City of Rancho Cucamonga
Local Hazard Mitigation Plan
January 2013

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Section 1--Introduction

1.1 Purpose of the Plan

Emergencies and disasters cause death or leave people injured or displaced, cause significant damage to our communities, businesses, public infrastructure and our environment, and cost tremendous amounts in terms of response and recovery dollars and economic loss. Hazard mitigation reduces or eliminates losses of life and property. After disasters, repairs and reconstruction are often completed in such a way as to simply restore to pre-disaster conditions. Such efforts expedite a return to normalcy; however, the replication of pre-disaster conditions results in a cycle of damage, reconstruction, and repeated damage. Hazard mitigation ensures that such cycles are broken and that post-disaster repairs and reconstruction result in a reduction in hazard vulnerability.

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

The purpose of this plan is to assess the significant natural and manmade hazards that may affect the City and its inhabitants, evaluate and incorporate ongoing mitigation activities and related programs in the community, determine additional mitigation measures that should be undertaken, and to outline a strategy for implementation of mitigation projects. In addition, this plan has been developed to identify actions, policies and tools for implementation over the long-term resulting in reduction of future losses community wide. The established mitigation projects provided were identified and reviewed by members of the planning committee. This plan has been created in conjunction with the recently updated City of Rancho Cucamonga General Plan and will be an extension of that document; adopted by resolution. Citizens and professionals active in disaster planning, response, and mitigation provided important input in the development of the plan and recommended goals and objectives, mitigation measures, and priorities for actions.

This plan fulfills the requirements of the following programs:

1. Pre-Disaster Mitigation (PDM)
2. National Flood Insurance Programs (NFIP) Community Rating System (CRS)
3. Hazard Mitigation Grant Program (HMGP)

Section 322 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act, 42 U.S.C. 5165, enacted under section 104 of the Disaster Mitigation Act of 2000, P.L. 106-390, provides new and revitalized approaches to mitigation planning. Section 322, in concert with other sections of the Act, provides a significant opportunity to reduce the Nation’s disaster losses through mitigation planning and emphasizing the need for State, local and tribal entities to closely coordinate mitigation planning and implementation efforts.

A major requirement of the law is the development of local hazard mitigation plans. These plans must be developed and approved by the Federal Emergency Management Agency (FEMA) before November 1, 2004, in order for the local jurisdictions to be eligible for Hazard Mitigation Grant Program (HMGP) project funding from a Presidentially-declared disaster that occurs after this date. Local mitigation plans must be reviewed, updated and re-approved by FEMA every five years to remain eligible. This Mitigation Plan has been updated to meet the requirements of the Act and the regulations established by FEMA. The FEMA regulations were published in the Federal Register on February 26, 2002, as an interim final rule at 44 CFR Parts 201 and 206. FEMA may revise the Interim Final Rule and publish a Final Rule; however, until such time, the Interim Final Rule will serve as the rule for mitigation planning implementation.

1.2 Authority

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

1.3 Community Profile

1.3.1 Physical Setting

The City of Rancho Cucamonga is at an elevation of 1,200 feet and is a part of the County of San Bernardino. The City of Rancho Cucamonga encompasses a total planning area of approximately 50 square miles. Thirty-nine square miles encompass the incorporated area, augmented by an 11 square mile Sphere of Influence that generally extends from the City's northern border up to the San Bernardino National Forest. Elevations in the City range from a high of 2,600 feet to a low of 1,020 feet. The terrain of the city is a combination of hilly and flat areas.

Temperatures in the City of Rancho Cucamonga range from 50ºF in the winter months to 95ºF in the summer months. It is important to note that temperatures can vary over a wide range, particularly when the Santa Ana winds blow, bringing higher temperatures and very low humidity. Temperatures may exceed 100ºF in the summer months (June – September), and rarely drop below 40ºF in the winter months (November- March). Rainfall in the City averages four inches of rain per year. However the term “average rainfall” is misleading because over the recorded history of rainfall in the City of Rancho Cucamonga rainfall amounts have ranged from almost no rain at all in some years to 26 inches in very wet years.

Further more, actual rainfall in Southern California tends to fall in large amounts during sporadic and often heavy storms rather than consistently over storms at somewhat regular intervals. Because the metropolitan basin is largely built out, water originating in higher

elevation communities can have a sudden impact on adjoining communities that have a lower elevation.

Four local canyons situated in the foothills of the San Gabriel Mountains north of the City supply water through runoff (surface and subsurface flows) to the Cucamonga Valley Water District (CVWD). The District has acquired surface and subsurface water rights in Cucamonga, Deer, Day and East Etiwanda watershed areas. Water supply from these four sources fluctuates annually based on wet weather conditions. Two smaller watershed areas, Demens and Hermosa, are located just south of Cucamonga and Deer Canyon. The small amount of water generated by these two watersheds, however, is not included in CVWD's analysis of developable water. Cucamonga Canyon drains into the Cucamonga Creek, which traverses the northwest corner of the City. The CVWD has surface water rights to runoff in Cucamonga Creek equivalent to a daily flow rate of approximately 3.2 million gallons per day.

1.3.2 History

The City of Rancho Cucamonga was incorporated in November 1977 and is the melding of three distinct communities: Alta Loma, Cucamonga and Etiwanda. These three communities have provided a colorful sense of history and pride lending to the area's appeal. At the time of incorporation, the population within the three communities was estimated to be 42,000. Today, the community has grown beyond 165,000. Major growth continues as people recognize the beauty of the area, its open space, availability of land and housing at moderate cost, and its accessibility to transportation.

Rancho Cucamonga was once the home of the Serrano Indians who referred to the Cucamonga area as the "sandy place". The roadway for Indians, padres, explorers, stagecoaches, and Mormon wagons, this area was settled first in 1839 by Don Tiburcio Tapia, who received 13,000 acres in a land grant from Mexico. Tapia named his large cattle ranch Cucamonga Rancho. After his untimely death, the ranch passed to his heirs and was purchased in 1858 by John and Merced Rains.

1.3.3 Demographics

The City of Rancho Cucamonga has a daytime population of 187,567 people and a nighttime population of 171,058. The median age of residents is 34.6 years with a median household income of $76,640. The average household income of residents is $88,474, with approximately 35.8% of households making over $100,000 dollars. There are approximately 72,600 people employed in the City and 38,885 students enrolled in K-12 schools. The city has a high level of high school graduates at 90.3% and its assessed valuation is $19.5 billion dollars with 2011 taxable sales totaling $2.17 billion dollars.

Rancho Cucamonga is located in one of the most sought after industrial real estate markets in the United States: the Inland Empire's I-15 corridor. A steady flow of manufacturing, distribution, and high technology firms are being drawn to this area to take advantage of Southern California's best combination of land availability and transportation infrastructure,

plus labor and space costs. The area's competitiveness is being enhanced by the increasing number of skilled technicians, professionals and executives migrating to the upscale but reasonably priced executive neighborhoods being built in cities like Rancho Cucamonga.

In addition, these firms retain ready access to Southern California's coastal counties and the huge internal Inland Empire market via the I-15 and new I-210 freeways that pass through Rancho Cucamonga. The city's firms can also save time to the eastern and southern United States as the I-15 and I-210 pass through the city on their way to nearby Cajon and Banning Passes, the two main routes carrying goods between the Southland and the rest of the country.

Rancho Cucamonga has attracted such firms as:

- Schlosser Forge Company, the world's major designer and producer of forged rings used for commercial and military aircraft engines and the space shuttle.
- Safetran Systems Corp, one of the world's leading developers and manufacturers of railroad safety systems.
- Smith Environmental, a world leader in thermal and catalytic oxidizers used to maintain clean air.
- Carpenter Technology, a major manufacturer of specialty steels used in industries like medical devices and aerospace.
- Penwal Industries, a manufacturer of high-end entertainment and retail environments for firms like Disney and Universal Studios.

Rancho Cucamonga has the fourth largest office market in the Inland Empire. Recent years have seen an accelerated demand for space in the inland region and Rancho Cucamonga. This has come about in part because the region's economy is getting quite large, with 1.1 million jobs and a population of 3.5 million. In addition, back office operations for firms engaged in financial services find that the area's lower space and labor costs are to their advantage. Meanwhile, the sudden acceleration in the number of high-end workers living in cities like Rancho Cucamonga is created a skilled labor pool necessary that is starting to attract professional, corporate office and technology operations.

The Inland Empire's traditional low costs for both office space and workers, has attracted firms like the following to Rancho Cucamonga:

· Ameriquest Mortgage (approximately 250 workers)
· Mercury Insurance (approximately 700 workers)
· First American Title has a regional operation with up to 500 workers
· ARS National Services (230 workers)
· Aetna Insurance (over 100 workers)
· Southern California Edison call center (approximately 300 workers)

Additional information regarding the City's demographic and industry information can be found in the City of Rancho Cucamonga's Community and Economic Profile at www.rcrda.us.

1.3.4 Existing Land Use

In Rancho Cucamonga, vacant land has become a scarce resource. Land use decisions must be carefully crafted to protect established residential neighborhoods and plan for appropriate infill development while connecting land uses and transportation modes. These key objectives provide the framework for the City's land use strategies. Land use is a term that describes different types of activities that occur in a particular area. For example, some areas in Rancho Cucamonga contain homes while other areas contain stores, warehouses, parks, or schools. In some places, like Victoria Gardens, a mixture of uses creates an active and vital commercial and cultural center.

The pattern of development within Rancho Cucamonga is characterized by essentially a north/south split roughly along Foothill Boulevard. The northern two thirds of the City are predominately residential, while the southern third is largely industrial. Commercial centers are primarily clustered along Foothill Boulevard, Base Line Road, and several other major roadways. The northern edge of the Sphere of Influence is dominated by open space and hillside terrain.

The residential character of Rancho Cucamonga can be described as primarily low density, and consisting of high-quality, stable neighborhoods. Most residential uses located in the northern areas include large lot, detached homes. The lots become gradually smaller south of Banyan Street. Higher-density housing such as townhomes, condominiums, and apartment complexes are located in the central portion of the City, in the Terra Vista and Victoria neighborhoods. Commercial uses vary greatly, from regional shopping centers to smaller neighborhood retail stores. Regional-serving commercial uses can be found on Foothill Boulevard, east of Haven Avenue, and at Victoria Gardens, located between Day Creek Boulevard, Foothill Boulevard, and I-15. Neighborhood shopping centers are distributed throughout the City and can be found at most major intersections. Many older neighborhood shopping centers located in the western portion of the City are struggling with vacancies, financial instability, and physical decay. Some of these centers may need revitalization or facelifts.

Industrial uses range from heavy industrial such as Tamco Steel and Mission Foods, to warehouses, distribution centers, and light industrial that includes business parks and office uses. Most of the industrial uses are located south of Foothill Boulevard, with the heavy industrial uses located on both sides of I-15.

Public facilities include government buildings such as City Hall, fire stations, and multi-purpose community facilities. Also included in this category are critical infrastructure sites such as cellular towers; water, gas, and electrical transmission lines; electrical plants and facilities; water district facilities; and flood control facilities (catch basins, levees, storm drainage channels, and spreading basins).

Rancho Cucamonga is a community that supports life-long learning with four elementary school districts (Alta Loma, Central, Cucamonga, and Etiwanda), one high school district

(Chaffey Joint Union High School District), one community college (Chaffey College), and satellite facilities for other institutions of higher learning (University of La Verne and University of Redlands are examples). These facilities are distributed throughout the community.

One of the City's most attractive assets is Rancho Cucamonga's world-class park system. The system features facilities throughout the community designed to meet the needs of residents of all ages. Preserving open space for environmental and aesthetic value is a primary objective of the General Plan. Open space can serve multiple functions such as groundwater recharge, wildlife corridors, and neighborhood connections. The largest significant open space remains within the City's Sphere of Influence.

Many vacant lands have already been entitled for development but construction has not occurred. These parcels will continue to contribute to the community in the future through thoughtful design and development. Over time, the distribution of uses within the community will change as vacant properties develop and application of land use policy will facilitate evolution toward the mix of uses the City envisions. Table LU-15 summarizes the level of development expected through the 2030 planning horizon year.

As can be seen on the Geotechnical Hazards map on page 26 and the Fault Hazards map on page 27 of this document, the entire geographical area of the City is vulnerable to seismic settling and the north end, hillside area of the City is vulnerable to landslides as well as wild land fires.

Table LU-15: Build-Out Summary

Table LU-15: Build-Out Summary

	Baseline: 2009[1]			General Plan Build Out: 2030			Change (total only)	Percent Change
	City	SOI[2]	Total	City	SOI[2]	Total		
Dwelling Units	55,608	91	**55,699**	62,196	1,057	**63,253**	7,554	13.6%
Population	179,200	300	**179,500**	200,400	3,400	**203,800**	24,300	13.5%
Non-Residential Square Feet	80,030,000	0	**80,030,000**	99,797,000	0	**99,797,000**	19,767,000	24.7%
Employment	77,350	0	**77,350**	103,040	0	**103,040**	25,690	33.2%

Notes:

1. *2009 Baseline data is based on Existing Land Use Geographical Information Systems land use data.*
2. *SOI: Rancho Cucamonga Sphere of Influence.*

The anticipated change from year 2009 baseline conditions are shown as well.
As planned infrastructure improvements, long-term public facility and service needs, and resource use set forth in the other LHMP chapters have been based on these growth projections, the City will continue to track development to monitor projected versus actual conditions, and to adjust policies and implementation programs accordingly.

Tables LU-16 through LU-18 summarizes the build-out capacity in detail for each Land-use designation.

Table LU-16: Land Use Plan Summary-Residential Designations

Table LU-16: Land Use Plan Summary-Residential Designations

Land Use Designations	Density Factor[1]	City Area			Sphere of Influence			Totals		
		Acres	Dwelling Units[2]	Target Dwelling Units[3]	Acres	Dwelling Units[2]	Target Dwelling Units[3]	Total Acreage	Total Dwelling Units	Total Target Dwelling Units
Residential Designations										
Hillside (0.1-2.0 du/ac)	1.29	133	13 to 268	151	695	70-1,400	831	828	83-1,668	982
Very Low (0.10-2.0 du/ac)	1.29	4,007	401 to 8,029	7,394	-	-	-	4,007	401-8,029	7,394
Low (2.0-4.0 du/ac)	3.25	4,371	9,194 to 18,080	18,050	-	-	-	4,371	9,194-18,080	18,050
Low Medium (4.0-8.0 du/ac)	6.50	1,852	7,739 to 15,100	13,320	-	-	-	1,852	7,739-15,100	13,320
Medium (8.0-14.0 du/ac)	11.75	790	6,270 to 10,837	9,283	-	-	-	790	6,270-10,837	9,283
Medium High (14.0-24.0 du/ac)	20.25	367	5,237 to 8,915	7,432	-	-	-	367	5,237-8,915	7,432
High (24.0-30.0 du/ac)	27.75	44	1,376 to 1,713	1,221	-	-	-	44	1,376-1,713	1,221
Mixed Use[4]	Varies	276	3,701 to 6,511	5,345	-	-	-	276	3,701-6,511	5,345
Open Space (0.0-0.1 du/ac)	0.10	483	0 to 48	-[5]	2,496	0-250	226	2,979	0-298	226
RESIDENTIAL SUBTOTAL		**12,323**	**33,931 to 69,501**	**62,196**	**3,191**	**70-1,650**	**1,057**	**15,514**	**34,001-71,151**	**63,253**

Notes:

1. *The Density Factor is based upon actual development that has occurred in the City and represents a level midway between 50% and 75% of the range. It is used to calculate the target number of dwelling units. This factor is only applied to vacant developable lands. A different Density Factor was applied to existing development to obtain an accurate baseline number.*
2. *The range of dwelling units is derived by multiplying the lower and upper threshold of density/intensity range by the number of acres, and rounded to the nearest whole number. This range represents the theoretical potential. Some development will produce densities at or near the top of the range; however, most will not.*
3. *Target dwelling units is the probable level of development based on historical development patterns, except for Mixed Use Residential, which is based primarily on a target density.*
4. *Mixed Use allows both residential and non-residential uses.*
5. *Open Space is generally a non-residential category that permits a very limited number of residential units on privately owned properties. Within the City, Open Space applies to the golf courses and the Pacific Electric Trail. In the northwest quadrant of the City, a few properties are designated Open Space and could yield residential units. However, any such development would be limited to a density of 0.1 units per acre (or one unit per parcel on lots less than 10 acres in size) and would be subject to the slope, drainage, flood zones, and fault zone analysis at a minimum under the Hillside Overlay Ordinance, further limiting any residential development potential.*

Table LU-17: Land Use Plan Summary-Non-Residential Designations

Table LU-17: Land Use Plan Summary-Non-Residential Designations

Land Use Designations	Acres		Square Feet (In thousands) [1] (City Only)	Probable Square Feet (In thousands) (City Only)	Employment [3] (City Only)	Total Acres
	City	SOI				
Non-Residential [2]						
Office (0.40-1.0 FAR)	86	-	1,497 to 3,746	1,497	3,180	86
Neighborhood Commercial (0.25-0.35 FAR)	164	-	1,785 to 2,500	1,785	3,030	164
Community Commercial (0.25-0.35 FAR)	119	-	1,292 to 1,810	1,292	1,970	119
General Commercial (0.25-0.35 FAR)	470	-	6,555 to 7,165	6,555	10,020	470
Subtotal	**839**	**-**	**11,129 to 15,221**	**11,129**	**18,200**	**839**
Mixed Use (0.25-1.0 FAR)[4]	626	-	6,498 to 25,996	11,973	20,270	626
Subtotal	**626**	**-**	**6,498 to 25,996**	**11,973**	**20,270**	**626**
Industrial Park (0.40-0.60 FAR)	559	-	9,739 to 14,610	9,739	6,610	559
- Haven Overlay (0.40-1.0 FAR)	215	-	3,745 to 9,365	3,745	7,950	215
General Industrial (0.50-0.60 FAR)	1,974	-	42,993 to 51,592	42,993	29,220	1,974
Heavy Industrial (0.40-0.50 FAR)	891	-	15,523 to 19,405	15,523	15,820	891
Subtotal	**3,639**	**-**	**72,000 to 94,972**	**72,000**	**59,600**	**3,639**
Open Space (0.0-0.10 du/ac)	483	2,496	-	-	-	2,979
Conservation	353	983	-	-	-	1,336
Flood Control/Utility Corridor	1,711	1,753	-	-	-	3,464
Subtotal	**2,547**	**5,232**	**-**	**-**		**7,779**
Civic/Regional (0.40-1.0 FAR)	130	-	2,265 to 5,662	2,265	1,050	130
Schools (0.10-0.20 FAR)	558	-	2,430 to 4,861	2,430	3,920	558
Parks	445	-	-	-	-	445
Subtotal	**1,133**	**-**	**4,695 to 10,523**	**4,695**	**4,970**	**1,133**
NON-RESIDENTIAL SUBTOTAL	**8,784**	**5,232**	**94,322 to 146,712**	**99,797**	**103,040**	**14,016**

Notes:

1. *The range of square footage is derived by multiplying the probable lower and upper threshold of intensity range by the number of acres, and rounded to the nearest hundred.*
2. *Non-residential FAR Range: lower number is the probable FAR on average, but in some cases it may be lower. Higher number is the maximum FAR allowed for any specific project.*
3. *Employment is calculated by using the Probable Square Feet and employment factors for each non-residential land use designations.*
4. *Mixed Use allows both residential and non-residential use.*

Table LU-18: Build Out Summary by Land Use

Table LU-18: Build Out Summary by Land Use

Land Use Designations	Acres[1]			Percent of Total	Target Dwelling Units			Probable Non-Residential (City Only)	
	City	SOI	Total		City	SOI	Total	Square Feet (In thousands)	Employment
Hillside Residential (0.1-2.0 du/ac)	133	695	828	3.1%	151	831	982	-	-
Very Low Residential (0.1-2.0 du/ac)	4,007	-	4,007	15.1%	7,394	-	7,394	-	-
Low Residential (2.0-4.0 du/ac)	4,371	-	4,371	16.5%	18,050	-	18,050	-	-
Low Medium Residential (4.0-8.0 du/ac)	1,852	-	1,852	7.0%	13,320	-	13,320	-	-
Medium Residential (8.0-14.0 du/ac)	790	-	790	3.0%	9,283	-	9,283	-	-
Medium High Residential (14.0-24.0 du/ac)	367	-	367	1.4%	7,432	-	7,432	-	-
High Residential (24.0-30.0 du/ac)	44	-	44	0.2%	1,221	-	1,221	-	-
Mixed Use[2]	902	-	902	3.4%	5,345	-	5,345	11,973	20,270
Office (0.40-1.0 FAR)	86	-	86	0.3%	-	-	-	1,497	3,180
Neighborhood Commercial (0.25-0.35 FAR)	164	-	164	0.6%	-	-	-	1,785	3,030
Community Commercial (0.25-0.35 FAR)	119	-	119	0.4%	-	-	-	1,292	1,970
General Commercial (0.25-0.35 FAR)	470	-	470	1.8%	-	-	-	6,555	10,020
Industrial Park (0.40-0.60 FAR)	559	-	559	2.1%	-	-	-	9,739	6,610
- Haven Ave Office Overlay (0.40-1.0 FAR)	215	-	215	0.8%	-	-	-	3,745	7,950
General Industrial (0.50-0.60 FAR)	1,974	-	1,974	7.4%	-	-	-	42,993	29,220
Heavy Industrial (0.40-0.50 FAR)	891	-	891	3.4%	-	-	-	15,523	15,820
Open Space (0.0-0.1 du/ac)	483	2,496	2,979	11.2%	-	226	226	-	-
Conservation	353	983	1,336	5.0%	-	-	-	-	-
Flood Control/Utility Corridor	1,711	1,753	3,464	13.0%	-	-	-	-	-
Civic/Regional 0.40-1.0 FAR)	130	-	130	0.5%	-	-	-	2,265	1,050
Schools (0.10-0.20 FAR)	558	-	558	2.1%	-	-	-	2,430	3,920
Parks	445	-	445	1.7%	-	-	-	-	-
GRAND TOTAL	**20,624**	**5,927**	**26,551**	**100.0%**	**62,196**	**1,057**	**63,253**	**99,797**	**103,040**

Notes:

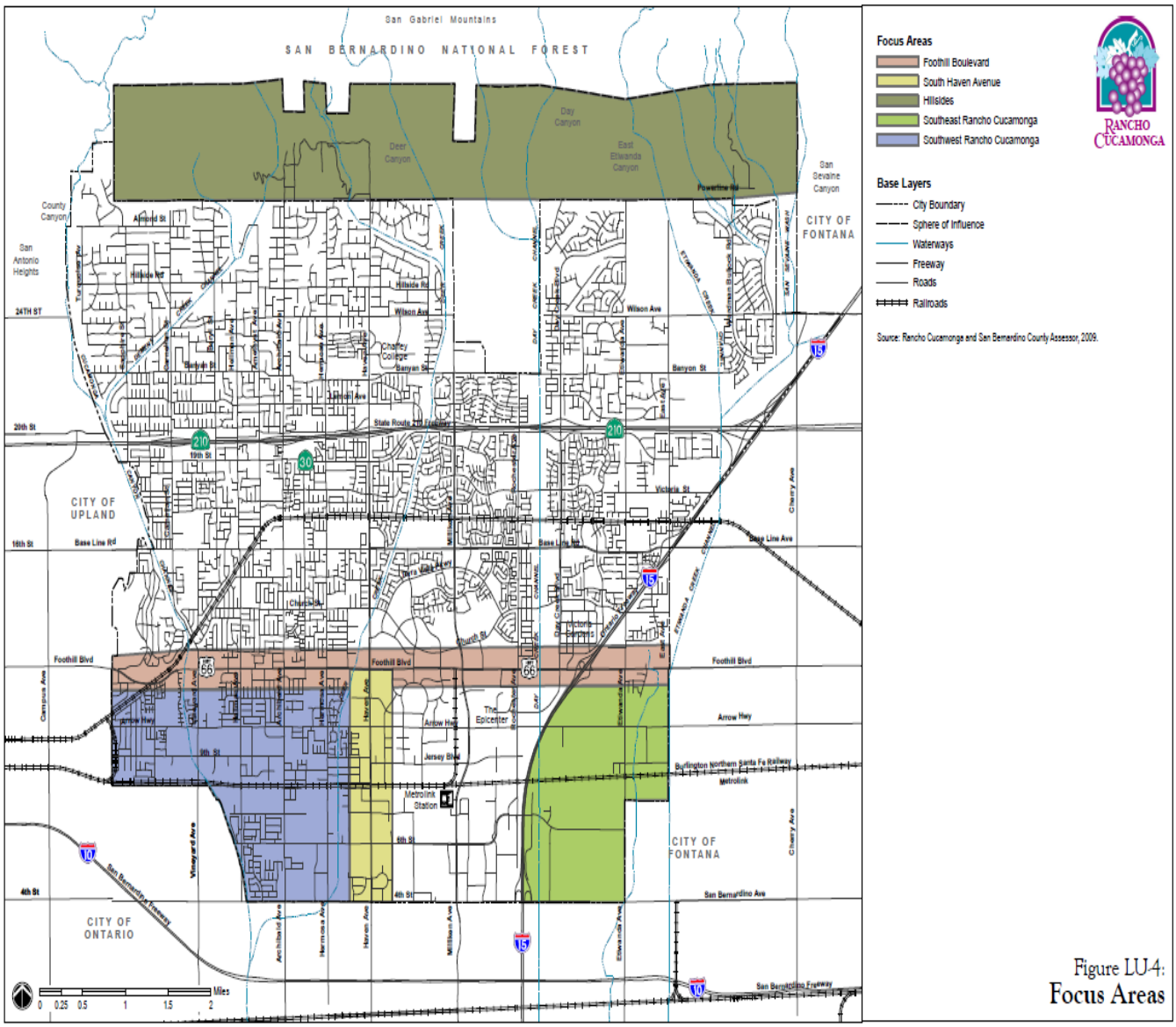
1. *Acres include existing development and undeveloped vacant properties.*
2. *Mixed Use allows both residential and non-residential uses.*

1.3.5 Development Trends

A combination of the current economic climate and being close to build out with current space has curtailed the City's expansion and made necessary careful planning. The City of Rancho Cucamonga is currently in the process of creating an Economic Development Strategic Plan to address future expansion.

Focus Areas

The process of preparing the LHMP involved focusing on potential areas of change, both from a geographic standpoint and a strategic or policy standpoint. For each of these potential areas of change, or focus areas, existing conditions were evaluated, and alternative directions were developed and analyzed. These focus areas are Foothill Boulevard, South Haven Avenue, Southwest, Southeast, and the Hillsides. See Map LU 4 for a graphical representation of Future focus areas.



Foothill Boulevard

The Foothill Boulevard Focus Area covers most of the length of Historic Route 66 as it runs through the City. While commercial uses predominate all along Foothill Boulevard, the western and eastern portions of the boulevard have distinct land use patterns. The western portion, which stretches from the western border of the City to roughly Haven Avenue, is fronted by comparatively small parcels, with housing developments directly behind them. In some instances, the residential uses extend all the way to Foothill Boulevard. The eastern portion, which runs from Haven Avenue to East Avenue, is fronted by much larger parcels that feature extensive retail centers surrounded by parking lots. The eastern portion also includes some of the large, vacant commercial lots remaining in Rancho Cucamonga, while the western portion is largely built out.

The vision for this area includes:

- Involving the concentration of community and regional serving uses east of Haven Avenue, while neighborhood serving uses are focused on the western portion

- Allow new mixed use, commercial, residential and civic development opportunities along the length of the boulevard

- Design new development in such a way as to accommodate both transit and automobile access

South Haven Avenue

The South Haven Avenue Focus Area covers a portion of Rancho Cucamonga that the City envisions as its major office corridor. The Development Code supports this vision through the use of an overlay district that offers incentives for office development. Haven Avenue, which north of the focus area runs past City Hall, is one of Rancho Cucamonga's most significant north-south corridors. To the south, the focus area borders the City of Ontario, making the large vacant property just inside the City of Rancho Cucamonga a prime location for a large "gateway" development to mark the entrance to the City. Established uses in the focus area range from small-scale office and commercial to large-scale light industrial and warehousing. Large vacant parcels exist throughout the area, although many have proposed or approved plans.

The vision for this area includes:

- Creating a central business hub at the intersection of Foothill Boulevard and Haven Avenue

- Encouraging development with an emphasis on the creation of pleasant, well-landscaped, office park settings, with restaurants and other amenities that are within walking distance for employees and visitors

- Attracting multi-story Class A office buildings

Southwest

The Southwest Focus Area is bordered to the south by the City of Ontario and to the west by the City of Upland. The area is divided north from the south by a Metrolink rail line that runs adjacent to 8th Street. Uses in the focus area are primarily light industrial and warehousing, but planned residential neighborhoods border the area to the southwest and the northeast. This area has several large vacant parcels remaining, although many have approved development plans. The focus area and the immediate surrounding area have several community centers, including the Mulberry Early Learning Center, Northtown Community

Center, and the RC Family Resource Center. The historic neighborhood of Northtown, which developed around the railroad tracks in the 1930s, is also located here, as is the historic Biane Winery.

The vision for this area includes:

- Allowing for the development of commercial and community services needed by the adjacent residential neighborhoods
- Encouraging the re-use and rehabilitation of historic or high-quality buildings to the greatest extent possible

Southeast

The Southeast Focus Area is bordered to the west by I-15 and to the east by unincorporated San Bernardino County and the City of Fontana. Heavy industrial uses, primarily steel and pipe manufacturing predominate. Development located directly north of the focus area includes a shopping center, a Metropolitan Water District reservoir, and a multi-unit residential neighborhood. The focus area surrounds Reliant Energy's Etiwanda Power Plant on Etiwanda Avenue. This area supports the only remaining land in Rancho Cucamonga devoted to heavy industrial uses; these businesses are a valuable source of employment and revenue.

The vision for this focus area includes:

- Concentrating heavy industrial uses
- Supporting infrastructure improvements to attract industrial, manufacturing, and green technology uses

Hillsides

The Hillside Focus Area is in unincorporated San Bernardino County, adjacent to Rancho Cucamonga's northern border; it lies within the City's Sphere of Influence. Most of the area consists of undeveloped hillsides, although large-lot residential also exists. The area also has significant land set aside for resource conservation in Day and East Etiwanda Canyons, where no development is allowed. Hillside development in Rancho Cucamonga is regulated by the Hillside Development Ordinance, which applies to all projects on land with natural slopes of eight percent grade or greater, with some exceptions, as indicated in the Ordinance. The Hillside Overlay District, as depicted on the Development District Map in the Development Code, defines the boundaries. The Hillside Overlay District also applies to areas outside of this focus area. The Ordinance includes a comprehensive set of guidelines and standards that seek to allow for reasonable development of hillside areas while minimizing the adverse effects of grading, protecting environmentally sensitive areas, and providing for public health and safety. The Ordinance contains basic design guidelines and minimum development standards. The intent is to encourage innovative and alternative

development solutions, as well as to establish minimum acceptable criteria. Clustering of units is encouraged where feasible, and positioning the units to "fit" the land and minimize grading is required.

The most significant provisions of the Ordinance involve the use of:

- Slope development standards, which require development integration with the slope and increasingly restrictive grading and structural design as the slope increases

- A slope density formula, which limits the maximum possible density allowed based upon the slope gradient

- Building envelopes, which limit the maximum allowable building height to 30 feet, as measured from the finished grade

The vision for the Hillside Focus Area includes:

- Limit development to densities that do not exceed the capacity of the City to provide public services and adequate public safety or the capacity of the land; in particular, the City's ability to protect any new development from wild-land and fires is a significant concern
- Protect visually prominent natural landforms and other sensitive land resources
- Protect natural resources and sensitive habitat
- Provide opportunities to experience natural habitats through education programs for students and trail extensions

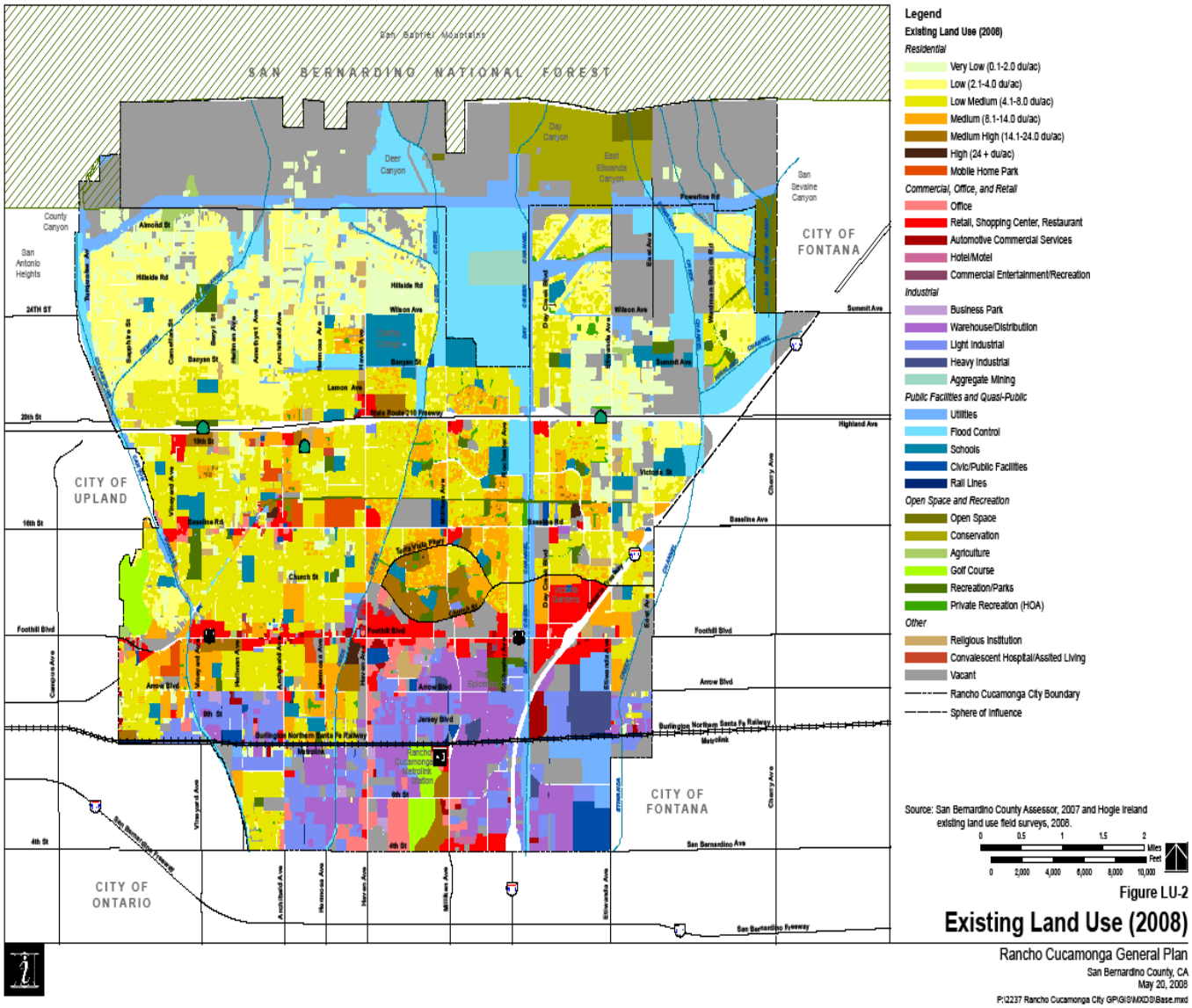
Table LU-19: Slope Development Guidelines

Table LU-19: Slope Development Guidelines

Percent Natural Slope	Guidelines
5 or less	This is not a hillside condition. Grading with conventional, fully padded lots and terracing is acceptable.
5 to 7.9	Development with grading is permitted in this zone, but existing landforms must retain their natural character. Padded building sites are permitted, however, techniques such as contour grading, combined slopes, limited cut and fill, and split level architecture, or padding for the structures only, may be required to reduce grading. When in conjunction with the techniques described above, and for a project within a master plan which includes special design features such as a golf course, extensive open space, or significant use of green belts or paseos, the Planning Commission may consider the use of mass grading techniques adjacent to these special design features as partial compliance with this standard.
8 to 14.9	This is a hillside condition. Special hillside architectural and design techniques that minimize grading are required in this zone. Architectural prototypes are expected to conform to the natural landform by using techniques such as split level foundations of greater than 18 inches, stem walls, stacking and clustering. In conjunction with the alternative techniques described above, and for a project within a master plan which includes special design features such as a golf course, extensive open space or significant use of green belts or paseos, the Planning Commission may consider padded building sites adjacent to those special features when it is found that said grading creates a better relationship between that special design feature and the adjacent lots.
15 to 29.9	Development within this zone is limited to no more than the less visually prominent slopes, and then only where it can be shown that safety, environmental and aesthetic impacts can be minimized. Use of larger lots, variable setbacks and variable building structural techniques such as stepped, or pole foundations are expected. Structures shall blend with the natural environment through their shape, materials, and colors. Impact of traffic and roadways is to be minimized by following natural contours, or using grade separations.
30 and over	This is an excessive slope condition and development is prohibited.

The vision for the Hillside Focus Area includes:

- Limit development to densities that do not exceed the capacity of the City to provide public services and adequate public safety or the capacity of the land; in particular, the City's ability to protect any new development from wildland and fires is a significant concern
- Protect visually prominent natural landforms and other sensitive land resources
- Protect natural resources and sensitive habitat
- Provide opportunities to experience natural habitats through education programs for students and trail extensions
- Maintain a natural "visual frame" for the northern edge of the City


SAN BERNARDINO NATIONAL FOREST
CITY OF FONTANA
CITY OF UPLAND
CITY OF ONTARIO
CITY OF FONTANA
Legend
Existing Land Use (2008)
Residential
Very Low (0.1-2.0 du/ac)
Low (2.1-4.0 du/ac)
Low Medium (4.1-8.0 du/ac)
Medium (8.1-14.0 du/ac)
Medium High (14.1-24.0 du/ac)
High (24 + du/ac)
Mobile Home Park
Commercial, Office, and Retail
Office
Retail, Shopping Center, Restaurant
Automotive Commercial Services
Hotel/Motel
Commercial Entertainment/Recreation
Industrial
Business Park
Warehouse/Distribution
Light Industrial
Heavy Industrial
Aggregate Mining
Public Facilities and Quasi-Public
Utilities
Flood Control
Schools
Civic/Public Facilities
Rail Lines
Open Space and Recreation
Open Space
Conservation
Agriculture
Golf Course
Recreation/Parks
Private Recreation (HOA)
Other
Religious Institution
Convalescent Hospital/Assited Living
Vacant
Rancho Cucamonga City Boundary
Sphere of Influence
Source: San Bernardino County Assessor, 2007 and Hogle Ireland existing land use field surveys, 2008.
Miles
Feet
Figure LU-2
Existing Land Use (2008)
Rancho Cucamonga General Plan
San Bernardino County, CA
May 20, 2008
P:\2237 Rancho Cucamonga City GP\GIS\MXD\BBase.mxd

Section 2-Plan Adoption

2.1 Adoption by Local Governing body

REQUIREMENT §201.6(c)(5):	[The local hazard mitigation plan shall include] documentation that the plan has been formally adopted by the governing body of the jurisdiction requesting approval of the plan (e.g., City Council, County Commissioner, Tribal Council) …

2.2 Promulgation Authority

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

City of Rancho Cucamonga City Council

REQUIREMENT §201.6(c)(5):	For multi-jurisdictional plans, each jurisdiction requesting approval of the plan must document that it has been formally adopted.

2.3 Primary Point of Contact

The Point of Contact for information regarding this plan is:

Breanna Medina
Emergency Management Coordinator
City of Rancho Cucamonga/Rancho Cucamonga Fire Protection District
10500 Civic Center Dr.
Rancho Cucamonga, CA 91730
909-477-2700
breanna.medina@cityofrc.us

Section 3 - Planning Process

3.1 Preparing for the Plan

For the update to the Local Hazard Mitigation Plan, The City of Rancho Cucamonga joined with the San Bernardino County Fire Department Office of Emergency Services (OES) who is coordinating the update of the *San Bernardino County Operational Area Multi-Jurisdictional Multi-Hazard Mitigation Plan*. As required by the Department of Homeland Security's Federal Emergency Management Agency (DHS-FEMA), all Hazard Mitigation Plans (HMP) must be updated, adopted and approved every five (5) years. The purpose of the update is to validate and incorporate new information into the plan and identify progress that has been made since the last approval of the plan. It should also be noted that an approved HMP is required to receive federal assistance under the Hazard Mitigation Grant Program (HMGP) or Pre-Disaster Mitigation (PDM) programs.

The current *San Bernardino County Operational Area Multi-Jurisdictional Multi-Hazard Mitigation Plan* process consists of information from 55 local HMPs, which are included as an annex to the County's Operational Area plan. The 55 participants include all 24 incorporated cities and towns, 30 special districts, and the unincorporated county.

San Bernardino County Fire OES hired a contractor (ICF International) to support the County, Cities and Towns, and Special Districts to update the 55 local HMPs and the *San Bernardino County Operational Area Multi-Jurisdictional Multi-Hazard Mitigation Plan*. The ICF Team, which includes subcontractors MMI Engineering and Natural Hazards, 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, not only to expedite the HMP update process, but also 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://tmsprojects.icfi.com/sbhmpupdate/default.aspx) to ensure the same information is available to all participants.

The City 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 2005 Local Hazard Mitigation Plan.

The following regulations (44 CFR 201.6) were adhered to:

- 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 vs. 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.

The City of Rancho Cucamonga completed a comprehensive revision to the General Plan in 2010. Emphasis was placed on the importance of incorporating the Local Hazard Mitigation Plan as an extension of that revision.

3.1.1 Planning Team

Falling in line with the planning process already established at the Operational Area level; the City formed an internal/external planning team to include representatives from city departments, external stakeholders/agencies and the general public. The following planning team developed and implemented the City of Rancho Cucamonga Local Hazard Mitigation Plan update and performed a liaison function between internal/external groups where appropriate.

Core Planning Team Members included:

- Breanna Medina, City of Rancho Cucamonga, Emergency Management (Chair)
- Kelley Donaldson, City of Rancho Cucamonga, Fire District
- John Thomas, City of Rancho Cucamonga, Building and Safety Dept.
- Joe Stofa, City of Rancho Cucamonga, Engineering Dept.
- Ingrid Bruce, City of Rancho Cucamonga, GIS/Special Districts Dept.
- Larry Henderson, City of Rancho Cucamonga, Planning Dept.
- Ernie Ruiz, City of Rancho Cucamonga, Public Works Services Dept.
- Sue Churchill, Chaffey Joint Union School District
- Michael Gregory, City of Ontario, Office of Emergency Management

The planning process for the City of Rancho Cucamonga Local Hazard Mitigation Plan began with the San Bernardino County Kick-Off meeting on July 15, 2010. Additional meetings of the core planning team were held as follows and all agendas and meeting specifics can be found in Section 8-Additional Documents:

City of Rancho Cucamonga
2010 Local Hazard Mitigation Plan
Kick-Off Meeting #1

July 15, 2010
5:00 pm to 6:00pm
City of Rancho Cucamonga
2010 Local Hazard Mitigation Plan
Planning Team Meeting #2
July 29, 2010
10:00 am to 11:30 am

City of Rancho Cucamonga
2010 Local Hazard Mitigation Plan
Planning Team Meeting #3
August 12, 2010
1:00 pm to 2:30 pm

Additional correspondence with the planning team occurred through e-mail and via phone conversation. All supporting documentation for this communication can be found in Section 8-Additional Documents.

3.2 Coordination with Other Jurisdictions, Agencies and Organizations

While the bulk of the 2010 Local Hazard Mitigation Plan Update was executed by the Planning Team, there were additional members consulted during the process and included representatives and/or contact (subject matter experts) from the following agencies:

- Cucamonga Valley Water District
- Sempra Energy
- Etiwanda School District
- County of San Bernardino
- City of Ontario
- City of Fontana
- American Red Cross
- Inland Empire United Way
- ICF International
- National Weather Service (NWS)
- Federal emergency Management Agency (FEMA)
- California Emergency Management Agency (CalEMA)

3.3 Public Involvement/Outreach

The 2005 Local Hazard Mitigation Plan update required extensive meetings and research as there was no pre-existing document from which to build on. In contrast, the 2010 Local Hazard Mitigation Plan Update had the benefit of a historical document and public involvement was limited to reviewing present information for accuracy and performing the review function on the final draft. This was accomplished by engaging the following public groups:

Rancho Cucamonga Fire Safe Council
Contact: Dennis Cisneros, President

(909) 948-5325

City of Rancho Cucamonga
Auxiliary Communications Service
Contact: Mike Albertson
(909) 908-5614

The use of social media was also introduced in this update and the public was kept informed and encouraged to participate in this process through the use of Facebook.

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 2005 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 2005 Hazard Mitigation Plan as necessary.

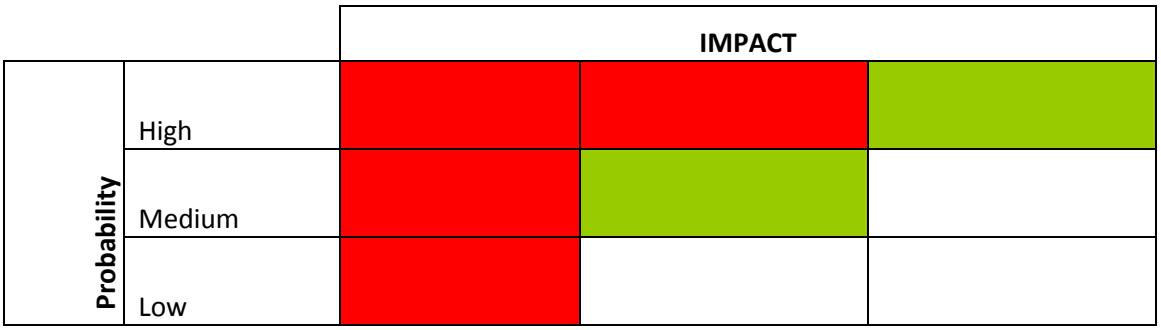
The intent of screening of hazards is to help prioritize which hazard creates the greatest concern in the community. Because the original 2005 process used to rank hazards (Critical Priority Risk Index (CPRI) software) was not utilized, the Planning Team screened hazards creating the greatest concern in the community.

The Planning Team utilized a non-numerical ranking system for the update process. This process consisted of generating a non numerical ranking (High, Medium, or Low) rating for the probability and impact from each screened hazard. The hazards were then placed in the appropriate/corresponding box/cell. The table below is an example of how the hazards were ranked. In this example the “Red” boxes represent the higher priority hazards; and the “Orange” and “Yellow” boxes represent additional levels of priority.

The definition of “High”, “Medium”, and “Low” probability and impacts are as follows:

Probability
High- Highly Likely/Likely
Medium- Possible
Low- Unlikely

Impact
High- Catastrophic/Critical
Medium- Limited
Low- Negligible



3.5 Set Goals

Project and community hazard mitigation goals and objectives 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. These were then commented on by stakeholders to refine the goals, resulting in a consensus agreement.

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.

Based on STAPLEE, the Planning Team addressed the following questions to determine mitigation options:

Does the Action:

- Solve the problem?
- Address Vulnerability Assessment?
- Reduce the exposure or vulnerability to the highest priority hazard?
- Address multiple hazards?
- Address more than one (1) Goal/Objective?
- Benefits equal or exceed costs?

Can the Action:

- Be implemented with existing funds?
- Be implemented by existing state or Federal grant programs?
- Be completed within the 5-year life cycle of the LHMP?
- Be implemented with currently available technologies?

Will the Action:

- Be accepted by the community?
- Be supported by community leaders?
- Adversely impact segments of the population or neighborhoods?
- Require a change in local ordinances or zoning laws?
- Result in legal action such as a lawsuit?
- Positively or negatively impact the environment?
- Comply with all local, state and federal environmental laws and regulations?

Is there:

- Sufficient staffing to undertake the project?
- Existing authority to undertake the project?

3.7 Draft the Hazard Mitigation Plan

The Hazard Mitigation Plan was drafted by the Planning Team members following the 2005 Hazard Mitigation Plan, the guidance document and Hazard Mitigation Plan outline provided by the consultant, and input from all stakeholders and City departments. The Planning Team provided opportunity for public comment and input and uploaded the draft Plan to the City's website at www.cityofrc.us/firedepartment. FEMA Guidance documents for Hazard Mitigation were also used extensively as additional reference materials. The results of the mitigation activities review are summarized in the Hazard Mitigation Plan update. The draft plan will be circulated for additional comment and review.

3.8 Adopt the Plan

After the public review, the draft plan was submitted to Cal EMA/FEMA for review and approval. FEMA provided the City with an “Approval Pending Adoption” letter because the Hazard Mitigation Plan update meets all federal requirements. Upon receipt of this letter, the final plan will be submitted to the Rancho Cucamonga City Council for consideration and adoption. Once adopted, the final Resolution will be submitted to FEMA for incorporation into the Hazard Mitigation Plan.

Adoption of the Hazard Mitigation Plan is only the beginning of this effort. City 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 post-disaster mitigation funding.

Section 4 - Risk Assessment

The goal of mitigation is to reduce the future impacts of a hazard including property damage, disruption to local and regional economies, and the amount of public and private funds spent to assist with recovery. However, mitigation should be based on risk assessment.
A risk assessment is measuring the potential loss from a hazard event by assessing the vulnerability of buildings, infrastructure and people. It identifies the characteristics and potential consequences of hazards, how much of the community could be affected by a hazard, and the impact on community assets. A risk assessment consists of three components: hazard identification, vulnerability analysis and risk analysis. Technically, these are three different items, but the terms are sometimes used interchangeably.

4.1 Hazard Identification

4.1.1 Hazard Screening Criteria

While there are many minor hazards that may affect the community. The planning team decided to focus on the main natural hazards that would most likely impact the city most frequently or catastrophically. This included: Flooding, Wildfires, Winds and Earthquake. Additionally, the man made threat of terrorism was added.

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

- Historic Occurrence of the Hazard - Assessment is based on frequency, magnitude and potential impact of the hazard.

- Mitigation Potential for the Hazard – Criteria considers if there are mitigation or counter measures possible to prevent or alleviate the risk.

- Expert Opinion - Evaluation of threats includes a literature review and the expertise of the Planning Team.

- Published Data and Information - Assessment is based on data and/or information from credible publications or websites. (i.e., U.S. Geological Survey, California Geological Survey, National Weather Service - National Climatic Data Center, or academic publications)

4.1.2 Hazard Assessment Matrix

Rankings used for the hazard screening were defined as follows:

High- There may or may not have been historic occurrences of the hazard in the community or region but experts feel that it is likely that the hazard will occur in the community and the risk is significant. Citizens feel that there is a likelihood of occurrence and the consequences will be significant in terms of building damage and loss of life.

Medium- There may or may not have been a historic occurrence of the hazard in the community or region but experts feel that it is possible that the hazard could occur in the community. Citizens may feel that there is a likelihood of occurrence but the consequences will be negligible in terms of building damage and loss of life.

Low- There have been no historic occurrences of the hazard in the community or region and experts feel that it is highly unlikely that the hazard will occur in the community.

The following table represents the hazards facing the community and their defined impact:

4.1.3. Hazard Prioritization

The results of the screening process described above are presented as a hazard assessment matrix. The matrix illustrates the nature and potential of threats from natural disasters to the City of Rancho Cucamonga. The Planning Team reviewed the probability and impact for each screened hazard and the potential for implementing mitigation measures to reduce the risk. The results were reviewed and modified during stakeholder meetings and a prioritized ranking of the hazards was developed. As shown in the table below, there were two hazards that were given a high priority: flooding, and wildfires.

		IMPACT		
		High	Medium	Low
Probability	High	Flooding Wildfires		
	Medium		High/Straight Line Winds	
	Low	Earthquake Terrorism		

4.2 Hazard Profile

4.2.1 Earthquake

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

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

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

There are 45 states and territories in the United States at moderate to very high risk from earthquakes, and they are located in every region of the country. California experiences the most frequent damaging earthquakes; however, Alaska experiences the greatest number of large earthquakes—most located in uninhabited areas. The largest earthquakes felt in the United States were along the New Madrid Fault in Missouri, where a three-month long series of quakes from 1811 to 1812 included three quakes larger than a magnitude of 8 on the Richter Scale. These earthquakes were felt over the entire Eastern United States, with Missouri, Tennessee, Kentucky, Indiana, Illinois, Ohio, Alabama, Arkansas, and Mississippi experiencing the strongest ground shaking.

Description:
The City of Rancho Cucamonga is located near two of California’s most active faults, the San Andreas and the San Jacinto. Both of these faults have the potential to generate an earthquake in the relatively near future. The Cucamonga fault, another major factor in the tectonics of the area, is located in the northernmost area of the City. In the event of an earthquake, the location of the epicenter as well as the time of day and season of the year would have a profound effect on the number of deaths and casualties, as well as property

damage.
A moderate earthquake occurring in or near the City could result in deaths, casualties, property damage, environmental damage, and disruption of normal government and community services and activities. The effects could be aggravated by collateral emergencies such as fires, flooding, hazardous material spills, utility disruptions, landslides, and transportation emergencies.

Given the magnitude of the earthquake, the community needs may exceed the response capability of the City's emergency management organization, requiring mutual assistance from the County, volunteer and private agencies, the California Emergency Management Agency, and the Federal Emergency Support Functions.

Historical Profile:
Although the City of Rancho Cucamonga's seismic history does not indicate any sizable earthquakes occurring in the City, residents have been affected by numerous earthquakes in the region that have produced significant ground shaking.

The Southern California landscape clearly reveals the earth forces that shaped the region and that we live with daily. The mountain ranges are expressions of the Earth's surface moving, which continues to push the San Gabriel Mountains upward at a rate of up to two centimeters per year. As a result of location, Rancho Cucamonga needs to plan for potential earthquakes, secondary seismic effects, and geologic conditions.

While many natural and man-made hazards have the potential to impact the City, the event with the greatest potential for loss of life, property, and economic damage is an earthquake. The hazards associated with an earthquake in Rancho Cucamonga include ground shaking, fault rupture, landslides, and foundation failures caused by liquefaction or settlement. Earthquakes can also trigger many secondary effects such as landslides and rock falls, urban fires, building collapse, water tank or dam failures, disruption of essential facilities and systems (water, sewer, gas, electricity, transportation, and communications), and hazardous materials releases.

Ground shaking is the general term that refers to all aspects of movement of the Earth's surface resulting from a seismic event. Ground shaking is normally the major cause of damage in earthquakes, and the amount of damage generally correlates to the magnitude of the earthquake and proximity to the event's epicenter.
The City of Rancho Cucamonga is located near two of California's most active faults, the San Andreas and San Jacinto Faults. These faults are thought to have the highest probability of generating a large earthquake in the near future (up to 7.3 and 6.7 magnitude, respectively). While activity on the San Andreas and San Jacinto Faults is considered more likely, a major earthquake (7.0 magnitude) on the Cucamonga Fault, located in the northern Sphere of Influence, is assumed to be the worst-case earthquake scenario for the City. Ground displacements of up to 9 feet could occur along the fault, intense ground shaking could last more than 30 seconds, and losses could be extensive.

Another major fault, traversing the City in a northeast direction, is the Red Hill Fault. This fault consists of three segments: (1) the Etiwanda Avenue Fault Scarp, which has been shown to be clearly active; (2) a southern section at the base of Red Hill with uncertain activity; and (3) a probable central segment that has not yet been located. The Etiwanda Avenue Fault Scarp (potential for 6.5 magnitude earthquake) is considered capable of ground shaking at an intensity that presents unacceptable risks to proposed structures. The other two segments, not yet detected, could induce further damage.

The following section lists and describes the historical events associated with this hazard in City of Rancho Cucamonga.

1. Hector Mine-10/16/1999
This magnitude 7.1 quake occurred 61 miles east of Rancho Cucamonga. Modified Mercalli Intensity = IV
Barstow, CA

2. Northridge-1/17/1994
This magnitude 6.7 quake occurred 54 miles west of Rancho Cucamonga. Modified Mercalli Intensity = V
Northridge, CA

3. Big Bear-6/28/1992
This 6.4 magnitude quake occurred 44 miles east of Rancho Cucamonga. Modified Mercalli Intensity = V
Big Bear, CA

4. Landers-6/28/1992
This 7.3 magnitude quake occurred 55 miles east of Rancho Cucamonga. Modified Mercalli Intensity = VI
Landers, CA

5. Joshua Tree-4/22/1992
This 6.1 magnitude quake occurred 59 miles east-southeast of Rancho Cucamonga. Modified Mercalli Intensity = III
Joshua Tree, CA

6. Sierra Madre-6/28/1991
This 5.8 magnitude quake occurred 16 miles west of Rancho Cucamonga. Modified Mercalli Intensity = V
Sierra Madre, CA

7. Upland-2/28/1990
This 5.4 magnitude quake occurred 6 miles southwest of Rancho Cucamonga. Modified Mercalli Intensity = VIII
Upland, CA

8. Upland-6/26/1988
This 4.7 magnitude quake occurred 6 miles southwest of Rancho Cucamonga. Modified Mercalli Intensity = VII

Upland, CA

9. Whittier-Narrows-10/1/1987
This 5.9 magnitude quake occurred 23 miles southwest of Rancho Cucamonga. Modified Mercalli Intensity = IV
Whittier, CA

10. North Palm Springs-7/8/1986
This 5.6 magnitude quake occurred 47 miles east-southeast of Rancho Cucamonga. Modified Mercalli Intensity = III
Palm Springs, CA

11. Lytle Creek-9/12/1970
This 5.2 magnitude quake occurred 5 miles northeast of Rancho Cucamonga. Modified Mercalli Intensity = VII
Lytle Creek, CA

12. Desert Hot Springs-12/4/1948
This 6.0 magnitude quake occurred 55 miles east of Rancho Cucamonga. Modified Mercalli Intensity = IV
Desert Hot Springs, CA

13. Long Beach-3/10/1933
This magnitude 6.4 quake occurred 35 miles southwest of Rancho Cucamonga. Modified Mercalli Intensity = V
Long Beach, CA

14. San Jacinto-4/21/1918
This 6.8 magnitude quake occurred 35 miles southwest of Rancho Cucamonga. Modified Mercalli Intensity = VI
San Jacinto, CA

15. Elsinore-12/25/1899
This 6.0 magnitude quake occurred 19 miles south of Rancho Cucamonga. Modified Mercalli Intensity = VI
Elsinore, CA

16. Cajon Pass-7/22/1899
This 5.7 magnitude quake occurred 5 miles northeast of Rancho Cucamonga. Modified Mercalli Intensity = VIII
Cajon Pass, CA

17. Wrightwood-12/8/1812
This 7.5 magnitude quake occurred 7 miles northeast of Rancho Cucamonga. Modified Mercalli Intensity = VIII
Wrightwood, CA

The following table provides data on the epicenters and magnitudes of earthquakes that have resulted in significant ground-shaking in the City of Rancho Cucamonga.

Date of Incident	Magnitude	Modified Mercalli Intensity (MMI) at Rancho Cucamonga	Location Relative to "Downtown" Rancho Cucamonga
Oct. 16, 1999; 2:40 am	7.1	IV	Hector Mine; 61 miles east
Jan. 17, 1994; 4:31 am	6.7	V	Northridge; 54 miles west
June 28, 1992; 8:05 am	6.4	V	Big Bear; 44 miles east
June 28, 1992; 4:57 am	7.3	VI	Landers; 55 miles east
April 22, 1992; 9:50 pm	6.1	III	Joshua Tree; 59 miles east-southeast
June 28, 1991; 7:43 am	5.8	V	Sierra Madre; 16 miles west
Feb. 28, 1990; 3:43 pm	5.4	VIII	Upland; 6 miles southwest
June 26, 1988; 8:05 am	4.7	VII	Upland; 6 miles southwest
Oct. 1, 1987; 7:42 am	5.9	IV	Whittier-Narrows; 23 miles southwest
July 8, 1986; 2:21 am	5.6	III	North Palm Springs; 47 miles east-southeast
Sept. 12, 1970; 7:30 am	5.2	VII	Lytle Creek; 5 miles northeast
Dec. 4, 1948; 3:43 pm	6.0	IV	Desert Hot Springs; 55 miles east
March 10, 1933; 5:54 pm	6.4	V	Long Beach; 35 miles southwest
April 21, 1918; 2:32 pm	6.8	VI	San Jacinto; 35 miles southwest
May 15, 1910; 7:47 am	6.0	VI	Elsinore; 19 miles south
Dec. 25, 1899; 4:25 am	6.5	V	San Jacinto; 45 miles east-southeast
July 22, 1899; 12:32 pm	5.7	VIII	Cajon Pass; 5 miles northeast
Dec. 8, 1812; 7:00 am	7.5	VIII	Wrightwood; 7 miles northeast

The entire geographic area of California is prone to the effects of an earthquake. UCERF probabilities of having a nearby earthquake rupture (within 3 or 4 miles) of magnitude 6.7 or larger in the next 30 years, exceeds 99%. The 30-year probability of an even more powerful quake of magnitude 7.5 or larger is about 46%.

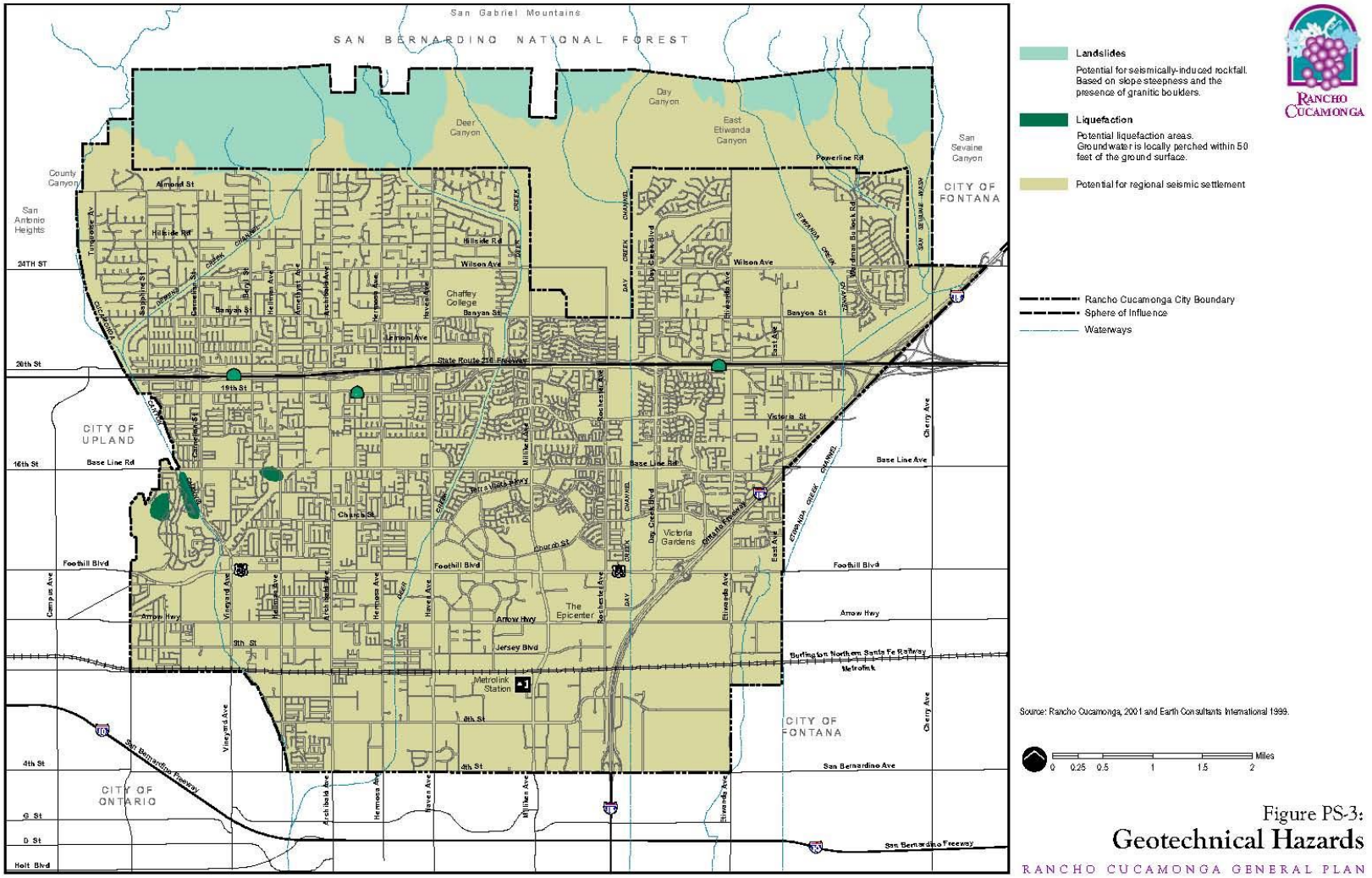
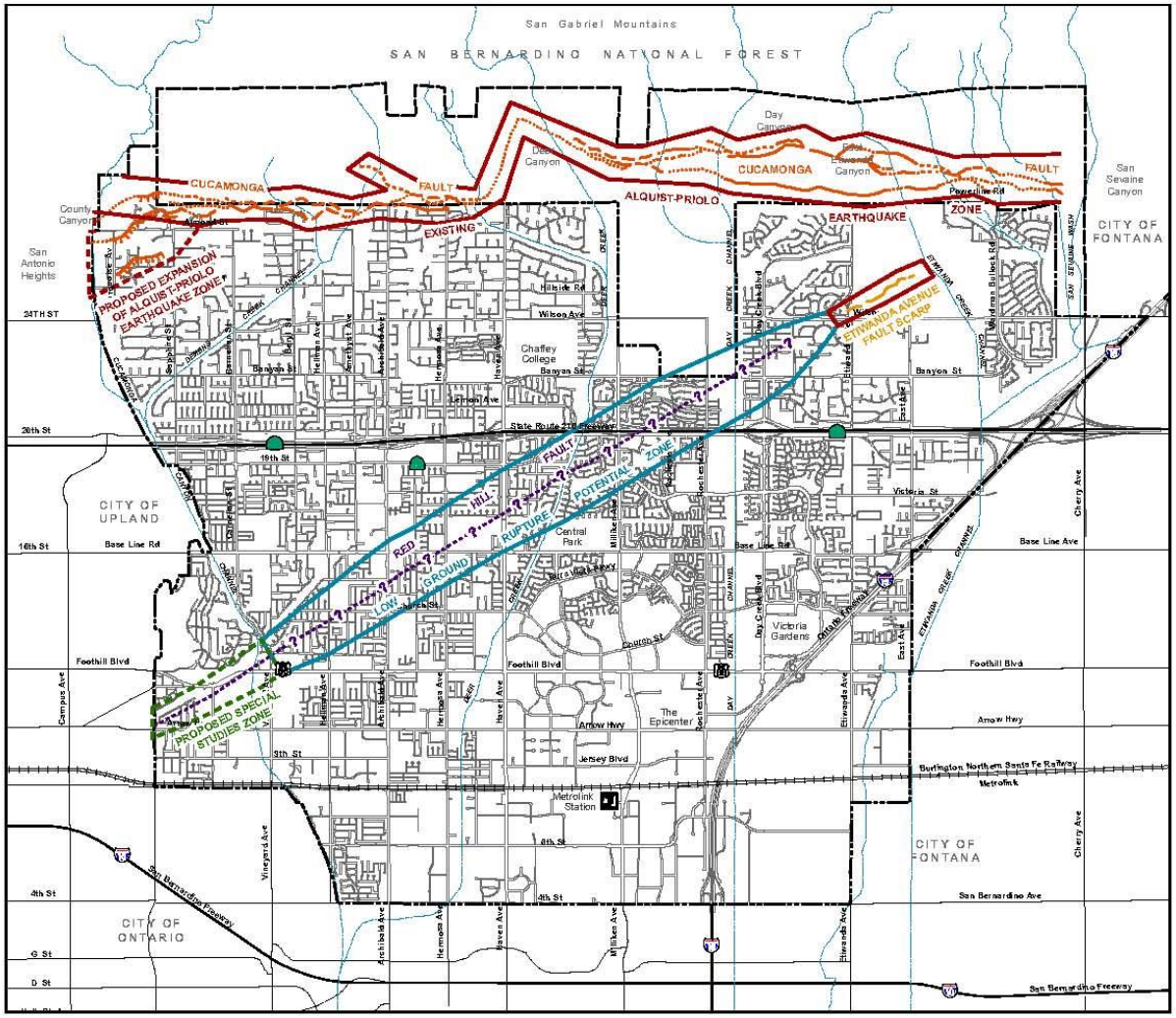


Figure PS-3:
Geotechnical Hazards
RANCHO CUCAMONGA GENERAL PLAN



Legend

Fault Zones

- Existing Alquist-Priolo Earthquake Zone *
- Proposed Expansion of Alquist-Priolo Earthquake Zone *
- Proposed Special Studies Zone *
- Low Ground Rupture Potential Zone **

* All proposed structures for human occupancy within these zones shall require special fault hazard studies.

** Associated with the uncertain segment of Red Hill Fault, special studies/foundations recommended for essential/critical facilities.

Active Faults

Cucamonga Fault
- Fault Accurately Located
- Fault Approximately Located
- Fault Inferred
- Fault Concealed
- Fault Scarp (ticks indicate downthrown side)

Etiwanda Avenue Fault Scarp
- Fault Accurately Located

Red Hill Fault
- Fault Inferred
- Fault Queried (uncertain)

Base Map
- Rancho Cucamonga City Boundary
- Sphere of Influence

Source: City of Rancho Cucamonga, 2008 and Earth Consultants International, 2000.

0 0.25 0.5 1 1.5 2 Miles

Figure PS-2:
Fault Hazards
RANCHO CUCAMONGA GENERAL PLAN

4.2.2. Flooding

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

A flood, as defined by the National Flood Insurance Program 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 your property) from:

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

The collapse or subsidence of land along the shore of a lake or similar body of water as a result of erosion or undermining caused by waves or currents of water exceeding anticipated cyclical levels that result in a flood."

Floods can occur incrementally, or be fast rising but generally develop over a period of 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 steps 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 to your home and financial loss from building and crop damage should a flood or flash flood occur. Flooding tends to occur in the summer and early fall because of the monsoon and is typified by increased humidity and high summer temperatures.

The standard for flooding is the so-called "100-year flood," a benchmark used by the Federal Emergency Management Agency to establish a standard of flood control in communities throughout the country. Thus, the 100-year flood is also referred to as the "regulatory" or "base" flood.

Actually, there is little difference between a 100-year flood and what is known as the 10-year flood. Both terms are really statements of probability that scientists and engineers use to describe how one flood compares to others that are likely to occur. In fact, the 500-year flood and the 10-year flood are only a foot apart on flood elevation-which means that the elevation of the 100-year flood falls somewhere in between. The term 100-year flood is often incorrectly used and can be misleading. It does not mean that only one flood of that size will occur every 100 years.

What it actually means is that there is a one percent chance of a flood of that intensity and elevation happening in any given year. In other words, it is the flood elevation that has a one percent chance of being equaled or exceeded each year. And it could occur more than once in a relatively short period of time. (By comparison, the 10-year flood means that there is a ten percent chance for a flood of its intensity and elevation to happen in any given year.) Rod Bolin, The Ponca City News, July 18, 2002. Page 5-A

Description:
Although the City of Rancho Cucamonga has experienced periods of significant drought, the City can experience substantial rainfall. The soil in the City is generally not able to effectively absorb water quickly, nor is it able to absorb a large volume of water. Therefore, when Rancho Cucamonga does experience heavy rain, or rain over a period of days or weeks, flash flooding is a common problem. This kind of event can occur even during a drought. A heavy rain can occur, and create flash floods, without relieving the overall drought conditions.

Floods are generally classed as either slow-rise or flash floods. Flash floods are the most difficult for which to prepare due to the extremely short warning time, if there is any at all. Flash flood warnings usually require immediate evacuation. On some occasions in the desert areas, adequate warning may be impossible. Conversely, slow-rise floods may be preceded by a warning time lasting from hours to days, or possibly weeks. Evacuation and sandbagging for a slow rise flood may lessen flood-related damage.

Historical Profile:
Even though historic records for the area exist only for the last 150 years, those records show rainfalls of three to five inches per hour and as much as 40 to 50 inches per storm. America's "Flood Book", the NOAA Atlas, shows 24 inches of rainfall per day for highest expected rainfall at Cucamonga's Peak, compared to many states where highest expected rainfall is only 3 to 5 inches per day. Rancho Cucamonga flood flows differ from the normal riverine model flooding in that nearly all of Rancho Cucamonga's flood problems are related to the sudden alluvial fan flood flows which occur without warning and make evacuations difficult.

However, the greatest danger is not from flood waters but from the debris that often accompanies flooding. After watershed burns, the flood and debris danger increases thirty-fold. Local peaks are also the only ones in the San Gabriel Mountains which regularly accumulate significant snow pack. The City's greatest floods have occurred when warm storms from the Pacific Ocean hit the snow covered peak, causing excessive run-off as the snow quickly melts. Local newspapers described the snow run off as quick as "melting ice cubes in a cup of hot water."

Rancho Cucamonga, due to its location at the base of the San Gabriel Mountains, has a history of flooding. Many of the streets in the northern portion of the City have been known to flood. Comprehensive storm drain improvements and flood control projects have reduced the threat of floods somewhat, but not entirely. An unusually large storm and flash flooding can create flooding hazards within the City.

The largest flood in recent memory occurred in 1969, and many residents were not prepared for a flood of this size. A damaged flood levee structure in the Cucamonga Spreading Grounds failed, causing the Cucamonga Creek to breach its channel and resulted in $68 million in damages. Another major flood occurred in 1977; damages were especially severe on Vineyard Avenue and Hellman Avenue.

The most recent large-scale flood occurred in 1983. Alta Loma High School on Base Line Road was damaged with more than 30 of its classrooms flooded. Flood waters damaged asphalt streets in the City causing wash-outs, cave-ins, and flooded homes.

The unpredictable range in seasonal rainfall that is typical of Southern California, coupled with the location near the San Gabriel Mountains, makes Rancho Cucamonga vulnerable to flooding during the winter storm season. To prepare and mitigate hazards from flooding, Rancho Cucamonga participates in the National Flood Insurance Program. Flood Insurance Rate Maps, or FIRMs, are prepared by the Federal Emergency Management Agency (FEMA) to identify potential flood zones. Figure PS-5: Flood Hazard Zones, identifies the "Special Flood Hazard Areas" for Rancho Cucamonga, as recorded by FEMA. The Flood Hazard map shows locations of essential public facilities.

Flood hazards related to storm events are generally described in terms of a 100- or 500-year flood. These are floods that, respectively, have a 1.0 percent and 0.2 percent chance of occurring every year. Rancho Cucamonga has adopted flood protection standards requiring minimum building elevation, flood proofing, and anchoring of buildings in areas that are identified as prone to flooding. The precise limits of the flood plain areas and the flood zone designations can be viewed on the FIRM maps in the City's Engineering Department.

Historical Events

The following section lists and describes the historical events associated with this hazard in City of Rancho Cucamonga.

1. 1983 Flood

In the 1983 storm area classrooms were flooded with mud and water. Alta Loma High School on Baseline was hit the hardest school with more than 30 classroom flooded. Flood waters ripped out asphalt streets and flooded homes. The street damages throughout the Cucamonga area were extensive with wash-outs and cave-ins common. The damage estimates for the streets alone exceeded $180,000 from just the initial hours of the storm.

2. 1977 Flood 8/16/1977

In August 16, 1977 a local summer storm spawned by a Baja hurricane caused flooding and street damage particularly on Vineyard and Hellman. Rancho reported the most rainfall anywhere in southern California.

During funding discussions, County Flood Control Director Shone estimated the 1978 storm caused $70 million in damages. More than $2 million of the damage was to local roads. Nearly $180,000 of the damage was to Beryl Avenue around Banyan. All the block retaining walls were washed out. Pieces of torn out asphalt floated down Hellman and Vineyard. The large chunks of pavement from Hellman Avenue formed a large dam diverting flood waters into 15 homes on La Vine street. Cucamonga Fire Department cleared the dam and checked on residents. It happened a second time around 2 AM in the morning, causing even more damage to the La Vine Street homes.

Debris got into the newly constructed Cucamonga Channel, causing severe damage to the concrete channel walls. Initially it was estimated it would cost only $250,000 to repair storm damage to the channel. However, as debris was removed from the channel, it became clear that whole sections of the channel would need to be rebuilt. The flood flows from that single storm had chewed away the entire six inch concrete wall, exposing and even damaging the rebar.

Thousands of feet of channel were in danger of totally collapsing during the storm. Had the storm lasted longer or been any more severe, the resulting channel failure would have cost more in both lives and extensive property damages. It cost more than $2,900,000 to repair the channel. Even more sobering was the reminder of the power and danger of flood flows from our canyons. Despite this reminder, there was so much additional development that Flood Director Shone estimated that if the 1978 storm had reoccurred in 1981, it would have caused $280 million in damages.

3. 1969 Flood March 1969

The largest flood in recent memory, the 1969 flood, rated as only the eighth largest storm in the previous hundred years. But most of Rancho's 15,000 residents were unprepared as it had been thirty years since a major storm. Complacency about flood dangers nearly resulted in disaster--no repairs were made when builders digging for fill dirt damaged a flood levee structure in Cucamonga Spreading Grounds. That levee failed. But the remaining levees and check dams held back the four million tons of debris which poured out of Cucamonga Canyon. This four million was in addition to the million and a half tons of debris already in the spreading grounds, left by the 1966 storm. The Spreading Grounds also reduced the peak canyon discharge from 15,000 cubic feet per second at the canyon mouth to less than 2,000 entering the channel. Most of the $68 million in damages resulted when the raging Cucamonga Creek hit a debris blockage and jumped out of its channel. This blockage was debris washout from a careless farm diversion. The fifteen-foot high wall of water carried an enormous 50,000 gallon wine barrel and wedged it between two buildings. The force of the flood waters pushed 8,000 gallon wine barrels right through the walls of Thomas Winery. Six thousand cases of wine were destroyed, and two houses on the Fillipi Winery property were washed away. One of these houses, built in 1839, was the last structure from the original Tapia Rancho Cucamonga. Thomas Winery, Kapu-Kai Restaurant, Farmboy Produce, and Aloha Lanes were so extensively damaged that only the winery was rebuilt.

Many of homes on Carnelian lost their garages as the Cucamonga Creek gouged out a new channel through their yards. Four homes at Vineyard and Carnelian were totally destroyed. Marine helicopters, some from as far away as El Toro, picked flood victims from the roof tops. Sheriff's deputies and the Cucamonga Fire Department evacuated homeowners from the Dawn Haven tract on 6th Street by pulling them hand over hand with ropes. Water three feet deep smashed through windows and flowed unimpeded through the homes. Many of the cars picked up the flood waters were never recovered.

The situation might have been much worse had not Don Woodall driven from house to house, warning residents before any official notice to evacuate. Families evacuating hit raging waters one and a half feet deep and turned back, going to the high ground at Otis Elevator on

Vineyard and Arrow. The Cucamonga fire truck trying to manage the evacuation was stranded in the area unable to move through the deep, thirty mile per hour waters. The fire department coordinated with Otis elevator management to use Otis' heavy diesel trucks to evacuate families to the elevator. Some households such as the Grables had pregnancy or physical problems which prevented them from being evacuated under such extreme conditions. Those families spent the night wondering if they would survive until morning.

As continued flooding began to inundate even the Otis property, the fire department and Otis mangers evacuated 290 people to safer ground. Seventy-five evacuees spent Saturday night in the Cucamonga Elementary School Cafeteria. An additional 100 persons were evacuated by Phillips Industries Equipment. Both Otis and Phillips sustained extensive damage. Phillips damages were $2,500,000 of their companies total $7,500,000 value.

4. 1943 Flood
In a small storm in January 1943, Arrow Highway totally washed away at Hellman. Various small buildings, vineyards, and citrus groves were washed out.

5. 1938 Flood 2/28/1938
The storm from February 28 - March 3, 1938 was the sixth largest storm of record. This storm was more than double the size of the 1969 flood. The recently constructed flood control projects on the major canyons minimized flood damages. After the storm, the Cucamonga and Deer Creek Spreading Grounds were reported as the only functioning flood structures in the entire tri-county area. The project reduced canyon discharges of 33,000 cubic feet per second to just 600 in the channel. There was no flooding from the Cucamonga or Deer Creek Canyons. The flood run-off was from the fans, not from the mountain. Cucamonga Creek was contained to just a 300 feet wide swath for 4 miles. Fifteen hundred acres of orchards & vineyards were entirely washed away. Severe post burn debris flows and flooding were reported from Etiwanda Canyon. Etiwanda Canyon caused extensive damage.

6. 1934 Floods 2/11/1934
The Rancho Cucamonga area was hit by two floods in 1934. On February 11, 1934 the James Whittington's and their two sets of twins were caught in the current on 4th Street. The father managed to get the two girls and one baby boy to the bank before the car overturned, and was swept downstream. Though he was repeatedly hit by boulders churning in the flood waters, he finally managed to pull his wife and remaining baby to upturned side of car. When the car was swept momentarily near a bank he pulled his wife and remaining baby boy to safety. The car was located a half mile south, completely buried in boulders. On March 2, 1934, two cloudbursts were reported in the Alta Loma area during the storm. Four inches of rain fell in just a few hours. Boulders washed across the highways. Schools closed and train service was halted.

7. 1916 Flood
In 1916 Cucamonga Creek began flooding down the west side of Red Hill into Upland. Upland residents arrived at the canyon mouth trying to divert the creek down the east side into Cucamonga. Cucamonga citizens arrived, trying to divert it back. The battle of shovels quickly came to near body blows. The creek itself ended the battle, going east to Cucamonga and no

shovels could have been a match for its raging waters. Turner Avenue was a canyon 10 to 30 feet deep and on Archibald a thousand feet of recently paved road way was washed out. In the follow on storm Day & Deer channel shifted to the west cutting a deep 30-foot gully and causing the destruction of valuable farming lands. In 1903 there were twenty-three structures on the Deer debris cone, however, only two remained after this series of storm activity.

8. 1891 Flood
In 1891 there was a great storm combined with a rapidly melting snow pack but with so few inhabitants damages were limited. The main damage was to the railroads from flows from Deer Creek. The “rail barons” pressed Congress to build a dam at the canyon mouth. The 500-ton boulders carried down by the flood flows persuaded the railroads’ engineers that a dam was impractical.” The damages would be repeated in 1910 and 1911 as all the tracks were washed out from Cucamonga, Deer, and Day Creeks. Again in 1914 the railroads were hard hit. Hellman was entirely washed out to a depth of 8 feet.

9. 1884 Flood
In 1884 severe flooding stranded travelers when twenty-foot walls of water came roaring out of the canyons. Construction activities on the railroads were disrupted.

10. 1862 Flood
The largest storm of record occurred in 1862. This storm was seven times larger than the 1969 Storm. It rained steadily for 28 days. There was little reported damage as there were only two ranches in the entire area. The Rains cattle survived by climbing into the hills The newly constructed Rains home was thought to be endangered despite that Cucamonga Creek was flooding on the west or Upland side of Red Hill. Lytle Creek cut a permanent new channel toward San Bernardino, making it unlikely to flood Cucamonga again.

The following maps illustrate the flooding hazards in the City of Rancho Cucamonga.

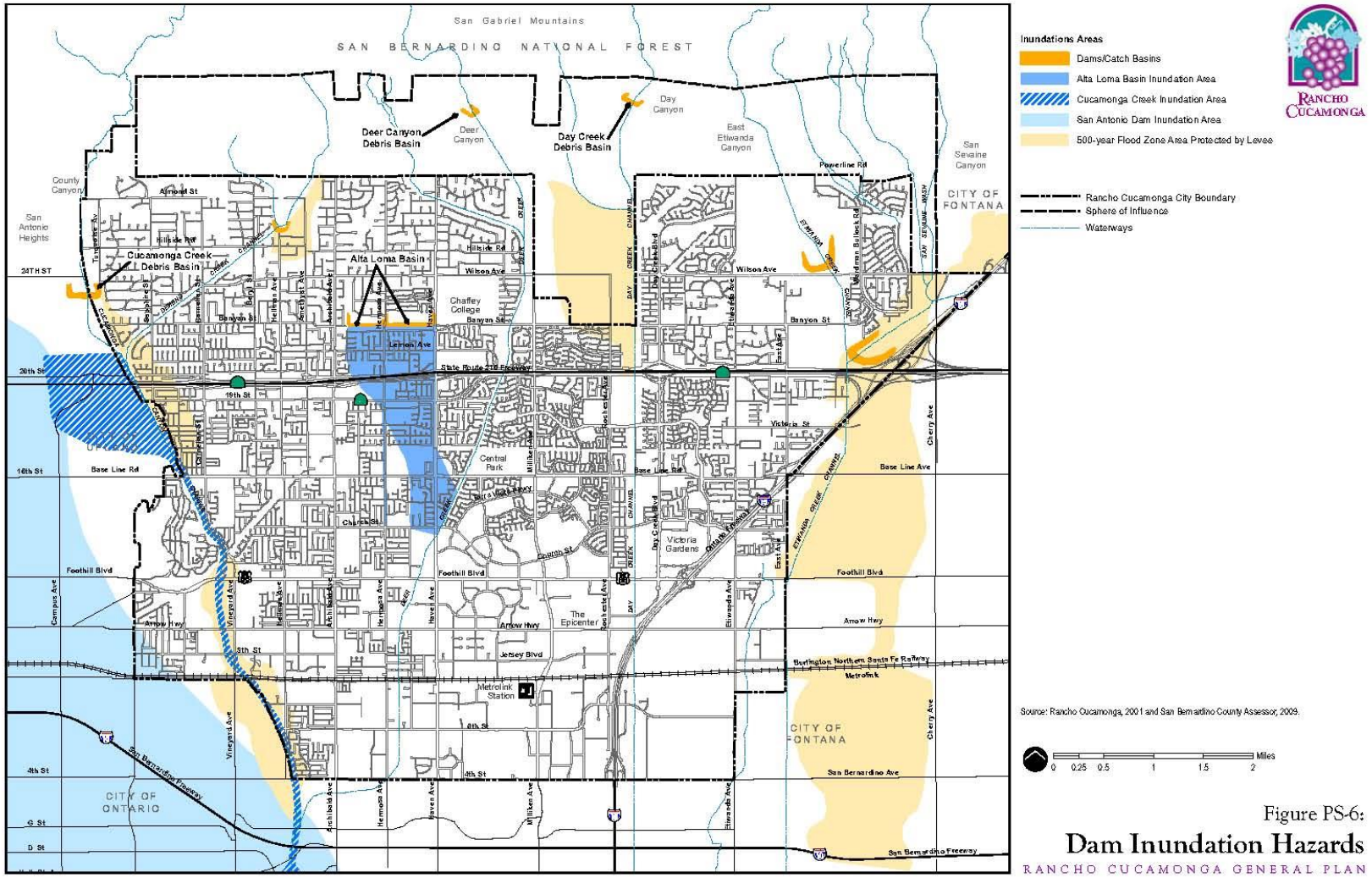


Figure PS-6:
Dam Inundation Hazards
RANCHO CUCAMONGA GENERAL PLAN

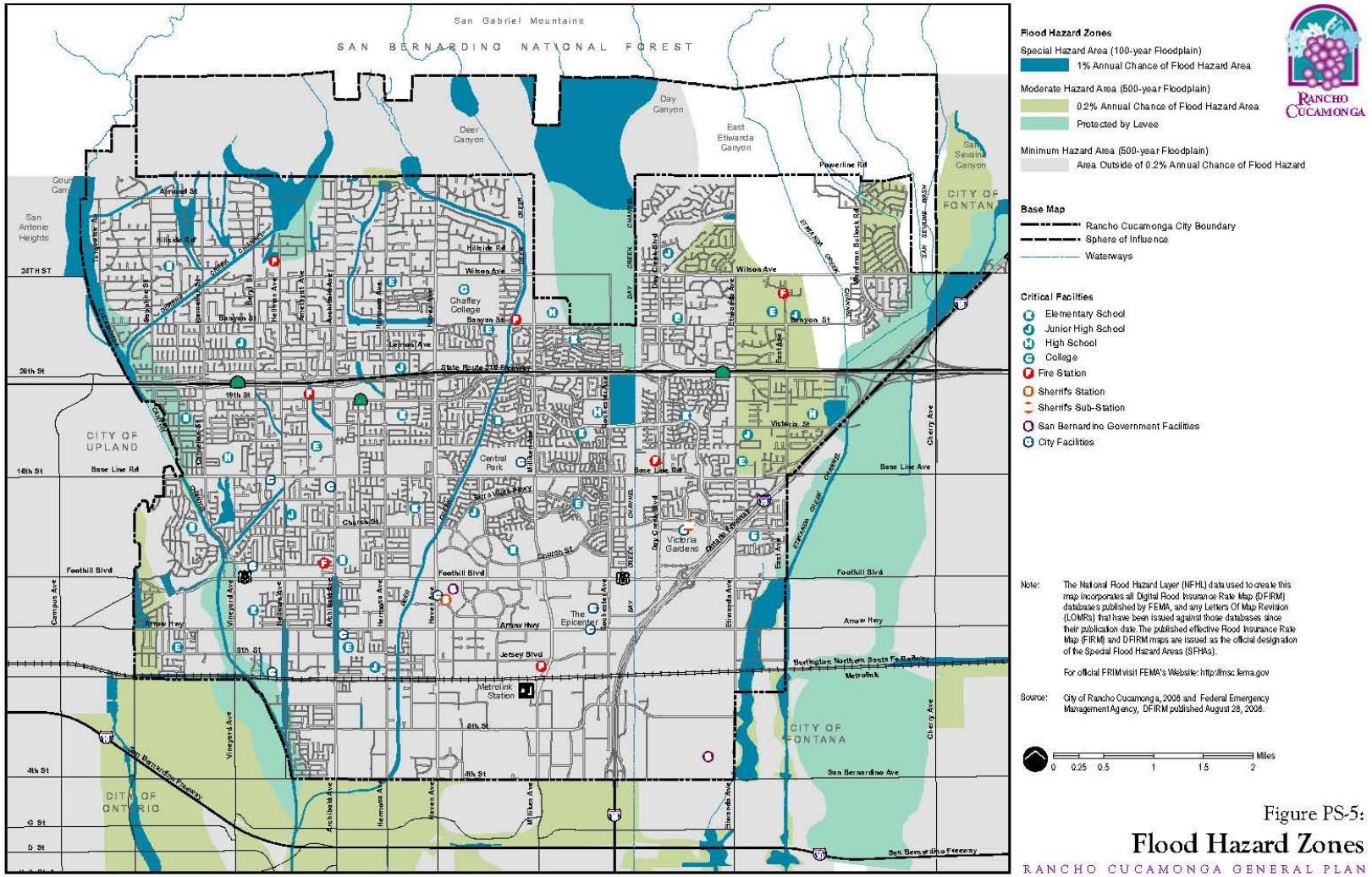


Figure PS-5:
Flood Hazard Zones
RANCHO CUCAMONGA GENERAL PLAN

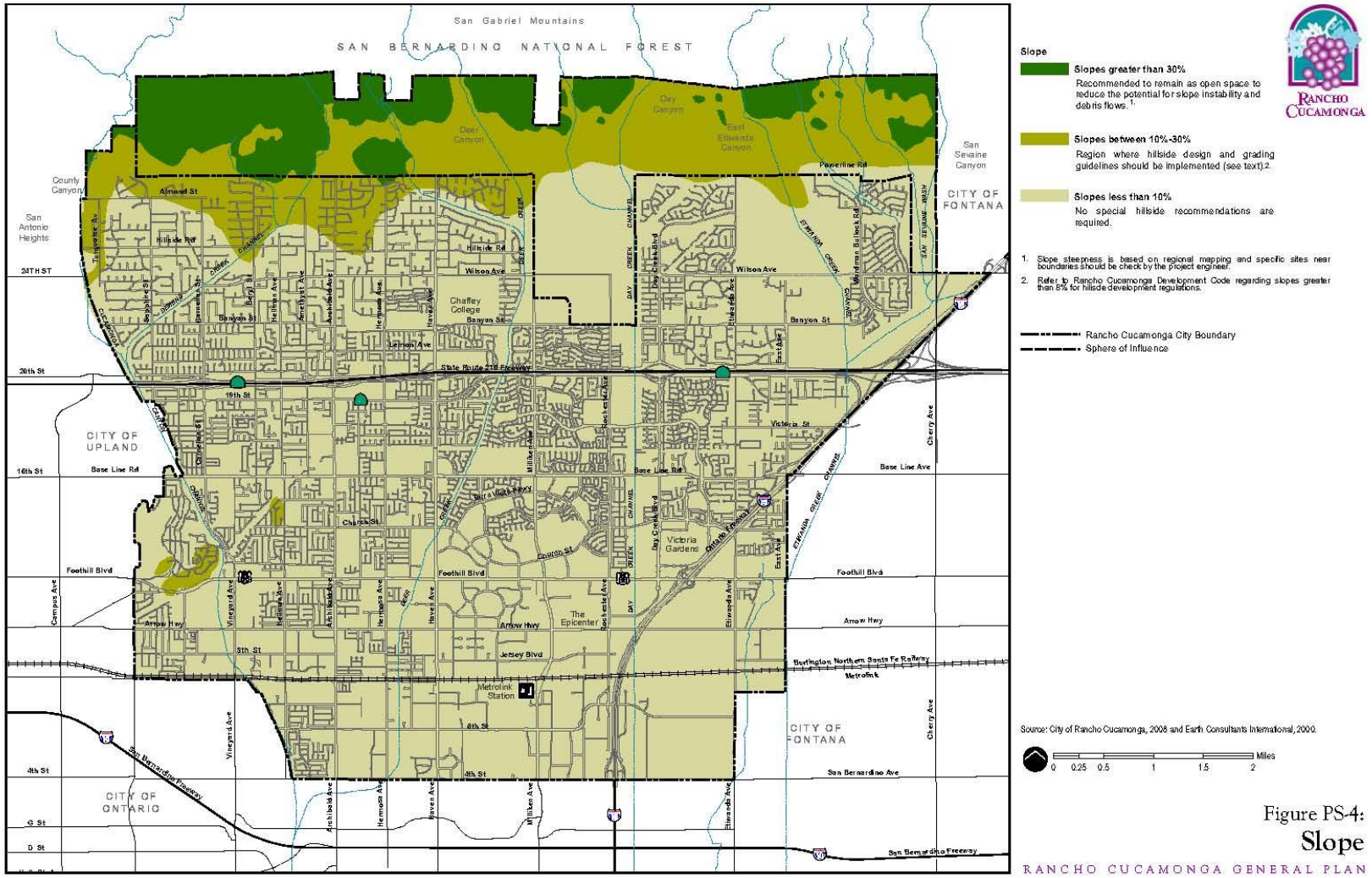


Figure PS-4:
Slope
RANCHO CUCAMONGA GENERAL PLAN

4.2.3 Wildfires

General Definition:
There are three different classes of wild land or wildfires. A surface fire is the most common type and burns along the floor of a forest, moving slowly and killing or damaging trees. A ground fire is usually started by lightning and burns on or below the forest floor. Crown fires spread rapidly by wind and move quickly by jumping along the tops of trees. Wildfires are usually signaled by dense smoke that fills the area for miles around. Wildfires present a significant potential for disaster in the southwest, a region of relatively high temperatures, low humidity, and low precipitation during the summer, and during the spring, moderately strong daytime winds. Combine these severe burning conditions with people or lightning and the stage is set for the occurrence of large, destructive wildfires.

Description:
Fire is a continuous threat in Southern California, particularly in San Bernardino County and the City of Rancho Cucamonga. The major areas of concern are the wild land and urban interfaces. Literally hundreds of homes now border major forests and brush areas. With thousands of people living near and visiting wild land areas, the probability of human-caused fires is growing. Although occurring with less frequency, the threat of fire from lightning strikes also exists.

Historical Profile:
There is a long history of wildfires in the City of Rancho Cucamonga. The fire risk assessment shows that the area of the City with the highest level of risk is the northern part of the City, along the Wild land Urban Interface (WUI).

Located along the northern parts of the City is the Wild land Urban Interface (WUI), which poses an ongoing threat to the community. During the summer season, dry vegetation, little seasonal rain, and Santa Ana wind conditions can combine to increase the likelihood of fires in the San Bernardino National Forest, potentially threatening residential development near the San Gabriel Mountains. New construction within WUI areas is required to comply with California Building Code Chapter 7A, including requirements for fire retardant or ignition resistant construction materials at roofs, eaves, vents, exterior walls, exterior windows, doors, and decks.

California Government Code Section 51182 also requires buildings within these areas to provide defensible space. Members of the Wild land Fire Protection Team work closely with the City’s Emergency Management Program to develop evacuation and travel routes in the event of a wild land fire.

The following section lists and describes the historical events associated with this hazard in the City of Rancho Cucamonga.

1. Grand Prix Fire 10/24/2003
Started in Fontana above Hunter's Ridge neighborhood. Pushed toward Lytle Creek and San Sevaine drainage for two days before strong Santa Ana winds drove the fire west toward the City of Rancho Cucamonga. The fire burned through entire wild land interface area of Rancho Cucamonga over a three-day period. Fifteen homes were destroyed and more were damaged. Thousands of homes were threatened and evacuated. The fire did not stop until it ran into burn from 2002 in La Verne. The fire destroyed homes in Lytle Creek, San Antonio Heights, and Claremont. One person was killed by the fire in San Antonio Heights.

2. Amethyst Fire Summer 1997
Started by children playing with fireworks near the horse ranch at the top of Amethyst. Pushed by mild onshore winds, burned 150 acres. The fire threatened structures at the top of Archibald and Santina Road. Power lines were affected, eliminating power to the Greater Los Angeles area temporarily.

3. Etiwanda Fire Winter 1996
Started by toppled high tension towers during 90 MPH Santa Ana wind event. Burned 400 acres. Jumped Summit Avenue to Highland, damaging Summit Intermediate and some properties on 23rd Street.

4. Etiwanda Fire Summer 1992
Started near I-5 and Foothill Blvd. Pushed by onshore winds, burned through fields around housing tracts. Jumped Etiwanda, Baseline, East, and Highland Ave. Burned 1200 acres, damaging several structures.

5. Texas Fire Fall 1988
Started near Lytle Creek. Pushed by strong Santa Ana winds, the fire came into the eastern part of the City of Rancho Cucamonga. 12,000 acres burned. The fire stopped at Etiwanda Canyon. Several structures were damaged, including Summit Intermediate School.

6. Archibald Fire Summer 1985
Started at the top of Archibald. The fire burned 500 acres in a northerly direction. Structures were threatened, but there was no damage.

7. Thunder Fire Fall 1980
Burned several thousand acres in the mountains above the City of Rancho Cucamonga. The fire did not come down into the City.

8. Meyers Fire Fall 1970
Started near Lytle Creek. Pushed by strong Santa Ana winds, the fire burned all the way to Cucamonga Canyon (similar to Grand Prix Fire). Little or no structural damage due to the lack of structures in the area. Chaffey College campus was the main concern as the fire surrounded the site, but the campus was protected by firefighters.

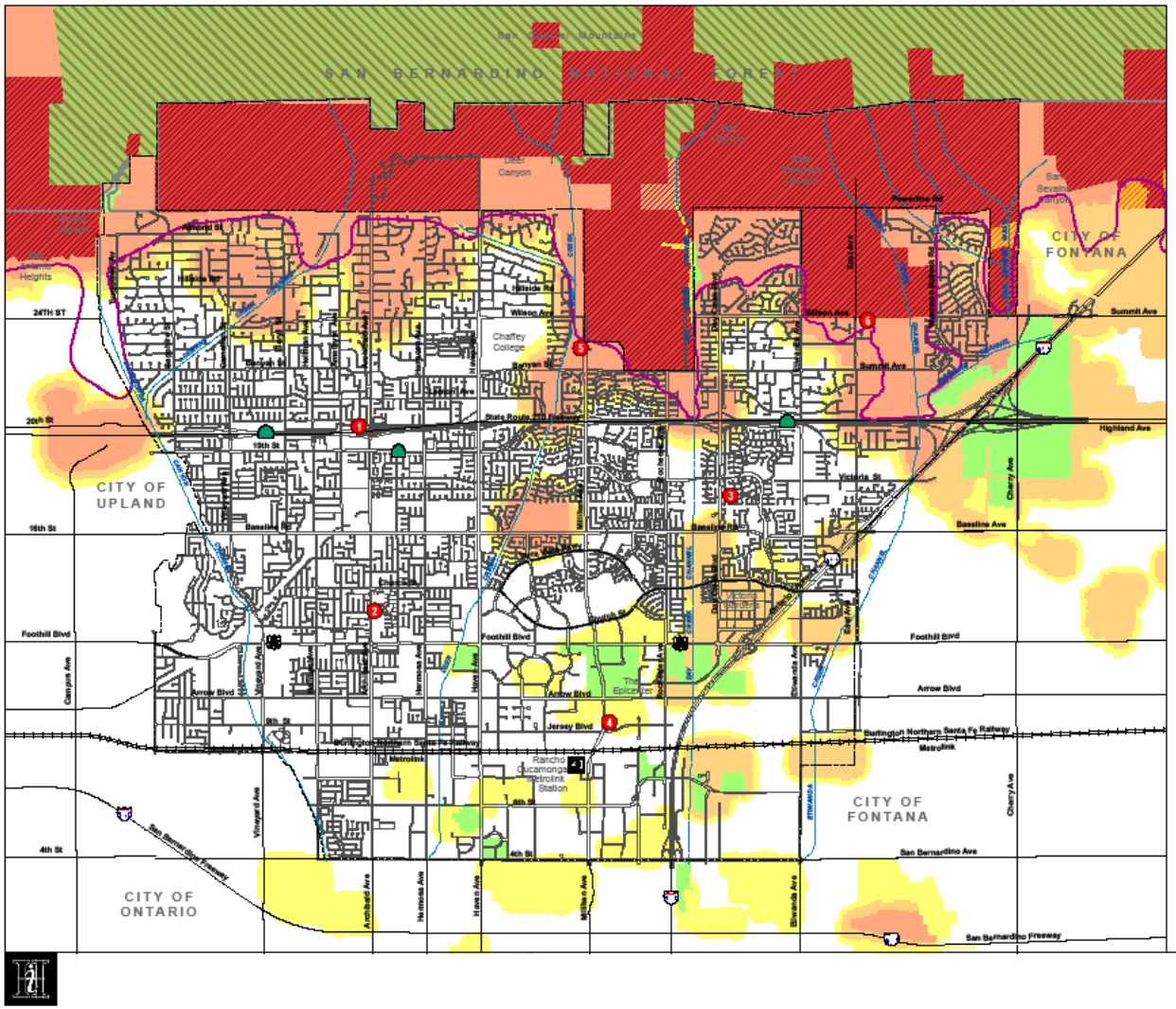
The following table shows a selected history of incidents over the past 35 years.

Date	Incident	Incident Description
Fall 2003	Grand Prix Fire	Started in Fontana above Hunter's Ridge neighborhood. Pushed toward Lytle Creek and San Sevaine drainage for two days before strong Santa Ana winds drove the fire west toward the City of Rancho Cucamonga. Burned through entire wild land interface area of Rancho Cucamonga over a three-day period. Fifteen homes were destroyed and more were damaged. Thousands of homes were threatened and evacuated. The fire did not stop until it ran into burn from 2002 in LaVerne. The fire destroyed homes in Lytle Creek, San Antonio Heights, and Claremont. One person was killed by the fire in San Antonio Heights.
Summer 1997	Amethyst Fire	Started by children playing with fireworks near the horse ranch at the top of Amethyst. Pushed by mild onshore winds, burned 150 acres. The fire threatened structures at the top of Archibald and Santina Road. Power lines were affected, eliminating power to the Greater Los Angeles area temporarily.
Winter 1996	Etiwanda Fire	Started by toppled high tension towers during 90 MPH Santa Ana wind event. Burned 400 acres. Jumped Summit Avenue to Highland, damaging Summit Intermediate and some properties on 23rd Street.
Summer 1992	Etiwanda Fire	Started near I-5 and Foothill Blvd. Pushed by onshore winds, burned through fields around housing tracts. Jumped Etiwanda, Baseline, East, and Highland Ave. Burned 1200 acres, damaging several structures.
Fall 1988	Texas Fire	Started near Lytle Creek. Pushed by strong Santa Ana winds, the fire came into the eastern part of the City of Rancho Cucamonga. 12,000 acres burned. The fire stopped at Etiwanda Canyon. Several structures were damaged, including Summit Intermediate School.
Summer 1985	Archibald Fire	Started at the top of Archibald. Burned 500 acres in a northerly direction. Structures were threatened, but there was no damage.
Fall 1980	Thunder Fire	Burned several thousand acres in the mountains above the City of Rancho Cucamonga. The fire did not come down into the City.

Date	Incident	Incident Description
Fall 1970	Meyers Fire	Started near Lytle Creek. Pushed by strong Santa Ana winds, the fire burned all the way to Cucamonga Canyon (similar to Grand Prix Fire). Little or no structural damage due to the lack of structures in the area. Chaffey College campus was the main concern as the fire surrounded the site, but the campus was protected by firefighters.

Fire prevention strategies concentrate on educating the public and enforcement of fire codes. Fire suppression strategies focus around containment and control while protecting structures in the threatened areas. Suppression activities may utilize natural firebreaks; direct suppression of the fire by hose lines, aircraft, bulldozers and hand crews; increasing defensible spaces around homes; utilizing fire suppression foams; and mop up and total extinguishment of the fire.

The following maps illustrate the fire hazard within the City of Rancho Cucamonga.



Legend

Federal Responsibility Area (FRA)

Federal Responsibility Area (FRA)

State Responsibility Area (SRA)

Fire Hazard Severity Zones

SRA Very High
SRA High
SRA Moderate

Draft Local Responsibility Area (LRA)

Fire Hazard Severity Zones

LRA Very High
LRA High
LRA Moderate
LRA Non-Wildland/Non-Urban

Previous Fires

Grand Prix Fire Extent (2003)

Fire Station No.

Fire Stations

1. Fire Station No. 1
2. Fire Station No. 2
3. Fire Station No. 3
4. Fire Station No. 4
5. Fire Station No. 5
6. Fire Station No. 6

Rancho Cucamonga City Boundary
Sphere of Influence
Railroad

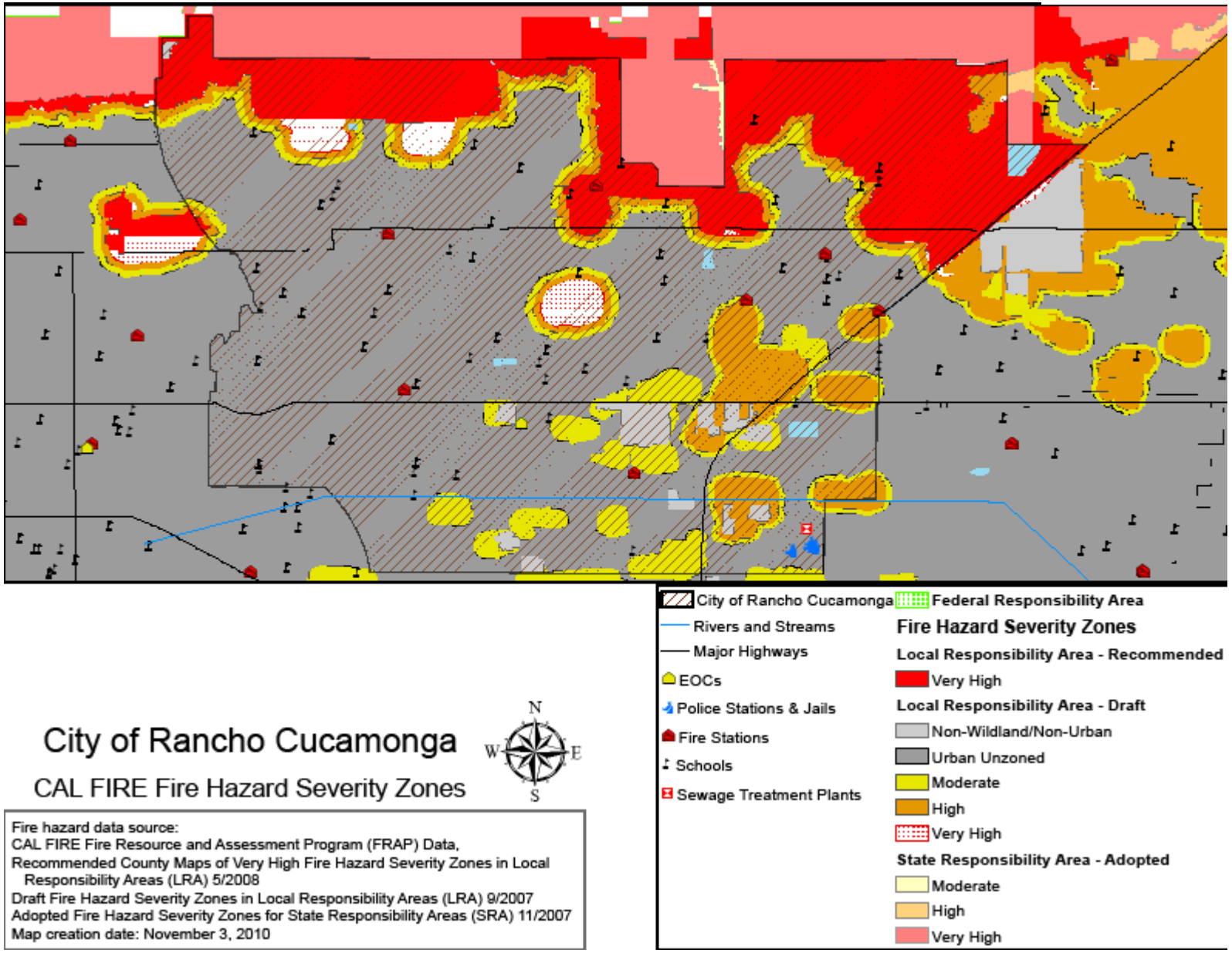
Source: City of Rancho Cucamonga and California Department of Forestry and Fire Protection, 2007. Website:
http://www.fire.ca.gov/fire_prevention/fhsz_maps/fhsz_maps_sanbernardinosw.php

0 0.5 1 1.5 2 Miles
0 2,000 4,000 6,000 8,000 10,000 Feet

Figure S-1

Fire Hazards Severity Zones

Rancho Cucamonga General Plan
San Bernardino County, CA
May 20, 2008
P:\2237 Rancho Cucamonga City GP\GIS\MXDS\FireHazards.mxd


City of Rancho Cucamonga
CAL FIRE Fire Hazard Severity Zones
N
W
E
S
Fire hazard data source:
CAL FIRE Fire Resource and Assessment Program (FRAP) Data,
Recommended County Maps of Very High Fire Hazard Severity Zones in Local Responsibility Areas (LRA) 5/2008
Draft Fire Hazard Severity Zones in Local Responsibility Areas (LRA) 9/2007
Adopted Fire Hazard Severity Zones for State Responsibility Areas (SRA) 11/2007
Map creation date: November 3, 2010
City of Rancho Cucamonga
Rivers and Streams
Major Highways
EOCs
Police Stations & Jails
Fire Stations
Schools
Sewage Treatment Plants
Federal Responsibility Area
Fire Hazard Severity Zones
Local Responsibility Area - Recommended
Very High
Local Responsibility Area - Draft
Non-Wildland/Non-Urban
Urban Unzoned
Moderate
High
Very High
State Responsibility Area - Adopted
Moderate
High
Very High

4.2.4 High/Straight Line Winds

General Definition:
High winds can result from thunderstorm inflow and outflow, or downburst winds when the storm cloud collapses, and can result from strong frontal systems, or gradient winds (high or low pressure systems) moving across Oklahoma. High winds are speeds reaching 50 mph or greater, either sustaining or gusting.

Description:
Wind events constitute one of the most frequent major hazards in the City of Rancho Cucamonga. Not only are windstorms chronic, they are costly in terms of property damage. It is also common for arsonists to increase activity during high winds.

Historical Profile:
The City of Rancho Cucamonga has a history of extensive windstorms, often related to Santa Ana winds. The Santa Ana winds are strong, extremely dry offshore winds that characteristically sweep through the area in late fall and early winter. High winds can also result from thunderstorm inflow and outflow or high and low pressure systems moving through the region. High winds have speeds reaching at least 50 miles per hour, and can exceed 100 miles per hour. Wind events constitute one of the most frequent major hazards in the City. Not only do windstorms happen frequently; they can be costly in terms of property damage and can cause injury to people.

The following section lists and describes the historical events associated with this hazard in City of Rancho Cucamonga.

1. Amethyst/Hillside-1/6/2003
Wires down in the vicinity of Amethyst and Hillside Dr.

2. Vineyard/Carnelian-1/6/2003
Wires down in the vicinity of Vineyard Ave. and Carnelian St.

3. 19th/Carnelian-1/6/2003
Blacked out intersection, including inoperable traffic signal at the intersection of 19th Street and Carnelian Street. Since this is a very busy intersection, residents were calling with the concern that motorists were not stopping nor yielding to on-coming traffic.

4. 9th Street-1/6/2003
Trees down on 9th Street, west of Vineyard Avenue, blocking the roadway.

5. Baker Ave.-1/6/2003
Trees down on Baker Avenue, south of 9th Street, blocking the roadway.

6. ValleVista/Red Hill-1/6/2003
Trees down on Valle Vista, south of Red Hill Drive, blocking the roadway.

7. Highland Ave.-1/6/2003
Trees down on Highland Avenue, west of Broken Star, blocking the roadway.

8. Haven Ave.-1/6/2003
Trees down on Haven Avenue, north of the railroad right-of-way, blocking the roadway (a major north-south artery for the City).

9. Sandalwood Ct.-1/6/2003
Trees down against the residential structure. Building & Safety officials inspected the property and posted it for limited occupancy.
8500 Sandalwood Ct., Rancho Cucamonga, CA 91730

10. Foothill/Vineyard-1/6/2003
Blacked out intersection, with traffic signal inoperable.

11. ViaLadera/AltaCuesta-1/6/2003
Trees down on Via Ladera at Alta Cuesta.

12. Vineyard-1/6/2003
Damage to property, but no damage to structure.
7840 Vineyard, Rancho Cucamonga, CA 91701

13. Hermosa/Baseline-1/6/2003
Wires down in the intersection of Hermosa and Baseline Rd.

14. Jersey Blvd.- 1/6/2003
Numerous trees down on Jersey Blvd. between Milliken and Haven Avenues, blocking the road for commercial trucks in this industrial neighborhood.

15. ValleVista/AltaVista-1/6/2003
Trees down on Valle Vista Drive, south of Alta Vista Drive, blocking the roadway.

16. Grandby/Banyan 1/6/2003
Trees down in the vicinity of Grandby and Banyan Street.

17. Grove Ave.-1/6/2003
Trees down to the rear of the residence, resulting in some damage to the structure. Occupant was not home at the time.
8725 Grove Ave., Rancho Cucamonga, CA

18. Vineyard-1/6/2003
Trees down at this address. No damage reported.
7669 Vineyard Ave., Rancho Cucamonga, CA 91701

19. Vineyard-1/6/2003
Trees down at this address. No damage reported.
7720 Vineyard, Rancho Cucamonga, CA

20. 4th Street-1/6/2003
Signage and roof damage to the structure of the business.

10090 4th Street, Rancho Cucamonga, CA 91730

21. Pepper St.-1/6/2003
Trees down at this address.
7639 Pepper St., Rancho Cucamonga, CA

22. Raspberry/Manzanita-1/6/2003
Trees down in the vicinity of Raspberry Place and Manzanita Drive.

23. Trademark/Commerce-1/6/2003
Trees down in the vicinity of Trademark Street and Commerce Drive.

24. 8th Street-1/6/2003
Trees down on 8th Street, west of Hellman, blocking the roadway.
25. Amethyst/19th-1/6/2003
Wires down on the east side of Amethyst Street, south of 19th Street.

26. Alta Loma Jr. High-1/6/2003
Wires down to the front of Alta Loma Jr. High School.
9000 Lemon St., Rancho Cucamonga, CA 91737

27. Sonoma-1/6/2003
Trees down at this address. No damage reported.
7111 Sonoma, Rancho Cucamonga, CA

28. Holly Street-1/6/2003
Fence down at this address. No other damage reported.
8690 Holly St., Rancho Cucamonga, CA

29. Fulton Ct. 1/6/2003
Trees down blocking the roadway at this address.
10661 Fulton Ct., Rancho Cucamonga, CA

30. Cedar Dr.-1/6/2003
Trees down blocking the roadway at this address.
8671 Cedar Dr., Rancho Cucamonga, CA

31. Leucite-1/6/2003
Trees down at this address. No damage reported.
8440 Leucite, Rancho Cucamonga, CA

32. Mt. Baker Ct.-1/6/2003
Trees down in the backyard. No structural damage reported.
11699 Mt. Baker Ct., Rancho Cucamonga, CA 91737

33. Hellman-1/6/2003
Trees down and blocking the driveway at this address.
6644 Hellman Ave., Rancho Cucamonga, CA

34. London/Arrow-1/6/2003
Trees down on London Avenue, south of Arrow.
8770 London Ave., Rancho Cucamonga, CA

35. Manzanita/Malachite-1/6/2003
Trees down in the road at Manzanita and Malachite.

36. Ramona Ave.-1/6/2003
Roof damage to single family dwelling. Residents were evacuated and the Red Cross was contacted for sheltering needs.
Displaced People: 2
6195 Ramona, Rancho Cucamonga, CA 91701

37. Ramona Ave.-1/6/2003
Building and Safety inspectors noted limited damage to the residence.
6207 Ramona Ave., Rancho Cucamonga, CA 91701

38. Madrone Ave.-1/6/2003
Minor damage to residential structure. Building & Safety officials inspected the home and found residents attempting to mitigate the damage.
8618 Madrone Ave., Rancho Cucamonga, CA 91730

39. Monte Vista-1/6/2003
Tree down on vehicle in the street.
8735 Monte Vista, Rancho Cucamonga, CA

40. Alpine-1/6/2003
Tree uprooted and falling on Senior Center.
9807 Alpine Street, Rancho Cucamonga, CA

41. 18th Street-1/6/2003
Trees down and blocking the sidewalk.
8660 18th Street, Rancho Cucamonga, CA 91701

42. Berkshire-1/6/2003
Trees down, blocking the sidewalk and roadway.
6961 Berkshire, Rancho Cucamonga, CA

43. ViaLadera/Baseline-1/6/2003
Trees down on Via Ladera, south of Baseline, blocking the roadway.

44. Highland/Amethyst-1/6/2003
Tree debris partially blocking Highland Avenue east of Amethyst.

45. Broken Star/Highland-1/6/2003
Trees down and blocking the roadway on the East Side of Broken Star off of Highland Avenue.

46. Finch-1/6/2003
Trees down in parkway, blocking the sidewalk at this address.
10351 Finch Ave., Rancho Cucamonga, CA

47. Azurite-1/6/2003
Wires down on Azurite Avenue between Candlewood and Yew St.

48. Valle Vista-1/6/2003
Trees down blocking the roadway at this address.
7490 Valle Vista, Rancho Cucamonga, CA

The City of Rancho Cucamonga has a history of chronic windstorms. Since opening its new Emergency Operations Center (EOC) and beginning to document high wind events, the City has had one very significant event. On January 6, 2003, high winds wreaked havoc in the City as shown by the following data recorded in the EOC incident log:

Location	Date of Incident	Incident Description
Hermosa and Baseline	Jan 6, 2003	Wires down
Amethyst and Hillside	Jan 6, 2003	Wires down
Vineyard and Carnelian	Jan 6, 2003	Wires down
19th and Carnelian	Jan 6, 2003	Traffic signal out
Jersey – Milliken to Haven	Jan 6, 2003	Trees down
9th – west of Vineyard	Jan 6, 2003	Trees down
Baker – south of 9th	Jan 6, 2003	Trees down
Valle Vista – south of Alta Vista	Jan 6, 2003	Trees down
Valle Vista – south of Red Hill	Jan 6, 2003	Trees down
Grandby and Banyan	Jan 6, 2003	Trees down
Highland – west of Broken Star	Jan 6, 2003	Trees down
Haven – north of railroad right-of-way	Jan 6, 2003	Trees down
6195 Ramona	Jan 6, 2003	Residential damage
6207 Ramona	Jan 6, 2003	Residential damage
8725 Grove	Jan 6, 2003	Residential damage
8618 Madrone	Jan 6, 2003	Residential damage
8500 Sandalwood	Jan 6, 2003	Residential damage

Location	Date of Incident	Incident Description
Foothill and Vineyard	Jan 6, 2003	Traffic signal out
Via Ladera at Alta Cuesta	Jan 6, 2003	Trees down
7669 Vineyard	Jan 6, 2003	Trees down
7720 Vineyard	Jan 6, 2003	Trees down
7840 Vineyard	Jan 6, 2003	Residential damage
Azurite and Candlewood	Jan 6, 2003	Low wires
Azurite between Candlewood and Yew	Jan 6, 2003	Wires down
7490 Valle Vista	Jan 6, 2003	Blocked street
Archibald and Highland	Jan 6, 2003	Hanging street sign
10090 4th Street	Jan 6, 2003	Signage and roof damage
Vineyard and Baseline at high school	Jan 6, 2003	Signals flashing
7639 Pepper	Jan 6, 2003	Tree down
Raspberry and Manzanita	Jan 6, 2003	Trees down
Trademark and Commerce	Jan 6, 2003	Trees down
8th Street west of Hellman	Jan 6, 2003	Trees down
East side of Amethyst, south of 19th	Jan 6, 2003	Wires down
Alta Loma Jr. High School	Jan 6, 2003	Wires down
7111 Sonoma	Jan 6, 2003	Trees down
8690 Holly Street	Jan 6, 2003	Fence down
10661 Fulton Court	Jan 6, 2003	Trees down – blocking street
8671 Cedar Drive	Jan 6, 2003	Trees down – blocking street
8440 Leucite	Jan 6, 2003	Trees down
11699 Mt. Baker Court	Jan 6, 2003	Trees down
Archibald and Church	Jan 6, 2003	Signal bent over
6644 Hellman	Jan 6, 2003	Trees down – blocking driveway
8770 London – south of Arrow	Jan 6, 2003	Trees down
10135 Stafford St.	Jan 6, 2003	Trees down – leaning toward street
7461 Mesada St.	Jan 6, 2003	Branch in backyard from tree on Haven
9547 San Bernardino Road	Jan 6, 2003	Tree – hanger
Civic Center Dr. – middle signal	Jan 6, 2003	Signal damaged

Location	Date of Incident	Incident Description
shifted		
Manzanita and Malachite	Jan 6, 2003	Tree down in road
8735 Monte Vista	Jan 6, 2003	Tree down on vehicle in street
9807 Alpine Street	Jan 6, 2003	Tree uprooted – leaning toward Senior Center
8660 18th Street	Jan 6, 2003	Trees down – across sidewalk
6961 Berkshire	Jan 6, 2003	Trees down – across sidewalk and street
Via Ladera, south of Baseline	Jan 6, 2003	Tree blocking street
Highland, east of Amethyst	Jan 6, 2003	Tree debris partially blocking street
East side of Broken Star, off Highland	Jan 6, 2003	Tree down and blocking road
10351 Finch Avenue	Jan 6, 2003	Trees down in parkway – across sidewalk

The winds affecting Rancho Cucamonga can damage structures, uproot trees, and create dust storms in the southern part of the City where the soil type is susceptible to wind erosion. Additionally, as the southern part of the City has shifted from agriculture to developed lands, the severity and frequency of dust storms has been reduced substantially. An additional consideration, given the agricultural heritage of the community, is the impact of these winds on aging windrows that consist mainly of Blue Gum Eucalyptus trees. Where urban development has encroached upon these windrows, the potential for damage to structures or even injury to people is substantial. When windrows are not well maintained, the debris that accumulates around the trees is a fire hazard and nuisance.

4.2.5 Terrorism

General Definition:
Terrorism is the use of force or violence against persons or property in violation of the criminal laws of the United States for purposes of intimidation, coercion, or ransom.

Terrorists often use threats to:

- Create fear among the public.
- Try to convince citizens that their government is powerless to prevent terrorism.
- Get immediate publicity for their causes.

Acts of terrorism include threats of terrorism; assassinations; kidnappings; hijackings; bomb scares and bombings; cyber attacks (computer-based); and the use of chemical, biological, nuclear and radiological weapons.

Historical Profile:
High-risk targets for acts of terrorism include military and civilian government facilities, international airports, large cities, and high-profile landmarks. Terrorists might also target large public gatherings, water and food supplies, utilities, and corporate centers. Further, terrorists are capable of spreading fear by sending explosives or chemical and biological agents through the mail. There have been no major documented acts of terrorism in the City of Rancho Cucamonga.

LA/Ontario International Airport is a commercial jet service airport located in the City of Ontario. The airport is owned and operated by Los Angeles World Airports (LAWA). In 2008, over six million passengers departed from and arrived at the airport on over 124,000 commercial and general aviation flights. In addition, over 480,000 tons of freight moved through the airport. The northern runway is located approximately one mile from Rancho Cucamonga's southern boundary. The airport's runway safety zones extend from both ends of the runways in the City of Ontario, but no aircraft safety zones affect Rancho Cucamonga. Departing planes primarily fly over Ontario and Montclair, and most commercial jet arrival flights cross Fontana and Ontario. Smaller private planes fly over southern Rancho Cucamonga as they take off and land, avoiding the jet aircraft flight patterns. The City keeps up to date records on portions of the community affected by airspace as documented in the following map.

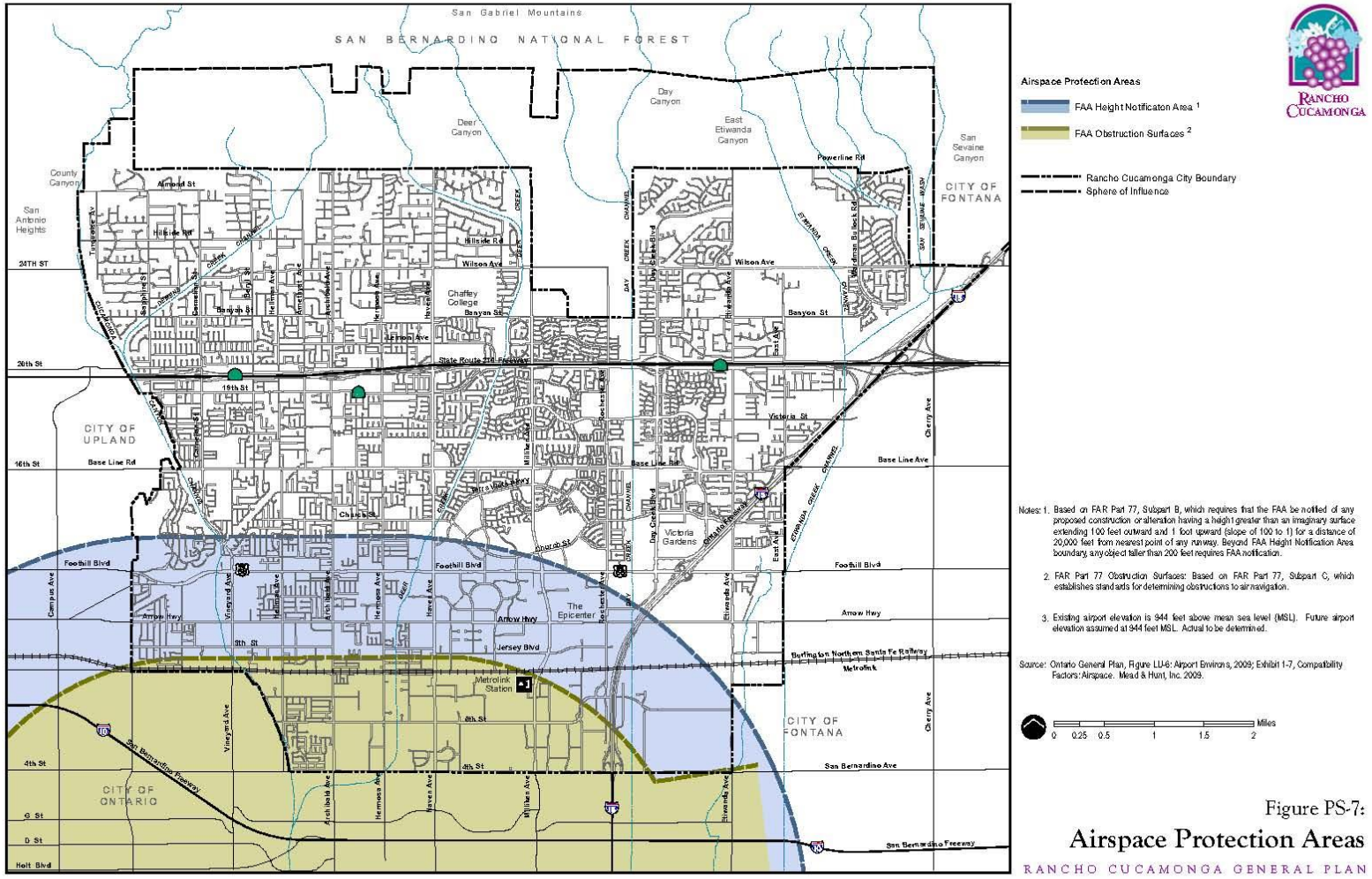


Figure PS-7:
Airspace Protection Areas
RANCHO CUCAMONGA GENERAL PLAN

4.3 Inventory Assets

Step three in the risk assessment process involves inventorying assets located in the community. Section 4.1 profiled the hazards in the City of Rancho Cucamonga. This information was used to identify the assets at risk from those hazards. Some hazards (such as earthquakes) may affect the entire community, while some affect limited areas (flooding incidents). This section provides a description of the inventory development and prioritization process.

4.3.1 Population

According to the City of Rancho Cucamonga General Plan the projected population at build-out in the year 2030 is 200,400 and increase of 13.5% from the year 2009. The General Plan predicts 6,497 more residential structures by build-out, an increase of 13.2% and an additional 19,767,000 square feet in commercial space divided into office, commercial and industrial, this is an increase of 24.7% from the year 2009.
The City of Rancho Cucamonga's Public Works, Planning, Engineering, Building and Safety, Police and Fire Department work together in a coordinated effort to plan future development with a primary concern being the mitigation of potential critical incident vulnerabilities.

4.3.2 Buildings

The following HAZUS default building information represents the City of Rancho Cucamonga.

Building Inventory Information by General Occupancy	**Building Replacement Value ($1,000)**	**Contents Replacement Value ($1,000)**	**Building Square Footage (1,000 Sq. Ft.)**	**Building Count**
Residential	$11,528,052	$5,764,014	93,147	38,504
Commercial	$3,331,682	$3,375,849	36,256	1,080
Industrial	$654,428	$981,648	8,646	341
Other	$757,972	$271,895	4,647	740
TOTAL	**$16,272,134**	**$10,393,406**	**142,697**	**40,665**
Selected Building Inventory Data by General Building Type	**Building Replacement Value ($1,000)**	**Building Replacement Value (%)**	**Estimated Building Count**	**% of Building Count**
Concrete	$1,048,701	6.4%	326	1%

Manufactured Housing	$69,296	0.4%	1,400	3%
Precast Concrete	$833,995	5.1%	268	1%
Reinforced Masonry	$1,242,930	7.6%	669	2%
Steel	$511,124	3.1%	184	0%
Unreinforced Masonry	$42,773	0.3%	18	0%
Wood Frame (Other)	$3,565,731	21.9%	2,036	5%
Wood Frame (Single-family)	$8,957,585	55.0%	35,764	88%
TOTAL	**$16,272,134**		**40,665**	

4.3.3 Critical Facility List

Critical Facilities:
The City of Rancho Cucamonga has identified several categories of critical facilities. These facilities were determined "critical" either due to their importance in the day-to-day operations of the City or for their role in response to a disaster.

Utilities –
Early in the development of the Hazard Mitigation Plan, utilities agencies were identified as critical infrastructure for the City. Although invitations were extended to representatives from the water, gas, electric, telephone, and cable companies, only a few of those agencies chose to participate in the planning process. The Cucamonga Valley Water District and the Southern California Gas Company participated in the City's plan development, however, will be producing their own Hazard Mitigation Plans for their respective agencies. The City still considers facilities belonging to the telephone, cable and electric companies as critical to the City's infrastructure, yet can't obtain detailed information on them due to the lack of participation in the planning process.
The City of Rancho Cucamonga owns a small municipal utility that powers limited facilities including portions of the Victoria Gardens Mall and limited residential areas.

Schools –
The City has determined that all public schools are deemed critical to the day-to-day operations of the City. In the event of a disaster, disruption to these educational institutions could result in a high economic impact. The City currently has 22 elementary schools (grades K-5), eight (8) middle schools (grades 6-8), and four (4) high schools (grades 9-12). In addition, the main campus of Chaffey College (a junior college) resides in the central northern portion of the City. Each of the high schools are pre-determined shelter sites in the event of a large-scale emergency that displaces people or results in an evacuation. A map of all school sites follows.

Public Safety –
The Rancho Cucamonga Fire Protection District provides emergency services to the City of Rancho Cucamonga. The Fire District currently operates from seven (7) fire stations strategically located throughout the City. These facilities are critical to the response of daily emergency calls for service as well as in the event of a large-scale disaster. In addition to the fire stations, the City also has a Fire Maintenance Facility and an Administrative Office that are crucial to the operations of the Fire District.

The City of Rancho Cucamonga contracts its law enforcement services with the San Bernardino County Sheriff's Department. Operating as the Rancho Cucamonga Police Department, law enforcement operations are carried out in the Police Station headquarters located in the Civic Center. This facility is crucial to the operations of the Police Department both during day-to-day operations and in the event of a large-scale disaster. The Police Department will be opening a substation in the Fall of 2004 in the Victoria Gardens shopping complex. This will also be considered a critical facility for public safety.

Local Government –
The City of Rancho Cucamonga conducts most of its daily operations from City Hall, located at 10500 Civic Center Drive. This facility is also commonly referred to as the Civic Center since the collection of buildings houses city departments, Fire District, Police Department and neighboring County Superior Courthouse (Superior Court of California, County of San Bernardino). Not only is this facility important to the day-to-day business conducted by the City, it would also result in a huge financial impact if damaged or destroyed in the event of a disaster. The City has identified some of the outlying City facilities as less critical, although they could be used as temporary facilities in the event City Hall sustains damage during a disaster.

The City of Rancho Cucamonga does not have any hospitals or emergency medical facilities located within the City limits. The closest hospital that services the City is San Antonio Community Hospital located in the City of Upland. Although the City does have several medical facilities that provide day-to-day medical assistance to the community including two urgent care centers, these facilities were identified as non-critical since they do not provide emergency medicine nor the facilities for it:

· Rancho San Antonio Medical Center - 7777 Milliken
· Angels Hospital - 10841 White Oak
· Kaiser Permanente Medical Offices - 10850 Arrow Rte.
· Urgent Care Center - 9695 Baseline Rd.

The following is a chart matrix for the functionality of City and School District facilities following certain types of earthquakes:

		Earthquake Scenario		
	FACILITY TYPE	**M7.8 ShakeOut Scenario (including Liquefaction)**	**M6.7 San Jacinto Fault (including Liquefaction)**	**M6.7 Chino Hills Fault (including Liquefaction)**
Fire Stations	**Rancho Cucamonga Fire Protection District**			
	Total Number of Buildings	**7**		
	Damage:			
	# Buildings with >50% Probability of Moderate or Greater Damage	0	0	0
	# Buildings with >50% Probability of Complete Damage	0	0	0
	Functionality:			
	Functionality < 50 % on Day 1	1	0	0
	Functionality 50 - 75% on Day 1	2	0	0
	Functionality >75% Day 1	4	7	7
EOCs	**City of Rancho Cucamonga**			
	Total Number of Buildings	**8**		
	Damage:			
	# Buildings with >50% Probability of Moderate or Greater Damage	2	0	0
	# Buildings with >50% Probability of Complete Damage	0	0	0
	Functionality:			
	Functionality < 50 % on Day 1	2	1	0
	Functionality 50 - 75% on Day 1	5	2	0
	Functionality >75% Day 1	3	5	1
Schools	**Central School District**			
	Total Number of Buildings	**89**		
	Damage:			
	# Buildings with >50% Probability of Moderate or Greater Damage	0	0	0
	# Buildings with >50% Probability of Complete Damage	0	0	0
	Functionality:			
	Functionality < 50 % on Day 1	19	1	1
	Functionality 50 - 75% on Day 1	70	0	26
	Functionality >75% Day 1	0	88	62

Schools	**Cucamonga Elementary School District**			
	Total Number of Buildings	**57**		
	Damage:			
	# Buildings with >50% Probability of Moderate or Greater Damage	1	0	0
	# Buildings with >50% Probability of Complete Damage	1	0	0
	Functionality:			
	Functionality < 50 % on Day 1	5	1	1
	Functionality 50 - 75% on Day 1	52	0	25
	Functionality >75% Day 1	0	56	31

Additionally, the City also owns several public facilities that are not considered critical, but may be used in the event of an emergency. All applicable facilities are outlined in the following maps for the designated risk.

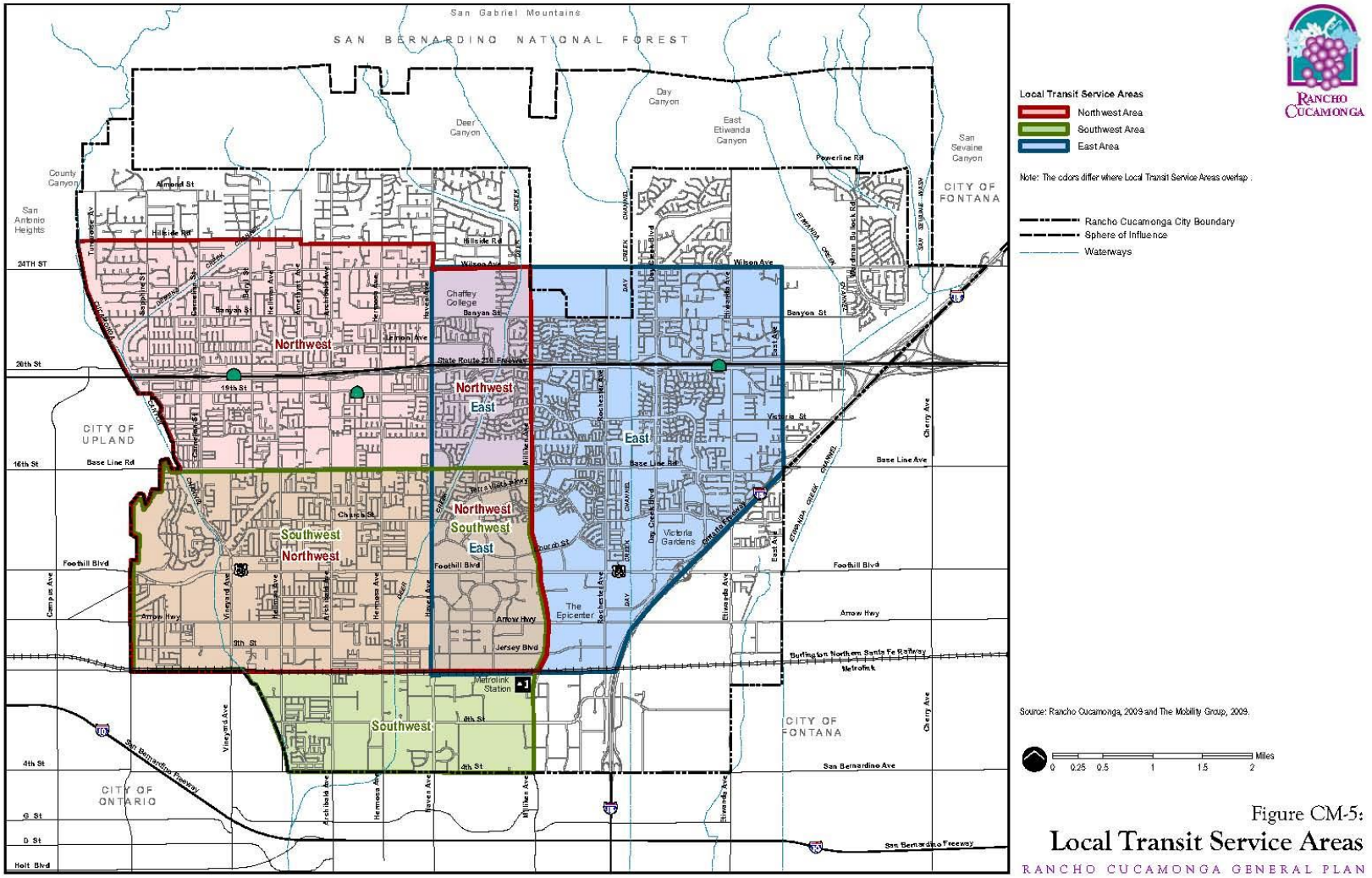


Figure CM-5:
Local Transit Service Areas
RANCHO CUCAMONGA GENERAL PLAN

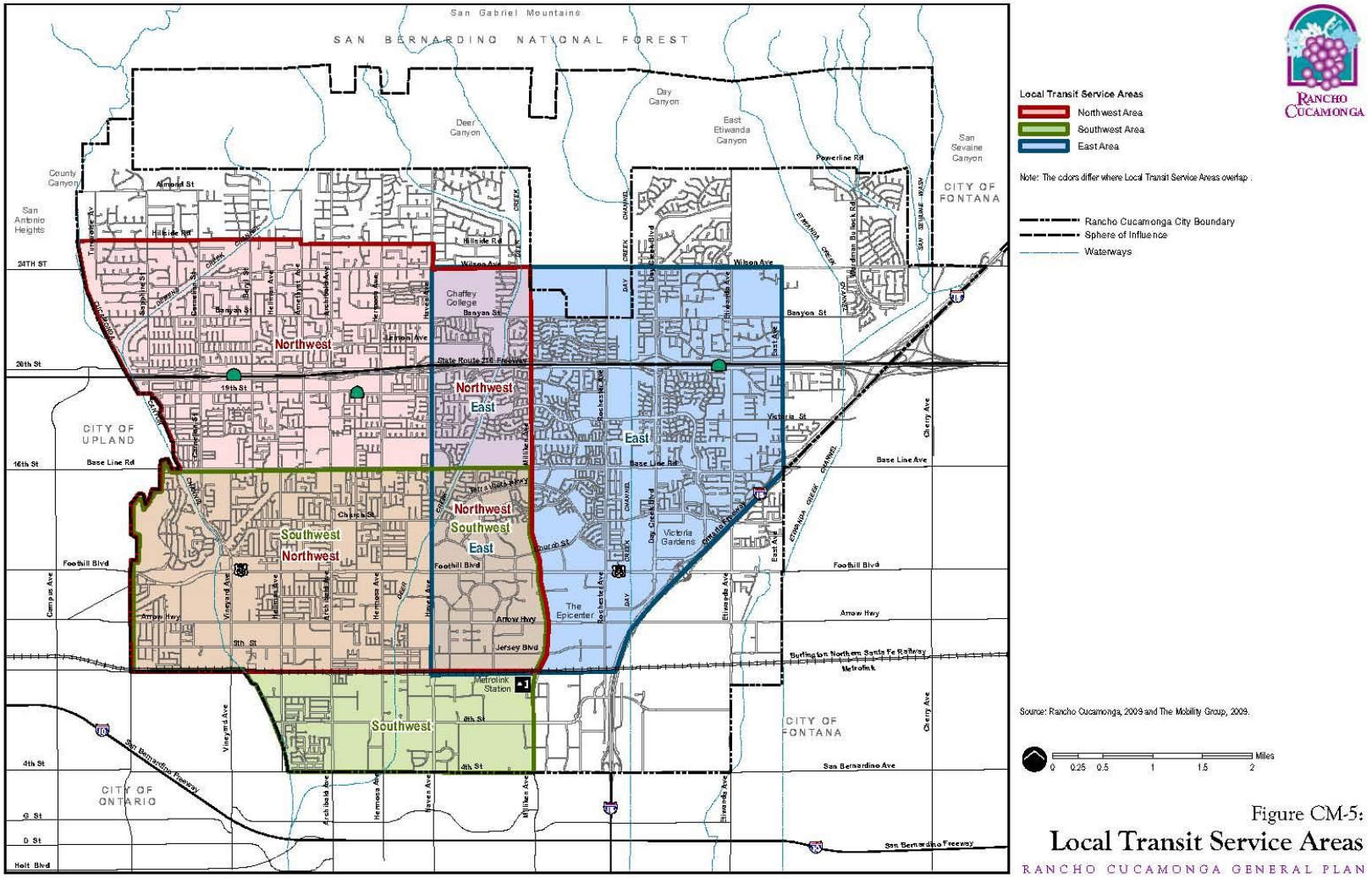


Figure CM-5:
Local Transit Service Areas
RANCHO CUCAMONGA GENERAL PLAN

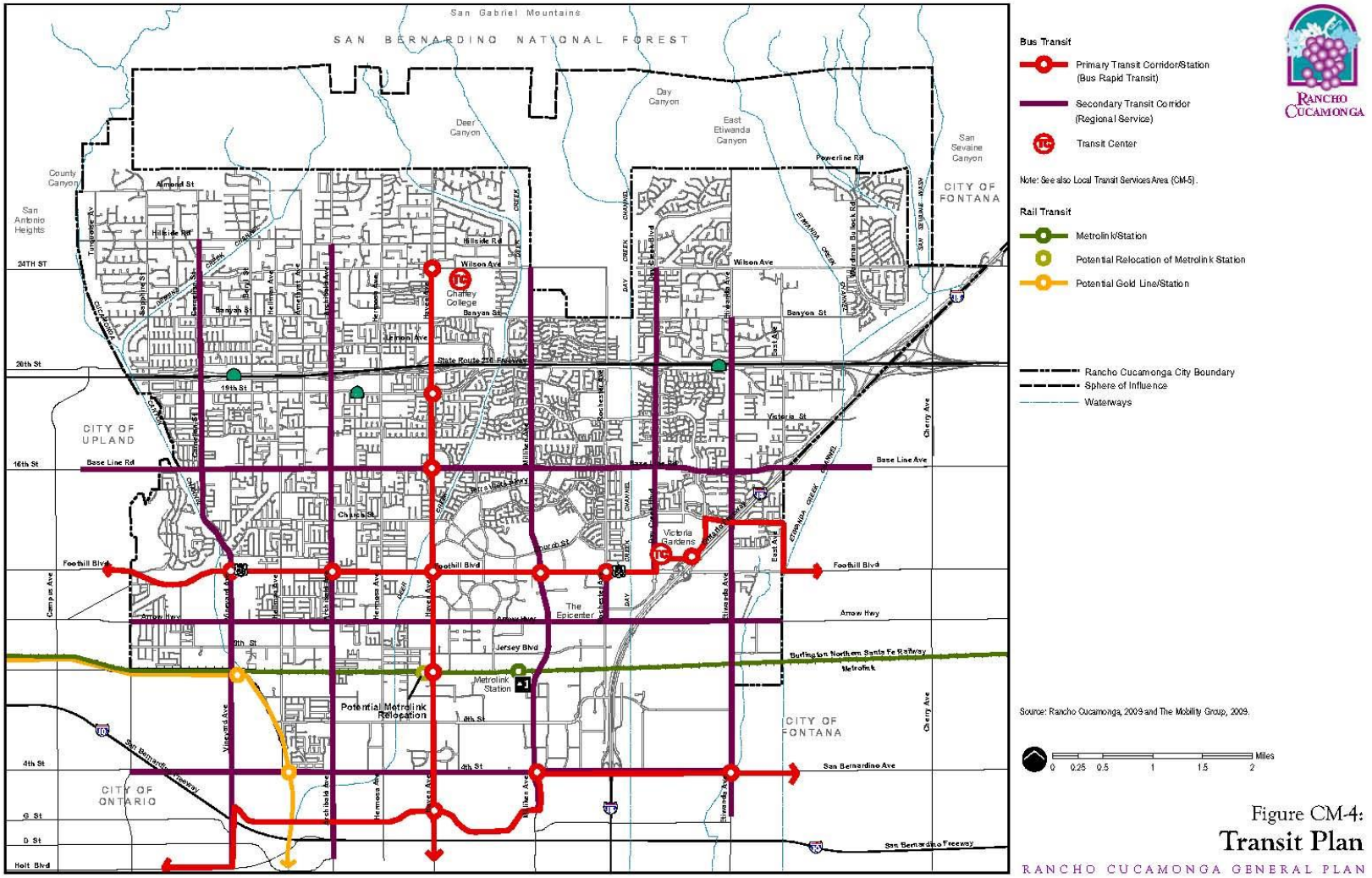
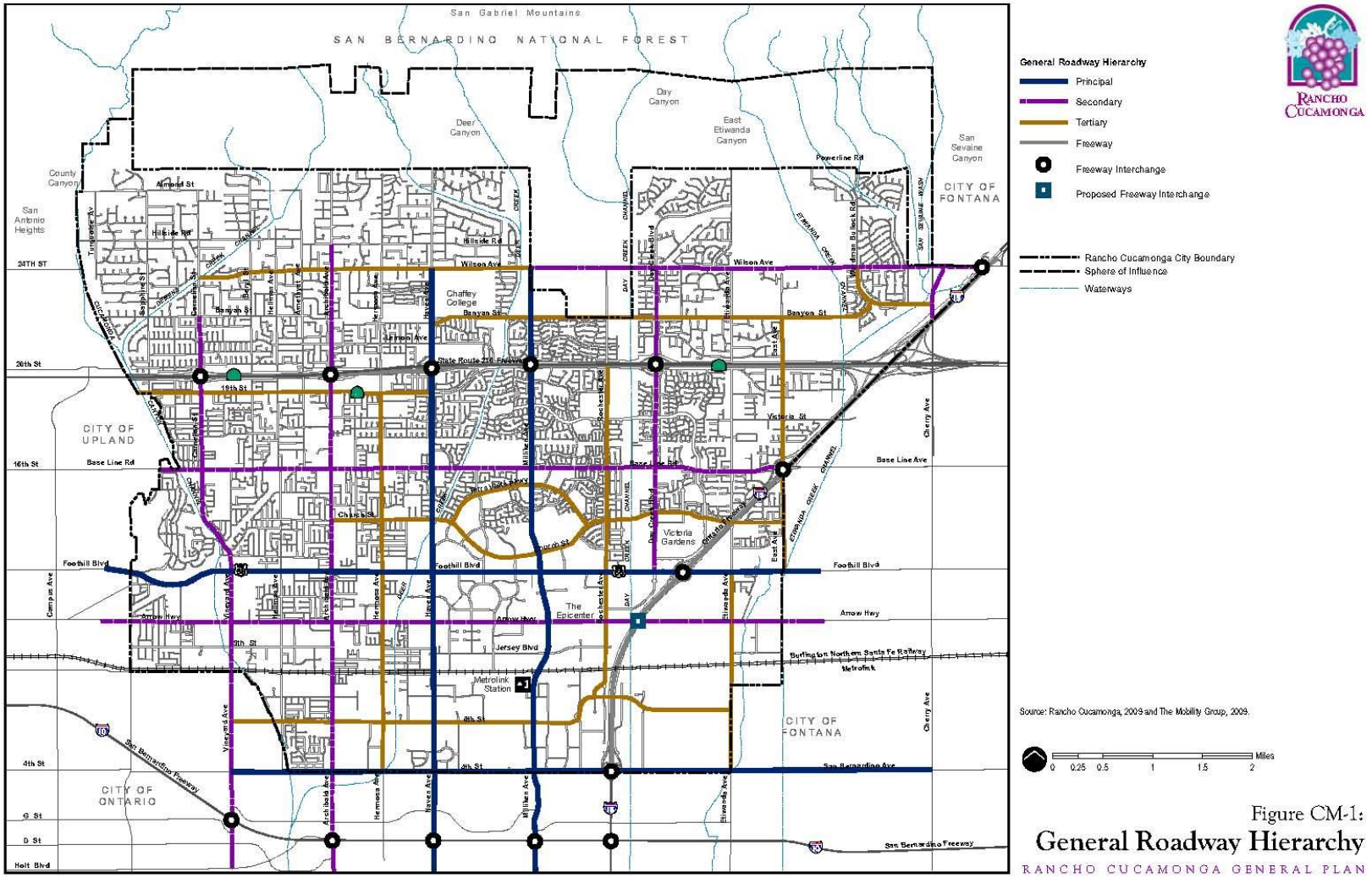
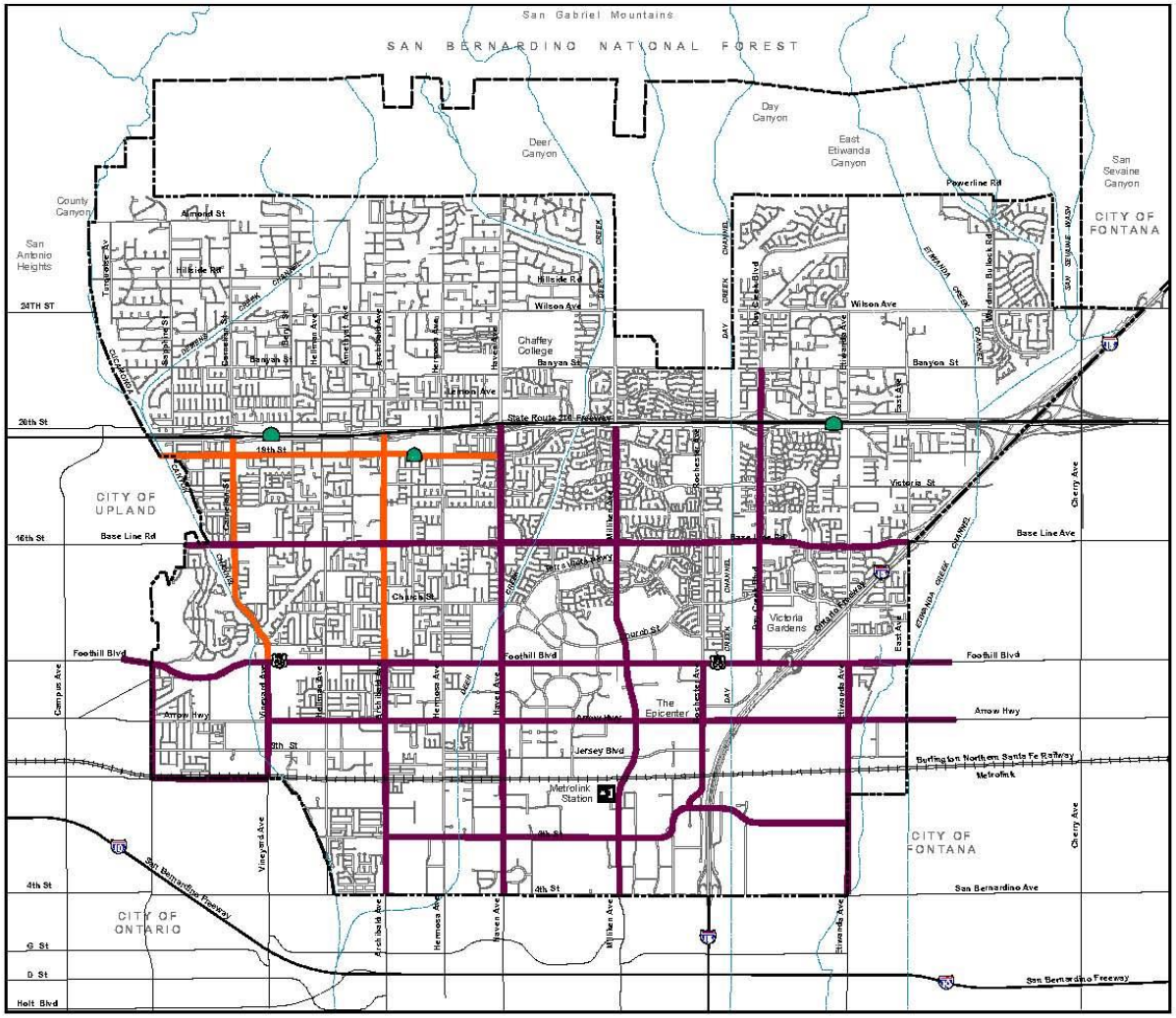


Figure CM-4:
Transit Plan
RANCHO CUCAMONGA GENERAL PLAN



RANCHO CUCAMONGA

Figure CM-1:
General Roadway Hierarchy
RANCHO CUCAMONGA GENERAL PLAN



Truck Routes

- Truck Routes
- Truck Routes (38-Foot Kingpin Limit)
- Rancho Cucamonga City Boundary
- Sphere of Influence
- Waterways

RANCHO CUCAMONGA

Source: Rancho Cucamonga, 2009 and The Mobility Group, 2009.

0 0.25 0.5 1 1.5 2 Miles

Figure CM-8:
Truck Routes
RANCHO CUCAMONGA GENERAL PLAN

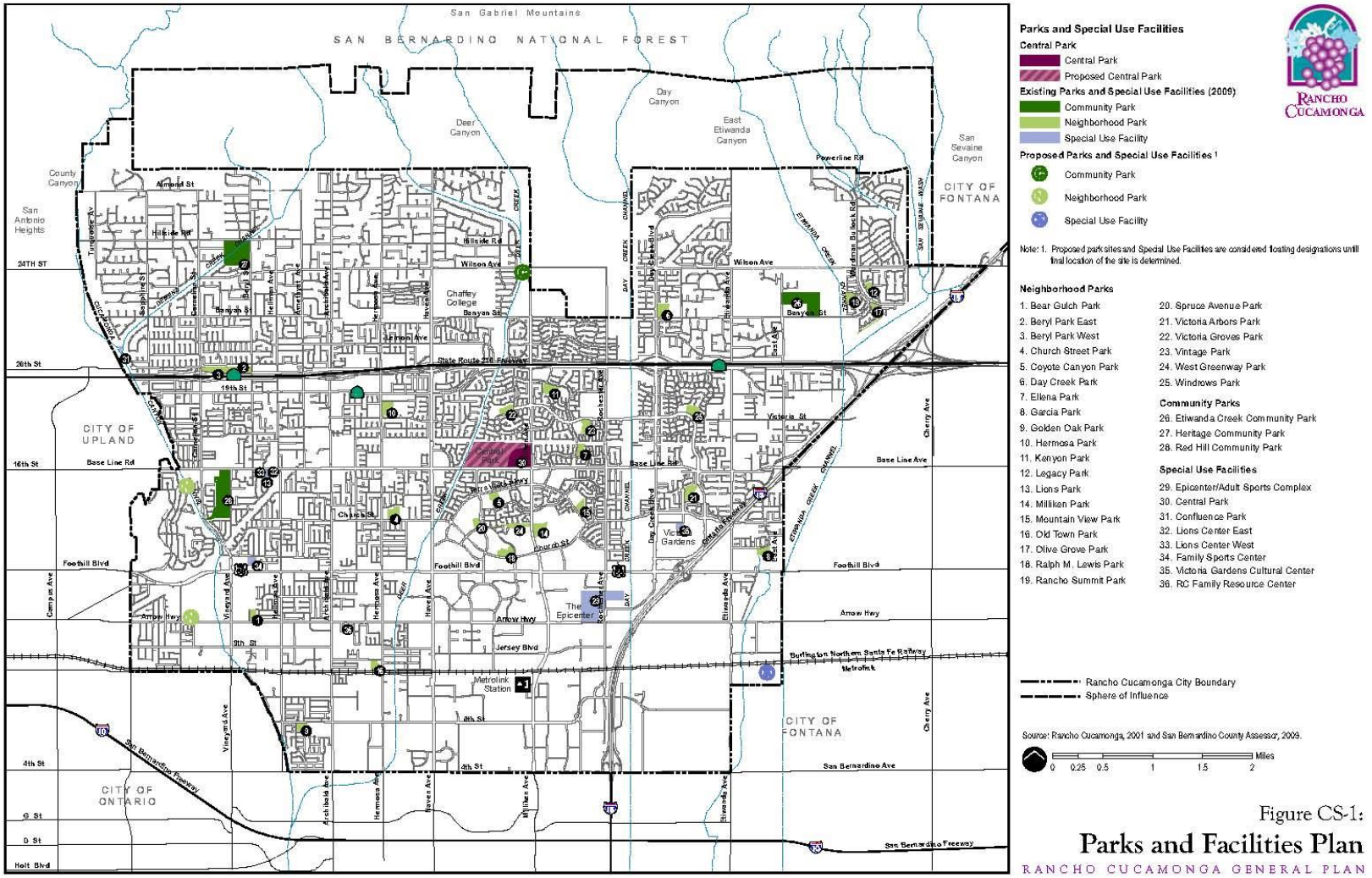


Figure CS-1:
Parks and Facilities Plan
RANCHO CUCAMONGA GENERAL PLAN

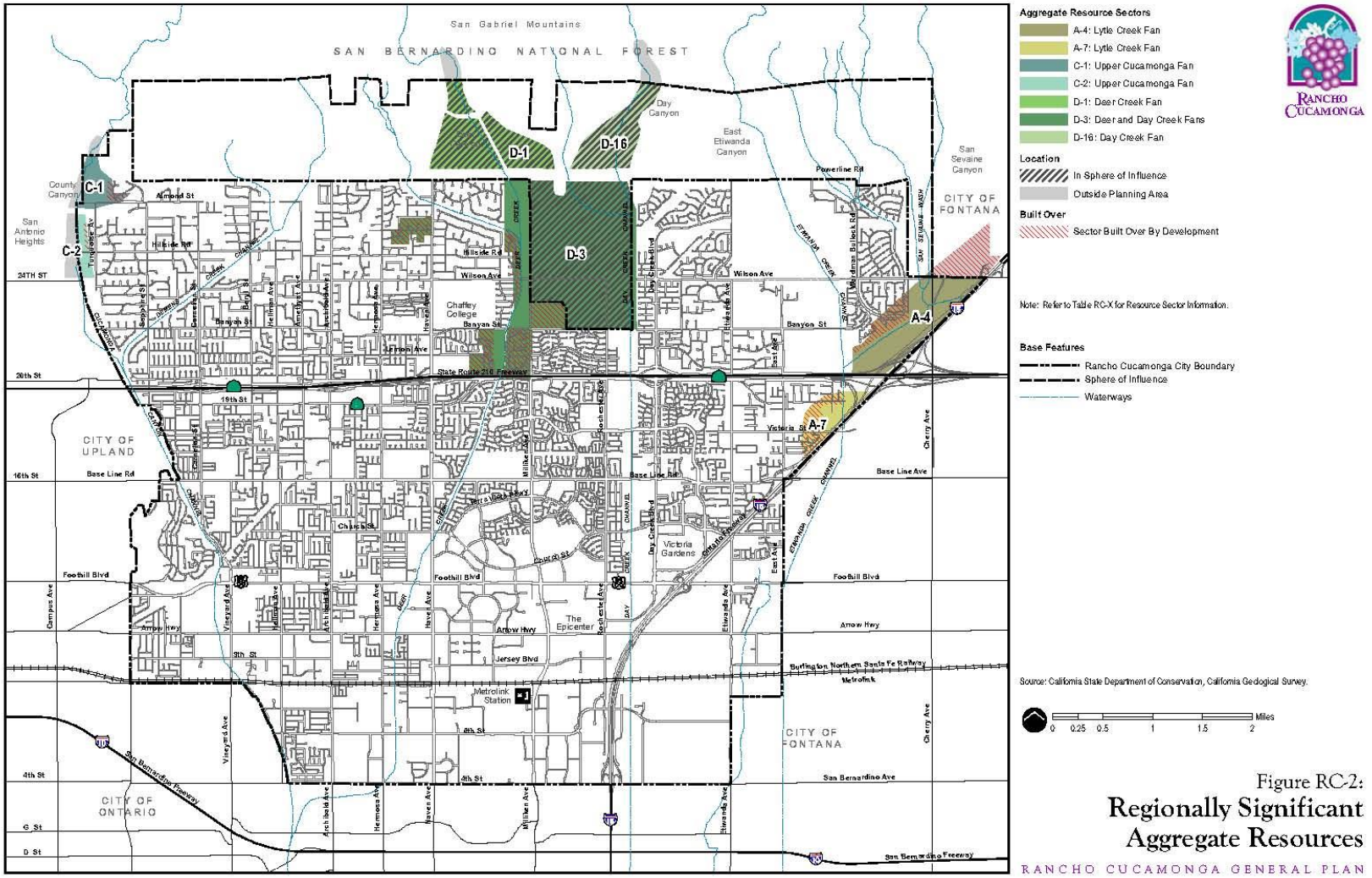


Figure RC-2:
Regionally Significant Aggregate Resources
RANCHO CUCAMONGA GENERAL PLAN

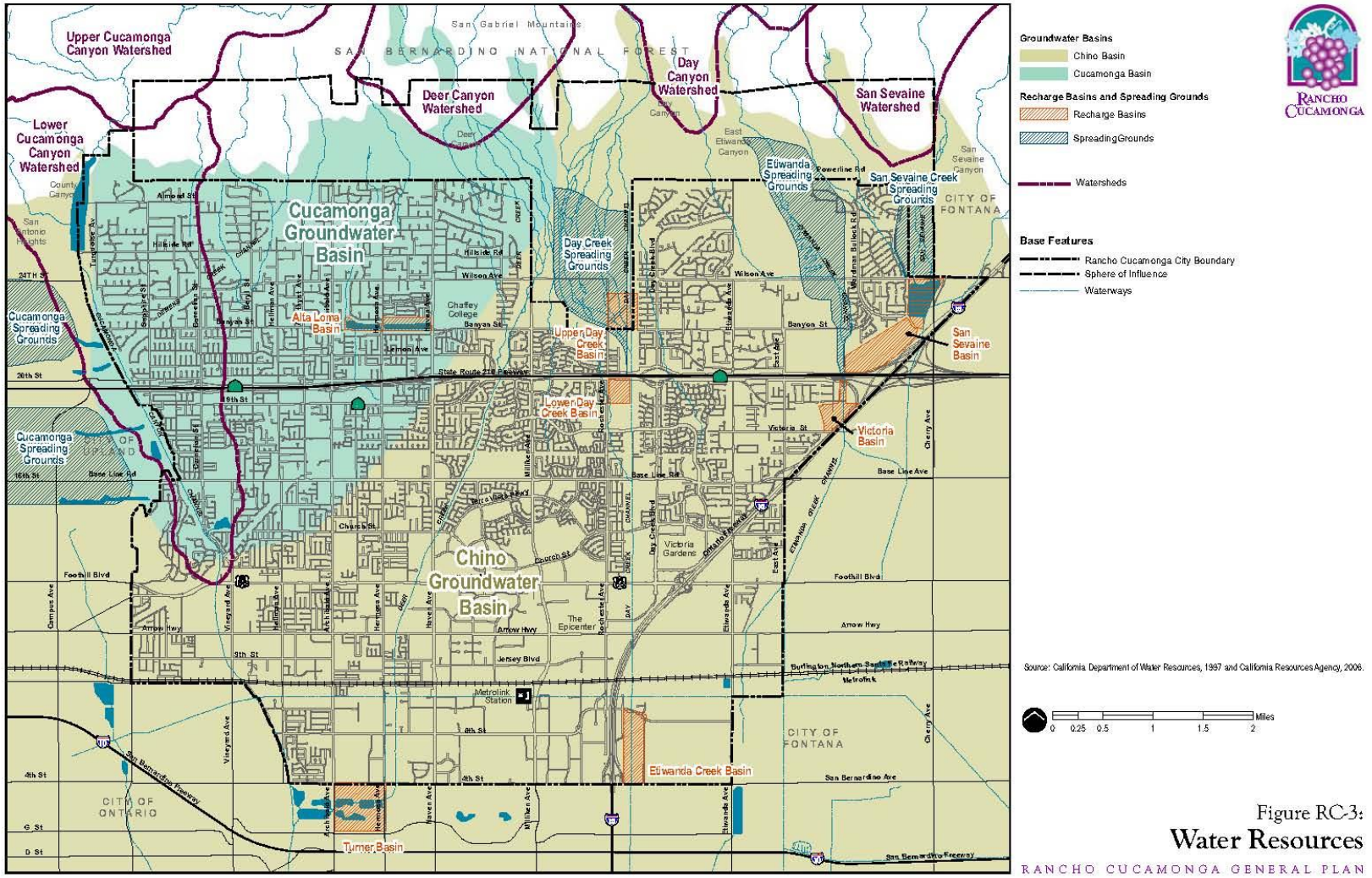


Figure RC-3:
Water Resources
RANCHO CUCAMONGA GENERAL PLAN

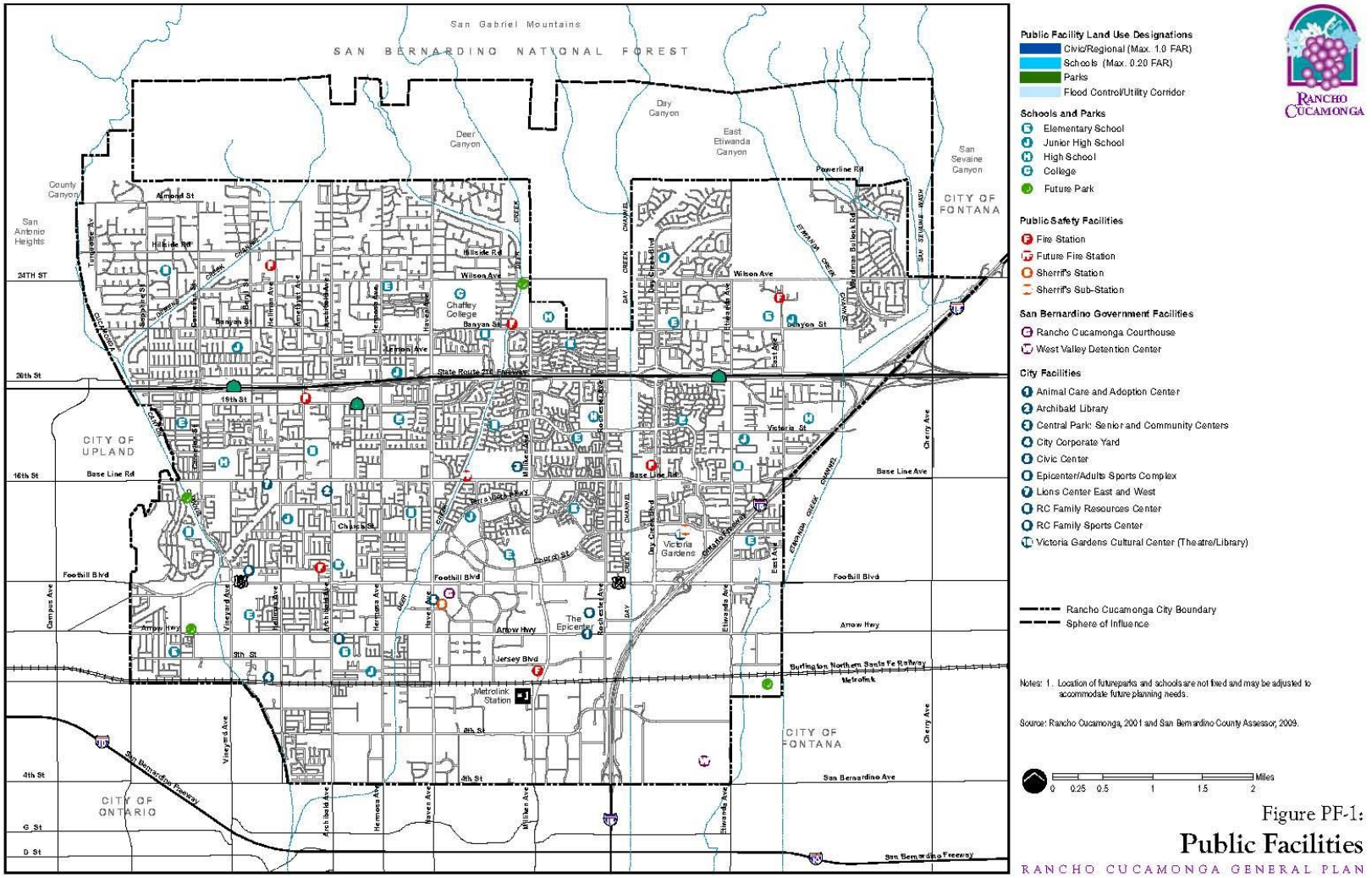


Figure PF-1:
Public Facilities
RANCHO CUCAMONGA GENERAL PLAN

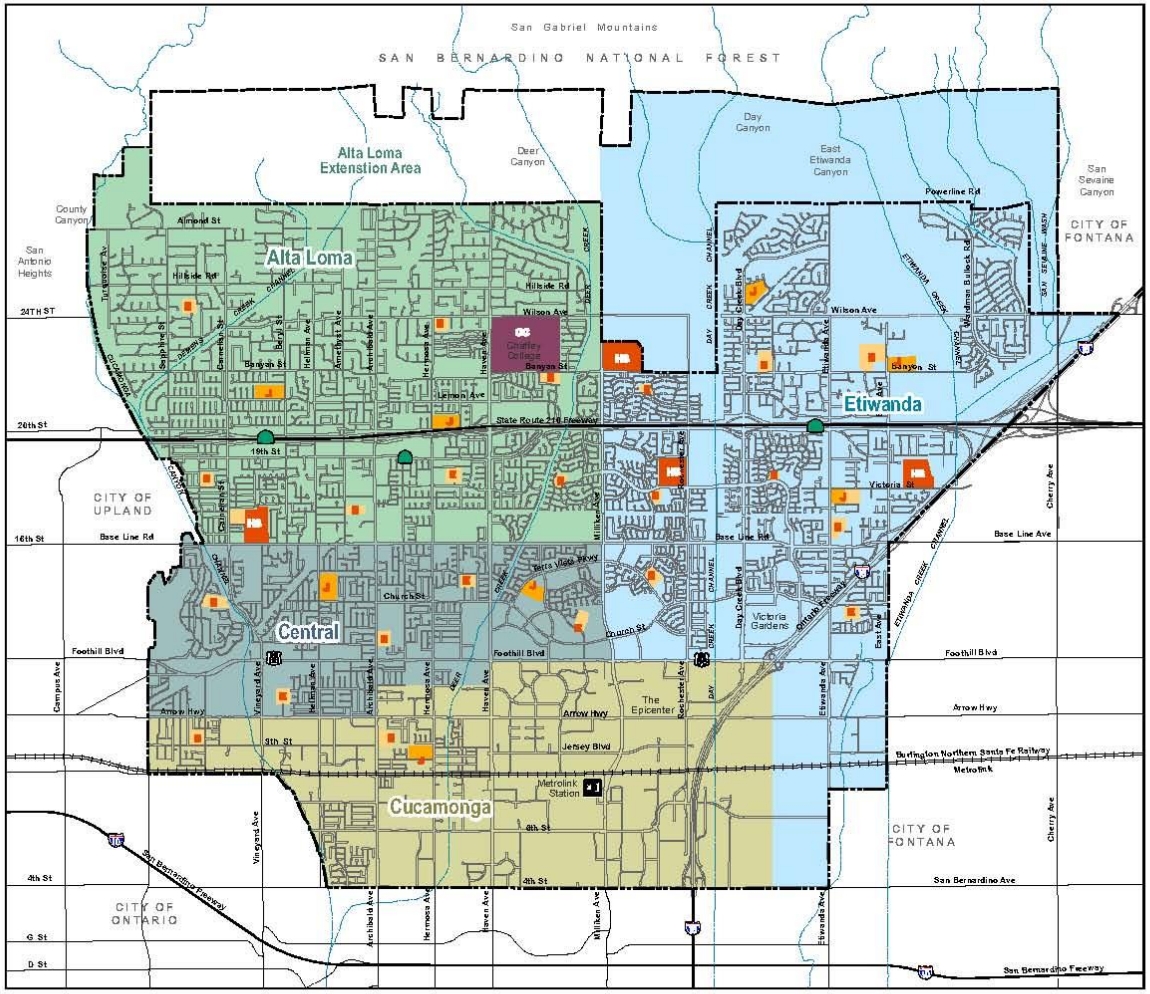


Figure PF-2:
Schools and School Districts
RANCHO CUCAMONGA GENERAL PLAN

4.4 Vulnerability Assessment

This section serves to identify each hazard confronting the community and its vulnerabilities to that hazard. This is the final step in the four-step risk assessment process and utilizes data and information collected from the City and various external agencies. It provides loss estimates and the vulnerability of general buildings, key facilities with critical functions and governance relationships, and the people who live and work in the City of Rancho Cucamonga. The vulnerability assessment provides a solid basis for analyzing the risk, the potential exposure, and the consequences to City operations and safety.

The following were taken into account when assessing the vulnerability:

- Updates to inventories of existing structures in hazard areas, including new development, redeveloped areas or structures located in annexed areas
- Potential impacts of future land development, including areas that may be annexed in the future
- New buildings that house special high-risk populations (i.e., elderly, low-income, disabled)
- Completed mitigation actions that reduced overall vulnerability

4.4.1 Methodology

To conduct the vulnerability assessment, a combination of quantitative and qualitative approaches was used. A quantitative assessment of earthquake risk was performed with City provided data and FEMA's HAZUS software.

4.4.2 Methodology and Results for Earthquakes

The San Andreas Fault is the "master" fault of an intricate fault network that cuts through rocks of the California coastal region. The entire San Andreas fault system is more than 800 miles long and extends to depths of at least 10 miles within the earth. The San Andreas fault forms a continuous, narrow break in the earth's crust that extends from northern California southward to Cajon Pass near San Bernardino. Southeastward from Cajon Pass, several branching faults, including the San Jacinto and Banning faults, share the movement of the crustal plates.

Recent studies of the eastern knot of the San Andreas near San Gorgonio Pass reveal that this area is more advanced in the cycle of strain accumulation than the western knot at the Cajon Pass. Recent earthquake activity around the Southern San Andreas, including the June, 1992 Landers-Big Bear earthquakes, has prompted scientists to increase their studies of this area.

An M 8.0 or greater earthquake in San Bernardino County could cause thousands of casualties, extensive major property damage, disruption in communications and utility

systems, disruption in supply and distribution systems, and general panic. An earthquake of this magnitude could directly affect all of Rancho Cucamonga and most of Southern California, causing a critical demand on mutual aid resources and competition for national relief.

Another interrelated fault, the San Jacinto fault, has had a higher level of moderate-to-large earthquakes during the past 50 to 100 years, although the rate of slip is not as high. Geodetic data indicates there is an "appreciable" strain accumulation across both faults, implying that either one or both may be primed for release. Historically, the San Jacinto Fault moves on average every 14 years, with the longest known interval being 19 years. The last slip occurred on the Borrego Springs segment in 1968.

In 1988, the Working Group on California Earthquake Probabilities (WGCEP) estimated 30-year probabilities of 20 percent for an M 7.0 event on the San Bernardino Valley segment of the San Jacinto Fault Zone. In late 1993, Special Publication 102, "Planning Scenario for a Major Earthquake on the San Jacinto Fault in the San Bernardino Area" was published by the California Department of Conservation, Division of Mines and Geology. This planning scenario states that an earthquake of M 7.0 on the San Bernardino Valley Segment of the San Jacinto Fault Zone is a significant hazard to lives and property.

The City of Rancho Cucamonga's building stock is predominately modern; however, as a result of the Northridge earthquake, it is now known that while occupants may be well-protected, economic losses associated with structural damage, loss of contents, and expensive repairs can be tremendous, even in a modern urban environment. The losses associated with the Northridge earthquake approached $30 billion.

Effects on people and housing. In any earthquake, the primary consideration is saving lives. Time and effort must also be dedicated to providing for mental health by reuniting families, providing shelter to displaced persons, and restoring basic needs and services. Major efforts will be required to remove debris and clear roadways, demolish unsafe structures, assist in reestablishing public services and utilities, and provide continuing care and temporary housing for affected citizens.

A survey of local, State, and Federal government emergency plans indicate that although there is a general capacity to respond to small and intermediate-sized earthquakes, it is unlikely that any of these governmental units will be able to cope with the *immediate* impact of a great quake, such as an M 8.3 event on the south-central San Andreas fault. The general public must realize that the assistance that they have been used to expecting simply will not be immediately available. In fact, in the event of an earthquake of such magnitude, citizens must be prepared to wait for up to 72 hours or more for any type of organized response.

Effects on commercial and industrial structures. After any earthquake, individuals are likely to lose wages due to the inability of businesses to function because of damaged goods and/or facilities. With business losses, the City of Rancho Cucamonga will lose revenue. Economic recovery from even a minor earthquake will be critical to the communities involved.

Effects on infrastructure. The damage caused by both ground breaking and ground shaking can lead to the paralysis of the local infrastructure: police, fire, medical, and governmental services.

The following table illustrates direct loss estimates with regard to catastrophic earthquake for the City of Rancho Cucamonga:

		Earthquake Scenario		
		M7.8 ShakeOut Scenario (including Liquefaction)	**M6.7 San Jacinto Fault (including Liquefaction)**	**M6.7 Chino Hills Fault (including Liquefaction)**
Direct Economic Losses for Buildings ($1,000)				
	Total Building Exposure Value	16,272,134		
Capital Stock Losses	Cost of Structural Damage	183,826	32,617	21,230
	Cost of Non-Structural Damage	800,868	202,731	143,141
	Total Building Damage (Str. + Non-Str.)	984,694	235,348	164,372
	Building Loss Ratio %	6.1%	1.4%	1.0%
	Cost of Contents Damage	258,796	85,146	67,286
	Inventory Loss	8,025	2,755	2,757
Income Losses	Relocation Loss	95,490	11,680	6,610
	Capital-Related Loss	22,256	2,379	1,830
	Rental Income Loss	66,158	8,190	5,379
	Wage Losses	29,206	3,152	2,338
	Total Direct Economic Loss	**1,464,625**	**348,651**	**250,573**
	% Of Countywide Loss	6.8%	6.9%	8.2%

Casualties				
Day Casualties	**Casualties - 2 pm**			
	Fatalities	7	0	0
	Trauma injuries	2	0	0
	Other (non-trauma) hospitalized injuries	13	0	0
	Total hospitalized injuries	**15**	**0**	0
	Injuries requiring Emergency Department Visits	389	26	18
	Injuries treated on an Outpatient basis	694	56	39
	Total injuries	**1,105**	**82**	57
	Hospital visits requiring EMS transport	27	1	0
Night Casualties	**Casualties - 2 am**			
	Fatalities	5	0	0
	Trauma injuries	1	0	0
	Other (non-trauma) hospitalized injuries	7	0	0
	Total hospitalized injuries	**8**	**0**	**0**
	Injuries requiring Emergency Department Visits	523	44	28
	Injuries treated on an Outpatient basis	967	94	60
	Total injuries	**1,503**	**138**	**88**
	Hospital visits requiring EMS transport	31	1	0
Shelter				
Shelter	Number of Displaced Households	2,157	220	96
	Number of People Requiring Short-term Shelter	644	65	30
Debris (thousands of tons)				
Debris	Brick, Wood & Other (Light) Debris	149	25	17
	Concrete & Steel (Heavy) Debris	224	17	13
	Total Debris	**373**	**42**	**30**
Building Damage Count by General Building Type				
Concrete	None	106	228	254
	Slight	103	80	63
	Moderate	76	18	8
	Extensive	28	0	0
	Complete	12	0	0
	TOTAL	**326**	**326**	**326**
Manuf. Housing	None	0	104	250
	Slight	1	363	519
	Moderate	39	800	595
	Extensive	327	131	36
	Complete	1,033	2	0
	TOTAL	**1,400**	**1,400**	**1,400**

Precast Concrete	None	107	165	161
	Slight	113	85	88
	Moderate	47	19	20
	Extensive	2	0	0
	Complete	0	0	0
	TOTAL	**268**	**268**	**268**
Reinforced Masonry	None	300	494	532
	Slight	221	144	118
	Moderate	112	29	18
	Extensive	28	1	0
	Complete	7	0	0
	TOTAL	**669**	**669**	**669**
Steel	None	25	110	138
	Slight	52	59	40
	Moderate	82	14	6
	Extensive	21	0	0
	Complete	4	0	0
	TOTAL	**184**	**184**	**184**
Unreinforced Masonry	None	1	6	6
	Slight	2	6	7
	Moderate	2	5	4
	Extensive	5	1	1
	Complete	8	0	0
	TOTAL	**18**	**18**	**18**
Building Damage Count by General Building Type (Continued)				
Wood Frame (Other)	None	747	1,385	1,611
	Slight	697	579	401
	Moderate	290	71	24
	Extensive	223	1	0
	Complete	80	0	0
	TOTAL	**2,036**	**2,036**	**2,036**
Wood Frame (Single-family)	None	14,246	24,904	28,458
	Slight	18,716	10,440	7,112
	Moderate	2,674	415	194
	Extensive	125	5	1
	Complete	4	0	0
	TOTAL	**35,764**	**35,764**	**35,764**

ALL BUILDING TYPES	None	15,531	27,396	31,410
	Slight	19,905	11,756	8,347
	Moderate	3,321	1,372	870
	Extensive	759	140	37
	Complete	1,149	2	0
	TOTAL	**40,665**	**40,665**	**40,665**

The City of Rancho Cucamonga is clearly at high risk for a significant earthquake causing catastrophic damage and strains on response and mitigation resources. Both property and human life are at high risk. The City experiences hundreds of minor quakes and tremblers each month from the myriad of faults in the area. Studies indicate that stress is building up in major faults like the San Andreas. A major quake could happen at any time.

Earthquakes can cause many cascading effects such as fires, flooding, hazardous material spills, utility disruptions, landslides, and transportation emergencies. Earthquakes can also cause dam failure, resulting in severe flooding. While the San Antonio dam is outside of the city limits of Rancho Cucamonga, a failure of that dam would have significant effects on emergency response by eliminating routes to the closest acute care hospital to the City (San Antonio Community Hospital) and for evacuation to the west of the City.

Earthquakes may cause landslides and rupture dams. Ground shaking may cause seiche, the rhythmic sloshing of water in lakes or bays. As noted earlier under the Hazard of Flooding, the City has made significant investments in improving drainage channels, including the Deer Creek and Day Creek debris basins.

4.4.3 Methodology and Results for Flooding

Floods that affect Rancho Cucamonga can be attributed to three different types of storm events, namely:

- A general winter storm that combines high-intensity rainfall and a rapid melting of the mountain snow pack.
- A tropical storm out of the southern Pacific Ocean.
- A summer thunderstorm.

There are three principal types of flood hazards, namely:

- Stream flooding (including bridge scour and stream erosion)
- Flash flooding (including debris and mud flows)
- Sheetflow flooding

When a major storm moves into the area, water collects rapidly and becomes surface runoff. Resultant flood flows have predominantly short durations and sharp peaks. Increased urbanization increases flood potential by increasing the percentage of impervious surfaces.

Storms with high volumes of precipitation in a short period of time have occurred in the City causing flash floods, contaminated drinking water, disrupted electrical service, and damaged homes and contents. In addition, land that has been stripped of foliage and trees due to fire or human activity has experienced serious erosion.

Excessive precipitation can inundate soil in slopes causing mudslides and landslides. This activity can destroy homes, block highways, and destroy power lines. The City is vulnerable to this type of flood damage.

Heavy storms also can strand individuals playing near or crossing streams, rivers, flood control channels and intersections.

Flooding can be rapid and quite severe during the period of July and August. Winter rains are generally more widespread, but flashflood potential is less due to steady-state rain fall. Winter rains are nonetheless flood-prone, but may be slightly more predictable. There is a danger to motorists who may attempt to drive through flooded washes.

Effects on people and housing. As the table of flood incidents from 1862-1977 shows, the effects on people and housing can be significant. In the community's early years, many people lost their homes or businesses due to the heavy rainfall and floodwaters that swept through the City. At the time of these early historical incidents, many people didn't have the economic means to rebuild their homes or businesses.

Effects on commercial and industrial structures. Depending on the geographic area involved and the economic and demographic characteristics of the area, the effects on industry and commerce may be significant.

Effects on infrastructure. A slow-rising flood situation will progress through a series of stages, beginning with minor rainfall and evolving to a major event such as substantial flooding. Once flooding begins, personnel will be needed to assist in rescuing persons trapped by flood waters, securing utilities, cordoning off flood areas, and controlling traffic. Several changes have been made to the City's infrastructure throughout its history to minimize the flooding hazard.

Flooding due to heavy precipitation is a potential hazard in the City of Rancho Cucamonga, with the resultant possibilities for damage to property and loss of life. Severe flooding can be particularly costly. In a relative sense, flooding due to precipitation does not present the degree of danger posed by other hazards such as major earthquakes. While the San Antonio dam is outside of the city limits of Rancho Cucamonga, a failure of that dam would have significant effects on emergency response by eliminating routes to the closest acute care hospital to the City (San Antonio Community Hospital) and for evacuation to the west of the City.

The HAZUS-MH Flood Model can be used to assess both riverine and coastal flooding and estimates potential damage to buildings, essential facilities, transportation lifelines, utility lifelines, vehicles, and agricultural crops. The model addresses building debris generation and

shelter requirements. Direct losses are estimated based on physical damage to structures, contents, and building interiors. The effects of flood warning are taken into account, as are flow velocity effects. The flood model provides a dam/levee analysis capability and incorporates NFIP entry dates that permit the Flood model to distinguish between census blocks that are Pre-FIRM and those that are Post-FIRM; modifies topological data for Census Track and Census Block geometrics; provides for consistent generation of debris results.

Results of the FEMA-funded SBEFRA Project completed in 2009 include county-wide flood loss estimates for areas subject to the 100-year flood (with and without levee protection) and the 500-year flood. The county level results are listed below:

		Flood Scenario		
	Regional Risk Assessment Results	**100-year Flood (1% Annual Chance Flood)**	**100-yr Flood (without levee protection)**	**500-year Flood (0.2% Annual Chance Flood)**
Regional Risk	Economic loss due to building damage ($B)	0.46	1.6	2.7
	Total building-related direct economic loss ($B)	1.4	5.4	8.6
	Number of buildings in the Complete Damage State	345	350	1,105
	Total # Displaced Households	14,828	52,856	86,062
	Total # people needing short-term shelter	32,095	138,991	231,452
	Debris Generated (million tons)	0.1	0.23	0.37
Essential Facilities	Fire Stations - # Non-functional buildings	2	5	12
	EOCs - # Non-functional buildings	0	0	2
	Police facilities - # Non-functional buildings	0	0	1
	Schools - # Non-functional buildings	149	466	791

Source: FEMA's San Bernardino County Essential Facilities Risk Assessment (SBEFRA) Study (2009)
http://www.fema.gov/library/viewRecord.do?id=3804

Floods can cause many cascading effects. Fire can break out as a result of dysfunctional electrical goods. Hazardous materials can also get into floodways, causing health concerns and polluted water supplies.

4.4.4 Methodology and Results for Wildfires

As a general rule, the dry seasons are a major time for an increase in the number of forest fires and structure fires. The standard "shake roof" is a particular hazard, as is the poor control of flammable growth around structures. During times of the strong "Santa Ana" winds, fire danger is particularly high.

Due to

- the undeveloped and rugged terrain of wild land near the City of Rancho Cucamonga,
- highly flammable brush-covered land, and
- long, dry summers,

The City and parts of San Bernardino County adjacent to the City have experienced numerous wild land fires in the recent past.

Effects on people and structures. As the table of selected historic wildfire incidents since 1970 shows, the effects on people and housing can be significant. Many of the fires shown in the table resulted in the evacuation of homes. In the recent Grand Prix Fire, *thousands* of homes were evacuated. The impact on people and structures of an incident like the Grand Prix Fire are overwhelming in terms of emotional, as well as economic, costs. Two of the fires noted in the table threatened an intermediate school, and one threatened a college campus. Moreover, as the table notes, in some cases, people were injured or killed by wildfire.

Effects on infrastructure. Wildfires often result in power outages. These outages can be extensive in geographic area and numbers of persons affected. As shown in the table above, the Amethyst Fire in the summer of 1997 caused power outages to the Greater Los Angeles area.

As the fires in the summer and fall of 2003 showed, the effects of wildfires can be far-reaching in terms of the number of acres involved, the toll on human life, and the economic consequences. Even though much fuel was consumed in the 2003 fires, there are still pockets with the potential to suffer high severity in a wildfire incident. Grasses are growing back since the 2003 incidents and there is the potential for a flash fire. Wildfire will continue to be a high risk hazard for the City of Rancho Cucamonga.

Major wildfires can completely destroy ground cover, setting the stage for flooding and erosion. If heavy rains follow a major fire, flash floods, heavy erosion, landslides and mudflows can occur. These cascading effects can have ruinous impacts on people, structures, infrastructure, and agriculture.

Fire Hazard Severity Zone Model
(***Adapted from California Department of Forestry and Fire Protection May 2007 "FACT SHEET: Fire Hazard Severity Zone Model - A Non-technical Primer)***
Most of the highest wildfire losses take place during hot, windy days or nights when flames spread so fast that many buildings catch fire and overwhelm available firefighting forces. Many buildings ignite when burning embers land on wood roofs, blow in through vents, pile up in cracks, or become lodged under boards. By constructing buildings in a way that reduces the ability of embers to intrude, a major cause of structure ignition is reduced. Recently adopted building codes reduce the risk of burning embers igniting buildings. Standards are already in effect for roofs and attic vents. Application of roofing standards depends on the Fire Hazard Severity Zone of a property. New building codes for California, will require siding, exterior doors, decking, windows, eaves, wall vents and enclosed overhanging decks, to meet new test standards. These standards apply throughout areas where the State has financial

responsibility for wild land fire protection and for local responsibility areas zoned as very high fire hazard severity.

While all of California is subject to some degree of fire hazard, there are specific features that make some areas more hazardous. California law requires CAL FIRE to identify the severity of fire hazard statewide. These fire zones, called Fire Hazard Severity Zones are based on factors such as fuel, slope of the land and fire weather. There are three zones, based on increasing fire hazard: medium, high and very high.

Model Behind Fire Hazard Severity Zone Mapping
The zone designation for each specific parcel is initially assigned by a computer model. The model is based both on existing fire behavior modeling techniques used by fire scientists throughout the United States and on new methodologies and data developed by the Fire Center at the University of California in Berkeley. The model evaluates land area using characteristics that affect the probability that the area will burn and the potential fire behavior that is expected should the area burn in a wildfire. Many factors are considered such as fire history, existing and potential fuel, flame length, blowing embers, terrain, and typical weather for the area.

Hazard versus Risk
As required by law, the model evaluates “hazard” not “risk”. Hazard refers to physical conditions that cause damage. “Hazard” as calculated in the model is based on the physical conditions that give a likelihood that an area will burn in the future, the heat produced when it does burn, and a prediction of the embers that spread the fire. It is based on the potential vegetation that will grow in the area over the next 30 – 50 years. Risk, on the other hand, is the potential damage a fire can do to values at risk in the area under existing and future conditions. Risk does consider modifications that affect susceptibility of property to damage, such as defensible space, irrigation and sprinklers, and building construction that reduces the risk of burning embers igniting buildings. Hazard does not equal risk, but is an important factor in determining risk.

Zones and Parcels
Mapping an area as large as California requires the creation of spatial units called zones. Zones are areas that form the spatial building blocks for constructing a map. They are akin to pieces in a jig-saw puzzle. Zones are created by computer from areas of similar terrain, vegetation, and fuel types. They are areas that have relatively similar burn probabilities and fire behavior characteristics. The zone size varies from 20 acres and larger in urbanized areas to 200 acres and larger in wild land areas. Urban areas are treated differently in mapping due to the significant changes in both fuel conditions and burn probability that happen as areas become urbanized.

Wild land zones are areas of similar terrain and fuel conditions created by using computer techniques to build the boundaries. Areas dominated by brush lands on steep slopes will generally occur in different zones than flat grassland areas.

Urban zones are delineated based on minimum area and average parcel size. They must be

at least 20 acres in size, and contain average parcel sizes that are less than two acres per parcel. In most counties, urban zones were developed using parcel data. Where such data was not available parcel density was interpreted using 2000 census data and statewide vegetation map data. In practice, the majority of areas mapped as urban zones have parcel sizes less than one acre, with highly developed infrastructure and ornamental vegetation. Fundamental to understanding the map is that hazard zones do not exist at scales smaller than those used to create the zones. Thus when looking at the map, one needs to know how information is averaged across the zone to derive the final hazard ranking. The zones will have smaller areas within them of different hazard characteristics. This detail is lost when scores are averaged over the entire area of the zone to obtain a zone-wide description of hazard.

Focus on Characterizing Fire Behavior and Fire Hazard to Buildings
Since new building standards seek to reduce the chance that buildings will ignite in a wildfire, the model focuses on those descriptions of fire behavior that influence structure ignition. The model uses fire behavior characteristics that describe the intensity of both radiation and convection from nearby flame sources (using flame length as a measure) and mass transport of firebrands due to convection lifting and wind).

Intrinsic to hazard, consequently, is the estimation of probability, or chance. Further, the conditions that give rise to hazard for an area are not solely a function of conditions in that particular area. Firebrands landing in an area may be produced some distance away, and hence the hazard for an area is influenced by hazards off-site.

Terms Used
Fire Hazard Severity has two key components: probability of burning and expected fire behavior. The factors considered in determining hazard are: 1) how often an area will burn; and 2) when it does burn, what characteristics might lead to buildings being ignited? Fire behavior refers to the physical characteristics of the fire – examples include rate of spread, length of flames, and the ability to produce firebrands or embers. Burn probability describes the average chance of a fire burning an area in any given year. It is based on the fire records spanning the last 55 years. Some areas of the state have much higher chances of burning, and this is reflected in the hazard zones.

Zoning and Scoring
The model uses building blocks to derive FHSZ classes based on a two-step process: Zoning and Scoring (See Figure 24). Urban areas are treated differently from wild lands due to the significant changes in both fuel conditions and burn probability that happen as areas become urbanized. Each wild land zone gets scores that tie together the burn probability with the expected flame sizes predicted by fuels, slope, and expected fire weather. Since it describes potential hazard to buildings, the model characterizes the fuel potential of the area over a 30-50 year period and the maximum expected hazard value is used.

While some areas may have recently been treated and currently have only moderate hazard, buildings in that area will be exposed to increasing hazards as these vegetation fuels develop, hence the use of “climax” or fuel potential in the model. As with the chance of fire, expected flame size varies significantly from one fuel type to the next.

Areas also receive a score for the amount of firebrands (burning embers transported by the wind) that are expected to land on an area. In the model, firebrands are produced based on fuel types and a model describing the distribution of firebrands transported from the source area. The firebrand score is a function of the number of brands that are expected to land on a given area, and are consequently influenced by areas around them where the embers are produced.

Each wild land zone gets an area-averaged classification for flaming and firebrands, which together determine the final hazard ranking for the zone: moderate, high or very high. Urban zones are scored based on their proximity to wild land zones and the flame score for that wild land zone, the number of firebrands being produced in the wild lands and received in the urban area, and the amount of vegetation fuels present in the urban zone. Urban areas immediately next to wild land zones typically have the highest hazard, and areas more removed from the wild lands have lower hazards.

The influence of wild land fire hazard into urban areas can range from only about 200 feet in low hazard conditions, to nearly a mile in very high hazard areas. The nature and depth of the zones are a function of both how likely a flame front will penetrate, and how many firebrands are expected to land in the urbanized areas.

Results of the Model

Results of the model lead to revised maps of fire hazard severity. To summarize, classification of a zone as moderate, high or very high fire hazard is based on the severity of fire behavior that leads to building ignition. Each area of the map gets a score for flame length, embers, and the likelihood of the area burning. Scores are averaged over the zone areas. Final FHSZ class (moderate, high and very high) is determined based on the averaged scores for the zone. Model results were tested and validated in four counties with very different conditions: Butte, Calaveras, Sonoma, and San Diego. Further, draft maps have been reviewed by the 21 CAL FIRE units and six contract counties; their recommendations for changes were evaluated and incorporated when appropriate. Updated information and support documents for FHSZ are available on CAL FIRE's Fire and Resource Assessment Program's website at http://frap.cdf.ca.gov/fhsz/review.html.

Water Supply and Distribution

In some areas of the community, water supply can become marginal during time of heavy emergency usage. Residents wetting their roof and properties during times of fire activity heavily impact water stored in hilltop reservoirs. Many times this practice takes place when the fire activity is a long distance from the property. Widespread use of this practice robs emergency fire equipment of needed water reserves in the fire area.

Some rural canyon structures and residences are built at a considerable distance from roadways and water distribution systems. This requires the laying of supply lines by fire companies, or the use of fire department water tenders to physically transport water to the area requiring protection. These practices become extremely dangerous when faced with the crowded street and driveways mentioned previously. Some water may be obtained from

private swimming pools in the area, through the use of portable pumps. These sources are relatively few, and should not be considered a reliable water source.

Roadways
Naturally occurring topographic restrictions lead to severe restrictions and congestion. Residents trying to evacuate the area, sightseers, and emergency equipment trying to enter have the potential of creating complete blockages on the roadways. Rapid response of law enforcement is crucial to the management of adequate traffic flow.

Evacuation and Shelter Needs
In most cases, wildfires are fast moving and present momentary dangers of intense proportions. When this situation exists, the need for evacuation takes a high priority, but the need for shelter areas is usually minimal. This is contingent on the ability of fire forces to adequately protect the homes of those residents evacuated. When the danger has subsided, the area can usually be re-entered. Should these residences be destroyed, then the need for shelters becomes evident.

4.4.5 Methodology and Results for High/Straight Line Winds

Wind events constitute one of the most frequent major hazards in the City of Rancho Cucamonga. Not only are windstorms chronic, they are costly in terms of property damage. It is also common for arsonists to increase activity during high winds.

Effects on people and housing. The effects of high winds on people and housing can be significant. In the past in the City of Rancho Cucamonga, houses have had roofs torn off and blown away by high winds. In one recent instance, winds were so strong that a car was lifted and moved across a street.

Effects on commercial and industrial structures. Commercial and industrial structures are subject to the same vulnerabilities as residential structures. Again, roofs are at high risk if not built to more recent code.

Effects on infrastructure. The January 6, 2003, high wind incident demonstrated that the effects on infrastructure can be significant. These effects include downed power lines; traffic signals not working; and transportation arteries clogged due to extremely poor visibility and/or high profile vehicles (e.g., “big rigs”) overturned on freeways. Windstorms are a chronic hazard for the City of Rancho Cucamonga. Wind events magnify the risks of wildfire.

Section 5-Community Capability Assessment

5.1 Agencies and People

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

The capabilities available to the City of Rancho Cucamonga fall into the following broad categories:

- Agencies and People
- Plans, Codes and Regulations
- Mitigation Programs and Financial Resources

Identifying and documenting these capabilities provides the basis for developing future mitigation opportunities and how they can be implemented within existing City programs.

Key Personnel
Departments have specific responsibilities and related activities/actions assigned to them for each identified hazard and threat. Each department is responsible for ensuring coordination with the other departments. In an emergency, all employees are disaster service workers. "Subject to such disaster service activities as may be assigned to them by their supervisors, or by law." (CA CG §3100). The City Manager is responsible for identifying key management personnel, with alternates, and alternative facilities to conduct government operations, based on the hazard analysis. Each department will be responsible for identifying key departmental personnel with backups and alternates for each position in the City's organization.

Alert List
The Emergency Management Coordinator is responsible for developing and maintaining an emergency alert list, which will be used to notify the key City personnel. Special rules related to disaster service workers are outlined in California Labor Codes Sections 3211.9, 3352.94, 4351, 4381, 4453, 4702.

Special Districts
Special Districts with responsibilities under this plan will coordinate all planning efforts with the City's Emergency Management Coordinator.

City EOC
The City Manager has overall responsibility for coordinating the City's response to each emergency.

5.2 Existing Plans

The Rancho Cucamonga General Plan documents our shared vision of tomorrow, and defines the steps to progress from the present to the future. As a long-range policy document (with a projected horizon of 15 to 20 years), frequently referred to as the guidebook or "blueprint" for our City's development, the General Plan directs the look, the feel, and the experience of our City now and in the future.

The General Plan is the foundation for many of the City's regulatory documents, including the Development Code, redevelopment plans, specific plans, community plans, master plans, and design guidelines. The way we evaluate proposed developments and plan for future public services and community projects is guided by the General Plan.

The Plan defines how we will maintain economic sustainability, meet our transportation and mobility needs, protect of our limited natural and historical resources, and enhance our cultural assets. The Plan is comprehensive and looks at all aspects of our built environment and natural resources, with the overarching goal of maintaining and enhancing the health of Rancho Cucamonga and our residents.

Since its incorporation in 1977, Rancho Cucamonga has revisited its General Plan on a consistent basis to measure progress toward goals and respond to changes in State law. The 2001 comprehensive General Plan update responded to the maturing nature of the City, recognizing that much of the City is fully developed or committed to development through large-scale master plans.

With the 2010 General Plan update, the focus shifted to infill development (development of remaining vacant properties within developed business districts and residential neighborhoods). With the emergence of new regional transportation plans in the mid-2000s and the State's mandates that cities consider global warming issues in their long-range plans, combined with the City's growing interest in creating opportunities for improved community health through land use, circulation, and related planning approaches, Rancho Cucamonga initiated a broad-based program to expand the scope of the Plan.

The General Plan takes a new approach to city-building that commits itself to the integration of systems (transportation, infrastructure, and land use), collaboration of efforts (residents, businesses, and City leaders), and full-circle comprehensiveness (property, block, neighborhood, and community levels). For Rancho Cucamonga, planning is action. It is not merely an exercise to meet State laws but a proactive way of realizing the City we strive to be.

5.3 Regulations, Codes, Policies and Ordinances

The following is a list of programs that the City of Rancho Cucamonga actively participates in to reduce risk:

Storm Water Management Ordinances: Yes
Stream Management Ordinances: No
Zoning Management Ordinances: Yes
Subdivision Management Ordinances: Yes
Erosion Management Ordinances: No
Floodplain Management Ordinances: Yes
Floodplain Management Last Delineation Date: 3/18/1996
National Flood Insurance Program Community: Yes
National Flood Insurance Join Date:9/5/1984
NFPI Number: 06071
Land Use Plan: Yes
Land Use Plan Last Update: 2010
Community Zoned: Yes
Established Building Codes: Yes
Type of Building Codes: 2001 California Building Code
Local Electric Utilities: Southern California Edison
Local Water Utilities: Cucamonga Valley Water District
Local Natural Gas Utilities: Southern California Gas
Local Telephone Utilities: Verizon
Fire Insurance Rating: The evaluation of the fire insurance classification for the Rancho Cucamonga Fire Protection District is a Class3/9. Class 3 applies to properties in the City within 1,000 feet of a public fire hydrant, five (5) road miles or less of the responding fire station, and with a needed fire flow of 3500 gpm or less. Class 9 applies to properties within five (5) road miles of the responding fire station but beyond 1,000 feet of a fire hydrant. The private and public protection at properties with larger needed fire flows are individually evaluated, and may vary from district classification.
All cities and counties in California are required to adopt a General Plan that lays out major policy goals. The General Plan includes elements, which are sections that address a variety of important topics. The element most closely related to this Hazard Mitigation Plan is the Safety Element. This section focuses on reducing risks posed by natural and technological hazards and other human caused emergency events. Other elements also provide guidance relevant to mitigation, including the Land Use, Open Space, Conservation, Housing, Transportation, and Noise elements. For example, the Land Use Element restricts land uses and density in hazardous areas, thereby limiting the number of people and buildings exposed to hazards. The City of Rancho Cucamonga Local Hazard Mitigation Plan will be adopted in conjunction with the Safety Element of the General Plan once completed.

5.4 Mitigation Programs

Comprehensive hazard mitigation programs include the identification and mapping of hazards, prudent planning and enforcement of building codes, and expedient retrofitting and rehabilitation of weak structures to reduce the scope of an earthquake disaster.

As noted in the Technical Background Report for the Safety Element of the General Plan, the City of Rancho Cucamonga Department of Building and Safety has adopted the 2010 California Building Code which has significant changes based on experience in recent earthquakes, as well as extensive research.

While the changes in code address new construction, the retrofit and strengthening of existing structures requires the adoption of ordinances. As required by state law, the City of Rancho Cucamonga has adopted an ordinance aimed at retrofitting unreinforced masonry (URM) buildings. Although retrofitted buildings may incur severe damage during an earthquake, the mitigation results in a substantial reduction in the numbers of casualties by preventing collapse of the building.

There are a number of programs and assets that are in place that help mitigate the severity of not only earthquake incidents, but also other types of hazards. These include:

- The City's state of the art Emergency Operations Center (EOC)
- An independent, stand-alone generator at the City Yard, part of the City's critical infrastructure for mitigating hazards;
- The City's Community Emergency Response Team Training (C.E.R.T.)
- ReadyRC Program – a public education program in which emergency preparedness information is made readily available to the public at various locations throughout the City.

A municipal ordinance requires implementation of the City's Master Plan for Drainage which addresses the 100-year floodplain. All drainage is focused into four main channels, namely:

- Cucamonga Creek
- Deer Creek
- Day Creek
- Etiwanda Creek

The City has participated in a regional effort to improve these four channels. Hundreds of millions of dollars have gone into the channel program. Other less permanent, "incidental" efforts include K-rails, debris racks, and use of localized inlets. Additionally, specialized operating procedures for storms and flooding are updated and maintained regularly. A public education program on flooding and erosion control has been implemented via Web and Public Access Cable.

The City's Public Works department conducts an annual tree-trimming program prior to the high-wind season. In addition, Public Works offers annual chainsaw training. The City's building code has been upgraded with respect to roof-resistance to damage caused by winds. In addition, the City has a grading ordinance that requires construction sites to be watered to minimize dust.

To achieve fire protection for all residents of the City, the City Department of Building and Safety and the City Fire Department enforce standards as they review building plans and conduct building inspections. Additional programs implemented to ensure compliance with established fire standards include:

- The maintenance of a City Information Map, showing area of high fire hazard areas; and
- The provision of uniform fire improvement standards for various land uses.

The City has conducted a number of fuel modification programs over the years to clear brush and inspect. On-going efforts are necessary because of the fairly predictable tension between enforcement of fuel modifications and residents desire to maintain their "beautiful hillsides." The City has an aggressive weed abatement program which has recently been moved from County of San Bernardino oversight to the City's Fire Prevention Bureau.

Lastly, the City of Rancho Cucamonga joined the National Flood Insurance Program (NFIP) on September 5, 1984. The federal government administers the NFIP with communities that have been identified as flood prone. The Federal Emergency Management Agency (FEMA) through the Federal Insurance Administration, makes flood insurance available to residents of Rancho Cucamonga, provided the City adopts and enforces adequate floodplain management regulations that meet the minimum NFIP requirements. The City's floodplain management is covered under Section 19.12.050 of the City's Floodplain Management Regulations, Section 17.16 of the Open Space Districts Ordinances, Title 17 or the Development Code and Chapter 19.04 of the City's grading standards. These sections establish regulations for development and construction within flood prone areas.

Every seven years FEMA schedules a Community Assistance Visit (CAV) with the City to maintain periodic contact and evaluate the effectiveness of the local floodplain management practices and to offer assistance as needed. A CAV was conducted on June 15, 2011. The purpose of the meeting was to provide City staff with the most current information on the NFIP, give staff an opportunity to discuss concerns they may have and assess the City's enforcement of the local ordinances that were adopted to meet the requirements of the NFIP. The CAV was satisfactorily closed, with Rancho Cucamonga in full compliance with NFIP regulations. This action also enables the City's participation in the Community Rating System (CRS).

There are 260 flood insurance programs in effect in Rancho Cucamonga, 22 claims have been paid for insured losses since 1978. The City has one repetitive loss property within it's jurisdiction. Although this is a very low number the City of Rancho Cucamonga Master Plan of Grading and Drainage carefully addresses development near floodplains. It is important to

continue on-going mitigation to reduce the short term and long term effects from potential flooding, and maintain a low number of repetitive loss properties within the community.

The City of Rancho does not utilize a specific permit for building in a floodplain, according to the City's floodplain manager, if a building permit is requested in an identified flood prone or floodplain area the information is forwarded to the FEMA Engineering Management Branch, Federal Insurance and Mitigation Administration for review prior to approval.

5.5 Fiscal Resources

The City has several service organizations that provide technical expertise in a variety of areas. These include citizen volunteers as well as City staff with expertise in distinct planning and operational needs.

The ReadyRc Advisory Group was established to coordinate mitigation, preparedness, response and recovery activities within the City of Rancho Cucamonga. This group also coordinates disaster training and works to make the City of Rancho Cucamonga disaster resilient.

Rancho Cucamonga's Auxiliary Communications Services (ACS) is a public service provided by a volunteer communications group assists to the City in times of extraordinary need. During periods of ACS activation, certified unpaid personnel are called upon to fulfill many of the communications needs for the City and the community. Traditional ACS operations involve emergency message handling on Amateur Radio Service frequencies. These operations typically involve messages between critical locations such as hospitals, emergency services, emergency shelters, and any other locations where communication is needed. ACS personnel also might become involved in non-amateur public-safety or other government communications, Emergency Operations Center (EOC) staffing, and emergency equipment repair.

Geographic Information Systems (GIS) - The City's GIS Division is responsible for mapping property parcel lines, designating right of way lines, mapping general plan and zoning ordinances and modifications, and mapping the City storm drain system and assessment district boundaries.

Hazardous Materials Team (Fire District) - The Hazardous Materials Team consists of 14 Hazardous Materials Specialists who are trained and certified to take corrective action to prevent or contain the spread of hazardous materials from a spill, explosion or fire. Additionally, the Fire District certifies all suppression personnel in First Responder Operational status in the event of a need to respond to a hazardous condition.

Our Haz-Mat Team also participates in a Joint Powers Authority (JPA) with four other surrounding agencies including cooperative assistance from the Ontario International Airport Fire Department. This JPA offers additional manpower or equipment as needed in the event of an incident. Participating JPA cities train monthly with quarterly countywide drill/training.

Rancho Cucamonga has also employed a Small Quantity Conditionally Exempt Generator (SQCEG) Program through the San Bernardino County Fire Department. The SQCEG program allows the Fire District to mitigate small spills without delay allowing the businesses less down time and reduced clean-up costs. The program was started as a pilot program January 1, 1999 and has been very successful.

Technical Rescue Team (Fire District) - With around-the-clock staffing, the Technical Rescue Team is comprised of personnel from Medic Rescue 175, Medic Engine 175 and Truck 174. This continuous staffing allows the team to respond without delay to calls in and out of Fire District boundaries. The Team is trained in confined space rescue, trench rescue, building collapse and shoring, swift water rescue and high angle rope rescue. Most of the team's calls require rope rescue usually located in the steep foothills of the Fire District. Training consists of monthly shift training, bi-annual county drills, bi-annual area drills and specialized training which are predominately out of the Fire District.

The Tech Rescue Team is certified as a Heavy Level Rescue and is the only Heavy Level Team in San Bernardino County. Additionally, the Tech Rescue Team is part of the California State Office of Emergency Services System, which allows for the Team to be activated throughout the state if needed.

The City also has several educational institutions that provide technical resources, which include:

- San Joaquin Valley College – a private junior college for business, medical and technical fields (10641 Church St.)
- Chaffey Community College – 5885 Haven
- University of La Verne – a private university satellite campus (10535 Foothill Blvd., Ste. 400)
- University of Redlands – a private university satellite campus (10300 4th Street, Ste. 130)
- Intersect Technology Training – a vocational school specializing in the field of telecommunications (9664 Hermosa)
- Everest College – a private junior college (9616 Archibald)
- Universal Technical Institute – a vocational school specializing in the field of auto/automotive mechanics and technicians (11530 6th Street, Ste. 110)

The City has several fiscal resources that contribute to the annual revenue.

The Weed Abatement program, administered by the City's Fire Prevention Bureau (FIB) is intended to reduce the amount of fire danger due to a high fuel load. The FIB sends notices to land owners requiring removal or reduction of excessive vegetation. Fines are imposed when land owners refuse to comply with this order.

As with any government organization, the City also receives consistent revenue from permit fees, business licenses/taxes as well as sales and use taxes. In addition, some developers are subject to paying drainage fees for those building in high flood hazard areas.

Section 6-Mitigation Strategies

6.1 Overview

The City of Rancho Cucamonga 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 three high risk hazards facing the City that were extensively examined in the risk assessment section: earthquakes, floods, and wildfires.

6.2 Mitigation 5-Year Progress Report

The following section provides an overview of the Mitigation Goals and Objectives outlined in the City of Rancho Cucamonga 2005 Local Hazard Mitigation Plan as well as the progress made on each goal:

<u>Mitigate severity of earthquake incidents through better continuity of government.</u>

Upgrade original standby generator (which provides only minimum egress power) to an emergency generator system capable of supporting occupancy and extended operation of City Hall. This building is integral to providing service and organizing responses to the community during emergencies.

The City is currently in the process of replacing the original standby generator with a 100% capable system that provides power to both City Hall and the Police Facility. The project was completed in May 2011.

<u>Mitigate severity of earthquake incidents through better preparedness.</u>

Improve preparedness of City personnel and citizens through the development of a preparedness training program for staff and resumption of the CERT program to the community.

The City re-instituted the CERT Program in January of 2011 and has provided the program to over 400 citizens, city employees, and private business employees.

The City has instituted an employee preparedness program which includes information on emergency preparedness for work, home and auto. Several procedures have been established for evacuations including an accountability officer function regularly trained in the CERT curriculum.

Reduce risks of flooding through improved drainage.

The city committed to continued implementation of the Master Plan for Drainage, including implementation of new construction at Hellman Lower Drain (~$8 million) and new construction at Cucamonga Drain (~$4 million).

The Hellman Lower Drain project has been completed and construction has begun on the Cucamonga Drain project.

Reduce susceptibility/occurrences of downed power lines.
Reduce likelihood of occurrence of downed power lines through the relocation of electrical utilities to underground locations.

The City is working in conjunction with Southern California Edison, and other local utility companies to locate power lines underground and has made some progress in this area in new residential and retail business locations north of the 210 interstate freeway between Haven and Day Creek Blvd.

Reduce risks of wildfires through fuel reduction.

The City committed to the following strategies:

- Implement aggressive fuel modification program.
- Focus effort immediately while fuel has been dissipated.
- Re-plant with fire-resistant vegetation, especially in areas adjacent to endangered structures on private property.
- Educate the public on fuel modification and replanting.

The City is in the process of adopting the Fire Hazard Severity Zone maps and creating a Community Wildfire Protection Plan. The city is awaiting further instruction from CalFIRE on an updated template.

Reduce risks of wildfires for vulnerable properties and ensure fire resistive construction of buildings.

The City committed to adopt updated building codes as appropriate and enforce Wild land Urban Interface (WUI) resistive building regulations.

The 2007 California Building Code contained a Chapter on the Wild land Urban Interface. While the City has adopted this Code, compliance cannot be fully accomplished without adoption of the CalFIRE Fire Hazard Severity Zone Maps which

is pending. However, all citizens proposing plans for the WUI are being reviewed adhering to the maps in preparation for the formal adoption.

Reduce occurrence and severity of wildfires through improved access to the Wild Land Urban Interface (WUI).

The proposed project consisted of improved access to WUI with the aims of preventing wildfires from occurring and reducing the severity of wildfires that do occur.
There have been several ingress/egress routes identified for improved access since 2005. The City continues to concentrate on the area north of the City at Snowdrop Rd. Improved access is continually being done through grading and a partnership with the San Bernardino County Special Districts to physically improve the road itself.

6.3 Mitigation Goals, Objectives, Actions, and Projects

The 2005 Mitigation Goals included overall mitigation goals established by the City (contained within the City's General Plan, adopted September 2004) to guide the establishment and priorities of specific goals, objectives, and mitigation measures for each high risk hazard. In reviewing and updating mitigation objectives and actions, it was the Planning Team's consensus that these goals remain in this Plan update. The City of Rancho Cucamonga's General Plan is on file at City Hall, 10500 Civic Center Dr., Rancho Cucamonga, CA, 91729, and is available for inspection during normal business hours. The General Plan is also available online at www.CityofRC.us.

6.3.1 Earthquake

Continuously integrate new data on natural and manmade hazards into overlay mapping and the review of land use proposals and applications and the enforcement of development standards through the use of mapping overlays, policies and land use designations.

Objectives: Because strong technical input is needed to refine, enlarge and improve the knowledge of geologic hazards in Rancho Cucamonga, the City shall implement the following actions.

1. Establish a geotechnical information collection, storage and retrieval system. Coordinate with the Countywide information gathering effort, and ensure that the City's system will accomplish the following tasks.

a. Solicit and coordinate geological studies by the United States Geological Survey (USGS), the California Division of Mines and Geology (DMG), the County and other local agencies, and make the resultant data available to the public and other agencies.

b. Incorporate all new research for the prediction and mitigation of geologic hazards.

c. File and coordinate with the County Geologist.

d. Maintain clear and comprehensive mapping of all geological hazards.

2. Utilize the County Geologist, the Geotechnical Advisory Committee or professional consultants to establish criteria, standards, guidelines and format for required geologic reports, and formulate standardized mitigation measures. A professional Geologist shall review and approve all required geologic reports.

3. Incorporate newly acquired data and technology into the mapping policies and procedures of this General Plan. Because of the potential for liquefaction impacts to certain areas in the City, an inventory and analysis of such areas with liquefaction potential shall be undertaken. Because of the potential relationship between seismic activity and landsliding effects, the City shall require that a seismic analysis be included as a part of landslide stability studies when required by the City Engineer. Because individual developments may be subject to spot flooding from all streams or unmapped areas adjacent to mapped flood areas, the City shall require specific hydrology and hydraulic studies to be prepared at the time developments are proposed, as follows.

Because of the potential for liquefaction impacts to certain areas in the City, an inventory and analysis of such areas with liquefaction potential shall be undertaken. Because of the potential relationship between seismic activity and landsliding effects, the City shall require that a seismic analysis be included as a part of landslide stability studies when required by the City Engineer. Because individual developments may be subject to spot flooding from all streams or unmapped areas adjacent to mapped flood areas, the City shall require specific hydrology and hydraulic studies to be prepared at the time developments are proposed as follows:

1. Identify existing drainage conditions, upstream and downstream drainage conditions at build out of the General Plan, and measures which must be taken within the development project or downstream from the project to preclude impacts on the proposed development or increased impacts to downstream development. These studies should be submitted and reviewed by the Engineering Department.

2. Fully account for all planned flood-control facilities within or adjacent to the project site. Where sections of flood-control facilities cannot be constructed, provision should be made for their ultimate construction, that is, right-of-way reserved and construction funds secured. Additionally, interim facilities must be provided which will be able to handle the additional runoff from the proposed development until the planned flood control facilities are constructed.

Goal 2:

Minimize the potential risks resulting from the exposure of City residents to manmade and natural hazards.

Objectives: Because the risks from many geologic hazards can be successfully mitigated through a combination of engineering, construction, land use and developmental standards, the City shall implement the following actions:

1. Require the formation of geologic hazard abatement districts where existing or proposed development is threatened by such hazards, and prevention, mitigation, abatement or control of a geologic hazard is deemed feasible.

2. Require sites to be developed and all structures designed in accordance with recommendations contained in any required geotechnical or geologic reports, through conditions, construction plans and field inspections.

3. Require that all recommended mitigation measures be clearly indicated and described on all grading and construction plans.

4. Require all facilities to meet appropriate geologic hazard specifications as determined by the City Engineer for discretionary and ministerial authorizations.

Because increased public awareness of geologic hazards can reduce the risk of those hazards, the City shall implement the following actions:

1. Develop a geologic educational program for use by schools, developers and the public at large, covering hazards, abatements, and emergency plans and procedures as part of the City's Emergency Management Program.

2. Make geotechnical data and mapping readily available to the public through the County-wide Geotechnical Information System coordinated by the County Geologist.

Because the County is traversed by many major active faults resulting in a relatively high level of risk, the City shall implement the following actions:

1. Adopt all future upgrading of the seismic design section of the Uniform Building Code.

2. Require new structures and facilities to be designed and constructed to meet seismic safety and related design requirements of the most recent Uniform Building Code, or more stringent requirements if indicated by site investigations.

3. Require all new critical, essential or high occupancy facilities to be designed and operated in such a manner as to remain standing and functional during and after a disaster as determined by the Division of Building and Safety.

Because of the potential for displacement along faults not classified as active, the City shall reserve the right to require site-specific geotechnical analysis and mitigation for development located contiguous to potentially active faults, if deemed necessary by the City Engineer.

Because many structures were built prior to both 1933 and 1971 seismic standards, they are considered unlikely to withstand a seismic event of the predicted intensity. The City shall undertake studies and develop programs to minimize the risk of potential seismic disaster in areas where inadequate structures exist in the following ways:

1. Initiate a structural hazards identification and abatement program through the Division of Building and Safety, with priority given to the identification and abatement of hazards in critical, essential and high occupancy structures, in structures located within areas of severe geologic hazard and in structures built prior to the enactment of applicable local or state earthquake design standards. This program shall be in accordance with SB547, enacted in Chapter 250, statutes of 1986, requiring local jurisdictions to develop structural hazard reduction programs for such buildings by January 1, 1990.

2. Require periodic inspection by the Office of Building and Safety of all critical, essential and high occupancy buildings to identify potential hazards in the event of a major earthquake. When hazards are identified, require mitigation by the owner.

3. Bring all existing critical, essential, and high occupancy structures found to be hazardous into conformance with applicable seismic and related safety (fire, toxic materials storage and uses, etc.) standards through rehabilitation, reconstruction, demolition, reduction of occupancy levels, or change in use.

4. Require rehabilitation of private unfit structures through implementation of the Uniform Building Code and Hazardous Building Ordinance. Priorities for critical, essential or high occupancy buildings shall be based on hazard to life, type of occupancy, method of construction, physical condition and location.

5. Require the upgrading of buildings and facilities to achieve compliance with the latest earthquake standards as a condition of granting building permits for major additions and repairs.

6. Establish and administer incentives for seismic retrofitting, including but not limited to the following:

- Area-wide revitalization programs
- Community Development Block Grants
- US Small Business Administration loans
- Public Purpose Bonds
- Marks History Bonds
- Local-General Funds
- Local-General Obligation Bonds
- Making seismic safety a major factor in selecting future areas for redevelopment
- Tax reductions for building rehabilitation to minimize personal economic costs
- Providing relocation assistance to persons and businesses temporarily or permanently dislocated from hazardous old buildings
- Requesting Federal and/or State financial assistance to implement corrective measures
- Support regional or statewide programs providing funding or technical assistance to local governments to allow accurate identification of existing structural hazards in private development and providing assistance to public and private sectors to facilitate and to minimize the social and economic costs of abatement.

Because many structures with important functions and potentially severe consequences of failure do not fall under City control (i.e., dams, utility installations, transportation structures) the City shall implement the following actions:

1. Continue to work with public utilities, school districts, the State Department of Transportation (CalTrans) and other agencies supplying critical public services to ensure that they have incorporated structural safety and other measures to be adequately protected from seismic hazards for both existing and proposed facilities.

2. Encourage CalTrans and all utilities to review all their facilities within the City to assess potential impacts of seismic hazards; comments based on this review should be forwarded to the City.

3. Encourage utility companies to institute orderly programs of installing cut-off devices on utility lines, starting with the lines that appear to be most vulnerable and those which serve the most people. Adequate emergency water supplies shall be established and maintained in areas dependent upon water lines which cross active fault zones.

Because the ground in close proximity to a fault is subject to rupture during an earthquake, exposing occupants and structures to high levels of risk, those areas identified shall be designated on the Hazards Overlay Map, and the following actions shall be implemented:

1. Maintain a minimum 50-foot setback from an identified fault for all new structures. For an inferred fault area, a 250-foot setback shall be maintained. However, critical, essential or high occupancy structures and facilities shall not be located in Special Studies Zones unless there is no feasible alternative, as determined by staff review, in which case these facilities shall maintain a 150-foot setback from an identified fault. (A 200-foot setback shall be maintained if the fault is inferred.)

2. Withhold public financing from buildings within the Studies Zone where there is a confirmed fault trace unless it can be established that there is no potential for surface fault displacement or ground rupture which would injure the public investment or fulfillment of its purpose.

3. Do not create new lots within the Studies Zone unless an appropriate geologic investigation establishes sufficient and suitable land area for development according to existing zoning and other applicable City ordinances.

4. Plan transportation facilities (i.e., roads, freeways, rail, rapid transit) and utility systems to cross active fault traces a minimum number of times and to be designed to accommodate fault displacement without major damage that would cause long term and unacceptable disruption of service. Utility lines shall be equipped with such mechanisms as flexible units, valving, redundant lines or auto valves to shut off flows in the event of fault rupture.

Because the entire San Bernardino Valley area is subject to severe hazard from the effects of shaking due to an earthquake, the City shall implement the following actions:

1. Require special studies, including dynamic analysis for all major structures (critical, essential and high occupancy land uses) within areas determined by the City Engineer to be subject to significant seismic shaking.

2. Design and construct all structures in areas determined by the City Engineer to be subject to significant seismic shaking to withstand ground shaking forces of a minor earthquake without damage, of a moderate earthquake without structural damage, and of a major earthquake without collapse. Critical, essential, and high occupancy structures shall be designed and constructed to remain standing and functional following a major earthquake and shall be so engineered as to withstand maximum probable ground motion accelerations.

3. Require all new construction to meet the most current and applicable lateral force requirements.

4. Strengthen earthquake resistance standards for non- structural components of structures including exterior veneers, internal partitions, lighting fixtures, elevators and equipment.

Because liquefaction can cause devastating structural damage and because there is a high potential for saturation when the groundwater level is within the upper 50 feet of alluvial material, the City shall implement the following actions:

1. Require that each site located within the Liquefaction Hazard Overlay shall be evaluated by a licensed geologist prior to design, land disturbance or construction for soil type, history of the water table's fluctuation and adequacy of the structural engineering to withstand the effects of liquefaction.

2. Apply the Land Use Compatibility Chart for Liquefaction Areas when reviewing all discretionary and ministerial actions.

Because portions of the City have moderate landslide potential, posing measurable risk to life and property, and because once landslides are recognized, many can be safely mitigated, the City shall implement the following actions:

1. Require that a stability analysis be required in Landslide Hazard areas designated "Generally Susceptible" and "Mostly Susceptible" on the Hazards Overlay Maps and where required by the Geologist.

2. Require site development and construction in compliance with soil and geologic investigation report recommendations.

3. Apply the Land Use Compatibility Chart for Landslides when reviewing all discretionary and ministerial actions.

4. Fund and prepare a land use plan that is in conformance with the Land Use Compatibility Chart for landslides in designated high landslide hazard areas as they are identified.

5. Restrict avoidable alteration of the land which is likely to increase the hazard within areas of demonstrated or potential landslide hazard, including concentrations of water through drainage or septic systems, removal of vegetative cover, steepening of slopes and undercutting the base of a slope.

6. Restrict grading to minimal amounts necessary to provide access, and require grading permits to have an approved site plan which minimizes grading and conforms to the recommendations of any required geologic investigation.

7. Require development on hillsides to be sited in the least obtrusive fashion, thereby minimizing the extent of topographic alteration required.

8. Restrict development in areas of known landslides or landslide-prone deposits on steep slopes, except where engineering and geologic site investigations indicate such sites are stable or can be made stable by the application of appropriate mitigating measures. In such cases, it must be shown to the satisfaction of the City that the risk to persons, property and public liability can be reduced to an acceptable degree.

9. Require that foundation and earth work be supervised and certified by a geotechnical engineer and, where deemed necessary, an engineering geologist, in projects where evaluations indicate that state-of-the-art measures can correct instability.

10. The City shall generate ma-specific (where appropriate) hillside development plans on the basis of baseline inventory and geotechnical analysis related to landslide potential.

Because of limited specific information on the extent of subsidence in the City, the City shall implement the following actions:

1. Undertake a program of subsidence hazard identification that will outline the extent of the hazard in the City and propose mitigation measures through the office of the City Engineer.

2. Restrict the construction of any facility which is needed for public safety or for the provision of needed emergency services where an interruption in service could result from structural failure due to settlement or subsidence unless the only alternative sites would be so distant as to thereby jeopardize the safety of the community served.

3. Require that all site-specific geotechnical investigations conducted for proposed development include an assessment of potential impacts and mitigation measures related to expansive reactive soils and erosion. Projects: To coordinate and support the State of California Multi-Hazard Mitigation Plan Strategies to reduce risks, the City of Rancho Cucamonga proposes the following projects:

Mobile Home Seismic Retrofit Program

- Develop and sponsor projects and programs to brace new or relocated mobile homes to resist earthquakes
- General Earthquake Mitigation Projects
- Develop projects and programs to install automatic gas shut-off valves in residential, commercial, and public buildings
- Develop and construct seismic retrofit of critical facilities
- Develop residential and commercial seismic retrofit programs
- Develop earthquake mitigation public outreach education programs
- Develop and construct seismic retrofit of City-owned bridges, transportation and utilities infrastructure.

6.3.2. Flood

Goal 1:

Minimize the potential risks resulting from the exposure of City residents to manmade and natural hazards.

Objective: Because the City has entered into an agreement to participate in the National Flood Insurance Program (NFIP) which provides flood insurance within designated floodplains, the following actions shall be implemented by the City:

1. Floodway and Floodplain areas as identified by the Federal Emergency Management Agency (FEMA) on Flood Insurance Rate Maps and Flood Boundary Maps shall be designated as Floodway (FW) on the Land Use Maps and Floodplain Overlays on the Hazards Overlay Maps.

2. Designated floodway areas shall be preserved for nonstructural uses through restrictions of the FW land use district.

3. All new development, including filling, grading and construction, proposed within designated floodplains shall require submission of a written assessment prepared by a qualified hydrologist or engineer, in accordance with the latest "San Bernardino County Hydrology Manual" to determine whether the development will significantly increase flood hazard and to show that all new structures will be adequately protected. Development shall be conditioned on receiving approval of this assessment by the City Engineer.

4. All new construction in the Floodplain Overlay areas shall be required to be flood-proofed and shall be located and designed to allow unrestricted flow of floodwaters.

5. The Land Use Compatibility Chart for the 100-Year Flood Plains shall apply when reviewing all discretionary and ministerial actions in the designated floodplain.

6. Lands within floodplain areas may be developed with noncritical and non-essential uses if mitigation measures are incorporated so as to ensure that the proposed development will not be hazardous, increase flood depths or velocities downstream, or degrade water quality.

7. Known flood hazard information shall be provided with every discretionary ministerial action application.

8. When no mapped data exists, existing topographical, watershed, and drainage course data shall be evaluated for a determination of potential flood hazard for every discretionary and ministerial action.

Because the FEMA mapping and studies do not yet identify all flood hazard areas in the entire City, the following shall actions shall be implemented:

1. As new overflow studies and mapping are completed and approved by either the City Engineer or the San Bernardino County Flood Control District, they shall supplement the FEMA mapping and shall be incorporated into Flood Hazard Overlay mapping.

2. Programs for the continuous elevation and designation of floodway, floodplain and drainage areas shall be initiated and financed.

3. Timely application for FEMA mapping changes shall be initiated to reflect any additions to or alterations in identified Floodways or Floodplains by the City's Floodplain Management Administrator.

4. The siting of residential and other types of development requiring substantial structures shall be prohibited on playas or dry lake beds as shown on the Floodplain Overlay Map. Industrial, commercial, recreational, or transportation and other uses which utilize the playa or dry lake as a resource may be permitted.

5. All City areas shall be continuously evaluated through the application of development conditions in the pre- construction flood hazard inspection process.

6. Site studies shall be performed in areas where development is proposed which have been tentatively identified as subject to flooding.

7. Construction shall take place in compliance with study recommendations as described in site study required under action item #6 above.

Because dam failure as a result of earthquake or other causes results in severe risk to downstream properties, the City shall implement the following actions:

1. Require an engineering geology report for all new or proposed public and private reservoirs. This report shall be completed by a registered engineering geologist, conform to City standards, and be approved by the City Engineer.

2. Include reservoirs as Dam Inundation areas on the Hazard Overlay Map as required by the State of California.

3. Prohibit new dams and reservoirs in areas designated as Geologic Hazards on the Hazard Overlay Map.

4. Seek elimination of potentially hazardous dams and reservoirs.

5. Initiate programs to increase the earthquake resistance of dams and reduce the potential impacts of seismically- induced dam failures.

6. Prohibit critical, essential and high-risk land uses from Dam Inundation areas.

Because substantial development has already occurred in floodways and floodplains, the City shall implement the following actions:

1. Continue to identify natural drainage courses and designate City of Rancho Cucamonga Drainage Easements as a means to preserve natural drainage flow paths and/or constructed drainage facilities.

2. Require identification, improvement and upgrading of critical facilities in flood hazard areas through such measures as anchorage to prevent flotation, water tight barriers over openings, reinforcement of walls to resist water pressures, use of materials to reduce wall seepage and installation of pumping facilities for internal and subsurface drainage.

3. Require implementation of flood protection measures when any additions to the original structure are proposed.

4. Establish funding mechanisms when flood control facilities are warranted.

Because drainage from adjacent development contributes to fire hazards, the following actions shall be implemented:

1. The run-off provisions of the Erosion and Sediment Control Ordinance shall apply City-wide.

2. Surface run-off from new development shall be controlled by on-site measures including but not limited to the following.

- Structural controls
- Restrictions regarding changes in topography, removal of vegetation, creation of impervious surfaces, and periods of construction such that the need for off-site flood and drainage control improvements is minimized and such that run-off from the development will not result in downstream flood hazards

Because public education plays a vital role in minimizing flood hazards, the City shall implement the following actions:

1. Establish a public information system through the Emergency Management Program outlining emergency operations plans and measures to reduce personal losses in the event of a flood disaster.

2. Develop a flood warning system, where possible, through the participation of the County Flood Control District.
3. Develop dam failure and flood plain inundation evacuation plans through the County Office of Emergency Services.

Because flood protection is both local and regional in nature, the City shall implement the following actions:

1. Continue the development of intergovernmental coordination with cities, adjacent counties, the Army Corps of Engineers, and other agencies which have an interest in flood control projects that cross-jurisdictional boundaries.

2. Coordinate land use and flood control planning through staff contacts between the County Flood Control District, Special Districts and cities within the County, and through the annual review of the Capital Improvements Program.

Because the funding of necessary flood control and drainage facilities is a major concern, the City shall coordinate with the County in the preparation of local area drainage plans and establish funding mechanisms to provide the backbone drainage system for watershed areas within and affecting the City.

Because the proliferation of private detention basins is not desirable, safe or economical, the following policies and criteria shall be supported by the City:

- San Bernardino County Detention Basin Policy
- San Bernardino County Detention Basin Maintenance Financing Policy
- San Bernardino County Detention Basin Submittal Procedures
- Detention Basin Design Criteria for San Bernardino County
- City of Rancho Cucamonga Master Plan of Drainage

Goal 2:

Continuously integrate new data on natural and manmade hazards into overlay mapping and the review of land use proposals and applications and the enforcement of development standards through the use of mapping overlays, policies and land use designations.

Objectives: Because of the need for additional flood control measures in the City and the opportunity presented by existing floodway areas as open space for human recreation and wildlife use, the City shall initiate a study for a revised City of Rancho Cucamonga Master Plan

of Drainage. This study shall include an investigation into the feasibility of combining flood control and open space use and a cost comparison with the existing plan.

Attain and maintain Community Rating System (CRS) Status including, but not limited to, enhancement of the City of Rancho Cucamonga's on-line Geographic Information System (GIS) as a public education tool and develop and sponsor programs and projects in support of the CRS. Maintain participation in the National Flood Insurance Program.

6.3.3. Wildfire

Goal 1:

Support and expand disaster response programs, and initiate a program for post-disaster planning.

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

1. Participate in the creation of a County-Wide Fire Protection Master Plan based upon land use districts.

2. Develop, adopt, and implement a recommended schedule of fees to finance the fire protection infrastructure that is tied to land use categories and specific community needs as prescribed by the County-Wide Fire Protection Master Plan.

3. Continue to coordinate fire protection services for the City, with the County, the California Department of Forestry and Fire Protection, (CAL FIRE), the United States Forest Service, the Bureau of Land Management, and all City and special districts with fire protection powers.

4. Require development applicants, in areas of identified fire risk, to prepare a site-specific fire protection plan.

5. Require applicants to fund expansion of local fire protection services by payment of appropriate impact fees.

6. Implement monitoring of fire-prevention measures (such as fuels reduction) to prevent damage to biological habitats in chaparral areas.

Goal 2:

Continuously integrate new data on natural and manmade hazards into overlay mapping and the review of land use proposals and applications and the enforcement of development standards through the use of mapping overlays, policies and land use designations.

Objectives:

The City shall require, where appropriate, the use of fire safety features in newly-proposed developments which will balance fire protection services with the potential need. These measures may include, but shall not be limited to, measures specified in the Fire Safety Review Area I and II Development Requirements.

Goal 3:

Minimize the potential risks resulting from the exposure of City residents to manmade and natural hazards.

Objectives: Because rapid urban development has resulted in potential fire hazards in wild land/urban intermix areas County-wide, the City shall implement the following actions:

1. Apply the regulations of the "Greenbelt" Fire Safety Overlay Ordinance as found in the Development Code to all City areas subject to wild land/urban intermix fire hazards; the provisions of the Hillside and Foothill Hazard Overlay Ordinances as found in the Development Code shall be incorporated into the Fire Hazard Overlay, insuring the following.

a. High fire hazard development shall incorporate careful site design, use of fire retardant building materials and landscaping, development and maintenance of fuel breaks and vegetation management programs, and provisions to limit public access to open space areas in order to minimize wild land fire hazard.
b. Adequate and reliable water storage for community fire protection in hazardous areas shall be provided.
c. Multiple access with minimum road design standards is required.
d. Clearances around structures and road widths in fire and geologic hazard areas as identified on the Hazard Overlay Map should generally meet the following requirements.
i. New structures proposed on parcels of sufficient width (usually 60 feet or greater) should maintain a minimum 30-foot wide building separation.
ii. All structures should maintain a minimum 30-foot wide vegetation clearance area with certain limited exceptions for ornamental landscaping, as recommended by the local fire authority.
iii. Public roadways should be developed with a minimum 50-foot wide right-of-way, with a minimum 26-foot wide paved way of travel. For privately maintained roads, the minimum should generally be no less than a 24-foot wide paving with no parking allowed, 32-foot paving with parking allowed on one side, or a 36-foot wide paving with parking allowed on both sides.
e. Require incorporation of High Fire Hazard Area criteria in the review of proposed General Plan amendments and in the development of Specific Plans.

2. Identify and map all such areas on a continuous basis, amending Hazard Overlay Maps where needed.

3. Evaluate the Fire Hazard Overlay Ordinance regularly and revise when necessary to reflect the most current fire-safe building and development techniques and standards.

Because public education is a vital part of fire hazard abatement, prevention and mitigation, the City shall implement the following actions:

1. Continue to support existing CAL FIRE education programs in the areas of vegetation modification and management, fire safe site design techniques and fire prevention, including smoke detector distribution, Exterior Hazard Inspection Programs Fire Safety Team Teaching and the Forest Protection Program.

2. Continue to disseminate an informational brochure on design and construction standards required in the Fire Hazard Overlay through the Division of Building and Safety.

Because fire exists as a hazard City-wide, the following requirements shall apply City-wide unless superseded by the more stringent requirements of the Fire Hazard Overlay:

1. The Peakload Water Supply System guidelines shall be met for all new development or be adequately served by water supplies for domestic use and community fire protection in accordance with standards as determined by the City and the local fire protection agency or authority.

2. Provide adequate fire protection facilities and services in accordance with standards of the City and the local fire protection agency or authority for all development, existing and proposed.

3. Require structures, features of structures or activities determined to be hazardous in terms of fire potential to be brought into conformance with current applicable fire and safety standards.

4. Limit or prohibit development or activities in areas lacking water and firefighting facilities.

5. Approve high intensity uses such as theaters, motels, restaurants, and schools, and uses requiring the handling or storage of large amounts of flammable materials only in areas with year-round fire protection and adequate water systems with hydrants.

6. Continue to evaluate and amend as necessary development standards for location, building separations, structural design and detection hardware.

7. Require adequate visible designation of all streets, roads and buildings, to the standards of the City Fire Warden or the local fire protection agency or authority.

8. Plumb all new swimming pools and static water sources to allow connection to firefighting equipment if requested by the City Fire Warden or the local fire protection agency or authority.

9. The City shall ensure that successive uses of individual buildings comply with appropriate building and fire standards.

10. Known fire hazard information shall be included in the application for every discretionary or ministerial action.

11. Adopt common standards for rue safety and building construction.

Because developments can add to the wind hazard due to increased dust, the removal of windbreaks, and other factors, the City shall require developments subject to discretionary permits in areas identified as susceptible to wind hazards to address site-specific analysis of the following:

Grading restrictions and/or controls on the basis of soil types, topography or season. Landscaping methods, plant varieties, and re-vegetation scheduling to achieve optimal revegetation success. Dust-control measures during grading, trucking, and other dust generating Activities.

Because erosion control is an important concern of the property owner and because many areas in the City are highly susceptible to erosion, the City shall implement the following actions:

1. Apply the provisions of the adopted Erosion and Sediment Control Ordinance City-wide.

2. Regulate grading, land clearance and grazing in susceptible areas to prevent erosion.

3. Establish an education program for homeowners, emphasizing land use for erosion control; coordinate this program with the Soil Conservation Service.

4. Restrict the use of off-road vehicles in areas susceptible to erosion.

Projects:

- Partner with the San Bernardino Community College District -Crafton Hills College/Fire Academy and local area and regional fire agencies to design, develop and construct mitigation programs and facilities that provide training opportunities in support of multihazard/multijurisdictional emergency incidents
- Develop and sponsor an enhanced public education program based on targeted needs that encourages the public to take responsibility for wildfire protection
- Develop and sponsor a hazardous fuels management program in support of the CAL FIRE Vegetation Management Program (VMP) and the California Forest Improvement Program (CFIP)

- Develop and support land use policies and standards that protect life, property, and natural resources
- Continue to develop and sponsor a defensible space management program. in support Public Resource Code 4291
- Design, develop and construct a defensible space demonstration garden in a location focal to the community

6.4 Mitigation Priorities

The process used to prioritize mitigation strategies involved lengthy discussions with various City stakeholders, followed by citizen and community review. The end result is a hazard mitigation action plan with a prioritized list of strategies that Rancho Cucamonga expects to carryout during the next five years.

The process used by the City first prioritized goals and their respective objectives based on priority maps created during the risk assessments. Available resources and public input were also considered. The City next assessed each strategy listed under the prioritized list of goals. In assessing and evaluating each strategy, Rancho Cucamonga considered the following factors:

1. The cost was justified
2. Financial resources were available; local or outside resources
3. Staff resources were adequate
4. Minimal impact on city department functions
5. Strategies mitigate risks for the riskiest hazard events
6. Strategies reflect the goals and objectives

Rancho Cucamonga then prepared a draft action plan that listed goals followed by a prioritized list of strategies which included the principal contact and cooperating parties, the cost, and the time involved in carrying out the strategy. This step involved lengthy discussions with City departments and staff.

6.5 Implementation Strategy

Each year the action plan will be revisited and the first year will be dropped as those activities are completed and another year will be added so that the action plan always reflects a five-year time frame and remains current. Strategies undertaken and completed will be evaluated as to their effectiveness. Those activities not completed during the first year will be re-evaluated and included in the first year of the new action plan if still appropriate.

Even though individual strategies have been assigned a principal contact to ensure implementation, overall responsibility, oversight, and general monitoring of the action plan has been assigned to Rancho Cucamonga Emergency Management Program under the direction of the Fire Chief. The Fire Chief will provide periodic updates to the City Council.

This action plan serves as a guide to spending priorities but will be adjusted annually to reflect current needs and financial resources. Some strategies will require outside funding in order to complete implementation. If outside funding is not available, then the strategy will be set aside until new sources of funding can be identified.

The following table represents the summation of all mitigation projects related to all hazards threatening the community of City of Rancho Cucamonga.

Hazard	Goal / Strategy	Action	Priority	Cost	Timeframe	Responsible Party
Wildfire	Public Education	Present Ready/Set/Go and CERT wild land urban interface classes to public	Medium	$150 thousand	5 years	Rancho Cucamonga Fire Department
Wildfire	Perform regular inspections	Implement codes specific to fire retardant materials, construction	High	$300 thousand	5 years	City Building & Safety Department
Wildfire	Perform regular inspections	Fire inspectors implement codes specific to defensible space and fire safety zones	High	$250 thousand	3 years	Rancho Cucamonga Fire Department
Wildfire	Mitigate fire threat	Complete parking area for Cucamonga Canyon Visitors	High	~$5 Million	3 Years (contingent upon and following the acquisition of funding)	City Engineering Department
Flooding	Improve drainage	Execute new construction at Hellman Lower Drain	High	~$8 million	3 Years (contingent upon and following the acquisition of funding)	City Engineering Department
Flooding	Improve drainage	Execute new construction at Cucamonga Drain	Medium	~$4 million	2 Years (contingent upon and following the acquisition of funding)	City Engineering Department

Hazard	Goal / Strategy	Action	Priority	Cost	Timeframe	Responsible Party
Flooding	Improve drainage	Execute new construction at Etiwanda Storm Drain #10 and #11	High		5 years (contingent upon and following the acquisition of funding)	City Engineering Department
Earth-quakes	Public Education	CERT and Advanced CERT Training	High	$150 thousand	5 years	Rancho Cucamonga Fire Department
Earth-quakes	Perform regular inspections	Implement codes specific to earthquake resistant construction	High	$1 million	3 years	City Building & Safety Department
High Winds	Reduce susceptibility to downed power lines.	Relocate electrical utilities to underground. (This has already proven to be a feasible approach at the new Central Park facility.)	Medium	~$100 million	50 years	City Engineering Department

Section 7 – Plan Maintenance

7.1 Monitoring, Evaluating and Updating the Plan

The effectiveness of the City's Hazard Mitigation Plan depends on the implementation of the Plan and incorporation of the proposed mitigation measures into existing City plans, policies, and programs. The Plan includes a range of mitigation measures that, if implemented, would reduce loss from high risk hazard events in the City of Rancho Cucamonga. Together, the mitigation measures in the Plan provide the framework for activities that the City can choose to implement over the next 5 years.

The Planning Team has prioritized the Plan's goals and has identified measures to be implemented. Integration with on-going City programs and processes is essential to the success of the implementation. For example, appending this Plan to the Public Safety Element of the General Plan ensures consistency between policies and programs designed to reduce future exposure to the hazards and risks identified in this mitigation plan.

Additional mechanisms to support plan implementation include the annual budget process, the Capital Improvement Plan, Redevelopment Projects, and the zoning and building code update process. The City of Rancho Cucamonga Emergency Management Coordinator will be responsible for overseeing the Plan's implementation and maintenance and will be supported by the Police Captain and the Fire Chief for emergency response, and by the existing Planning Team. The Emergency Management Coordinator will assume lead responsibility for facilitating plan implementation and the maintenance meetings of the Planning Team.

The Planning Team will be tasked with oversight, review, evaluation, and update of the Plan. The City of Rancho Cucamonga Planning Team will review the Plan at least annually and update project status and other Plan elements as applicable. Departments with projects (i.e., Administrative Services, Community Development, Community Services, Fire Services, Police Services, and Public Works) track the status of the projects through the entire life cycle from concept to completion. Each year proposed projects are reviewed by their respective Department Heads and the City Manager during budget development and selected projects are submitted for funding to the appropriate funding source. In order for recommendations to be considered by the City in the budget process, the annual review will be completed and submitted to the City Council before July 1 of every calendar year.

To facilitate the hazard mitigation planning process, the Hazard Mitigation Plan will be reviewed annually by the Planning Team and revisions will be provided to FEMA in a five-year cycle, as required. The cycle may be accelerated to less than 5 years based on one of the following triggers:

- A Presidential Disaster Declaration that impacts the City of Rancho Cucamonga
- A hazard event that causes loss of life
- A comprehensive update of the City of Ranch Cucamonga General Plan

It will not be the intent of this update process to start from scratch and develop a new complete hazard mitigation plan for the City of Rancho Cucamonga. The update will be based on needs identified by the Planning Team and will lead to a draft update that will be made available for City, citizen, and stakeholder review before being submitted to the City Council for adoption.

7.2 Implementation through Existing Programs

The City of Rancho Cucamonga is well aware of the hazards that face our community as historic incidents prove that natural disasters are a common occurrence in this area. The City will continue to strive toward protecting a healthy, family lifestyle and thriving industrial economy.

The City maintains a current Emergency Operations Plan to aid in the emergency response to a disaster. The EOP is updated and kept current by the City's Emergency Management Program.

The Planning and Building & Safety Departments form a tight-knit partnership for development in the City. They will continue to maintain current zoning and building codes to set a standard for new and current developments throughout the City, taking into consideration the threat of earthquakes, wildfires, flooding and extreme windy conditions. Enforcement of these standards begins in the planning phase and continues through the completion of construction, thus completing a system of checks and balances to ensure every effort has been made to meet this goal.

The Fire District strives to reduce the risk of wildfire through the Weed Abatement Program which targets specific hazard areas that face an increased danger of wildfires. In addition, the Fire District utilizes the Fire Safe Council to help educate the community about the dangers of wildfire.

The City continually identifies key flooding issues that face our community and reassesses the progress of mitigation projects aimed at eliminating or reducing the risks associated with this hazard. To ensure residents are prepared, the City will continue to offer free sandbags to those in need as well as continue with public education efforts relating to flood and erosion control. The City is committed to making capital improvements to alleviate the dangers that flooding imposes on our community.

7.3 Continued Public Involvement

A critical part of maintaining an effective and relevant Hazard Mitigation Plan is ongoing public review and comment. Consequently, the City is dedicated to the direct involvement of its citizens in providing feedback and comments on the plan on a continued basis. The public will continue to be apprised of Local Hazard Mitigation Plan actions through the City's website at www.cityofrc.us as well as through regular updates at City council meetings and the use of Social Media. All proposed changes to the plan will be subject to citizen review prior to City Council action. The City will follow its standard public input process, consistent with the process used in the initial plan development, as previously outlined in this plan.