	149,768	54.0%	277,421	2%
Governmental	18,719	46.0%	21,941	54.0%	40,660	0%
Industrial	206,910	43.3%	271,175	56.7%	478,085	3%
Religion	116,478	50.0%	116,478	50.0%	232,956	2%
Residential	7,977,134	66.7%	3,989,622	33.3%	11,966,756	81%
Total	**$9,335,217**	**63%**	**$5,495,990**	**37%**	**$14,831,207**	

Total Building Input Values by Occupancy

Census Tract Level



Total Content Input Values by Occupancy

Census Tract Level

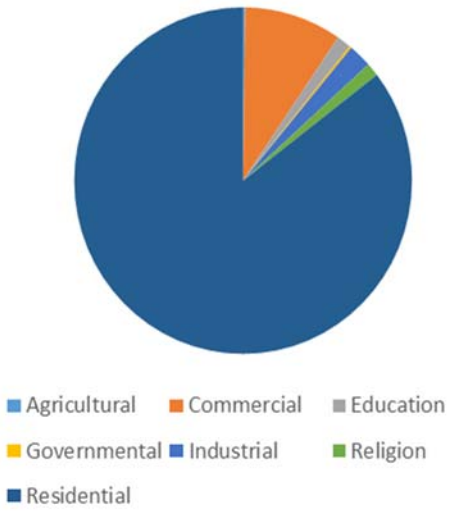


Figure 4-17: Figure 4 17: Census Tract Building and Content Exposure Values-EQ

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4.9 Vulnerability Assessment-Flooding

Flooding has shown to be a natural hazard with concerns in the Town of Apple Valley as described in the flood hazard profile. Historically, San Bernardino County 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 the Town of Apple Valley 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 by waterways.

4.9.1 Population living with 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 4-18. More than 1400 residents live near or within the 100-year floodplain and approximately 1500 residents live within the 500-year floodplain.

Population Exposure

Population Count within Unincorporated San Bernardino County by Flood Hazard Zone

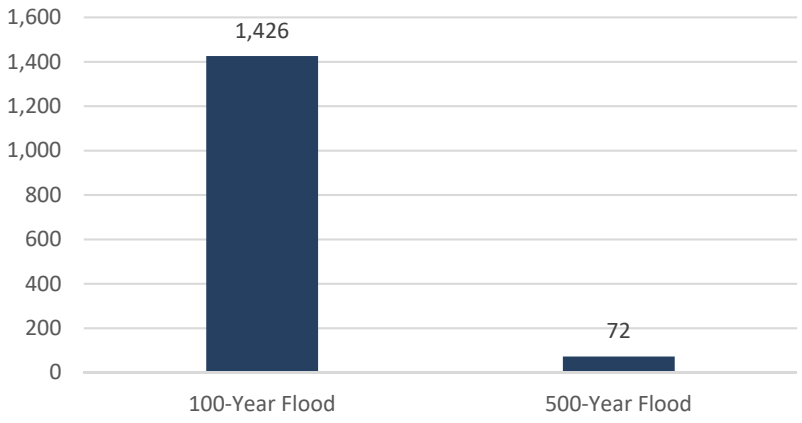


Figure 4-18: Population Exposed to NFIP Flood Zones

4.9.2 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 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 4-13 shows the count of at-risk parcels and their improvement and land exposure values.

Table 4-133: 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	323	$55,890	$14,092	$69,982
500-Year Flood	22	$5,356	$1,537	$6,892
500-Year, Protected by Levee	- -		-	-
Grand Total	**345**	**$61,246**	**$15,629**	**$76,875**

Notes:
1-The table above does not display loss estimation results; the table exhibits total value at risk based upon the hazard overlay and San Bernardino County Assessor data.
2- Parcel information is for all county parcels with greater than $20,000 in assessed parcel improvement value only. The San Bernardino County Assessor's roles only provide spatial information on assessed improvement and land values.

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.

4.9.3 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 4-14 and Table 4-15 provides an inventory of critical facilities in the floodplain for Apple Valley and provides the locations of lifelines relative to the floodplain in the areas of the Apple Valley. With a total of nine essential facilities, high potential losses, and transportation and lifeline structures located in either the 100- or 500-year flood zone, the impact to the community could be devastating if these critical facilities were damaged or destroyed during a flood event.

Table 4-144: Critical Facility Exposed to NFIP Flood Zones

Infrastructure Type	100 Year Flood Zone	500 Year Flood Zone	500 Year Flood Zone, Protected by Levee	Total Feature Count
Essential Facility	1	0	0	1
EOC	0	0	0	0
Fire Station	1	0	0	1
Government Facility	0	0	0	0
Hospital	0	0	0	0
Police Station	0	0	0	0
School	0	0	0	0
High Potential Loss	6	0	0	6
Dam	0	0	0	0
Economic Element-Major Employer	0	0	0	0
Hazmat	3	0	0	3
Historic/Cultural Resource-Historic	0	0	0	0
Utility-Communication Facility	0	0	0	0
Utility-Electric Power Facility	0	0	0	0
Utility-Natural Gas Facility	0	0	0	0
Utility-Potable Water Facility	0	0	0	0
Utility-Waste Water Facility	3	0	0	3
Vulnerable Population-Adult Residential Care	0	0	0	0
Vulnerable Population-Child Care	0	0	0	0
Vulnerable Population-Flood Zone	0	0	0	0
Vulnerable Population-Foster/Home Care	0	0	0	0
Vulnerable Population-Mobile Home Park	0	0	0	0
Vulnerable Population-RV Park	0	0	0	0
Vulnerable Population-Senior Care	0	0	0	0
Transportation and Lifeline	2	0	0	2
Highway/Road Bridge	2	0	0	2
Railway Bridge	0	0	0	0
Bus Facility	0	0	0	0
Rail Facility	0	0	0	0
Airport Facility	0	0	0	0
Grand Total	**9**	**-**	**-**	**9**

Table 4-155: Lifelines Exposure to NFIP Flood Zones

Facility Type	100 Year	500 Year Flood Zone	500 Year Flood Zone, Protected by Levee	Total Mileage
Transportation and Lifeline	22	1	0	23
Railway	0	0	0	0
Roads	22	1	0	23
Interstate Highway	0	0	0	0
State / County Highway	3	0	0	3
Primary Highway	0	0	0	0
Local Road, Major	2	0	0	2
Local Road	14	0	0	14
Other Minor Road	3	0	0	3
Vehicular Trail	0	0	0	0
Cul-de-Sac / Traffic Circle	0	0	0	0
Ramp	0	0	0	0
Service Road	0	0	0	0
Total	**22**	**1**	**0**	**23**

4.9.4 Loss Estimation Results

The Hazus analysis was used to assess the risk from and vulnerability to flooding within the Town Apple Valley. 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 Apple Valley's mapped regulatory floodplain. The total value of exposed buildings and content within Apple Valley'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 Figure 4-19 and Figure 4-20.

An estimated $3.9 million of damage could occur in the Town Apple Valley's regulatory floodplain if all flooding sources experienced a 100-year flood event. If all flooding sources experienced a 500-year flood event in Apple Valley there could be an additional $254,000 in damage, for a total of near $4.15 million in lo, Table 4-16.

Table 4-17 & 4-18 show loses for each building type for both the 100-year and 500-year flood event. The Total Town Value shown at the end of each of these tables represents an estimate of the total value of these building types throughout the entire Town of Apple Valley.

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 4-166: Flood Loss Estimation (Based on Depth) in NFIP Flood Zones

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	2,039	0.0%	1,874	0.0%	3,914	0.1%
500-Year	138	0.0%	115	0.0%	254	0.0%

*Note: *from section 4.10.3 'Hazus Floods Census Block Input Values' totals*
1- Building Replacement Costs($000) = $3,603,272
2- Content Replacement Cost($000) = $1,969,305
3- Total Value($000) = $5,572,577

Table 4-177: 100-Year 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)	Total Town Value ($000)
Agricultural	-	0.00%	-	0.00%	-	0.00%	6,514
Commercial	181	0.05%	723	0.18%	904	0.23%	396,282
Educational	14	0.02%	91	0.15%	105	0.17%	60,126
Government	-	0.00%	-	0.00%	-	0.00%	2,684
Industrial	12	0.01%	16	0.02%	28	0.03%	84,506
Religious	5	0.01%	54	0.10%	59	0.11%	52,524
Residential	1,827	0.04%	990	0.02%	2,818	0.06%	4,969,941
Grand Total	**$2,039**	**0.04%**	**$1,874**	**0.03%**	**$3,914**	**0.07%**	**$5,572,577**

Note: *from section 4.10.3 'Hazus Floods Census Block Input Values' totals
1- Building Replacement Costs($000) = $3,603,272
2- Content Replacement Cost($000) = $1,969,305
3- Total Value($000) = $5,572,577

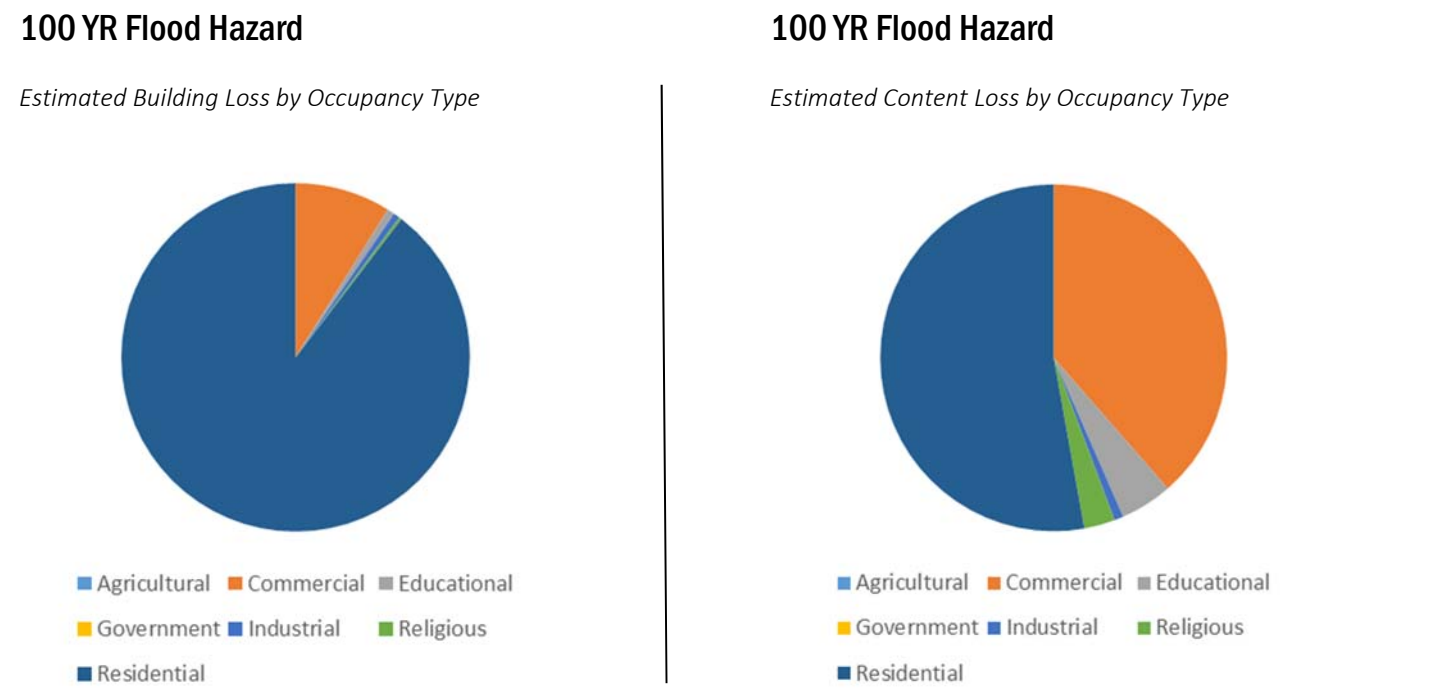


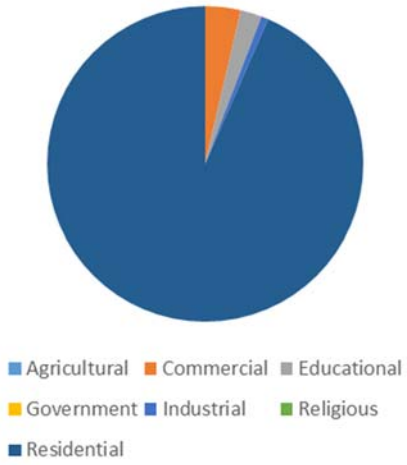
Figure 4-19: Total Building and Content Loss by Occupancy Type

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)	Total Town Value ($000)
Agricultural	-	0.00%	-	0.00%	-	0.00%	6,514
Commercial	5	0.00%	17	0.00%	22	0.01%	396,282
Educational	3	0.00%	23	0.04%	27	0.04%	60,126
Government	-	0.00%	-	0.00%	-	0.00%	2,684
Industrial	1	0.00%	1	0.00%	2	0.00%	84,506
Religious	-	0.00%	8	0.02%	8	0.02%	52,524
Residential	129	0.00%	66	0.00%	195	0.00%	4,969,941
Grand Total	**$138**	**0.00%**	**$115**	**0.00%**	**$254**	**0.00%**	**$5,572,577**

Note: *from section 4.10.3 'Hazus Floods Census Block Input Values' totals
1- Building Replacement Costs($000) = $3,603,272
2- Content Replacement Cost($000) = $1,969,305
3- Total Value($000) = $5,572,577

500 YR Flood Hazard

Estimated Building Loss by Occupancy Type



500 YR Flood Hazard

Estimated Content Loss by Occupancy Type

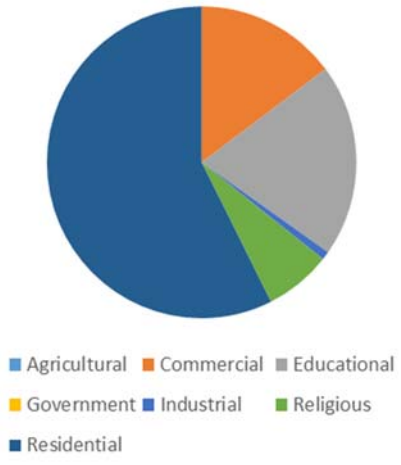
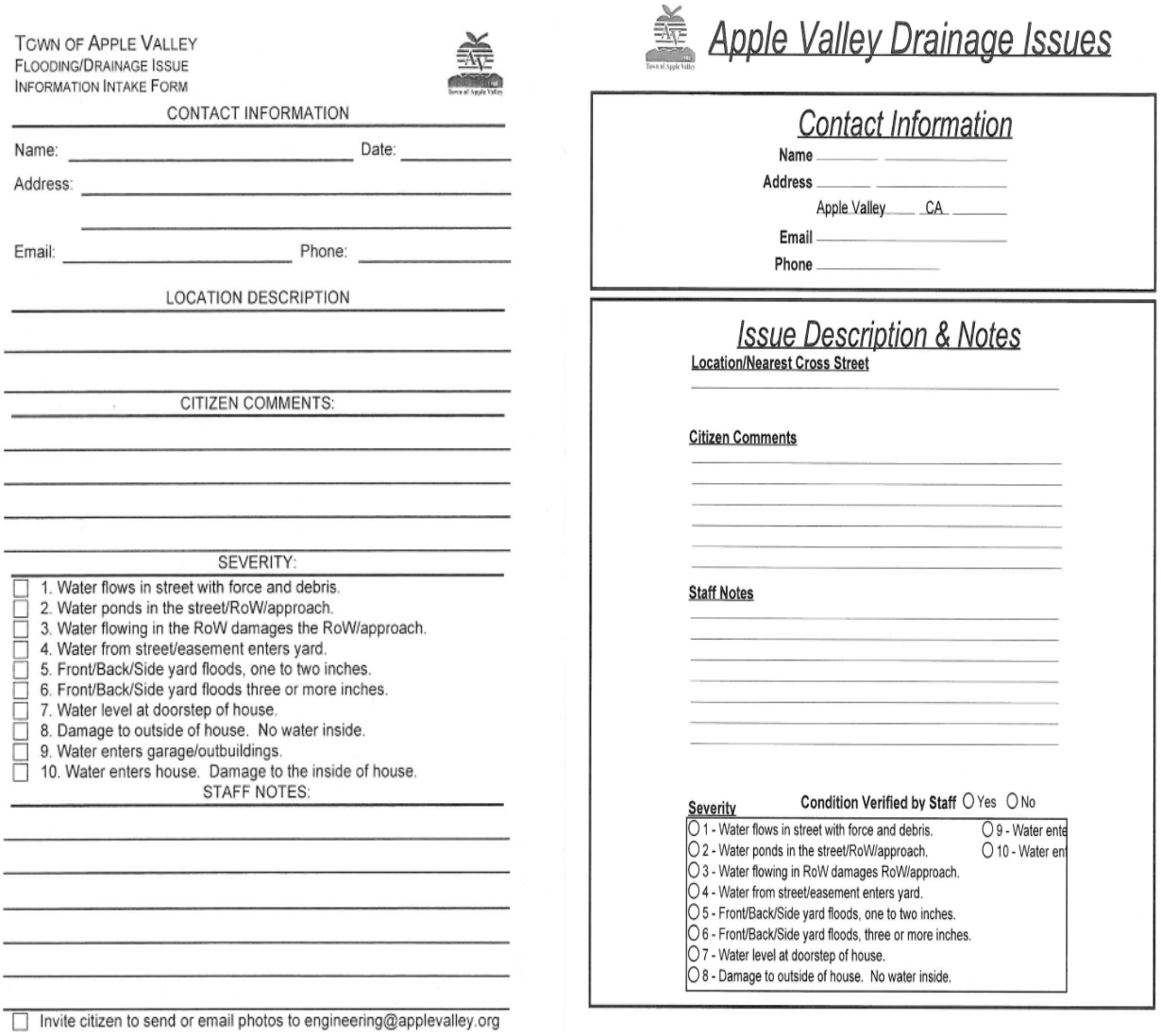


Figure 4-20: Total Building and Content Loss by Occupancy Type

4.9.5 The Local Data Collection

The Town of Apple Valley Engineering Department collects data regarding flooding and drainage issues from the public on a regular basis. Data is collected by the Engineering Department staff and used to identify areas of concerns throughout the Town. Majority of the data is received after heavy rains but data can also be obtained due to broken water mains or private property issues regarding water. Figure 4-20 below is a copy of the two forms that are used to collect data. The first form is used to gather data from the resident and the second form is used by engineering staff to evaluate the reported concern.



TOWN OF APPLE VALLEY
FLOODING/DRAINAGE ISSUE
INFORMATION INTAKE FORM

CONTACT INFORMATION

Name: _____ Date: _____

Address: _____

_____

Email: _____ Phone: _____

LOCATION DESCRIPTION

_____

_____

CITIZEN COMMENTS:

_____

_____

_____

_____

SEVERITY:

- ☐ 1. Water flows in street with force and debris.
- ☐ 2. Water ponds in the street/RoW/approach.
- ☐ 3. Water flowing in the RoW damages the RoW/approach.
- ☐ 4. Water from street/easement enters yard.
- ☐ 5. Front/Back/Side yard floods, one to two inches.
- ☐ 6. Front/Back/Side yard floods three or more inches.
- ☐ 7. Water level at doorstep of house.
- ☐ 8. Damage to outside of house. No water inside.
- ☐ 9. Water enters garage/outbuildings.
- ☐ 10. Water enters house. Damage to the inside of house.

STAFF NOTES:

_____

_____

_____

_____

_____

_____

☐ Invite citizen to send or email photos to engineering@applevalley.org

Apple Valley Drainage Issues

Contact Information

Name _____ _____

Address _____ _____

Apple Valley ____ CA ____

Email _____

Phone _____

Issue Description & Notes

Location/Nearest Cross Street

_____

Citizen Comments

_____

_____

_____

_____

_____

_____

Staff Notes

_____

_____

_____

_____

_____

_____

_____

Severity — Condition Verified by Staff ○ Yes ○ No

- ○ 1 - Water flows in street with force and debris.
- ○ 2 - Water ponds in the street/RoW/approach.
- ○ 3 - Water flowing in RoW damages RoW/approach.
- ○ 4 - Water from street/easement enters yard.
- ○ 5 - Front/Back/Side yard floods, one to two inches.
- ○ 6 - Front/Back/Side yard floods, three or more inches.
- ○ 7 - Water level at doorstep of house.
- ○ 8 - Damage to outside of house. No water inside.
- ○ 9 - Water ente
- ○ 10 - Water en

Figure 4-21: Flooding/Drainage Resident Forms

4.10 Vulnerability Assessment-Wildfire

Risk to the Town of Apple Valley 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, 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.

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 the Town of Apple Valley 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. Development in the area along the Mojave River 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 the Town of Apple Valley 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 Mojave River

4.10.1 Population at Risk

Wildfire risk is of greatest concern to populations residing in the moderate, high, and very high wildfire hazard zones. According to the LRA Fire Hazard Severity Zone Apple Valley has a moderate risk of wildfire within Town boundaries. Apple Valley census block data was used to estimate populations within the hazard zones. There are a significant number of people living within the WUI described in the wildfire profiles. More than 30,000 residents in the Town limits live within areas considered moderate fire hazard, see Figure 4-21.

Population Exposure

Population Count by Wildfire Hazard Zone

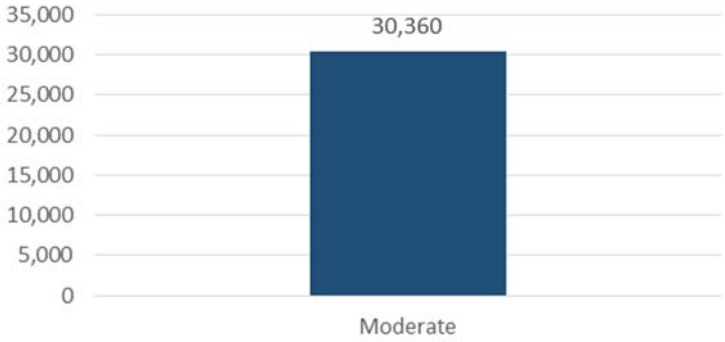


Figure 4-22: Population at risk from Wildfire Hazards

4.10.2 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. Figure 4-19 exhibits portions of the Town of Apple Valley that have significant assets at risk to wildfire in the Moderate fire severity zones.

Table 4-188: Residential Buildings and Content at Risk from Wildfire

Fire Hazard Severity Hazard Zone	Improved Parcel Count	Improvement Value Exposure ($000)	Land Value Exposure ($000)	Total Exposure ($000)
Very High	-	-	-	-
High	-	-	-	-
Moderate	9,664	3,419,489	750,783	4,170,272
Non-Wildland/Non-Urban	39	7,932	1,264	9,196
Urban Unzoned	12,633	3,326,800	1,157,957	4,484,757
Total	**22,336**	**$6,754,220**	**$1,910,004**	**$8,664,225**

Note:
1-The table above does not display loss estimation results; the table exhibits total value at risk based upon the hazard overlay and San Bernardino County Assessor data.
2- Parcel information is for all county parcels with greater than $20,000 in assessed parcel improvement value only. The San Bernardino County Assessor's roles only provide spatial information on assessed improvement and land values

4.10.3 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. Lists only included the critical facilities in the High and Very High wildfire hazard zones for Town of Apple Valley. Since Apple Valley only has Medium risk classification within Town boundaries there are no critical facilities at risk.

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4.11 Vulnerability Assessment-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, 2016). 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.

To analyze the risk to the Town of Apple Valley 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.

Apple Valley follows all existing building codes as required by Section 17992 of the Health and Safety Code of the State of California and Chapter 8 of the Apple Valley Municipal Code.

4.11.1 Population at Risk

According to the 2010 US Census, the population of the Town of Apple Valley is 69,130. Though rural residential construction is not particularly vulnerable to earthquakes, the chosen earthquake scenarios will directly or indirectly expose the entire population of the Town of Apple Valley to ground shaking. Depending on the time of day and exact location of the modeled epicenter, the earthquake scenarios could be experienced differently. Figure 4-23 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

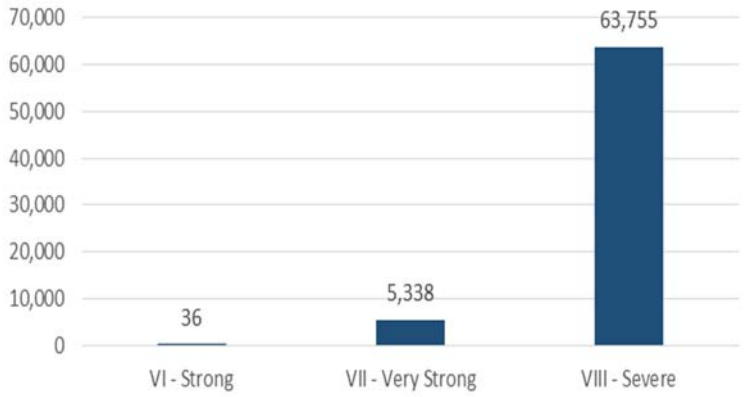


Figure 4-23: Population Exposure to The Great Shakeout EQ Shake Severity Zone

4.11.2 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 4-21 shows the count of at-risk structures and their associated improvement and land exposure values.

Table 4-19: 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)
IV - Light	-	-	-	-
V - Moderate	-	-	-	-
VI - Strong	16	4,773	1,289	6,062
VII - Very Strong	1,798	428,924	93,924	522,848
VIII - Severe	20,522	6,320,523	1,814,791	8,135,314
IX - Violent	-	-	-	-
Total	**22,336**	**$6,754,220**	**$1,910,004**	**$8,664,225**

Notes:
1-The table above does not display loss estimation results; the table exhibits total value at risk based upon the hazard overlay and San Bernardino County Assessor data.
2- Parcel information is for all county parcels with greater than $20,000 in assessed parcel improvement value only. The San Bernardino County Assessor's roles only provide spatial information on assessed improvement and land values.

4.11.3 Critical Facilities with Damage Potential

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 4-22 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 4-190: Critical Facilities with EQ Risk Southern California Great Shakeout

Infrastructure Type	Violent Shake Zone (IX)	Severe Shake Zone (VIII)	Very Strong (VII)	Strong Shake Zone (VI)	Total Feature Count
Essential Facility	-	2	37	-	39
EOC	-	-	1	-	1
Fire Station	-	-	6	-	6
Government Facility	-	1	3	-	4
Hospital	-	-	1	-	1
Police Station	-	-	1	-	1
School	-	1	25	-	26
High Potential Loss	-	8	115	-	123
Dam	-	-	-	-	-
Economic Element-Major Employer	-	-	-	-	-
Hazmat	-	4	39	-	43
Historic/Cultural Resource-Historic	-	-	-	-	-
Utility-Communication Facility	-	-	8	-	8
Utility-Electric Power Facility	-	-	-	-	-
Utility-Natural Gas Facility	-	-	-	-	-
Utility-Potable Water Facility	-	-	2	-	2
Utility-Waste Water Facility	-	-	8	-	8
Vulnerable Population-Adult Residential Care	-	-	21	-	21
Vulnerable Population-Child Care	-	1	20	-	21
Vulnerable Population-Flood Zone	-	-	-	-	-
Vulnerable Population-Foster/Home Care	-	-	3	-	3
Vulnerable Population-Mobile Home Park	-	-	-	-	-
Vulnerable Population-RV Park	-	-	-	-	-
Vulnerable Population-Senior Care	-	3	14	-	17
Transportation and Lifeline		2	2	-	4
Highway Bridge		2	1	-	3
Railway Bridge	-	-	-	-	-
Bus Facility	-	-	-	-	-
Rail Facility	-	-	-	-	-
Airport Facility	-	-	1	-	1
Grand Total	**-**	**12**	**168**	**-**	**180**

4.11.3.1 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.

4.11.3.2 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 Town bridges provide access across water courses, they are 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.

4.11.3.3 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 4-23 provide best available transportation infrastructure data and it should be assumed that these systems are exposed to breakage and failure.

Table 4-201: Lifelines with EQ Risk; Southern California Great Shakeout Scenario

Facility Type	Strong (VI)	Very Strong (VII)	Severe (VIII)	Violent (IX)	Total Mileage
Transportation and Lifeline	11	104	528	0	642
Railway	0	2	3	0	5
Roads	11	101	525	0	637
Interstate Highway	2	2	0	0	4
State / County Highway	0	9	74	0	84
Primary Highway	0	0	0	0	0
Local Road, Major	0	2	54	0	56
Local Road	7	79	377	0	463
Other Minor Road	0	7	18	0	26
Vehicular Trail	1	2	1	0	3
Ramp	0	1	0	0	1
Service Road	0	0	0	0	0
Total	**11**	**104**	**528**	**0**	**642**

4.11.3.4 Loss Estimation Results

The Hazus Level 2 analysis was used to assess the risk from and vulnerability to earthquake shaking within the Town of Apple Valley. 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 Town of Apple Valley. 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 Shake Out Scenario ground shaking data (shakemaps) were acquired from CISN 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 4-24 and Figure 4-22 for the Great Shake Out 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.

In the Great Shake Out 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 4-212: 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)	Total Value ($000)
Agricultural	1,071	3.2%	328	1.0%	1,399	4.1%	33,890.00
Commercial	67,058	3.7%	18,665	1.0%	85,724	4.8%	1,801,439.00
Educational	8,089	2.9%	2,725	1.0%	10,814	3.9%	277,421.00
Government	1,532	3.8%	443	1.1%	1,975	4.9%	40,660.00
Industrial	15,727	3.3%	6,510	1.4%	22,238	4.7%	478,085.00
Religious	8,811	3.8%	2,462	1.1%	11,274	4.8%	232,956.00
Residential	244,144	2.0%	58,577	0.5%	302,721	2.5%	11,966,756.00
Grand Total	**$346,433**	**2.3%**	**$89,711**	**0.6%**	**$436,144**	**2.9%**	**$14,831,207**

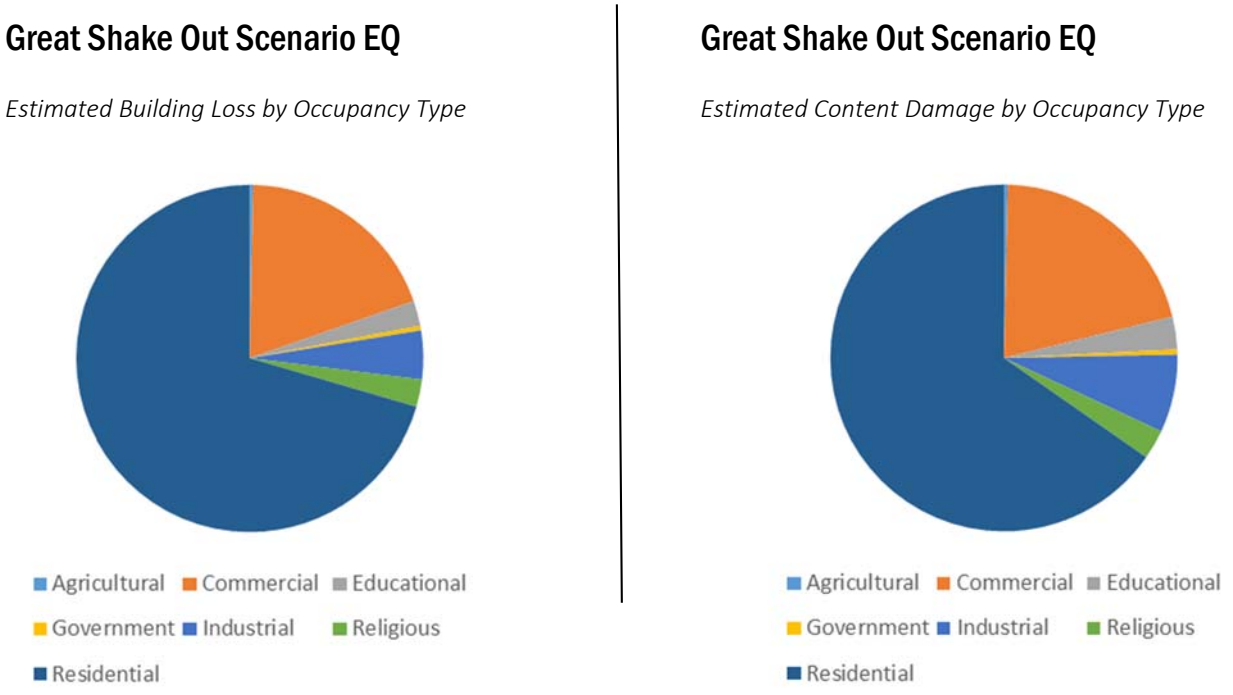


Figure 4-24: Estimated Building and Content by Occupancy Type Shake Out Scenario EQ

4.12 Climate Change

4.12.1 The Impact of Climate Change

Climate change can increase hazards associated with wildfires, rising sea levels, and groundwater supply. Public health can suffer due to greater temperature extremes and more frequent extreme weather events, increases in transmission of infectious disease, and increases in air pollution. Agricultural production can be altered by changes in temperature and rainfall patterns.

Rises in temperature have the potential, for example, to cause a shift in the hydrological cycle. While predicted patterns vary with latitude and global location, roughly 75% of analyzed climate change models agree that within the western United States there will be a 10% to 40% decrease in stream flows by 2050. This may be due to a decrease in precipitation levels, which has been evident in the drought conditions suffered by the southwest in recent years, as well as an increase in evaporation, which is temperature dependent and increases as temperatures climb. It has been predicted that a change in the global average surface temperature of 2°C would be at the low end of the possible range. According to the Institute for the Study of Planet Earth at the University of Arizona, it is estimated that a 2°C increase in temperature corresponds to a 9% to 21% decrease in stream flow on the Colorado River.

The coast of California is likely to see a rise in sea level that could threaten shorelines, cause increased erosion, and loss of life and property. Sea level rise and storm surges could lead to flooding of low-lying property, loss of coastal wetlands, erosion of cliffs and beaches, saltwater contamination of drinking water, and damage to roads, causeways, and bridges.

Between the beginning of the industrialized era and 2005, the atmospheric concentration of CO2 in the atmosphere had increased by 35%, methane by 151%, and nitrous oxide by 18%.

It is estimated that in 2004, total GHG emissions were 20,135 teragrams (Tg) of carbon dioxide equivalents (Tg CO2e), excluding emissions/removals from land use, land use change, and forestry. The U. S. Environmental Protection Agency in 2004 estimated that the U.S. contributed 35% of global GHG emissions, with a total of 7074.4 Tg CO2e, an increase of 15.8% over 1990 emissions.

California is the second largest greenhouse gas contributor in the U.S. and the sixteenth largest in the world. From 1990 to 2003, California's GHG emissions increased 12%. In 2004, California produced 492 Tg CO2e, which is approximately 7% of all U.S. emissions. Transportation is responsible for 41 percent of the state's total GHG emissions; while electricity generation represents 22% of the state's GHG emissions. Conversely, emissions from residential and commercial fuel use in California decreased 9.7% from 1990 to 2004. This decrease may be due to increases in the effectiveness of energy conservation in buildings (Title 24 requirements) and more efficient appliances.

4.12.2 Population at Risk

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. 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.

4.12.3 Critical Facilities

The Town's Climate Action Plan updated in 2013 addresses concerns that affect the Town in regards to Climate Change. Currently, the focus is on reducing Greenhouse Gas Emissions (GHG) at existing facilities, homes, businesses and institutions. Reducing GHG for new developments in the same categories are discussed in detail as priority measures. This hazard mitigation plan will defer to the CAP for measures and mitigation strategies related to Climate Change in an effort to provide consistent practices. The CAP can be accessed:

http://www.applevalley.org/services/planning-division/climate-action-plan

4.12.3.1 Apple Valley Choice Energy

Apple Valley is addressing issues relating to Climate Change through the implementation of Apple Valley Choice Energy (AVCE). This program, started April of 2017, allows residents within Apple Valley to receive energy with a higher "renewable" content than what is currently provided by the franchised utility (SCE). The minimum renewable energy content for AVCE customers is 35%. In addition, the program provides an alternate selection of 50% renewable energy content for those who choose to "opt-up" to that plan. AVCE's minimum 35% renewable energy content already exceeds the California state mandate of 33% renewable energy content that will be required in the year 2020.

The renewable energy content is derived from solar, wind, hydro and geothermal sources primarily within California. Apple Valley Choice Energy plans to offer customers of AVCE a 100% renewable energy option in future years that will further reduce the overall impacts of Greenhouse Gases affecting Climate Change as a result of burning fossil fuels.

In addition to supplying renewable energy, AVCE actively promotes Net Energy Metering (NEM) for customers with rooftop solar by offering a premium by-back rate that is nearly double the rate that they would receive from SCE. AVCE will also offer future incentives to Town residents and businesses for improvements that contribute to energy efficiency as well as develop programs to encourage implementation of energy conservation measures. The Town also participates in the High Desert Regional Partnership with the other cities in the High Desert to promote energy efficiency on a regional basis.

Section 5. Community Capability Assessment

The Town of Apple Valley 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 Town can use a variety of different tools, assets, and authorities to effectively prepare for, mitigate toward, 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. 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 Town of Apple Valley fall into the following broad categories: Agencies and People; Existing Plans; Regulations, Codes, Policies, and Ordinances; Mitigation Programs and Fiscal Resources. Identifying and documenting these capabilities provides the basis for developing future mitigation opportunities and how they can be implemented within existing Town programs.

5.1 Active Mitigation Programs

Town of Apple Valley Capability Assessment

- Storm Water Management: Yes
- Zoning Management: Yes
- Subdivision Management: Yes
- Erosion Management: Yes
- Floodplain Management: Yes
- Floodplain Management Plan Published Date: 10/2008
- Floodplain Management Last Delineation Date: 10/2008
- Elevation Certificates Maintained: Yes
- National Flood Insurance Program Community: Yes
- National Flood Insurance Join Date: 03/03/96
- NFIP Number: TAV 060752
- NFIP Rating: None
- NFIP Rating Date: 10/2008
- Land Use Plan: Yes
- Land Use Plan Last Update: 2009
- Community Zoned: Yes
- Zoned Date: 4/27/10
- Established Building Codes: Yes
- Building Codes Last Updated: 09/27/2016
- Type of Building Codes: California Building Code
- Local Electric Utilities: Southern California Edison
- Local Water Utilities:
- Liberty Utilities

- Apple Valley Foothill County Water District
- Rancheritos Mutual Water Company
- Golden State Water Company
- County Service Area 64
- Navajo Mutual Water Company
- Local Sewage Treatment Utilities: Victor Valley Wastewater Reclamation Authority
- Local Natural Gas Utilities: Southwest Gas Corporation
- Local Telephone Utilities: Frontier
- Fire Insurance Rating: Apple Valley Fire Protection District, a self-governing special district, provides fire-related services to the Town of Apple Valley and its sphere of influence. The District's fire insurance rating within Town limits is 4.
- Fire Insurance Rating Date: 06/01/10
- Previous Mitigation Plans: 2011

5.2 Local Planning and Regulatory Capabilities (Supporting Possible Mitigation Activities)

The State of California recommends that the General Plan is updated every 10-20 years; depending mostly on whether or not the plan is meeting the community's needs. The Apple Valley General Plan was last updated and adopted in 2009. The Land Use Element of the General Plan establishes 17 land use designations that apply only to lands within the Town's incorporated boundaries (see Section 1.3, for a listing of the 17 Land Use districts in the Land Use Element). The Land Use Element also describes land use compatibility for the primary three (3) hazards: Geologic; Flood; and, Wildfire.

On an annual basis staff revisits all of these planning and regulatory capabilities to ensure that local hazards and their mitigation strategies are being brought to the discussion table when it is time to update department policy and procedures as well as annual departmental budgets. Funding opportunities through such measures as grants, general funds and taxing authorities are consistently being researched and discussed based on feasibility and accessibility based on current Town staffing and fiscal resources.

In addition to the general plan, the information in Table 5-1 *is used to construct mitigation actions aligned with existing planning and regulatory capabilities of the* Town of Apple Valley. *Planning and regulatory tools typically used by local jurisdictions to implement hazard mitigation activities are building codes, zoning regulations, floodplain management policies, and other County programs or planning documents.*

Table 5-1: Planning and Regulatory Capabilities

Hazard	Plan/Program/ Regulation	Responsible Agency	Comments
Multi-Hazard	California Building Codes	Building & Safety Dept.	California Residential Code California Code of Regulations, Title 24, Part 2.5.

Hazard	Plan/Program/ Regulation	Responsible Agency	Comments
			California Building Code California Code of Regulations, Title 24, Part 2, Volumes 1 and 2.
Multi-Hazard	Municipal Codes	Building & Safety Dept.	Section 17992 of the Health & Safety Code of the State of CA and Chapter 8 of the Apple Valley Municipal Code.
Drought	Urban Water Management Plan (UWMP)	Each water agency is responsible for own plan.	Visit each water agency for plan or visit www.mojavewater.org for their plan.
Drought	Town of Apple Valley Landscape Ordinance	Planning Division	In accordance with Governor Brown's Drought Executive Order, on July 15, 2015 the California Water Commission approved revisions to its MWELO. The Governor's Order mandates that all local agencies have until December 1, 2015 to adopt the Ordinance or adopt their own ordinance which must be at least as effective in conserving water as the State's Ordinance
Drought	2010 California Drought Contingency Plan	California Dept. of Water Resources	Section VI provides an overview of drought preparedness strategies from the California Water Plan Update. Section VII provides a brief description of local, utility, and State agency drought response roles. Situation and assessment reports will be distributed to appropriate agencies and will be posted on the DWR Drought website (www.water.ca.gov/drought).
Flood	Flood Resistant Construction	Building & Safety	Appendix G of the 2013 California Building Codes stipulates existing Flood Resistant Construction standards.
Flood	NFIP Administration	Engineering Dept.	NFIP makes federally backed flood insurance available to homeowners, renters, and business owners in participating communities. As a participating member of the NFIP, the City is dedicated to protecting homes of more than 60 policies currently in force.
Climate Change	Town of Apple Valley Climate Action Plan	Planning	Outline a course of action for the community of Apple Valley to reduce per capita greenhouse gas emissions 15% below business as usual by 2020. 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 Administrative and Technical Mitigation Capabilities

This section contains a summary of administrative and technical capabilities organized by the Town of Apple Valley staff. The department(s) responsible for the capability is also listed. Each department can provide greater detail of the resources available under each capability.

Table 5-2: Administrative and Technical Capabilities

Staff/Personnel Resources	Dept. / Agency	Comments
Planners (with land use / land development knowledge)	Planning Division	
Planners or engineers (with natural and/or human caused hazards knowledge)	Public Works, Local Utilities, Planning, & Engineering Dept.	Fire Prevention can assist as well.
Engineers or professionals trained in building and/or infrastructure construction practices (includes building inspectors)	Engineering, Planning & Public Works Dept.	
Floodplain Management	Engineering Dept.	NFIP is managed by Town Engineer.
Land/Building surveyors	Engineering Dept.	Services are available through contract with CAA.
Personnel skilled in Geographic Information Systems (GIS)	Planning Division	Not a full time position.
Grant writers or fiscal staff to handle large/complex grants	Special Projects Manager & each Dept. manages own smaller grants	Numerous types of federal, state, local, and private grants have been administered for mitigation at the local level in California. .
Construction Equipment	Public Works Dept.	Public Works departments owns and maintains large pieces of equipment available for construction and moving and removal of earthen material.
Emergency Management Personnel	Police Department, Fire Departments and Office of Emergency Preparedness (OEP)	OEP is housed within the Town of Apple Valley and reports directly to the Town Manager.

Staff/Personnel Resources	Dept. / Agency	Comments
Care and Sheltering	Regional Red Cross Personal 17199 Yuma St. Suite #2, Victorville, CA, 92395	Care and sheltering during extreme disaster related events when evacuations orders are mandatory.

5.4 Local Fiscal Capabilities

This section provides a summary of local fiscal capabilities. The department(s) responsible for the revenue raising activity is also listed. The local Fiscal Resources are updated every fiscal year. Each year allocation of funds for hazard mitigation will be adjusted based on the current years' population growth, location, and future hazard risks.

Table 5-3: Local Fiscal Capabilities

Financial Resources	Dept. / Agency	Comments
Permitting Fees	Building & Safety, Engineering, Planning & Finance Dept.	Development fees
General Fund Revenue	Town Council or Finance Dept.	There is no dedicated budget line items for hazard mitigation.
Sewer and Trash Funds	Finance Dept.	
Capital Improvements Program	Engineering Dept.	
State and Federal Community Development Dept. Block Grants (CDBG)	CA Dept. of Housing and Community Development Dept., Dept. of Housing & Urban Dev. (HUD) Town of Apple Valley Housing Division	Programs Include: Community Development Neighborhood Stabilization Program Residential Rehabilitation Program
Home Investments Partnership Program	CA Dept. of Housing and Community Development Dept. of Housing & Urban Dev. (HUD)	Must apply competitively for grant funds.

5.5 Local & San Bernardino County Capabilities

This section contains a summary of Town of Apple Valley and San Bernardino County programs and capabilities organized by hazard type. The example tables below provide details on possible Town and County Capabilities that the Apple Valley community can coordinate with or use as an implementation mechanism for local mitigation activities. While the following programs can be used by the Apple Valley to develop and perform mitigation actions, they are the County of San

Bernardino's programs and the Fire Districts, so the Town is unable to determine how that entity will expand and improve it at this time.

5.5.1 Apple Valley Fire Protection District & County Wildfire Mitigation Programs

Table 5-4: Wildfire Mitigation Programs

Hazard	Program	Responsible Agency	Comments
Wildfire	*Community Based Fuels Reduction program*	*Fire District*	*This program is designed to create community based fuel modification programs across the Town communities. For more information visit www.applevalleyfd.com.*
Wildfire	*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 visit www.applevalleyfd.com.*
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.*
Wildfire	*Inland Empire Fire Safe Alliance*	*Inland Empire Fire Safe Alliance*	*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.*
Wildfire	*Community Wildfire Protection Plans (CWPP)*	*Fire District*	*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.*
Wildfire	*Organized Group Volunteer Activities*	*Fire District*	*There are several volunteer citizen groups throughout the Town that are capable of providing significant resources that are not provided by traditional governmental agency services. For more information visit ww.readyapplevalley.org.*

5.5.2 County Flood Mitigation Programs

Table 5-5: Count Flood Mitigation Programs

Hazard	Program	Responsible Agency	Comments

Flood	Flood Area Safety Taskforce (FAST)	Flood Control District	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.
Flood	Alluvial Fan Task Force	Alluvial Fan Task Force	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.

5.5.3 Town of Apple Valley & SB County Public Education and Alert Programs

Table 5-6: Public Education and Alert Programs

Hazard	Program	Responsible Agency	Comments
Multi-Hazard	CERT	Town of Apple Valley	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 visit www.readyapplevalley.org
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. Visit www.sbcfire.org.
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. The program is 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 visit www.sbcfire.org.
Multi-Hazard	ECS	Town of Apple Valley	The Emergency Communications Service (ECS) is a volunteer group providing front-line communications, technical and logistical support to the Apple Valley Fire Protection District and Office of Emergency Preparedness. For more information visit www.readyapplevalley.org.
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

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

5.6 State and Federal Fiscal Resources

To augment local resources, the table in this section provides a list of potential funding programs and resources provided by state and federal agencies and programs which can be used for local hazard mitigation activities. While the following programs can be used by the Town of Apple Valley to develop and perform mitigation actions, they are the State of California/federal programs, so the Town is unable to determine how that entity will expand and improve it at this time.

Table 5-7: Potential Funding Programs/Grants from State & 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

Agency / Grant Name	Potential Programs/Grants
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
CA 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/eecbg.html
Dept. of Homeland Security (DHS) / FEMA Grants	For more information on current grants visit: http://www.fema.gov/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.*** ***More information can be obtained at:*** https://www.ovc.gov/AEAP/
U.S. Department of State Office of Antiterrorism Assistance (ATA): **Antiterrorism Assistance Program**	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. Learn more by visiting: 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,

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

5.7 The Budget in Brief

The Town of Apple Valley has a total adopted general fund budget for all funds in the amount of $80.6 million for Fiscal Year 2016-17. Adopted Budget reflects the operating and capital spending plans for the General Fund, Special Revenue Funds, Capital Project Funds, Debt Service and Enterprise Funds.

In comparison to the total adopted FY16-17 budget, on an all funds basis the operating budget comprises 67.48% of the total budget. The following discussion will focus primarily on the operating budget. The adopted operating budget is $54.2 million, an increase of $381,388 or .71% compared to the amended budget in FY 15-16.

5.7.1 Salaries & Benefits

Personnel costs decreased by $120,212 or 1.09% in total. This decrease is mainly due to three long-term employees retiring during the 2015-16 fiscal year. In addition, there is no Cost of Living Allowance (COLA) included in the adopted budget.

5.7.2 Revenues

As a result of the slow but steady rebound in the economy, most revenue sources are projected to increase slightly. The Town has been experiencing slight increases in Sales Tax, Property Tax, and Franchise Taxes and the expectation is that those increases will continue into FY 16-17. A portion of the increased property tax revenues is resulting from an increase in property tax collections due to the elimination of the Redevelopment Agency and subsequent redistribution of previously captured tax increments. In the near term, the local economy is not generally expected to grow at a comparable rate when compared to the economic growth rates realized prior to FY 07-08. However, most economic indicators appear optimistic and most economic projections are generally calling for a long period of sustained 'slow growth'.

5.7.3 Property Tax

Property tax is the single largest source of revenue for the Town. The FY 16-17 estimated revenue from property tax is $9,418,358 or 32.33% of the total General Fund revenues. This amount is $423,200 more than the amended FY 15-16 estimated property tax revenues. This increase of approximately 4.71% in revenue is attributed to the continued slow growth in property values which are anticipated to continue for the foreseeable future. In previous years, the declining market values of property in the Town depressed property tax revenues by as much as 40% in some areas. However, over the last year, property values have begun to rise steadily on a month-over-month basis.

While market values of property in the Town are still at reduced levels when compared to assessed values prior to the beginning of the recession in 2007, a large portion of the property tax base is still assessed at market values less than the maximum taxable value per Proposition 13 limits. These properties may experience Prop. 8 recoveries or increases in assessed values at a rate above 2% up to the Prop. 13 limit over the next year. As such, there is an expectation that the assessed values of those properties will increase at a rate greater than 2% over the next year thereby increasing property tax revenue collections by the Town.

5.7.4 Sales & Use Tax

Sales tax represents the Town's second largest revenue source estimated at $6,015,500 or 20.65% of the total General Fund estimated revenues for FY 16-17. This amount represents an increase of $475,600 compared to the amended revenue estimate for FY 15-16. The majority of the increase is due to the expiration of the sales tax backfill payment ("triple flip") that was received from the State in the form of property taxes (accounted for as Sales Tax In-Lieu). The backfill payment from the State was the result of the "triple flip" that was approved by the voters in November 2004 under Proposition 57 to finance the State's Economic Recovery Bonds. Under this Proposition, the State took one fourth of the local agencies' sales tax and backfilled it with a like amount in property taxes from the Educational Revenue Augmentation Fund (ERAF).

Apple Valley's sales tax base has consistently trended upward over the last several years. This predictability of the sales tax revenue source is due to the diversity of the types of businesses and retailers located within the Town. While the sales tax revenue category had been most directly affected by the recession, sales tax revenues have begun to move upward at a slow gradual pace. Staff is estimating that sales tax revenues will increase (8.19%) when compared to the FY 15-16 revised revenue estimates.

5.7.5 The VLF (Vehicle License Fee)

The VLF swap is the result of the State's action in 2003 to permanently reduce the Vehicle License Fee from 2% to 0.65%. In the past, local government received its full share of the revenues from the 2% rate. When the State reduced the rate,

the State also promised to make local governments whole by backfilling the lost revenue with a like amount in property tax revenues. This backfill payment is linked directly to the growth in property tax revenues. Apple Valley has experienced some revenue losses from the swap as most property values have fallen since the recession began in May, 2007. Although the recession ended in June, 2009, property values in the Town have yet to fully recover to property values existent in 2007.

5.7.6 Franchise Fees

Franchise fees represent the Town's third largest source of revenue. Currently, the Town collects electric franchise fees from Southern California Edison, gas franchise fees from Southwest Gas Company, cable franchise fees from Cable providers and Solid Waste Hauler's franchise fees from the Town's waste hauler. For FY 16-17, estimated revenue from all sources of Franchise Fees is $2,118,500, which represents 7.30% of the total General Fund revenue. The estimated revenue reflects a net increase of $45,500 or 2.19% over the FY 15-16 amended revenue estimate.

5.7.7 Animal Service Contract

Contract payments for animal sheltering services with the County of San Bernardino represent the Town's fourth largest source of revenue. The FY 16-17 revenue estimate from this source is $483,500, which represents 1.66% of the total General Fund revenues. This revenue is a new revenue source to the Town since the County began contracting with the Town for animal sheltering services beginning in January, 2013.

5.7.8 Capital Improvement Program

The Town's Seven-Year Capital Improvement Program (CIP) is listed within the "Capital Improvement Program" section of the adopted budget. This section provides comprehensive, detailed information on each of the capital projects that the Town plans to undertake in the coming fiscal year and beyond. Twenty-four capital improvement projects totaling $10.9 million are adopted for funding in FY 16-17, a decrease of $18.7 million or 63.15% over the adopted CIP in FY 15-16.

5.7.9 Use of Fund Balances

During times of emergency or due to other needs, the Town may utilize its general operating reserve, which is part of the "committed" and "unassigned" portions of General Fund fund balance, if circumstances warrant. The General Fund fund balance should be distinguished from other fund balances. Special Revenue Funds and Capital Projects Funds fund balances are earmarked for specific uses based upon the criteria for which these funds were established. These types of funds may accumulate monies for future appropriations. For example, when the Town is ready and able to embark upon a capital improvement project or special program that meets the specific requirements for the use of the funds, appropriations from fund balances may be used.

5.7.10 Property and Business Improvement District (PBID)

Information on the Apple Valley Village PBID may be found within the "PBID" section of the general budget document. The Town acts as trustee and custodian of PBID funds although the Town does not exercise direct control over PBID activities or expenditures.

Information on all of these programs can be found within the Town's current FY16-17 approved general budget.

Section 6. Mitigation Strategy

6.1 Mitigation Overview

The Town of Apple Valley's mitigation strategy is derived from the in-depth review of the existing vulnerabilities and capabilities outlined 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, recognizes both mitigation challenges and opportunities, and is demonstrated by the goals and objectives outlined below. The mitigation measures identified under each objective include an implementation plan for each measure. The measures were individually evaluated during discussions of mitigation alternatives and the conclusions 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 risk hazards facing the Town that were extensively examined in the risk assessment section: climate change, earthquakes, floods, and wildfires.

The intent of the mitigation strategy is to provide the Town of Apple Valley with a guidebook to future hazard mitigation administration. This will help the staff to achieve compatibility with existing planning mechanisms, and ensure that mitigation activities provide specific roles and resources for implementation success.

6.1.1 Mitigation 5 Year Progress Report

The following, Table 6-1, identifies the completed, deleted, or ongoing actions or activities from the previously approved 2011 plan. Due to changes in funding availability and management's change of priorities, some 2011 mitigations actions have been removed from the 2017 mitigation actions. Mitigation efforts are being focused on the community as a whole as opposed to the actions that may only benefit a small percentage of the community.

Table 6-1: Mitigation 5 Year Progress Report

Mitigation Action	Completed	No longer priority	Ongoing	Comments
Develop projects and programs to install automatic gas shut-off valves in residential, commercial, and public buildings		X		No longer an action the Town wants to pursue.
Develop and construct seismic retrofit of critical facilities	X			Adoption of Ord. No. 453 & No. 489
Develop residential and commercial seismic retrofit programs	X			Adoption of Ord. No. 453 & No. 489
Develop earthquake mitigation public outreach education programs			X	
Develop and construct seismic retrofit of city-owned transportation and utilities infrastructure	X			Completion of Yucca Loma Bridge May 2017

Mitigation Action	Completed	No longer priority	Ongoing	Comments
Develop and sponsor projects and programs to brace new or relocated mobile homes to resist earthquakes		X		No longer a priority.
Install detention basin: **Navajo and Ottawa**			X	In process of acquiring property to connect pipe to ret. Basin. **FI Action 1.1**
Install detention basin: **Huasna Road and Chippewa Rd**		X		Vacant property. Will be completed when property developed by landowner.
Install detention basin: Bear Valley and Mohawk Road	X			Installed Dry well – Completed in 2015
Install Dry Well: Quapaw Rd / Eyota Rd	X			Completed in 2011
Install Dry Well: Seneca Rd / Rancherias Road	X			Completed in 2015
Install Dry Well: Pocomoke Rd / Minnetonka Rd	X			Completed in 2011 Minnetonka Rd/Tamiani Rd
Install Dry Well: Algonquin Rd / Lone Eagle Rd		X		No longer priority
Install Dry Well: Mohawk Rd / Laguna Rd.		X		2015 installed dry well on Bear Valley/Mohawk instead
Install Dry Well: Little Beaver / Mesquite Rd		X		No longer priority
Install Dry Well: **Dale Evans/Otoe/Thunderbird/ Rancherias neighborhood area**	X			Completed in 2015 Rancherias Rd & Thunderbird Rd

6.2 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 hazard in Table 6-2 to Table 6-6.

Table 6-2: All Hazard Problem Statements Table

Problem Description	Problem Type	Action No.
1. Lack of public notification system in the Town	Public Notification	AH 1.1
2. No backup power for EOC	Infrastructure	AH 2.1

Table 6-3: Earthquake Problem Statements Table

Problem Description	Problem Type	Action No.
1. Potential damage to essential facilities and major bridges.	Infrastructure	EQ 1.1, 1.2, 1.3
2. Public awareness and preparedness of earthquake risks at businesses and homes	Public Education and Notification	EQ 2.1
3. Majority of residents live in the severe shaking zone in the Great Shakeout Scenario	Vulnerable Populations	EQ 2.1

Table 6-4: Wildfire Problem Statements Table

Problem Description	Problem Type	Action No.
1. Vegetative fuels in open spaces and backing up to resident's property/homes.	Maintenance Policy	WF 1.1
2. Inadequate water supply for firefighting	Infrastructure	WF 2.1
3. Public education on brush clearance and defensible space.	Public Education and Notification	WF 3.1

Table 6-5: Flood Problem Statements Table

Problem Description	Problem Type	Action No.
1. Drainage issues along major transportation roads throughout Town.	Lifeline/Infrastructure	FL 1.1, 1.2, 1.3
2. Debris/sediment buildup in storm culverts and basins after major storms	Maintenance	FL 2.1

Table 6-6: Climate Change Problem Statements Table

Problem Description	Problem Type	Action No.
1. Greenhouse gas emissions with residential and commercial properties.	Utilities	1.1
2. Greenhouse gas emissions with residential and commercial vehicles	Transportation	1.1

6.3 Mitigation Goals, Objectives, and Projects

The Mitigation Goals included overall goals established by the Town (contained within the Town'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. Our mitigation projects for each hazard are stated within the mitigation actions for each respective hazard. The Town's 2009 General Plan is on file at Town Hall, 14955 Dale Evans Parkway, Apple Valley, CA 92307 and is available for review during normal business hours. The General Plan is also available online at www.applevalley.org.

6.3.1 All Hazard (AH)

Goal: Improve emergency services management capability

Objective 1: Develop warning and evacuation notification system for residents and businesses.

> ***AH Action 1.1:*** Implement a public notification system to increase ability to alert the public to potential emergency situations and hazards.

Objective 2: Identify the need for, and acquire, any special emergency services and equipment to enhance response capabilities for hazards.

> ***AH Action 2.1:*** To ensure continual power supply, purchase and install backup generator at EOC.

6.3.2 Earthquake/Geologic Hazards (EQ)

Goal: The protection and safety of human life, land, and property from the effects of seismic and geotechnical hazards shall be increased. (General Plan, Geotechnical Element)

Earthquake Objective 1: The Town shall coordinate and cooperate with public and quasi-public agencies to ensure that major infrastructure, utility systems and roadways have continued functionality in the event of a major earthquake.

> ***EQ Action 1.1*:** Seismic retrofit of the Bear Valley Bridge over Mojave River.
> ***EQ Action 1.2:*** Seismic analysis of the James Woody Community Center.
> ***EQ Action 1.3:*** Seismic analysis of the Town Hall Development Services Building.
> ***Responsible Agency:*** Planning Division, Public Works Division, Town Engineer, Public and Quasi-Public Utilities.
> ***Schedule:*** Ongoing.

Earthquake Objective 2: The Town shall actively support and participate in local and regional efforts to educate the public on reducing earthquake risks.

***EQ Action 2.1*:** Increase number of residents who complete public education programs such as CERT for earthquake risks and response.
Responsible Agency: Emergency Preparedness
Schedule: Ongoing.

6.3.3 Wildfire (WF)

Goal: Continue to reduce fire hazards in the Town of Apple Valley.

Wildfire Objective 1*:* Reduce fire risk in open spaces through vegetation management policies.

***WF Action 1.1*:** Continue and enhance the hazard abatement program to reduce wildfire hazards.
Responsible Agency: Fire District
Schedule: ongoing.

Wildfire Objective 2*:* Improve understanding of locations, potential impacts, and linkage between hazards, vulnerability, and measures needed to protect life and property.

WF Action 2.1: Continue to identify areas vulnerable to wildfire due to inadequate water supply for firefighting and implement improvements such as expansion of water supply and storage hydrants.
Responsible Agency: Fire District
Schedule: ongoing.

Wildfire Objective 3*:* Increase Public education on brush clearance and defensible space.

WF Action 3.1: Continue and enhance community risk reduction programs such as Ready Set Go!, burn permits, and educational programs through the schools.
Responsible Agency: Fire District
Schedule: ongoing.

6.3.4 Flood (FL)

Goal: Protect lives and property from flooding hazards through a comprehensive system of flood control facilities throughout the Town. (General Plan, Flooding and Hydrology Element)

Flood Objective 1: Upgrade the Town's local and regional drainage system through proactive planning and coordination with other responsible agencies.

FL Action 1.1: Drainage system upgrade on Navajo Road near James Woody Community Center.
FL Action 1.2: Install drywell Seneca/Cronese Road
FL Action 1.3: Install drywell Gayhead/Seminole Road
Responsible Agencies: Engineering Division, Public Works Division
Schedule: 5-10 years

Flood Objective 2: Assure that adequate access to roadways is maintained during major storm events, and that safe all-weather crossings over drainage facilities and flood control channels are provided where necessary.

FL Action 2.1: Purchase resources such as a skid steer loader and automatic sandbag machine needed to perform routine and annual maintenance for roadways and drainage facilities.
Responsible Agency: Public Works Division, Engineering Division
Schedule: Ongoing

6.3.5 Climate Change (CC)

Goal: Reduce the impacts of climate change on the Town and limit human activities that change the atmosphere's makeup.

Climate Change Objective 1: Meet greenhouse gas (GHG) reduction targets set forth by the Town of Apple Valley's Climate Action Plan (CAP).

CC Action 1.1: Continue implementing measures to reduce GHG and energy usage as identified in the Town of Apple Valley's Climate Action Plan.
Responsible Agency: Planning Division
Schedule: 5-10 years

6.4 Considering Mitigation Alternatives

The HMP Planning Team 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 Team 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 Town'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 (Our Town)
- 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
- Obtain StormReady certification
- Provide alert and notification to residents through social media for flood risk
- Evacuate and shelter populations displaced due to flooding
- Training

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/drywells
- Utility upgrades
- Seismic Retrofits
- New construction standards

SP Alternatives:

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

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

6.5 Mitigation Priorities

During the development of the risk assessment for the Town of Apple Valley, the Planning Team proposed and discussed alternative mitigation goals, objectives, and specific mitigation measures that the Town should undertake to reduce the risk from the three high risk hazards facing the Town.

6.5.1 Prioritization Process

Multiple factors were considered to establish the mitigation priorities included in this plan. The Planning Team utilized the 2011 rankings and the last five-year disaster related occurrences to develop the Hazard Summary Worksheet and Risk Factor Final Worksheet identified in Section 4.1 and in Appendix D.1-D.4) to help assess mitigation priorities and determined that the highest priority rankings would be assigned to those mitigation measures that met three primary criteria:

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

All rankings were determined by the consensus of the Planning Team. As described in the previous section on hazard and risk assessment, clearly earthquakes have the potential to affect the largest number of people, critical facilities and buildings and to cause the greatest economic losses. This fact, combined with the relatively high probability of an earthquake occurrence in the next several decades, makes increasing disaster resistance and readiness to earthquakes a high priority.

Given the extreme importance of maintaining critical government functions in times of disaster and the large number of the population who depend and rely on government services and infrastructure, those mitigation measures that improve government disaster resistance, readiness, or recovery capacity are generally given higher priority than mitigation of privately owned buildings in which the loss or damage affects relatively few.

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

The Planning Team discussed alternative mitigation strategies and mitigation measures during workshops, provided their preferences and also suggested additional mitigation measures that the Town should consider. The Planning Team reviewed the list of possible objectives and mitigation measures, made a final selection and then prioritized the individual mitigation measures considered most appropriate for Apple Valley.

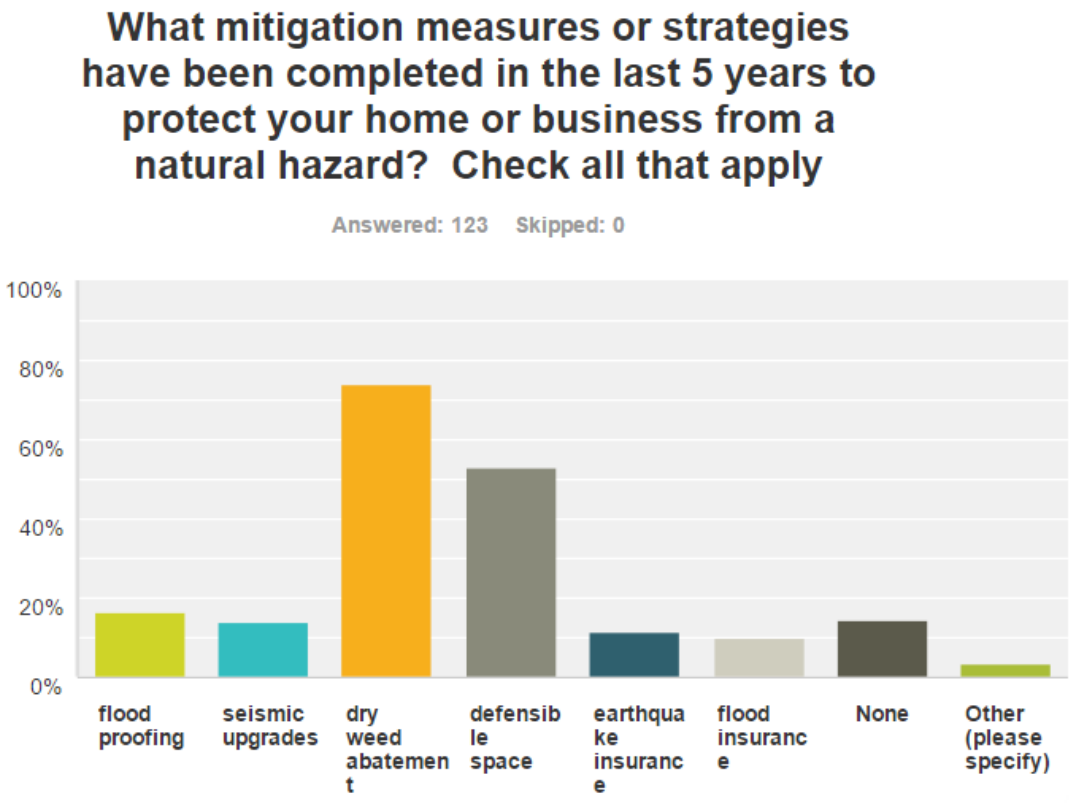
6.5.1.1 Public Input for Mitigation Prioritization:

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. The summary of results can be found in Appendix C.2.

The community survey found that 75.5% of respondents had experienced an earthquake within the past 15 years within the Town of Apple Valley, 46.8% experienced wildfire, and 46.8% had experienced flooding. When asked which hazards

would be very likely to cause damage to buildings or harm residents in the Town, respondents believed drought, wildfire and earthquake were the most likely to cause damage.

As seen in figure 6-1 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 financial assistance programs. This community feedback was taken into consideration when prioritizing mitigation actions.



Answer Choices		Responses	
flood proofing		16.26%	20
seismic upgrades		13.82%	17
dry weed abatement		73.98%	91
defensible space		52.85%	65
earthquake insurance		11.38%	14
flood insurance		9.76%	12
None		14.63%	18
Other (please specify)	Responses	3.25%	4

Figure 6-1: Example survey question

6.5.2 Cost Benefit:

The action plan was prioritized according to a benefit/cost analysis of the proposed projects and their associated costs (44 CFR, Section 201.6(c)(3)(iii)). 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 and the planning team arrived at such ratings notated in Table 6-7.

Cost ratings were defined as:

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.

Using this approach, projects with positive benefit versus cost ratios (such as high over high, high over medium, medium over low, etc.) are considered cost-beneficial and are prioritized accordingly.

6.5.3 Goal, Objective, and Mitigation Action Matrix

Based upon the risk assessment, the City's capabilities and public input, Table 6-7 shows primary objectives and corresponding mitigation actions selected for further implementation and development during the next planning cycle. Table 6-x 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-x are shown in further detail in Section 7 (Implementation).

Table 6-7: Goal, Objective, and Mitigation Action Prioritization Matrix

RF Factor	Action No.	Priority Rating	Action Description
EARTHQUAKE			
3.6	EQ 1.1	1	Seismic retrofit of the Bear Valley Bridge over Mojave River.

RF Factor	Action No.	Priority Rating	Action Description
EARTHQUAKE			
3.6	EQ 1.1	3	Seismic analysis of the James Woody Community Center.
3.6	EQ 2.1	2	Seismic analysis of the Town Hall Development Services Building.
3.6	EQ 3.1	4	Increase number of residents who complete public education programs such as CERT for earthquake risks and response.
FIRE			
2.3	WF 1.1	2	Continue and enhance the hazard abatement program to reduce wildfire hazards.
2.3	WF 2.1	1	Continue to identify areas vulnerable to wildfire due to inadequate water supply for firefighting and implement improvements such as expansion of water supply and storage hydrants.
2.3	WF 3.1	3	Continue and enhance community risk reduction programs such as Ready Set Go, burn permits, and educational programs through the schools.
FLOOD			
2.25	FL 1.1	2	Drainage system upgrade on Navajo Road near James Woody Community Center.
2.25	FL 1.2	3	Install drywell Seneca/Cronese Road
2.25	FL 1.3	4	Install drywell Gayhead/Seminole Road
2.25	FL 2.1	1	Purchase resources such as skid steer loader, dump truck and automatic sandbag machine needed to perform routine and annual maintenance for roadways and drainage facilities.
CLIMATE CHANGE			
1.7	CC 1.1	1	Implement measures to reduce GHG and energy usage as identified in the Town's CAP.

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Action No.	Mitigation Action	Description / Background	Mitigation Category	Funding	Cost/Benefit	Lead Dept.	Timeline
AH 1.1	Implement a public notification system to increase ability to alert the public to potential emergency situations and	The Town currently does not have a Town wide notification system for residents, business owners and visitors.	Emergency Services	General Fund Grants	High/High	Emergency Preparedness/PIO	5-10 years
AH 2.1	To ensure continual power supply, purchase and install backup generator at EOC.	The Town would like to move the current location of the EOC to a Town owned facility, however, we do not have a backup generator at any facility.	Public Education & Awareness	General Fund Grants	High/High	Emergency Preparedness & Facilities	3-5 years
EQ 1.1	Seismic retrofit of Bear Valley Bridge over Mojave River.	Town Engineering Department is in the planning stages for seismic retrofit of Bear Valley bridge.	Structural Projects	General Fund Grants	High/High	Engineering	5-10 years
EQ 1.2	Seismic analysis of the James Woody Community Center.	Seismic analysis of the James Woody Community Center would provide information on needed improvements to the building to respond to seismic activity.	Property Protection Alternatives	Grants	High/High	Building & Safety	3-5 years
EQ 1.3	Seismic analysis of the Town Hall Development Services Building.	Seismic analysis of the Town Hall Development Services Building would provide information on needed improvements to the building to respond to seismic activity.	Property Protection Alternatives	Grants	High/High	Building & Safety	3-5 years
EQ 2.1	Increase number of residents who complete public education programs such as CERT for earthquake risks and response.	Apple Valley has one of the most successful CERT programs in the High Desert. To increase public education and preparedness, expansion of CERT and the DSW program is necessary.	Public Education & Awareness	General Fund Grants	Low/High	Emergency Preparedness	On going
WF 1.1	Continue and enhance fire hazard abatement program.	The Fire Hazard/Weed Abatement Program goal is to have combustible vegetation and debris removed to reduce available fuel for fires. Continuation and enhancement of the program is necessary to decrease wildfires throughout Town.	Natural Resource Protection	AVFPD General Fund, Grants	Medium/High	AVFPD	On going
WF 1.2	Continue to identify areas vulnerable to wildfire due to inadequate water supply for firefighting and implement improvements such as expansion of water supply and storage hydrants.	There are some areas of Apple Valley that have sparse development and limited water supply for firefighting capabilities. The Fire District will continue to identify these areas and develop improvements to increase water supply.	Structural Projects	AVFPD General Fund, Grants	Medium/High	AVFPD	On going
WF 2.1	Continue and enhance community risk reduction programs such as Ready Set Go, burn permits, and educational programs through the schools.	The Community Risk Reduction program is dedicated to maintaining a proactive approach to reducing the risk to lives and property within the Apple Valley. The programs aim at preventing an emergency before it happens through education, preparedness, permits, and fire codes.	Public Education & Awareness	AVFPD General Fund, Grants	Medium/High	AVFPD	On going
FL 1.1	Drainage system upgrade on Navajo Road near James Woody Community Center.	During and after a major storm, flooding occurs on Navajo Road near the James Woody Community Center. Town Engineering department has identified the private property adjacent and to the south of the Community Center as a vital acquisition in order to build a basin for flowing water on Navajo Road.	Structural Projects	General Fund Grants	Low/Medium	Engineering	5-10 years
FL 1.2	Install drywell Seneca/Cronese Road	This intersection has been identified by our Engineering Department as an area in need of a drywell to combat flooding after a storm.	Structural Projects	General Fund Grants	Low/Medium	Engineering	3-5 years

Action No.	Mitigation Action	Description / Background	Mitigation Category	Funding	Cost/Benefit	Lead Dept.	Timeline
FL 1.3	Install drywell Gayhead/Seminole Road	This intersection has been identified by our Engineering Department as an area in need of a drywell to combat flooding after a storm.	Structural Projects	General Fund Grants	Low/Medium	Engineering	3-5 years
FL 2.1	Purchase resources such as a skid steer loader and automatic sandbag machine needed to perform routine and annual maintenance for roadways and drainage facilities.	The Town's Public Works department has limited resources to clear drainage facilities and roadways before and after major storms. Purchase of these two resources will aid in increasing staff's efficiency when conducting routine maintenance.	Prevention	General Fund Grants	High/High	Public Works	3-5 years
CC 1.1	Implement measures to reduce GHG and energy usage as identified in the Town's CAP.	The Town of Apple Valley's Climate Action Plan addresses the environmental effects of climate change and GHG reduction for the Town.	Prevention	General Fund Grants	Low/Low	Planning	On Going

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 the Town of Apple Valley'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 Town of Apple Valley's. This section describes the incorporation of the HMP into existing Apple Valley's planning mechanisms, and how the Apple Valley's staff will continue to engage the public.

7.2 Plan Adoption

To comply with DMA 2000, the Town Council has officially adopted the 2017 Town of Apple Valley HMP. The adoption of the 2017 HMP recognizes Apple Valley's commitment to reducing the impacts of natural hazards within Town limits. A copy of the 2017 HMP adoption resolution is included in the front of the approved HMP document.

7.3 Implementation

Over time, Implementation Strategies will become more detailed and the Town's mitigation planners will work to provide greater detail for priority mitigation actions. In conjunction with the Mitigation Implementation Plan Worksheet and Mitigation Action Reporting Form outlined at the end of Section 7 these 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 6. By using planning mechanisms already in use and familiar to Town 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. Section 6 provides more information on existing planning mechanisms.
- **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.

7.4 Future Participation

The Town of Apple Valley's 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 Office of Emergency Preparedness will lead the 2017 HMP plan development and updates and all associated HMP

maintenance requirements. Other duties include reviewing and promoting mitigation opportunities, informing and soliciting input from the public and developing grant applications for hazard mitigation assistance.

7.5 Schedule

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 Town Council adoption date of the HMP notated at the beginning of this plan. However, should a significant disaster occur within Apple Valley, the HMP Planning Committee will reconvene within 30 days of the disaster to review and update the HMP as needed. The Town Council will adopt written updates to the HMP as a DMA 2000 requirement.

7.6 Process

The HMP Planning Committee will coordinate with responsible agencies/departments identified for each mitigation action. These responsible agencies/departments 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 at the end of this section 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 Town changed?
- Are there new hazards that have the potential to impact the Town?
- 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 the Appendix D.7, 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 HMP in 2022. The questions identified above would remain valid during the preparation of the 2022 update.

7.7 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.

The 2017 Hazard Mitigation Plan update process was followed by inclusion of mitigation measures in the Town of Apple Valley's General Plan. The Town of Apple Valley addresses statewide planning goals and legislative requirements through its General Plan, Capital Improvement Projects, Climate Action Plan and City Building and Safety Codes. The Hazard Mitigation Plan will implement a series of recommendations, many of which are closely related to the goals and objectives of existing planning programs just mentioned. The Town of Apple Valley will have the opportunity to implement recommended mitigation action items through existing programs and procedures.

The Hazard Mitigation Plan goals and actions will be incorporated into various general operations of government. For example, much of the information from the Hazard Mitigation Plan will be included in the Town of Apple Valley's Emergency Operations Plan (EOP). As any future Town plans are developed, the Hazard Mitigation Plan will be a great asset in any plan development efforts. As noted earlier, much of the information contained in this Hazard Mitigation Plan is from the Town's General Plan and is already part of the planning process.

7.8 Continued Public Involvement

A critical part of maintaining an effective and relevant Hazards Mitigation Plan is ongoing public review and comment. Consequently, the Town is dedicated to the direct involvement of its citizens in providing feedback and comments on the plan on a continued basis. The public will continue to be apprised of Local Hazard Mitigation Plan actions through the Town's website and through the local media.

The Town of Apple Valley will continue to promote and secure hazard mitigation, preparedness, response, and recovery actions via:

- Regular quarterly meetings of the Apple Valley Disaster Council
- Continued participation in the Operational Area Coordinating Council meeting.
- Regular revision of the Emergency Operations Plan and the Hazard Mitigation Plan as outlined respectively
- Annual drills and training with Emergency Operations Center staff
- Support of the full-time Emergency Preparedness Program
- Promotion at community events whenever possible

All proposed changes to the plan will be subject to citizen review prior to Town Council action. The Town will follow its standard public input process, consistent with the process used in the initial plan development, which is described in Section 3 of this Plan.

7.9 2017 HMP Mitigation Action Implementation Plans

Mitigation Action Implementation Plan	
Action:	
Implementing Agencies	
Lead Agency (ies):	Town of Apple Valley
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:	

7.10 Blank Mitigation Action Reporting Forms

Your jurisdictional 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:_____

Town: _____

Contact Person:_____

Phone#: _____ Email _____

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):_____

Milestones	Completed (✓)	Projected Date of Completion

HMP Goal Addressed: _____

Indicator of Success:_____

Project Status:

□ Project on schedule □ Cost unchanged □ Project completed

□ Cost overrun* □ Project delayed*

*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?

Other Comments:

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Section 8. Work Cited

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Appendix A

A.1 Copy of Town Resolution adopting HMP

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Appendix B

B.1 Planning Committee Team

B.2 Planning Committee Invite Letters

B.3 Committee Meeting Documents (PPT's, sign in sheets and agendas)

B.4 Other Meeting Agendas (CERT, Disaster Council, Town Council)

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B.1 Planning Committee Team

Apple Valley HMP Team

Suggested Planning Team Members

Emergency Management
Building Code Enforcement
Fire District
GIS
Parks & Recreation
Planning/Com. Development
PIO
Public Works
Stormwater Management
Transportation

Proposed 2016 HMP Core Planning Team

Title	Person
Emer. Management	Joseph Ramos
Building Official	Patrick Carroll
AVFPD	Sid Hultquist
GIS	Pam Cupp
Parks & Rec	Ralph Wright
Planning/Comm Dev.	Lori Lamson
PIO	Kathie Martin
Public Works	Greg Synder
Engineer	Brad Miller

Key Stakeholders

DSW	Dawn Harrison
City of Hesperia	Rachel Molina
City of Victorville	Dana Welborn
AVUSD	Janet Gould
American Red Cross	Don Gordon
County of SB	Cindy Serrano
SW Gas	Bill Hensley
Edison	Bob Stiens
Liberty Utilities	Kevin Phillips
Nat. Weather Service	Alex Tardy
St. Josephs- St. Mary's	Shannon Welsh
Cal OES	HMP division
FEMA	HMP division

2010

Title	Person
DSW	Shelley Alfieri
Fire Chief	Art Bishop
United Way	Chris Briggs
AV Ranchos Water	Mike Cook
ATM- TOAV	Dennis Cron
CERT Commander	Dawn Harrison
DSW	Pat Hayes
TOAV- Engineer	Brad Miller
PW manager- TOAV	Lance Miller
Risk Manager- AVUSD	David Pinnecker
Building Official- TOAV	Claude Stewart
St. Mary's	Robert Suchomel
ESO- TOAV & AVFPD	Laura Whitehead
P & R Manager	Ralph Wright

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B.2 Planning Committee Invite Letters

Town of Apple Valley
Office of Emergency Preparedness

A Better Way of Life

July 20, 2016

You are invited to make a difference!

Town of Apple Valley is required to maintain a current Local Hazard Mitigation Plan (HMP) approved by CalOES and FEMA that identifies hazards and mitigation potential within the Town of Apple Valley. In addition to preparedness, this plan is necessary to insure that Apple Valley is eligible to receive federal grants and/or aid related to natural disaster. This is a 5-year plan. Apple Valley has begun the process to prepare the 2016 update to the Local 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 Apple Valley.

To guide this process, Apple Valley has established two groups: The Core Planning Committee who will work closely to shape the plan; and the Stakeholder Group to give a broad perspective during plan development. You are receiving this because our ***Town Manager*** has identified you as a key participant at the Core Planning level. We welcome your participation as part of the HMP Core Planning Team to update our natural hazard mitigation documents for Apple Valley.

To provide solidarity in the process, we would like to kick-off the planning efforts with a meeting for team members. The strategy of this meeting is to have members meet, organize and provide input on the hazards, mitigation strategies, and other components of the HMP planning process. Later in the planning process, we will start engaging a larger group of stakeholders, and develop a plan together with the help of a consultant team hired by the County.

The kick-off meeting will be on ***Tuesday, August 2, 2016 at 8:30 a.m.*** at the Town Hall Development Services Building meeting room 1 located at 14975 Dale Evans Parkway.

For more information about the HMP process and history behind the program visit:

www.readyapplevalley.org.

Cal OES Local Hazard Mitigation Planning Program (LHMP):
http://hazardmitigation.calema.ca.gov/plan/local_hazard_mitigation_plan_lhmp

FEMA's Website on Hazard Mitigation Planning Resources:
http://www.fema.gov/hazard-mitigation-planning-resources

www.AppleValley.org 14955 Dale Evans Parkway • Apple Valley, California 92307 • 760.240.7000

FEMA's Guide on Mitigation Ideas: A Resource for Reducing Risk to Natural Hazards:
http://www.fema.gov/library/viewRecord.do?id=6938

FEMA's Guide on Integrating Hazard Mitigation Intro Local Planning: Case Studies and Tools for Community Officials:
http://www.fema.gov/library/viewRecord.do?id=7130

Please advise if you will or will not be able to attend this kick off meeting. If you are unable to attend this meeting, additional information regarding future meetings, draft documents for review, and other project milestones will be provided soon!

If you have any additional questions, please do not hesitate to contact me by phone or email. Thank you for your time and consideration,

Joseph Ramos
Town of Apple Valley
Emergency Services Officer
jramos@applevalley.org
760-240-7000 ext. 7890

Town of Apple Valley
Office of Emergency Preparedness

A Better Way of Life

July 28, 2016

You are invited to make a difference!

Town of Apple Valley has begun the process to prepare the 2016 update to 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 Town of Apple Valley. To guide this process, the Town has established two groups: The Planning Committee who will work most closely to shape the plan; and the Stakeholder Group to give a broad perspective during plan development. You are receiving this because you or your agency has been identified as a key participant at the "Stakeholder Group" level. The Town welcomes you (or other interested parties) to assist the HMP Project Management Team to update our natural hazard mitigation documents for the Town of Apple Valley. ***This will involve periodic review of documentation and feedback during certain points of the planning process.***

To provide solidarity in the planning process, we would like to inform you that our project will be starting soon with a kick-off meeting. You are more than welcome to join this meeting but attendance at this meeting is not a requirement to be involved in the entire process. The strategy of this meeting is to have members meet, organize and discuss next steps and other components of the HMP planning process. Later in the planning process, we will start engaging a larger group of stakeholders through various means of engagement. We anticipate the HMP development process to last about 8 to 12 months.

The kick-off meeting will be on ***Tuesday, August 2, 2016 at 8:30 a.m.*** at the Town Hall Development Services Building meeting room 1 located at 14975 Dale Evans Parkway.

For more information about the HMP process and history behind the program visit:

www.readyapplevalley.org.

Cal OES Local Hazard Mitigation Planning Program (LHMP):
http://hazardmitigation.calema.ca.gov/plan/local_hazard_mitigation_plan_lhmp

FEMA's Website on Hazard Mitigation Planning Resources:
http://www.fema.gov/hazard-mitigation-planning-resources

FEMA's Guide on Mitigation Ideas: A Resource for Reducing Risk to Natural Hazards:
http://www.fema.gov/library/viewRecord.do?id=6938

www.AppleValley.org 14955 Dale Evans Parkway • Apple Valley, California 92307 • 760.240.7000

FEMA's Guide on Integrating Hazard Mitigation Intro Local Planning: Case Studies and Tools for Community Officials:
http://www.fema.gov/library/viewRecord.do?id=7130

Please respond to this e-mail and advise if you will be participating in this process, and who will be assigned to represent your agency. If you are unable to attend this meeting but still wish to participate in the planning process, additional information regarding future meetings, draft documents for review, and other project milestones will be provided through e-mails.

If you have any additional questions, please do not hesitate to contact me by phone or email. Thank you for your time and consideration,

Joseph Ramos
Town of Apple Valley
Emergency Services Officer
jramos@applevalley.org
760-240-7000 ext. 7890

Town of Apple Valley
Office of Emergency Preparedness

A Better Way of Life

Media Alert
July 28, 2016
For immediate release

You are invited to make a difference!

Town of Apple Valley has begun the process to prepare the 2016 update to 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 Town of Apple Valley. The Town welcomes you (or other interested parties) to assist the HMP Project Management Team to update our natural hazard mitigation documents for the Town of Apple Valley. This will involve periodic review of documentation and feedback during certain points of the planning process.

To provide solidarity in the planning process, we would like to inform you that our project will be starting soon with a kick-off meeting. You are more than welcome to join this meeting but attendance in this meeting is not a requirement to be involved in the entire process. We anticipate the HMP development process to last about 8 to 12 months.

The kick-off meeting will be on ***Tuesday, August 2, 2016 at 8:30 a.m.*** at the Town Hall Development Services Building meeting room 1 located at 14975 Dale Evans Parkway.

We will have additional discussions of the HMP during all upcoming Disaster Council Meetings and CERT meetings.

For more information about the HMP process and history behind the program visit: www.readyapplevalley.org.

If you have any additional questions, please do not hesitate to contact me by phone or email. Thank you for your time and consideration.

Joseph Ramos
Town of Apple Valley
Emergency Services Officer
jramos@applevalley.org
760-240-7000 ext. 7890

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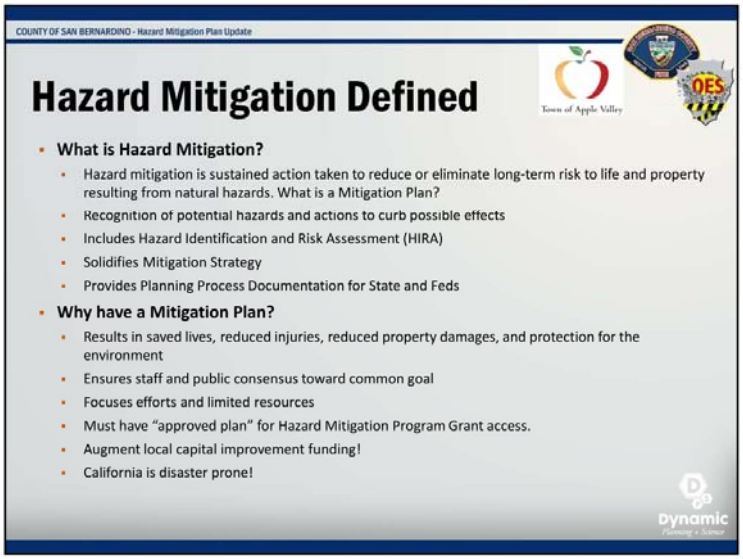
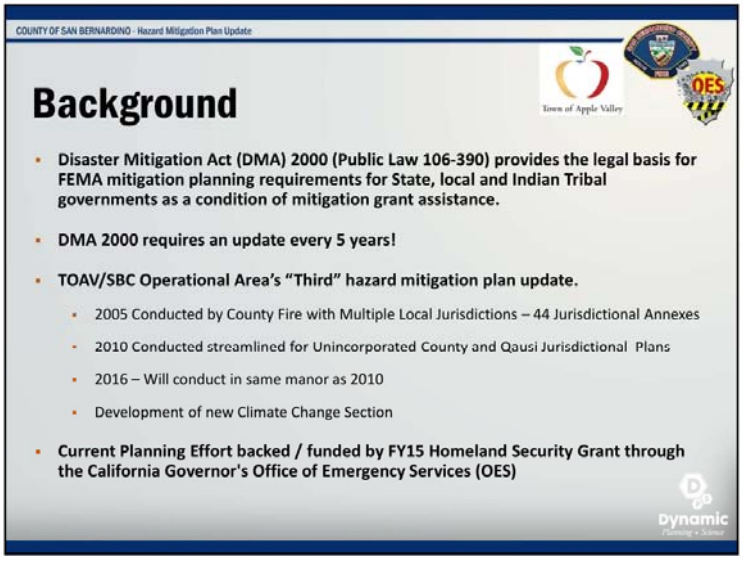
B.3 Committee Meeting Documents (PPT's, sign in sheets and agendas)

6/15/2017

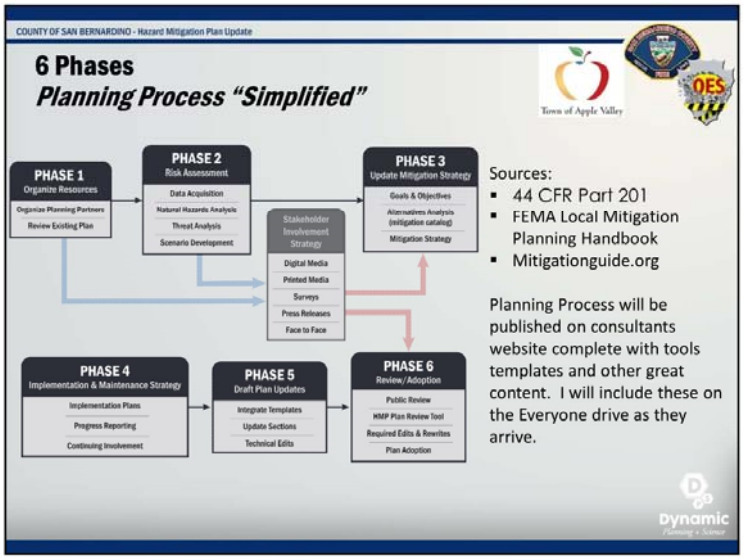
1

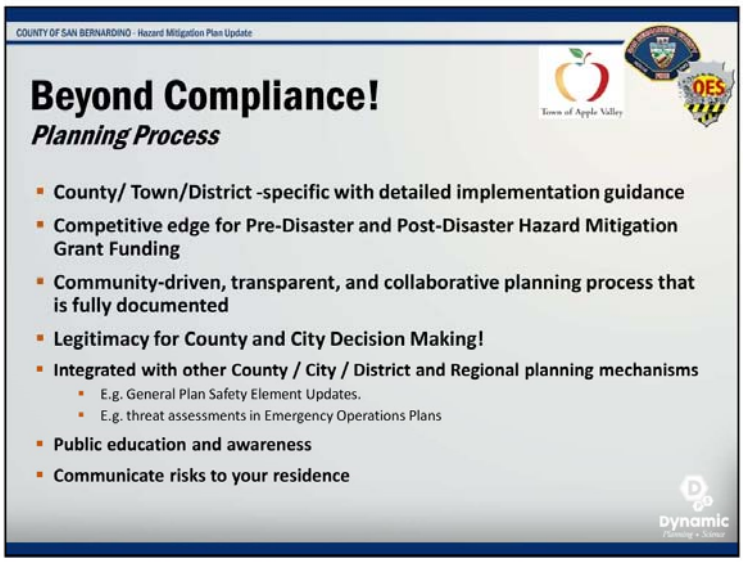
6/15/2017


COUNTY OF SAN BERNARDINO - Hazard Mitigation Plan Update
Hazard Mitigation Defined
Town of Apple Valley
OES
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 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, reduced 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!
Dynamic


COUNTY OF SAN BERNARDINO - Hazard Mitigation Plan Update
Background
Town of Apple Valley
OES
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.
DMA 2000 requires an update every 5 years!
TOAV/SBC Operational Area's "Third" hazard mitigation plan update.
2005 Conducted by County Fire with Multiple Local Jurisdictions – 44 Jurisdictional Annexes
2010 Conducted streamlined for Unincorporated County and Qausi Jurisdictional Plans
2016 – Will conduct in same manor as 2010
Development of new Climate Change Section
Current Planning Effort backed / funded by FY15 Homeland Security Grant through the California Governor's Office of Emergency Services (OES)
Dynamic

6/15/2017


COUNTY OF SAN BERNARDINO - Hazard Mitigation Plan Update
6 Phases
Planning Process "Simplified"
Town of Apple Valley
OES
PHASE 1
Organize Resources
Organize Planning Partners
Review Existing Plan
PHASE 2
Risk Assessment
Data Acquisition
Natural Hazards Analysis
Threat Analysis
Scenario Development
PHASE 3
Update Mitigation Strategy
Goals & Objectives
Alternatives Analysis (mitigation catalog)
Mitigation Strategy
Stakeholder Involvement Strategy
Digital Media
Printed Media
Surveys
Press Releases
Face to Face
PHASE 4
Implementation & Maintenance Strategy
Implementation Plans
Progress Reporting
Continuing Involvement
PHASE 5
Draft Plan Updates
Integrate Templates
Update Sections
Technical Edits
PHASE 6
Review/Adoption
Public Review
HMP Plan Review Tool
Required Edits & Rewrites
Plan Adoption
Sources:
44 CFR Part 201
FEMA Local Mitigation Planning Handbook
Mitigationguide.org
Planning Process will be published on consultants website complete with tools templates and other great content. I will include these on the Everyone drive as they arrive.
Dynamic


COUNTY OF SAN BERNARDINO - Hazard Mitigation Plan Update
Beyond Compliance!
Planning Process
Town of Apple Valley
OES
County/ Town/District -specific with detailed implementation guidance
Competitive edge for Pre-Disaster and Post-Disaster Hazard Mitigation Grant Funding
Community-driven, transparent, and collaborative planning process that is fully documented
Legitimacy for County and City Decision Making!
Integrated with other County / City / District and Regional planning mechanisms
E.g. General Plan Safety Element Updates.
E.g. threat assessments in Emergency Operations Plans
Public education and awareness
Communicate risks to your residence
Dynamic

6/15/2017

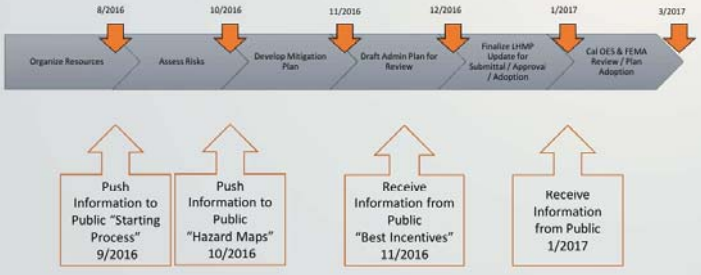
COUNTY OF SAN BERNARDINO - Hazard Mitigation Plan Update

Primary Objectives

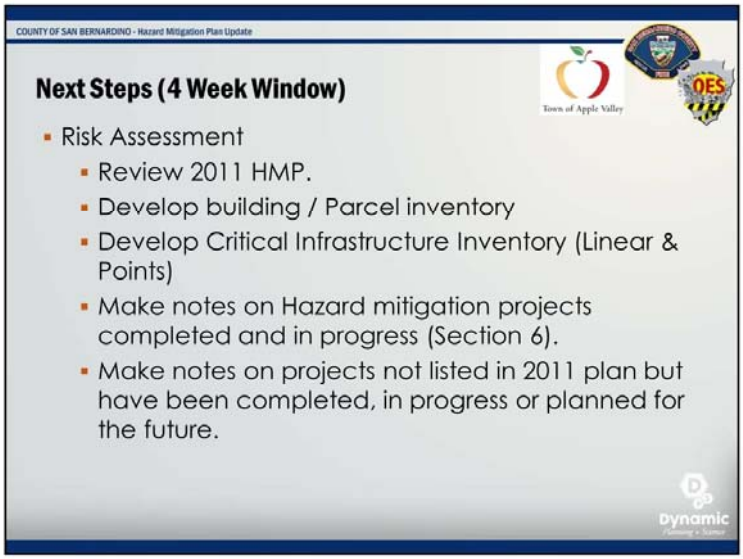
- Setting the expectations and define mitigation planning and actions.
- Mitigate the identified risk.
- This is not a emergency response document!
- Create umbrella planning process with a set prescribed phases and tasks to follow if needed.
- Remain Flexible; Implementation will change over time based upon resources, grants and other leveraging.
- Develop something useful!

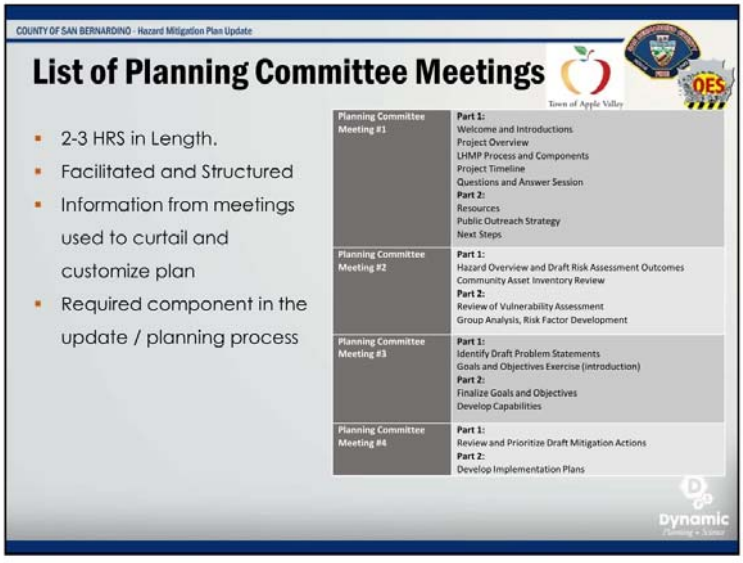
COUNTY OF SAN BERNARDINO - Hazard Mitigation Plan Update

"Ideal" Schedule



6/15/2017


COUNTY OF SAN BERNARDINO - Hazard Mitigation Plan Update
Next Steps (4 Week Window)
Risk Assessment
Review 2011 HMP.
Develop building / Parcel inventory
Develop Critical Infrastructure Inventory (Linear & Points)
Make notes on Hazard mitigation projects completed and in progress (Section 6).
Make notes on projects not listed in 2011 plan but have been completed, in progress or planned for the future.
Town of Apple Valley
OES
Dynamic


COUNTY OF SAN BERNARDINO - Hazard Mitigation Plan Update
List of Planning Committee Meetings
2-3 HRS in Length.
Facilitated and Structured
Information from meetings used to curtail and customize plan
Required component in the update / planning process
Planning Committee Meeting #1
Part 1:
Welcome and Introductions
Project Overview
LHMP Process and Components
Project Timeline
Questions and Answer Session
Part 2:
Resources
Public Outreach Strategy
Next Steps
Planning Committee Meeting #2
Part 1:
Hazard Overview and Draft Risk Assessment Outcomes
Community Asset Inventory Review
Part 2:
Review of Vulnerability Assessment
Group Analysis, Risk Factor Development
Planning Committee Meeting #3
Part 1:
Identify Draft Problem Statements
Goals and Objectives Exercise (introduction)
Part 2:
Finalize Goals and Objectives
Develop Capabilities
Planning Committee Meeting #4
Part 1:
Review and Prioritize Draft Mitigation Actions
Part 2:
Develop Implementation Plans
Town of Apple Valley
OES
Dynamic

6/15/2017


COUNTY OF SAN BERNARDINO - Hazard Mitigation Plan Update
QUESTIONS
Joseph Ramos
Emergency Services Officer
760-240-7000 ext. 7890
Dawn Harrison
Emergency Services Assistant
760-240-7000 ext. 7791
Dynamic

Kick Off Meeting-Monday August 2, 2016

Planning Committee Dept. / Members	E-Mail	Initial
Town Engineering/Building & Safety Department		
Brad Miller	bmiller@applevalley.org	
Patrick Carroll	pcarroll@applevalley.org	
Brett Morgan	bmorgan@applevalley.org	
Town Community Development		
Lori Lamson	llamson@applevalley.org	
Pam Cupp	pcupp@applevalley.org	
Ralph Wright	rwright@applevalley.org	
AV Fire Protection District		
Sid Hultquist	shultquist@applevalleyfd.com	
Rich Unferdorfer	runferdorfer@applevalleyfd.com	
Town Public Works		
Greg Snyder	gsnyder@applevalley.org	
Mike Cady	mcady@applevalley.org	
Town PIO		
Kathy ~~Martin~~ ie	kmartin@applevalley.org	
Office of Emergency Preparedness		
Joseph Ramos	jramos@applevalley.org	
Dawn Harrison	dharrison@applevalley.org	
Carol Miller	cmiller@applevalley.org	CM

6/15/2017


COUNTY OF SAN BERNARDINO - Hazard Mitigation Plan Update
OES
Town of Apple Valley
2016-17
Hazard Mitigation Plan
Update Process
Town of Apple Valley, SBC OES
HMP Meeting
October 18, 2016
Dynamic


COUNTY OF SAN BERNARDINO - Hazard Mitigation Plan Update
OES
Town of Apple Valley
Agenda
Hazard Mitigation Planning
Hazard Mitigation Defined
Town HMP webpage/survey
Schedule
Project Review
Section 1-3
Schedule
Prep for next sections
Hazard Prioritization
Mitigation Strategies
Exercise Problem Statements
Next Step- section 4-5
Dynamic

6/15/2017

COUNTY OF SAN BERNARDINO - Hazard Mitigation Plan Update

Hazard Mitigation Defined

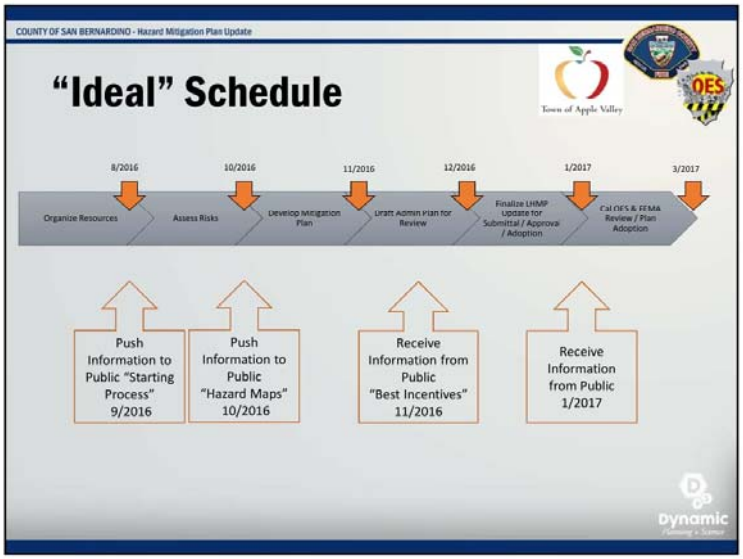
- **What is Hazard Mitigation?**
  - Hazard mitigation is sustained action taken to reduce or eliminate long-term risk to life and property resulting from natural hazards. What is a Mitigation Plan?
  - Recognition of potential hazards and actions to curb possible effects
  - Includes Hazard Identification and Risk Assessment (HIRA)
  - Solidifies Mitigation Strategy
  - Provides Planning Process Documentation for State and Feds
- **Why have a Mitigation Plan?**
  - Results in saved lives, reduced 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!

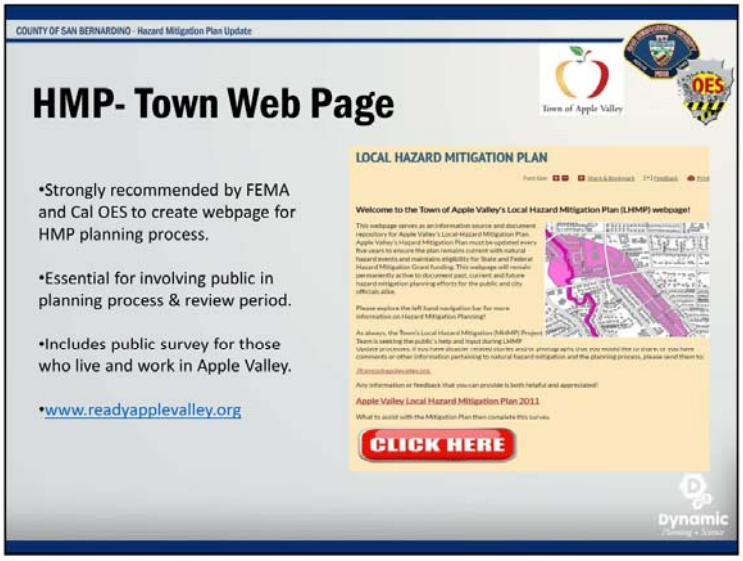
COUNTY OF SAN BERNARDINO - Hazard Mitigation Plan Update

Background

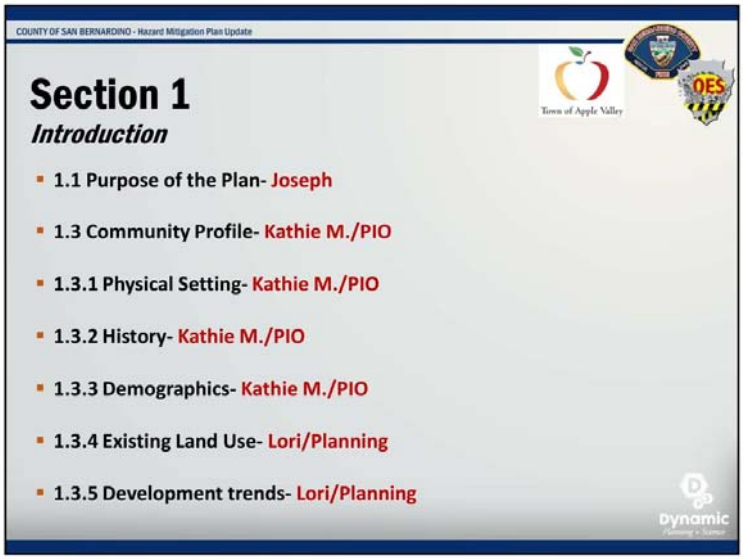
- **Disaster Mitigation Act (DMA) 2000 (Public Law 106-390) provides the legal basis for FEMA mitigation planning requirements for State, local and Indian Tribal governments as a condition of mitigation grant assistance.**
- **DMA 2000 requires an update every 5 years!**
- **TOAV/SBC Operational Area's "Third" hazard mitigation plan update.**
  - 2005 Conducted by County Fire with Multiple Local Jurisdictions – 44 Jurisdictional Annexes
  - 2010 Conducted streamlined for Unincorporated County and Qausi Jurisdictional Plans
  - 2016 – Will conduct in same manor as 2010
  - Development of new Climate Change Section
- **Current Planning Effort backed / funded by FY15 Homeland Security Grant through the California Governor's Office of Emergency Services (OES)**

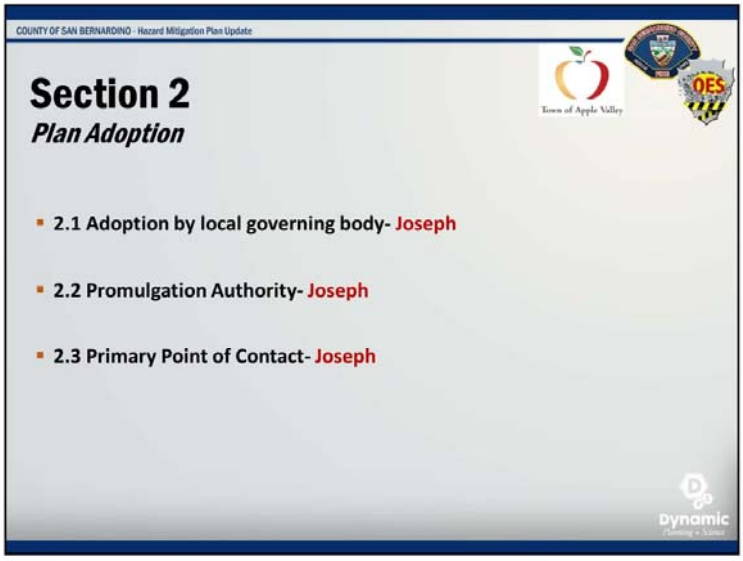
6/15/2017


COUNTY OF SAN BERNARDINO - Hazard Mitigation Plan Update
"Ideal" Schedule
Town of Apple Valley
OES
8/2016
10/2016
11/2016
12/2016
1/2017
3/2017
Organize Resources
Assess Risks
Develop Mitigation Plan
Draft Admin Plan for Review
Finalize LHMP Update for Submittal / Approval / Adoption
Cal OES & FEMA Review / Plan Adoption
Push Information to Public "Starting Process" 9/2016
Push Information to Public "Hazard Maps" 10/2016
Receive Information from Public "Best Incentives" 11/2016
Receive Information from Public 1/2017
Dynamic


COUNTY OF SAN BERNARDINO - Hazard Mitigation Plan Update
HMP- Town Web Page
Town of Apple Valley
OES
•Strongly recommended by FEMA and Cal OES to create webpage for HMP planning process.
•Essential for involving public in planning process & review period.
•Includes public survey for those who live and work in Apple Valley.
•www.readyapplevalley.org
LOCAL HAZARD MITIGATION PLAN
Welcome to the Town of Apple Valley's Local Hazard Mitigation Plan (LHMP) webpage!
Apple Valley Local Hazard Mitigation Plan 2011
CLICK HERE
Dynamic

6/15/2017


COUNTY OF SAN BERNARDINO - Hazard Mitigation Plan Update
Section 1
Introduction
1.1 Purpose of the Plan- Joseph
1.3 Community Profile- Kathie M./PIO
1.3.1 Physical Setting- Kathie M./PIO
1.3.2 History- Kathie M./PIO
1.3.3 Demographics- Kathie M./PIO
1.3.4 Existing Land Use- Lori/Planning
1.3.5 Development trends- Lori/Planning
OES
Dynamic


COUNTY OF SAN BERNARDINO - Hazard Mitigation Plan Update
Section 2
Plan Adoption
2.1 Adoption by local governing body- Joseph
2.2 Promulgation Authority- Joseph
2.3 Primary Point of Contact- Joseph
OES
Dynamic

6/15/2017

COUNTY OF SAN BERNARDINO - Hazard Mitigation Plan Update

Section 3

Planning Process

- 3.1 Preparing for the Plan- Joseph
- 3.1.1 Planning Team- Dawn
- 3.2 Coordinating w/other jurisdictions, agencies & organizations- Dawn
- 3.3 Public involvement/Outreach- Dawn
- 3.4-3.8 Assess the Hazard, Set Goals, Review & Propose Mitigation Measures, Draft & Adopt Plan- Joseph

COUNTY OF SAN BERNARDINO - Hazard Mitigation Plan Update

Preparing for next sections

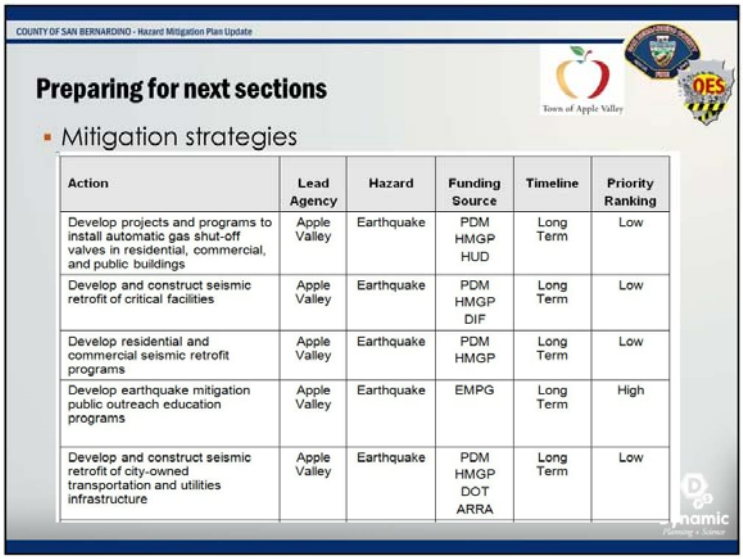
- Hazard Prioritization

Probability	Impact: High	Impact: Medium	Impact: Low
High	Earthquake Flooding Wildfires		
Medium	Drought and Water Shortage	Extreme Heat High Winds Straight Line Winds	
Low			Dam Failure

Red boxes represent the higher priority hazards; "Orange" and "Yellow" boxes represent additional levels of priority.

Figure 9 – Hazard Assessment Matrix

6/15/2017

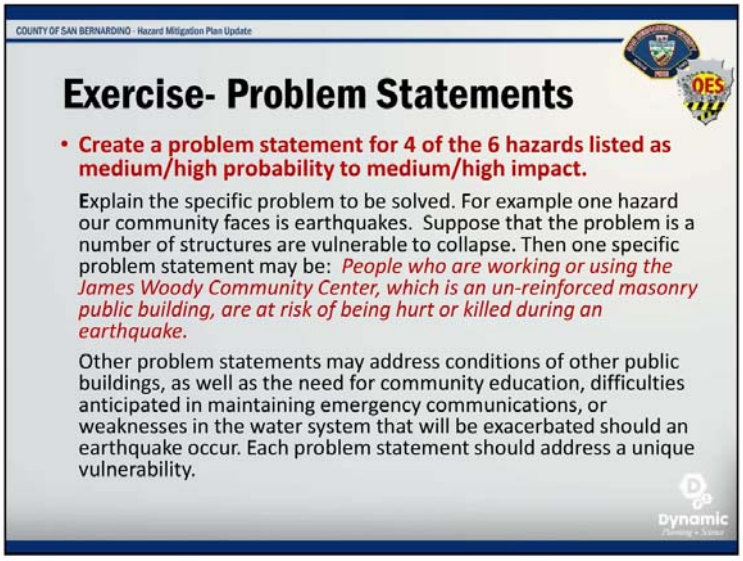

COUNTY OF SAN BERNARDINO - Hazard Mitigation Plan Update
Preparing for next sections
Mitigation strategies
Action | Lead Agency | Hazard | Funding Source | Timeline | Priority Ranking
Develop projects and programs to install automatic gas shut-off valves in residential, commercial, and public buildings | Apple Valley | Earthquake | PDM HMGP HUD | Long Term | Low
Develop and construct seismic retrofit of critical facilities | Apple Valley | Earthquake | PDM HMGP DIF | Long Term | Low
Develop residential and commercial seismic retrofit programs | Apple Valley | Earthquake | PDM HMGP | Long Term | Low
Develop earthquake mitigation public outreach education programs | Apple Valley | Earthquake | EMPG | Long Term | High
Develop and construct seismic retrofit of city-owned transportation and utilities infrastructure | Apple Valley | Earthquake | PDM HMGP DOT ARRA | Long Term | Low


COUNTY OF SAN BERNARDINO - Hazard Mitigation Plan Update
Preparing for next sections
Mitigation strategies-Cont.
Develop and sponsor projects and programs to brace new or relocated mobile homes to resist earthquakes | Apple Valley | Earthquake | PDM HMGP | Long Term | Low
Install detention basins Navajo and Ottawa Roads | Apple Valley | Flood | PDM | Long Term | Low
Install detention basins Huasna Road and Chippewa Rd | Apple Valley | Flood | PDM | Long Term | Low
Install detention basins Bear Valley and Mohawk Roads | Apple Valley | Flood | PDM | Long Term | Low
Install Dry Wells Quapaw Rd / Eyota Rd | Apple Valley | Flood | PDM | Long Term | Low
Install Dry Wells Seneca Rd / Rancherias Road | Apple Valley | Flood | PDM | Long Term | Low
Install Dry wells Pocomoke Rd / Minnetonka Rd | Apple Valley | Flood | PDM | Long Term | Low
Install Dry Wells Algonquin Rd / Lone Eagle Rd | Apple Valley | Flood | PDM | Long Term | Low
Install Dry wells | Apple | Flood | PDM | Long | Low

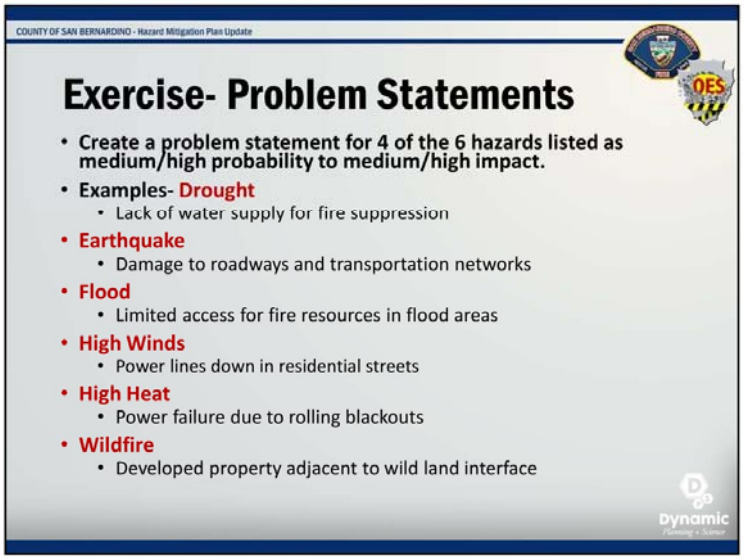
6

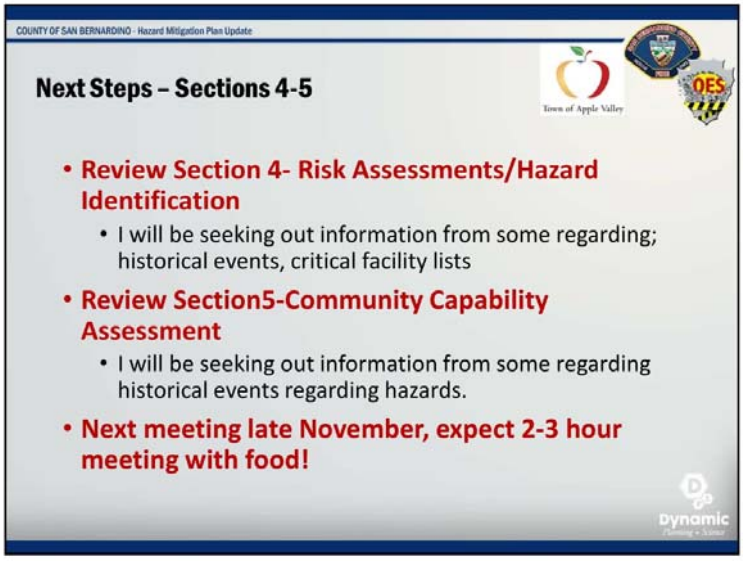
6/15/2017


COUNTY OF SAN BERNARDINO - Hazard Mitigation Plan Update
Preparing for next sections
Mitigation strategies-Cont.
Action | Lead Agency | Hazard | Funding Source | Timeline | Priority Ranking
Mohawk Rd / Laguna Rd. | Valley | | | Term |
Install Dry Wells Little Beaver / Mesquite Rd | Apple Valley | Flood | PDM | Long Term | Low
Install Dry wells Dale Evans/Otoe/Thunderbird/ Rancherias neighborhood area | Apple Valley | Flood | PDM | Long Term | Low
Dynamic


COUNTY OF SAN BERNARDINO - Hazard Mitigation Plan Update
Exercise- Problem Statements
• Create a problem statement for 4 of the 6 hazards listed as medium/high probability to medium/high impact.
Explain the specific problem to be solved. For example one hazard our community faces is earthquakes. Suppose that the problem is a number of structures are vulnerable to collapse. Then one specific problem statement may be: People who are working or using the James Woody Community Center, which is an un-reinforced masonry public building, are at risk of being hurt or killed during an earthquake.
Other problem statements may address conditions of other public buildings, as well as the need for community education, difficulties anticipated in maintaining emergency communications, or weaknesses in the water system that will be exacerbated should an earthquake occur. Each problem statement should address a unique vulnerability.
Dynamic

6/15/2017


COUNTY OF SAN BERNARDINO - Hazard Mitigation Plan Update
OES
Exercise- Problem Statements
• Create a problem statement for 4 of the 6 hazards listed as medium/high probability to medium/high impact.
• Examples- Drought
• Lack of water supply for fire suppression
• Earthquake
• Damage to roadways and transportation networks
• Flood
• Limited access for fire resources in flood areas
• High Winds
• Power lines down in residential streets
• High Heat
• Power failure due to rolling blackouts
• Wildfire
• Developed property adjacent to wild land interface
Dynamic


COUNTY OF SAN BERNARDINO - Hazard Mitigation Plan Update
OES
Town of Apple Valley
Next Steps – Sections 4-5
• Review Section 4- Risk Assessments/Hazard Identification
• I will be seeking out information from some regarding; historical events, critical facility lists
• Review Section5-Community Capability Assessment
• I will be seeking out information from some regarding historical events regarding hazards.
• Next meeting late November, expect 2-3 hour meeting with food!
Dynamic

6/15/2017


COUNTY OF SAN BERNARDINO - Hazard Mitigation Plan Update
QUESTIONS
Joseph Ramos
Emergency Services Officer
760-240-7000 ext. 7890
Dawn Harrison
Emergency Services Assistant
760-240-7000 ext. 7791
Dynamic

Meeting-Tuesday October 18, 2016

Planning Committee Dept. / Members	E-Mail	Initial
Town Engineering/Building & Safety Department		
Brad Miller	bmiller@applevalley.org	
Patrick Carroll	pcarroll@applevalley.org	
Brett Morgan	bmorgan@applevalley.org	
Town Community Development		
Lori Lamson	llamson@applevalley.org	
Carol Miller	cmiller@applevalley.org	
Pam Cupp	pcupp@applevalley.org	
Ralph Wright	rwright@applevalley.org	
AV Fire Protection District		
Sid Hultquist	shultquist@applevalleyfd.com	
Rich Unferdorfer	runferdorfer@applevalleyfd.com	
Town Public Works		
Greg Snyder	gsnyder@applevalley.org	
Mike Cady	mcady@applevalley.org	
Town PIO		
Kathy Martin	kmartin@applevalley.org	
Office of Emergency Preparedness		
Joseph Ramos	jramos@applevalley.org	
Dawn Harrison	dharrison@applevalley.org	

6/15/2017

Town of Apple Valley
2016-17
Hazard Mitigation Plan Update Process

HMP Meeting #3
February 21, 2017

1

Town of Apple Valley Hazard MitigationAgenda:

1. Review- HMP Citizen Survey Results
2. Hazard Summary Worksheet
3. Risk Factor Worksheet
4. Agree on hazards to identify
5. Discuss next steps
6. Next meeting in March- this timeframe work?

2

6/15/2017

Town of Apple Valley
Local Hazard Mitigation Plan Survey

Thursday, February 16, 2017

Powered by SurveyMonkey

123

Total Responses

Date Created: Thursday, September 29, 2016

Complete Responses: 123

6/15/2017

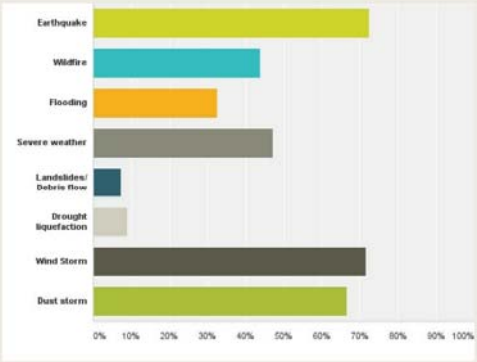
Q1: Do you.. (Check all that apply).

Answered: 123 Skipped: 0

Answer Choices	Responses	
Live in the Town of Apple Valley	84.55%	104
Work in the Town of Apple Valley	58.54%	72
Visit the Town of Apple Valley, but live and work elsewhere	1.63%	2
Total Respondents: 123		

***Q2: Which of the following types of natural disasters have you or someone in your household experienced in the past 15 years within the Town of Apple Valley? (Check all that apply)

Answered: 123 Skipped: 0



6/15/2017

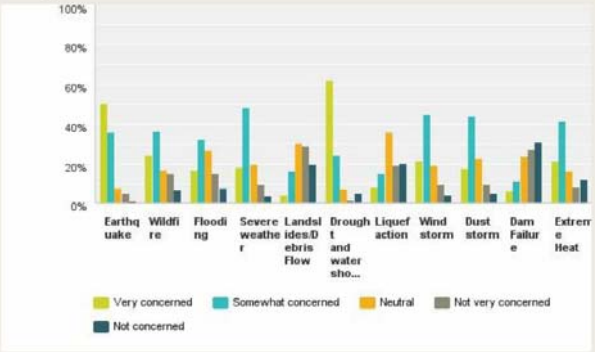
*****Q2: Which of the following types of natural disasters have you or someone in your household experienced in the past 15 years within the Town of Apple Valley? (Check all that apply)**

Answered: 123 Skipped: 0

Answer Choices	Responses	
Earthquake	72.36%	89
Wildfire	43.90%	54
Flooding	32.52%	40
Severe weather	47.15%	58
Landslides/ Debris flow	7.32%	9
Drought liquefaction	8.94%	11
Wind Storm	71.54%	88
Dust storm	66.67%	82
Total Respondents: 123		

*****Q3: How concerned are you about the following natural hazards affecting your home and/or business in Apple Valley? Please check ONE response for each hazard.**

Answered: 123 Skipped: 0



6/15/2017

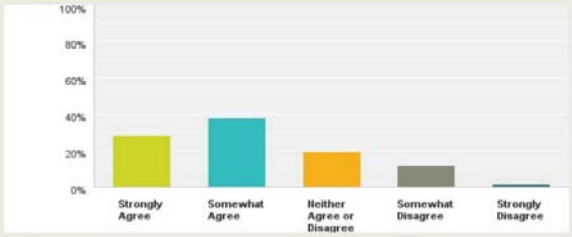
*****Q3: How concerned are you about the following natural hazards affecting your home and/or business in Apple Valley? Please check ONE response for each hazard.**

Answered: 123 Skipped: 0

	Very concerned	Somewhat concerned	Neutral	Not very concerned	Not concerned	Total	Weighted Average
Earthquake	50.41% 62	35.77% 44	8.13% 10	4.88% 6	0.81% 1	123	1.70
Wildfire	24.39% 30	36.59% 45	17.07% 21	15.45% 19	6.50% 8	123	2.43
Flooding	17.07% 21	32.52% 40	26.83% 33	15.45% 19	8.13% 10	123	2.65
Severe weather	18.33% 22	48.33% 58	20.00% 24	10.00% 12	3.33% 4	120	2.32
Landslides/Debris Flow	4.13% 5	16.53% 20	30.58% 37	28.93% 35	19.83% 24	121	3.44
Drought and water shortage	61.79% 76	24.39% 30	7.32% 9	1.63% 2	4.88% 6	123	1.63
Liquefaction	8.55% 10	15.38% 18	35.90% 42	19.66% 23	20.51% 24	117	3.28
Wind storm	21.31% 26	45.08% 55	19.67% 24	9.84% 12	4.10% 5	122	2.30
Dust storm	18.18% 22	43.80% 53	23.14% 28	9.92% 12	4.96% 6	121	2.40
Dam Failure	5.83% 7	11.67% 14	24.17% 29	27.50% 33	30.83% 37	120	3.66
Extreme Heat	21.49% 26	41.32% 50	16.53% 20	8.26% 10	12.40% 15	121	2.49

Q4: Information about the risks from natural hazards is readily available and easy to locate.

Answered: 123 Skipped: 0

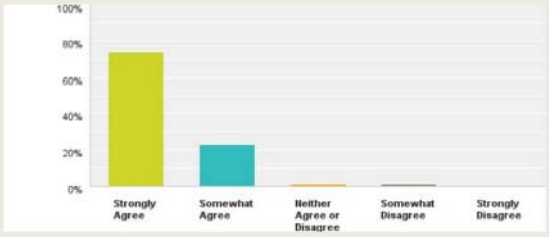


Answer Choices	Responses	
Strongly Agree	28.46%	35
Somewhat Agree	38.21%	47
Neither Agree or Disagree	19.51%	24
Somewhat Disagree	12.20%	15
Strongly Disagree	1.63%	2
Total		123

6/15/2017

Q5: It is my responsibility to educate myself and take actions that will reduce my exposure to the risks from natural hazards.

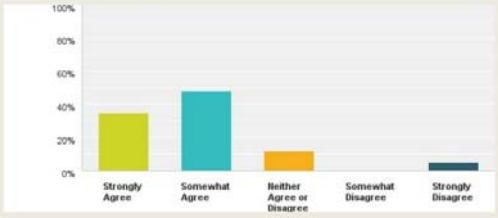
Answered: 123 Skipped: 0



Answer Choices	Responses	
Strongly Agree	73.98%	91
Somewhat Agree	22.76%	28
Neither Agree or Disagree	1.63%	2
Somewhat Disagree	1.63%	2
Strongly Disagree	0.00%	0
Total		123

Q6: 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: 123 Skipped: 0

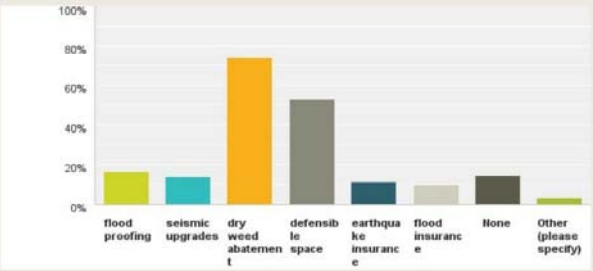


Answer Choices	Responses	
Strongly Agree	34.96%	43
Somewhat Agree	47.97%	59
Neither Agree or Disagree	12.20%	15
Somewhat Disagree	0.00%	0
Strongly Disagree	4.88%	6
Total		123

6/15/2017

Q7: What mitigation measures or strategies have been completed in the last 5 years to protect your home or business from a natural hazard? Check all that apply

Answered: 123 Skipped: 0



Q7: What mitigation measures or strategies have been completed in the last 5 years to protect your home or business from a natural hazard? Check all that apply

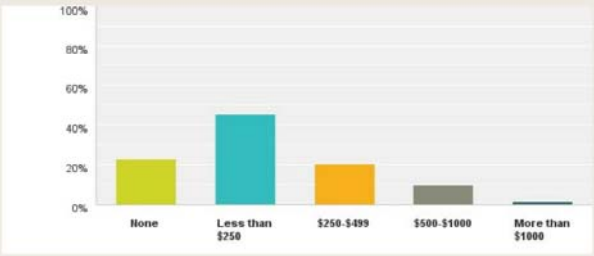
Answered: 123 Skipped: 0

Answer Choices	Responses	
flood proofing	16.26%	20
seismic upgrades	13.82%	17
dry weed abatement	73.98%	91
defensible space	52.85%	65
earthquake insurance	11.38%	14
flood insurance	9.76%	12
None	14.63%	18
Other (please specify)	3.25%	4
Total Respondents: 123		

6/15/2017

Q8: How much money do you spend annually on mitigation measures to protect your home or business from natural hazards?

Answered: 123 Skipped: 0



Q8: How much money do you spend annually on mitigation measures to protect your home or business from natural hazards?

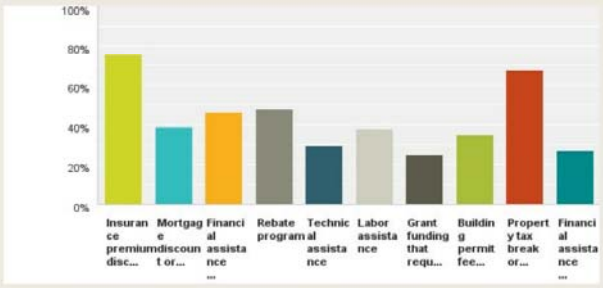
Answered: 123 Skipped: 0

Answer Choices	Responses	
None	22.76%	28
Less than $250	45.53%	56
$250-$499	20.33%	25
$500-$1000	9.76%	12
More than $1000	1.63%	2
Total		123

6/15/2017

Q9: Which of the following incentives would encourage you to protect your home against natural hazards? (Check all that apply)

Answered: 123 Skipped: 0



Q9: Which of the following incentives would encourage you to protect your home against natural hazards? (Check all that apply)

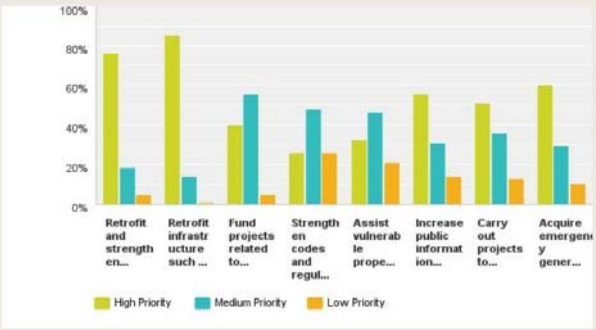
Answered: 123 Skipped: 0

Answer Choices	Responses	
Insurance premium discount	75.61%	93
Mortgage discount or low interest loan	39.02%	48
Financial assistance for property upgrades or equipment	46.34%	57
Rebate program	47.97%	59
Technical assistance	29.27%	36
Labor assistance	38.21%	47
Grant funding that requires cost share from property owner	25.20%	31
Building permit fee reduction or waiver	34.96%	43
Property tax break or incentive	67.48%	83
Financial assistance for equipment	26.83%	33
Total Respondents: 123		

6/15/2017

Q10: What protection methods do you believe the Town, County, State or Federal agencies should be using in order to reduce damage and disruption from hazard events within the Town of Apple Valley?

Answered: 123 Skipped: 0



Q10: What protection methods do you believe the Town, County, State or Federal agencies should be using in order to reduce damage and disruption from hazard events within the Town of Apple Valley?

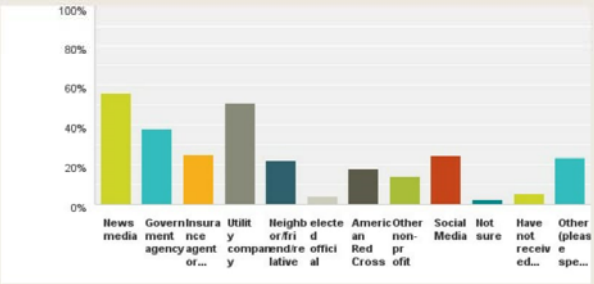
Answered: 123 Skipped: 0

	High Priority	Medium Priority	Low Priority	Total
Retrofit and strengthen essential facilities such as police, fire, schools and hospitals	76.42% 94	18.70% 23	4.88% 6	123
Retrofit infrastructure such as roads, bridges, drainage facilities, water supply, and waster water.	85.37% 105	13.82% 17	0.81% 1	123
Fund projects related to drainage control measures and improvements.	39.84% 49	55.28% 68	4.88% 6	123
Strengthen codes and regulations to include higher standards in hazard areas.	26.02% 32	47.97% 59	26.02% 32	123
Assist vulnerable property owners with securing funding for mitigation/property protection.	32.52% 40	46.34% 57	21.14% 26	123
Increase public information about risks and the exposure to hazards within the Town of Apple Valley.	55.28% 68	30.89% 38	13.82% 17	123
Carry out projects to restore the natural environment's capacity to absorb the impacts from natural hazards.	51.22% 63	35.77% 44	13.01% 16	123
Acquire emergency generators for essential government facilities and buildings identified as care and shelter.	60.16% 74	29.27% 36	10.57% 13	123

6/15/2017

Q11: Thinking back in the last three years, from whom have you received information about how to make members of your household and your home safer from natural disasters? Check all that apply.

Answered: 123 Skipped: 0



Q11: Thinking back in the last three years, from whom have you received information about how to make members of your household and your home safer from natural disasters? Check all that apply.

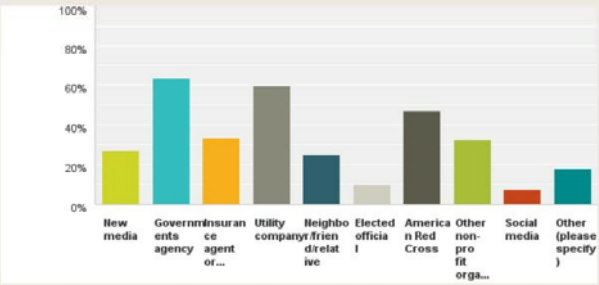
Answered: 123 Skipped: 0

Answer Choices	Responses	
News media	56.10%	69
Government agency	38.21%	47
Insurance agent or company	25.20%	31
Utility company	51.22%	63
Neighbor/friend/relative	21.95%	27
elected official	4.07%	5
American Red Cross	17.89%	22
Other non-profit	13.82%	17
Social Media	24.39%	30
Not sure	2.44%	3
Have not received information	5.69%	7
Other (please specify)	23.58%	29
Total Respondents: 123		

6/15/2017

*****Q12: Whom would you most trust to provide you with information about how to make your household and home safer from natural disasters? Choose at least 3 responses.**

Answered: 123 Skipped: 0



*****Q12: Whom would you most trust to provide you with information about how to make your household and home safer from natural disasters? Choose at least 3 responses.**

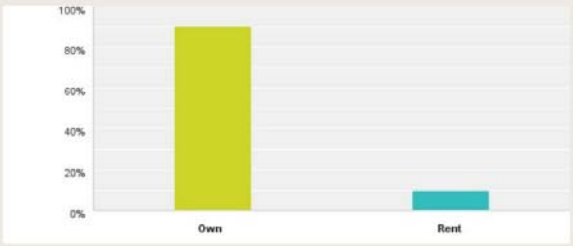
Answered: 123 Skipped: 0

Answer Choices	Responses	
New media	26.83%	33
Governments agency	63.41%	78
Insurance agent or company	33.33%	41
Utility company	59.35%	73
Neighbor/friend/relative	25.20%	31
Elected official	9.76%	12
American Red Cross	47.15%	58
Other non-profit organization	32.52%	40
Social media	7.32%	9
Other (please specify)	17.89%	22
Total Respondents: 123		

6/15/2017

Q13: Do you rent or own your home or business?

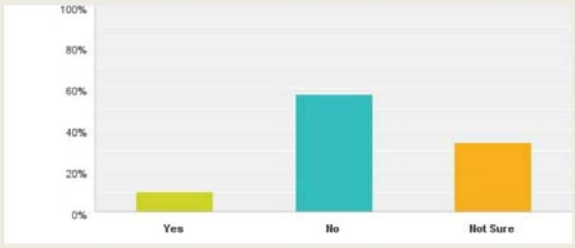
Answered: 123 Skipped: 0



Answer Choices	Responses	
Own	90.24%	111
Rent	9.76%	12
Total		123

Q14: Is your home or business in or near a FEMA designated floodplain?

Answered: 123 Skipped: 0

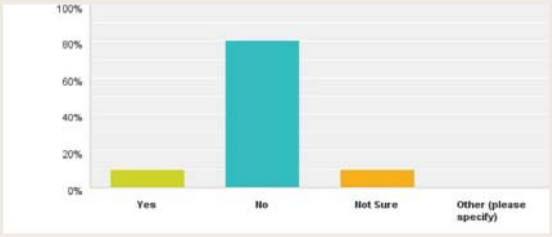


Answer Choices	Responses	
Yes	9.76%	12
No	56.91%	70
Not Sure	33.33%	41
Total		123

6/15/2017

Q15: Do you have flood insurance?

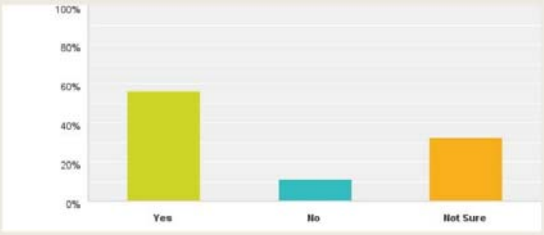
Answered: 123 Skipped: 0



Answer Choices	Responses	
Yes	9.76%	12
No	80.49%	99
Not Sure	9.76%	12
Other (please specify)	0.00%	0
Total		123

Q16: Is your home or business located near an earthquake fault?

Answered: 123 Skipped: 0

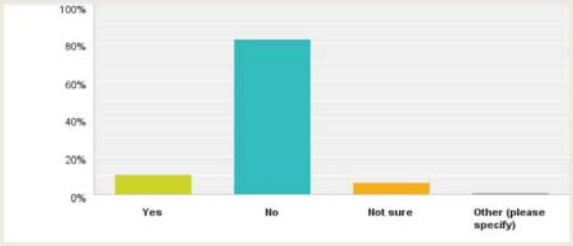


Answer Choices	Responses	
Yes	56.10%	69
No	11.38%	14
Not Sure	32.52%	40
Total		123

6/15/2017

Q17: Do you have earthquake insurance?

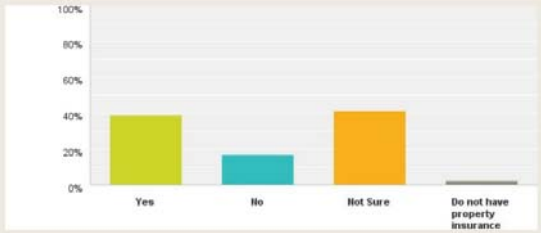
Answered: 123 Skipped: 0



Answer Choices	Responses	
Yes	10.57%	13
No	82.11%	101
Not sure	6.50%	8
Other (please specify)	0.81%	1
Total		123

Q18: To the best of your knowledge, does your homeowner's, renter's, or general insurance policy provide coverage for damage from natural hazards?

Answered: 123 Skipped: 0

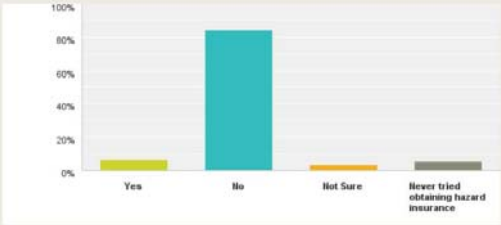


Answer Choices	Responses	
Yes	39.02%	48
No	17.07%	21
Not Sure	41.46%	51
Do not have property insurance	2.44%	3
Total		123

6/15/2017

Q19: Have you ever had problems obtaining homeowner's or renter's insurance due to risks from natural hazards?

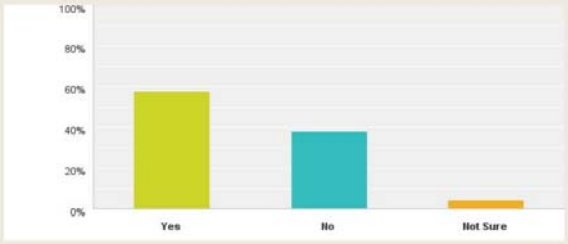
Answered: 123 Skipped: 0



Answer Choices	Responses	
Yes	6.50%	8
No	84.55%	104
Not Sure	3.25%	4
Never tried obtaining hazard insurance	5.69%	7
Total		123

***Q20: When you moved into your home, did you consider the impact a natural hazard event could have on your home?

Answered: 123 Skipped: 0

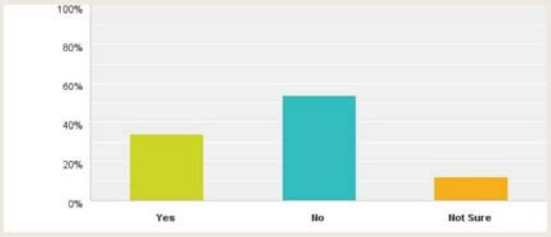


Answer Choices	Responses	
Yes	57.72%	71
No	38.21%	47
Not Sure	4.07%	5
Total		123

6/15/2017

Q21: 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?

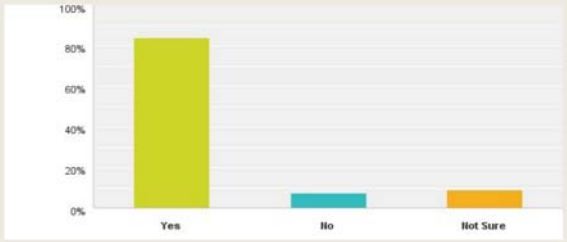
Answered: 123 Skipped: 0



Answer Choices	Responses	
Yes	34.15%	42
No	53.66%	66
Not Sure	12.20%	15
Total		123

Q22: Would natural hazard real estate disclosures or risk information influence your decision on where to buy or rent a home?

Answered: 123 Skipped: 0



Answer Choices	Responses	
Yes	83.74%	103
No	7.32%	9
Not Sure	8.94%	11
Total		123

6/15/2017

LHMP Hazard Summary Worksheet

Planning Team Meeting- Feb. 21, 2017

Use this worksheet to summarize hazard description information and identify which hazards are most significant to the planning area. The definitions provided on the following page can be modified to meet local needs and methods.

Hazard	Location (Geographic Area Affected)	Maximum Probable Extent (Magnitude/Strength)	Probability of Future Events	Overall Significance Ranking
Climate Change				
Dam Failure				
Drought				
Earthquake				
Erosion				
Expansive Soils				
Extreme Cold				
Extreme Heat				
Flood				
Landslide				
Lightning				
Severe Wind				
Severe Winter Weather				
Subsidence				
Terrorism				
Wildfire				

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Definitions for Classifications

Location (Geographic Area Affected)

- **Negligible:** Less than 10 percent of planning area or isolated single-point occurrences
- **Limited:** 10 to 25 percent of the planning area or limited single-point occurrences
- **Significant:** 25 to 75 percent of planning area or frequent single-point occurrences
- **Extensive:** 75 to 100 percent of planning area or consistent single-point occurrences

Maximum Probable Extent (Magnitude/Strength based on historic events or future probability)

- **Weak:** Limited classification on scientific scale, slow speed of onset or short duration of event, resulting in little to no damage
- **Moderate:** Moderate classification on scientific scale, moderate speed of onset or moderate duration of event resulting in some damage and loss of services for days
- **Severe:** Severe classification on scientific scale, fast speed of onset or long duration of event, resulting in devastating damage and loss of services for weeks or months
- **Extreme:** Extreme classification on scientific scale, immediate onset or extended duration of event, resulting in catastrophic damage and uninhabitable conditions

Hazard	Scale / Index	Weak	Moderate	Severe	Extreme
Drought	Palmer Drought Severity Index	-1.99 to +1.99	-2.00 to -2.99	-3.00 to -3.99	4.00 & below
Earthquake	Modified Mercalli Scale	I to IV	V to VII	VII	IX to XII
	Richter Magnitude	2, 3	4, 5	6	7, 8

Probability of Future Events

- **Unlikely:** Less than 1 percent probability of occurrence in the next year or a recurrence interval of greater than every 100 years.
- **Occasional:** 1 to 10 percent probability of occurrence in the next year or a recurrence interval of 11 to 100 years.
- **Likely:** 10 to 90 percent probability of occurrence in the next year or a recurrence interval of 1 to 10 years
- Highly Likely: 90 to 100 percent probability of occurrence in the next year or a recurrence interval of less than 1 year.

Overall Significance

- **Low:** Two or more criteria fall in lower classifications or the event has a minimal impact on the planning area. This rating is sometimes used for hazards with a minimal or unknown record of occurrences or for hazards with minimal mitigation potential.
- **Medium:** The criteria fall mostly in the middle ranges of classifications and the event's impacts on the planning area are noticeable but not devastating. This rating is sometimes used for hazards with a high extent rating but very low probability rating.
- **High:** The criteria consistently fall in the high classifications and the event is likely/highly likely to occur with severe strength over a significant to extensive portion of the planning area.

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6/15/2017

LHMP RISK FACTOR EXCEL WORKSHEET

HAZARD PRIORITIZATION /

MITIGATE HAZARDS

Rank	Natural Hazards	Probability (1-4)	Factor1 = (Probability Index * .30)	Impact (1-4)	Factor2 = (Impact Index * .30)	Spatial Extent (1-4)	Factor3 = (Spatial Extent Index * .20)	Warning Time (1-4)	Factor4 = (Warning Time Index * .10)	Duration (1-4)	Factor5 = (Probability Index * .10)	RF Factor Total = (Add Factors 1-5)
1	Hazard 1		0		0		0		0		0	0
2	Hazard 2		0		0		0		0		0	0
3	Hazard 3		0		0		0		0		0	0
4	Hazard 4		0		0		0		0		0	0
5	Hazard 5		0		0		0		0		0	0
6	Hazard 6		0		0		0		0		0	0

The RF approach combines historical data, local knowledge, and consensus opinions to produce numerical values that allow identified hazards to be ranked against one another. These criteria were used to evaluate hazards and identify the highest risk hazard in the Lawndale region.
The RF approach produces numerical values that allow identified hazards to be ranked against one another (the higher the RF value, the greater the hazard risk). RF values are obtained by assigning varying degrees of risk to five categories for each hazard: probability, impact, spatial extent, warning time, and duration. Each degree of risk is assigned a value ranging from 1 to 4 and a weighing factor for each category was agreed upon by the MPC.

Calculated Field

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Risk Factor (RF) Approach

MITIGATE HAZARDS

For use in multi-hazard mitigation planning hazard prioritization exercises.

The RF approach combines historical data, local knowledge, and consensus opinions to produce numerical values that allow identified hazards to be ranked against one another. These criteria were used to evaluate hazards and identify the highest risk hazard in the project region.

The RF approach produces numerical values that allow identified hazards to be ranked against one another (the higher the RF value, the greater the hazard risk). RF values are obtained by assigning varying degrees of risk to five categories for each hazard: *probability, impact, spatial extent, warning time,* and *duration*. Each degree of risk is assigned a value ranging from 1 to 4 and a weighing factor for each category should be agreed upon by the planning committee. Based upon any unique concerns for the planning area, the planning committee may also adjust the RF weighting scheme. To calculate the RF value for a given hazard, the assigned risk value for each category is multiplied by the weighting factor. The sum of all five categories equals the final RF value, as demonstrated in the example equation below:

RF Value = [(Probability x .30) + (Impact x .30) + (Spatial Extent x .20) + (Warning Time x .10) + (Duration x .10)]

According to the default weighting scheme applied, the highest possible RF value is 4.0.

Please see the Risk Factor Criteria table on the following page for information on the risk factor weighting index and other definitions.

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6/15/2017

Risk Factor Index Criteria Table

Risk Assessment Category	Level	Degree of Risk Criteria	Index	Weight Value
PROBABILITY What is the likelihood of a hazard event occurring in a given year?	UNLIKELY	LESS THAN 1% ANNUAL PROBABILITY	1	30%
	POSSIBLE	BETWEEN 1 & 10% ANNUAL PROBABILITY	2	
	LIKELY	BETWEEN 10 &100% ANNUAL PROBABILITY	3	
	HIGHLY LIKELY	100% ANNUAL PROBABILITY	4	
IMPACT In terms of injuries, damage, or death, would you anticipate impacts to be minor, limited, critical, or catastrophic when a significant hazard event occurs?	MINOR	VERY FEW INJURIES, IF ANY. ONLY MINOR PROPERTY DAMAGE & MINIMAL DISRUPTION ON QUALITY OF LIFE. TEMPORARY SHUTDOWN OF CRITICAL FACILITIES.	1	30%
	LIMITED	MINOR INJURIES ONLY. MORE THAN 10% OF PROPERTY IN AFFECTED AREA DAMAGED OR DESTROYED. COMPLETE SHUTDOWN OF CRITICAL FACILITIES FOR MORE THAN ONE DAY.	2	
	CRITICAL	MULTIPLE DEATHS/INJURIES POSSIBLE. MORE THAN 25% OF PROPERTY IN AFFECTED AREA DAMAGED OR DESTROYED. COMPLETE SHUTDOWN OF CRITICAL FACILITIES FOR MORE THAN ONE WEEK.	3	
	CATASTROPHIC	HIGH NUMBER OF DEATHS/INJURIES POSSIBLE. MORE THAN 50% OF PROPERTY IN AFFECTED AREA DAMAGED OR DESTROYED. COMPLETE SHUTDOWN OF CRITICAL FACILITIES FOR 30 DAYS OR MORE.	4	
SPATIAL EXTENT How large of an area could be impacted by a hazard event? Are impacts localized or regional?	NEGLIGIBLE	LESS THAN 1% OF AREA AFFECTED	1	20%
	SMALL	BETWEEN 1 & 10% OF AREA AFFECTED	2	
	MODERATE	BETWEEN 10 & 50% OF AREA AFFECTED	3	
	LARGE	BETWEEN 50 & 100% OF AREA AFFECTED	4	
WARNING TIME Is there usually some lead time associated with the hazard event? Have warning measures been implemented?	MORE THAN 24 HRS	SELF DEFINED	1	10%
	12 TO 24 HRS	SELF DEFINED	2	
	6 TO 12 HRS	SELF DEFINED	3	
	LESS THAN 6 HRS	SELF DEFINED	4	
DURATION How long does the hazard event usually last?	LESS THAN 6 HRS	SELF DEFINED	1	10%
	LESS THAN 24 HRS	SELF DEFINED	2	
	LESS THAN 1 WEEK	SELF DEFINED	3	
	MORE THAN 1 WEEK	SELF DEFINED	4	

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Due to the inherent errors possible in any disaster, the results of the risk factor analysis should only be used for planning purposes and in developing hazard priorities and concentrating jurisdictional resources. Before assigning risk factors and prioritization to hazards it is recommended to complete a draft of the hazard profiles and risk assessment information to aid in determining potential impacts. Before the hazard prioritization process you may want to consider the following risk assessment criteria:

- ✓ Inventory and summarize vulnerable assets
- ✓ Characterize repetitive flood loss properties
- ✓ Estimated harm to residents and estimated damages to buildings
- ✓ Describe vulnerability to future development

[Example Risk Factor Results from Plumas County Hazard Mitigation Project]

PLUMAS COUNTY HAZARD MITIGATION PLAN

Department of Health / Office of Emergency Services

Risk Factor Worksheet

Ranking	Natural Hazards	Probability	Calc.1	Impact	Calc.2	Spatial Extent	Calc.3	Warning Time	Calc.4	Duration	Calc.5	RF Factor
1	Wildfire	4	1.2	3	0.9	4	0.8	3	0.3	4	0.4	3.6
2	Severe Weather	4	1.2	3	0.9	4	0.8	1	0.1	3	0.2	2.9
3	Geologic Hazards	4	1.2	2	0.6	3	0.2	4	0.4	2	0.2	2.6
4	Flooding	3	0.9	3	0.9	2	0.4	3	0.3	4	0.4	2.4
5	Drought	2	0.6	3	0.9	3	0.6	3	0.3	3	0.3	2
6	Climate Change	2	0.6	3	0.9	4	0.8	1	0.1	3	0.3	1.9
7	Dam Failure	1	0.3	3	0.9	3	0.6	2	0.2	3	0.3	1.4

Risk Factor Description	
HIGH RISK (3.0 – 4.0)	Wildfire
MODERATE RISK (1.0 – 2.9)	Severe Weather, Geologic Hazards, Flooding
LOW RISK (0.1 – 1.0)	Drought, Climate Change, Dam Failure

The conclusions from the example risk factor results above, were translated into three categories for a final summary of hazard risk based on *High*, *Moderate*, or *Low* risk designations. The designations values are arbitrary and can be adjusted as deemed necessary. It should be noted that although some hazards are classified as posing Low risk, their occurrence of varying or unprecedented magnitudes is still possible and will continue to be reevaluated during future updates of this plan.

Use the Risk Factor Excel Worksheet to determine RF values for each hazard. The Excel worksheet is available for download under Phase 2, Planning Process Worksheets:

http://mitigatehazards.com/bds/sb-docs

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6/15/2017

LHMP RISK FACTOR EXCEL WORKSHEET

HAZARD PRIORITIZATION /

MITIGATE HAZARDS

Rank	Natural Hazards	Probability (1-4)	Factor1 = (Probability Index * .30)	Impact (1-4)	Factor2 = (Impact Index * .30)	Spatial Extent (1-4)	Factor3 = (Spatial Extent Index * .20)	Warning Time (1-4)	Factor4 = (Warning Time Index * .10)	Duration (1-4)	Factor5 = (Probability Index * .10)	RF Factor Total = (Add Factors 1-5)
1	Hazard 1		0		0		0		0		0	0
2	Hazard 2		0		0		0		0		0	0
3	Hazard 3		0		0		0		0		0	0
4	Hazard 4		0		0		0		0		0	0
5	Hazard 5		0		0		0		0		0	0
6	Hazard 6		0		0		0		0		0	0

The RF approach combines historical data, local knowledge, and consensus opinions to produce numerical values that allow identified hazards to be ranked against one another. These criteria were used to evaluate hazards and identify the highest risk hazard in the Lawndale region.
The RF approach produces numerical values that allow identified hazards to be ranked against one another (the higher the RF value, the greater the hazard risk). RF values are obtained by assigning varying degrees of risk to five categories for each hazard: probability, impact, spatial extent, warning time, and duration. Each degree of risk is assigned a value ranging from 1 to 4 and a weighing factor for each category was agreed upon by the MPC.

Calculated Field

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- Discussion on identified hazards
- Due to limited resources will only focus on High Risk Identified Hazards
- Next meeting will discuss vulnerability assessment as it relates to these hazards. Will also begin the discussion on mitigation strategies for the identified hazards

HMP Meeting - Tuesday February 21, 2017

Planning Committee Dept. / Members	E-Mail	Initial
Town Engineering/Building & Safety Department		
Brad Miller	bmiller@applevalley.org	
Patrick Carroll	pcarroll@applevalley.org	
Brett Morgan	bmorgan@applevalley.org	
Town Community Development		
Lori Lamson	llamson@applevalley.org	
Pam Cupp	pcupp@applevalley.org	
Ralph Wright	rwright@applevalley.org	
AV Fire Protection District		
Sid Hultquist	shultquist@applevalleyfd.com	SH
Rich Unferdorfer	runferdorfer@applevalleyfd.com	
Town Public Works		
Greg Snyder	gsnyder@applevalley.org	
Mike Cady	mcady@applevalley.org	
Town PIO		
Kathy Martin	kmartin@applevalley.org	
Office of Emergency Preparedness		
Joseph Ramos	jramos@applevalley.org	
Dawn Harrison	dharrison@applevalley.org	
Carol Miller	cmiller@applevalley.org	CM

Planning Committee / Stakeholder Members	Name	E-Mail
County		
Regional Utilities		
Partner Agencies		
City of Hesperia	April Antunio	aantonio@cityofhesperia.us
Cal OES (Hazard Mitigation Pre-Disaster & Flood Mitigation)		

Town of Apple Valley

Town of Apple Valley
HMP Meeting #4

April 28, 2017

Agenda:

1. Review Section 6 Mitigation Goals, Objectives, Actions
2. Review Cost/Benefit
3. Discuss Cost/Benefit for each action
4. Rate each Cost/Benefit for each action
5. Discuss priority for each action
6. Rate priority for each action
7. Discuss crosswalk

HMP Meeting - April 28, 2017

Planning Committee Dept. / Members	E-Mail	Initial
Town Engineering/Building & Safety Department		
Brad Miller	bmiller@applevalley.org	
Patrick Carroll	pcarroll@applevalley.org	
Brett Morgan	bmorgan@applevalley.org	
Town Community Development		
Lori Lamson	llamson@applevalley.org	
Carol Miller	cmiller@applevalley.org	
Pam Cupp	pcupp@applevalley.org	
Ralph Wright	rwright@applevalley.org	
AV Fire Protection District		
Sid Hultquist	shultquist@applevalleyfd.com	
Rich Unferdorfer	runferdorfer@applevalleyfd.com	
Town Public Works		
Greg Snyder	gsnyder@applevalley.org	
Mike Cady	mcady@applevalley.org	
Town PIO		
Kathie Martin	kmartin@applevalley.org	
Office of Emergency Preparedness		
Joseph Ramos	jramos@applevalley.org	
Dawn Harrison	dharrison@applevalley.org	

B.4 Other Meeting Agendas (CERT, Disaster Council, Town Council)

CERT COMMUNITY EMERGENCY RESPONSE TEAM

CERT MEETING

AGENDA

August 4, 2016

Thursday

6:00-8:00pm

LOCATION:

FIRE STATION 336

19235 Yucca Loma Rd.

Welcome & Announcements

Pledge
Introductions
Guest Speaker

Announcements:
Shirts/Hats –C-ME – Order directly with ID Card – C-ME – 760-241-3577
Names on Vests - $5

Disaster Volunteer Network – Please complete information form
Remind – To receive CERT text messages (Emergencies)
Update from ECS – Mark Yosten
Update from FF Rehab – Kathy Love
Update from Sandbag – Cathy Westmoreland
Hazard Mitigation Plan – What is it?
Station Leaders – Need Leader & Asst. for 335, Asst. for 334, Leader for 336
Please let me know if you are interested or have questions. Thank you.

Useful Links

www.Readyapplevalley.org
www.applevalleyfd.com
www.FEMA.gov
www.ready.gov

Upcoming Event

August 6, 27 and Sept 3 – CERT Class – Help with assisting/refreshments
September 8- 10 - 30 year National CERT Conference, Universal Studios
September 24 – Terrorism Training – Ontario - Eventbrite
September 24 – Command Bus - Reverse Triathlon
October 1 – Annual DSW Drill – VVC Regional Training Facility
October 6 – Meeting/Training – Volunteer Reception Center/Shake Out
Oct 7-8-9 – SAR City – Barstow
October 15 – Health Fair – St 337 – Help needed
October 20 – Great Shake Out – Drill at Town Hall – Sign Up

Today's Training

GET READY FOR ANNUAL DRILL
DO YOU REMEMBER THE BASICS FROM YOUR CERT CLASS?
DAWN HARRISON

CERT MEETING

AGENDA

October 6, 2016

Thursday

6:00-8:00pm

LOCATION:

FIRE STATION 336

19235 Yucca Loma Rd.

Welcome & Announcements

Pledge
Oath/Introductions – New DSW Members

Announcements:

- Shirts/Hats –C-ME – Order directly with ID Card – C-ME – 760-241-3577
- Names on Vests - $5
- Disaster Volunteer Network – Please complete information form
- Remind – To receive CERT text messages (Emergencies)
- Update from ECS – Mark Yosten
- Update from FF Rehab – Kathy Love
- Update from Asst. CERT Commanders- Bonnie Ebright/Cathy Westmoreland
- Hazard Mitigation Plan – Link for Survey will be shared
- Suggestions for 2017 Trainings

Station Leaders – Need Leader & Asst. for 335, Asst. for 334, Leader for 336 Please let me know if you are interested or have questions. Thank you. We would like to give more responsibility & training to station leaders in 2017.

Useful Links

www.Readyapplevalley.org
www.applevalleyfd.com
www.FEMA.gov
www.ready.gov

Upcoming Event (Final 3 of the year)

October 15 – Health Fair – St 337 – Help needed – Sign Up
October 20 – Great Shake Out – Drill at Town Hall – Sign Up
November 3 – Potluck – End of 2016!

Today's Training

BRIEFING – CERT CONFERENCE
BONNIE & KELLY
BRIEFING – TERRORIST SYMPOSIUM
CATHY & KELLY
SHARE YOUR EXPERIENCE WITH THE BLUE CUT FIRE & ANNUAL DRILL
VOLUNTEER RECEPTION CENTER
DAWN HARRISON
JASON NAILON – GUEST SPEAKER – VOLUNTEERS HELPING WITH MEASURE A

CERT MEETING

AGENDA

February 2, 2017

Thursday

6:00-8:00pm

LOCATION:

FIRE STATION 336

19235 Yucca Loma Rd.

Welcome & Announcements

Pledge
Introductions – New DSW Members

Announcements:

- Shirts/Hats –C-ME – Order directly with ID Card – C-ME – 760-241-3577
- Names on Vests - $5
- Remind – To receive CERT text messages (Emergencies)
- Update from ECS – Mark Yosten
- Update from FF Rehab – Kathy Love
- Update from Asst. CERT Commanders- Bonnie Ebright/Cathy Westmoreland
- Hazard Mitigation Plan – Link for Survey will be shared/Update
- Red Cross Training – Update – Only if you took the training at the Town Jan. 2017 are you registered with the Red Cross, even if you took the 8 hour training previously!
- Apple Valley CERT Coin – Input needed
- Update on opening of fire stations

Station Leaders – Need Leader & Asst. for 335, Asst. for 334, Leader for 336 Please let me know if you are interested or have questions. Thank you. We would like to give more responsibility & training to station leaders in 2017.

Useful Links

www.Readyapplevalley.org
www.applevallevfd.com
www.FEMA.gov
www.ready.gov

Upcoming Events

February 4 – Simulation – Help Needed
March 25 – CPR/First Aid – Sign Up
April 6 – Meeting - ICS/Forms Training
April 7-8-9 CERT Train the Trainer - Hesperia
April 15, 22, and 29 – CERT Class
May 6 – Family Safety/Emergency Prep Fair – Town Hall

Today's Training

CUSTOMER SERVICE FOR CERT
CAPT. UNFERDORFER

CERT MEETING

AGENDA

April 6, 2017

Thursday

6:00-8:00pm

LOCATION:

FIRE STATION 336

19235 Yucca Loma Rd.

Welcome & Announcements

Pledge
Oath of Office
Introductions – New DSW Members

Announcements:
- Shirts/Hats –C-ME – Order directly with ID Card – C-ME – 760-241-3577
- Names on Vests - $5
- Remind – To receive CERT text messages (Emergencies)
- Update from ECS – Mark Yosten
- Update from FF Rehab – Kathy Love
- Update from Asst. CERT Commanders- Bonnie Ebright/Cathy Westmoreland
- Hazard Mitigation Plan – Update

Useful Links

www.Readyapplevalley.org
www.applevalleyfd.com
www.FEMA.gov
www.ready.gov

Upcoming Events

April 7-8-9 CERT Train the Trainer – Rancho Cucamonga
April 11 – Disaster Council – 1:30pm – 14975 Dale Evans Pkwy
April 15, 22, and 29 – CERT Class (Help Needed)
May 6 – ECS Meeting
May 6 – Family Preparedness Fair – 10am-1pm Town Hall
(Help Needed – Sign Up)
June 1 – Meeting/Training – START Triage/Treatment
Review/Games

Today's Training

Fire Season/Grass Fires – Capt. Unferdorfer

ICS SYSTEM
WHO'S IN CHARGE & WHAT DO I DO?
DAWN HARRISON

CERT MEETING

AGENDA

June 1, 2017

Thursday

6:00-8:00pm

LOCATION:

FIRE STATION 336

19235 Yucca Loma Rd.

Welcome & Announcements

Pledge

Introductions – New DSW Members

Announcements:

- Shirts/Hats –C-ME – Order directly with ID Card – C-ME – 760-241-3577
- Names on Vests - $5
- Remind – To receive CERT text messages (Emergencies)

**Thank you to everyone for helping with Family Preparedness Fair!
**Thank you to ECS for participating in Opening of Yucca Loma Bridge!

- Update from ECS – Mark Yosten
- Update from FF Rehab – Kathy Love
- Update from Asst. CERT Commanders- Bonnie Ebright/Cathy Westmoreland
- Hazard Mitigation Plan – Update

Useful Links

****NEW – Twitter Account – Twitter.com/ReadyAV**

www.Readyapplevalley.org
www.applevalleyfd.com
www.FEMA.gov
www.ready.gov

Upcoming Events

August 1 – National Night Out (Super Target, 1700-2000)
May 3 – ECS Meeting
August 3 – Meeting/Training CERT Olympics
Sept 16, 23, 30 – CERT Basic Training

Today's Training – Review

START
Triage/Treatment Review/Games

DAWN HARRISON

Town of Apple Valley

TOWN OF APPLE VALLEY
DISASTER COUNCIL
Citizen Corps Council

Tuesday, October 18, 2016 1:30 p.m.

Conference Center, Development Services Building, Apple Valley Town Hall, 14975 Dale Evans Parkway

AGENDA

1. Call to Order — *Mayor Stanton*
2. Flag Salute — _____
3. Self-Introductions — *Group*
4. Approval of July 12, 2016 minutes — *Mayor Stanton*
5. Approval of CERT/ECS 2017 calendar — *Mayor Stanton*
6. Citizen Corps Activities
   - CERT *(Community Emergency Response Team)* — *CERT : Dawn Harrison*
   - ECS *(Emergency Communications Services)* — *ECS: Rich Unferdorfer*
   - COP's, Neighborhood Watch — *Trish Hill*
7. Update on Emergency Preparedness — *Joseph Ramos*
   - Blue Cut Activation
   - Local Hazard Mitigation Plan
8. **Spotlight Program: Southwest Gas**
   - Gas properties- William Hensley-Intro
9. Roundtable Discussion — *Group*
10. Next Meeting: Tuesday, January 10, 2017, 1:30 p.m. @ Conference Center, Development Services Building, Apple Valley Town Hall, 14975 Dale Evans Parkway
11. Adjournment: _____PM — *Mayor Stanton*

Town of Apple Valley

TOWN OF APPLE VALLEY
DISASTER COUNCIL
Citizen Corps Council

Tuesday, January 10, 2017 1:30 p.m.

Conference Center, Development Services Building, Apple Valley Town Hall, 14975 Dale Evans Parkway

AGENDA

1. Call to Order — *Mayor Nassif*
2. Flag Salute — _____
3. Self-Introductions — *Group*
4. Approval of October 18, 2016 minutes — *Mayor Nassif*
5. Citizen Corps Activities
   - CERT *(Community Emergency Response Team)* — *CERT: Dawn Harrison*
   - ECS *(Emergency Communications Services)* — *ECS: Mark Yosten*
   - COP's, Neighborhood Watch — *Trish Hill*
6. Update on Emergency Preparedness — *Joseph Ramos*
   - Blue Cut Reimbursements
   - Local Hazard Mitigation Plan
7. Update on Measure A — *Chief Hultquist*
8. **Spotlight Program: COAD (Community Organizations Active in Disasters)**
   - Dan Coleman- Co-Chair East End COAD
9. Roundtable Discussion — *Group*
10. Next Meeting: Tuesday, April 11, 2017, 1:30 p.m. @ Conference Center, Development Services Building, Apple Valley Town Hall, 14975 Dale Evans Parkway
11. Adjournment: _____PM — *Mayor Nassif*

TOWN OF APPLE VALLEY
DISASTER COUNCIL
Citizen Corps Council

Tuesday, April 11, 2017 1:30 p.m.

Conference Center, Development Services Building, Apple Valley Town Hall, 14975 Dale Evans Parkway

AGENDA

1. Call to Order — *Mayor Nassif*
2. Flag Salute — _____
3. Self-Introductions — *Group*
4. Approval of January 10, 2017 minutes — *Mayor Nassif*
5. Citizen Corps Activities
   - CERT *(Community Emergency Response Team)* — *CERT: Dawn Harrison*
   - ECS *(Emergency Communications Services)* — *ECS: Mark Yosten*
   - COP's, Neighborhood Watch — *Trish Hill*
6. Update on Emergency Preparedness — *Joseph Ramos*
   - Local Hazard Mitigation Plan
7. **Spotlight Program: Ounce of Prevention**
   - Dr. Gloria Peak- Director of Community Health Services- St. Mary Medical Center Presentation on Preventative Health Services
8. Roundtable Discussion — *Group*
9. Next Meeting: Tuesday, July 11, 2017, 1:30 p.m. @ Conference Center, Development Services Building, Apple Valley Town Hall, 14975 Dale Evans Parkway
10. Adjournment: _____PM — *Mayor Nassif*

Town of Apple Valley

TOWN OF APPLE VALLEY
DISASTER COUNCIL
Citizen Corps Council

Tuesday, July 11, 2017
1:30 p.m.

Conference Center, Development Services Building,
Apple Valley Town Hall, 14975 Dale Evans Parkway

AGENDA

1. Call to Order — *Mayor Nassif*
2. Flag Salute — _____
3. Self-Introductions — *Group*
4. Approval of April 11, 2017 minutes — *Mayor Nassif*
5. Citizen Corps Activities
   - CERT *(Community Emergency Response Team)* — *CERT: Dawn Harrison*
   - ECS *(Emergency Communications Services)* — *ECS: Mark Yosten*
   - COP's, Neighborhood Watch — *Trish Hill*
6. Update on Emergency Preparedness — *Joseph Ramos*
   - Hazard Mitigation Plan Update
7. **Spotlight Program: San Bernardino County 211**
   - Cari Thomas- Inland Empire United Way Regional Director
8. Roundtable Discussion — *Group*
9. Next Meeting: Tuesday, October 17, 2017, 1:30 p.m. @ Conference Center, Development Services Building, Apple Valley Town Hall, 14975 Dale Evans Parkway
10. Adjournment: _____PM — *Mayor Nassif*

TOWN OF APPLE VALLEY
TOWN COUNCIL/SUCCESSOR AGENCY

REGULAR MEETING

MINUTES – March 28, 2017

CALL TO ORDER:

Mayor Nassif called to order the regular session of the Apple Valley Town Council and the Successor Agency at 6:30 p.m.

Roll call was taken with the following members present:

Roll Call
Present: Council Members Cusack; Emick; Stanton; Mayor Pro Tem Bishop; Mayor Nassif
Absent: None.

OPENING CEREMONIES

INVOCATION: Pastor Joseph Valery, Victory in Jesus Bible Faith Center

PLEDGE OF ALLEGIANCE: The Pledge of Allegiance was led by Mayor Pro Tem Bishop

PRESENTATIONS: Deputy Derrick Griego, Apple Valley SHOCK Program

PUBLIC COMMENTS

Matthew Fairchild, Apple Valley commented on providing the San Bernardino County Sheriff's Division with all the resources they need to enforce Town speed limits, as well as provide sidewalks for pedestrian safety.

Laloni Flusher, Apple Valley commented on the continued deterioration of east Stoddard Wells Road and the dangerous conditions that exist.

Brad Miller, Town Engineer commented on the location of the section of Stoddard Wells Road east of Dale Evans Parkway is in the unincorporated area of the Town.

Bryen Wright, Apple Valley commented on the Town's Impartial Analysis and that he believes information has been left out of the document.

Patricia Perry, Apple Valley commented that the troubles she has had with her property have gotten better and wanted to thank the Town for their assistance.

COUNCILMEMBER COMMITTEE/COMMISSION PARTICIPATION

Council Member Emick commented on committee meetings and events that he attended.

Council Member Cusack commented on committee meetings and events that he attended.

1A-1

Council Member Stanton commented on committee meetings and events that she attended.

Mayor Pro Tem Bishop commented on committee meetings and events that he attended.

Mayor Nassif commented on committee meetings and events that he attended.

TOWN COUNCIL ANNOUNCEMENTS

Suggested items for future agenda:

Mayor Pro Tem Bishop asked staff to bring back a report on AB 1194 regarding bond issues and property taxes.

Mayor Nassif asked staff to bring back a report to discuss standards that would help elevate the quality of apartments but make them affordable.

Time, Date & Place for Next Town Council Regular or Special Meeting:
A. Regular Meeting – Tuesday, April 11, 2017 – Council Chamber
Regular Session at 6:30 p.m.

TOWN COUNCIL CONSENT AGENDA

Motion by Council Member Emick, seconded by Mayor Pro Tem Bishop, to approve the Consent Calendar items numbered 1-4.

Vote: Motion carried 5-0-0-0
Yes: Council Members Cusack; Emick; Stanton; Mayor Pro Tem Bishop; Mayor Nassif.
Absent: None.

1. Approval of Minutes of the Town Council
A. Special Meeting – March 7, 2017
B. Special Meeting – March 9, 2017
C. Regular Meeting – March 14, 2017
Recommendation:
Approve the subject minutes as part of the consent agenda.

2. Mojave Riverwalk South – Project No. 2015-08
Recommendation:
That the Town Council:
1. Accept the work completed as part of the Mojave Riverwalk South Project No. 2015-08, for a total contract cost of $947,868.51.
2. contractor.

3. Release of Securities for Tract Map No. 16134
Recommendation:
Find that the construction of various improvements required for Tract 16134 is complete, and approve the fifty-percent (50%) reduction of the performance securities.

1A-2

TOWN COUNCIL MINUTES
REGULAR MEETING OF 03/28/2017

4. Fee Waiver Request for St. Mary's High Desert Fit for Life Challenge 5K/10K Event for the Use of the Civic Center Park/Amphitheater
Recommendation:
For good cause shown and finding a waiver will serve a public purpose, approve the waiver of the Facility Rental Fee of $728.00.

PUBLIC HEARINGS

None.

REPORTS, REQUESTS AND COMMUNICATIONS

None.

TOWN MANAGER'S COMMENTS & LEGISLATIVE UPDATE

Frank Robinson, Town Manager, reported that the State Legislature has come to an agreement about transportation funding and an announcement will be made soon.

Joseph Ramos, Emergency Operations Officer shared information on the Hazard Mitigation Plan and the need for update.

CLOSED SESSION

5. Closed Session

Mayor Nassif stated that if needed, Council Member Cusack will be abstaining from one (1) or more of the Closed Session items as it pertains to Liberty Utilities Company due to a potential conflict of interest, as his company does business with the above company.

Mayor Nassif adjourned to Closed Session at 7:23 p.m. to discuss items 5A-5G

A. Conference with Legal Counsel – Anticipated Litigation – Significant exposure to litigation pursuant to Paragraph (2) of subdivision (d) of Section 54956.9: one or more potential cases.

B. Conference with Legal Counsel – Anticipated Litigation – Initiation of litigation pursuant to Paragraph (4) of subdivision (d) of Section 54956.9: one or more potential cases.

C. Conference with Real Property Negotiators – Pursuant to Government Code Section 54956.8. Property: Apple Valley Ranchos Water Company (now Liberty Utilities (Apple Valley Ranchos Water) Corp.); Authority Negotiator: Town Manager; Negotiating Parties: Liberty Utilities Co., Liberty WWH, Inc., Algonquin Power & Utilities Corp., Park Water Company, Western Water Holdings LLC, Tony Penna, General Manager, Apple Valley Ranchos Water Company; Under Negotiation: Price and Terms of Payment.

1A-3

D. Conference with Legal Counsel – Existing Litigation – Pursuant to Paragraph (1) of subdivision (d) of Government Code Section 54956.9, Case No.: CIVDS1517935 - Apple Valley Ranchos Water Company vs. Town of Apple Valley Et Al.

E. Conference with Legal Counsel – Existing Litigation – Pursuant to Paragraph (1) of subdivision (d) of Government Code Section 54956.9, Case No.: CIVDS1600180 – Town of Apple Valley vs. Apple Valley Ranchos Water Company Et Al.

F. Personnel Matters – Government Code Section 54957/Public Employee Performance Evaluation. Title: Town Manager.

G. Conference with Legal Counsel – Existing Litigation – Pursuant to Paragraph (1) of subdivision (d) of Government Code Section 54956.9, Case No.: CIVDS1601999 – Town of Apple Valley vs. Jess Ranch Development, Et Al.

Upon returning from Closed Session at 8:27p.m., Mayor Nassif stated there was no reportable action taken.

John Brown, Town Attorney requested that a settlement agreement be read into the record, verbatim. The settlement resolved a recent lawsuit against the Town.

Debra Thomas, Deputy Town Clerk read into the record, verbatim, the Settlement Agreement and General Release of Claims in the matter of *Lopez-Burton et al. v. Town of Apple Valley*, Case No. CIVDS1604968.

Discussion ensued describing what this agreement's result ultimately means and described the difference between a Nexus Study and Cost Allocation Study and the ultimate cost to ratepayers.

ADJOURNMENT

Motion by Council Member Emick, seconded by Council Member Cusack, and unanimously carried, to adjourn the meeting of the Apple Valley Town Council at 8:46 p.m.

_____
Scott Nassif, Mayor

_____
Debra Thomas, Deputy Town Clerk

1A-4

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Appendix C

C.1 Survey Media Alert

C.2 Survey Results

C.3 Website/Survey Link

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C.1 Survey Media Alert

Town of Apple Valley
Office of Emergency Preparedness

A Better Way of Life

Media Alert
July 28, 2016
For immediate release

You are invited to make a difference!

Town of Apple Valley has begun the process to prepare the 2016 update to 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 Town of Apple Valley. The Town welcomes you (or other interested parties) to assist the HMP Project Management Team to update our natural hazard mitigation documents for the Town of Apple Valley. This will involve periodic review of documentation and feedback during certain points of the planning process.

To provide solidarity in the planning process, we would like to inform you that our project will be starting soon with a kick-off meeting. You are more than welcome to join this meeting but attendance in this meeting is not a requirement to be involved in the entire process. We anticipate the HMP development process to last about 8 to 12 months.

The kick-off meeting will be on ***Tuesday, August 2, 2016 at 8:30 a.m.*** at the Town Hall Development Services Building meeting room 1 located at 14975 Dale Evans Parkway.

We will have additional discussions of the HMP during all upcoming Disaster Council Meetings and CERT meetings.

For more information about the HMP process and history behind the program visit: www.readyapplevalley.org.

If you have any additional questions, please do not hesitate to contact me by phone or email. Thank you for your time and consideration.

Joseph Ramos
Town of Apple Valley
Emergency Services Officer
jramos@applevalley.org
760-240-7000 ext. 7890

www.AppleValley.org 14955 Dale Evans Parkway • Apple Valley, California 92307 • 760.240.7000

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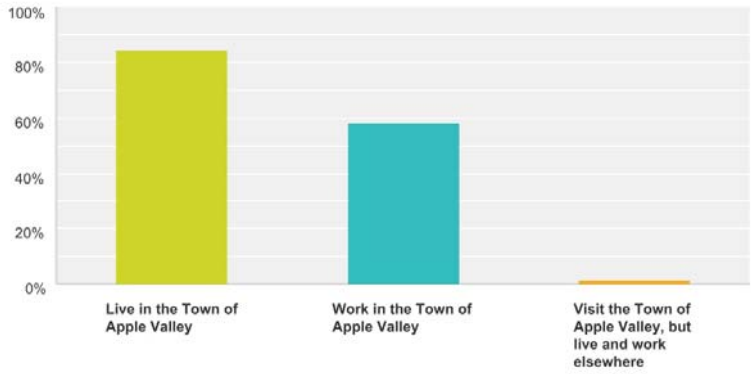
C.2 Survey Results

Town of Apple Valley Local Hazard Mitigation Plan Survey

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

Answered: 123 Skipped: 0

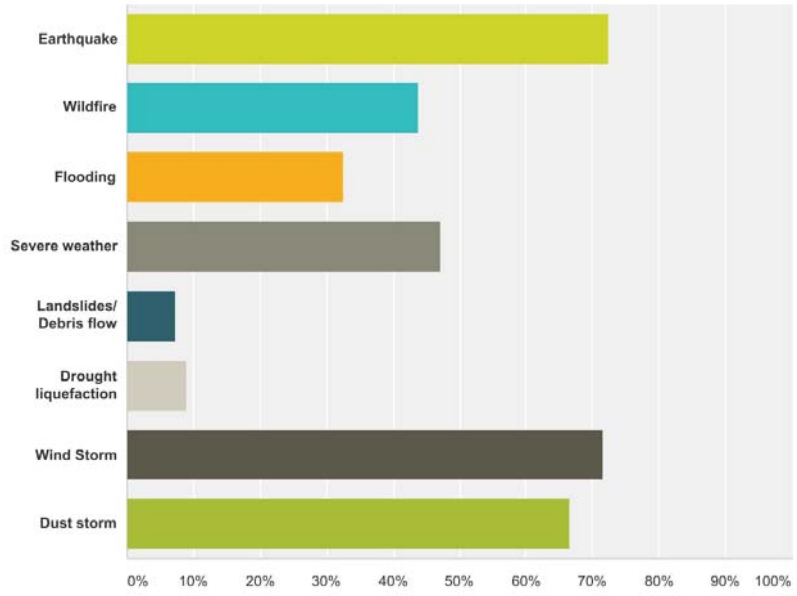


Answer Choices	Responses	
Live in the Town of Apple Valley	84.55%	104
Work in the Town of Apple Valley	58.54%	72
Visit the Town of Apple Valley, but live and work elsewhere	1.63%	2
Total Respondents: 123		

Town of Apple Valley Local Hazard Mitigation Plan Survey

Q2 Which of the following types of natural disasters have you or someone in your household experienced in the past 15 years within the Town of Apple Valley? (Check all that apply)

Answered: 123 Skipped: 0

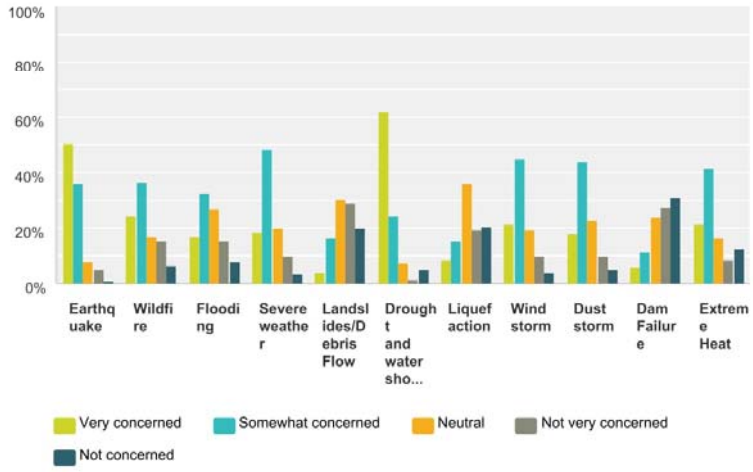


Answer Choices	Responses	
Earthquake	72.36%	89
Wildfire	43.90%	54
Flooding	32.52%	40
Severe weather	47.15%	58
Landslides/ Debris flow	7.32%	9
Drought liquefaction	8.94%	11
Wind Storm	71.54%	88
Dust storm	66.67%	82
Total Respondents: 123		

Town of Apple Valley Local Hazard Mitigation Plan Survey

Q3 How concerned are you about the following natural hazards affecting your home and/or business in Apple Valley? Please check ONE response for each hazard.

Answered: 123 Skipped: 0



	Very concerned	Somewhat concerned	Neutral	Not very concerned	Not concerned	Total	Weighted Average
Earthquake	50.41% 62	35.77% 44	8.13% 10	4.88% 6	0.81% 1	123	1.70
Wildfire	24.39% 30	36.59% 45	17.07% 21	15.45% 19	6.50% 8	123	2.43
Flooding	17.07% 21	32.52% 40	26.83% 33	15.45% 19	8.13% 10	123	2.65
Severe weather	18.33% 22	48.33% 58	20.00% 24	10.00% 12	3.33% 4	120	2.32
Landslides/Debris Flow	4.13% 5	16.53% 20	30.58% 37	28.93% 35	19.83% 24	121	3.44
Drought and water shortage	61.79% 76	24.39% 30	7.32% 9	1.63% 2	4.88% 6	123	1.63
Liquefaction	8.55% 10	15.38% 18	35.90% 42	19.66% 23	20.51% 24	117	3.28
Wind storm	21.31% 26	45.08% 55	19.67% 24	9.84% 12	4.10% 5	122	2.30
Dust storm	18.18% 22	43.80% 53	23.14% 28	9.92% 12	4.96% 6	121	2.40
Dam Failure	5.83% 7	11.67% 14	24.17% 29	27.50% 33	30.83% 37	120	3.66

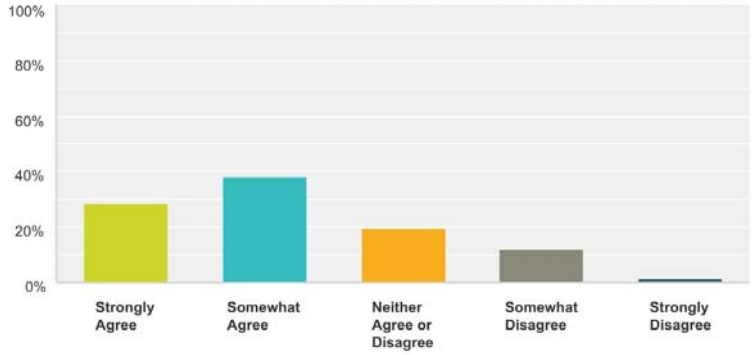
Town of Apple Valley Local Hazard Mitigation Plan Survey

Extreme Heat	**21.49%** 26	**41.32%** 50	**16.53%** 20	**8.26%** 10	**12.40%** 15	121	2.49

Town of Apple Valley Local Hazard Mitigation Plan Survey

Q4 Information about the risks from natural hazards is readily available and easy to locate.

Answered: 123 Skipped: 0

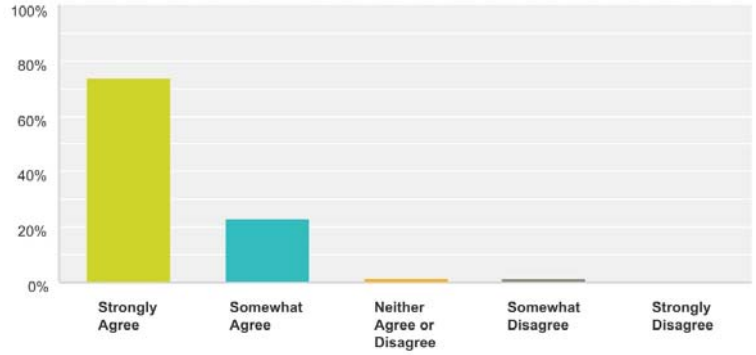


Answer Choices	Responses	
Strongly Agree	28.46%	35
Somewhat Agree	38.21%	47
Neither Agree or Disagree	19.51%	24
Somewhat Disagree	12.20%	15
Strongly Disagree	1.63%	2
Total		123

Town of Apple Valley Local Hazard Mitigation Plan Survey

Q5 It is my responsibility to educate myself and take actions that will reduce my exposure to the risks from natural hazards.

Answered: 123 Skipped: 0

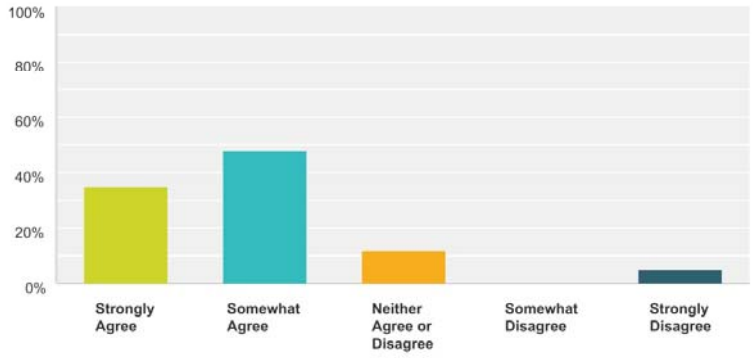


Answer Choices	Responses	
Strongly Agree	73.98%	91
Somewhat Agree	22.76%	28
Neither Agree or Disagree	1.63%	2
Somewhat Disagree	1.63%	2
Strongly Disagree	0.00%	0
Total		123

Town of Apple Valley Local Hazard Mitigation Plan Survey

Q6 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: 123 Skipped: 0

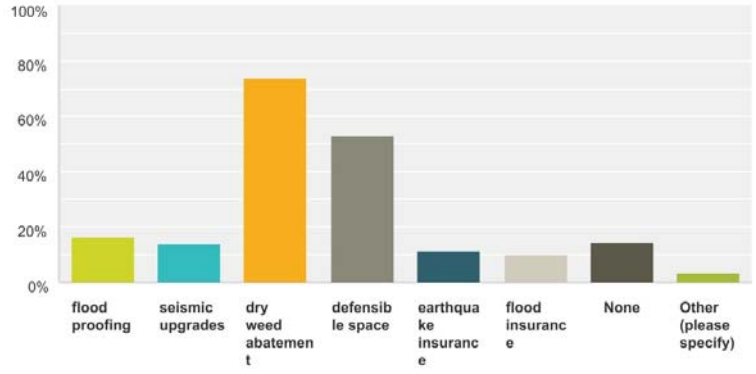


Answer Choices	Responses	
Strongly Agree	34.96%	43
Somewhat Agree	47.97%	59
Neither Agree or Disagree	12.20%	15
Somewhat Disagree	0.00%	0
Strongly Disagree	4.88%	6
Total		123

Town of Apple Valley Local Hazard Mitigation Plan Survey

Q7 What mitigation measures or strategies have been completed in the last 5 years to protect your home or business from a natural hazard? Check all that apply

Answered: 123 Skipped: 0

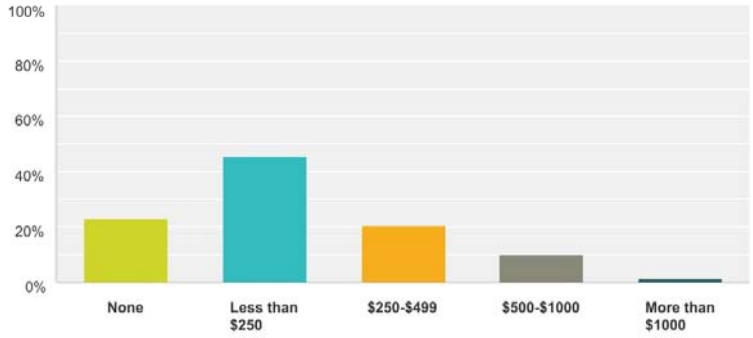


Answer Choices	Responses	
flood proofing	16.26%	20
seismic upgrades	13.82%	17
dry weed abatement	73.98%	91
defensible space	52.85%	65
earthquake insurance	11.38%	14
flood insurance	9.76%	12
None	14.63%	18
Other (please specify)	3.25%	4
Total Respondents: 123		

Town of Apple Valley Local Hazard Mitigation Plan Survey

Q8 How much money do you spend annually on mitigation measures to protect your home or business from natural hazards?

Answered: 123 Skipped: 0

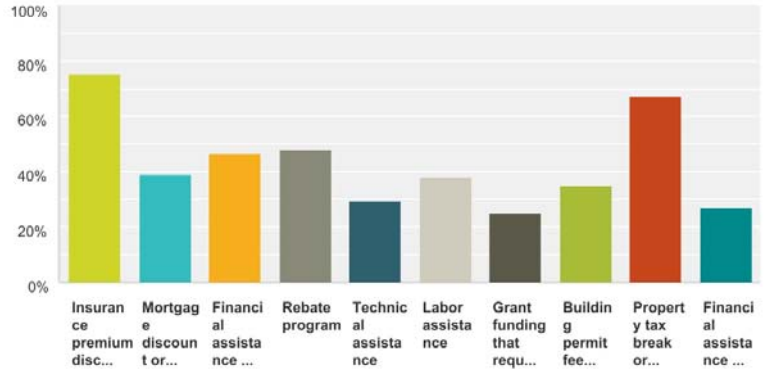


Answer Choices	Responses	
None	22.76%	28
Less than $250	45.53%	56
$250-$499	20.33%	25
$500-$1000	9.76%	12
More than $1000	1.63%	2
Total		123

Town of Apple Valley Local Hazard Mitigation Plan Survey

Q9 Which of the following incentives would encourage you to protect your home against natural hazards? (Check all that apply)

Answered: 123 Skipped: 0

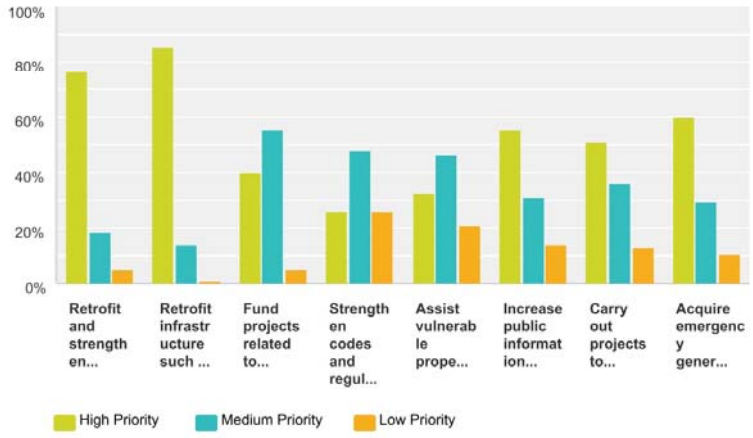


Answer Choices	Responses	
Insurance premium discount	75.61%	93
Mortgage discount or low interest loan	39.02%	48
Financial assistance for property upgrades or equipment	46.34%	57
Rebate program	47.97%	59
Technical assistance	29.27%	36
Labor assistance	38.21%	47
Grant funding that requires cost share from property owner	25.20%	31
Building permit fee reduction or waiver	34.96%	43
Property tax break or incentive	67.48%	83
Financial assistance for equipment	26.83%	33
Total Respondents: 123		

Town of Apple Valley Local Hazard Mitigation Plan Survey

Q10 What protection methods do you believe the Town, County, State or Federal agencies should be using in order to reduce damage and disruption from hazard events within the Town of Apple Valley?

Answered: 123 Skipped: 0

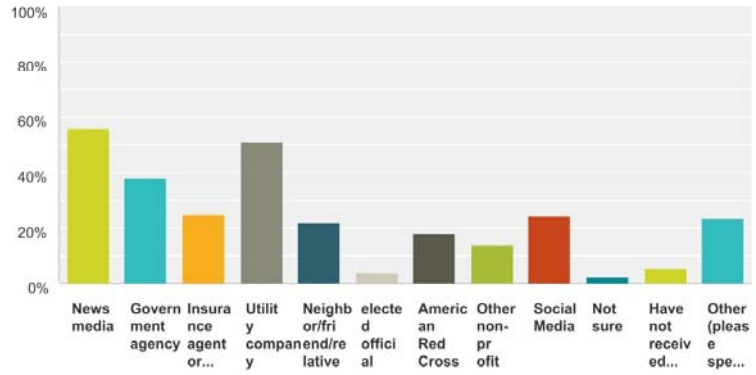


	High Priority	Medium Priority	Low Priority	Total
Retrofit and strengthen essential facilities such as police, fire, schools and hospitals	76.42% 94	18.70% 23	4.88% 6	123
Retrofit infrastructure such as roads, bridges, drainage facilities, water supply, and waster water.	85.37% 105	13.82% 17	0.81% 1	123
Fund projects related to drainage control measures and improvements.	39.84% 49	55.28% 68	4.88% 6	123
Strengthen codes and regulations to include higher standards in hazard areas.	26.02% 32	47.97% 59	26.02% 32	123
Assist vulnerable property owners with securing funding for mitigation/property protection.	32.52% 40	46.34% 57	21.14% 26	123
Increase public information about risks and the exposure to hazards within the Town of Apple Valley.	55.28% 68	30.89% 38	13.82% 17	123
Carry out projects to restore the natural environment's capacity to absorb the impacts from natural hazards.	51.22% 63	35.77% 44	13.01% 16	123
Acquire emergency generators for essential government facilities and buildings identified as care and shelter.	60.16% 74	29.27% 36	10.57% 13	123

Town of Apple Valley Local Hazard Mitigation Plan Survey

Q11 Thinking back in the last three years, from whom have you received information about how to make members of your household and your home safer from natural disasters? Check all that apply.

Answered: 123 Skipped: 0

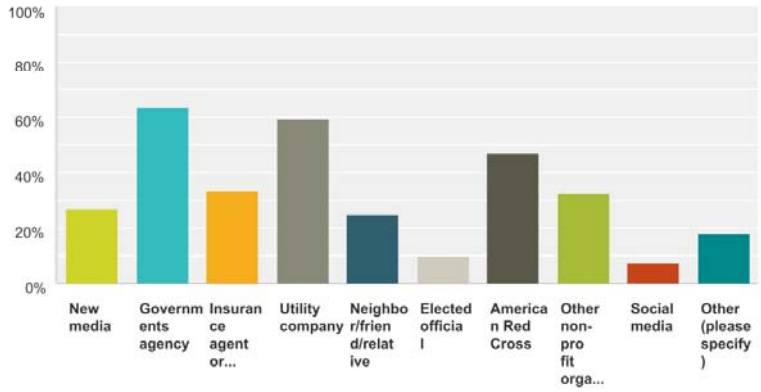


Answer Choices	Responses	
News media	56.10%	69
Government agency	38.21%	47
Insurance agent or company	25.20%	31
Utility company	51.22%	63
Neighbor/friend/relative	21.95%	27
elected official	4.07%	5
American Red Cross	17.89%	22
Other non-profit	13.82%	17
Social Media	24.39%	30
Not sure	2.44%	3
Have not received information	5.69%	7
Other (please specify)	23.58%	29
Total Respondents: 123		

Town of Apple Valley Local Hazard Mitigation Plan Survey

Q12 Whom would you most trust to provide you with information about how to make your household and home safer from natural disasters? Choose at least 3 responses.

Answered: 123 Skipped: 0

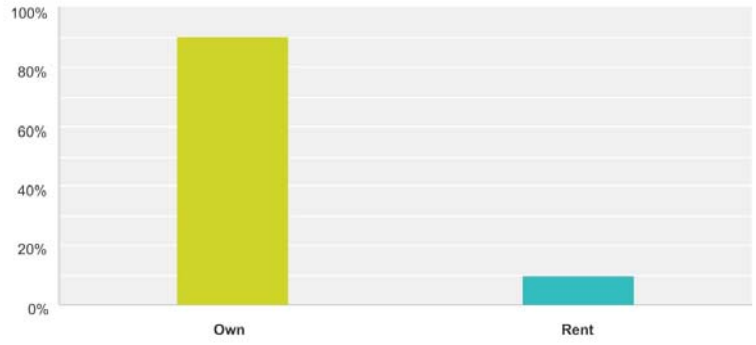


Answer Choices	Responses	
New media	26.83%	33
Governments agency	63.41%	78
Insurance agent or company	33.33%	41
Utility company	59.35%	73
Neighbor/friend/relative	25.20%	31
Elected official	9.76%	12
American Red Cross	47.15%	58
Other non-profit organization	32.52%	40
Social media	7.32%	9
Other (please specify)	17.89%	22
Total Respondents: 123		

Town of Apple Valley Local Hazard Mitigation Plan Survey

Q13 Do you rent or own your home or business?

Answered: 123 Skipped: 0

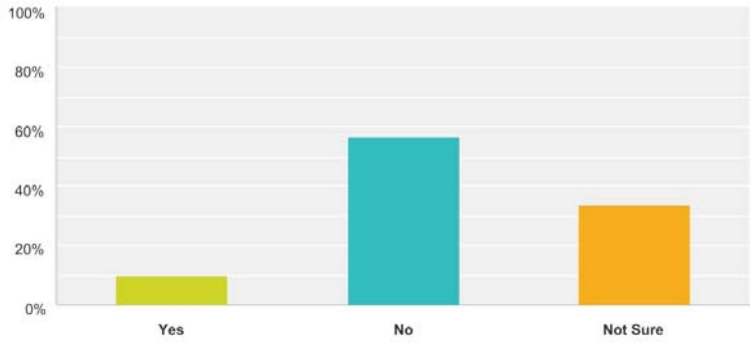


Answer Choices	Responses	
Own	90.24%	111
Rent	9.76%	12
Total		123

Town of Apple Valley Local Hazard Mitigation Plan Survey

Q14 Is your home or business in or near a FEMA designated floodplain?

Answered: 123 Skipped: 0

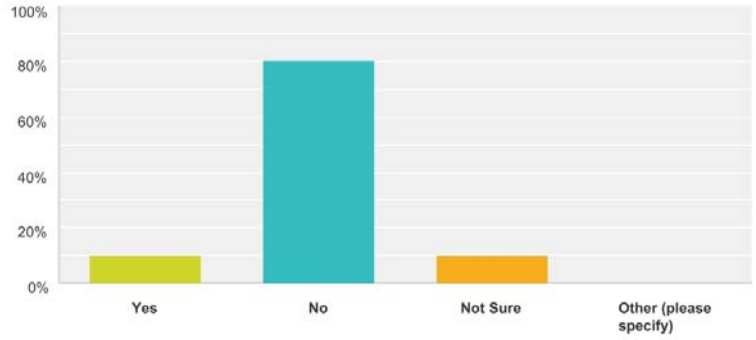


Answer Choices	Responses	
Yes	9.76%	12
No	56.91%	70
Not Sure	33.33%	41
Total		123

Town of Apple Valley Local Hazard Mitigation Plan Survey

Q15 Do you have flood insurance?

Answered: 123 Skipped: 0

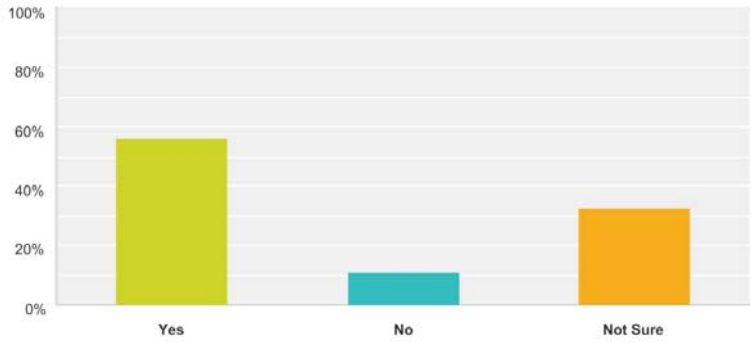


Answer Choices	Responses	
Yes	9.76%	12
No	80.49%	99
Not Sure	9.76%	12
Other (please specify)	0.00%	0
Total		123

Town of Apple Valley Local Hazard Mitigation Plan Survey

Q16 Is your home or business located near an earthquake fault?

Answered: 123 Skipped: 0

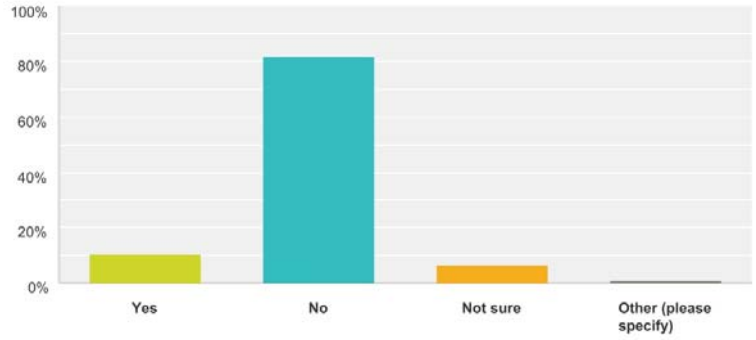


Answer Choices	Responses	
Yes	56.10%	69
No	11.38%	14
Not Sure	32.52%	40
Total		123

Town of Apple Valley Local Hazard Mitigation Plan Survey

Q17 Do you have earthquake insurance?

Answered: 123 Skipped: 0

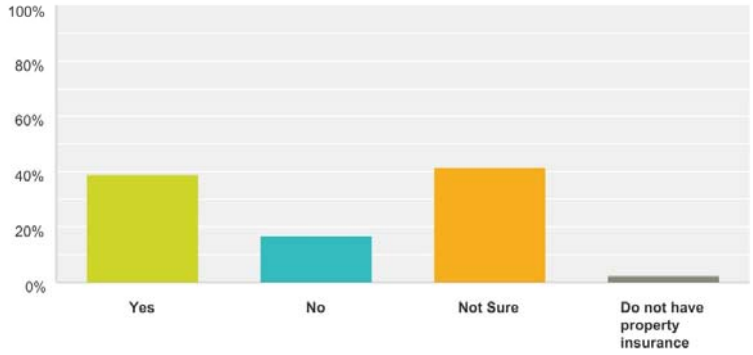


Answer Choices	Responses	
Yes	10.57%	13
No	82.11%	101
Not sure	6.50%	8
Other (please specify)	0.81%	1
Total		123

Town of Apple Valley Local Hazard Mitigation Plan Survey

Q18 To the best of your knowledge, does your homeowner's, renter's, or general insurance policy provide coverage for damage from natural hazards?

Answered: 123 Skipped: 0



Answer Choices	Responses	
Yes	39.02%	48
No	17.07%	21
Not Sure	41.46%	51
Do not have property insurance	2.44%	3
Total		123

Town of Apple Valley Local Hazard Mitigation Plan Survey

Q19 Have you ever had problems obtaining homeowner's or renter's insurance due to risks from natural hazards?

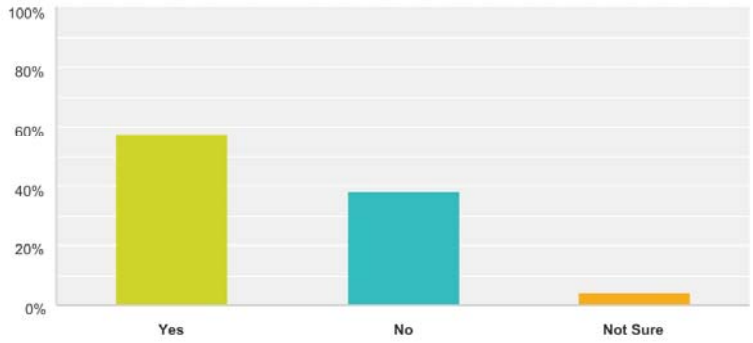
Answered: 123 Skipped: 0

Answer Choices	Responses	
Yes	6.50%	8
No	84.55%	104
Not Sure	3.25%	4
Never tried obtaining hazard insurance	5.69%	7
Total		123

Town of Apple Valley Local Hazard Mitigation Plan Survey

Q20 When you moved into your home, did you consider the impact a natural hazard event could have on your home?

Answered: 123 Skipped: 0

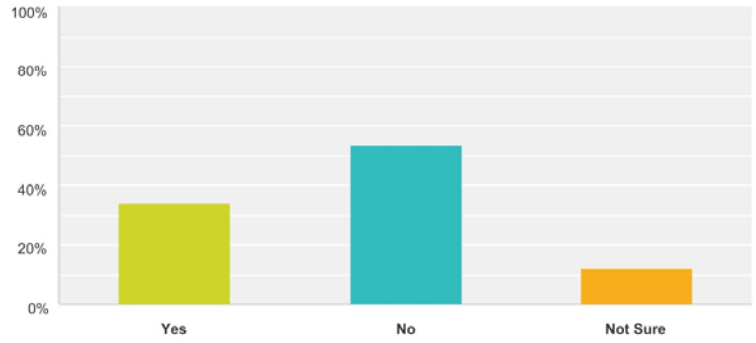


Answer Choices	Responses	
Yes	57.72%	71
No	38.21%	47
Not Sure	4.07%	5
Total		123

Town of Apple Valley Local Hazard Mitigation Plan Survey

Q21 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: 123 Skipped: 0

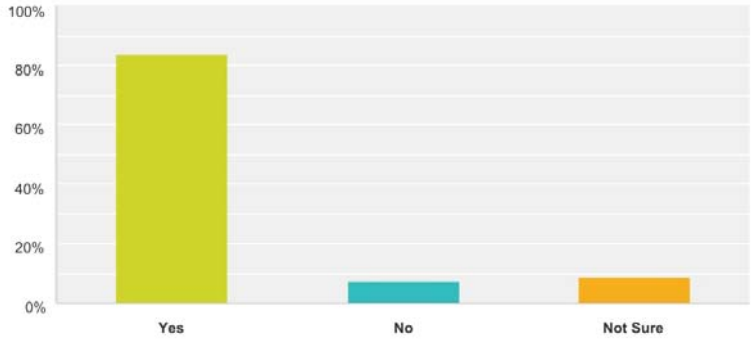


Answer Choices	Responses	
Yes	34.15%	42
No	53.66%	66
Not Sure	12.20%	15
Total		123

Town of Apple Valley Local Hazard Mitigation Plan Survey

Q22 Would natural hazard real estate disclosures or risk information influence your decision on where to buy or rent a home?

Answered: 123 Skipped: 0



Answer Choices	Responses	
Yes	83.74%	103
No	7.32%	9
Not Sure	8.94%	11
Total		123

Town of Apple Valley Local Hazard Mitigation Plan Survey

Q23 Thank you again for completing the survey!!!! Please provide any additional comments that you may have regarding hazard mitigation and community protection against natural disasters.

Answered: 15 Skipped: 108

C.3 Website/Survey Link

Apple Valley, CA : Local Hazard Mitigation Plan http://www.applevalley.org/services/emergency-preparedness/hazard-mit...

Local Hazard Mitigation Plan

Welcome to the Town of Apple Valley's Local Hazard Mitigation Plan (HMP) webpage!

This webpage contains information and documents for Apple Valley's Local Hazard Mitigation Plan (HMP). The HMP must be updated every five years to stay current with natural hazard events and maintain eligibility for State and Federal grant funding. This webpage will remain active to document past, current and future hazard mitigation planning efforts for the public and Town officials alike.

Please explore the links on this page to learn more about the HMP.

As always, we are seeking the public's help and input during the local HMP Update process. If you have disaster-related stories and/or photographs that you would like to share, or you have comments or other information pertaining to natural hazard mitigation and the planning process, please send them to:

JRamos@applevalley.org.

Any information or feedback that you can provide is both helpful and appreciated!

Help our community by completing an important survey that will be used for the HMP 2017 update at the link below.

CLICK HERE

Apple Valley Local Hazard Mitigation Plan 2011

United States Geological Survey - Link to the United States Geological Survey's Earthquakes Hazards Program

Federal Emergency Management Agency - Link to FEMA's website dealing with flooding

San Bernardino County Hazard Maps - SBC's Hazard Maps

California My Hazard Maps- CalOES Hazard Maps

Earthquakes in California - Link to a list of major earthquakes throughout California's history.

Chronology of San Bernardino County Proclaimed Disasters - Link to a list of many of the proclaimed disasters that took place in San Bernardino County from 1954 to 2016. Includes earthquakes, floods and fires.

History of San Bernardino County - Link to a County website with major historical milestones of San Bernardino County, from 1853 to 2003.

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Appendix D

D.1 Hazard Summary Worksheet Instructions

D.2 Hazard Summary Worksheet agreed upon by Planning Committee

D.3 Risk Factor Approach Instruction Sheet

D.4 Risk Factor Final Worksheet agreed upon Planning Committee

D.5 Mitigation Action Implementation Plan Form

D.6 Mitigation Action Reporting Form

D.7 Annual HMP Review Questionnaire

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D.1 Hazard Summary Worksheet Instructions

Hazard Summary Worksheet Instructions

Definitions for Classifications

Location (Geographic Area Affected)

- **Negligible:** Less than 10 percent of planning area or isolated single-point occurrences
- **Limited:** 10 to 25 percent of the planning area or limited single-point occurrences
- **Significant:** 25 to 75 percent of planning area or frequent single-point occurrences
- **Extensive:** 75 to 100 percent of planning area or consistent single-point occurrences

Maximum Probable Extent (Magnitude/Strength based on historic events or future probability)

- **Weak:** Limited classification on scientific scale, slow speed of onset or short duration of event, resulting in little to no damage
- **Moderate:** Moderate classification on scientific scale, moderate speed of onset or moderate duration of event, resulting in some damage and loss of services for days
- **Severe:** Severe classification on scientific scale, fast speed of onset or long duration of event, resulting in devastating damage and loss of services for weeks or months
- **Extreme:** Extreme classification on scientific scale, immediate onset or extended duration of event, resulting in catastrophic damage and uninhabitable conditions

Hazard	Scale / Index	Weak	Moderate	Severe	Extreme
Drought	Palmer Drought Severity Index	-1.99 to +1.99	-2.00 to -2.99	-3.00 to -3.99	4.00 & below
Earthquake	Modified Mercalli Scale	I to IV	V to VII	VII	IX to XII
	Richter Magnitude	2, 3	4, 5	6	7, 8

Probability of Future Events

- **Unlikely:** Less than 1 percent probability of occurrence in the next year or a recurrence interval of greater than every 100 years.
- **Occasional:** 1 to 10 percent probability of occurrence in the next year or a recurrence interval of 11 to 100 years.
- **Likely:** 10 to 90 percent probability of occurrence in the next year or a recurrence interval of 1 to 10 years
- Highly Likely: 90 to 100 percent probability of occurrence in the next year or a recurrence interval of less than 1 year.

Overall Significance

- **Low:** Two or more criteria fall in lower classifications or the event has a minimal impact on the planning area. This rating is sometimes used for hazards with a minimal or unknown record of occurrences or for hazards with minimal mitigation potential.
- **Medium:** The criteria fall mostly in the middle ranges of classifications and the event's impacts on the planning area are noticeable but not devastating. This rating is sometimes used for hazards with a high extent rating but very low probability rating.
- **High:** The criteria consistently fall in the high classifications and the event is likely/highly likely to occur with severe strength over a significant to extensive portion of the planning area.

3- Cumulative meteorological drought and wet conditions: http://ncdc.noaa.gov/

4 Earthquake intensity and effect on population and structures http://earthquake.usgs.gov/

5 Earthquake magnitude as a logarithmic scale, measured by a seismograph http://earthquake.usgs.gov/

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D.2 Hazard Summary Worksheet agreed upon by Planning Committee

LHMP Hazard Summary Worksheet

Planning Team Meeting- Feb. 21, 2017

Use this worksheet to summarize hazard description information and identify which hazards are most significant to the planning area. The definitions provided on the following page can be modified to meet local needs and methods.

Hazard	Location (Geographic Area Affected)	Maximum Probable Extent (Magnitude/Strength)	Probability of Future Events	Overall Significance Ranking
+ Climate Change	— Neg.	— W	— O	Low
~~Dam Failure~~	L	W	U	Low
Drought	E	M	O	Low
+ Earthquake	E	S	L	High
+ Erosion	N	W	U	Low
~~Expansive Soils~~	N	W	U	Low
~~Extreme Cold~~	N	W	U	Low
+ Extreme Heat	E	M	L	Med
+ Flood	L	M	L	Med
~~Landslide~~	N	W	U	Low
~~Lightning~~	Z N	W	O	Low
~~Severe Wind~~	E	M	L	Med
~~Severe Winter Weather~~	E	M	L	Med
~~Subsidence~~	N	W	U	Low
~~Terrorism~~	N	W	U	Low
+ Wildfire	L	M-S	L	M-H

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D.3 Risk Factor Approach Instruction Sheet

Risk Factor (RF) Approach

For use in multi-hazard mitigation planning hazard prioritization exercises.

The RF approach combines historical data, local knowledge, and consensus opinions to produce numerical values that allow identified hazards to be ranked against one another. These criteria were used to evaluate hazards and identify the highest risk hazard in the project region.

The RF approach produces numerical values that allow identified hazards to be ranked against one another (the higher the RF value, the greater the hazard risk). RF values are obtained by assigning varying degrees of risk to five categories for each hazard: *probability, impact, spatial extent, warning time*, and *duration*. Each degree of risk is assigned a value ranging from 1 to 4 and a weighing factor for each category should be agreed upon by the planning committee. Based upon any unique concerns for the planning area, the planning committee may also adjust the RF weighting scheme. To calculate the RF value for a given hazard, the assigned risk value for each category is multiplied by the weighting factor. The sum of all five categories equals the final RF value, as demonstrated in the example equation below:

RF Value = [(Probability x .30) + (Impact x .30) +

(Spatial Extent x .20) + (Warning Time x .10) + (Duration x .10)]

According to the default weighting scheme applied, the highest possible RF value is 4.0.

Please see the Risk Factor Criteria table on the following page for information on the risk factor weighting index and other definitions.

Risk Factor Index Criteria Table

Risk Assessment Category	Level	Degree of Risk Criteria	Index	Weight Value
PROBABILITY **What is the likelihood of a hazard event occurring in a given year?**	**UNLIKELY**	LESS THAN 1% ANNUAL PROBABILITY	**1**	**30%**
	POSSIBLE	BETWEEN 1 & 10% ANNUAL PROBABILITY	**2**	
	LIKELY	BETWEEN 10 &100% ANNUAL PROBABILITY	**3**	
	HIGHLY LIKELY	100% ANNUAL PROBABILTY	**4**	
IMPACT ***In terms of injuries, damage, or death, would you anticipate impacts to be minor, limited, critical, or catastrophic when a significant hazard event occurs?***	**MINOR**	VERY FEW INJURIES, IF ANY. ONLY MINOR PROPERTY DAMAGE & MINIMAL DISRUPTION ON QUALITY OF LIFE. TEMPORARY SHUTDOWN OF CRITICAL FACILITIES.	**1**	**30%**
	LIMITED	MINOR INJURIES ONLY. MORE THAN 10% OF PROPERTY IN AFFECTED AREA DAMAGED OR DESTROYED. COMPLETE SHUTDOWN OF CRITICAL FACILITIES FOR MORE THAN ONE DAY.	**2**	
	CRITICAL	MULTIPLE DEATHS/INJURIES POSSIBLE. MORE THAN 25% OF PROPERTY IN AFFECTED AREA DAMAGED OR DESTROYED. COMPLETE SHUTDOWN OF CRITICAL FACILITIES FOR MORE THAN ONE WEEK.	**3**	
	CATASTROPHIC	HIGH NUMBER OF DEATHS/INJURIES POSSIBLE. MORE THAN 50% OF PROPERTY IN AFFECTED AREA DAMAGED OR DESTROYED. COMPLETE SHUTDOWN OF CRITICAL FACILITIES FOR 30 DAYS OR MORE.	**4**	
SPATIAL EXTENT ***How large of an area could be impacted by a hazard event? Are impacts localized or regional?***	**NEGLIGIBLE**	LESS THAN 1% OF AREA AFFECTED	**1**	**20%**
	SMALL	BETWEEN 1 & 10% OF AREA AFFECTED	**2**	
	MODERATE	BETWEEN 10 & 50% OF AREA AFFECTED	**3**	
	LARGE	BETWEEN 50 & 100% OF AREA AFFECTED	**4**	
WARNING TIME ***Is there usually some lead time associated with the hazard event? Have warning measures been implemented?***	**MORE THAN 24 HRS**	SELF DEFINED	**1**	**10%**
	12 TO 24 HRS	SELF DEFINED	**2**	
	6 TO 12 HRS	SELF DEFINED	**3**	
	LESS THAN 6 HRS	SELF DEFINED	**4**	

DURATION ***How long does the hazard event usually last?***	**LESS THAN 6 HRS**	SELF DEFINED	**1**	**10%**
	LESS THAN 24 HRS	SELF DEFINED	**2**	
	LESS THAN 1 WEEK	SELF DEFINED	**3**	
	MORE THAN 1 WEEK	SELF DEFINED	**4**	

Due to the inherent errors possible in any disaster, the results of the risk factor analysis should only be used for planning purposes and in developing hazard priorities and concentrating jurisdictional resources. Before assigning risk factors and prioritization to hazards it is recommended to complete a draft of the hazard profiles and risk assessment information to aid in determining potential impacts. Before the hazard prioritization process you may want to consider the following risk assessment criteria:

- ✓ Inventory and summarize vulnerable assets
- ✓ Characterize repetitive flood loss properties
- ✓ Estimated harm to residents and estimated damages to buildings
- ✓ Describe vulnerability to future development

[Example Risk Factor Results from Plumas County Hazard Mitigation Project]

PLUMAS COUNTY HAZARD MITIGATION PLAN

Department of Health / Office of Emergency Services

Risk Factor Worksheet

Ranking	Natural Hazards	Probability	Calc.1	Impact	Calc.2	Spatial Extent	Calc.3	Warning Time	Calc.4	Duration	Calc.5	RF Factor
1	Wildfire	4	1.2	3	0.9	4	0.8	3	0.3	4	0.4	3.6
2	Severe Weather	4	1.2	2	0.6	4	0.8	1	0.1	2	0.2	2.9
3	Geologic Hazards	4	1.2	2	0.6	1	0.2	4	0.4	2	0.2	2.6
4	Flooding	2	0.6	3	0.9	2	0.4	1	0.1	4	0.4	2.4
5	Drought	2	0.6	1	0.3	3	0.6	1	0.1	4	0.4	2
6	Climate Change	2	0.6	1	0.3	4	0.8	1	0.1	1	0.1	1.9
7	Dam Failure	1	0.3	2	0.6	1	0.2	2	0.2	1	0.1	1.4

Risk Factor Conculsion	
HIGH RISK (3.0 – 4.0)	***Wildfire***
MODERATE RISK (2.0 – 2.9)	***Severe Weather, Geologic Hazards, Flooding***
LOW RISK (0.1 – 1.9)	***Drought, Climate Change, Dam Failure***

The conclusions from the example risk factor results above, were translated into three categories for a final summary of hazard risk based on *High*, *Moderate*, or *Low* risk designations. The designations values are arbitrary and can be adjusted as deemed necessary. It should be noted that although some hazards are classified as posing Low risk, their occurrence of

varying or unprecedented magnitudes is still possible and will continue to be reevaluated during future updates of this plan.

D.4 Risk Factor Final Worksheet agreed upon Planning Committee

LHMP RISK FACTOR EXCEL WORKSHEET

HAZARD PRIORITIZATION /

MITIGATE HAZARDS

Rank	Natural Hazards	Probability (1-4)	Factor1 = (Probability Index * .30)	Impact (1-4)	Factor2 = (Impact Index * .30)	Spatial Extent (1-4)	Factor3 = (Spatial Extent Index * .20)	Warning Time (1-4)	Factor4 = (Warning Time Index * .10)	Duration (1-4)	Factor5 = (Probability Index * .10)	RF Factor Total = (Add Factors 1-5)
1	Climate Change	1	0.3	1	0.3	3	0.6	1	0.1	4	0.4	**1.7**
2	Earthquake	3	0.9	4	1.2	4	0.8	4	0.4	3	0.3	**3.6**
3	Erosion	1.5	0.45	1	0.3	1	0.2	3	0.3	1.5	0.15	**1.4**
4	Extreme Heat	2.5	0.75	1	0.3	2.5	0.5	1	0.1	2.5	0.25	**1.9**
5	Flooding	2	0.6	2	0.6	2	0.4	4	0.4	2.5	0.25	**2.25**
6	Wildfire	2	0.6	2	0.6	2	0.4	4	0.4	3	0.3	**2.3**

The RF approach combines historical data, local knowledge, and consensus opinions to produce numerical values that allow identified hazards to be ranked against one another. These criteria were used to evaluate hazards and identify the highest risk hazard in the Lawndale region.
The RF approach produces numerical values that allow identified hazards to be ranked against one another (the higher the RF value, the greater the hazard risk). RF values are obtained by assigning varying degrees of risk to five categories for each hazard: probability, impact, spatial extent, warning time, and duration. Each degree of risk is assigned a value ranging from 1 to 4 and a weighing factor for each category was agreed upon by the MPC.

Calculated Field

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D.5 Mitigation Action Implementation Plan Form

Mitigation Action Implementation Plan	
Action:	
Implementing Agencies	
Lead Agency (ies):	Town of Apple Valley
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:	

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D.6 Mitigation Action Reporting Form

Mitigation Action Reporting Forms

Your jurisdictional 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:_____

Town: _____

Contact Person:_____

Phone#: _____ Email _____

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):_____

Milestones	Completed (✓)	Projected Date of Completion

HMP Goal Addressed: _____

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D.7 Annual HMP Review Questionnaire

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 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 team?			
	Has the committee undertaken any public outreach activities regarding the HMP or implementation of mitigation actions?			
	How can public participation be improved?			
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 Mitigation Action plan been incorporated into existing planning mechanisms?			
	Has the Mitigation Action plan incorporated existing plan mechanisms?			

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