City of Carson City
Agenda Report

Date Submitted: 2/22/11

Agenda Date Requested: 3/3/11
Time Requested: Consent

To: Mayor and Supervisors
From: Fire Department

Subject Title: Action to adopt a resolution adopting and approving the Carson City Hazard Mitigation Plan and other matters properly related thereto.

Staff Summary: This Plan identifies and evaluates specific hazards that can affect Carson City. The Plan offers supporting documentation from subject matter experts and identifies mitigation strategies that can be implemented to reduce the impact of those identified hazards upon the community.

Type of Action Requested: (check one)

(X) Resolution (___) Ordinance
(___) Formal Action/Motion (___) Other (Specify)

Does This Action Require A Business Impact Statement: (___) Yes (X) No

Recommended Board Action: I move to adopt a resolution adopting and approving the Carson City Hazard Mitigation Plan and other matters properly related thereto.

Explanation for Recommended Board Action: The development of this plan is required by the federal Disaster Mitigation Act of 2000. In order for a community to be eligible for pre, post, and active disaster funds through FEMA this plan must be adopted and updated every 5 years. The Carson City Hazard Mitigation Plan was first adopted in 2005; this is a completely updated version of the 2005 document. The Plan has received tentative approval from FEMA, final approval will be forthcoming upon adoption of the Plan by the Board

Applicable Statute, Code, Policy, Rule or Regulation: Disaster Mitigation Act of 2000.

Fiscal Impact: No direct fiscal impact from the adoption of this document.

Explanation of Impact: While there are potential costs associated with the mitigation actions identified in the Plan, the Plan itself does not require the expenditure of funds.

Funding Source: N/A

Alternatives: The alternative, choosing not to adopt the plan, would restrict any future disaster funding Carson City could receive.

Supporting Material: Carson City Hazard Mitigation Plan

Prepared By: R. Stacey Giomi, Fire Chief

Reviewed By: _____ Date: 2-22-11
(Fire Chief)

_____ Date: 2/22/11
(City Manager)

_____ Date: 2/22/11
(District Attorney)

_____ Date: 2/22/11
(Finance Director)

Board Action Taken:

Motion:_____ 1)_____ Aye/Nay
2)_____ _____
_____
_____
_____
_____

_____
(Vote Recorded By)

RESOLUTION NO._____

A RESOLUTION ADOPTING AND APPROVING THE CARSON CITY HAZARD MITIGATION PLAN AND OTHER MATTERS PROPERLY RELATED THERETO.

WHEREAS, Carson City has historically experienced severe damage from natural and human-caused hazards such as flooding, wildfire, drought, thunderstorms/high winds, and hazardous materials incidents on many occasions in the past century, resulting in loss of property and life, economic hardship, and threats to public health and safety;

WHEREAS, the Carson City Hazard Mitigation Plan (the Plan) has been developed after more than one year of research and work by the Fire Department's Office of Emergency Management in association and cooperation with a multi-jurisdictional and multi-agency Planning Team for the reduction of hazard risks to the community;

WHEREAS, the Plan specifically addresses hazard mitigation strategies and plan maintenance procedures for Carson City;

WHEREAS, the Plan recommends several hazard mitigation actions/projects that will provide mitigation for specific natural and human caused hazards that impact our community with the effect of protecting people, property, and the environment from loss associated with those hazards;

WHEREAS, public input was gathered through meetings, direct mail, and media outlets to garner comments and collect input as required by law;

NOW THEREFORE BE IT RESOLVED that:

1. The Plan is hereby Adopted as an official plan of Carson City
2. The respective officials identified in the mitigation strategy of the Plan are hereby requested to pursue implementation of the recommended actions based upon availability of resources.
3. Future revision and Plan maintenance required by the Disaster Mitigation Act of 2000 and FEMA are hereby adopted as part of this resolution for a period of five (5) years from the date of this resolution

Upon motion by Supervisor _____, seconded by Supervisor _____, the foregoing Resolution was passed and adopted this 17th day of February, 2011 by the following vote.

VOTE: AYES: _____
_____
_____
_____
_____

NAYS: _____
_____
_____

ABSENT: _____

ABSTAIN: _____

_____
Robert L. Crowell, Mayor
Carson City, Nevada

ATTEST

_____
Alan Glover, Clerk
Carson City, Nevada

Carson City, Nevada
Hazard Mitigation Plan

Carson City, Nevada

777 S. Stewart Street
Carson City, NV 89701

November 2010

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BLM	United States Bureau of Land Management
CCHHS	Carson City Health & Human Services
CC PW	Carson City Public Works
CIA	Central Intelligence Agency
CDC	Center for Disease Control
cfs	cubic feet per second
CFR	Code of Federal Regulations
City	Carson City
DHS	Department of Homeland Security
DMA 2000	Disaster Mitigation Act of 2000
DOJ	Department of Justice
DOT	United States Department of Transportation
EHS	Extremely Hazardous Substance
EMPG	Emergency Management Planning Grant
EOC	Emergency Operation Center
EPA	United States Environmental Protection Agency
EPCRA	Emergency Planning and Community Right to Know Act
FEMA	Federal Emergency Management Agency
FBI	Federal Bureau of Investigation
GIS	Geographic Information System
HAZUS-MH	(abbreviation for **HAZ**ards **U**nited **S**tates) is a geographic information system-based natural hazard loss estimation software package developed and freely distributed by the Federal Emergency Management Agency
HMGP	Hazard Mitigation Grant Program
HMP	Hazard Mitigation Plan
InSAR	Interferometric Synthetic Aperture Radar
JAVMA	Journal of the Federal coordinator for Meterology
M	Magnitude
MMI	Modified Mercalli Intensity
mph	miles per hour
NDEM	Nevada Division of Emergency Management
NDEP	Nevada Division of Environmental Protection
NDF	Nevada Division of Forestry
NDOT	Nevada Department of Transportation
NERMP	Nevada Earthquake Risk Mitigation Plan
NFIP	National Flood Insurance Program

NBMG	Nevada Bureau of Mines & Geology
NPS	National Park Service
NRC	National Response Center
NWS	National Weather Service
OFCM	Office of the Federal Coordinator for Meteorology
PDM	Pre-Disaster Mitigation
POC	Point of Contact
Planning Task Force	Hazard Mitigation Planning Task Force
SERC	State Emergency Response Commission
SFHA	Special Flood Hazard Area
SHMO	State Hazard Mitigation Officer
SPWB	State Public Works Board
Stafford Act	Robert T. Stafford Disaster Relief and Emergency Assistance Act
State	State of Nevada
SR	State Route
UBC	Uniform Building Code
UNR	University of Nevada Reno
URM	Unreinforced Masonry Buildings
URS	URS Corporation
USC	United States Code
USDA	US Department of Agriculture
USEPA	United States Environmental Protection Agency
USFS	United States Forest Service
USGS	United States Geological Survey
WMD	Weapons of Mass Destruction

Across the United States, natural and human-caused disasters have led to increasing levels of death, injury, property damage, and interruption of business and government services. The toll on families and individuals can be immense and damaged businesses cannot contribute to the economy. The time, money and effort to respond to and recover from these emergencies or disasters divert public resources and attention from other important programs and problems. With four Federal declarations in the last ten years, Carson City, Nevada, recognizes the consequences of disasters and the need to reduce the impacts of natural and human-caused hazards.

The elected and appointed officials of Carson City also know that with careful selection, mitigation actions in the form of projects and programs can become long-term, cost effective means for reducing the impact of natural and human-caused hazards. Applying this knowledge, the Carson City Hazard Mitigation Planning Task Force updated the *Carson City, Nevada, Hazard Mitigation Plan*. With the support of various City officials, the State of Nevada, and the United State Department of Homeland Security/Federal Emergency Management Agency (FEMA), this plan is the result of several months worth of work to update a hazard mitigation plan that will guide the City toward greater disaster resistance in full harmony with the character and needs of the community and region.

People and property in Carson City are at risk from a variety of hazards that have the potential for causing widespread loss of life and damage to property, infrastructure, and the environment. The purpose of hazard mitigation is to implement actions that eliminate the risk from hazards, or reduce the severity of the effects of hazards on people and property. Mitigation is any sustained action taken to reduce or eliminate long-term risk to life and property from a hazard event. Mitigation encourages long-term reduction of hazard vulnerability. The goal of mitigation is to save lives and reduce property damage. Mitigation can reduce the enormous cost of disasters to property owners and all levels of government. In addition, mitigation can protect critical community facilities, reduce exposure to liability and minimize community disruption. Preparedness, response, and recovery measures support the concept of mitigation and may directly support identified mitigation actions.

The *Carson City, Nevada Hazard Mitigation Plan* has been updated in compliance with Section 322 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act (Stafford Act or the Act), 42 U.S.C. 5165, enacted under Sec. 104 the Disaster Mitigation Act of 2000 (DMA 2000), Public Law 106-390 of October 30, 2000. Since the first plan was adopted in 2005, 11 mitigation actions have been completed. This updated plan identifies on-going and new hazard mitigation actions intended to eliminate or reduce the effects of future disasters throughout the City.

This section provides an overview of the Disaster Mitigation Act of 2000 (DMA 2000; Public Law 106-390), the adoption of the updated *Carson City, Nevada, Hazard Mitigation Plan* (HMP) by the local governing body, and supporting documentation for the adoption.

1.1 DISASTER MITIGATION ACT OF 2000

The DMA 2000 was passed by Congress to emphasize the need for mitigation planning to reduce vulnerability to natural and human-caused hazards. The DMA 2000 amended the Robert T. Stafford Disaster Relief and Emergency Assistance Act (Stafford Act; 42 United States Code [USC] 5121-5206 [2008]) by repealing the act's previous Mitigation Planning section (409) and replacing it with a new Mitigation Planning section (322). In addition, Section 322 provides the legal basis for the Federal Emergency Management Agency's (FEMA's) mitigation plan requirements for mitigation grant assistance.

To implement the DMA 2000 planning requirements, the Federal Emergency Management Agency (FEMA) published an Interim Final Rule in the *Federal Register* on February 26, 2002. This rule (44 Code of Federal Regulations [CFR] Part 201) established the mitigation planning requirements for states, tribes, and local communities. The planning requirements are described in detail in Section 2 and identified in their appropriate sections throughout the Plan. In addition, a crosswalk documenting compliance with 44 CFR is included as Appendix E.

1.2 ADOPTION BY THE LOCAL GOVERNING BODY AND SUPPORTING DOCUMENT

The requirements for the adoption of an HMP by the local governing body, as stipulated in the DMA 2000 and its implementing regulations, are described below.

DMA 2000 REQUIREMENTS: PREREQUISITES

Adoption by the 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).

Element

Has the local governing body adopted the plan?

Is supporting documentation, such as a resolution, included?

Source: FEMA, March 2008.

The Consolidated Municipality of Carson City, to be referred to as Carson City or the City throughout this plan, is the sole jurisdiction represented in this HMP. There are no other political subdivisions within Carson City. The Carson City HMP meets the requirements of Section 409 of the Stafford Act and Section 322 of the DMA 2000.

The local governing body of Carson City (Carson City Board of Supervisors) has adopted this HMP. The signed resolution is provided in Appendix A.

This section provides an overview of the City's HMP. This includes a review of the purpose and authority of the HMP and a description of the document.

2.1 PLAN PURPOSE AND AUTHORITY

The DMA 2000, also referred to as the 2000 Stafford Act amendments, was approved by Congress on October 10, 2000. On October 30, 2000, the President signed the bill into law, creating Public Law 106-390. The purposes of the DMA 2000 are to amend the Stafford Act, establish a national program for pre-disaster mitigation, and streamline administration of disaster relief.

The Carson City HMP meets the requirements of the DMA 2000, which calls for all communities to prepare hazard mitigation plans. By preparing this HMP, the City is eligible to receive Federal mitigation funding after disasters and to apply for mitigation grants before disasters strike. This HMP starts an ongoing process to evaluate the risks different types of hazards pose to the City, and to engage the City and the community in dialogue to identify the steps that are most important in reducing these risks. This constant focus on planning for disasters will make the City, including its residents, property, infrastructure, and the environment, much safer.

The local hazard mitigation planning requirements encourage agencies at all levels, local residents, businesses, and the non-profit sector to participate in the mitigation planning and implementation process. This broad public participation enables the development of mitigation actions that are supported by these various stakeholders and reflect the needs of the entire community.

States are required to coordinate with local governments in the formation of hazard mitigation strategies, and the local strategies combined with initiatives at the state level form the basis for the State Mitigation Plan. The information contained in HMPs helps states to identify technical assistance needs and prioritize project funding. Furthermore, as communities prepare their plans, states can continually improve the level of detail and comprehensiveness of statewide risk assessments.

For FEMA's Pre-Disaster Mitigation (PDM) grant program and Hazard Mitigation Grant Program (HMGP), a local jurisdiction must have an approved HMP to be eligible for PDM and HMGP funding for a Presidentially declared disaster after November 1, 2004. Plans approved any time after November 1, 2004, will allow communities to be eligible to receive PDM and HMGP project grants.

Adoption by the local governing body demonstrates the jurisdiction's commitment to fulfilling the mitigation goals and objectives outlined in the HMP. Adoption legitimizes the updated HMP and authorizes responsible agencies to execute their responsibilities. The resolution adopting this HMP is included in Appendix A.

2.2 STAFFORD ACT GRANT PROGRAMS

The following grant programs require a State, tribe, or local entity to have a FEMA-approved State or Local Mitigation Plan.

Hazard Mitigation Grant Program (HMGP): HMGP provides grants to State, tribes, and local entities to implement long-term hazard mitigation measures after a major disaster declaration. The purpose of the HMGP is to reduce the loss of life and property as a result of natural disasters and to enable mitigation measures to be implemented during the immediate recovery from disaster. Projects must provide a long-term solution to a problem: for example, elevation of a home to reduce the risk of flood damages as opposed to buying sandbags and pumps to fight the flood. In addition, a project's potential savings must be more than the cost of implementing the project. Funds may be used to protect either public or private property or to purchase property that has been subjected to, or is in danger of, repetitive damage. The amount of funding available for the HMGP under a particular disaster declaration is limited. The program may provide a State or tribe with up to 20 percent of the total disaster grants awarded by FEMA. The cost-share for this grant is 75/25 percent (Federal/non-Federal).

Pre-Disaster Mitigation (PDM) Program: PDM provides funds to State, tribes, and local entities, including universities, for hazard-mitigation planning and the implementation of mitigation projects before a disaster event. PDM grants are awarded on a nationally competitive basis. Like HMGP funding, a PDM project's potential savings must be more than the cost of implementing the project. In addition, funds may be used to protect either public or private property or to purchase property that has been subjected to, or is in danger of, repetitive damage. Congress appropriates the total amount of PDM funding available on an annual basis. The cost-share for this grant is 75/25 percent (Federal/non-Federal).

Flood Mitigation Assistance (FMA): The FMA program provides funds on an annual basis so that measures can be taken to reduce or eliminate risk of flood damage to buildings insured under the National Flood Insurance Program (NFIP). FMA provides up to 75% Federal funding for a mitigation activity grant and/or up to 90% Federal funding for a mitigation activity grant containing a repetitive loss strategy.

Repetitive Flood Claims (RFC): The RFC program provides funds on an annual basis to reduce the risk of flood damage to individual properties insured under the NFIP that have had one or more claim payments for flood damages. RFC provides up to 100% Federal funding for eligible projects in communities that qualify for the program.

Severe Repetitive Loss (SRL): The SRL program provides funds on an annual basis to reduce the risk of flood damage to residential structures insured under the NFIP that have had one or more claim payments for flood damages. SRL provides up to 75% Federal funding for eligible projects in communities that qualify for the program.

2.3 PLAN ORGANIZATION

The remainder of this HMP consists of the following sections.

- ***Section 3 - Community Description***

Section 3 provides a general history and background of the City and historical trends for population, demographic and economic conditions that have shaped the area. Trends in land use and development are also discussed.

- ***Section 4 - Planning Process***

Section 4 describes the planning process, identifies Planning Committee members, and the key stakeholders within the community and surrounding region. In addition, this section documents public outreach activities and the review and incorporation of relevant plans, reports, and other appropriate information.

- ***Section 5 - Risk Assessment***

Section 5 describes the process through which the Planning Committee identified and compiled relevant data on all potential natural hazards that threaten the City and the immediately surrounding area. Information collected includes historical data on natural hazard events that have occurred in and around the City and how these events impacted residents and their property.

The descriptions of natural hazards that could affect the City are based on historical occurrences and best available data from agencies such as FEMA, the U.S. Geological Survey (USGS), and the National Weather Service (NWS). Detailed hazard profiles include information on the frequency, magnitude, location, and impact of each hazard as well as probabilities for future hazard events.

- ***Section 6 – Vulnerability Analysis***

Section 6 identifies potentially vulnerable assets such as people, housing units, critical facilities, infrastructure and lifelines, hazardous materials facilities, and commercial facilities. These data were compiled by assessing the potential impacts from each hazard using GIS and FEMA's natural hazards loss estimation model, HAZUS-MH. The resulting information identifies the full range of hazards that the City could face and potential social impacts, damages, and economic losses.

- ***Section 7 - Capability Assessment***

Although not required by the DMA 2000, Section 7 provides an overview of the City's resources in the following areas for addressing hazard mitigation activities:

- Legal and regulatory resources
- Administrative and technical: The staff, personnel, and department resources available to expedite the actions identified in the mitigation strategy
- Fiscal: The financial resources to implement the mitigation strategy

- ***Section 8- Goals, Objectives & Actions - Mitigation Strategy***

As Section 8 describes, the Planning Committee developed a list of mitigation goals, objectives, and actions based upon the findings of the risk assessment and the capability assessment. Based upon these goals and objectives, the Planning Committee reviewed and prioritized a comprehensive range of appropriate mitigation actions to address the risks facing the community. Such measures include preventive actions, property protection techniques, natural resource protection strategies, structural projects, emergency services, and public information and awareness activities.

- ***Section 9 - Plan Maintenance Process***

Section 9 describes the Planning Committee's formal plan maintenance process to ensure that the HMP remains an active and applicable document. The process includes monitoring, evaluating, and updating the HMP; implementation through existing planning mechanisms; and continued public involvement.

- ***Section 10 - References***

Section 10 lists the reference materials used to prepare this HMP.

- ***Appendices***

The appendices include the Adoption Resolution, Maps, Planning Committee Meetings, and Public Involvement process.

This section describes the history, location, and geography of the City as well as its government, demographic information, and current land use and development trends.

3.1 HISTORY, LOCATION, AND GEOGRAPHY

The Consolidated Municipality of Carson City, Nevada's territorial and state capital, has a rich and colorful frontier past. Carson City was founded as a community in 1858, seven years after the first settlement of Eagle Station trading post in 1851. Eagle Valley had been settled by ranchers. Carson City is named for the famous frontiersman and scout Cristopher “Kit” Carson. During his 1843-1844 expedition, John C. Fremont had named Carson City's nearby river for Kit Carson, Fremont's scout. Pioneer Abraham Curry arrived in Eagle Valley in 1858 and soon thereafter surveyed and plotted a town site. A cadre of well-connected attorneys whose names still decorate street signs here (Proctor, Musser) bought the richest part of the valley for $500 and a herd of horses. The farsighted and optimistic Curry set aside 10 acres expressly for the construction of a capitol -- this was before the formation of Nevada Territory in 1861. Carson City was soon designated both the territorial capital and county seat of the new Ormsby County. President Abraham Lincoln, recognizing the importance of Nevada's silver and gold to the Union's Civil War effort, signed the proclamation that ushered Nevada into statehood on October 31, 1864. Carson City was selected as the state capital at the constitutional convention and has retained that honor to the present day.

Following the discovery of gold and silver on the nearby Comstock Lode in 1859, Carson City became a thriving commercial center. To their astonishment and delight of its citizens, the discovery of the Comstock Lode brought their Carson City to life as a freight and transportation center. Abe Curry, then built the crude Warm Springs Hotel a mile to the east, and when Carson City was selected as the territorial capital in 1861, leased it to the Legislature as a meeting hall. The legislature established Carson City as the seat of Ormsby County (named for one of the dead "heroes" at the Battle of Pyramid Lake). The legislators also leased the Warm Springs Hotel to serve as the Territorial Prison, and named their genial host and landlord, as its first warden. The property was eventually purchased by the state and is still a part of the state prison system.

Carson City was confirmed as Nevada's permanent capital with statehood in 1864, and development thereafter was no longer completely dependent on the health of the Comstock mines. Until they began to decline in the 1880s, these mines provided Carson City with most of its economic importance as freight staging center, and as a marshalling point for much of the timber harvest in the Lake Tahoe basin. The United States Mint in Carson City was completed in 1869; it is today the site of the Nevada State Museum.

Long shallow flumes, capable of carrying enormous pine logs in a shallow spill of fast water, swooped down the steep eastern slope of the Sierra from Spooner Summit to Carson City. Scorched and smoldering where they had rubbed against the flume's sides in their dashing descent, the logs were fed into sawmills where they became timbers for the underground mines, and planed boards for the surface cities. The finished lumber was then loaded onto flatcars and rolled off to Silver City, Gold Hill and Virginia City via the Virginia and Truckee Railroad (V&T).

The V&T was completed between Carson City and Virginia City in 1869, with the railroad's shops and main offices in Carson City. The V&T rails were extended north to connect with the

transcontinental railroad at Reno in 1872. By 1874, when the Comstock mines were reaching their peak production, 36 trains a day passed through Carson City. The huge sandstone V&T engine house and roundtable dominated the northeast corner of the city for well over a century. Neglected and falling into ruin since the track was torn up in 1950, they have now been torn down and the stones sent to create facades for wineries in the Napa Valley.

Like many another Nevada town in its youth Carson City was made lively, and occasionally dangerous, by the presence of dozens of rootless, restless men. Shootings, stabbings and street brawls were commonplace around Nevada, but Carson City was unique in contending with outbreaks from the State Prison.

After the turn of the century Carson City participated vicariously in the Tonopah and Goldfield booms far to the south. Much of the freight and passenger traffic bound for those two celebrated cities was routed to Reno and then through Carson City to Mound House on the V&T railroad. From there the narrow gauge Carson & Colorado carried it to Sodaville where freight wagons and stage coaches were waiting for the last leg of the journey.

This traffic through Carson City came to a sudden halt when the Southern Pacific built a branch line connecting with the C & C from the east that bypassed the V&T altogether. The capital then resumed the quiet lifestyle that evolved after the decline of the Comstock, and which still continues (with variations) today. At the turn of the century the railroad extended its line south into the Carson Valley, but the Minden-Gardnerville traffic never came close to replacing the Tonopah-Goldfield traffic, and the railroad, and Carson City, slipped back into quiescence. In 1930, the population had dwindled to 1,800, about a quarter of what it had been at the peak of the mining boom 50 years earlier.

In 1933, the highway was paved through town, but for a long time afterward the kids could roller skate on it without worrying too much about traffic. In those innocent days Carson City advertised itself as America's smallest state capital.

In 1960, Carson City regained its 1880 population level, and in 1969, Ormsby County was merged into Carson City to consolidate government services. There are now nine state capitals with smaller populations than Carson City, and in fact, with its area of 146 square miles, Carson City could now advertise itself as one of the largest state capitals in America!

Carson City is a growing area located along the eastern slopes of the Sierra Nevada Mountains in western Nevada at 4,687 feet above sea level. Average annual snowfall is 22.2” and average annual rainfall is 11.8”. Temperatures range from average summer high of 89 degrees to average winter low of 19 degrees. There is an average of 266 days of sunshine. The Carson River runs along the eastern part of the city.

Recreational activities abound, including skiing, fishing, lakes and hiking, all within minutes of the metropolitan area. Citizens enjoy cultural events, quality public schools, and excellent public services. The economy is growing, housing is plentiful, and the cost of living is moderate. Carson City’s

climate is mild, with low humidity and rainfall, and we enjoy the full range of the four seasons. Appendix B, Figure B-1 Project Location and Figure B-2 Surface Management are attached.

3.2 GOVERNMENT

The debate concerning consolidation of Ormsby County and Carson City continued for some 20 years. Finally, the process was formally initiated and, after two legislative sessions, and a favorable statewide vote by the citizens in 1966, the required constitutional amendment was ratified by the electorate in November 1968. Thereafter the 55th Session of the Legislature passed Senate Bill No. 75 and Ormsby County and Carson City were thereby consolidated into one municipal government known as Carson City Consolidated Municipality. The Charter was approved on April 1, 1969.

The local governing body is composed of a five-member elected representation called the Board of Supervisors (BOS). The Mayor and four Supervisors are elected by and accountable to the voters. All of the members of the Board serve 4-year staggered terms. The Mayor and Supervisors from Wards 2 and 4 are elected during Presidential election years. The Supervisors from Wards 1 and 3 are elected during off-Presidential election years.

The Board of Supervisors appoints a City Manager to be responsible for the general direction, supervision, administration, and coordination of all affairs for the City. Below please see Carson City departments and key divisions.

Key Officials

Mayor	City Manager	District Attorney
Supervisor, Ward 1	Assessor	Environmental Health Director
Supervisor, Ward 2	City Engineer	Finance Director/Risk Manager
Supervisor, Ward 3	Clerk-Recorder	Fire Chief/Emergency Manager
Supervisor, Ward 4	Cooperative Extension Director	Judges
	Development Services Director	Sheriff

City Departments/Divisions

Assessor	Fire	Public Administrator
Building and Safety	GIS Program	Public Guardian
Community Development	Human Resources	Purchasing
Community Support	Justice Court	Recorder
Finance/Comptroller	Information Technology	Registrar of Voters
City Clerk	Internal Audit	Senior Services
District Attorney	Library	Sheriff
District Courts	City Manager's Office	Social Services
District Health	Parks and Recreation	Treasurer

Engineering	Public Works

Washoe Tribe

The Washoe Tribe boundary is within the Carson City boundary and a brief description is included in this plan. Washoe Tribe has an approved Tribal Level Hazard Mitigation Plan dated August 4, 2005 and an update is in process.

The ancestral homeland of the Washoe Tribe radiated from Lake Tahoe, a spiritual and cultural center in the central Sierra Nevada Mountain Range west of Carson City. The area originally encompassed over 1.5 million acres, the traditional homelands stretched from the Central Sierra Nevada in California to the Great Basin in Nevada.

Today, through ongoing tribal efforts and federal collaborations, the Tribe has recovered approximately 4,920 acres and approximately 61,000 acres of individual trust allotments within the ancestral homelands. Washoe Tribal lands are unique in that they do not comprise a single reservation, but are fractionated into several discrete parcels, located in six different counties and two different states. While the Tribe has some forested lands in the Sierra Nevada, most current lands are located just within the boundaries of the Great Basin desert, in the Carson River Watershed.

The last Tribal census in 1993 determined the total tribal enrollment to be 1,596 (one-quarter or more blood quantum), with 1,380 Tribal members living on one of the four reservation communities. While not all of these Tribal members live within Carson City, a significant number do. In addition, the Tribe maintains around 250 employees, most of whom work out of the administration buildings in the Dresslerville parcel. While many of these employees are not residents of Tribal lands, they are nonetheless exposed to the hazards therein.

There are two federally recognized communities under the Washoe Tribe of Nevada and California that are located within the jurisdictional boundary covered by this Hazard Mitigation Plan:

<u>Federally Recognized Communities:</u>

Carson Colony (Carson) west of Carson City, NV

Stewart Community (Stewart) southeast of Carson City, NV

Twenty miles south of Carson City, Washoe Tribal headquarters is centrally located on Tribal Land within the Dresslerville Community and within a 20-mile radius of nearly all current Tribal lands.

The Tribe is organized under the provisions of the Indian Reorganization Act of June 18, 1934, exercising rights of home rule and responsibility for the general welfare of its membership. The Washoe Tribal Council, a 12-member body, serves as the local authority for purposes of authorizing any planning program for the Tribe's future.

3.3 DEMOGRAPHICS

According to the U.S. Census Bureau 2000 census, the City's population was 52,457 and estimated at 57,600 in 2009 by the NV State Demographer. Approximately 23.0 percent of the total population was under 18 years, 54.2 percent was between 18 and 64 years, and 16.1 percent was 65 years and over. While the City experienced a 4.6 percent growth rate from 2000 to 2008, it is well below the state average of 30.1 percent. The number of people within the City during the work day is much higher as many people working in the City commute from outside the City.

Carson City's nonfarm employment was 27,581 persons in 2006 (US Census Bureau). This is a 11.3% change from 2000 and is estimated to be higher in 2009. The economic base of the City primarily consists of government, trade, and service. The unemployment rate has been historically low, but has risen in the last year to 10.8 percent, April 2009, according to the US Bureau of Labor Statistics. In 2007, the median household income was $50,884 according to the US Bureau of Labor Statistics.

Table 3-1. Census Data

2000 Census Demographic Summary *Carson City, NV*									
	2000 Census		1990 Census		1990-2000 Average Annual Growth Rate	Median Age	Median Household Income	Median Rent	Median Housing Value
Carson City	52,457		40,443		2.97%	38.7	$41,809	$580	$147,500
Retail Sales Sub regions*									
Downtown Carson City	973	1.9%	1,026	2.5%	-0.53%	41.9	$37,849	$484	$189,490
East Carson City	21,553	41.1%	15,160	37.5%	3.58%	36.5	$38,840	$568	$130.198
North Carson City	11,997	22.9%	10,071	24.9%	1.77%	40.4	$40,661	$586	$169,116
South Carson City	14,362	27.4%	11,658	28.8%	2.11%	42.5	$45,213	$609	$146,191
* Carson City totals may differ from the sum of the four retail sales sub regions due to the geographic limitations of the sub region boundaries.									
2000 Census Tracts									
1.00	3,175	6.1%	3,155	7.8%	0.06%	45.4	$39.896	$538	$157,400
2.00	3,376	6.4%	2,892	7.2%	1.56%	46.2	$47,125	$640	$171,400
3.00	3,626	6.9%	2,300	5.7%	4.66%	47.1	$61,658	$385	$273,700
1.00	3,670	7.0%	3,389	8.4%	0.80%	39.4	$46,165	$684	$162,800
5.00	8,128	15.5%	5,379	13.3%	4.21%	32.5	$32,962	$540	$129,400
6.00	6,057	11.5%	5,525	13.7%	0.92%	35.9	$36,983	$575	$119,900
7.00	7,432	14.2%	5,427	13.4%	3.19%	40.8	$46,818	$758	$138,700
8.00	4,266	8.2%	3,075	7.6%	3.38%	41.0	$53,850	$659	$187,100
9.00	4,960	9.5%	4,788	11.8%	0.35%	45.0	$35,775	$590	$122,400
10.00	7,747	14.8%	4,513	11.2%	5.55%	31.1	$44,011	$569	$148,500
2000 Carson City Business Activity Report					*9/5/2002*		*Nevada Small Business Development Center University of Nevada, Reno (775) 784-1771*		

3.4 LAND USE AND DEVELOPMENT TRENDS

The majority of the City is already developed with infill being the primary future development. There are three ranches, Lompa (bi-sected by 395, eastern Carson), Schulz (southeast Carson) and Anderson (western Carson) that will provide some area for future development as well as the remaining sites in the Silver Oaks housing track. The City has approved 2,000 single family residence parcels within the City for future development. The infill will trend towards higher density in residential development and multi-story office buildings for commercial development. However there is ample land for development beyond the Carson City borders and therefore density will not take the form of high rise apartments but smaller land parcels for single family homes.

Development of the residential parcels is estimated to be slow with a decline in population over the next 4 years and then an increase of less than 1% each year according to the NV State Demographer. A land use map is provided in Appendix B, Figure B-11 and a Population Density Map is provided in Appendix B, Figure B-6.

Carson City will have an impact from the Lands Bill that passed Congress in 2009 which includes trading of land with Carson City, Bureau of Land Management (BLM), US Forestry and Washoe Tribe. The new land incorporated into Carson City should be examined for planning, zoning, and hazard evaluation.

This section provides an overview of the planning process; identifies Planning Committee members, and key stakeholders; documents public outreach efforts; and summarizes the review and incorporation of existing plans, studies, and reports used in the development of this HMP. Additional information regarding the Planning Committee and public outreach efforts is provided in Appendices C and D.

The requirements for the planning process, as stipulated in the DMA 2000 and its implementing regulations, are described below.

DMA 2000 Requirements: Planning Process

Documentation of the Planning Process

Requirement §201.6(b): In order to develop a more comprehensive approach to reducing the effects of natural disasters, the planning process shall include:

1. An opportunity for the public to comment on the plan during the drafting stage and prior to plan approval;
2. An opportunity for neighboring communities, local and regional agencies involved in hazard mitigation activities, and agencies that have the authority to regulate development, as well as businesses, academia and other private and nonprofit interests to be involved in the planning process; and
3. Review and incorporation, if appropriate, of existing plans, studies, reports, and technical information.

Requirement §201.6(c)(1): [The plan shall document] the planning process used to develop the plan, including how it was prepared, who was involved in the process, and how the public was involved.

Element

- Does the new or updated plan provide a narrative description of the process followed to prepare the plan?
- Does the new or updated plan indicate who was involved in the planning process? (For example, who led the development at the staff level and were there any external contributors such as contractors? Who participated on the plan Committee, provided information, reviewed drafts, etc.?)
- Does the new or updated plan indicate how the public was involved? (Was the public provided an opportunity to comment on the plan during the drafting stage and prior to the plan approval?)
- Does the new or updated plan indicate that an opportunity was given for neighboring communities, agencies, businesses, academia, nonprofits, and other interested parties to be involved in the planning process?
- Does the updated plan document how the planning team reviewed and analyzed each section of the plan?
- Does the planning process describe the review and incorporation, if appropriate, of existing plans, studies, reports, and technical information?
- Does the updated plan indicate for each section whether or not it was revised as part of the update process?

Source: FEMA, March 2008.

4.1 OVERVIEW OF PLANNING PROCESS

The first step in the planning update process was to establish a Planning Committee composed of existing Carson City agencies. Stacey Giomi, Fire Chief and Gary Dunn Emergency Services Preparedness Coordinator both of Carson City, served as the primary Points of Contact (POC) for the Carson City and the public. Karen Johnson functioned as project leader for the update process.

The City assisted by the State of Nevada, Hazard Mitigation Officer updated this HMP. Each section of the previous HMP plan was reviewed for content and the committee revised every section of the plan. The plan was re-drafted into a new outline to better assist the State Hazard Mitigation Officer in the review process. All NV state plans are requested to be in this new outline.

During the 5 years since the previous plan was adopted there was no plan maintenance performed. There was discussion on mitigation actions taken and planned regarding wildfire during the update of the Community Wildfire Protection Plan. However other than wildfire all information on mitigation action accomplishments and new public input was derived during the planning process. There has been a change in Emergency Management leadership within Carson City and with this new plan and the new plan maintenance section this omission will be corrected.

The following table provides the new section format and provides details on the update.

Table 4-1. Plan Outline and Update Effort

Plan Section	Update Effort	What Changed
Section 1 – Official Record of Adoption	New	The process for plan adoption remains the same but the update provides a discussion of this process.
Section 2 - Background	Moderate Revisions	This section was revised and expanded to include the Disaster Mitigation Act of 2000 and Stafford Grant Programs for completeness.
Section 3 – Community Description	Minor Revisions	This section was updated to include new land use map and expanded to include land use and development trends to address new requirements.
Section 4 – Planning Process	Major Revisions	This section details the current plan's planning process. Public and stakeholders outreach efforts
Section 5 – Hazard Analysis	Major Revisions	Special Events, Radon Gas, Economic Loss, Prison Riots, Air Crash, Transportation Loss were deleted as hazards by the committee after reviewing the definition of hazards. Water Loss and Communication Loss were bundled into Utility Loss. Biological Disease was renamed as Epidemic. The committee rated the hazards according to low, moderate or high planning significance. The individual hazard sections were reformatted to the new outline and then provided to the committee member with expertise to update history and revise as needed. New Hazus information was used for the earthquake hazard and new FIRM maps were used for flood hazard.
Section 6 – Vulnerability Analysis	New	This section was not included in the previous plan except in terms of City owned critical facilities. New analysis of residential, non residential and critical facilities based on mapping efforts tied to hazards was included. Identified URMs was included. Future development was included. This new section was added to meet requirements and help with the mitigation strategy section. The team used it to prioritize projects.
Section 7 – Capability Assessment	Moderate Revisions	This section was reviewed and new information included. Financial resources was expanded to include effect on HM. A local mitigation capability assessment was included and a section on NFIP was included to address requirements.
Section 8 – Mitigation Strategy	Major Revisions	The goals and actions were reviewed and progress was included, actions deleted, and actions added. The prioritization process was expanded to include the STAPLE+E process to better evaluate and prioritize actions.
Section 9 – Plan Maintenance	Major Revisions	The planning leads determined the maintenance process needed to be improved. Planning forms were included in Appendix F to help with the maintenance process.
Section 10 – Reference	New	This section was added for future plan update reference.

Once the Planning Committee was formed, the following five-step planning process took place during the 11-month period from July 2009 to June 2010.

- **Organize resources:** The Planning Committee identified resources, including Carson City staff, agencies, and local community members, which could provide technical expertise and historical information needed in the development of the HMP.
- **Assess risks:** The Planning Committee identified the hazards specific to the Carson City, and developed the risk assessment for the thirteen identified hazards. The Planning Committee reviewed the risk assessment, including the vulnerability analysis, prior to and during the development of the mitigation strategy.
- **Assess capabilities:** The Planning Committee reviewed current administrative and technical, legal and regulatory, and fiscal capabilities to determine whether existing provisions and requirements adequately address relevant hazards.
- **Develop a mitigation strategy:** After reviewing the risks posed by each hazard, the Planning Committee worked to develop a comprehensive range of potential mitigation goals, objectives, and actions. Subsequently, the Planning Committee identified and prioritized the actions to be implemented.
- **Monitor progress:** The Planning Committee developed an implementation process to ensure the success of an ongoing program to minimize hazard impacts to the Carson City.

4.2 HAZARD MITIGATION PLANNING COMMITTEE

4.2.1 Formation of the Planning Committee

As previously noted, the planning process began in July 2009. Stacey Giomi, Fire Chief and Emergency Manager for Carson City, formed the advisory body, known as the Planning Committee, utilizing staff from relevant Carson City agencies and community organizations. The Planning Committee members are listed in Table 4-2. The Planning Committee meetings are described in section 4.2.2. Meeting minutes are provided in Appendix C.

Table 4-2. Carson City Hazard Mitigation Planning Committee

Name	Department	
Chair: Stacey Giomi	Emergency Management & Fire Department	Chair of the Committee, chaired meetings, provided evaluation and information on the following sections, wildfire, vulnerability analysis, risk assessment, mitigation strategies, plan maintenance, provided public outreach Attended meetings, reviewed drafts and provided input
Elizabeth Ashby	State Hazard Mitigation Officer	Provided information on tools, guidance, plan outline, state hazards, mitigation strategies, plan maintenance Attended meetings, reviewed drafts and provided input
William Berquist	Washoe Tribe of Nevada & California	Reviewed and provided revisions for tribe description, Attended meetings, reviewed drafts and provided input
Brian Crowe	Western Nevada College	Provided information on college buildings for vulnerability assessment Attended meetings, reviewed drafts and provided input

Kevin Curnes	Carson City School District	Provided information on school buildings Attended meetings, reviewed drafts and provided input
Gary Dunn	Emergency Management & Fire Department	Compiled public input Attended meetings, reviewed drafts and provided input
Robb Fellows	Public Works (Storm Water/Flood Mgr.)	Provided flood hazard information Attended meetings, reviewed drafts and provided input
Phillip Harrison	Taiyo America & Chamber of Commerce	Provided HM Plan outreach to Chamber of Commerce
Linda Hurst	Carson Tahoe Regional Healthcare (CTRH)	Provided building information on CTRH Attended meetings, reviewed drafts and provided input
Ed James	Carson Water Subconservancy District	Provided information on flood and mitigation strategy Attended meetings, reviewed drafts and provided input
Karen Johnson	Mitigation Planning, NV DEM	Lead meetings, gathered information , drafted plan,
Hank Lucas	Carson Tahoe Regional Healthcare	Attended meetings, reviewed drafts and provided input
Curt Marshall	State Public Works Board	Provided information on state buildings Attended meetings, reviewed drafts and provided input
Rhett Milne	National Weather Service	Provided information on severe weather Attended meetings, reviewed drafts and provided input
Casey Pullman	Airport Manager	Attended meetings, reviewed drafts and provided input
Lee Radtke	Community Emergency Response Team & Citizen Representative	Attended meetings, reviewed drafts and provided input Attended as a member of the general public
Ray Saylo	Sherriff's Office	Provided information on terrorism Attended meetings, reviewed drafts and provided input
Darren Selby	Public Works	Provided information on flood Attended meetings, reviewed drafts and provided input
Tom Tarulli	Fire Department	Provided information on wildfire Attended meetings, reviewed drafts and provided input
Jim Walker	Nevada Dept. of Transportation	Provided information on roads and bridges for vulnerability assessment
Larry Werner	City Manager	Provided information through City Planning and Building Dept. on buildings and planning
Marena Works	Health Director	Provided information on epidemic Attended meetings, reviewed drafts and provided input

Although individuals have changed the departments they represent have remained largely the same. The NV Department of Transportation, NV State Public Works Board, and the Washoe Tribe of CA and NV were asked and agreed to participate. This provided additional information and input since Carson City is the State Capitol, highways and bridges are critical infrastructure and the Washoe Tribe's boarders are within Carson City. The City Assessor and Development Services were represented by Larry Werner, City Manager, who provided information from staff. Public comments were received from Larry Radke who participated as a community representative by attending, providing input and review of the plan.

4.2.2 Planning Committee Meetings & Monthly Progress

- ***August 2009***

During the kick-off meeting, at Carson City Fire Station #1, the Committee discussed the objectives of the DMA 2000, the hazard mitigation planning process, the public outreach process, and the steps involved in updating the HMP and achieving the City's goals. The planning process was discussed including the purpose of the plan and the previous plans tasks, goals and objectives and new goals and objectives were considered. The Committee approved the committee By-Laws. The 20 potential hazards from the original HMP (as shown in Section 5.2), were reviewed and modifications to the hazards list were discussed. A hazard identification table was completed for the update. The exercise identified the specific hazards that the Planning Committee wanted to address in the HMP. See Appendix E for agenda, handouts and minutes.

- ***September 2009***

Briefed the Planning Committee on progress made to date, including a press release and notification letter to neighboring communities and relevant agencies of the HMP preparation. The Committee completed the Incorporation of Existing Plans/Study Table to identify all the plans/studies available (as shown in section 4.4). The Planning Committee used the hazards identified in the previous meeting and completed a Hazard Profiling Worksheet. The exercise used group averaging to prioritize the hazards into high, medium and low categories. See Appendix E for meeting agenda, handouts and minutes.

- ***October 2009***

Coordinated with Carson City Public Works and the Planning Department to gather data, to include copies of their Land Use Map and Flood Plain Map. Coordinated with UNR, Bureau of Mines and Geology to gather earthquake data. As information was gathered, additions were made to the developing plan.

- ***November 2009***

Continued to gather information. Began formation of the Risk Assessment and Vulnerability Analysis. The outline of the draft plan was coming together, maintained communication and update status with Carson City HMP Project Manager.

- ***December 2009***

Met with Public Works to initiate the risk assessment. Met with Planning Department to review the master plan, city building codes and reviewed previous plan's mitigation actions and new actions. Met with Floodplain Manager, Sherriff's Department, and Fire Department to review previous plan's mitigation actions and new actions.

- ***January 2010***

Presented the Planning Committee with the initial analysis of the risk assessment, describing which assets were analyzed and how values were estimated. The Planning Committee reviewed past goals and actions, identified completed actions and drafted new actions. Planning Committee used STAPLE+E form to prioritize actions. See Appendix E for a list of attendees, meeting handouts and minutes.

- ***February 2010***

With the information from the prioritization process the Planning Committee selected the top actions they felt were feasible and realistic to be completed during this iteration of the HMP. With this information they completed the Mitigation Action matrix.

- ***April 2010***

The completed plan was distributed to the Planning Committee for their review.

- ***May 2010***

The Planning Committee met to discuss the plan. The SHMO provided a review of Nevada's hazard mitigation program and projects. The plan was provided to the NV State Hazard Mitigation Officer for review and submission to FEMA.

4.2.3 Plans, Studies, Reports and Technical Information

Staci Giomi the Chair of the Committee felt that the information available was of high quality. He identified two studies, URM building mapping and better identification of fire access roads and dirt road, would be helpful to the next plan update. Although the URM buildings were identified they have not been mapped. Mapping these structures would provide information regarding proximity to fault lines and buildings that are located in the flood zones. The access and dirt road system would provide a better understanding of escape routes and fire breaks.

4.3 PUBLIC INVOLVEMENT

The public and stakeholder input in the previous plan was considered successful by the plan leads and was followed generally in this plan. This consisted of a questionnaire in the utility bill and on the city website, a press release and letters to stakeholders for their participation. From this outreach a large amount of input and review was provided.

Questionnaire

In August 2009, the City sent 17,000 hazard mitigation questionnaires out with the utility bills to the public. This plan also used the City's website for outreach efforts and the questionnaire was placed on the site. Changes to the questionnaire included a question regarding how open a respondent was to a buyout, elevation or relocation and a ranking of how prepared a respondent felt their household was from the impact of an event. A section for a general comment was added (however no comments regarding hazard mitigation were included in the response). The questionnaire and the results can be found in Appendix D.

Press Release & Public Awareness

A press release was posted on the City web site and an e-mail was sent out to BAC TV, KOLO TV, Nevada Appeal, Reno Gazette-Journal and News Carson City. The press release can be found in Appendix D. Additionally, all committee planning meeting agendas were posted at the City offices and Carson City Fire Department and the public was welcome and invited to attend. The community citizens who attended, provided input and review were Lee Radke and Mary Ann Radke.

Letters to Stakeholders and Neighboring Communities

The City mailed letters (see Appendix D) regarding the update of the HMP to the following entities:

- FEMA – Did not attend but will review the plan.
- State NDEM, NDOT, SPWB, NDEP – All but NDEP attended, provided input and review.
- State Assembly & Senate Representative – Did not participate.
- Counties of Washoe, Douglas, Lyon and Storey – Did not participate but their HM plans were reviewed for hazard information.
- Carson City Public Airport – Attended, provided input and review.
- Carson / Tahoe Regional Healthcare – Attended, provided input and review.
- National Weather Service – Attended, provided input and review.
- Western Nevada College – Attended, provided input and review.
- Washoe Tribe of Nevada – Attended, provided input and review.

All but FEMA, NDEP, State Assembly and Senate Representative, and neighboring counties participated. FEMA will be sent the plan for review. NDEP stated that Carson City had sufficient flood expertise in Rob Fellows the City's Flood Plain Manager. The neighboring counties were aware of the planning effort and offered to provide answers to specific questions. No questions were requested of them during the planning effort.

4.4 INCORPORATION OF EXISTING PLANS AND OTHER RELEVANT INFORMATION

During the planning process, the Planning Committee reviewed and incorporated information from existing plans, studies, reports, and technical reports into the HMP. A synopsis of the sources used follows.

- ***Carson City Building Code*** **(January 2008):** These regulations concern zoning districts, variances, and general development standards within Carson City and includes the 2006 US Building Codes.
- ***Carson City Fire Code*** **(January 2008)*:*** This document includes a wildland/urban interface section that delineates regulations for building and maintaining homes in wildland fire prone areas.
- ***Carson City Mass Illness Plan*** **(In Draft):** This plan addresses the City's response to a pandemic/influenza outbreak.
- ***Carson City Master Plan – Land Use Element*** **(Carson City Planning April 2006):** Guiding principle includes a stewardship section which addresses Hazard Mitigation.
- ***Carson City Sandbagging Plan 2007****:* This document includes a plan in case of flood for sand bagging specific identified areas.
- ***Carson River Watershed Regional Floodplain Management Plan*** **(Carson Water Sub conservancy District, 2008)** *:* This plan provides strategies for floodplain management that can be applied regionally as well as locally.
- ***Community Wildfire Protection Plan*** **(August 2009):** This document includes findings and recommendations for mitigating the threat to property from wildland fires.
- ***Emergency Operations Plan****:* This document is the main reference source for managing disasters and large scale emergencies in Carson City.
- ***Carson River Geographic Response Plan****:* This is a regional plan covering five counties in two states. The plan was developed to protect the health, safety, environment, and property (both public and private) from the effects of hazardous materials incidents in or near the Carson River.
- ***Carson City Hazardous Materials Response Plan****:* This plan provides guidance to emergency response personnel on the general plan of action for a response to a hazardous materials emergency and provides for a resource directory.
- ***Emergency Action Plan (*****Brunswick Canyon Dam – Manhard Consult. Mar. 2005, Eagle Valley Dam - MacTec Jan. 2009, Shanandoah Heights Dam – Manhard Consult. Oct. 2006)** This plan provides a tool for development service personnel and public safety agencies to ensure public safety and minimize property damage.
- ***State of Nevada Multi-Hazard Mitigation Plan****:* This plan, prepared by NDEM, was used to ensure that the City's HMP was consistent with the State's Plan.
- ***FEMA Flood Insurance Study for Carson City, NV (*****FEMA 2009***):* This outlined the principal flood problems and floodplains within the City.
- ***Washoe Tribe of NV & CA Hazard Mitigation Plan 2005***

The following FEMA guides were also consulted for general information on the HMP process:

- ***How-To Guide #1: Getting Started: Building Support For Mitigation Planning*** **(FEMA 2002c)**

- ***How-To Guide #2: Understanding Your Risks – Identifying Hazards and Estimating Loss Potential*** **(FEMA 2001)**
- ***How-To Guide #3: Developing the Mitigation Plan: Identifying Mitigation Actions and Implementing Strategies*** **(FEMA 2003a)**
- ***How-To Guide #4: Bringing the Plan to Life: Implementing the Hazard Mitigation Plan*** **(FEMA 2003b)**

A complete list of the sources consulted is provided in Section 10, Reference.

A hazard analysis includes the identification and screening of each hazard and subsequent profiling of each hazard. Hazard identification is the process of recognizing the natural and human-caused events that threaten an area. Natural hazards result from unexpected or uncontrollable natural events of sufficient magnitude. Human-caused hazards result from human activity and include technological hazards and terrorism. Technological hazards are generally accidental or result from events with unintended consequences, for example, an accidental hazardous materials release. Terrorism is defined as the calculated use of violence or thereat of violence to attain goals that are political, religious, or ideological in nature.

Even though a particular hazard may not have occurred in recent history in the study area, all hazards that may potentially affect the study area are including in the screening process. The hazards that are unlikely to occur or for which the risk of damage is accepted as being very low, are eliminated from consideration.

All identified hazards will be profiled by describing hazards in terms of their nature, history, magnitude, frequency, location, and probability. Hazards are identified through the collection of historical and anecdotal information, review of existing plans and studies, and preparation of hazard maps of the study area. Hazard maps are used to determine the geographic extent of the hazards and define the approximate boundaries of the areas at risk.

5.1 HAZARD IDENTIFICATION AND SCREENING

The requirements for hazard identification, as stipulated in DMA 2000 and its implementing regulations, are described below.

DMA 2000 Requirements: Risk Assessment – Overall

Identifying Hazards

§201.6(c)(2)(i): [The risk assessment shall include a] description of the type of all natural hazards that can affect the jurisdiction.

Element

- Does the new or updated plan include a description of all the types of all natural hazards that affect the jurisdiction?

Source: FEMA, March 2008.

The first step of the hazard analysis is the identification and screening of hazards, as shown in Table 5-1. During the first HMP meeting, the Planning Committee (comprised of representatives from City agencies, City governments, local businesses, State Division of Emergency Management and Western Nevada College) using the Nevada State Hazard Mitigation Plan and the City's previous plan as a starting point and reviewing previous disaster declarations the Committee identified 18 possible hazards (14 natural hazards and 4 human-caused hazards).

Seiche is the only new hazard profiled. Utility loss was combined with water loss and communications loss. Air Crash, Transportation Loss, Radon Gas, Special Events, Prison Riots and Economic Loss shown in the previous plan were reviewed and left out of this update as they were not considered hazards but may be the result of hazards.

Table 5-1. Identification and Screening of Hazards

Hazard Type	Should It Be Profiled?	If Yes is this a New Hazard?	Explanation
Avalanche	Yes	No	Carson City is located in area prone to frequent or significant snowfall. No historical record of avalanche or damage
Civil Disturbance	No		No historical record of this hazard in the City.
Dam Failure	No		There are no high-hazard dams within the City.
Drought	Yes	No	Statewide drought declarations were issued in 2002 and 2004.
Earthquake	Yes	No	Several active fault zones pass through the City.
Epidemic	Yes	No	This hazard was addressed in the State Multi-Hazard Mitigation Plan.
Flood	Yes	No	Flash floods and other flood events occur regularly during rainstorms.
Hazardous Material Event	Yes	No	Carson City has several facilities that handle or process hazardous materials.
Infestations	No		No significant historic events have occurred in the City.
Land Subsidence	No		No significant historic events have occurred in the City.
Landslide	Yes	No	No significant historic events have occurred in the City.
Severe Weather Snow/Ice/Windstorm	Yes	No	Carson City is susceptible to severe weather. Previous events have caused damage to property.
Tornado	No		No significant historic events have occurred in the City.
Seiche	Yes	Yes	No recent historic events have occurred however the City does include part of Lake Tahoe. If a large earthquake occurred in the Tahoe basin a seiche may impact roads and utility lines. Information provided by NV State HM Plan.
Volcano	Yes	No	No significant historic events have occurred in the City. However there is small chance of an event occurring.
Utility Loss	Yes	No	This event has occurred and was addressed in the previous plan. The City combined radon gas, water disruption, communication loss in this assessment.
WMD / Terrorism	Yes	No	This hazard is addressed due to the significant number of state capitol building present.
Wildland Fire	Yes	No	The terrain, vegetation, and weather conditions in the region are favorable for the ignition and rapid spread of wildland fires.

Assigning Vulnerability Ratings

During a Committee meeting the members were tasked to prioritize the hazards by their total impact in the community. An exercise requiring the committee to complete a form which tabulated their ratings of each hazard was accomplished. The exercise formula took into account the historical occurrence of each respective hazard, the potential area of impact when the disaster does occur, and the magnitude. Please see Table 5-2 below for scoring criteria.

It is important to note that hazards of the same magnitude and the same frequency can occur in similar sized areas; however, the overall impact to the areas would be different because of population densities and property values in the areas impacted.

Table 5-2. Vulnerability Ratings Rubric

		Magnitude	Duration	Economic	Area Affected
Lowest	1	Insured Loss	1-3 Days	Community	Community
	2	Local	4-7 Days	City / Town	City / Town
	3	State	8-14 Days	County	County
	4	Federal Emergency	15-20 Days	State	State
Highest	5	Federal Disaster	20 + Days	Federal	Federal

		Frequency	Degree of Vulnerability	State & Community Priorities
Lowest	1	10+ years	1-5% damaged	Advisory
	2	6-9 years	6-10%	Considered further Plan
	3	1-5 years	11-25%	Prompt Action
	4	2-12 months	26-35%	Immediate Action
Highest	5	0-30 days	36-50%	Utmost immediacy

The Committee referenced the NV DEM historical records, RCI plans and HAZUS runs from Nevada Bureau of Mines and Geology (NBMG) for scientific data used for magnitude, economic and frequency scores based on historical frequencies and / or projected probabilities of the hazards identified, as well as members' knowledge of previous occurrences and technical expertise.

A value of 1-5 was given to each category (i.e. magnitude, duration etc.) by each committee member. The members' totals for each hazard were tallied. The following table provides the results of the exercise.

Table 5-3: Hazards Rating

		Total
High	Wildland Fire	253
	Earthquake	251
	Epidemic	228
	Terrorism/WMD	229
	Flood	216
	Severe Weather	200
	Hazmat	192
	Drought	186
	Utility Loss	172
	Volcano	140
	Landslide	116
	Seiche	98
Low	Avalanche	90

Upon obtaining total scores for each hazard, the team utilized the scores to analyze and prioritize the hazards to focus upon during the profiling, vulnerability assessment and mitigation planning. Table 5-4 is a summary of the hazards scoring results of both the members present at the meeting and those that supplied feedback via e-mail after the meeting. The Committee only used the scores from the present members in their priority determination, however there was no substantial change to the ratings.

The Planning Committee determined that thirteen hazards pose a threat to Carson City: avalanche, drought, earthquakes, epidemic, floods, hazardous materials events, land slide, seiche, severe weather, terrorism/WMD, utility loss, volcano, wildland fires. The Committee then discussed the results of the exercise and through Committee deliberation, earthquake, epidemic, flood, severe weather, terrorist threat, and wildfire are considered high hazards. Epidemic and terrorist threat were moved from moderate to high, during this update, due primarily to the current public awareness from the H1N1 outbreak and terrorism in the news. Drought, hazmat, utility loss and volcano were considered moderate hazards, and avalanche, land slide and seiche were considered low hazards.

The remaining hazards excluded through the screening process were considered to pose a lower threat to life and property in the City due to the low likelihood of occurrence or the low probability that life and property would be significantly affected. Should the risk from these hazards increase in the future, the HMP can be updated to incorporate a vulnerability analyses for these hazards.

5.2 HAZARD PROFILE

The requirements for hazard profile, as stipulated in the DMA 2000 and its implementing regulations, are described below.

DMA 2000 Requirements: Risk Assessment – Profiling Hazards

Profiling Hazards

Requirement §201.6(c)(2)(i): [The risk assessment **shall** include a] description of the location and extent of all natural hazards that can affect the jurisdiction. The plan **shall** include information on previous occurrences of hazard events and on the probability of future hazard events.

Element

- Does the risk assessment identify the **location** (i.e., geographic area affected) of each natural hazard addressed in the plan?
- Does the risk assessment identify the **extent** (i.e., magnitude or severity) of each hazard addressed in the plan?
- Does the plan provide information on **previous occurrences** of each hazard addressed in the plan?
- Does the plan include the **probability of future events** (i.e., chance of occurrence) for each hazard addressed in the plan?

Source: FEMA, March 2008.

The specific hazards selected by the Planning Committee for profiling have been examined in a methodical manner based on the following factors:

- Nature
- History
- Location of future events

- Extent of future events
- Probability of future events

The hazards profiled for the City and presented in Section 5.3 are in alphabetical order. The order of presentation does not signify the level of importance or risk. Committee members considered expert in the specific hazard (Flood Plain Manager for Floods) were tasked to review the previous HM Plan and make modifications to each profile. Revisions were made to update the historical information and new information was incorporated for example new FIRM maps were used in the Flood profile and a new HAZUS run was used in the Earthquake profile. Utility loss, water/waste water loss and communication loss were combined.

5.2.1 Avalanche

Planning Significance - Low

5.2.1.1 Nature

An avalanche is a mass of snow sliding down a mountainside. An avalanche occurs when gravitational pull exceeds the bonding strength of the snow cover. There are four factors that contribute to an avalanche; a steep slope, a snow cover, a weak layer in the snow cover, and a trigger. About 90 percent of all avalanches start on slopes of the 30-45 degrees; about 98 percent of all avalanches occur on slopes of 25-50 degrees. Avalanches release most often on slopes above timberline, such as gullies, roads cuts, and small openings in the trees. Avalanches can also occur on small slopes well below timberline, such as gullies, road cuts, and small openings in the trees. Very dense trees can anchor the snow to steep slopes and prevent avalanches from starting; however, avalanches can release and travel through a moderately dense forest.

The vase majority of avalanches occur during and shortly after winter storms, during the winter and spring months between January and April. The most avalanche-prone months are in order, February, March, and January. The avalanche danger increases with major snowstorms and periods of thaw. Duration of avalanche impacts is generally one to three days or less.

5.2.1.2 History

The NOAA representative, Rhett Milne, had no recorded history of avalanches for Carson City. Washoe County to the north has had two avalanches one with an injury since 2006.

5.2.1.3 Location, Extent, and Probability of Future Events

The area affected is the western section of Carson City within the higher altitudes of the Sierra Nevada Mountains and near Lake Tahoe. There are no homes within the avalanche areas however there is Nevada State Route Highway 28 and some electrical and sewer utilities along the road. The avalanche hazard would not have disaster magnitude and would be rated as an emergency incident. There is a low probability of future events based on no previous occurences.

5.2.2 Drought

Planning Significance - Moderate

5.2.2.1 Nature

Drought is a normal, recurrent feature of virtually all climatic zones, including areas of both high and low rainfall, although characteristics will vary significantly from one region to another. Erroneously, many consider it a rare and random event. It differs from normal aridity, which is a permanent feature of the climate in areas of low rainfall. Drought is the result of a natural decline in the expected precipitation over an extended period of time, typically one or more seasons in length. Other climatic characteristics, such as high temperature, high wind, and low relative humidity, impact the severity of drought conditions.

Drought can be defined using both conceptual and operational definitions. Conceptual definitions of drought are often utilized to assist in the widespread understanding of drought. Many conceptual definitions portray drought as a protracted period of deficient precipitation resulting in extensive damage to agricultural crops and the consequential economic losses. Operational definitions define the beginning, end, and degree of severity of drought. These definitions are often used to analyze drought frequency, severity, and duration for given periods of time. Such definitions often require extensive weather data on hourly, daily, monthly, or other time scales and are utilized to provide a greater understanding of drought from a regional perspective. Four common definitions for drought are provided as follows:

- Meteorological drought is defined solely on the degree of dryness, expressed as a departure of actual precipitation from an expected average or normal amount based on monthly, seasonal, or annual time scales.
- Hydrological drought is related to the effects of precipitation shortfalls on stream flows and reservoir, lake, and groundwater levels.
- Agricultural drought is defined principally in terms of soil moisture deficiencies relative to water demands of plant life, usually crops.
- Socioeconomic drought associates the supply and demand of economic goods or services with elements of meteorological, hydrologic, and agricultural drought. Socioeconomic drought occurs when the demand for water exceeds the supply as a result of weather-related supply shortfall. This may also be called a water management drought.

A drought's severity depends on numerous factors, including duration, intensity, and geographic extent as well as regional water supply demands by humans and vegetation. Due to its multi-dimensional nature, drought is difficult to define in exact terms and also poses difficulties in terms of comprehensive risk assessments.

Drought differs from other natural hazards in three ways. First, the onset and end of a drought are difficult to determine due to the slow accumulation and lingering of effects of an event after its apparent end. Second, the lack of an exact and universally accepted definition adds to the confusion of its existence and severity. Third, in contrast with other natural hazards, the impact of drought is less obvious and may be spread over a larger geographic area. These characteristics have hindered the preparation of drought contingency or mitigation plans by many governments.

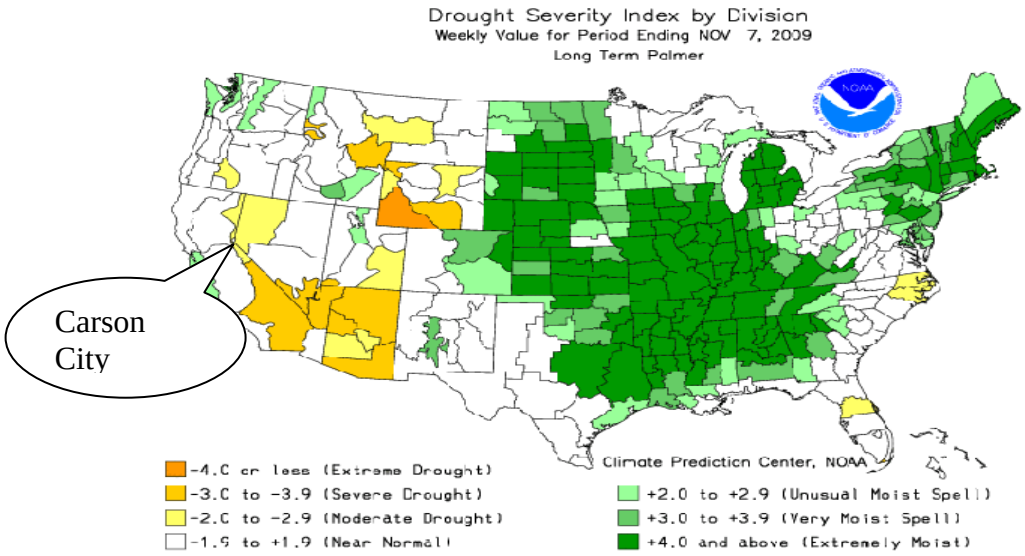
5.2.2.2 History

In 2002, 2004, and 2008 the U.S. Department of Agriculture designated all 17 counties in Nevada as drought affected. The U.S. Seasonal Drought Monitor classified the majority of Nevada as being in a D3 extreme drought intensity. Implications from this drought include increased risk of wildfires, water shortages, insect infestations, and crop damages.

5.2.2.3 Location, Extent, and Probability of Future Events

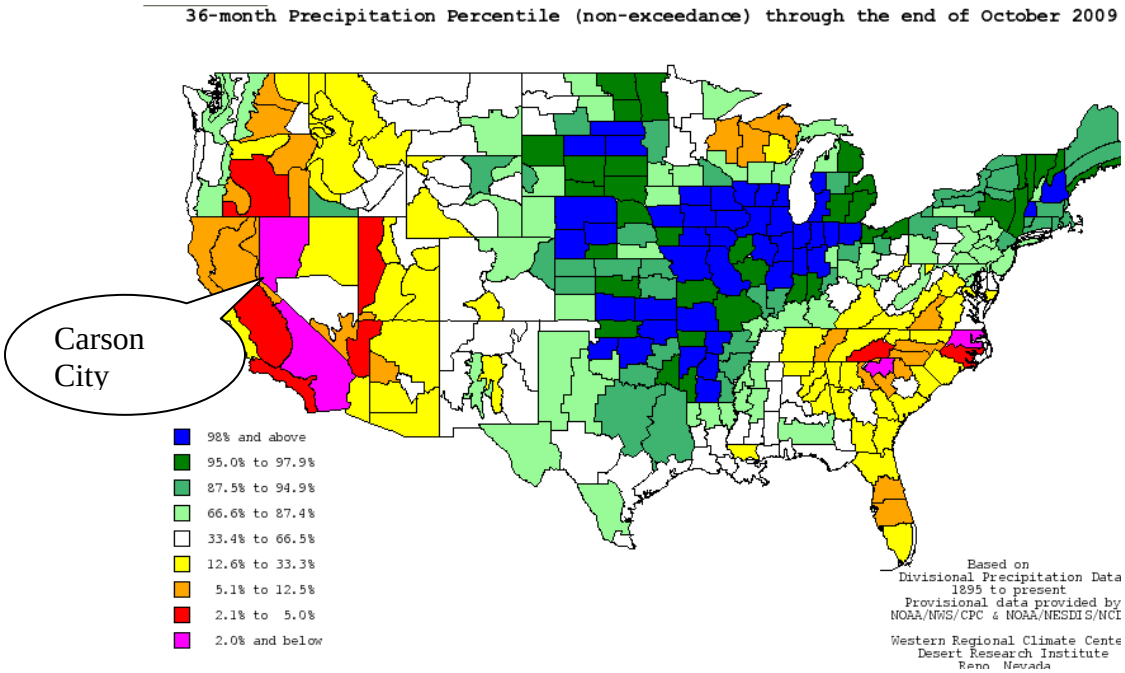
In Carson City, moderate, severe and extreme drought conditions (D-0 to D4-rated intensities on the U.S. Seasonal Drought Monitor) have persisted over the past five years. The U.S. Seasonal Drought Outlook forecasts that Nevada, including Carson City, will continue to be affected by drought. However, the longer-term forecasting by the Palmer Drought Severity Index estimates that Carson City can expect severe or extreme drought at least 10 percent of the time in the future. Please see Figures below.

Figure 5-1. Drought Severity Index



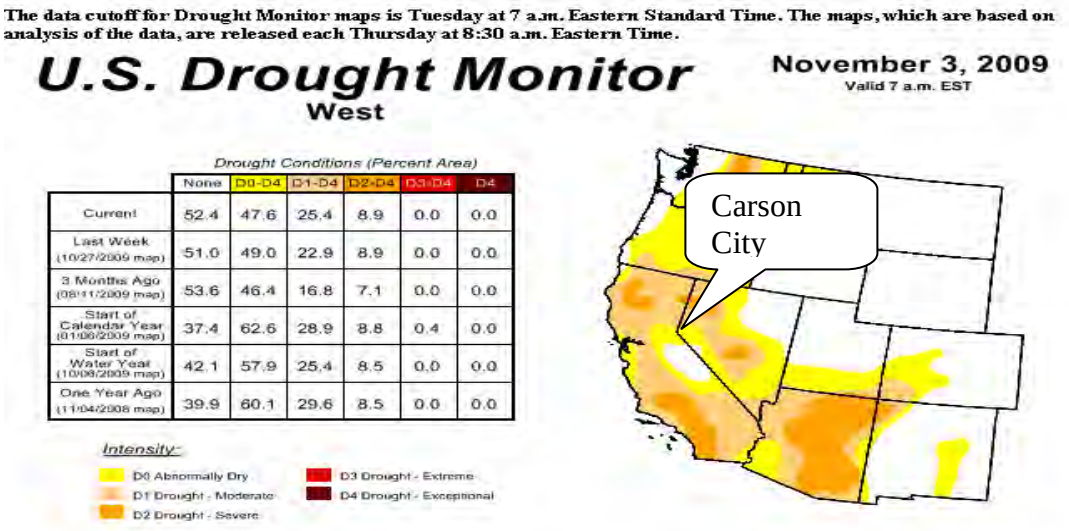
Source USGS; http://www.cpc.ncep.noaa.gov/products/analysis_monitoring/regional_monitoring/palmer.gif

Figure 5-2. 36 Monthly Precipitation



Source: NOAA; www.NOAA.gov

Figure 5-3. Drought Monitor



Source: National Drought Mitigation Center; http://www.drought.unl.edu/dm/DM_west.htm

5.2.3 Earthquake

Planning Significance - High

5.2.3.1 Nature

An earthquake is a sudden motion or trembling caused by a release of strain accumulated within or along the edge of the earth's tectonic plates. The effects of an earthquake can be felt far beyond the site of its occurrence. Earthquakes usually occur without warning and, after just a few seconds, can cause massive damage and extensive casualties. The most common effect of earthquakes is ground motion, or the vibration or shaking of the ground during an earthquake.

The severity of ground motion generally increases with the amount of energy released and decreases with distance from the fault or epicenter of the earthquake. Ground motion causes waves in the earth's interior, also known as seismic waves, and along the earth's surface, known as surface waves. There two kinds of seismic waves. P (primary) waves are longitudinal or compressional waves similar in character to sound waves that cause back-and-forth oscillation along the direction of travel (vertical motion). S (secondary) waves, also known as shear waves, are slower than P waves and cause structures to vibrate from side to side (horizontal motion). There are also two kinds of surface waves: Raleigh waves and Love waves. These waves travel more slowly and typically are significantly less damaging than seismic waves.

In addition to ground motion, several secondary hazards can occur from earthquakes, such as surface faulting. Surface faulting is the differential movement of two sides of a fault at the earth's surface. Displacement along faults, both in terms of length and width, varies but can be significant (e.g., up to 20 feet), as can the length of the surface rupture (e.g., up to 200 miles).

Surface faulting can cause severe damage to linear structures including railways, highways, pipelines, and tunnels.

Earthquake-related ground failure due to liquefaction is another secondary hazard. Liquefaction occurs when seismic waves pass through saturated granular soil, distorting its granular structure and causing some of the empty spaces between granules to collapse. Porewater pressure may also increase sufficiently to cause the soil to behave like a fluid for a brief period and cause deformations. Liquefaction causes lateral spreads (horizontal movements of commonly 10 to 15 feet, but up to 100 feet), flow failures (massive flows of soil, typically hundreds of feet, but up to 12 miles), and loss of bearing strength (soil deformations causing structures to settle or tip). Liquefaction can cause severe damage to property.

The effects of earthquake waves at the surface can be measured using the Modified Mercalli Intensity (MMI) Scale, which consists of arbitrary rankings based on observed effects, or the Richter Magnitude Scale, a mathematical basis that expresses the effects of an event in magnitude (M).

5.2.3.2 History

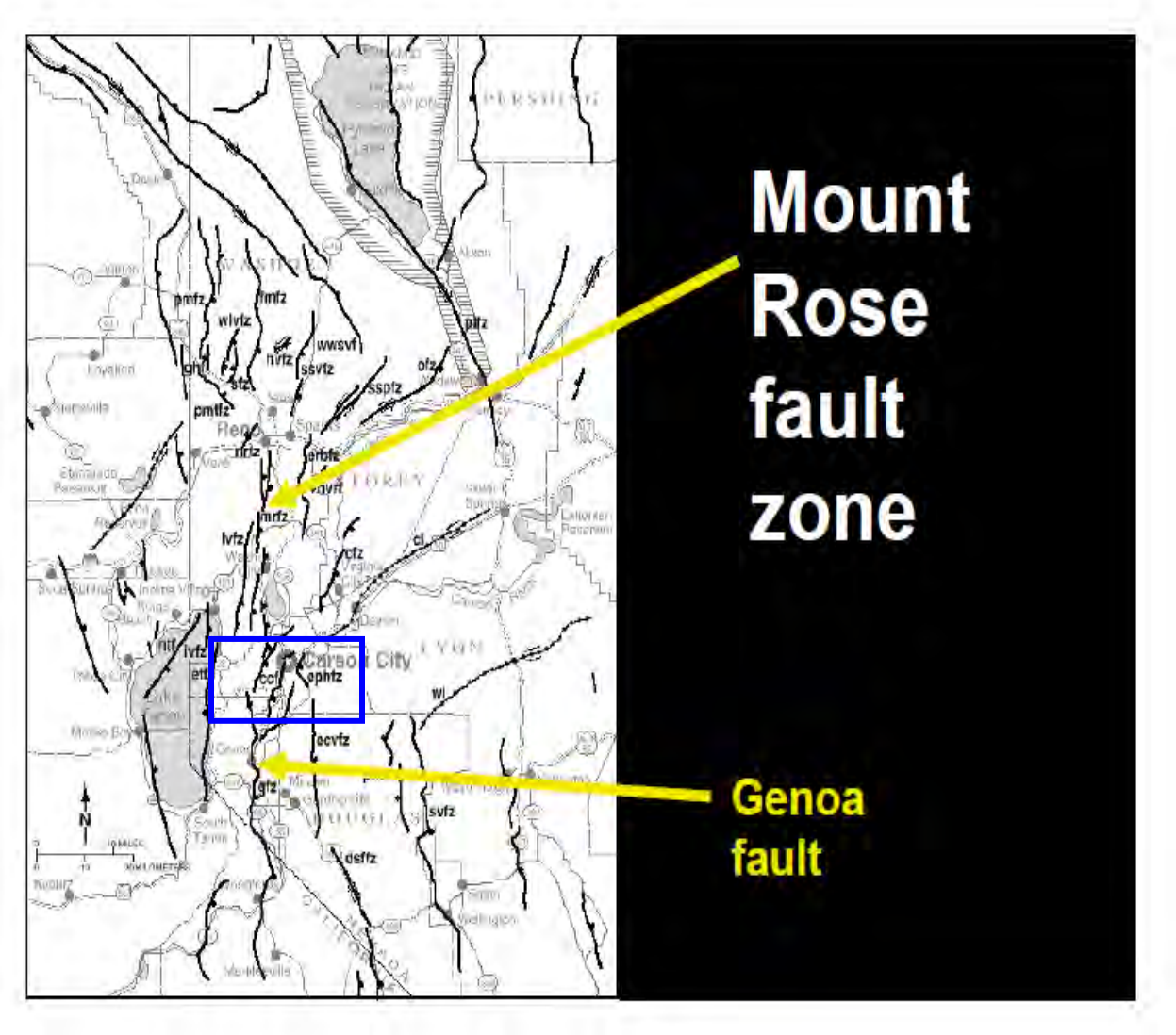
Nevada is ranked third in the states having the highest number of large earthquakes. The Sierra Nevada-Great Basin seismic belt includes earthquakes along the eastern side of the Sierra Nevada and appears to be a northern continuation of the Eastern California seismic belt. The Central Nevada seismic belt, shown on the map below, which trends north-south in the west-central part of the state, includes the largest historic earthquakes in Nevada in the 20th century. Carson City sits within both belts.

The first recorded earthquake in Carson City occurred in 1857. This earthquake was recorded as a severe 6.0 event, however because of fires in Virginia City and San Francisco most of the records have been destroyed. The best documented earthquake of the 19th century was also the largest event in Carson City's history and occurred June 3, 1887. The earthquake shook western Nevada, the Sierra Nevada, and the central Great Basin. Rock falls, landslides, and liquefaction occurred and several buildings were severely cracked and large amounts of plaster fell. There are no accounts of death or serious injury, and major concerns were limited to re-establishment of business. If the 1887 earthquake occurred today, there would be much more structural and nonstructural damage because of the exposure of risk (population and infrastructure) to these earthquakes is so much greater. Earthquakes in Carson City/Reno metropolitan area continue to be highly active.

5.2.3.3 Location, Extent, and Probability of Future Events

The location of damage from an earthquake would impact all of Carson City. The figure below provides a map of the major faults in Carson City. The map in Appendix B, Figure B-9 shows greater detail of the fault lines in Caron City.

Figure 5-4. Major Faults Carson City



Source: Bureau of Mines & Geology, UNR; http://www.nbmg.unr.edu/nhmpc/earthquakesinnevada.pdf

The Nevada Earthquake Safety Council, in part through the services of the Nevada Bureau of Mines and Geology (NGMG) and the Nevada Seismological laboratory, provides assistance of Earthquake risk assessment and earthquake mitigation activities for the State of Nevada. The Hazard Mitigation Steering Committee will utilize the Nevada Earthquake Risk Mitigation Plan (NERMP) for consideration in identifying Carson City Policy and mitigation Strategies.

The Executive Summary of the NERMP states that Nevada is earthquake country, ranking third in the nation in the number of major earthquakes. Since the 1850s, 62 earthquakes have occurred in Nevada that have had potentially destructive magnitudes of 5.5 (Richter Scale) or greater. Nevada is a national leader in population growth, and the risk of harm and loss from earthquakes increases proportionally with population and development. We can expect earthquakes to

continue to occur in Nevada and some of these will strike our growing urban centers and communities.

"The occurrence rates of major historical earthquakes in western Nevada produced 1 ½ to 7 times higher probabilities of having a major earthquake than estimates based on instrumental seismicity and geological data sets." NBMG Open-File Report 03-3, Nevada Bureau of Mines and Geology, 2003. The extent & probability for the entire Carson City is shown on Figure 5-4 was provided by the Nevada Bureau of Mines & Geology and is the probability of earthquakes of various magnitudes occurring within 50 years within 50 kilometers.

Table 5-5. Earthquake Probability

County	% of Probability of magnitude greater than					Rank by Probability
	5.0	5.5	6.0	6.5	7.0	
Carson City	>90	~80	70	50-55	12-15	2nd highest in the state of NV

Source: Bureau of Mines & Geology, UNR, Estimated Losses from Earthquakes Near NV Communities, 2009

5.2.4 EPIDEMIC

Planning Significance - High

5.2.4.1 Nature

A disease is a pathological (unhealthy or ill) condition of a living organism or part of the organism that is characterized by an identifiable group of symptoms or signs. Disease can affect any living organism, including people, animals, and plants. Disease can both directly (via infection) and indirectly (via secondary impacts) harm these living things. Some infections can cause disease in both people and animals. The major concern here is an epidemic, a disease that affects an unexpected number of people or sentinel animals at one time. (Note: an epidemic can result from even one case of illness if that illness is unheard of in the affected population, i.e., smallpox)

Of great concern for human health are infectious diseases caused by the entry and growth of microorganisms in man. Most, but not all, infectious diseases are communicable. They can be spread by coming into direct contact with someone infected with the disease, someone in a carrier state who is not sick at the time, or another living organism that carries the pathogen. Disease-producing organisms can also be spread by indirect contact with something a contagious person or other carrier has touched and contaminated, like a tissue or doorknob, or another medium (e.g., water, air, food).

According to the Centers for Disease Control and Prevention (CDC), during the first half of the twentieth century, optimism grew as steady progress was made against infectious diseases in humans via improved water quality and sanitation, antibiotics, and inoculations (October 1998). The incidences and severity of infectious diseases such as tuberculosis, typhoid fever, smallpox, polio, whooping cough, and diphtheria were all significantly reduced during this period. This optimism proved premature, however, for a variety of reasons, including the following: antibiotics began to lose their effectiveness against infectious disease (e.g., Staphylococcus

aureus); new strains of influenza emerged in China and spread rapidly around the globe; sexually transmitted diseases resurged; new diseases were identified in the U.S. and elsewhere (e.g., Legionnaires's disease, Lyme disease, toxic shock syndrome, and Ebola hemorrhagic fever); acquired immunodeficiency syndrome (AIDS) appeared; and tuberculosis (including multidrug-resistant strains) reemerged (CDC, October 1998).

In a 1992 report titled *Emerging Infections: Microbial Threats to Health in the United States*, the Institute of Medicine (IOM) identified the growing links between U.S. and international health, and concluded that emerging infections are a major and growing threat to U.S. health. An emerging infectious disease is one that has newly appeared in a population or that has been known for some time, but is rapidly increasing in incidence or geographical range. Emerging infectious diseases are a product of modern demographic and environmental conditions, such as global travel, globalization and centralized processing of the food supply, population growth and increased urbanization.

In response to the threat of emerging infectious diseases, the CDC launched a national effort to protect the US public in a plan titled *Addressing Emerging Infectious Disease Threats*. Based on the CDC's plan, major improvements to the US health system have been implemented, including improvements in surveillance, applied research, public health infrastructure, and prevention of emerging infectious diseases (CDC, October 1998).

Despite these improvements, infectious diseases are the leading cause of death in humans worldwide and the third leading cause of death in humans in the U.S. (American Society for Microbiology, June 21, 1999). A recent follow-up report from the Institute of Medicine, titled *Microbial Threats to Health: Emergence, Detection, and Response*, notes that the impact of infectious diseases on the U.S. has only grown in the last ten years and that public health and medical communities remain inadequately prepared. Further improvements are necessary to prevent, detect, and control emerging, as well as resurging, microbial threats to health. The dangers posed by infectious diseases are compounded by other important trends: the continuing increase in antimicrobial resistance; the diminished capacity of the U.S. to recognize and respond to microbial threats; and the intentional use of biological agents to do harm (Institute of Medicine, 2003).

The CDC has established a national list of over 50 nationally reportable diseases. A reportable disease is one that, by law, must be reported by health providers to report to federal, state or local public health officials. Reportable diseases are those of public interest by reason of their communicability, severity, or frequency. The long list includes such diseases as the following: AIDS; anthrax; botulism; cholera; diphtheria; encephalitis; gonorrhea; Hantavirus pulmonary syndrome; hepatitis (A, B, C); HIV (pediatric); Legionellosis; Lyme disease; malaria; measles; mumps; plague; polio (paralytic); rabies (animal and human); Rocky Mountain spotted fever; rubella (also congenital); Salmonellosis; SARS; Streptococcal disease (Group A); Streptococcal toxic-shock syndrome; *Streptococcus pneumoniae* (drug resistant); syphilis (also congenital); tetanus; Toxic-shock syndrome; Trichinosis, tuberculosis, Typhoid fever; and Yellow fever (Centers for Disease Control and Prevention, May 2, 2003).

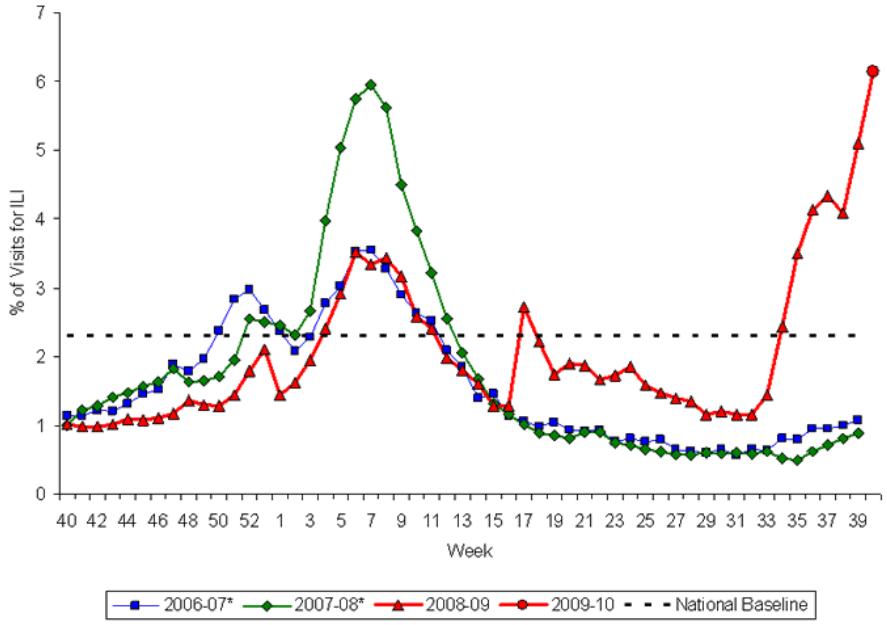
Many other hazards, such as floods, earthquakes or droughts, may create conditions that significantly increase the frequency and severity of diseases. These hazards can affect basic services (e.g., water supply and quality, wastewater disposal, electricity), the availability and quality of food, and the public and agricultural health system capacities. As a result, concentrated areas of diseases may result and, if not mitigated right away, increase, potentially leading to large losses of life and damage to the economic value of the area's goods and services.

5.2.4.2 History

The influenza pandemic of 1918 and 1919, known as the Spanish Flu, had the highest mortality rate in recent history for an infectious disease. More than 20 million persons were killed worldwide, some 500,000 of which were in the U.S. alone (Centers for Disease Control and Prevention, October 1998). More recent incidences of major infectious diseases affecting people in the U.S. include the following:

- **H1N1,** an influenza strain that was first recognized in Mexico and entered the US in Southern California in April 2009. H1N1 was recognized as a world wide pandemic by the World Health Organization in May 2009. The CDC graph below illustrates the number of office visits due to the flu and demonstrates how easily the US medical system can be overwhelmed by a pandemic.

Figure 5-6. Percentage of Visits for Influenza-like Illness (ILI)



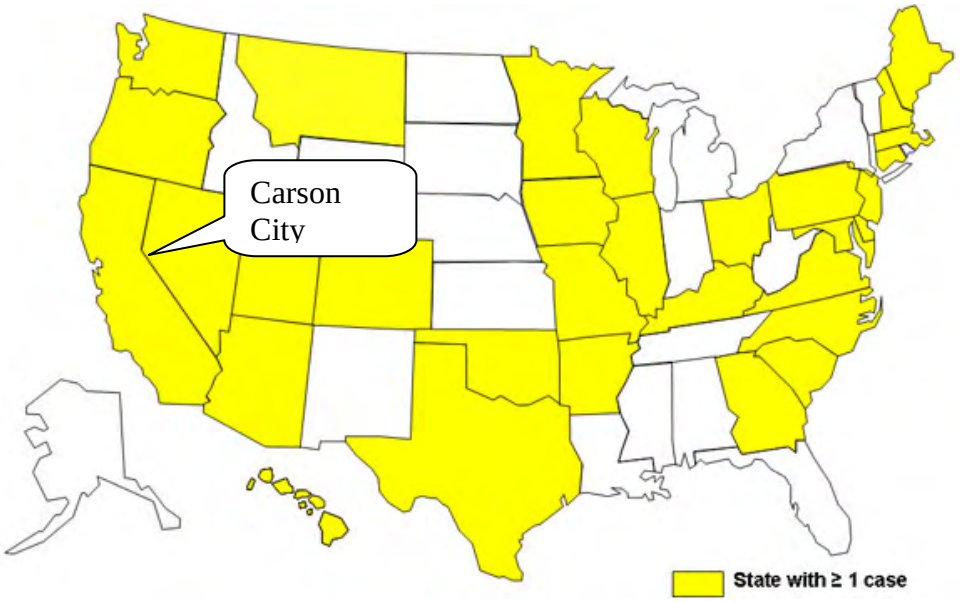
*There was no week 53 during the 2006-07 or 2007-08 influenza seasons, therefore the week 53 data point for those seasons is an average of weeks 52 and 1.

Source: U.S. Outpatient Influenza-like Illness Surveillance Network (ILINet), National Summary 2008-2009 and Previous Two Seasons (Posted October 16, 2009, 7:30 PM ET, for Week Ending October 10, 2009)

H1N1 varies from other influenzas in that it doesn't seem to affect populations born after 1950 due to that group's immunity to a similar strain. The CDC has taken an aggressive approach to this highly contagious strain and is in the process of inoculating the US public through vaccinations. Although H1N1 has a less than 1% mortality rate due to the high contagion rate this could lead to a significantly higher than normal number of deaths for the 2009-2010 flu season. (Centers for Disease Control and Prevention, October 2009)

- **West Nile Virus (WNV)**, a seasonal infection transmitted by mosquitoes, caused an epidemic which grew from an initial U.S. outbreak of 62 disease cases in 1999 to 4,156 reported cases, including 284 deaths, in 2002. However due to communities' aggressive approach to mosquito control the number of cases dropped to 1356 with 44 deaths in 2008 (Centers for Disease Control and Prevention, October 2009).
- **Severe acute respiratory syndrome (SARS)**, which is estimated to have killed 774 and infected 8,098 worldwide. In the U.S., there were 175 suspect cases and 8 confirmed cases all who traveled to other parts of the world, although no reported deaths (Centers for Disease Control and Prevention, October 2009).
- **Norovirus** - CDC estimates that 23 million cases of acute gastroenteritis are due to norovirus infection, and it is now thought that at least 50% of all food borne outbreaks of gastroenteritis can be attributed to noroviruses (Centers for Disease Control and Prevention, October 2009).
- **Escherichia coli (abbreviated as *E. coli*)** are a large and diverse group of bacteria. Although most strains of *E. coli* are harmless, others can make you sick. Some kinds of *E. coli* can cause diarrhea, while others cause urinary tract infections, respiratory illness and pneumonia, and other illnesses. Experts think that there may be about 70,000 infections with *E. coli* O157 each year in the United States. (Centers for Disease Control and Prevention, October 2009).

Figure 5-7. States Where Persons Infected with the Outbreak Strain of E. coli O157:H7, Live United States, by State March 1, 2009 to June 22, 2009



Source: Centers for Disease Control; http://www.cdc.gov/ecoli/

Table 5-6. Historic Occurrences of Epidemics Registered in Nevada

Date	Details
February 1992	Cholera outbreak confirmed. At least 26 passengers from Aerolineas Argentinas Flight 386 that brought a cholera outbreak to Los Angeles traveled on to Las Vegas, where 10 showed symptoms of the disease. Cholera or cholera-like symptoms developed in 67 passengers of Flight 386.
Spring 2000	Five cases of the measles confirmed. Outbreak identified and confirmed, Clark County Health District (CCHD) Office of Epidemiology (OOE) worked with the Immunization Clinic and the media to alert the community about the prevention of the spread of the disease.
October 2004	Norovirus confirmed at a major public accommodation facility on the Strip. Details regarding the spread of this disease and the exact number affected are still under investigation and pending at time of print of this plan.
April 2009	H1N1 virus confirmed by the WHO as a worldwide epidemic. The CDC is currently working on vaccinating the public for the 2009-2010 flu season.

5.2.4.3 Extent and Probability of Future Events

The probability and magnitude of disease occurrence, particularly an epidemic, is difficult to evaluate due to the wide variation in disease characteristics, such as rate of spread, morbidity and mortality, detection and response time, and the availability of vaccines and other forms of prevention. A review of the historical record (see above) indicates that disease related disasters do occur in humans with some regularity and varying degrees of severity. There is growing concern, however, about emerging infectious diseases as well as the possibility of a bioterrorism attack.

Epidemics constitute a significant risk to the population of Nevada, particularly as it relates to the frequency in which the Carson City population travels and the proximity of Las Vegas and Reno's tourist population. Of highest concern is in the Reno area, in various entertainment venues, and Reno/Tahoe International Airport. The transient nature of the Washoe County population, coupled with dense population gatherings increase the potential for an epidemic as well as for its spread into neighboring counties such as Carson City.

5.2.4.4 Location

An epidemic in Carson City would affect a regional response requiring coordination among Carson Tahoe Regional Medical Center, City, neighboring counties, state and federal agencies. Segments of the population at highest risk for contracting an illness from a foreign pathogen are the very young, the elderly, or individuals who currently experience respiratory or immune deficiencies. These segments of the population are present within Carson City.

5.2.4.5 Warning Time

Due to the wide variation in disease characteristics, the warning time for a disease disaster can vary from no time to months, depending upon the nature of the disease. No warning time may be available due to an extremely contagious disease with a short incubation period, particularly if

combined with a terrorist attack in a crowded environment. However, there are agencies in place that have capabilities to prevent, detect, and respond to these types of diseases, such as Carson City Health and Human Services (CCHHS), the Centers for Disease Control (CDC), and the Nevada State Health Division (NSHD). This provides a positive, balancing influence to the overall outcome of a disease disaster event.

The CCHHS conducts surveillance of communicable disease occurrences in the municipality of Carson City. They also implement control measures and develop reports as mandated by Nevada Revised Statutes (NRS), as well as receive and investigate complaints from the public regarding possible food borne illness.

5.2.5 Floods

Planning Significance - High

5.2.5.1 Nature

Flooding 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 from:

- Overflow of inland or tidal waters;
- Unusual and rapid accumulation or runoff of surface waters from any source;
- Mudflow, (a river of liquid and flowing mud on the surfaces of normally dry land areas, as when earth is carried by a current of water, or
- Collapse or subsidence of land along the shore of a lake or similar body of water as a result of erosion or undermining caused by waves or currents of water exceeding anticipated cyclical levels that result in a flood as defined above.

Floodplains are lowlands adjacent to water bodies that are subject to recurring floods. Floods are natural events that are considered hazards only when people and property are affected.

Nationwide, floods result in more deaths than any other natural hazard. Physical damage from floods includes the following:

- Inundation of structures, causing water damage to structural elements and contents.
- Erosion or scouring of stream banks, roadway embankments, foundations, footings for bridge piers, and other features.
- Impact damage to structures, roads, bridges, culverts, and other features from high-velocity flow and from debris carried by floodwaters. Such debris may also accumulate on bridge piers and in culverts, increasing loads on these features or causing overtopping or backwater effects.
- Destruction of crops, erosion of topsoil, and deposition of debris and sediment on croplands.
- Release of sewage and hazardous or toxic materials as wastewater treatment plants are inundated, storage tanks are damaged, and pipelines are severed.

Floods also cause economic losses through closure of businesses and government facilities; disrupt communications; disrupt the provision of utilities such as water and sewer service; result in excessive expenditures for emergency response; and generally disrupt the normal function of a community.

In Carson City, flooding is most commonly associated with unusually heavy rainfall in The State of Nevada and can be influenced by both frontal systems out of the Northern Pacific Ocean and tropical storms coming from the South. Due to the aridity of the City, the area is dry except during and shortly after these storms. When a major storm develops, water collects rapidly in a short period of time. As a consequence, flows are of the flash-flood type. Flash floods are generally understood to involve a rapid rise in water level, high velocity, and large amounts of debris, which can lead to significant damage that includes the uprooting of trees, undermining of buildings and bridges, and scouring of new channels. The intensity of flash flooding is a function of the intensity and duration of rainfall, steepness of the watershed, stream gradients, watershed vegetation, natural and artificial flood storage areas, and configuration of the streambed and floodplain.

In areas where alluvial fans are present, the flow paths of flash floods lack definition. Flow depths with alluvial fan flooding are generally shallow with damage resulting from inundation, variable flow paths, localized scour, and the deposition of debris.

5.2.5.2 History

The storm water problems of Carson City are different than those in many other communities. The core of the urban area is directly below several canyons that drain into the Carson Range. They are prone to flooding and flow of sediment and debris. However, there is no large river in Carson City that poses the risk of massive, life threatening flooding of the scale that exists in other parts of the country. Even though the flooding problems in Carson City are relatively localized, many homes and businesses are directly impacted and people's lives are disrupted by storm water. By creating saturated soil conditions, storm water also contributes to some other pressing problems in the urban area. Water quality impacts directly resulting from storm water run-off are not generally recognized, but there is a general public concern regarding the association of storm water and waste water problems based on health considerations. (Carson City Stormwater Management Utility Final Funding Report; Water Resources Inc. 12/14/2002)

Table 5-7. Historical Flash Floods in the Carson River Drainage

Date	Location	Description
July 25, 1875	Ash and Kings Canyon Creeks; Carson City	Torrential rains on the logged-off Carson range sent flash flooding into Carson City on Ash and Kings Canyon Creeks, and into Carson City. Ranches below the mouths of these Creeks suffered extensive damage through erosion and deposition on their croplands. On Kings Canyon, the toll road (predecessor to U.S. 50) and bridge were washed away, the tollgate keeper and his family were rescued. In Carson City, streets and basements were flooded, and gardens were washed away.
July 13-17, 1911	Daggett Pass to Carson Valley (Kingsbury Grade-Haines Canyon);	A wall of water rolled down Haines Canyon on the afternoon of July 15, and took out everything in its path. A large portion of the lower section of Kingsbury Grade road was destroyed. The Kingsbury Grade toll-house, built in 1959 was also destroyed. Luckily, no automobiles were on the road at the time.

Table 5-7. Historical Flash Floods in the Carson River Drainage

Date	Location	Description
	Kings Canyon Road (Clear Creek); Dayton-El Dorado Canyon-Churchill Canyon (northeast slopes of the Como Range); Canyons on the East Side of the Virginia and Flowery Ranges.	The Kings Canyon Road to Spooner Summit (predecessor to U.S. 50) was also severely damaged along its higher reaches in this storm by Clear Creek, and was closed for 11 days. Severe flash flooding also occurred on July 15th on the Dayton, El Dorado and Churchill Canyons out of the north and east slopes of the Como Range east of Carson City. On July 17th, flash flooding occurred on most of the canyons draining the east side of the Virginia and Flowery Range (east of Virginia City) and also on the west slopes of the Como Range. Some ranches in the area sustained severe agricultural and irrigation structure damage.
July 18-27, 1913	Carson and Eagle Valley (Carson City)	Ten daily thunderstorms, with the worst being on the 21st, 22nd, 23rd and 27th were probably the longest-lasting, most widespread and destructive in recorded history. Flash flooding was occurring simultaneously from Lassen County south to the Walker River drainage in Mono County and eastward to Lovelock in Pershing County. In the Carson Drainage, flash floods washed out Kings Canyon Road to Spooner Summit (predecessor to U.S. 50), caused extensive flash flood damage, especially to roads, throughout the Carson and Eagle Valleys. The heavy rain caused the Carson River to rise out of its banks in a few locations near Carson City, causing severe agricultural damage. The Cradlebaugh Road connecting Carson City and Gardnerville was severely damaged, and was closed for two days. Likewise, the main road from Carson City to Reno was impassable through Pleasant Valley. Virginia City sustained major flash flooding on the 22nd, with many basements and ground floors flooded.
July 11, 1927	Kings Canyon Creek, Carson City	The same storm which caused the Grass Lake Dam on Browns Canyon Creek to fail further north (see Truckee River Flash Flood section) caused flash flooding on Kings Canyon Creek, and sent mud and debris into parts of Carson City.
July 31, 1949	Cottonwood and Hennington Sloughs-Gardnerville	Heavy rain in Alpine County caused flash flooding on tributaries of the upper East Fork of the Carson River. Cottonwood and Hennington Sloughs south of Gardnerville received most of the flow, and consequently caused damage to irrigation structures in the area. However, the storms only caused a very slight rise on the East Fork of the Carson near Gardnerville, with the flow rising from 95 to 237 cfs.
August 16, 1958	Carson City	Thunderstorms over Eagle Valley and surrounding mountains dumped over an inch of rain in less than an hour, causing a flash flood off "C" Hill southwest of Carson City, which had just been burned. Residences along Circle Drive and Sharrow Way had a flow of sediment 3 to 4 inches deep through their yards.
July 29, 1960	Kings Canyon Creek	There were flash-flood producing thunderstorms across much of western Nevada this afternoon, affecting the Truckee, Carson, and Walker Basins. Thunderstorms over the Carson Range caused an extensive mudflow (as well as boulders and pine trees), out of Kings Canyon Creek. The channel of the creek was scoured down to bedrock due to the large amount of debris the creek carried. Ranch land was covered with debris, and a few homes suffered flood

Table 5-7. Historical Flash Floods in the Carson River Drainage

Date	Location	Description
		damage. Two trailers were carried as far as 600 feet by the mudflow. The flow was estimated at about 200 cfs on Kings Canyon Creek.
Aug. 5, 1971	Genoa	Thunderstorms caused a flash flood which sent a four foot wall of water down School Canyon (just north of Genoa Canyon). Flash flooding occurred from Kingsbury Grade north to Jacks Valley.
Aug. 6, 1974	Silver Springs	Thunderstorms caused flash flooding and mudslides that closed highways, cut power for many hours, and closed highways in the area for over 24 hours.
June 14, 1984	Dayton	Isolated heavy thunderstorms caused flash flooding which closed Highway 50 on the afternoon of the 14th.
July 14, 1992	Johnson Lane Area	Heavy rainfall from a thunderstorm in the Pine Nut Mountains east of Carson City and Minden caused Johnson Lane Wash to flood very quickly, with a few homes receiving minor damage. Less than $5000 damage.
July 22, 1994	Johnson Lane Area	Very heavy rainfall from a thunderstorm in the Pine Nut Mountains east of Carson City and Minden caused Johnson Lane Wash to flood very quickly, with up to three feet of water damaging many homes, and numerous backyards and garages. A number of homes had to be evacuated, and there was severe damage to roads and some damage to underground utilities in the area. Many local roads were closed for hours. Damage was estimated at over $500,000.
March 10, 1995	Storey County, Carson City, Douglas County (Johnson Lane), Lyon County	Six Mile Canyon, between Virginia City and U.S. Highway 50 was closed due to flash flooding caused by very heavy rainfall (about 0.2 to 0.5 in. per hour in the afternoon and evening hours, with moderate rainfall from 10am to 10pm, with 12 hour totals of from 1 to 3.5 inches). In Carson City, flash flooding caused water over three feet deep in many parts of the city, stranding people in their cars all over the City. Over $2 million in damage due to small stream flooding occurred in Douglas County, where 4 homes and 8 businesses were damaged in Genoa. In northern Douglas County, the Johnson Lane area again sustained major flood damage...over $300,000 in damages to homes, drainage structures and roads. Heavy rain in the northern Pine Nut Mountains caused the Hughes Gavel Pit near Dayton to flood, causing about $300,000 damage to the pit and mining equipment. Also, a subdivision about 5 miles northeast of Dayton flooded, causing about $60,000 damage.
June 26, 1995	Carson City and Douglas County	Strong thunderstorms dropped heavy rain across western NV, causing flash flooding in Carson City and Douglas County. Rainfall rates of from 1 to 2 inches per hour were reported by spotters in these areas. About a dozen homes were damaged, as basements, garages and yards were flooded, and many roads were inaccessible. U.S. 395 through Gardnerville was closed for many hours.
Dec. 12, 1995	Carson City, Gardnerville, Dayton	Many roads closed and some businesses flooded due very heavy rainfall.
Feb. 4, 1996	Dayton, Fernley, Stagecoach, Silver Springs	Several homes and trailers flooded or needed to be sandbagged. Extensive damage to one of Nevada's oldest cemeteries in Dayton.
June 26, 1996	Fallon	A strong, cold low pressure system brought strong thunderstorms to the eastern Sierra. Up to 0.5 inch of rain fell in less than 30 minutes in the Fallon area with resultant widespread urban flooding.
July 29, 1996	Silver Springs	A flash flood caused serious damage to the Silver Stage Middle School in Silver Springs.

Table 5-7. Historical Flash Floods in the Carson River Drainage

Date	Location	Description
Aug. 13, 1996	Gardnerville	Up to 2 inches of rain in 20 minutes (3 inches in less than an hour) caused extensive street flooding, flooding of several homes, duplexes and businesses which necessitated evacuation. The heavy rain also caused a mudslide. The flooding was mostly due to plugged storm drains; the slide blocked U.S. 395. A convalescent home was sandbagged as over a foot of water collected near the front door, but the facility was not evacuated.
Jan. 1-3, 1997	Carson Basin	Extremely heavy rainfall, combined with snow levels above 10,000 feet and complete melt-off of a heavy low-elevation snow pack cause moderate to severe flash flooding and small stream flooding on streams coming out of the mountains throughout the Carson Basin, especially above Carson City, throughout this period. Damages are too numerous to mention here, but amounted to millions of dollars, separate from losses due to mainstream river flooding.
	Carson City	Rain-swollen Ash Canyon, Kings Canyon and Vicee Canyon Creeks caused extensive flood damage to homes, businesses and roads in downtown Carson City.
July 23, 1998	14 Miles N of Fallon (Upsal Hogback)	Just north of Upsal Hogback, about 14 miles north of Fallon, about 60 4th grade children were camped with their teachers on a dry lake bed on a "desert survival" overnight camping trip. Their camp was flooded to a depth of 4 to 6 inches at about 10pm from an extremely heavy downpour. There were no injuries, but children and teachers were forced to carry all their soaked camping gear back to their buses over 2 miles away in complete darkness in the middle of the night.
December 31, 2005 January 1, 2006 New Year's Flood	Carson City	In Carson City, King Street was completely closed due to the flooding. Portions of Stewart, Mountain, and Curry Streets were also closed. Flooding occurred on US Hwy 395 near Carson Mall. 2 Business & 12 houses were flooded. At the Waterfall Fire burn area west of Carson City, the heavy rain caused damage to trees & vegetation on the mountainside, along with rockslides & mudslides. FEMA 1629, New Years Flood

5.2.5.3 Location, Extent, and Probability of Future Events

Flooding, whether localized or basin-wide, is a common phenomenon in the Carson River Basin and occurs with some regularity over the historic period of record. There is no reason to assume this will change now or in the future. Earlier snowmelt or less overall snow accumulation (in favor of more rain at higher elevations) may occur in response to climate change. Additionally the effects of the Waterfall Fire in July 2004 have an impact on the watershed from the Sierras (see Section 5.2.11 Utility Loss for a more detail). However, both localized and regional-scale flooding will continue to be of concern to communities living on or near flood-prone areas. From the USGS website http://nevada.usgs.gov/crfld/floodhistory.cfm#

Floods are described in terms of their extent (including the horizontal area affected and the vertical depth of floodwaters) and the related probability of occurrence. Flood studies often use historical records, such as stream flow gages, to determine the probability of occurrence for floods of different magnitudes. The probability of occurrence is expressed as a percentage for the chance of a flood of a specific extent occurring in any given year.

Factors contributing to the frequency and severity of flooding include the following:

- Rainfall intensity and duration
- Antecedent moisture conditions
- Watershed conditions, including steepness of terrain, soil types, amount and type of vegetation, and density of development
- The existence of attenuating features in the watershed, including natural features such as swamps and lakes and human-built features such as dams
- The existence of flood control features, such as levees and flood control channels
- Velocity of flow
- Availability of sediment for transport, and the erodibility of the bed and banks of the watercourse

These factors are evaluated using (1) a hydrologic analysis to determine the probability that a discharge of a certain size will occur, and (2) a hydraulic analysis to determine the characteristics and depth of the flood that results from that discharge.

The magnitude of flood used as the standard for floodplain management in the United States is a flood having a 1 percent probability of occurrence in any given year. This flood is also known as the 100-year flood or base flood. The most readily available source of information regarding the 100-year flood is the system of Flood Insurance Rate Maps (FIRMs) prepared by FEMA. These maps are used to support the National Flood Insurance Program (NFIP). The FIRMs show 100-year floodplain boundaries for identified flood hazards. These areas are also referred to as Special Flood Hazard Areas (SFHAs) and are the basis for flood insurance and floodplain management requirements. The FIRMs also show floodplain boundaries for the 500-year flood, which is the flood having a 0.2 percent chance of occurrence in any given year. FEMA has prepared a FIRM for Carson City, dated 2009 and this was used by the Carson City Flood Plain Manager to create the flood map, see Appendix B, Figure B-8 which uses the 100-year flood as a basis and provides the areas susceptible to flood.

5.2.6 Hazardous Materials Events

Planning Significance - High

5.2.6.1 Nature

Hazardous materials may include hundreds of substances that pose a significant risk to humans. These substances may be highly toxic, reactive, corrosive, flammable, radioactive, or infectious. Hazard materials are regulated by numerous Federal, State, and local agencies including the U.S. Environmental Protection Agency (EPA), U.S. Department of Transportation (DOT), National Fire Protection Association, FEMA, U.S. Army, and International Maritime Organization.

Hazardous material releases may occur from any of the following:

- Fixed site facilities (such as refineries, chemical plants, storage facilities, manufacturing, warehouses, wastewater treatment plants, swimming pools, dry cleaners, automotive sales/repair, and gas stations)

- Highway and rail transportation (such as tanker trucks, chemical trucks, and railroad tankers)
- Air transportation (such as cargo packages)
- Pipeline transportation (liquid petroleum, natural gas, and other chemicals)

Unless exempted, facilities that use, manufacture, or store hazardous materials in the United States fall under the regulatory requirements of the Emergency Planning and Community Right to Know Act (EPCRA) of 1986, enacted as Title III of the Federal Superfund Amendments and Reauthorization Act (42 USC 11001–11050; 1988). Under EPCRA regulations, hazardous materials that pose the greatest risk for causing catastrophic emergencies are identified as Extremely Hazardous Substances (EHSs). These chemicals are identified by the EPA in the *List of Lists – Consolidated List of Chemicals Subject to the Emergency Planning and Community Right-to-Know Act (EPCRA) and Section 112 of the Clean Air Act*. Releases of EHSs can occur during transport to and from fixed site facilities. Transportation-related releases are generally more troublesome because they may occur anywhere, including close to human populations, critical facilities, or sensitive environmental areas. Transportation-related EHS releases are also more difficult to mitigate due to the variability of locations and distance from response resources.

In addition to accidental human-caused hazardous material events, natural hazards may cause the release of hazardous materials and complicate response activities. The impact of earthquakes on fixed facilities may be particularly serious due to the impairment or failure of the physical integrity of containment facilities. The threat of any hazardous material event may be magnified due to restricted access, reduced fire suppression and spill containment, and even complete cut-off of response personnel and equipment. In addition, the risk of terrorism involving hazardous materials is considered a major threat due to the location of hazardous material facilities and transport routes throughout communities and the frequently limited antiterrorism security at these facilities.

On behalf of several Federal agencies including the EPA and the DOT, the National Response Center (NRC) serves as the point of contact for reporting oil, chemical, radiological, biological, and etiological discharges into the environment within the United States.

5.2.6.2 History

The NRC Web-based query system of non-Privacy Act data shows that since 1999, ten oil and chemical spills have occurred within the Carson City. In addition to oil and chemical spills, the EPA has recorded 3 airborne hazardous material releases.

Table 5-8. Hazardous Material Release in Carson City

Location	Date	Substance	Description
2727 Lockheed Way	5/5/1999	Sulfuric Acid	One 30 gal. drum. Drum was punctured by a forklift causing a spill.
NV 798 @ Marker 17	1/8/2002	Arsenic Tri sulfide	A pile of rocks found in parking area. Material may be ore that contained 2.6lbs of arsenic tri sulfide
Washoe Tribe Snider & Clear Cr. Rd	3/31/2002	Sewage	Old sewer line next to creek has leaked.
S. Lake Tahoe	11/13/2002	Oil/Diesel	Pleasure craft sank.
Entire W. Side Carson	7/14/2004	Other	Potential release from auto body shop and fertilizer store.

Table 5-8. Hazardous Material Release in Carson City

Location	Date	Substance	Description
Timberline Subdivision	7/16/2004	Natural Gas	Wildland fire destroyed 8 homes. Gas main shut off.
Ash Canyon Water Storage Tank	11/17/2004	Diesel	Diesel release from a temp. storage tank due to tank tipped over.
1111 N. Saliman Rd.	9/14/2005	Mercury	Mercury release from portable blood pressure machine break.
3915 Fairview	4/17/2007	Chromic Acid Flakes	Acid flakes were accidently mixed in with caustic based sludge creating vapors making one employee sick. Bldg evacuated. Road closed.
Carson High School	2/6/2009	Mercury	Release of mercury from unknown source. School evacuated.
3301 E. 5th St.	6/18/2008	Mercury	Release of mercury due to broken thermometer near drain.
1600 Airport Rd	8/9/2009	Mercury	Release of mercury from unknown source. A 20 unit apartment building evacuated. Three month cleanup
Source: NRC and EPA			

5.2.6.3 Location, Extent, and Probability of Future Events

The EPA regulates 12 facilities within the City that are permitted to discharge to water and 256 that handle hazardous waste; 13 have reported toxic releases and 5 produce and release air pollutants; and 4 are active and/or archived Superfund sites. However, while several of the small, fixed facilities (e.g., body shops) have varying uses of hazardous chemicals, in general these facilities do not pose a significant risk to the City.

In addition to fixed facilities, hazardous material events have the potential to occur along Interstate 50 and SR 395. The trucks that use these transportation arteries commonly carry a variety of hazardous materials including gasoline, other crude oil derivatives, and other chemicals known to cause human health problems.

Comprehensive information on the probability and magnitude of hazardous material events from all types of sources (such as fixed facilities or transport vehicles) is not available. Wide variations among the characteristics of hazardous material sources and among the materials themselves make such an evaluation difficult. While it is beyond the scope of this HMP to evaluate the probability and magnitude of hazardous material events in the City in detail, it is possible to determine the exposure of population, buildings, and critical facilities should such an event occur. EHSs, as shown in Appendix B, Figure B-3, pose the greatest risk for causing catastrophic emergencies. Areas at risk for hazardous material events include any area within a 1-mile radius of Interstate 50 and SR 395 and EHS fixed facilities.

5.2.7 Landslide

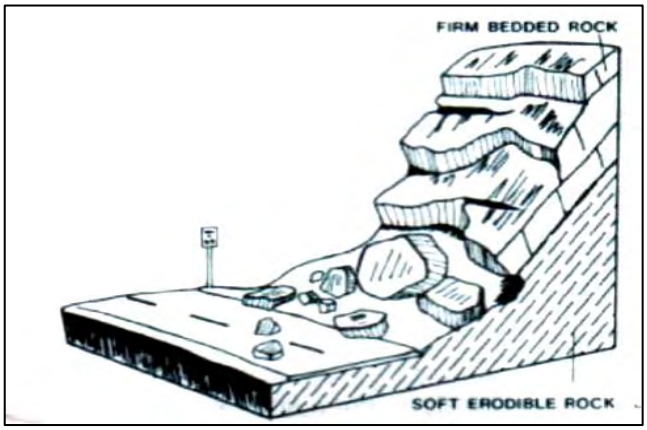
Planning Significance - Low

5.2.7.1 Nature

A landslide is the movement of rock and soil that may take place gradually over a small area, or it may be very rapid and involve a huge area, such as the landslides that have been documented at Slide Mountain. Landslides may also be initiated by removal, or absence, of soil-retaining vegetation, from causes such as range fires (e.g., Waterfall fire July 2004) or changes in agricultural practices. Removal of material at the base of slopes may result in unstable conditions. Heavy building structures, mine dumps and road fill may add enough stress to initiate landslide movement in otherwise stable conditions.

Landslides in Nevada include rockfalls. Some rockfalls occur where sedimentary rocks are capped by volcanic rocks (lava flows and other layered volcanic rocks). When the sedimentary rock weathers and erodes it undermines the lava cap and a rock fall results. Another type of landsliding in Nevada occurs in areas cut by perennial streams. Water undermines the supporting base of a steep surface, which eventually collapses. An example of this type of slide is Mogul, on the Truckee River, West of Reno. Landslides in Nevada tend to be localized and therefore tend not to result in very large dollar damages. They can occur with earthquakes and major storms and floods, and they can be initiated by melting ice and snow.

Figure 5-8. Landslide Soil



Source: Planning for Natural Hazards: The Oregon Technical Resource Guide

5.2.7.2 History

The largest recorded event in recent history in neighboring Washoe County was on May 30, 1983, on the eastern slopes of Slide Mountain. The rockslide killed one man, destroyed a house and caused $2M in damage to the area. There are no other recorded events however this may be because there was no damage from previous landslide events.

5.2.7.3 Location, Extent, and Probability of Future Events

The Landslide Map B-4, located in Appendix B, shows the potential locations of landslide within Carson City. During the Waterfall Fire in 2004, the area west of Carson City (Ash Canyon, Kings Canyon and Combs Canyon) lost soil-retaining vegetation which may pose a threat for small landslides during heavy precipitation. However each year that goes by reduces that threat. The Silver Oak residential area in the center of town and Prison Hill on the east side may experience rock fall out. C Hill area in southwest Carson City may experience landslide due to a fault that runs near the steep hillside.

This risk will need to be re-evaluated if development continues at the base of possible slide area slopes. The probability of a landslide is considered low within Carson City based on no previous occurrences within the City.

5.2.8 Seiche

Planning Significance – Low

5.2.8.1 Nature

US Army Corps of Engineers defines Seiche as:

- A standing wave oscillation of an enclosed waterbody that continues, pendulum fashion, after the cessation of the originating force, which may have been either seismic or atmospheric.
- An oscillation of a fluid body in response to a disturbing force having the same frequency as the natural frequency of the fluid system. Tides are no considered to be seiches induced primarily by the periodic forces caused by the Sun and Moon.

Seiches (also known as tsunamis) can be generated when land tilts or drops as a result of fault rupture or other seismic activity. Computer modeling, by a group at the University of Nevada at Reno that is working with a Japanese tsunami expert, showed ruptures along either fault could lift or drop the bottom of the lake and possibly generate a tsunami. The tsunami in turn could trigger seiche waves within seconds that could crisscross the lake, and reach heights of 30 feet or more and persist for hours.

5.2.8.2 History

There have been no occurrences of major seiche activity at Lake Tahoe in recent years. University of Nevada geologists have found deposits that extend for ten miles along the McKinney Bay shore from Sunnyside through Tahoma. These deposits indicate a tsunami or seiche with 30 foot high waves occurred approximately 7,000 years ago.

Research performed by the Scripps Institute of Oceanography using acoustic trenching to research the lake's topography indicates that McKinney Bay was formed when a massive landslide slipped into Lake Tahoe which likely caused major seiche activity at that time. Research from the University of Nevada shows evidence of a massive landslide that tumbled from Homewood and may have caused a seiche on the Nevada side.

5.2.8.3 Location, Extent, and Probability of Future Events

The figure below demonstrates the location of possible seiches. The Carson City boundary resides in the central eastern side of Lake Tahoe.

Figure 5-9. Lake Tahoe Contours of Vertical Component Ground and Lake Bottom Displacements

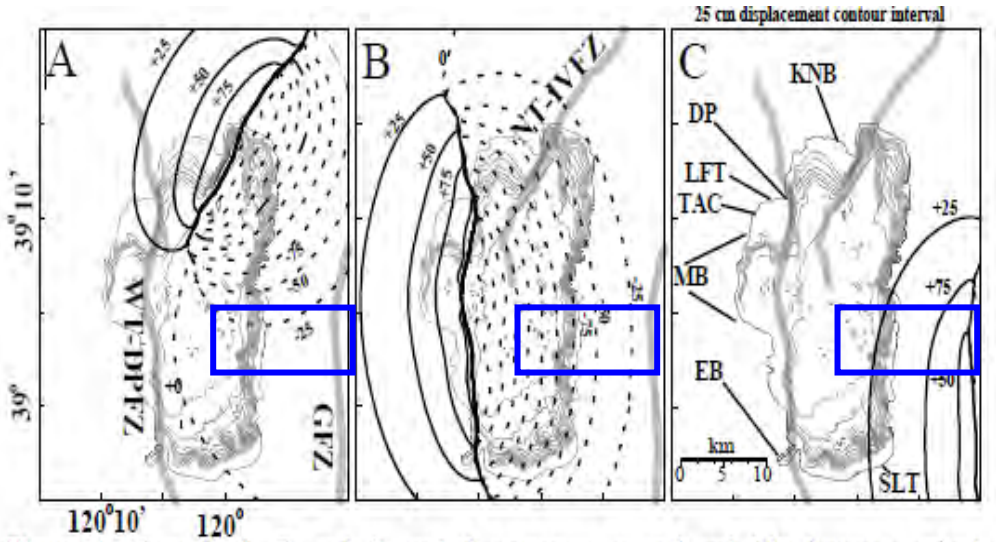


Figure 1. Scenario A, B, and C vertical component ground and lake bottom coseismic displacements. Dashed contours represent subsidence and solid contours represent uplift. Geographic locations: TAC-Tahoe City, KNB-Kings Beach, LFT-Lake Forest, SLT-South Lake Tahoe, MB-McKinney Bay, EB-Emerald Bay, DP-Dollar Point

Carson City Area

Source: The Potential Hazard from Tusnami and Seiche Waves Generated by Future Lark earthquakes within the Lake Tahoe Basin, California-Nevada, April 2000; Gene A. Ichinose, Kenju Satake, John G. Anderson, Rich A. Schweickert, and Mary M. Lahren; Nevada Seismological laboratory; University of Nevada; (University of Nevada 2000 study)

Carson City's boundary along the lake includes a few privately owned structures. The road and utilities are at a high enough elevation that they would not be affected by a 30 foot wave. The overall magnitude and potential severity of impacts from a seiche is considered low in Carson City. Based on the frequency of seiche occurrences in Lake Tahoe, probability of future flooding events is very low with less than .01 percent chance of occurrence in a given year based on scientific data from UNR.

5.2.9 Severe Weather

Planning Significance - High

5.2.9.1 Nature

Thunderstorms, hailstorms, tornadoes, windstorms, and winter storms were combined into the category of severe weather. Thunderstorms are further defined due to the numerous threats associated with them.

Thunderstorms:

Thunderstorms are formed from a combination of moisture, rapidly rising warm air, and a force capable of lifting the air, such as warm and cold fronts or mountainous terrain. A thunderstorm produces lightning, thunder, and rainfall and can develop in just minutes. Thunderstorms may occur singly, in clusters, or in lines. As a result, it is possible for several thunderstorms to affect one location in the course of a few hours. The main threats from thunderstorms are hail, wildfires, deadly lightning, tornadoes, flash floods, and downburst winds. Flash floods and wildfires are detailed in this plan.

Hailstorms:

Hail is a form of solid precipitation which consists of balls or irregular lumps of ice, that are individually called hail stones. Hail stones consist mainly of water ice and measure between 0.20” and 6.00” (5 and 150 millimeters) in diameter, with the larger stones coming from severe and dangerous thunderstorms. Hail is possible with most thunderstorms as strong rising air currents in the thundercloud transport moisture laden air well above the freezing level converting super-cooled water vapor into hail stones. The stronger the updraft into the thunderstorm, the longer these initially small hails stones stay suspended in the storm, allowing them to grow to in size to the point where they eventually become too heavy for the updraft to keep them aloft, and they fall to the surface.

Tornadoes:

A tornado is a violent, rotating column of air which is in contact with both the surface of the earth and a thunderstorm cloud. Tornadoes come in many sizes but are typically in the form of a visible condensation funnel, whose narrow end touches the earth and is often encircled by a cloud of debris. Most tornadoes have wind speeds between 65 mph and 110 mph, are approximately 250 feet across, and travel less than a mile before dissipating. Some attain wind speeds of more than 300 mph, stretch more than a mile across, and stay on the ground for dozens of miles.

Downburst Winds:

A downburst is created by an area of significantly rain-cooled air that, after hitting ground level, spreads out in all directions producing strong winds. Unlike winds in a tornado, winds in a downburst are directed outwards from the point where it hits land or water. Dry downbursts are associated with thunderstorms with very little rain, while wet downbursts are created by

thunderstorms with high amounts of rainfall. Downburst winds are often termed microbursts, macrobursts, or outflow thunderstorm winds. Most downburst winds that impact Carson City occur as dry downbursts due to the high cloud bases of the associated thunderstorms, which allows for much of the rainfall to evaporate before reaching the ground. They are also usually microbursts compared to macrobursts since the area affected is typically less than 2.5 miles. Macrobursts do occur in the region when individual thunderstorm cells organize into a line or cluster, but are less common. Downburst winds are typically 35 to 75 mph, but can exceed over 100 mph in rare cases.

Downburst winds typically damages fences, roofs, weakened structures, trees, and power lines. Downbursts do pose a significant risk to aviation, especially to aircraft taking off and landing due to strong winds that change direction over very short distances. In addition, small aircraft on the ground can incur damage if not secured. Downburst winds do pose a significant risk to new lightning induced wildfire starts, allowing small fires to grow quickly. During periods of drought, dust storms result from downburst winds and cause visibilities to drop below ½ mile, creating hazardous driving conditions. Downburst winds from thunderstorms are common in Carson City from late spring through early fall.

Down-slope Wind Storms:

Winds are horizontal flows of air that blow from areas of high pressure to areas of low pressure. Wind strength depends on the difference between the high- and low-pressure systems and the distance between them. Therefore, a strong pressure gradient results from a large pressure difference over short distance between places and causes strong winds.

Strong and/or severe winds often precede or follow frontal activity, including cold fronts, warm fronts, and dry lines. Down-slope wind storms are common in Carson City during the winter months when winter storms approach the Sierra. Strong winds ahead of a cold front are ducted down to the surface due to mountain waves, enhancing wind speeds that are often stronger than Down-slope wind storms seen in the rest of the United States. Down-slope winds in the lee of the Sierra typically produce sustained southwest winds of 30 to 50 mph with gusts to 70 mph. During the strongest down slope wind storms, winds can exceed over 100 mph and last numerous hours.

Down-slope wind storms and can overturn mobile homes, tear roofs off of houses, down fences, topple trees, snap power lines, shatter windows, and sandblast paint from cars. Other associated hazards include utility outages, arcing power lines, and dust storms.

In addition to strong and/or severe winds caused by large regional frontal systems, locally strong winds caused from the funneling of winds through mountain peaks or drainages do occur. Areas impacted by these local winds are much smaller in scale, although wind speeds can be equally as strong as those caused by large scale weather systems.

Winter Storms:

Winter storms can bring heavy rain, snow, high winds, extreme cold, and freezing rain to the region. In Nevada, winter storms are massive low-pressure weather systems originating in the North Pacific Ocean that sweep across the western states. Winter storms can also plunge southward from arctic regions and drop heavy amounts of snow and ice. The severity of winter storms is generally minor. However, a heavy accumulation of snow or ice can create hazardous conditions. Additionally, a large winter storm event can also cause exceptionally high rainfall

that persists for days, resulting in heavy flooding. Winter storms that are able to tap into subtropical moisture are the ones most likely to lead to flooding due to heavy warm rain. Flooding is exacerbated by warm heavy rains falling on low elevation snowpack.

5.2.9.2 History

The National Climate Data Center identified 3 major winter storms in Carson City and FEMA declared 2 Snow Emergencies between 1996 and 2009. These storms include the following.

- On December 26 & 27, 1996, a storm which dropped heavy rain causing road damage to a business.
- On December 29, 2004 through January 2, 2005, a storm which dropped heavy snow, shutting down roads and requiring snow removal. FEMA 3202.
- On January 2 through 10, 2005, a storm which dropped heavy snow, shutting down roads and requiring snow removal. FEMA 3204.
- On December 30 -31, 2005 heavy rain of up to 6 inches in a 24 hour period was reported. The rain caused flooding in Carson City, FEMA 1629. (see Floods)
- On February 26, 2006, heavy rain up to 3.5 inches fell west of Carson City.

Between 1994 and 2009, a total of 5 severe windstorms were reported in Carson City. The severe winds reported were independent or in advance of thunderstorm activities. The following highlights these events.

- On July 26, 1998 in the central portion of Carson City, thunderstorm winds estimated to 60 knots knocked over a tree which downed power and telephone lines near the Carson River 3 miles east of Carson City NV.
- On July 20, 2003, a women and child were slightly injured by falling tree branches when thunderstorm wind gusts estimated at 50 knots blew through Mills Park in Carson City.
- On April 27, 2005, an F0 tornado was reported near the Carson-Tahoe Hospital**.**
- On June 5, 2007, the Nevada Appeal newspaper reported that strong wind gusts up to 48 knots brought down tree limbs in Carson City. One downed tree limb on Fifth Street knocked out power to 900 residents, including the Carson City Courthouse and Sheriff's Department. A late-season cold front moved through the Sierra and western Nevada on June 5th. Strong winds accompanied the front and caused damage mainly in western Nevada.
- On February 25, 2009, a possible dust devil descended the foothills just west of Carson City. Flying debris generated by the dust devil damaged 12 automobiles in the DMV parking lot. A low pressure system brought strong winds to the northern Sierra and western Nevada.

5.2.9.3 Location, Extent, and Probability of Future Events

Thunderstorms that produce hail and downburst winds occur in Carson City every year. An active thunderstorm pattern, resulting from monsoon moisture over the Southwestern United States being transported into Nevada can lead to a prolonged period of thunderstorm days and severe weather. In addition, weak weather systems moving over Nevada after a period of hot

weather often leads to dry thunderstorms with strong downburst winds. The frequency of tornado occurrence is 1 in 25 years with most being categorized as weak tornadoes (EF0 or EF1 on the Fujita Scale).

Hailstorms are a common occurrence in Carson City, especially during the late spring through early fall months when thunderstorms are most frequent. Hail sizes are typically between pea and marble size, but can get larger than golf balls during the strongest storms that impact the area. A Severe Thunderstorm for hail, as defined by the National Weather Service, is a thunderstorm capable of producing hail stones greater than 1" in diameter, which usually occurs only a few times per year.

Tornadoes are rare in Carson City due to the mountainous terrain which prevents them from spinning up. Historically, tornadoes in the region are usually weak, often categorized as EF0 (65-85 mph) or EF1 (86-110 mph) on the Enhanced Fujita Scale. An upper level low pressure system is often required for tornado development in Carson City due to the need for sufficient wind shear in the lower atmosphere, which is necessary to create an environment favorable for tornado genesis.

Severe wind events in Carson City occur every year and are the result of two weather events known as the "Nevada Low" and the Southwest Monsoon Flow. The Nevada low is a local name given to a low or deep trough that develops over California and Nevada between February and April in advance of an associated cold front moving down from the north. A well developed Nevada low system can sustain 17-23 mph winds with 34-46 mph gusts through Carson City. However, Carson City has recorded severe winds speeds of nearly 70 mph. Carson City also experiences local thermally driven winds due to the areas valley/mountain topography.

Down-slope wind storms occur two to three times per winter season, more often during active years. Extreme Down-slope wind storms with gusts in excess of 80 to 100 mph are less frequent, occurring a few times per decade.

Winter storms that generate heavy rainfall that leads to flooding in Carson City generally occur once every several years. Snowfall accumulation in Carson City from the bigger snowstorms can often be between 8-24 inches over a 24-hour period. Heavy snowfall events are generally associated with a strong low pressure system dropping out of the Gulf of Alaska with the higher elevations receiving the greatest amount of snow. See Appendix B, Figure B-5 for Potential Winter Storm Areas.

5.2.10 Terrorism

Planning Significance - High

5.2.10.1 Nature

The Department of Justice (DOJ) Federal Bureau of Investigation (FBI) defines terrorism as the unlawful use of force or violence against persons or property to intimidate or coerce a government and/or the civilian population in furtherance of political or social objectives. Weapons of Mass Destruction (WMD) associated with terrorism are defined as nuclear, biological and chemical in origin. Technological terrorism is defined as the intentional disruption in the nation's data control systems. Attacks on financial, business, and governmental computer networks are being considered as technological terrorist-related acts.

The FBI is the primary investigatory agency for domestic terrorism. The Central Intelligence Agency (CIA) monitors potential security threats from foreign sources. The DOJ through the FBI will coordinate the domestic preparedness programs and activities of this nation to address the threat posed by terrorists and the use of weapons of mass destruction.

Acts of terrorism may originate from a single person, special interest groups, or acts sponsored by a foreign government. Terrorist acts include the use of arson, hostile takeovers, shootings, biological agents (such as anthrax, plague, botulism and others), chemical agents (such as hydrogen cyanide, sulfur mustard, sarin and chlorine), and hostage taking. The most popular method used in recent events in the United States has been terrorism by bombing.

Conventional Explosive Devices

The easiest to obtain and use of all weapons is still a conventional explosive device, or improvised bomb, which may be used to cause massive local destruction or to disperse chemical, biological, or radiological agents. The components are readily available, as are detailed instructions to construct such a device. Improvised explosive devices are categorized as being explosive or incendiary, employing high or low filler explosive materials to explode and/or cause fires.

Bombs and firebombs are cheap and easily constructed, involve low technology, and are the terrorist weapon most likely to be encountered. Large, powerful devices can be outfitted with timed or remotely triggered detonators and can be designed to be activated by light, pressure, movement, or radio transmission. The potential exists for single or multiple bombing incidents in single or multiple municipalities. Historically, less than five percent of actual or attempted bombings were preceded by a threat. Explosive materials can be employed covertly with little signature, and are not readily detectable. Secondary devices may be targeted against responders.

Nuclear Weapon/Radiological Agent Use

The difficulty of responding to a nuclear or radiological incident is compounded by the nature of radiation itself. In an explosion, the fact that radioactive material was involved may or may not be obvious, depending upon the nature of the explosive device used. Unless confirmed by radiological detection equipment, the presence of a radiation hazard is difficult to ascertain. Although many detection devices exist, most are designed to detect specific types and levels of radiation and may not be appropriate for measuring or ruling out the presence of radiological hazards. The table below lists some indicators of a radiological release.

General indicators of possible nuclear weapon/radiological agent use are as follows.

• A stated threat to deploy a nuclear or radiological device
• The presence of nuclear or radiological equipment (e.g., spent fuel canisters or nuclear transport vehicles)
• Nuclear placards or warning materials along with otherwise unexplained casualties

:

The scenarios constituting an intentional nuclear/radiological emergency include the following:

1. Use of an **Improvised Nuclear Device (IND)** includes any explosive device designed to cause a nuclear yield. Depending on the type of trigger device used, either uranium or plutonium isotopes can fuel these devices. While "weapons-grade" material increases the efficiency of a given device, materials of less than weapons grade can still be used.

2. Use of a **Radiological Dispersal Device (RDD)** includes any explosive device utilized to spread radioactive material upon detonation. Any improvised explosive device could be used by placing it in close proximity to radioactive material.

3. Use of a **Simple RDD** that spreads radiological material without the use of an explosive. Any nuclear material (including medical isotopes or waste) can be used in this manner.

Biological Agents

An identified terrorist tactic or weapon is the use of toxic biological agents in an attempt to harm or intimidate the public. Anthrax, Yersinia pestis, and small pox are examples of this type of threat. Anthrax is found naturally in the soil in some of the old ranch areas in Nevada. UNR and the Nevada State Agriculture Labs maintain a vigilant watch of these threats.

According to information from the Nevada State Health Division, most biological agents are naturally occurring in various parts of the world. They can be weaponized to enhance their virulence in humans and make them resistant to vaccines and antibiotics. Weaponization of biological agents usually involves using selective reproduction pressure or recombinant engineering to mutate or modify the genetic composition of the agent. Terrorist may choose to use biological weapons to achieve their goals because a very small amount can harm many people. It is reported that many of these agents would be relatively easy to prepare and easy to hide. The actual or threatened use of bio-weapons can have tremendous psychological impact on the population.

The CIA currently lists 15 animal pathogens as having potential Biological Weapons application that could potentially be used in a terrorist act:

- African swine fever
- Avian influenza
- Bluetongue
- Foot and Mouth Disease
- Goat Pox
- Monkey Pox
- Pseudo-rabies
- Hog cholera
- Lyssa virus
- Newcastle disease
- Pest des petits
- Swine vesicular disease
- Rinderpest
- Sheep pox

- Porcine enteroviral encephalomyelitis
- Vesicular stomatitis

Yersinia pestis is used an aerosol attack can cause cases a pneumonic form of plague. One to six days after becoming infected with the bacteria, people would develop pneumonic plague. Once people have the disease, the bacteria can spread to others who have close contact with them. Because of the delay between being exposed to the bacteria and becoming sick, people could travel over a large area before becoming contagious and possibly infecting others. Controlling the disease would then be more difficult. A biological weapon carrying Y. pestis is possible because the bacterium occurs in nature and could be isolated and grown in quantity in a laboratory. Even so, manufacturing an effective weapon using Y. pestis would require advanced knowledge and technology.

Smallpox is caused by the variola virus that emerged in human populations thousands of years ago. Except for laboratory stockpiles, the variola virus has been eliminated. However, in the aftermath of the events of September and October, 2001, there is heightened concern that the variola virus might be used as an agent of bioterrorism. For this reason, the US government is taking precautions for dealing with a small pox outbreak.

Unless the agent is disseminated in an airborne or other mass contaminate methodology, the exposures will be limited in nature. Mass distributed biologic agents could require mass contamination and isolation. Medical responders and facilities would be stressed. Infrastructure such as drinking water could be affected. Some critical buildings could be closed and sealed pending decontamination if possible. Economic losses could be incurred due to lack of tourism or if major gaming establishments were effected.

According to USDA-ARS Arthropod-Borne Animal Diseases Research Laboratory (ABADRL) att the present time, the most economically important arthropod-borne disease of US livestock is Bluetongue Disease (BLU). As articulated in the Journal of American Veterinary Medical Association article, *Biological Terrorism and Veterinary Medicine in the United States*, "Although recent reports have emphasized the need for improving the ability to detect a biological terrorist attack on human populations, the use of veterinary services in this effort and the potential for the targeting of livestock (e.g., horses, cattle, sheep, goats, swine, and poultry) have been addressed only briefly. Improving surveillance for biological terrorist attacks that target livestock and improving detection and reporting of livestock, pet, and wild animal morbidity and mortality are important components of preparedness for a covert biological terrorist attack."

Chemical Agents

The table below lists those chemical agents that might be used in a terrorist attack and categorizes them by effect.

Table. 5-9. Hazardous Chemical Agents Potentially Used in Terrorist Act

Effects	Chemical Agent
Blood (Blister/Vesicants)	Arsine (SA)
	Cyanogen Chloride (CK)
	Hydrogen Chloride

Table. 5-9. Hazardous Chemical Agents Potentially Used in Terrorist Act

Effects	Chemical Agent
	Hydrogen Cyanide (AC)
Choking/Lung/Pulmonary Damaging	
	Chlorine (CL)
	Diphosgene (DP)
	Cyanide
	Nitrogen Oxide (NO)
	Perfluroisobutylene (PHIB)
	Phosgene (CG)
	Red Phosphorous (RP)
	Sulfur Trioxide-Chlorosulfonic Acid (FS)
	Teflon and Perfluroisobutylene (PHIB)
	Titanium Tetrachloride (FM)
	Zinc Oxide (HC)
Incapacitating (Nerve, Riot Control/Tear Gas)	Bromobenzylcyanide (CA)
	Chloroacetophenone (CN)
	Chloropicrin (PS)
	CNB – (CN in Benzene and Carbon Tetrachloride)
	CNS – (CN and Chloropicrin in Chloroform)
	CR
	CS
Vomiting	
	Adamsite (DM)
	Diphenylchloroarsine(DA)
	Diphenylcyanoarsine (DC)

The State of Nevada is comprised of diverse populations that include members of nation-wide militia organizations. The Federal government has continually released terrorism warnings since 1998 that state most communities in the United States are vulnerable to terrorist attack. The State of Nevada Standard Multi-Hazard Mitigation Plan currently lists nine domestic terrorism groups with representatives and offices in Nevada. Those groups are included in this plan to give local governments information of their existence and their geographical location. See the table below.

Table 5-10. Identified Hate Groups and Patriot Groups, Nevada

Type	Group	Location
Domestic Terrorism Groups		
	World Church of the Creator	Carson City
	Hammerskin Nation	Las Vegas
	Nation of Islam	Las Vegas
	National Alliance	Las Vegas
	National Socialist Movement	Las Vegas
	Aryan Nations/Aryan National Alliance	Reno
	National Alliance	Reno
	Aryan Nations/Aryan National Alliance	Wellington
Patriot Groups		
	Center for Action	Sandy Valley

5.2.10.2 History

According to the FBI, sporting events, political conventions, and other special events are attractive targets for domestic and foreign terrorists because they are highly visible and attract celebrities and political leaders. Other targets of opportunity for terrorism include large public works facilities, utilities, transportation facilities such as airports, train stations, subways, bridges and ferries, military bases, schools, medical facilities and other state and federal facilities. Examples of terrorism include the World Trade Center bombing in New York City, the Murray Federal Building bombing in Oklahoma City, the Olympic Centennial Park bombing in Atlanta, and the Pan American Flight bombing over Lockerbie, Scotland.

Acts of terrorism may originate from a single person, special interest groups, or acts sponsored by a foreign government. The most popular method used in recent events in the United States has been terrorism by bombing. Terrorist acts include the use of arson, hostile takeovers, shootings, biological agents (such as anthrax, plague, botulism and others); chemical agents (such as hydrogen cyanide, sulfur mustard, sarin and chlorine), and hostage taking.

5.2.10.3 Location, Extent, Probability of Future Events

In determining the risk areas within a jurisdiction, the vulnerabilities of potential targets should be identified, and the targets themselves should be prepared to respond to a WMD incident. In-depth vulnerability assessments are needed for determining a response to such an incident.

All areas of Carson City are potentially susceptible to the impacts of terrorism, though risk is comparatively higher for the State Capitol Building, Supreme Court Building and Legislative Building, State Computer Center as well as Nevada State Military facilities in and around the Capital city in the downtown corridor. Additionally, special events (drawing between 5,000 to 40,000 individuals per day), above-ground fuel tank farm, and the sewage plants are also susceptible. The sewage plant uses chlorine to disinfect the treated wastewater before discharge into an adjacent waterway. The chlorine is housed in a chlorine tanker located in on site buildings for this purpose.

Standard models are available for estimating the effects of a nuclear, chemical, or biological release, including the area affected and consequences to population, resources, and infrastructure. Some of these models include databases on infrastructure that can be useful in preparing the TIA. A good source of information on available Federal government models is the *Directory of Atmospheric*

Transport and Diffusion Consequence Assessment Models, published by the Office of the Federal Coordinator for Meteorology (OFCM).

The overall magnitude and potential severity of impacts of terrorism and weapons of mass destruction is considered high in Carson City. Assessment of probability of future terrorism events in Carson City is gauged primarily on speculation, as no terrorism or events involving weapons of mass destruction have previously occurred in the planning area. The consensus of the Planning Committee is that probability of future events is high. Based on the Homeland Security Threatened Level System, it is anticipated that terrorism will remain a high threat into the foreseeable future. Because terrorism events typically are focused on a single high payoff area or facility, estimated damage is less than one percent damage to facilities in Carson City.

5.2.11 Utility *Loss*

Planning Significance - Moderate

5.2.11.1 *Nature*

This section will address electrical utility, natural gas utility and water utility loss. Any disruption in the supply of energy, gas or water utility causes human suffering and economic loss. The causes of most of the shortages are beyond the control of local governments. Response to these emergencies may include rationing and emergency supply distribution.

Telephone loss is not included in this section. AT&T is the community provider and is responsible for restoration plans. Responsible distributors:

Table 5-11. Utility Distributors

Utility	Company
Electricity	NV Energy
Natural Gas	Southwest Gas Corp.
Water	Carson City Public Works

Carson City electricity is generated at the following sites within the State of Nevada:

Table 5-12. Electrical Generation Sites

Electrical Generation Site	Location
Valmy	East of Winnemucca
Tracey	East of Sparks
Naniwa	East of Sparks
Fort Churchill	East of Carson City

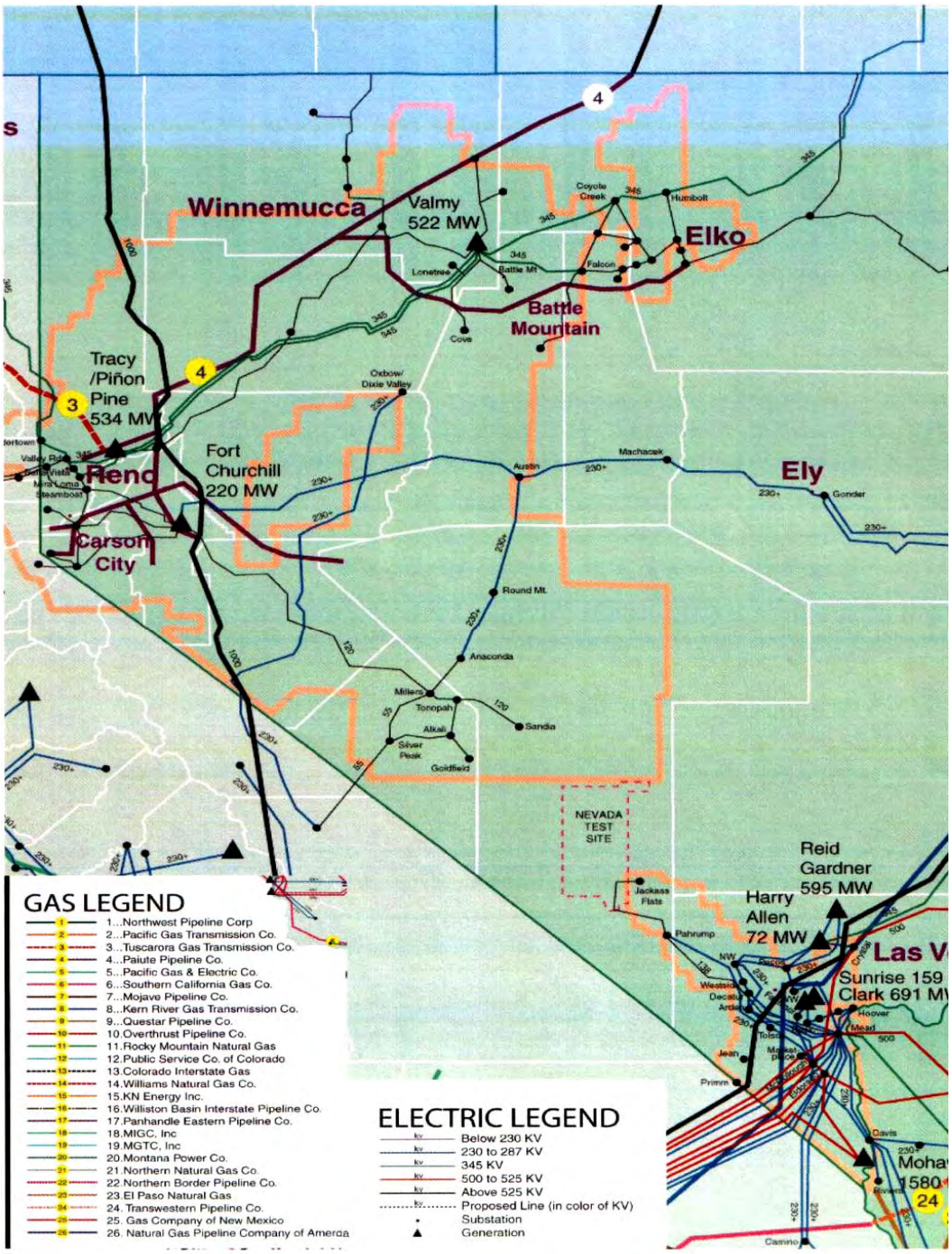
There are two high pressure natural gas transmission lines that supply Carson City, and they are run by Paiute Pipeline and Tuscarora Gas Transmission Company. These companies sell gas to Southwest Gas Corporation. Both transmission lines originate in Canada but enter Nevada in different locations.

Table 5-13. High Pressure Natural Gas Transmission Line

Attribute	Paiute Pipeline	Tuscarora Gas Transmission
Date of Construction	1963	1995
Entry to Nevada	Approx. Mountain Home, ID	Herlong, CA
Size of Pipeline	12", 16", & 20"	20"
Line Pressure	1400 psl	1000 psi
Buried Depth	24" to 60"	24" to 60"
Purpose	Natural gas for industry, business and residential uses	Natural gas to the SPPCO Tracy-Clark Power Plant

Both lines are monitored by telemetry and can be remotely shut down. Both lines have block valves that are consistent with industry standards applicable at the time of installation. The map below provides the gas and electrical lines.

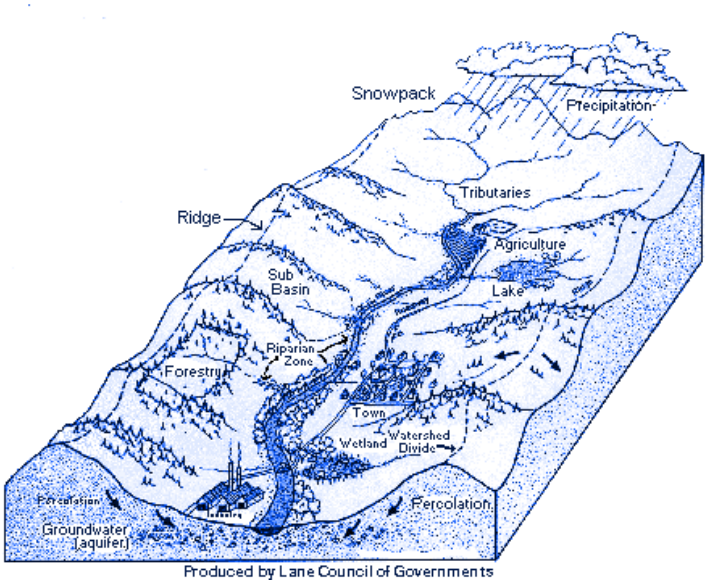
Figure 5-10. Map of Gas & Electric Lines in Nevada



Water is provided by Carson City Public Works Department and is provided through watersheds and ground water. With a growing population and economy, increasing environmental concerns, how we choose to collect, store, distribute, use and dispose of water has never been more critical.

A watershed is the area of land where all of the water that is under it or drains off of it goes into the same place. John Wesley Powell, scientist geographer, put it best when he said that a watershed is, "that area of land, a bounded hydrologic system, within which all living things are inextricably linked by their common water course and where, as humans settled, simple logic demanded that they become part of a community." Watersheds come in all shapes and sizes. They cross county, state, and national boundaries.

Figure 5-11. Watershed Example



Ground water is an important component of our nation's fresh water resources. The use of ground water is of fundamental importance to human life and is also significant to economic vitality. Inventories of ground water and surface water use patterns in the United States emphasize the importance of ground water. The United States Geological Survey (USGS) compiles national water use information every 5 years and publishes a report that summarizes this information.

Groundwater is a hidden resource. At one time, its purity and availability were taken for granted. Now contamination and availability are serious issues. The following should be considered:

- Scientists estimate groundwater accounts for more than 95% of all fresh water available for use.
- Approximately 50% of Americans obtain all or part of their drinking water from groundwater.
- Nearly 95% of rural residents rely on groundwater for their drinking supply.
- About half of irrigated cropland uses groundwater.
- Approximately one third of industrial water needs are fulfilled by using groundwater.

- About 40% of river flow nationwide (on average) depends on groundwater.

Thus, groundwater is a critical component of management plans developed by an increasing number of watershed partnerships.

Groundwater and surface water are fundamentally interconnected. It is often difficult to separate the two because they "feed" each other. This is why one can contaminate the other.

- As rain or snow falls to the earth's surface:
- Some water runs off the land to rivers, lakes, streams and oceans (surface water).
- Water also can move into those bodies by percolation below ground.

Water entering the soil can infiltrate deeper to reach groundwater which can discharge to surface water or return to the surface through wells, springs and marshes. Here it becomes surface water again. And, upon evaporation, it completes the cycle. This movement of water between the earth and the atmosphere through evaporation, precipitation, infiltration and runoff is continuous.

One of the most commonly used forms of groundwater comes from unconfined shallow water table aquifers. These aquifers are major sources of drinking and irrigation water. They also interact closely with streams, sometimes flowing (discharging) water into a stream or lake and sometimes receiving water from the stream or lake.

An unconfined aquifer that feeds streams is said to provide the stream's baseflow. (This is called a gaining stream.) In fact, groundwater can be responsible for maintaining the hydrologic balance of surface streams, springs, lakes, wetlands and marshes.

This is why successful watershed partnerships with a special interest in a particular stream, lake or other surface waterbody always have a special interest in the unconfined aquifer, adjacent to the water body.

The source of groundwater (recharge) is through precipitation or surface water that percolates downward. Approximately 5-50% (depending on climate, land use, soil type, geology and many other factors) of annual precipitation results in groundwater recharge. In some areas, streams literally recharge the aquifer through stream bed infiltration, called losing streams. Left untouched, groundwater naturally arrives at a balance, discharging and recharging depending on hydrologic conditions.

Partnerships using the watershed approach to protect natural resources identify and understand the individual resources-water, soil, air, plants, animals and people-early in the process. This is why watershed partnerships select or define boundaries to address all natural resources - not just one. They realize that groundwater, surface water, air quality, and wildlife and human activities all affect each other.

Occasionally watershed partnerships run into difficulty combining boundaries of surface water (watersheds) and recharge areas (groundwater). If this occurs, consider combining surface and groundwater into a single, larger area. In other situations-for example if water is being transferred from one watershed or aquifer to distant users-there can be, and should be, two distinct areas. Thus, watershed partnerships' boundaries may combine the wellhead area, aquifer, watershed, or many other areas depending on the issue(s).

Aquifers are often difficult to delineate. It requires someone with an understanding of the aquifer, the geology, the surface above it, and the land that drains toward the surface.

An unconfined aquifer area often extends to the surface waterbody's (i.e. lake, river, estuary) watershed. When determining an aquifer protection area, pumping (working) wells are not considered. The biggest risk to an unconfined aquifer is contaminated water moving through the permeable materials directly above it. This area is known as the primary recharge area. Depending on the depth and overlying geologic characteristics, travel time from the surface to the aquifer can be relatively short.

Less permeable deposits located at higher elevations than the aquifer form a secondary recharge area. These areas also recharge the aquifer through both overland runoff and groundwater flow. Because they are less permeable and tend to be a greater distance from the aquifer, they often filter out contaminants.

Additional recharge areas to consider include an adjacent stream that potentially contributes to the aquifer through infiltration. When pumping wells are located near a stream or lake, infiltration can be increased. Infiltrating streams typically provide an aquifer with large quantities of water and a pathway for bacteria, viruses and other contaminants.

A confined aquifer area may be limited to the outcrop of the aquifer unit and its immediate contributing area. This area may actually be isolated from the location of water supply wells within the aquifer.

Semi-confined aquifers may receive water from both outcrop areas and overlying aquifers. Delineating the aquifer protection area can be extensive and complex.

Sole-source aquifers are delineated based on aquifer type - confined, semi - confined or unconfined - and local geologic and hydrologic conditions. Defined as providing a minimum of 50% of the water for its users, sole-source aquifers usually exist only where there simply are no viable alternative water sources.

Wellhead protection areas (also known as zone of contribution and contributing areas) are the surface and subsurface areas surrounding a well or field of wells (wellfield) supplying a public water system.

The area is calculated by determining the distance contaminants are reasonably likely to move before reaching a well. Some common methods for determining the wellhead protection area include:

- Arbitrary fixed radius
- Calculated fixed radius
- Simplified variable shapes
- Analytical method
- Numerical method
- Hydro-geologic mapping

When selecting the best method, consider available funds and the level of concern. Other factors to consider include the cone of depression and drawdown.

Surface watersheds are defined by a simple process of identifying the highest elevations in land that drains to the surface water body (i.e. lake, pond, river, estuary, etc.). Watersheds are all shapes and sizes, ranging from just a few acres to several million acres ... many smaller watersheds "nested" inside a larger watershed.

Most successful watershed partnerships work with a manageable size yet encompass all the different, but integrated, areas. This enables faster measurable progress and stronger ties between stakeholders and the water body they affect.

5.2.11.2 History

The West coast Energy shortages have raised the issue among local jurisdiction on the prioritization of risks for communities in Northern Nevada. The State of Nevada Energy Conservation Plan (NECP) for State government is designed to provide for the prevention of delays and interruptions in providing energy and establish guidance for State agencies in planning for energy conservation and future energy requirements. The NECP describes the methods by which the State of Nevada will assist in the statewide mitigation efforts to prevent energy emergencies through conservation measures and reducing energy usage when demand is highest.

Carson City's primary source of water is surface water. The other sources of water are pumped from wells within Carson City and purchased from the State of Nevada through the Marlette Hobart pipeline. In 2009, Carson City is still feeling the effects of the Waterfall Fire. From 14 through 20 July, 2004, the Waterfall Fire burned the eastern flank of the Carson Range along the margins of Carson City and throughout most of three of the four watersheds contributing surface water from the Carson Range to the Eagle Valley. The Carson Range flanks the western margin of the Eagle Valley, and rises to over 9,000 feet in elevation. The impacted watersheds are Kings Canyon Creek, North Kings Canyon Creek, Ash Canyon Creek, and Vicee Canyon Creek. Of these watersheds, only the uppermost portion of Ash Canyon Creek was left unburned.

5.2.11.3 Location, Extent, and Probability of Future Events

Electrical or Gas Lines

Nevada Power Company representatives report that the power systems under their control meet or exceed building standards, and they have had an ongoing mitigation program in place since 1980 to retrofit their facilities for risk exposure. However, the water, electrical and gas supplies are at low risk both inside Carson City and along power pipelines outside the City. The following is a list of the source of potential damage.

1. Construction

Excavation is the most likely cause of damage to a water, electrical wire or pipeline. The potential for rupture due to nearby excavation is greatest in areas where the pipeline corridor intersects highways and railroad right of ways and areas of new construction. Breaks in the pipeline caused by excavation are also the most easily preventable type of break. Public education and awareness of the need for pipeline locates before digging or operating heavy equipment near the pipeline and coordinated efforts to make pipeline and utility locates easy to acquire and to identify will help to prevent future breaks. As the area within the pipeline corridor continues to grow and expand the potential for damage will also continue to grow.

2. Earthquake

Earthquakes pose a threat to the water pipes, electrical grid and pipeline. An earthquake has the potential of damage through three major forms of ground deformation liquefaction, surface rupture, and landslide. The pipeline is constructed of high-grade steel using modern full penetration welding techniques. Pipelines have withstood major earthquakes in the past with

minor to no damage due to the ability of welded steel pipe to withstand considerable ground deformation without failure. The ductility of high-grade steel pipe provides the pipe with a large amount of resistance to rupture due to most ground deformation and shaking. The pipeline was constructed to withstand a 7.5 magnitude earthquake and have a proven track record in this area.

Damage to tanks and connections, however, are common during events of extreme shaking. Tank damage such as sidewall buckling, separation of sidewalls from the bottom plate, and sloshing of liquids can result from severe shaking. If connections between pipes and tanks are not flexible they are vulnerable to damage during earthquakes. Containment dikes serve as a good line of defense in the event pipe connections break. Once contained within the dikes the petroleum products can be kept from ignition sources and the spill can be controlled.

3. Flood and Erosion

River and stream crossings and locations where a pipeline is near embankments are subject to erosion. Floodwaters pose the greatest threat to breaking a pipeline since flooding can result in large amounts of erosion and mass wasting along drainage over a very short period of time. Preventative measures have kept stream erosion from causing any breaks in the pipeline in the past, however heavy flood waters can change the whole course of a river or stream in minutes. Some of these crossing may be at higher risk of erosion or embankment failure due to soil types, nearby tectonic activity, and gradient of the embankments and river. There are many more washes, dry creeks, marshes, and irrigation ditches that drain into the Carson River that are traversed by the pipeline. It is imperative that, in the event of a spill, an assessment of the location is made to determine if it is in drainage.

4. Corrosion & Settlement

Pipelines are often subject to corrosion due to saline or alkaline ground water or in some cases chemical spills near the pipeline. Corrosion can in extreme cases lead to seepage and leakage underground.

5. Landslide

In the mountainous terrain landslides and avalanches have the potential of disrupting power or uncovering and/or damaging the pipeline. The greatest hazard exists where the electrical wire or pipeline crosses steep mountainous areas due to landslides and stream erosion. Earthquakes, flooding and times of high run off can lead to an increased likelihood of landslides.

6. Wildland Fire

In the mountainous terrain wildland fires have the potential for disrupting power.

Water

1. Earthquake

Earthquake has a high probability of impacting the water and waste water in entire Carson City area due to underground and above ground piping that would be damaged. Please see earthquake section for probability and frequency.

2. Flood

Flooding has historically impacted the waste water treatment facility since it lies in a low area north east of the city. Impact is historically for a short duration however the probability of an event occurring is high.

3. Wildland Fire

Since the majority of Carson City's water is obtained from surface water from Ash & Kings Canyon, wildland fire in those areas provides the greatest risk to water loss. Mike Dondero, Nevada Division of Forestry, states that fire in that area reoccurs every fifteen (15) years. The probability for a future water loss event is high. The extent of damage caused by a fire can be determined from the section below titled Potential Impacts of the Waterfall Fire.

Potential Impacts of the Waterfall Fire on Carson City Surface Water & Groundwater Supply

The fire-impacted portion of the Carson Range is generally steep and inaccessible. Prior to the Waterfall Fire, the area was vegetated with grasses, bitterbrush, sagebrush, buck brush (ceanothus), and ponderosa pine. Creek bottom vegetation was, in part, characterized by riparian plant communities.

Potential impacts of the Waterfall Fire to surface water supplies to Carson City include increases in sediment load and turbidity in the creeks that supply surface water to Carson City, and a possible increase in pH. A potential impact to groundwater supplies is a possible decrease in aquifer recharge caused by decreased infiltration of precipitation.

The potential increased sediment load in surface waters would come from an increase in soil erosion caused by the destruction of vegetation. Without plant root systems, precipitation runoff will tend to down cut through soils, creating rills, and carrying soils into the streams. Landslides and/or mudslides are more catastrophic erosion effects that may be seen as a result of the destruction of vegetation.

The increased sediment load to the surface water treatment plant will likely cause greater maintenance effort, and at times may cause temporary shutdown of the plant during precipitation events and heavy runoff periods. Landslides and/or mudslides would likely create the same effects, but may have the potential for longer-term disruption of operations if they occur in the stream bottoms.

An increase in pH in the surface waters may occur as ash from the fire is incorporated into runoff. This change in chemistry is likely to be of a relatively short duration, and the potential effect on water treatment plant is unknown.

Groundwater supplies may be impacted by a decrease in precipitation infiltration (area recharge) throughout the burned areas, which would reduce the recharge to the Eagle Valley aquifer system. The Eagle Valley aquifer system is recharged primarily by infiltration in the Carson Range and by range front recharge where creeks drain the Carson Range. Two factors may combine to decrease infiltration: canalization of precipitation, which tends to remove water before it can infiltrate, and the creation by the fire of hydrophobic soil conditions, which could in turn exacerbate erosion.

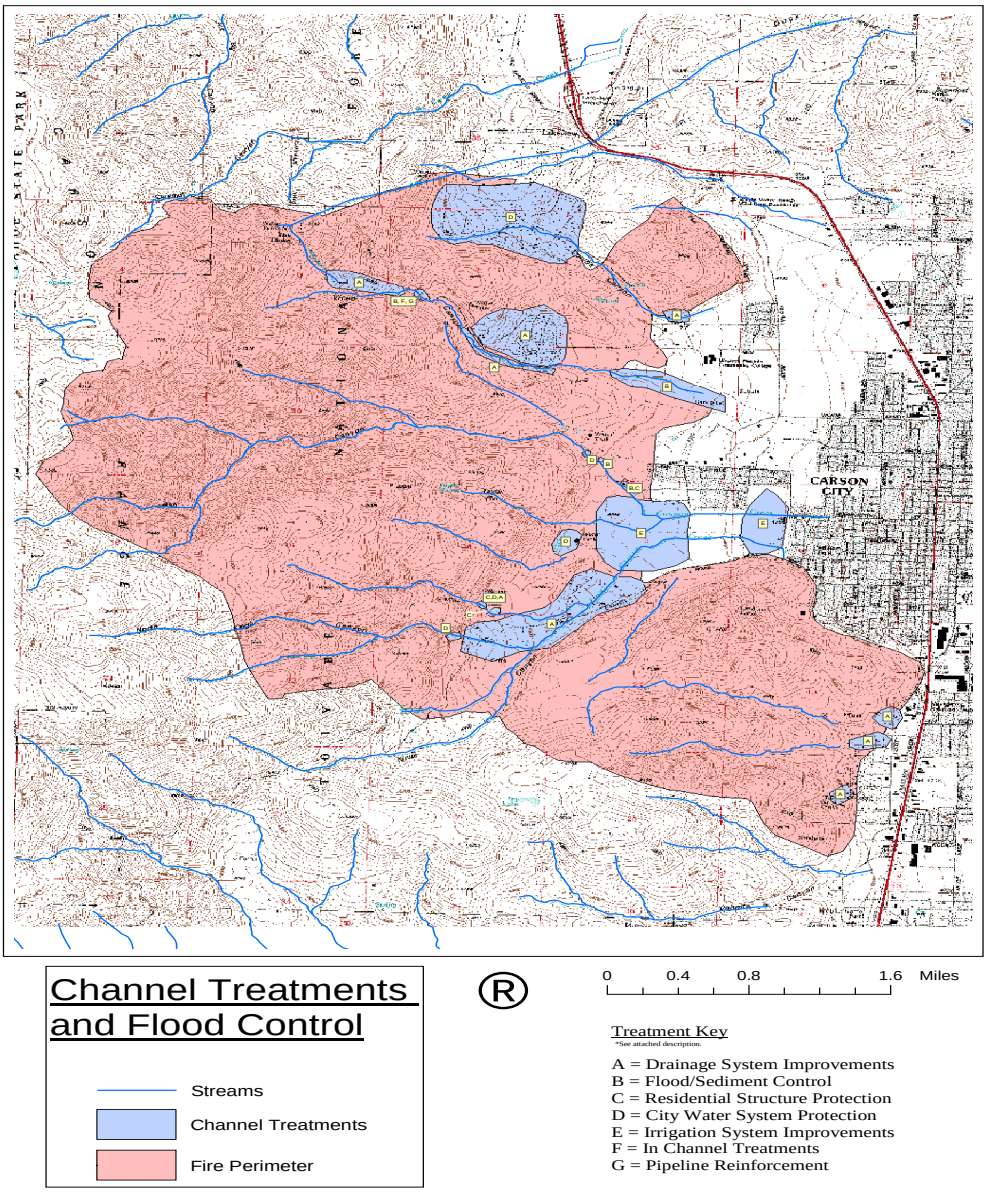
Sedimentation caused by the fire may also reduce the infiltration capacity of the Vicee Canyon recharge basins by plugging the sands with fine-grained material. Other debris carried downstream during major precipitation events may also interrupt operations at the recharge facility.

Probably the most effective means of reducing the impact of the Waterfall Fire on Carson City water supplies is to mitigate erosion in the watersheds. This can be accomplished through extensive re-vegetation efforts and the use of best management practices (BMPs) to control

runoff. The watersheds should be surveyed to determine where erosion control efforts should be concentrated, including locations where steep hillsides coincide with highly erodable soils.

The map below illustrates the burn area of the Waterfall fire and the recommended channel treatment areas.

Figure 5-12. Carson City Waterfall Fire Channel Treatment & Flood Control



Source: Carson City; Burned Area Emergency Response Team (BAER) report, 7/27/2004, Recommended Channel Treatment and Flood Control for the Water Fall Fire Burn Area

Recommended "Channel Treatment & Flood Control" for the Water Fall Fire Burn Area

Other sources of concern include threats to ground water. If the surface water is not accessible by Carson City ground water will be used. Some of the typical threats associated with this include overdraft, drawdown and subsidence.

Overdraft occurs when groundwater is removed faster than recharge can replace it. This can result in

- A permanent loss of a portion of its storage capacity
- A change that can cause water of unusable quality contaminate good water. In coastal basins, salt water intrusion can occur.

Generally, any withdrawal in excess of safe yield (the amount that can be withdrawn without producing an undesirable result) is an overdraft.

Drawdown differs significantly from overdraft. It results in a temporarily lowered water table generally caused by pumping. In this situation, the water table recovers when the supply is replenished.

Subsidence is one of the dramatic results from over-pumping. As the water table declines, water pressure is reduced. This causes the fine particles that held water to become compacted. In addition to permanently reducing storage capacity, the land above the aquifer can sink ... from a few inches to several feet ... causing a sinkhole. This can damage property and fields.

Inorganic compounds, pathogens and organic compounds can harm water quality, affecting the health of humans, fish and wildlife. Scientists continually learn more about contaminants, their sources and prevention practices.

Each state is responsible for designating uses for groundwater, surface waters, wetlands, etc. Designated uses include fishable, swim able, drinkable, recreational, agricultural, aquatic life, and more. Each state is also responsible for developing water quality standards for each use. For example, while most rivers are designated to be used for fishing, a few river sections are designated to be used for drinking water. The same is true for groundwater. Uses are defined and standards identified. A few groundwater uses and standards are:

- Drinking water
- Meet maximum contaminant level for pollutants
- Industrial process
- Quality & quantity criteria
- Stream base flow
- Discharge quantity & quality

Note that, for most groundwater uses, quality and quantity are important, while for surface water uses, generally quality is the primary concern (with the realization the quantity affects quality).

Inorganic Compounds include all compounds that do not contain carbon. Nutrients (nitrogen and phosphorus) and heavy metals are two examples.

- *Nitrates* can cause problems in drinking water or marine waters

- *Phosphorus* can reduce uses of fresh surface waters
- *Heavy metals* include selenium, arsenic, iron, manganese,sulfur, cadmium and chromium and others. Some (iron,manganese and arsenic) occur naturally

Pathogens, including bacteria and viruses, have been credited with causing more than 50% of the waterborne disease outbreaks in the U.S. *Cryptosporidium Parvum* and *Giardia* both commonly cause illnesses when consumed.

Organic Compounds include Volatile Organic Compounds (VOCs) like benzene, toluene, xylene; semi-volatile compounds like napthaline and phenol; PCBs and pesticides.

Potential Sources

Point sources are easily identified because they usually come out of a "pipe." Examples include sewage treatment plants, large injection wells, industrial plants, livestock facilities, landfills, and others. Regulated by the state water quality agency and the U.S. EPA, point sources are issued a National Pollutant Discharge Elimination System (NPDES) permit when they meet regulations.

Many point sources were established generations ago, before the threat they posed was understood. Some of these sources have been "grandfathered" into compliance with some regulations. Thus, you may find some point sources located in areas that would be considered inappropriate now.

Nonpoint sources refer to widespread, seemingly insignificant amounts of pollutants which, cumulatively, threaten water quality and natural systems. Examples of nonpoint sources include septic systems, agriculture, construction, grazing, forestry, recreational activities, careless household management, lawn care, and parking lot and other urban runoff.

Nonpoint sources are not required to have a permit. Individually, each may not be a serious threat, but together they may be a significant threat.

Other sources that aren't classified under point or nonpoint sources include underground petroleum storage systems and many large and small businesses like dry cleaners, restaurants, and automotive repair shops. Although a large number of underground storage tanks have been removed or upgraded, a significant number remain. Businesses can threaten groundwater with a wide variety of potentially contaminating substances.

Table 5-14. Groundwater Contaminant Sources

Source	Contaminant
Salting practices & storage	Chlorides
Snow dumping	Chlorides
Agricultural fertilizers	Nitrates
Manure handling	Nitrates, pathogens
Home fertilizer	Nitrates
Septic systems	Nitrates, pathogens
Urban landscapes	Hydrocarbons, pesticides, pathogens
Agricultural dealers	Hydrocarbons, pesticides, nitrates
Agricultural feedlots	Nitrates, pathogens
Solid waste landfills	Hazardous materials
Industrial uses RCRA 'C'	Hazardous materials
Industrial uses RCRA 'D'	Hazardous materials
Small quantity generators	Hazardous materials
Households	Hazardous materials
Gas stations	Hydrocarbons
Auto repair shops	Hydrocarbons
Recycling facilities	Hydrocarbons
Auto salvage yards	Hydrocarbons
Underground storage tanks	Hydrocarbons
Industrial floor drains	Hydrocarbons
Injection wells	Hydrocarbons
Junkyards	Hydrocarbons

5.2.12 Volcanic Activity

Planning Significance - Moderate

5.2.12.1 Nature

A volcano is an opening, or rupture, in a planet's surface or crust, which allows hot, molten rock, ash and gases to escape from below the surface. Volcanic activity involving the extrusion of rock tends to form mountains or features like mountains over a period of time.

Volcanoes are generally found where tectonic plates pull apart or come together. By contrast, volcanoes are usually not created where two tectonic plates slide past one another. Volcanoes can also form where there is stretching and thinning of the earth's crust (called "non-hotspot intra plate volcanism"), such as in the Rio Grande Rift in North America.

5.2.12.2 History

There is a history of ancient volcanic action in State of Nevada; however, the risk is not considered significant within the State's geographic area. Volcanic activity surrounding the State of Nevada could potentially cause some ash fall over portions of the State. However this is predicted to cause little or no damage or significant disruptions. There is no immediate indication of renewed volcanic activity in State of Nevada. (U.S. Geological Survey)

5.2.12.3 Location, Extent, and Probability of Future Events

Any volcanic activity that produces ash would impact Carson City's water for a short period of time. The probability is very low of an event occurring. The following Forum Report was made available to the Hazard Mitigation Steering Committee on volcanic hazard risks in Nevada from the Nevada Bureau of Mines and Geology.

Volcanic Hazards

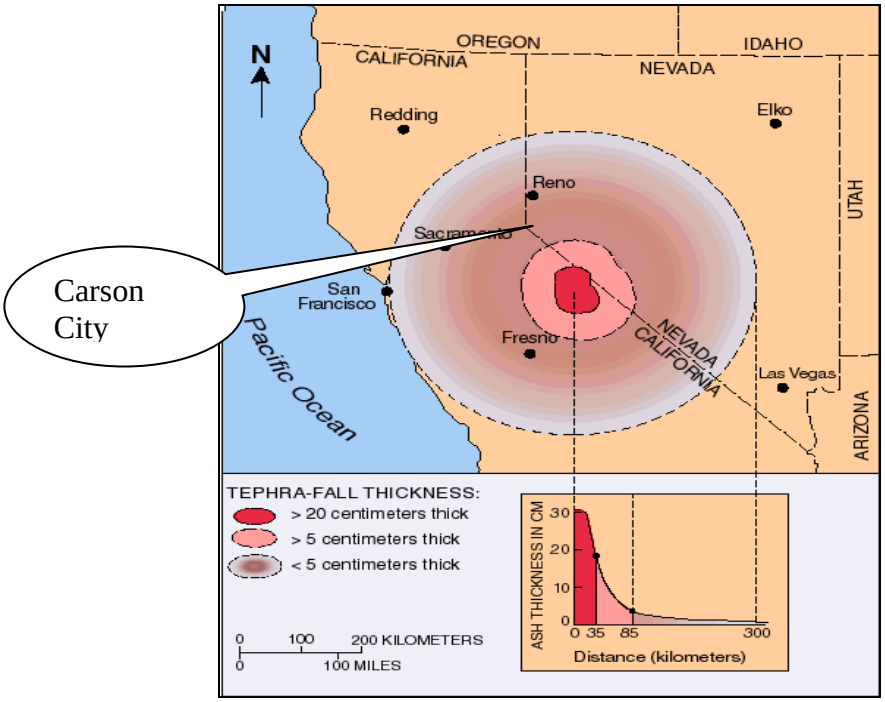
Jon Price, State Geologist and Larry Garside, Research Geologist, Nevada Bureau of Mines and Geology. 6/04/02

"The most likely volcanic hazard for Nevada is an eruption from the Mono Craters area near Lee Vining and Mono Lake in Eastern California. Small eruptions from thee volcanoes have sent ash into Nevada as recently as about 260 years ago. Other volcanoes that could deposit ash in Nevada include Mount Lassen, Mount Shasta and the Long Valley Caldera in California and volcanoes in the Cascade Mountains in Oregon.

The biggest threat for Nevada from eruptions in California and Oregon is damage to flying aircraft. Ash from eruptions in California or Oregon is not likely to cause long-term problems in Nevada, because the ash deposits are likely to be thin, typically only a few inches thick at most.

A massive eruption from the Long Valley Caldera near Mammoth Lakes, California over 700,000 years ago devastated a considerable area in Owens Valley when thick, hot flows of ash were deposited as far south as Bishop. Air-fall ash from these eruptions did collect as thick piles of ash in parts of Nevada, and some of the ash may have been hot enough or thick enough to devastate the landscape locally. Scientist would expect to see strong indications from seismographs before another eruption of this magnitude. The U.S. Geological Survey continues to monitor the area around Mammoth Lakes, and will issue warnings prior to any subsurface changes that could precede a major eruption. Below please see the volcanic ash dispersal map for the Long Valley Caldera. "

Figure 5-13. Volcanic Ash Dispersal Map for the Long Valley Caldera



Source: USGS Volcano hazards program; C.D. Miller, J. Johnson; http://lvo.wr.usgs.gov/zones/TephraFall.html

Eruptions inside Nevada are not likely in the near future, judging from past activity and lack of earthquakes that would suggest current movement of magma. This opinion may change if seismic signals indicate possible movement of magma in the future. Our ability to monitor small tremors associated with magma at depth is limited by the currently limited number of seismographs that are operated in Nevada. The Nevada Seismological Laboratory and the U.S. Geological Survey have joint responsibilities for earthquake monitoring and warnings. The Advanced National Seismic System, which is authorized by Congress but currently has been funded at only a fraction of its intended size, will help to monitor for earthquakes and pending volcanic eruptions.

The Soda Lake and Little Soda Lake (near Fallon in Churchill County) maars (volcanoes that form by explosions when magma rises near the surface of the earth and boils the groundwater) are probably the youngest volcanoes within the borders of the State. They have not erupted in recorded history, although they definitely are younger then the last high stand of Lake Lahontan, about 13,000 years ago because deposits from these volcanoes overlie sediments deposited in the lake. On the basis of preliminary helium isotopic studies (Thure Cerling, University of Utah, personal communication, 1997), the eruption at Soda Lake may be younger then 1,500 years before present.

Other relatively young volcanoes occur in the Crater Flat – Lunar Crater Zone, Nye County, which includes basaltic volcanoes ranging in age from about 38,000 to 1 million years old (Smith, E.I. Keenan, D.L., Plank, T. 2002, Episodic Volcanism and Hot Mantle: Implications for Volcanic Hazard Studies at the Proposed Nuclear Waste Repository at Yucca Mountain, Nevada:

GSA Today, v.12, no.4, p. 4-10); in Clayton Valley, near Silver Peak in Esmeralda County; near Winnemucca in Humboldt County; and near Reno in Storey County. Most of these are basaltic volcanoes, which typically form small cinder cones and small lava flows. There are also some one million-year-old rhyolitic lava flows in the Reno area near Steamboat Hot Springs, but volcanoes in this area are thought to be extinct.

5.2.13 Wildland Fire

Planning Significance - High

5.2.13.1 Nature

A wildland fire is a type of wildfire that spreads through consumption of vegetation. It often begins unnoticed, spreads quickly, and is usually signaled by dense smoke that may be visible from miles around. Wildland fires can be caused by human activities (such as arson or campfires) or by natural events such as lightning. Wildland fires often occur in forests or other areas with ample vegetation. In addition to wildland fires, wildfires can be classified as urban fires, interface or intermix fires, and prescribed fires.

The following three factors contribute significantly to wildland fire behavior and can be used to identify wildland fire hazard areas.

- **Topography:** As slope increases, the rate of wildland fire spread increases. South-facing slopes are also subject to more solar radiation, making them drier and thereby intensifying wildland fire behavior. However, ridge tops may mark the end of wildland fire spread, since fire spreads more slowly or may even be unable to spread downhill.
- **Fuel:** The type and condition of vegetation plays a significant role in the occurrence and spread of wildland fires. Certain types of plants are more susceptible to burning or will burn with greater intensity. Dense or overgrown vegetation increases the amount of combustible material available to fuel the fire (referred to as the "fuel load"). The ratio of living to dead plant matter is also important. The risk of fire is increased significantly during periods of prolonged drought, as the moisture content of both living and dead plant matter decreases. The fuel's continuity, both horizontally and vertically, is also an important factor.
- **Weather:** The most variable factor affecting wildland fire behavior is weather. Temperature, humidity, wind, and lightning can affect chances for ignition and spread of fire. Extreme weather, such as high temperatures and low humidity, can lead to extreme wildland fire activity. By contrast, cooling and higher humidity often signals reduced wildland fire occurrence and easier containment.

The frequency and severity of wildland fires also depends upon other hazards, such as lightning, drought, and infestations. If not promptly controlled, wildland fires may grow into an emergency or disaster. Even small fires can threaten lives and resources and destroy improved properties. In addition to affecting people, wildland fires may severely affect livestock and pets. Such events may require emergency watering/feeding, evacuation, and shelter.

The indirect effects of wildland fires can be catastrophic. In addition to stripping the land of vegetation and destroying forest resources, large, intense fires can harm the soil, waterways, and

the land itself. Soil exposed to intense heat may lose its capability to absorb moisture and support life. Exposed soils erode quickly and enhance siltation of rivers and streams, thereby increasing flood potential, harming aquatic life, and degrading water quality. Lands stripped of vegetation are also subject to increased debris flow hazards, as described above.

5.2.13.2 History

Nevada averages 1022 wildland fires per year that consume over 675,194 acres based upon current ten year average. Of the 900,498 acres burned during a normal year like 2007, 76 were large fires of 300+ acres, consuming a total of 95% of the total acres burned. This information was obtained by the Department of Conservation and Natural Resources, Nevada Division of Forestry from the Western Great Basin Intelligence Reports.

As shown in Table 5-14, there have been a number of moderate wildland fires recorded in Carson City over the past ten years. Approximately 10 percent of these fires were due to lightning, while humans and unknown causes make up the remaining 90 percent of ignition sources.

Table 5-15. Nevada & Carson Summary of Fire History Data, 1999-2009

Year	Number of Wildland Fire Ignitions Carson City	Carson City Total Wildland Fire Acreage	NV Total Wildland Fire Acreage
1999	59	Not Available	1,575,956
2000	48	Not Available	699,210
2001	35	Not Available	654,253
2002	52	2,000	77,551
2003	41	200	17,546
2004	43	10,000 (Total) Waterfall Fire* 8,799	40,950 (Total) - Waterfall Fire 8,799
2005	44	6,500	1,032,104
2006	49	250	1,348,871
2007	57	150	900,498
2008	32	<50	71,930
2009	15	<50	33,365

Source: Nevada Division of Forestry, Carson City Fire Department
**Additional Information on the 2004 Waterfall Fire can be found in Section 5.2.11, Utilities.*

5.2.13.3 Location, Extent, Probability of Future Events

Communities in Carson City have a varying degree of risk from Wildfire. This risk is varied, largely due to past fire activity and the type of moisture received during the winter months. Lengthy rainy seasons tend to increase the production of grasses which can create fast moving fires in the brush and grass areas of Carson City. Drought seasons tend to decrease the fuel moisture in the large fuels (trees and large brush) and create high output BTU fires that are difficult to control and can extend for days.

Depending upon the type and amount of moisture received the risk to a given community in Carson City can change from season to season. Carson City has developed a Community Wildfire Protection Plan to help guide the community and its residents on where and how to

focus fuel reduction efforts. The Community Wildfire Protection Plan generally speaks to protecting the built environment from the threats of wildland fire.

Based on historical records, Carson City can anticipate nearly 50 wildland fire starts per year. While a very small percentage of these (less than 2%) will exceed 100 acres, the potential for destructive fires is evident every fire season. See Appendix B, Figure B-10.

A vulnerability analysis predicts the extent of exposure that may result from a hazard event of a given intensity in a given area. The analysis provides quantitative data that may be used to identify and prioritize potential mitigation measures by allowing communities to focus attention on areas with the greatest risk of damage. A vulnerability analysis consists of the following six steps: assets inventory, methodology, data limitations, exposure analysis, and summary of impacts. Land use and development trends are not discussed in this version of the HMP.

6.1 ASSET INVENTORY

Asset inventory is the first step of a vulnerability analysis. Assets within each community that may be affected by hazard events include population, residential and non residential buildings, and critical facilities and infrastructure. Assets and insured values throughout the City are identified and discussed in detail below.

6.1.1 Population and Building Stock

Population data for the City was obtained from the NV State Demographer and verified from the 2000 U.S. Census and shown in Table 6-1. The Nevada State Demographer's Office maintains annual population estimates by county. Estimated numbers and replacement values for residential and nonresidential buildings, as shown in Table 6-1, were obtained from the City Assessor's office and were verified by photo and by parcel data. To achieve a value, the net assessed value was increased by 20% to get current market value.

The residential buildings considered in this analysis include single-family dwellings, mobile homes, multi-family dwellings, temporary lodgings, institutional dormitory facilities, and nursing homes. Nonresidential buildings were also analyzed including commercial, industrial, agricultural, government, educational, and religious centers.

The HAZUS-MH 2009 run for earthquake by the Bureau of Mines & Geology, UNR, was reviewed the HAZUS-MH software presents a data limitation by which this software identifies nonresidential buildings by square footage resulting in some nonresidential buildings not being counted. Additionally, the City's Assessor Office supplied residential and non-residential costs as much higher than the HAZUS-MH software and it was determined by the Committee Chair to use the Assessor's values. The building count was verified by photo and parcel data from the Assessor's Office. The buildings' values were calculated by adding 20% to the net assessed value of buildings to get the market value. This was done by Ken Shannon from Carson City Public Works. Un-reinforced masonry (URM) building information was obtained from Wayne Carlson and Advanced Data Systems, Inc.

Although the building count or value may not be precise, whether residential or nonresidential, this analysis will meet the intention of DMA 2000 by providing Carson City residents with an accurate visual representation of their community's risk by hazard. This data is the most complete dataset available at the time and will be updated in future version of the HMP.

Table 6-1. Estimated Population and Building Inventory

Population		Residential Buildings		Nonresidential Buildings	
2000 Census Population Count	NV Demographer Projected 2009 Population	Total Building Count	Total Value of Buildings (in millions)	Total Building Count	Total Value of Buildings (in millions)
52,457	57,600	20,409	5,880	1918	2,271

Source: *U.S. Census 2000 population data, http://censtats.census.gov/data/NV/05032510.pdf , State of Nevada Demographer, Carson City Assessor's Office, Carson City Public Works*

6.1.2 Critical Facilities and Infrastructure

A critical facility is defined as a public or private facility that provides essential products and services to the general public, such as preserving the quality of life in the City and fulfilling important public safety, emergency response, and disaster recovery functions. They include:

- 1 sheriff station
- 3 fire stations (includes ambulance facilities & local EOC)
- 1 emergency operation centers (EOCs)
- 11 public primary and secondary schools (3 schools designated as shelters)
- 1 hospital w/emergency room & urgent care
- 2 urgent care facilities
- 6 communication facilities
- 60 state owned facilities (capital buildings)
- 1 state military government facility (national guard)

Similar to critical facilities, critical infrastructure is defined as infrastructure that is essential to preserving the quality of life and safety in the City. Critical infrastructure includes:

- 45 miles of State and Federal highways
- 1 airport facilities
- 8 bridges
- 1,714 miles of pipe (utilities)

The City's critical facilities are listed in Table 6-2 and shown, see Appendix B, Figure B-7, Critical Facilities; NV State buildings are not included.

Table 6-2. Critical Facilities and Infrastructure

Category	Type	Number	Estimated Value Per Structure/Mile (millions of $)
Critical Facilities	Sherriff Stations	1	36
	Fire Stations	3	27
	EOCs	1	10.5

Table 6-2. Critical Facilities and Infrastructure

Category	Type	Number	Estimated Value Per Structure/Mile (millions of $)
	Public Primary and Secondary Schools	11	169
	Hospital w/Emergency Room	1	130
	Urgent Care Facilities	2	10
	Ambulance Facilities	3	Included in fire station
	Communication Facilities	6	.10
	State Owned Critical Buildings	60	447
Critical Infrastructure	State and Federal Highways (miles)	45	192.30
	Airport Facilities	1	39.80
	Bridges	8	3.9
	Utilities (Water, Waste Water, Gas, Electrical)	n/a	106.90

Source: FEMA HAZUS-MH, Carson City Fire Department, NV Division of Emergency Management, Carson-Tahoe Regional Healthcare, CC School District, NV State Dept of Risk Mgmt.

6.2 METHODOLOGY

A conservative exposure-level analysis was conducted to assess the risks of the identified hazards. Hazard areas were determined using information provided by the U.S. Seasonal Drought Monitor, EPA, HAZUS, Nevada Bureau of Mines and Geology, and NWS. This analysis is a simplified assessment of the potential effects of the hazard on values at risk without consideration of probability or level of damage.

Using GIS, the building footprints of critical facilities were compared to locations where hazards are likely to occur. If any portion of the critical facility fell within a hazard area, it was counted as impacted. Using census block level information, a spatial proportion was used to determine the percentage of the population and residential and nonresidential structures located where hazards are likely to occur. Census blocks that are completely within the boundary of the hazard area were determined to be vulnerable and were totaled by count. A spatial proportion was also used to determine the amount of linear assets, such as highways and pipelines, within a hazard area. The exposure analysis for linear assets was measured in miles. For drought, population was the only asset analyzed, as drought mainly affects people and agricultural lands (which were not considered in this version of the HMP).

Replacement values or insurance coverage were developed for physical assets. These values were obtained from the City's Assessor's Office, Public Works, NV State Risk Management and HAZUS-MH 2009 run. For facilities that did not have specific values per building in a multi-building scenario (e.g., schools), the buildings were grouped together and assigned one value. For each physical asset located within a hazard area, exposure was calculated by assuming the worst-case scenario (that is, the asset would be completely destroyed and would have to be replaced). Finally, the aggregate exposure, in terms of replacement value or insurance coverage, for each category of structure or facility was calculated. A similar analysis was used to evaluate the proportion of the population at risk. However, the analysis simply represents the number of people at risk; no estimate of the number of potential injuries or deaths was prepared.

6.3 DATA LIMITATIONS & FUTURE DEVELOPMENT

The vulnerability estimates provided herein use the best data currently available, and the methodologies applied result in an approximation of risk. These estimates may be used to understand relative risk from hazards and potential losses. However, uncertainties are inherent in any loss estimation methodology, arising in part from incomplete scientific knowledge concerning hazards and their effects on the built environment, as well as approximations and simplifications that are necessary for a comprehensive analysis.

The resulting analysis was complied to the highest degree possible with the hardware, software and data availability limitations discovered during plan preparation. HAZUS was able to determine the population and critical facilities within a given hazard area and from there a limited assessment was derived. In the situation of Drought & Epidemic, where structures would not usually be affected the term N/A (not applicable) is used.

It is also important to note that the quantitative vulnerability assessment results are limited to the exposure of people, buildings, and critical facilities and infrastructure to a hazard. It was beyond the scope of this HMP to develop a more detailed or comprehensive assessment of risk (including annualized losses, people injured or killed, shelter requirements, loss of facility/system function, and economic losses). Such impacts may be addressed with future updates of the HMP.

6.3.1 Future Development

Caron City has historically low growth with an average of 1% per year for population. During 2009 and 2010 the State Demographer estimated a decrease in population growth with growth expected to reach 2008 levels in 2015 and then a 1% per year increase starting in 2016. As discussed in at the end of Section 3 – Community Description there are several ranches which have growth potential. The City Planning Department has approved 2000 single-family sub-divided lots, however build out is not expected within the next 10 years and no start date is in the foreseeable future. There are no plans for a significant employer to move to the City and the City Planning Department only has one commercial project that it is in the planning stage, the City Library building and a 100,000 square foot technology and retail space downtown. It is unclear when this building may start. Future non-residential growth is also connected to state growth overall since Carson City is the state capitol. However, population growth for the overall state is down and with the state facing a major budget shortfall this year all projects are currently under review. For critical infrastructure Highway 395, is expected to extend from Fairview Drive and connect with Highway 50. This will include two bridges for overpass. However, it will incorporate existing or future building codes and regulations that include mitigation measures and does not pose a significant vulnerability.

The population decline and economic issues for the State of Nevada are having enormous impacts on residential and non-residential growth. For the purposes of this plan significant growth over the next five years is not expected, growth from 2016 to 2020 is expected at less than 1%. Therefore the numbers and values of the Figures in the Table 6-3 and 6-4 below are viewed as accurate. During the plan maintenance activities this should be reviewed and during the next plan update process growth can be revisited.

6.4 EXPOSURE ANALYSIS

The requirements for a risk assessment, as stipulated in the DMA 2000 and its implementing regulations, are described below.

DMA 2000 Requirements: Assessing Vulnerability, Overview

Assessing Vulnerability: Overview

Requirement §201.6(c)(2)(ii): [The risk assessment shall include a] description of the jurisdiction's vulnerability to the hazards described in paragraph (c)(2)(i) of this section. This description shall include an overall summary of each hazard and its impact on the community.

Element

- Does the new or updated plan include an overall summary description of the jurisdiction's vulnerability to each hazard?
- Does the new or updated plan address the impact of each hazard on the jurisdiction?

Source: FEMA 2008.

DMA 2000 Recommendations: Assessing Vulnerability, Identifying Structures

Assessing Vulnerability: Identifying Structures

Requirement §201.6(c)(2)(ii)(A): The plan should describe vulnerability in terms of the types and numbers of existing and future buildings, infrastructure, and critical facilities located in the identified hazard area.

Element

- Does the new or updated plan describe vulnerability in terms of the types and numbers of existing buildings, infrastructure, and critical facilities located in the identified hazard areas?
- Does the new or updated plan describe vulnerability in terms of the types and numbers of future buildings, infrastructure, and critical facilities located in the identified hazard areas?

Source: FEMA 2008.

DMA 2000 Recommendations: Assessing Vulnerability, Estimating Potential Losses

Assessing Vulnerability: Estimating Potential Losses

Requirement §201.6(c)(2)(ii)(B): [The plan should describe vulnerability in terms of an] estimate of the potential dollar losses to vulnerable structures identified in paragraph (c)(2)(i)(A) of this section and a description of the methodology used to prepare the estimate.

Element

- Does the new or updated plan estimate potential dollar losses to vulnerable structures?
- Does the new or updated plan reflect changes in development in loss estimates?
- Does the new or updated plan describe the methodology used to prepare the estimate?

Source: FEMA 2008.

The results of the exposure analysis are summarized in Tables 6-3 and 6-4 and in the discussion below. The results in this exposure analysis were greatly affected by the hardware, software and data availability limitations described above.

Table 6-3. Potential Hazard Vulnerability Assessment – Population and Buildings

Hazard	Population[4]	Buildings			
		Residential		Nonresidential	
	Number	Number[3]	Value ($)[1]	Number[3]	Value ($)[1]
Total for Carson City	57600	20409	5,880,094	1918	2,271,389
Avalanche	0	0	0	0	0
Drought	57600	20409	N/A	1918	N/A
Earthquake – 100yr Magnitude 6.5[2]	57600	7551	2,175,634	710	840,414
Epidemic	57600	N/A	N/A	N/A	N/A
Flood - 100-Year Flood Zone	18952	1698	556,280	174	817,565
Hazardous Materials Event – 1-mile radius EHS facilities 10% of 95%	5472	1938	558,609	182	215,782
Hazardous Materials Event – 1-mile radius hazardous facilities 5% of 95%	2736	969	279,305	86	107,891
Hazardous Materials Event – 1-mile buffer transport corridors 5% of 95%	2736	969	279,305	86	107,891
Severe Weather – High – 25% of population & .5% buildings	14,400	102	29,400	10	11,357
Landslide	10	5	1,450,000	0	0
Seiche	0	0	0	0	0
Terrorism 25%	14400	9525	1,550,410	1358	833,824
Utility Loss	57600	38100	N/A	5431	N/A
Wildland Fires - Extreme	11632	2423	705,611	504	613,275
Volcano/Ash	57600	38100	N/A	5431	N/A

[1] Value = Estimated Market value (x1000) Data acquired from Carson City Assessor's Office

[2] Data acquired from Nevada Bureau of Mines and Geology Open-file Report 09-8, HAZUS-MH

[3] Data acquired from Carson City Assessor's Office.

N/A = Not Applicable

[4] Data source Nevada State Demographer

Table 6-4. Potential Hazard Vulnerability Assessment – Critical Facilities

	Police Stations (1)		Fire Station/EOC Ambulance (3)		Hospital/Urgent Care Facilities (3)		Schools (11)		Communication Facilities (6)		Water / Sewer Facilities (2)	
Hazard	**Number**	**Value ($)[1]**	**Number**	**Value ($)[1]**	**Number**	**Value ($)[1]**	**Number**	**Value ($)[1]**	**Number**	**Value ($)[1]**	**Number**	**Value ($)[1]**
Avalanche	0	0	0	0	0	0	0	0	0	0	0	0
Drought	0	0	0	0	0	0	0	0	0	0	0	0
Earthquake - 100yr Magnitude 6.5[2]	1	13,000	3	8,000	4	400,000	2	300,000	6	15,000	2	109,000
Epidemic	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Flood - 100-Year Flood Zone	0	0	1	2,500	2	500	2	5,700	0	0	2	50,000
Hazardous Materials Event – 1-mile radius EHS facilities	1	130	3	8000	2	500	12	5,700	1	300	2	N/A/
Hazardous Materials Event – 1-mile buffer transport corridors	1	130	3	8000	4	500	12	5,700	1	300	2	N/A/
Landslide	0	0	0	0	0	0	0	0	0	0	0	0
Seiche	0	0	0	0	0	0	0	0	0	0	0	0
Severe Weather	0	0	0	0	1	250	0	0	1	300	2	50,000
Terrorism	1	3,750	3	8,000	4	1,000	12	5,700	6	15,000	2	50,000
Utility Loss	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Wildland Fire	0	0	0	0	1	100,000	1	50,000	1	1,000	1	23,000
Volcano/Ash	0	0	0	0	1	200	12	500	0	0	2	200
Total	**1**		**3**		**4**		**12**		**6**		**2**	

[1] Value = Estimated Market value (x1000)

[2] Data acquired from Nevada Bureau of Mines and Geology Open-file Report 09-8, HAZUS-MH with additions estimated by Planning Committee, Carson City School District, and Carson Tahoe Hospital.

N/A = Not Applicable

6.4.1 Avalanche

Only the high elevations which get large amounts of snow fall each year are at risk to Avalanche. None of the population or buildings including critical facilities are at risk to this hazard. The highway and utility lines are at low risk however there are alternate routes and utility lines that could be used.

6.4.2 Drought

According to the U.S. Seasonal Drought Monitor, the entire area of the City is at equal risk to a drought event. The entire population of Carson City, 57,600, may be affected by the drought however building and critical facilities would just be limited in their use but would not be damaged.

6.4.3 Earthquakes

Using HAZUS-MH earthquake perimeters of a 100-year 6.5 magnitude event, 37% of the buildings will be at least moderately damaged. This includes the addition of all structures including sheds, carports, detached garages and other auxiliary buildings. The 37% estimated damages sustained from moderate to severe could be up to 7,551 residential buildings (worth $2.175 billion), and 710 non-residential buildings (worth $840 million) all within close proximity to fault lines.

Although the HAZUS run indicated that only one school would be affected, the Planning Committee determined that due to the proximity of the faults that numerous critical facilities are at risk to perceived severe shaking; they include: One sheriff station valued at $13M , three first-responder buildings (Fire) valued at $8M; one hospital and three urgent care facilities valued at $400M; two schools valued at $300M , six communication facilities valued at $15M , transportation facilities valued at 240.8M and two water/sewer facilities valued at $109M. The entire population of Carson City (57,600) is considered impacted by an earthquake due to potential road and utility damage, critical infrastructure damage leading to reduced services, in addition to building damage.

The percentage of building damage (37%) was obtained from the HAZUS-MH run dated August 14, 2009 from the Bureau of Mines and Geology. The assessor's office total building numbers and values were used instead of the HAZUS estimates. The affected population, building inventories, and values were calculated from the City's Assessors Office and the Nevada State Demographer.

UNR has a contract with Advanced Data Solutions to inventory the un-reinforced masonry buildings within the State. During the writing of this update the data was made available. The report showed that 289 Commercial Buildings (11.6M sq ft) and 160 residential buildings (876K sq ft) were constructed of un-reinforced masonry. These buildings would have significantly more damage during an earthquake than other buildings. Unreinforced masonry buildings accounted for 876K square feet or $101.6M (using $116/sqft) in residential buildings and 11.6M square feet or $2.030B (using $175/sqft) in commercial buildings. The data from the report can be used by the City to identify and target structures for reinforcement. UNR will be using the

data to up-grade information for the HAZUS runs and it is recommended that the City identify these structures on a map for the next HM Plan update.

6.4.4 Epidemics

Epidemic was included as a possible hazard to the citizens of the City. The entire population of Carson City 57,600 may be affected by the illness however building and critical facilities would just be limited in their use but would not be damaged.

6.4.5 Floods

Digital FIRMs were used for the Carson City area to estimate at risk population and buildings. Within the 100-year floodplain area, the population at risk is 18,952 or one-third of the population. Within Carson City, the risk posed by the 100-year flood is high with 1,698 homes within or immediately adjacent to the 100-year floodplain. The exposure to the 1,698 residential buildings are $556 million, exposure to the 174 nonresidential buildings is $817 million, which includes exposure to the following critical facilities – a fire station, ($2.5 million), two urgent care facilities ($500,000), two schools ($5.7 million), two water/sewer facilities ($50 million) and NV State facilities ($116 million). The affected population, building inventories, and values were calculated from the State Demographer and Carson City Assessor's office. The Nevada State Risk Management office supplied values for state buildings within the 100 year flood area. There are no repetitive loss or severe repetitive loss structures (as defined by NFIP) within the 100-year flood plain.

6.4.6 Hazardous Materials Events

Due to the small size of Carson City, ninety-five percent (95%) of the buildings and population reside within the 1-mile buffer around the identified hazardous sites, see Figure B-3 and may overstate the exposure since the probability of multiple adjacent facilities having an event simultaneously is very low. Therefore, the City Public Works and Fire Department, estimated that 10% of the population (5,472) and buildings (residential $558 million and non-residential $216 million) which are within the 1-mile buffer may be affected for EHS but only 5% would be affected for other hazardous waste facilities. Within the 1-mile buffer around the transportation corridors are 45,995 people 33,948 residential buildings (worth $5.04 billion), 5,204 nonresidential buildings (worth $2.26 billion), and 22 critical facilities (worth $14.6 million). These figures are for the entirety of the transportation corridors. Therefore, these figures overstate the exposure since a hazardous materials event along the corridors is unlikely to affect all of the area within the 1-mile buffer. Therefore the figure of 5%, of the 95% population, (2,736) and buildings (969 residential $279 million and 86 non-residential at $107 million) within the affected area was used. The affected population, building inventories, and values were calculated from the City's Assessors Office information using GIS mapping for the percentage affected.

6.4.7 Landslide

The landslide area could affect approximately 100 residential buildings and 0 commercial buildings, however landslide is usually limited to a specific area and these figures overstate the

exposure. Therefore 5% was used to represent those structures that are at risk which include 5 residential buildings worth $1.4M with 10 people exposed. There are no critical facilities within the landslide area.

6.4.8 Seiche

Only those areas of Carson City near Lake Tahoe are at risk and there are no buildings or critical facilities in that area. The highway and utility lines are at low risk however there are alternate routes and utility lines that could be used.

6.4.9 Severe Weather

Using winter storm data provided by the NWS, risk posed by winter storms were calculated for the City. All population and buildings are within the sever winter storm hazard area however homes and buildings within Carson City are built to withstand a degree of severe weather. The Planning Committee determined that a severe winter storm or wind event may affect 25% of population (due to road closures) and .5% of the buildings which are 14,400 people, 102 residential buildings (worth $29 million), ten nonresidential buildings (worth $11 million) which include four critical facilities (worth $6 million). The affected population, building inventories, and values were calculated from the Nevada State Demographer and the City's Assessors office.

6.4.10 Terrorism

Due to the small size of the City and the varied number and potential extent of a terrorism event it was difficult to determine the extent of damage. The Planning Committee agreed on an estimate of 25% of the total population and buildings which are 14,400 people, 9,525 residential buildings (worth $1.55 billion), 1,301 nonresidential buildings (worth $834 million) which include state buildings, and four critical facilities (worth $6 million). The high figure was used with the consideration that the area is the State Capitol and therefore a greater potential of terrorism. The affected population, building inventories, and values were calculated from the Nevada State Demographer and the City's Assessors office.

6.4.11 Utilities

Utility loss was included as a possible hazard to the citizens of the City. The entire population of Carson City, 57,600 persons, would be affected by the loss however buildings and critical facilities would just be limited in their use not damaged. The hospital has back up generators along with some of the state buildings including the EOC and national guard buildings.

6.4.12 Wildland Fires

According to the Nevada Community Wildfire Risk/Hazard Assessment Project for Carson City, the risk posed by wildland fire is rated moderate. The smaller neighborhood of Clear Creek is categorized as high hazard if evaluated separately. Exposed within this moderate and high wildland fire hazard area, are 11,632 people, 2,423 residential buildings (worth $705 million), 504 nonresidential buildings (worth $613 million). The critical facilities are one hospital ($100 million), one school ($50 million), one communication facility ($1 million) and one water/sewer

facility ($23 million). The affected population, building inventories, and values were calculated from the Nevada State Demographer and the City Assessor's office.

6.4.13 Volcano

The volcano risk is mainly due to ash fall out from a volcano in the Mammoth, CA area to the south. Although the total population (57,600) is at risk to illness from ash in the air, the damage to buildings is limited to ventilation systems which may be contaminated from the ash and need replacement. The critical facilities included the hospital ($200,000) and the 12 schools ($500,000), which may have damage to their HVAC systems and the sewer/water facility of $200,000 for debris removal costs. The affected population, building inventories, and values were calculated from the Nevada State Demographer, the City Assessor's office and Carson Tahoe Hospital.

6.5 REPETITIVE LOSS PROPERTIES

The requirements for a risk assessment, as stipulated in the DMA 2000 and its implementing regulations, are described below.

DMA 2000 Requirements: Assessing Vulnerability, Addressing Repetitive-Loss Properties

Assessing Vulnerability: Addressing Repetitive Loss Properties

Requirement §201.6(c)(2)(ii): [The risk assessment **must** also address National Flood Insurance Program (NFIP) insured structures that have been repetitively damaged by floods.

Element

- Does the updated plan document how the planning team reviewed and analyzed this section of the plan and whether this section was revised as part of the update process?
- Does the new or updated plan describe vulnerability in terms of the types and numbers of repetitive loss properties located in the identified hazard areas?

Source: FEMA 2008.

Carson City has no repetitive loss properties. This should be discussed during the annual review of this plan with the City's Flood Plain Manager.

While not required by the DMA 2000, an important component of a hazard mitigation plan is a review of the City's resources to identify, evaluate, and enhance the capacity of those resources to mitigate the effects of hazards. This section evaluates Carson City's resources in three areas—legal and regulatory, administrative and technical, and financial—and assesses capabilities to implement current and future hazard mitigation actions.

7.1 LEGAL AND REGULATORY CAPABILITIES

The City currently supports hazard mitigation through its regulations, plans, and programs. The Carson City Building Code outlines hazard mitigation-related ordinances. Additionally, the Carson City Master Plan identifies goals, objectives, and actions for natural hazards, including floods, drought, and earthquakes. In addition to policies and regulations, the City carries out hazard mitigation activities by participating in the National Flood Insurance Program (NFIP) see section 7.4.1.

The following table, Table 7-1, summarizes the City's hazard mitigation legal and regulatory capabilities.

Table 7-1. Legal and Regulatory Resources Available for Hazard Mitigation

Regulatory Tool	Title	Effect on Hazard Mitigation
Plans	Master Plan	Updated 2006. Lists goals for coordination, neighborhood design, public awareness, floodplain & hazard area development, and geologic hazards to guide land use planning.
	Capital Improvements Plan	Provides earthquake & flood identification
	Economic Development Plan	Business Development
	Emergency Response Plan	Provides emergency response
	Community Wildfire Protection Plan	Provides Wildfire hazards. Enables Carson City to mitigate fuel loads.
	Hazmat Plan	Provides emergency response to reduce impact of HAZMAT spill.
	Post-Disaster Recovery Plan	Provide directives to reduce future hazard impact
	Habitat Management Plan	Provides flood & wildfire hazard identification, remediation, and education
	Master Drainage, Sewer, Water & Reclaimed Water	Provides flood hazard identification, regulation, remediation, and education to Carson City residents about floods and flood hazards. Enables Carson City to prioritize flood control and infrastructure needs.
	King Street Sandbagging Plan	Updated in 2007, plan provides guidance & locations which benefit from sand bagging prior to flood and during flood.
	Bomb Threat Procedures, Suspicious Substances Procedure & Active Shooter Plan	Provides terrorist identification, containment and response.

Table 7-1. Legal and Regulatory Resources Available for Hazard Mitigation

Regulatory Tool	Title	Effect on Hazard Mitigation
Programs	National Flood Insurance Program	Carson City adopts and enforces a floodplain management ordinance to reduce future flood damage. In exchange, the NFIP makes Federally backed flood insurance available to homeowners, renters, and business owners
Ordinances and Policies	Building Code Title 12, 14 15 & 18 (IBC 2006)	Master Plan, Land Use Plan Element. Provides regulations to reduce hazard impact
	Zoning Ordinances	
	Subdivision ordinance or regulations	
	Development Standards	
	Growth management ordinances	
	Special purpose ordinances	Floodplain management, storm water management, hillside or steep slope ordinances, wildfire ordinances, hazard set back requirements

7.2 ADMINISTRATIVE AND TECHNICAL CAPABILITIES

The administrative and technical capability assessment identifies the staff and personnel resources available within the City to engage in mitigation planning and carry out mitigation projects. The administrative and technical capabilities of the City are listed in Table 6-2.

Table 7-2. Administrative and Technical Resources for Hazard Mitigation

Staff/Personnel Resources	Department / Agency
Planner(s) or engineer(s) with knowledge of land development and land management practices	Public Works
Engineer(s) or professional(s) trained in construction practices related to buildings and/or infrastructure	Building & Safety
Planner(s) or engineer(s) with an understanding of manmade or natural hazards	Building & Safety, Planning, Fire Dept.
Staff with education or expertise to assess the community's vulnerability to hazards	Building, Fire, Public Works
Floodplain manager	Public Works
Personnel skilled in GIS and/or HAZUS-MH	GIS Program, Public Works
Scientist familiar with the hazards of the community	UNR, Bureau of Mines & Geology for Earthquakes
Emergency Services	Fire Department Emergency Management
Finance (purchasing) – Fiscal Management	Carson City Finance
Public Information Officers, Planner(s)	Sheriff's Office, Fire Dept, Carson City Executive Staff

7.3 FINANCIAL CAPABILITIES

The fiscal capability assessment lists the specific financial and budgetary tools that are available to the City for hazard mitigation activities. These capabilities, which are listed in Table 6-3, include both local and Federal entitlements.

Table 7-3. Financial Resources for Hazard Mitigation

Financial Resources	Effect on Hazard Mitigation
Local	
Authority to levy taxes for specific purposes	Yes. Upon approval of the Carson City Board of Supervisors, staying within the stipulations set forth in the Nevada Revised Statues.
Capital Improvement Plans and Impact Fees	Assigns impact development fees to finance fire and flood control capital improvement programs.
Community Development Block Grants	Yes. Subject to grant from Fed/State.
Incur debt through general obligation bonds	Yes. Upon voter approval, staying within the stipulations set forth in the Nevada Revised Statues.
Incur debt through special tax and revenue bonds	Yes. Upon voter approval, staying within the stipulations set forth in the Nevada Revised Statues.
Incur debt through private activity bonds	Yes. Upon voter approval, staying within the stipulations set forth in the Nevada Revised Statues.
Withhold spending in hazard-prone areas	Yes.
State	
Question #1 State Bond	Funding for Parks which can include re-vegetation.
Federal	
FEMA Hazard Mitigation Project Grants (HMPG) and Pre-Disaster Mitigation (PDM) grants	Provides technical and financial assistance for cost-effective pre-disaster and post-disaster mitigation activities that reduce injuries, loss of life, and damage and destruction of property.
FEMA Flood Mitigation Grant Program (FMA)	Mitigate repetitively flooded structures and infrastructure.
USFA Assistance to Firefighters Grant (AFG) Program	Provide equipment, protective gear, emergency vehicles, training, and other resources needed to protect the public and emergency personnel from fire.
FEMA/DHA Homeland Security Preparedness Technical Assistance Program (HSPTAP)	Build and sustain preparedness technical assistance activities in support of the four homeland security mission areas (prevention, protection, response, recovery) and homeland security program management.
US HUD Community Block Grant Program Entitlement Communities Grants	Acquisition of real property, relocation and demolition, rehabilitation of residential and non-residential structures, construction of public facilities and improvements, such as water and sewer facilities, streets, neighborhood centers, and the conversion of school buildings for eligible purposes.
EPA Community Action for a Renewed Environment (CARE)	Through financial and technical assistance offers an innovative way for a community to organize and take action to reduce toxic pollution (i.e., storm water) in its local environment. Through CARE, a community creates a partnership that implements solutions to reduce releases of toxic pollutants and minimize people's exposure to them.

Table 7-3. Financial Resources for Hazard Mitigation

Financial Resources	Effect on Hazard Mitigation
EPA Clean Water State Revolving Fund (CWSRF)	A loan program that provides low-cost financing to eligible entities within state and tribal lands for water quality projects, including all types of non-point source, watershed protection or restoration, estuary management projects, and more traditional municipal wastewater treatment projects
CDC Public Health Emergency Preparedness (PHEP) Cooperative Agreement.	Funds are intended to upgrade state and local public health jurisdictions' preparedness and response to bioterrorism, outbreaks of infectious diseases, and other public health threats and emergencies.

7.4 CURRENT MITIGATION CAPABILITIES & ANALYSIS

Carson City's current mitigation programs, projects, and plans, as shown in Table 7-4, are listed as follows.

Table 7-4. Carson City Local Mitigation Capability Assessment

Agency Name (Mission/ Function)	Programs, Plans Policies, Regulations, Funding, or Practices	Point of Contact Name and Phone	Effect on Loss Reduction			Comments
			Support	Facilitate	Hinder	
Building & Planning Dept.	Code Enforcement, Economic Development	Lee Plemel 775-887-2000 x 30075	✓	✓		Engineering and planning support
Public Works	Roads, water, flood plain management, sewer, capital projects, building maintenance, parks, pool	Robb Fellows 775-283-7370	✓	✓		Engineering, detailed knowledge of infrastructure
Fire Department	Emergency Mt, Fuels mitigation, public education, mitigation plan	Stacey Giomi 775-283-7150	✓	✓		Familiar w/fire grants; detailed knowledge of vulnerability
School District	Identify and implement mitigation actions for school property	Kevin Curnes 775-283-2171	✓	✓		Familiar w/school district infrastructure
Sherriff's Office	Public Safety	Ray Saylo 775-887-2000 x41903	✓	✓		Familiar w/terrorist mitigation
Health/Human Services	Health and Animal Control	Marena Works 775-283-7235	✓	✓		Familiar w/ epidemic and CDC grants, health capability

The programs, plan, policies and regulations listed above provide a basic framework for mitigation projects. These programs cover the City's infrastructure and program needs and are effective however the funding for mitigation projects may not always be available.

Carson City has strong legal, administrative and financial capabilities in relation to other counties within Nevada. Carson City has a fuels reduction and chipping program, is able to enforce the International Building Code & International Fire Code, Building Code Title 12.09 and 15.05 which restrict building within a floodway, and is a member of the NFIP, in addition to programs for public safety, health and human services, public works and the school district. These programs are run by trained Carson City staff, who are provided the resources to implement and promote the programs. Future implementation may be constrained by budget reduction in the next few years due to the recession.

The following provides an overview of the four-step process for preparing a mitigation strategy: developing mitigation goals and objectives, identifying and analyzing potential actions, prioritizing mitigation actions, and implementing an action plan.

8.1 MITIGATION GOALS AND OBJECTIVES

The requirements for the local hazard mitigation goals, as stipulated in the DMA 2000 and its implementing regulations, are described below.

DMA 2000 Requirements: Mitigation Strategy

Local Hazard Mitigation Goals

Requirement §201.6(c)(3)(i): [The hazard mitigation strategy shall include a] description of mitigation goals to reduce or avoid long-term vulnerabilities to the identified hazards.

Element

- Does the new or updated plan include a description of mitigation goals to reduce or avoid long-term vulnerabilities to the identified hazards?

Source: FEMA, March 2008.

The previous plan's goals were as follows:

- Goal 1 – Promote Disaster-resistant future development
- Goal 2 – Increase public understanding and support for effective hazard mitigation.
- Goal 3 - Build and support local support and commitment to become less vulnerable to hazards.
- Goal 4 – Enhance hazard mitigation coordination and communication with federal, state, local and tribal governments. Reduce the possibility of damage and losses to existing assets particularly people, critical facilities/infrastructure, and City-owned facilities due to each of the hazards profiled.

Using the 2005, Hazard Mitigation Plan Goals, as a starting point, local planning documents as guidelines and the State's requested format, the lead committee reorganized the 4 long term Goals and developed 11 Goals to reduce or avoid long-term vulnerabilities to the identified hazards (Table 8-1).

The lead committee determined that each hazard identified in the plan would have a goal except for avalanche, seiche, volcano and utility loss. For the these hazards, all rated low hazards with no previous occurrence, the lead committee agreed the benefit versus the cost would be prohibitive for project actions, however, actions under current Goals 1 and 2 can be used to advance hazard mitigation for these hazards as well as all the hazards profiled in Section 5.

Mitigation goals are defined as general guidelines that explain what a community wants to achieve in terms of hazard and loss prevention. Goal statements are typically long-range, policy-oriented statements representing community-wide visions.

Essentially the new Goal 1 was the old Goal 1 & 3, the new Goal 2 includes the previous Goal 2 and includes some preparedness and public awareness. Goals 3-10 were the second sentence of Goal 4. The first part of Goal 4 was not included as it was seen as too general and

communication was included in Goal 2. Goals 4, 7 and 11 actions were added due terrorism, epidemics and hazardous materials being included in the high & moderate hazard planning significance during the review process.

Table 8-1. Mitigation Goals

Goal Number	Goal Description
1	Promote increased and ongoing Carson City involvement in hazard-mitigation planning and projects.
2	Build and support local capacity to enable the public to prepare for, respond to, and recover from disasters
3	Reduce the possibility of damage and losses due to earthquakes
4	Reduce the possibility of threat to life and losses due to epidemic
5	Reduce the possibility of damage and losses due to floods
6	Reduce the possibility of damage and losses due to severe weather
7	Reduce the possibility of damage and losses due to terrorist events
8	Reduce the possibility of damage and losses due to wildland fires
9	Reduce the possibility of damage and losses due to drought
10	Reduce the possibility of damage and losses due to landslide
11	Reduce the possibility of damage and losses due to hazardous materials

8.2 IDENTIFYING MITIGATION ACTIONS

The requirements for the identification and analysis of mitigation actions, as stipulated in the DMA 2000 and its implementing regulations, are described below.

DMA 2000 Requirements: Mitigation Strategy

Identification and Analysis of Mitigation Actions

Requirement §201.6(c)(3)(ii): [The mitigation strategy shall include a] section that identifies and analyzes a comprehensive range of specific mitigation actions and projects being considered to reduce the effects of each hazard, with particular emphasis on new and existing buildings and infrastructure.

Element

- Does the plan identify and analyze a comprehensive range of specific mitigation actions and projects for each hazard?
- Do the identified actions and projects address reducing the effects of hazards on new buildings and infrastructure?
- Do the identified actions and projects address reducing the effects of hazards on existing buildings and infrastructure?
- Does the mitigation strategy identify actions related to the participation in and continued compliance with the NFIP?

Source: FEMA, March 2008.

During December 2009, the Planning Lead met with individual Planning Committee members with expertise and reviewed the updated hazard profiles in Section 5 as a basis for developing mitigation actions, reviewed the previous plans goals and actions and used those to formulate new actions. Through these discussions with each department, 13 actions were determined to be completed or in-process (see Table 8-2) of the 21 high, moderate and low mitigation strategies

from the previous plan. The list of these actions, status and current placement in update is included below.

Table 8-2. High & Moderate Actions from Previous Plan

Action	Current Status / New Action #
Completed or In Process	
Earthquake Mitigation Ordinance	Carson City adopted International Building Code 2006, update Action 3.A
Erosion Control	New erosion control program for new construction 2006, update Action 1.A
Evacuation Plan Revision	Statewide 2009 plan to be adopted, update Action 2.A
Flood Protection	Currently updating FEMA Flood Hazard maps, update Action 5.A, 5.C, 5.F
Landowner Defensible Space Ordinance	Ordinance completed 2007, update Action 8.A
Landslide – Slope Stabilization Strategy	Waterfall Fire Report completed 2006, update Action 5.F, 10.A, 10.B
Re-Vegetation	On-going, update Action 8.E
Sewage Overflow Prevention	Completed in 2007, update Action 5.I
Watershed Recharge	Ongoing, update Action 9.A
Resident Emergency Notification System	Emergency notification system completed, removed
City Building-Access Control	Facility Lock & Key Audit completed, removed
Back Up Telephone System Carson City Government	Completed 2009, removed
Acquire Back Up Computer & Network Routing Equipment	In Process
Not Completed	
Storm Drain Capacity	Continued in update Action 5.E
Wildland Fire Ordinance	Continued in update Action 8.A
Stream Restoration	No funding, update Action 8.H & 9.A
Public Education Program	No funding, continued in Action 1.B, 1.E, 2.E, 2.F, 2.G
Communication Interoperability	No funding, this is not considered mitigation, removed
Provide back up generator power to City Hall	No funding, this is not considered mitigation, removed
New Fire Suppression System for Computer Rooms	No funding, update Action 3.D
Land Acquisition	No funding, as written this is not considered mitigation, new version update Action 5.L

In addition to the 21 listed above there were 120 Future Actions, ten of which were considered top priority and are listed below with their current status.

Table 8-3. Top Priority Actions

Action	Description	Current Status / New Action #
1	Coordinate the development of a Hazard Mitigation Plan	Completed 2005, removed
2	Review & Update Plans	Completed 2005-2010, update Action 1.A
3	Update City Fire Code every 3 years	Completed 2008, update Action 1.A
4	Promote cooperative vegetation management programs	Ongoing, update Action 8.E
5	Publicize and encourage the adoption of mitigation actions	Ongoing, update Action 2.G
6	Update building codes to reflect current earthquake standards	Completed 2008, update Action 1.A & 3.A
7	Review & compare existing flood control standards, zoning &	Ongoing, update Action 1.A & 5.B

Table 8-3. Top Priority Actions

Action	Description	Current Status / New Action #
	building	
8	Develop a Business Continuity Plan for each City Department	No funding, not mitigation, removed
9	Develop partnerships for a citywide vegetative management program	Ongoing, update Action 8.E
10	Encourage the public to prepare and maintain a 3-Day Preparedness Kit	Preparedness, ongoing, not mitigation, update Action 2.B

The balance of the Future Actions in the previous plan were reviewed by the individual experts on the Planning Committee and are listed in Appendix G with their current status and decision on their inclusion into this update. Many future actions were not included due to the action not being considered mitigation by definition or they were repetitive and are now addressed as a single action in this plan. The balance are clarified through discussions and were re-instated or revised (see Table 8-3 for a complete list of new/updated actions).

Mitigation actions are usually grouped into six broad categories: prevention, property protection, public education and awareness, natural resource protection, emergency services, and structural projects. As such, Table 8-3 lists the revised goals and potential actions selected for this HMP and which actions address reducing hazards on new and/or existing buildings.

Table 8-3 was developed and sent out via e-mail to the committee members for their comments. Comments were incorporated and the table details all the actions considered important to hazard mitigation by the committee.

Although mitigation planning is fairly new to Carson City and the effectiveness of the planning has not been tested, it has embraced the concept of mitigation policies, programs and capabilities. The 2006 Carson City Master Plan included Goal 3.3 – Minimize Impacts of Potential Natural Disaster Events on the Community. The 2006 International Building Code was adopted to reduce impacts from earthquake. Building Code Title 12.09, 15.05 and Division 1 of the Development Standards restrict building within the flood plain. Additionally, 13 of the 21 high or moderate mitigation strategies and 9 of the 10 top priority actions from the previous plan have been completed or are underway. Carson City submitted two projects for consideration to the Pre-Disaster Mitigation Grant Program 2010 for fire and flood mitigation that were actions addressed in the previous plan and are again included in the update.

The lesson learned in this update is that hazard mitigation actions have been implemented. More mitigation has been done than realized at the beginning of the planning effort. Actions can be specific projects as well as more broad based programs so that over the course of five years additional projects can be implemented.

Table 8-3: Mitigation Goals and Potential Actions

Goals	Action	New or Existing Buildings	Description
Goal 1: ***Promote increased and ongoing Carson City involvement in hazard-mitigation planning and projects***	1.A	N	Update the Master Plan to be consistent with the hazard area maps and implementation strategies developed in the HMP every 10 years. Review & update ordinances & code every 3 years.
	1.B	N/E	Identify & educate Carson City personnel on high hazard areas
	1.C	N/E	Coordinate existing Geographic Information Systems (GIS) capabilities to identify hazards through the City
	1.D	N/E	Develop the data sets that are necessary to test hazard scenarios and mitigation tools, including HAZUS MH
	1.E	N/E	Utilize the Internet as a communication tool, as well as an education tool
	1.F	N	Develop city building codes and ordinances that protect people and structures from drought, earthquake, flood, landslide, severe weather & wildfire
Goal 2: ***Build and support local capacity to enable the public to prepare for, respond to, and recover from disasters***	2.A	E	Develop emergency evacuation programs for neighborhoods in flood prone areas and wildland fire areas
	2.B	N/E	Annually review the City's Emergency Operations Plan and identify needed plan updates
	2.C	E	Conduct a minimum of one disaster exercise each year
	2.D		Establish a budget and identify funding sources for mitigation outreach
	2.E		Work with school districts to develop a public outreach campaign that teaches children how to avoid danger and behave during an emergency
	2.F	N/E	Utilize Business for Innovative Climate Change (BICEP) to increase awareness and knowledge of hazard mitigation and encourage businesses to develop/implement hazard mitigation actions
	2.G	N/E	Prepare, develop, & distribute appropriate public information about hazard mitigation programs and projects at Carson City-sponsored events and on the Carson City's/Fire Department's website
Goal 3: ***Reduce the possibility of damage and losses due to earthquakes***	3.A	N	Continue to enforce the International Building Code (IBC) provisions pertaining to grading and construction relative to seismic hazards. Update Carson City Codes to IBC 2012 when it is released.
	3.B	E	Implement an Unreinforced Masonry (URM) building program that determines the structural safety of critical infrastructure, and retrofit buildings, if necessary
	3.C	E	Identify hazard-prone structures through GIS modeling
	3.D	E	Acquire and install a foam fire suppression systems for the City Hall and Public Safety computer rooms to reduce damage to computer equipment

Table 8-3: Mitigation Goals and Potential Actions

Goals	Action	New or Existing Buildings	Description
Goal 4: ***Reduce the possibility of threat to life and losses due to epidemic***	4.A		Update Mass Illness Plan and integrate with local Hazard Mitigation Plan
	4.B		Create & implement a training and exercise program relative to epidemics
	4.C		Prepare by acquiring/storing needed medical equipment
Goal 5: ***Reduce the possibility of damage and losses due to floods***	5.A	N/E	Identify flood-prone areas using GIS. Identify those community areas that have recurring losses and conduct detailed analysis of the hydro graphic basins for planning, update storm water system plans, including erosion/sediment transport, and develop project proposals to improve storm water facilities and reduce flooding
	5.B	N	Adopt or update policies that discourage growth in flood-prone areas
	5.C	N/E	Review and update flood plans that would include coordination with adjacent counties, cities, and special districts supporting a regional approach to flood control
	5.D	E	Update and expand Sandbagging Plan
	5.E	E	Install new flood facilities to include, upgrade the existing storm drain system to current standards including culverts and channel improvements
	5.F	N	Upon completion of land transfers associated with the Lands Bill which includes land trading with Carson City, BLM, US Forestry, and Washoe Tribe; identify/implement projects within transferred lands and other areas within Carson City that need slope stabilization for flood and landslide
	5.G	E	Design and install facilities to capture debris/sediment within Eagle Valley
	5.H	E	Develop a Flood Management Plan for the New Empire Area and install a new flood control facility for the area
	5.I	E	Protect and enhance existing municipal water conveyance structures, storage, and treatment facilities to reduce impact from flood
	5.J	E	Install a storm water retention facility at Goni Canyon Creek & Channel D & construct a new storm drainage system further downstream along Goni Creek
	5.K	E	Design & install facilities to capture debris/sediment within Eagle Valley
	5.L	E	Land acquisition of buildings with recurring loss or of land which could be used as catch basins for flood control projects.

Table 8-3: Mitigation Goals and Potential Actions

Goals	Action	New or Existing Buildings	Description
Goal 6: ***Reduce the possibility of damage and losses due to Severe Weather***	6.A	E	In areas at risk to severe weather, retrofit public buildings to withstand snow loads and sever winds to prevent roof collapse/damage
	6.B	N/E	Develop a storm water management plan for snow melt
Goal 7: ***Reduce the possibility of damage and losses due to terrorist events***	7.A	N	Develop building codes for public buildings to mitigate impacts from terrorist events
	7.B	N/E	Develop a planning document to cover terrorist events and exercises
	7.C	E	Retrofit public buildings to increase safety and reduce the impact of terrorist events.
Goal 8: ***Reduce the possibility of damage and losses due to wildland fires***	8.A	N/E	Continue to identify areas and update and enforce the most current versions of the Urban-Wildland Interface Code
	8.B*	N/E	Update the Carson City Fire Code and model weed abatement and fuel modification ordinances
	8.C	E	Continue to conduct current fuel management programs (i.e., weed abatement programs) and investigate and apply new and emerging fuel management techniques
	8.D	E	Develop a public outreach campaign of the extreme wildland fire dangers and steps that can be taken to reduce these dangers
	8.E	E	Develop partnerships for a community based vegetation management program including chipping programs
	8.F	N/E	Utilize GIS and the internet as information tools
	8.G	E	Establish a continuing wildland fire technical working group
	8.H	N/E	Protect municipal water recharge zones from wildfires and flooding by stabilizing upper watershed slopes
	8.I	E	Retrofit buildings (public and private) to reduce the risk of wild fire in Lakeview, Pinyon Hills, Kings Canyon, Voltaire Canyon and Timberlake Canyon.
Goal 9 ***Reduce the possibility of***	9.A	N/E	Watershed stabilization and recharge program to maximize the use of surface sources when available and preserving the groundwater sources for system peaking needs and times of drought.
	9.B	N/E	Encourage public participation in drought strategies through public

Table 8-3: Mitigation Goals and Potential Actions

Goals	Action	New or Existing Buildings	Description
damage and losses due to drought			information programs on water conservation and drought resistant landscaping and through building code ordinances.
Goal 10: ***Reduce the possibility of damage and losses due to landslide***	10.A	N/E	Evaluate natural slopes to determine if there are slope stabilization treatments that would be appropriate to prevent landslides.
	10.B	N/E	Conduct slope stabilization projects to prevent landslides.
Goal 11: ***Reduce the possibility of damage and losses due to hazardous materials***	11.A	N/E	Review building codes and zoning ordinances to reduce public health risks from hazardous materials releases

Reduce Hazard Effect on N = New Buildings, E = Existing Buildings, N/E = New and Existing Buildings

8.3 NATIONAL FLOOD INSURANCE PROGRAM (NFIP) COMPLIANCE

DMA 2000 Requirements: Mitigation Strategy – National Flood Insurance Program

National Flood Insurance Program (NFIP) Compliance)

Requirement: §201.6(c)(3)(iii): [The mitigation strategy] must also address the jurisdiction's participation in the National Flood Insurance Program (NFIP), and continued compliance with NFIP requirements, as appropriate.

Element

- Does the updated plan document how the planning team reviewed and analyzed this section of the plan and whether this section was revised as part of the update process?
- Does the new or updated plan describe the jurisdiction(s) participation in the NFIP?)
- Does the mitigation strategy identify, analyze and prioritize actions related to continued compliance with the NFIP?

Source: FEMA, March 2008.

Carson City does have identified special flood-hazard areas and entered the NFIP 24 years ago in 1986. The City has participated in the Community Rating System (CRS) since 1986. Participation in both programs has been continuous since initiation. The CRS is a voluntary program for the NFIP-participating communities. The goals of the CRS are to reduce flood

losses, to facilitate accurate insurance rating, and to promote the awareness of flood insurance. Carson City is a CRS Class 6 community, one of only two counties in Nevada to have this rating. To support its continued voluntary participation in the CRS of the NFIP, Carson City outlined mitigation actions listed under goals 5 and 6 detailed below in Table 8-3, Mitigation Goals and Potential Actions. There are no repetitive loss or severe repetitive loss properties (as defined by the NFIP) within Carson City. Building Code Title 12.09 and 15.05 restricts future building within a floodway.

8.4 EVALUATING AND PRIORITIZING MITIGATION ACTION

The requirements for the evaluation and implementation of mitigation actions, as stipulated in DMA 2000 and its implementing regulations, are described below.

DMA 2000 Requirements: Mitigation Strategy - Implementation of Mitigation Actions

Implementation of Mitigation Actions

Requirement: §201.6(c)(3)(iii): [The mitigation strategy section shall include] an action plan describing how the actions identified in section (c)(3)(ii) will be prioritized, implemented, and administered by the local jurisdiction. Prioritization shall include a special emphasis on the extent to which benefits are maximized according to a cost benefit review of the proposed projects and their associated costs.

Element

- Does the mitigation strategy include how the actions are prioritized? (For example, is there a discussion of the process and criteria used?)
- Does the mitigation strategy address how the actions will be implemented and administered? (For example, does it identify the responsible department, existing and potential resources, and timeframe?)
- Does the prioritization process include an emphasis on the use of a cost-benefit review (see page 3-36 of *Multi-Hazard Mitigation Planning Guidance*) to maximize benefits?

Source: FEMA, March 2008.

The mitigation actions were finalized during the Planning Committee meeting on January 19, 2010. At this time the Planning Committee evaluated and prioritized each of the actions. To complete this task, the Planning Committee completed the STAPLE+E evaluation criteria using rankings of one for lowest and three for highest priority, acceptance, feasibility etc. The rankings for each action were totaled and used as a starting point by the committee. See Table 8-4 for the evaluation criteria.

Table 8-4. STAPLE+E Evaluation Criteria for Mitigation Actions

Evaluation Category	Discussion "It is important to consider…"	Considerations
Social	The public Support for the overall mitigation strategy and specific mitigation actions	Community acceptance; adversely affects population
Technical	If the mitigation action is technically feasible and if it is the whole or partial solution	Technical feasibility; Long-term solutions; Secondary impacts
Administrative	If the community has the personnel and administrative capabilities necessary to implement the action or whether outside help will be necessary	Staffing: Funding allocation; Maintenance/operations
Political	What the community and its members feel about issues related to the environment, economic development, safety, and emergency management	Political support; Local champion; Public support
Legal	Whether the community has the legal authority to implement the action, or whether the community must pass new regulations	Local, State, and Federal authority; Potential legal challenge
Economic	If the action can be funded with current or future internal and external sources, if the costs seem reasonable for the size of the project, and if enough information is available to complete a FEMA Benefit Cost Analysis	Benefit/cost of action; Contributes to other economic goals; Outside funding required; FEMA Benefit Cost Analysis
Environmental	The impact on the environment because of public desire for a sustainable and environmentally healthy community	Effect on local flora and fauna; Consistent with community environmental goals; Consistent with local, State and Federal laws

Upon review by the Planning Committee, mitigation actions were selected for Carson City that best fulfill the goals of the HMP and were appropriate and feasible to implement during the 5-year lifespan of this version of the HMP. In reviewing the actions the Planning Committee considered the following:

- Actions that strengthen, elevate, relocate, or otherwise improve buildings, infrastructure, or other facilities to enhance their ability to withstand the damaging impacts of future disasters
- Actions in which the benefits (which are the reduction in expected future damages and losses) are greater than the costs considered as necessary to implement the specific action
- Actions that either address multi-hazard scenarios or address a hazard that present the greatest risk to the jurisdiction

The lead committee used the Staple+E results (see Appendix E) as a starting point and then through discussion and consensus made adjustments to include actions that were considered a high, moderate and low priority to the City. These are shown in Table 8-5.

8.5 IMPLEMENTING A MITIGATION ACTION PLAN

The Mitigation Action Plan Matrix which was prepared detailing how the overall benefit-cost were taken into consideration and how each mitigation action will be implemented and administered. This matrix is Table 8-5.

Table 8-5. Action Plan Matrix

Action Number	Action Item	Department / Division	Potential Funding Source	Implementation Timeline	Economic Justification	Priority Level
1.A	Update Master Plan every 10 yrs. Review update ordinances every 3 years	Planning	Local Gen. Fund	2 Years	Protection of lives due to better infrastructure and building codes	Moderate
1.B	ID & educate City personnel on high hazards	Planning Committee/Emergency Mgmt.	Local Gen. Fund	18 months	Provide information for planning & Public Works project to protect lives and property	Moderate
1.C	Coordinate existing GIS capabilities to ID hazards through the City	Public Works	Local Gen. Fund	Ongoing	Provide information to agencies in their efforts to protect lives and property	Low
1.D	Develop the data sets that are necessary to test hazard scenarios and mitigation tools, including HAZUS MH	Emergency Management	UNR, HMGP	Ongoing	Provide information to agencies in their efforts to protect lives and property	Low
1.E	Utilize the Internet as a communication tool, as well as an education tool	City PIO, Emergency Management	Local Gen. Funds	Ongoing	Provide information to the community in their effort to protect lives and property	Moderate
1.F	Develop city building codes and ordinances that protect people and structures from drought, earthquake, flood, landslide, severe weather & wildfire	Building Dept.	Local Gen. Fund	Ongoing	Protection of lives due to better infrastructure and building codes	Moderate
2.A.	Develop emergency evacuation programs for neighborhoods in flood prone & wildland areas	Public Works – Flood Plan Mgr. Fire Dept.	EMPG, SERC, USEPA, NDEP, NDCNR, Utility Service Charge	18-24 months	Protection of lives due to pre-planning.	High
2.B	Annually review the City's EOP & update & integrate w/local Hazard Mitigation Plan	Emergency Mgr. Fire Dept.	HMGP, PDM, SERC, EMPG, USEPA, NDEP, NDCNR; DHS, Local Gen. Fund	Ongoing	Protection of lives and property due to pre-planning.	High
2.C	Conduct minimum of one disaster exercise/year	Emergency Mgr. Fire Dept.	EMPG, SERC, USEPA, NDEP, NDCNR, Local Gen Fund	Ongoing	Protection of lives and property due to pre-planning.	High
2.D	Establish a budget and identify	Emergency	EMPG, HMGP, NV	18-24 Months	Protection of lives & property due to	Low

Table 8-5. Action Plan Matrix

Action Number	Action Item	Department / Division	Potential Funding Source	Implementation Timeline	Economic Justification	Priority Level
	funding sources for mitigation outreach	Management	Health & Human Services, CDC, USFS		awareness	
2.E	Work with school districts to develop a public outreach campaign that teaches children how to avoid danger and behave during an emergency	Emergency Management	EMPG, HMGP, NV Health & Human Services, CDC, USFS	18-24 Months	Protection of lives & property due to awareness	Low
2.F	Utilize Business for Innovative Climate Change (BICEP) to increase awareness and knowledge of hazard mitigation and encourage businesses to develop/implement hazard mitigation actions	Emergency Management	EMPG, HMGP, NOAA, USFS	18-24 Months	Protection of lives & property due to awareness	Low
2.G	Prepare, develop, & distribute appropriate public information about hazard mitigation programs and projects at Carson City-sponsored events and on the Carson City's/Fire Department's website	Emergency Management	EMPG, HMGP, NV Health & Human Services, CDC, USFS	18-24 Months	Protection of lives & property due to awareness	Moderate
3.A	Continue to enforce the International Building Code (IBC) provisions pertaining to grading and construction relative to seismic hazards. Update Carson City Codes to IBC 2012 when it is released.	Planning & Building Dept.	Local Gen. Fund,	Ongoing	Protection of lives and property through improved infrastructure	Moderate
3.B	Implement an Unreinforced Masonry (URM) building program that determines the structural safety of critical infrastructure, and retrofit buildings, if necessary	Building Maintenance, Building Dept.	Local Gen. Fund, HMGP, PDM	24-48 Months	Protection of lives and property through improved infrastructure	Low
3.C	Identify hazard-prone structures through GIS modeling	Public Works	Local Gen. Fund	Ongoing	Protection of lives and property through improved infrastructure	Low
3.D	Acquire and install a foam fire suppression systems for the City Hall	Building Maintenance	Local Gen. Fund	2 Months	Public Safety	Low

Table 8-5. Action Plan Matrix

Action Number	Action Item	Department / Division	Potential Funding Source	Implementation Timeline	Economic Justification	Priority Level
	and Public Safety computer rooms to reduce damage to computer equipment					
4.A	Update Mass Illness Plan & integrate with local Hazard Mitigation Plan	Health Dept.	NV Health & Human Services, CDC	6-12 months	Protection of lives due to pre-planning.	High
4.C	Prepare by acquiring/storing needed medical equipment	Health Dept.	NV Health & Human Services, CDC, Carson Hospital	6-12 months	Protection of lives due to pre-planning	High
5.A	ID flood prone areas w GIS. Update storm water system plans. Develop project proposals to improve storm water facilities	Public Works	PDM, HMGP, FMA, RFC, USDA, NDEP, USEPA, NDCNR, 319(h) grants (Clean Water Act), USGS, CC PW	24-36 months	Protection of homes, businesses, infrastructure, and critical facilities.	High
5.B	Adopt or update policies that discourage growth in flood-prone areas	Public Works	Local Gen Fund	Ongoing	Protection of homes, businesses, infrastructure, and critical facilities.	Low
5.C	Review & update flood plans for coordination w/adjacent counties, cities, and special districts supporting a regional approach to flood	Public Works	PDM, HMGP, FMA, RFC, USDA, NDEP, USEPA, NDRCS, Local, CC PW	24-36 months	Protection of homes, businesses, infrastructure, and critical facilities while strengthening regional coordination.	High
5.D	Update and expand Sandbagging Plan	Public Works	Local Gen. Fund, EMGP	24 months	Protection of homes, businesses, infrastructure, and critical facilities.	Low
5.E	Install new flood facilities & update storm drain system	Public Works	PDM, HMGP, FMA, RFC, USDA, NDEP, USEPA, NRCS, Local, CC PW	24-36 months	Protection of homes, businesses, infrastructure, and critical facilities.	High
5.F	Upon completion of land transfers associated with the Lands Bill which includes land trading with Carson City, BLM, US Forestry, and Washoe Tribe; identify/implement projects within transferred lands and other	Public Works	PDM, HMGP, USFS, BLM, Local Gen. Fund	24-36 months	Protection of homes, businesses, infrastructure, and critical facilities.	Low

Table 8-5. Action Plan Matrix

Action Number	Action Item	Department / Division	Potential Funding Source	Implementation Timeline	Economic Justification	Priority Level
	areas within Carson City that need slope stabilization for flood and landslide					
5.G	Design and install facilities to capture debris/sediment within Eagle Valley	Public Works	PDM, HMGP, FMA, RFC, USDA, NDEP, USEPA, NRCS, Local, CC PW	24-36 months	Protection of homes, businesses, infrastructure, and critical facilities.	Low
5.H	Develop a Flood Management Plan for the New Empire Area and install a new flood control facility for the area	Public Works	PDM, HMGP, FMA, RFC, USDA, NDEP, USEPA, NRCS, Local, CC PW	24-36 months	Protection of homes, businesses, infrastructure, and critical facilities.	Low
5.I	Protect & enhance existing municipal water conveyance structures, storage & treatment facilities	Public Works	PDM, HMGP, FMA, RFC, USDA, NDEP, USEPA, NRCS, FEMA, 319(h) grants (Clean Water Act), CC PW	24-36 months	Protection of homes, businesses, infrastructure, and critical facilities.	High
5.J	Install a storm water retention facility at Goni Canyon & storm drain system at Goni Creek	Public Works	PDM, HMGP, FMA, RFC, USDA, NDEP, USEPA, NRCS, FEMA, 319(h) grants (Clean Water Act), CC PW	24-36 months	Protection of homes, businesses, infrastructure, and critical facilities.	High
5.K	Design & install facilities to capture debris/sediment within Eagle Valley	Public Works	PDM, HMGP, FMA, RFC, USDA, NDEP, USEPA, NRCS, FEMA, 319(h) grants (Clean Water Act), USGS, CC PW	18-24 Months	Protection of homes, businesses, infrastructure, and critical facilities	High
5.L	Land acquisition of buildings with recurring loss or of land which could be used as catch basins for flood control projects.	Public Works	PDM, HMGP, FMA, RFC, USDA, NDEP, USEPA, NRCS, FEMA, 319(h) grants (Clean Water Act), USGS, CC PW	Ongoing	Protection of homes, businesses, infrastructure, and stopping the cycle of loss	Moderate
6.A	In areas at risk to severe weather,	Public Works	PDM, HMGP, Local	Ongoing	Protection of homes, businesses,	Low

Table 8-5. Action Plan Matrix

Action Number	Action Item	Department / Division	Potential Funding Source	Implementation Timeline	Economic Justification	Priority Level
	retrofit public buildings to withstand snow loads and sever winds to prevent roof collapse/damage		Gen. Fund		infrastructure, and critical facilities.	
6.B	Develop Storm Water Management Plan for snow melt & integrate with local Hazard Mitigation Plan	Public Works	PDM, HMGP, FMA, RFC, USDA, NDEP, USEPA, NRCS, FEMA, 319(h) grants (Clean Water Act), USGS, CC PW	12-14 months	Protection of homes, businesses, infrastructure, and critical facilities.	High
7.A	Develop building codes for public buildings to mitigate impacts from terrorist events	Planning, Building Dept.	Local Gen. Fund	6-12 months	Protection of critical facilities	Low
7.B	Develop a planning document to cover terrorist events and exercises	Emergency Management/ Sherriff Dept.	EMPG, Local Gen Fund	6-12 months	Protection of lives and property	Low
7.C	Retrofit public buildings to increase safety and reduce the impact of terrorist events.	Public Works, Building Maintenance	EMPG, Local Gen Fund	Ongoing	Protection of critical facilities	Low
8.A	ID areas & update & enforce Urban Wildland Interface Code (UWIC)	NV Div. of Forestry, CC Fire Dept.	NDF, BLM, National Fire Monies, Local Gen Fund	6-12 Months	Mitigation Project will ensure a greater number of residential structures and critical facilities and infrastructure benefit from actions to protect lives and property from wildfire.	High
8.B	Update the CC Fire code and model weed abatement and fuel modification ordinances	Fire Dept.	National Fire monies, USFS, BLM, NDF	Ongoing	Mitigation Project will ensure a greater number of residential structures and critical facilities and infrastructure benefit from actions to protect lives and property from wildfire.	Moderate
8.C	Continue conducting Fuel Management Programs	NV Div. of Forestry, CC Fire Dept.	HMGP, PDM, NDF, BLM, National Fire Monies, Stimulus , funds, USFS, Local General Fund	6-12 Months	Mitigation Project will ensure a greater number of residential structures and critical facilities and infrastructure benefit from actions to protect lives and property from wildfire.	High
8.D	Develop a public outreach campaign	CC Fire Dept.	HMGP, PDM, Local	12-24 Months	Mitigation Project will ensure a greater	Moderate

Table 8-5. Action Plan Matrix

Action Number	Action Item	Department / Division	Potential Funding Source	Implementation Timeline	Economic Justification	Priority Level
	of the extreme wildland fire dangers and steps that can be taken to reduce these dangers		General Fund, National Fire Monies		number of residential structures and critical facilities and infrastructure benefit from actions to protect lives and property from wildfire.	
8.E	Develop partnerships for a community based vegetation management program including chipping programs	CC Fire Dept.	HMGP, PDM, Local General Fund, National Fire Monies	12-24 Months	Mitigation Project will ensure a greater number of residential structures and critical facilities and infrastructure benefit from actions to protect lives and property from wildfire.	Moderate
8.F	Utilize GIS and the internet as information tools	CC Fire Dept.	HMGP, PDM, Local General Fund, National Fire Monies	Ongoing	Mitigation Project will ensure a greater number of residential structures and critical facilities and infrastructure benefit from actions to protect lives and property from wildfire.	Low
8.G	Establish a continuing wildland fire technical working group	CC Fire Dept.	HMGP, PDM, Local General Fund, National Fire Monies	12-24 Months	Mitigation Project will ensure a greater number of residential structures and critical facilities and infrastructure benefit from actions to protect lives and property from wildfire.	Moderate
8.H	Protect municipal water recharge zones from wildfires and flooding by stabilizing upper watershed slopes	CC Fire Dept.	HMGP, PDM, Local General Fund, National Fire Monies	12-24 Months	Mitigation Project will ensure a greater number of residential structures and critical facilities and infrastructure benefit from actions to protect lives and property from wildfire.	Moderate
8.I	Retrofit buildings (public and private) to reduce the risk of wild fire in Lakeview, Pinyon Hills, Kings Canyon, Voltaire Canyon and Timberlake Canyon.	CC Fire Dept.	HMGP, PDM, Local General Fund, National Fire Monies	12-24 Months	Mitigation Project will ensure a greater number of residential structures and critical facilities and infrastructure benefit from actions to protect lives and property from wildfire.	High
9.A	Watershed stabilization and recharge program to maximize the use of surface sources when available and preserving the groundwater sources for system peaking needs and times	Public Works	NDEP, USEPA, NRCS, FEMA, 319(h) grants (Clean Water Act), USGS, CC PW	24-36 months	Protection of available water.	Low

Table 8-5. Action Plan Matrix

Action Number	Action Item	Department / Division	Potential Funding Source	Implementation Timeline	Economic Justification	Priority Level
	of drought.					
9.B	Encourage public participation in drought strategies through public information programs on water conservation and drought resistant landscaping and through building code ordinances.	Public Works	NDEP, USEPA, NRCS, FEMA, 319(h) grants (Clean Water Act), USGS, CC PW	Ongoing	Protection of available water.	Low
10.A	Evaluate natural slopes to determine if there are slope stabilization treatments that would be appropriate to prevent landslides.	Public Works	PDM, HMGP, BLM, USFS, Local Gen Fund	24-36 Months	Protection of lives, property and water availability	Low
10.B	Conduct slope stabilization projects to prevent landslides.	Public Works	PDM, HMGP, BLM, USFS, Local Gen Fund	24-36 Months	Protection of lives, property and water availability	Moderate
11.A	Review zoning ordinances to reduce public health risks from hazardous materials releases	Planning, Building Dept.	Local Gen. Fund	6-12 Months	Protection of lives & property from exposure and contamination.	Low

BLM= Bureau of Land Management
CC PW = Carson City Public Works
DHS= Dept. of Homeland Security
EMPG = Emergency Management Performance Grant
HMGP = Hazard Mitigation Grant Program
NDEP = Nevada Division of Environmental Protection
NDF = Nevada Department of Forestry
PDM = Pre-Disaster Mitigation
SERC = State Emergency Response Commission
USDA = U.S. Department of Agriculture
USEPA = U.S. Environmental Protection Agency
USFS = U.S. Fire Service
USGS = US Geological Survey

This section describes a formal plan maintenance process to ensure that the HMP remains an active and applicable document. It includes an explanation of how the City and the Planning Committee intend to organize its efforts to ensure that improvements and revisions to the HMP occur in a well-managed, efficient, and coordinated manner.

The following three process steps are addressed in detail below:

- Monitoring, evaluating, and updating the HMP
- Implementation through existing planning mechanisms
- Continued public involvement

9.1 MONITORING, EVALUATING, AND UPDATING THE HMP

The requirements for monitoring, evaluating, and updating the HMP, as stipulated in the DMA 2000 and its implementing regulations, are described below.

DMA 2000 Requirements: Plan Maintenance Process - Monitoring, Evaluating, and Updating the Plan

Monitoring, Evaluating and Updating the Plan

Requirement §201.6(c)(4)(i): [The plan maintenance process shall include a] section describing the method and schedule of monitoring, evaluating, and updating the mitigation plan within a five-year cycle.

Element

- Does the new or updated plan describe the method and schedule for monitoring the plan? (For example, does it identify the party responsible for monitoring and include a schedule for reports, site visits, phone calls, and meetings?)
- Does the new or updated plan describe the method and schedule for evaluating the plan? (For example, does it identify the party responsible for evaluating the plan and include the criteria used to evaluate the plan?)
- Does the new or updated plan describe the method and schedule for updating the plan within the five-year cycle?

Source: FEMA 2008.

Maintenance on the previous plan was not conducted. This may be due the previous Chair of the Steering Committee retiring and a new Fire Chief being hired. Or it may be due to the previous plan suggesting a review every 2 years which may have been too long of a period. However, success in implementing many of the actions from the previous plan was accomplished. The lead Committee recognizes the need for plan maintenance and wanted to include tools into the plan for improved maintenance. The HMP was prepared as a collaborative effort between the Planning Committee and Nevada Division of Emergency Management. To maintain momentum and build upon this hazard mitigation planning effort and successes, the Planning Committee will monitor, evaluate, and update the HMP. The Planning Committee will be responsible for implementing the Mitigation Action Plan. Carson City Emergency Manager, the Planning Committee leader, will serve as the primary point of contact and will coordinate all local efforts to monitor, evaluate, and revise the HMP. He has recently hired an Emergency Coordinator who will provide back up as well as continuity if there is turnover. He stated he will include a reminder on his MS Outlook calendar for the annual maintenance meeting.

The Planning Committee will conduct an annual review of the progress in implementing the HMP, particularly the Mitigation Action Plan. As shown in Appendix F, the Annual Review

Questionnaire and Mitigation Action Progress Report will provide the basis for possible changes in the overall Mitigation Action Plan by refocusing on new or more threatening hazards, adjusting to changes to or increases in resource allocations, and engaging additional support for the HMP implementation. The Carson City Emergency Manager will initiate the annual review one month prior to the date of adoption. The findings from this review will be presented annually to the City Manager. The review will include an evaluation of the following:

- Participation of Carson City agencies and others in the HMP implementation.
- Notable changes in the City's risk of natural or human-caused hazards.
- Impacts of land development activities and related programs on hazard mitigation.
- Progress made implementing the Mitigation Action Plan (identify problems and suggest improvements as necessary).
- The adequacy of resources for implementation of the HMP.

The process of reviewing the progress on achieving the mitigation goals and implementing the Mitigation Action Plan activities and projects will also be accomplished during the annual review process. During each annual review, a Mitigation Action Progress Report will be submitted to the Planning Committee and provide a brief overview of mitigation projects completed or in progress since the last review. As shown in Appendix F, the report will include the current status of the mitigation project, including any changes made to the project, the identification of implementation problems and appropriate strategies to overcome them, and whether or not the project has helped achieve the appropriate goals identified in the plan.

In addition to the annual review, the Planning Committee will update the HMP every five years. To ensure that this occurs, in the third year following adoption of the HMP, the Planning Committee will undertake the following activities:

- Thoroughly analyze and update the City's risk of natural and man-made hazards.
- Provide a new annual review (as noted above), plus a review of the three previous annual reports.
- Provide a detailed review and revision of the mitigation strategy.
- Prepare a new action plan with prioritized actions, responsible parties, and resources.
- Prepare a new draft HMP and submit it to the Board of Supervisors for adoption.
- Submit an updated HMP to the Nevada State Hazard Mitigation Officer and FEMA for approval.

9.2 IMPLEMENTATION THROUGH EXISTING PLANNING MECHANISMS

The requirements for implementation through existing planning mechanisms, as stipulated in the DMA 2000 and its implementing regulations, are described below.

DMA 2000 Requirements: Plan Maintenance Process - Incorporation into Existing Planning Mechanisms
Incorporation into Existing Planning Mechanisms

DMA 2000 Requirements: Plan Maintenance Process - Incorporation into Existing Planning Mechanisms

Requirement §201.6(c)(4)(ii): [The plan shall include a] process by which local governments incorporate the requirements of the mitigation plan into other planning mechanisms such as comprehensive or capital improvement plans, when appropriate.

Element

- Does the new or updated plan identify other local planning mechanisms available for incorporating the requirements of the mitigation plan?
- Does the new or updated plan include a process by which the local government will incorporate the requirements in other plans, when appropriate?

Source: FEMA 2008.

Although the maintenance process did not track the past five years activity, the following actions did occur and additional planning mechanisms which where adopted and include hazard mitigation can be found in section 4.4 of this plan:

- A new Master Plan 2006 included a section on Guiding Principles which address Hazard Mitigation.
- Carson City Sandbagging Plan includes a plan in case of flood for sand bagging specific identified areas.
- Carson City Fire Code 2008 was adopted which includes a wildland/urban interface section that delineates regulations for building and maintaining homes in wildland fire prone areas.
- Carson City Building Code 2008 was adopted which includes updates the code to include the 2006 US Building Codes.

This activity is considered successful due to the volume of plans which now include hazard mitigation activities. After the adoption of the HMP, the Committee will continue to ensure that the HMP, in particular the Mitigation Action Plan, is incorporated into existing planning mechanisms. Each member of the Planning Committee will achieve this incorporation by undertaking the following activities.

- Conduct a review of the community-specific regulatory tools to assess the integration of the mitigation strategy. These regulatory tools are identified in Table 7-1.
- Work with pertinent divisions and departments to increase awareness of the HMP and provide assistance in integrating the mitigation strategy (including the action plan) into relevant planning mechanisms. Implementation of these requirements may require updating or amending specific planning mechanisms.

9.3 CONTINUED PUBLIC INVOLVEMENT

The requirements for continued public involvement, as stipulated in the DMA 2000 and its implementing regulations, are described below.

DMA 2000 Requirements: Plan Maintenance Process - Continued Public Involvement

Continued Public Involvement

Requirement §201.6(c)(4)(iii): [The plan maintenance process **shall** include a] discussion on how the community

DMA 2000 Requirements: Plan Maintenance Process - Continued Public Involvement

will continue public participation in the plan maintenance process.

Element

- Does the new or updated plan explain how **continued public participation** will be obtained? (For example, will there be public notices, an ongoing mitigation plan committee, or annual review meetings with stakeholders?)

Source: FEMA 2008.

Public participation was not solicited between the previous plan's adoption until the current planning process due to the maintenance of the plan not being conducted or tracked. However, many of the actions and planning mechanism changes did occur and since these are public documents the public was included. Additionally, each time one of the planning mechanisms mentioned above was completed it was included on the City website.

However, the City is dedicated to involving the public directly in the continual reshaping and updating of the HMP. Hard copies of the HMP will be provided to each department. In addition, a downloadable copy of the plan and any proposed changes will be posted on the City's Web site. This site will also contain an e-mail address and phone number to which interested parties may direct their comments or concerns.

The Planning Committee will also identify opportunities to raise community awareness about the HMP and the City's hazards. This could include attendance and provision of materials at Carson City-sponsored events. Any public comments received regarding the HMP will be collected by the Planning Committee leader, included in the annual report to the City Manager, and considered during future HMP updates. A press release and notice on the City's website will be issued each year before the annual maintenance meeting inviting the public to participate. A sample press release can be found in Appendix F.

The following websites or documents were accessed between August 2009 and January 2010.

Carson City Building Department 2008. *Carson City Municiple Code Title 14, 15, 17, 18.* http://library6.municode.com/default-now/home.htm?infobase=16249&doc_action=whatsnew .

Carson City Fire Department 2008. *Carson City Fire Code.* http://www.carson-city.nv.us/Index.aspx?page=344

Carson City Fire Department 2009. *Community Wildfire Protection Plan.* http://www.carson-city.nv.us/Index.aspx?page=344

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Appendix A
Adoption Resolution

RESOLUTION NO._____

A RESOLUTION ADOPTING AND APPROVING THE CARSON CITY HAZARD MITIGATION PLAN AND OTHER MATTERS PROPERLY RELATED THERETO.

WHEREAS, Carson City has historically experienced severe damage from natural and human-caused hazards such as flooding, wildfire, drought, thunderstorms/high winds, and hazardous materials incidents on many occasions in the past century, resulting in loss of property and life, economic hardship, and threats to public health and safety;

WHEREAS, the Carson City Hazard Mitigation Plan (the Plan) has been developed after more than one year of research and work by the Fire Department's Office of Emergency Management in association and cooperation with a multi-jurisdictional and multi-agency Planning Team for the reduction of hazard risks to the community;

WHEREAS, the Plan specifically addresses hazard mitigation strategies and plan maintenance procedures for Carson City;

WHEREAS, the Plan recommends several hazard mitigation actions/projects that will provide mitigation for specific natural and human caused hazards that impact our community with the effect of protecting people, property, and the environment from loss associated with those hazards;

WHEREAS, public input was gathered through meetings, direct mail, and media outlets to garner comments and collect input as required by law;

NOW THEREFORE BE IT RESOLVED that:

1. The Plan is hereby Adopted as an official plan of Carson City
2. The respective officials identified in the mitigation strategy of the Plan are hereby requested to pursue implementation of the recommended actions based upon availability of resources.
3. Future revision and Plan maintenance required by the Disaster Mitigation Act of 2000 and FEMA are hereby adopted as part of this resolution for a period of five (5) years from the date of this resolution

Upon motion by Supervisor _____, seconded by Supervisor _____, the foregoing Resolution was passed and adopted this 17th day of February, 2011 by the following vote.

VOTE: AYES: _____
_____
_____
_____
_____

NAYS: _____
_____
_____

ABSENT: _____

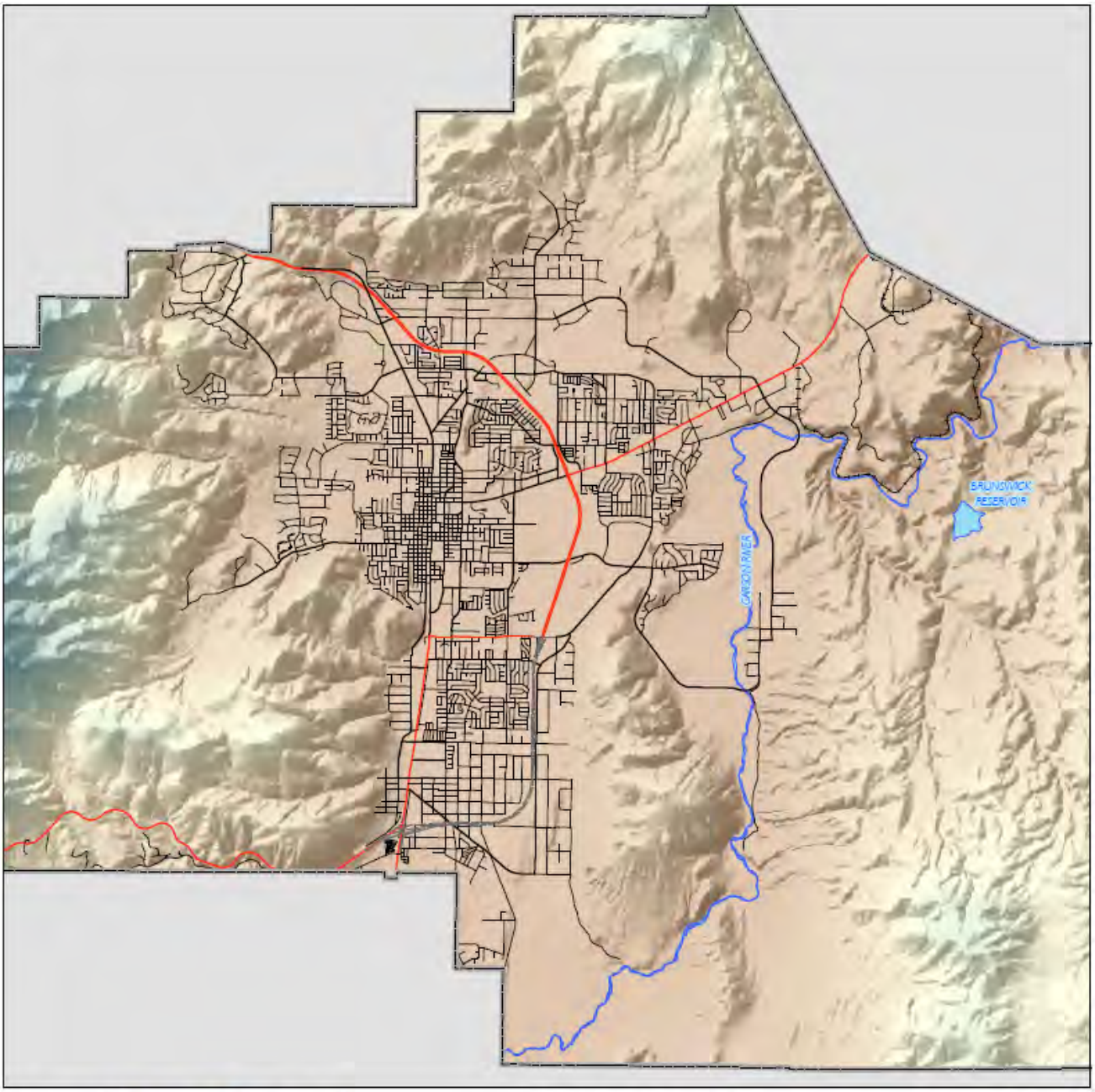
ABSTAIN: _____

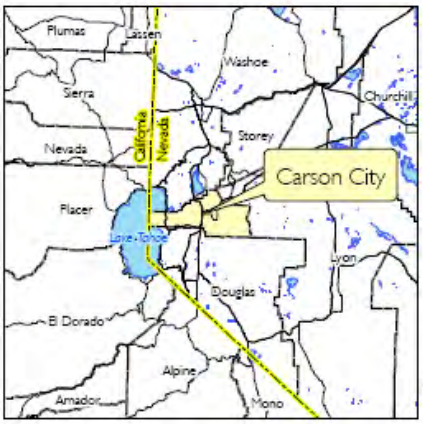
_____
Robert L. Crowell, Mayor
Carson City, Nevada

ATTEST

_____
Alan Glover, Clerk
Carson City, Nevada

Appendix B
Figures





0 0.5 1 2 Miles

Project Location

Figure: B-1

Legend

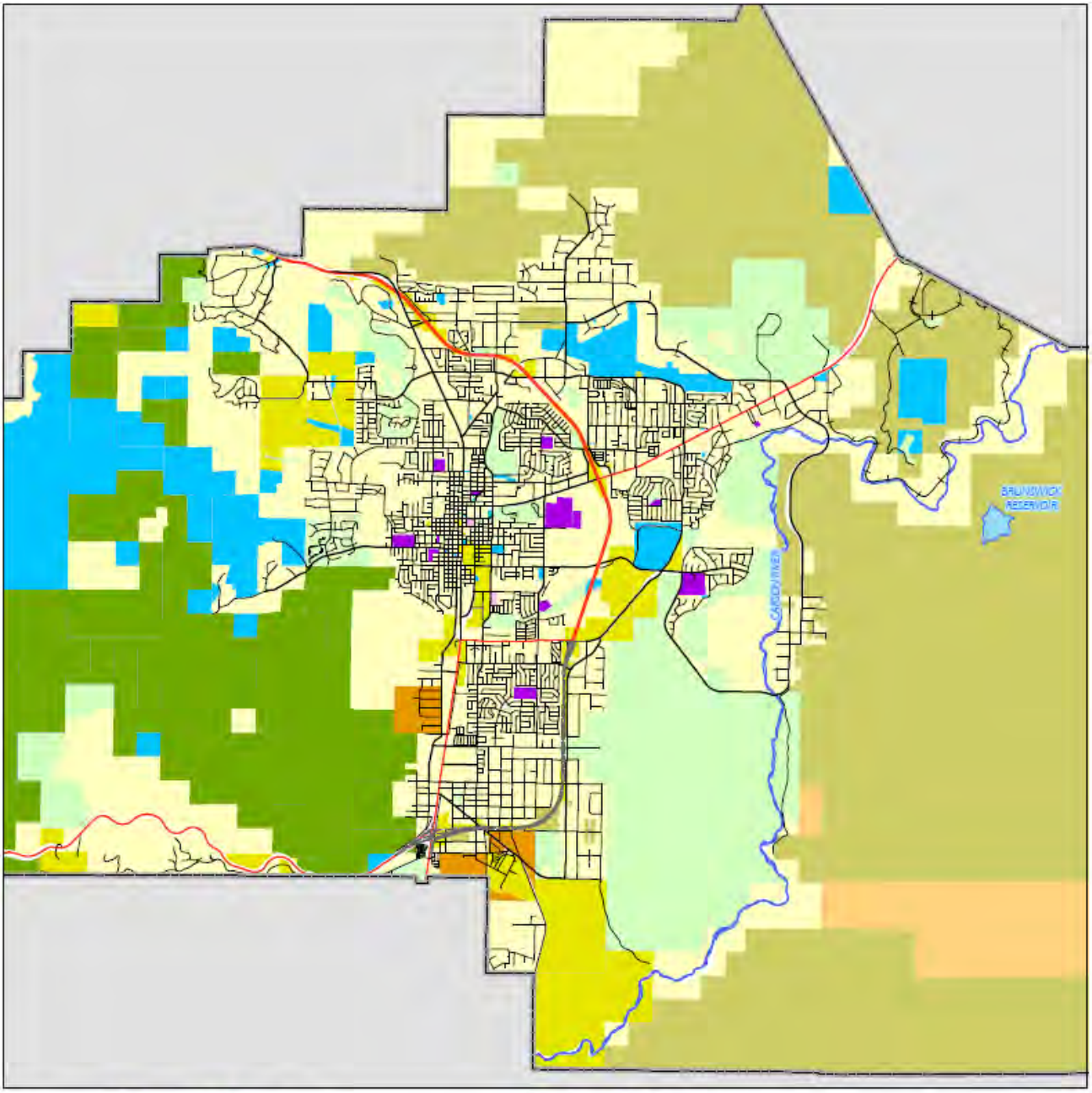
Street Centerline

- Arterial Route
- Collector Route
- Local Route
- Proposed Freeway
- Proposed V&T Railroad
- Water Bodies

N

Carson City
Hazard Mitigation Plan

FINAL - 1/19/2010



Surface Management

Figure: B-2

Legend

Street Centerline
- Arterial Route
- Collector Route
- Local Route
- Proposed Freeway
- Proposed V&T Railroad
- Water Bodies

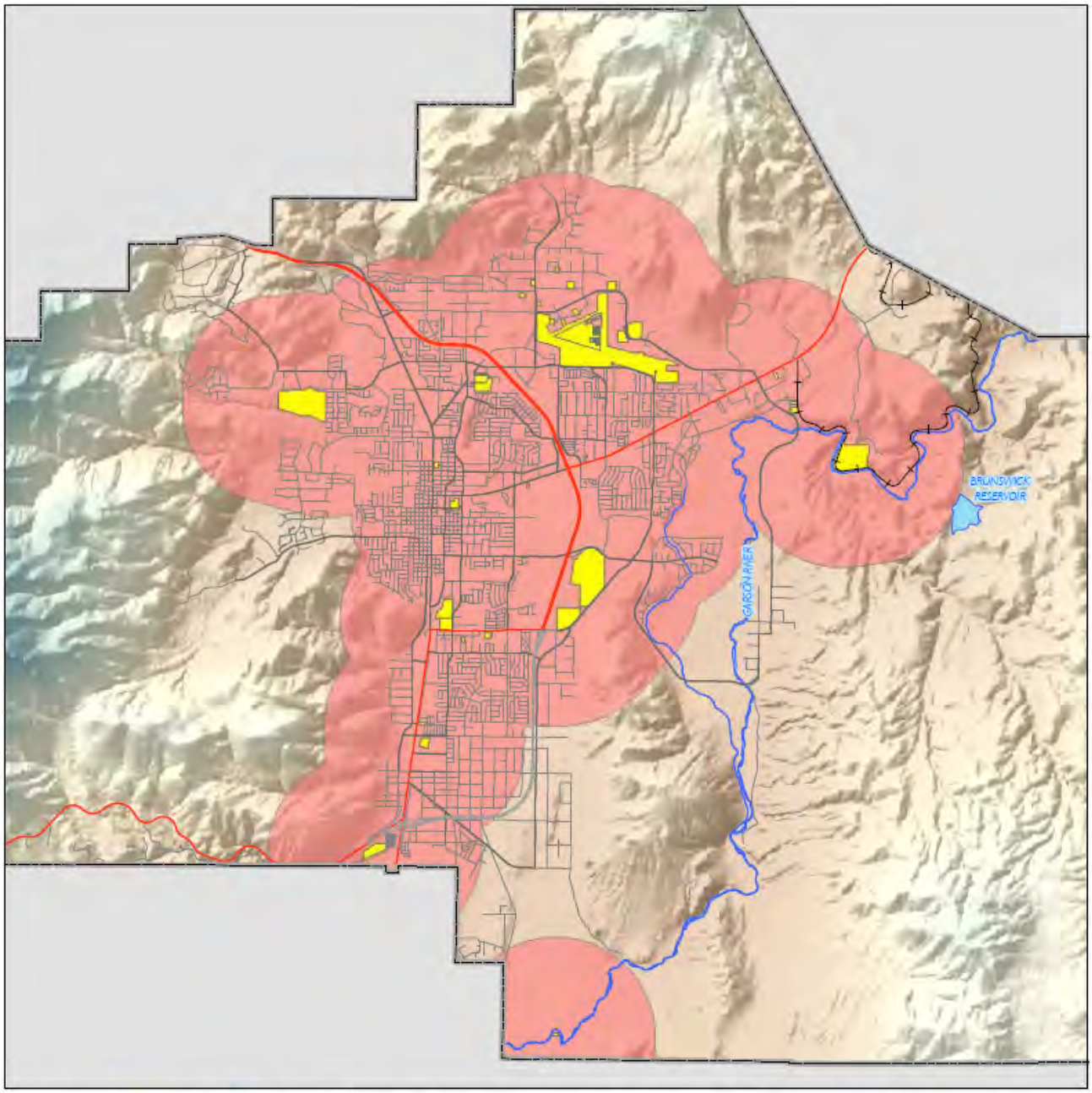
- Washoe Tribe
- Bureau of Indian Affairs
- Bureau of Land Management
- Private
- State of Nevada
- U.S. Forest Service
- U.S. Government
- City of Carson City
- Carson City Schools
- Carson City Parks

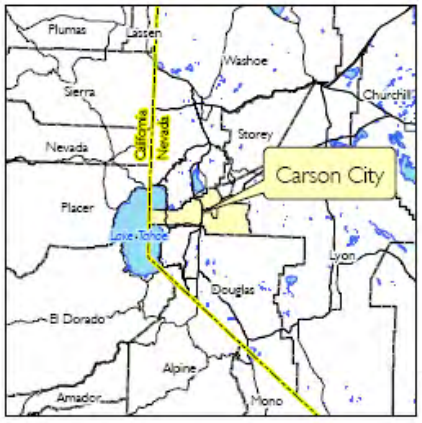
0 0.5 1 2 Miles

FINAL - 1/19/2010

N

Carson City
Hazard Mitigation Plan





Potential Hazardous Substance Facilities

Figure: B-3

Legend

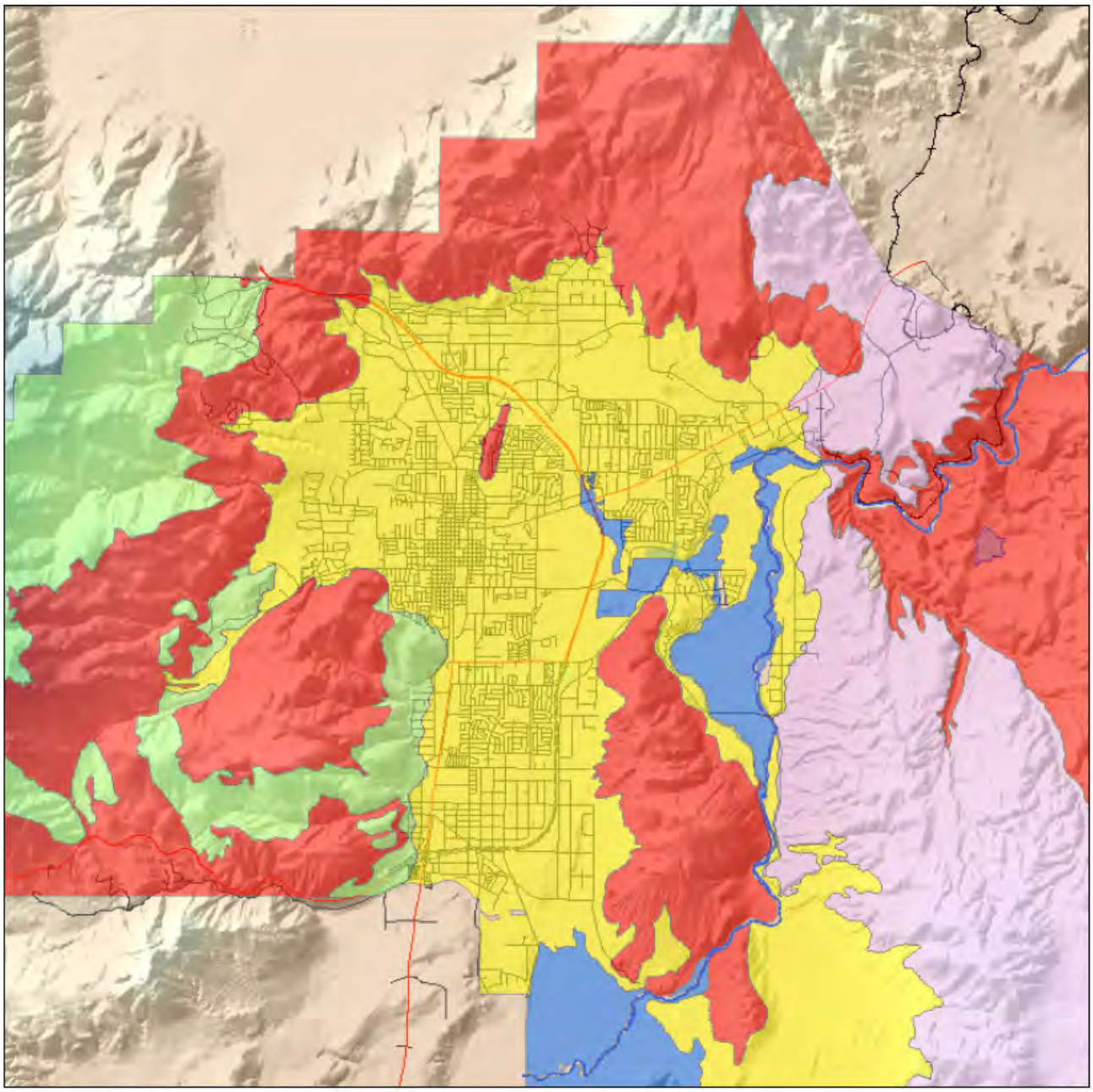
- Proposed Freeway
- Proposed V&T Railroad
- **Street Centerline**
- Arterial Route
- Collector Route
- Local Route
- Water Bodies
- EHS Facilities
- EHS Facilities 1Mile Buffer

0 0.5 1 2 Miles

FINAL - 1/19/2010

N

Carson City
Hazard Mitigation Plan



Landslide Hazard Areas

Figure: B-4

Legend

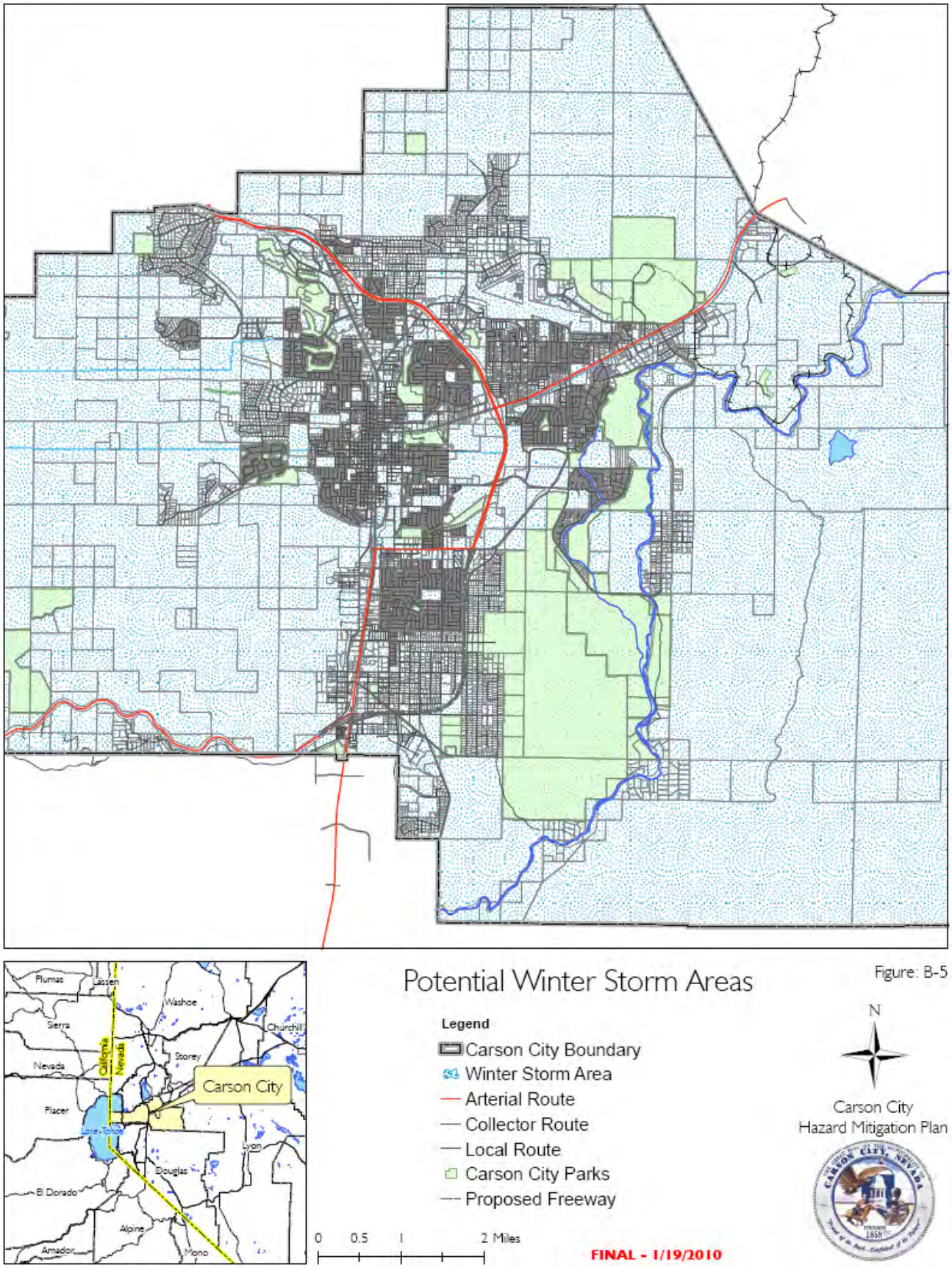
- High (Slopes Range from 25% to 75%)
- Moderate (Slopes Range from 30% to 55%)
- Low (Silty,Rocky Slopping Formations range from 20% to 50%)
- Very Low (Urban Area nearly flat)
- Silty, Sandy Marsh Area (LandLiquification Probable)

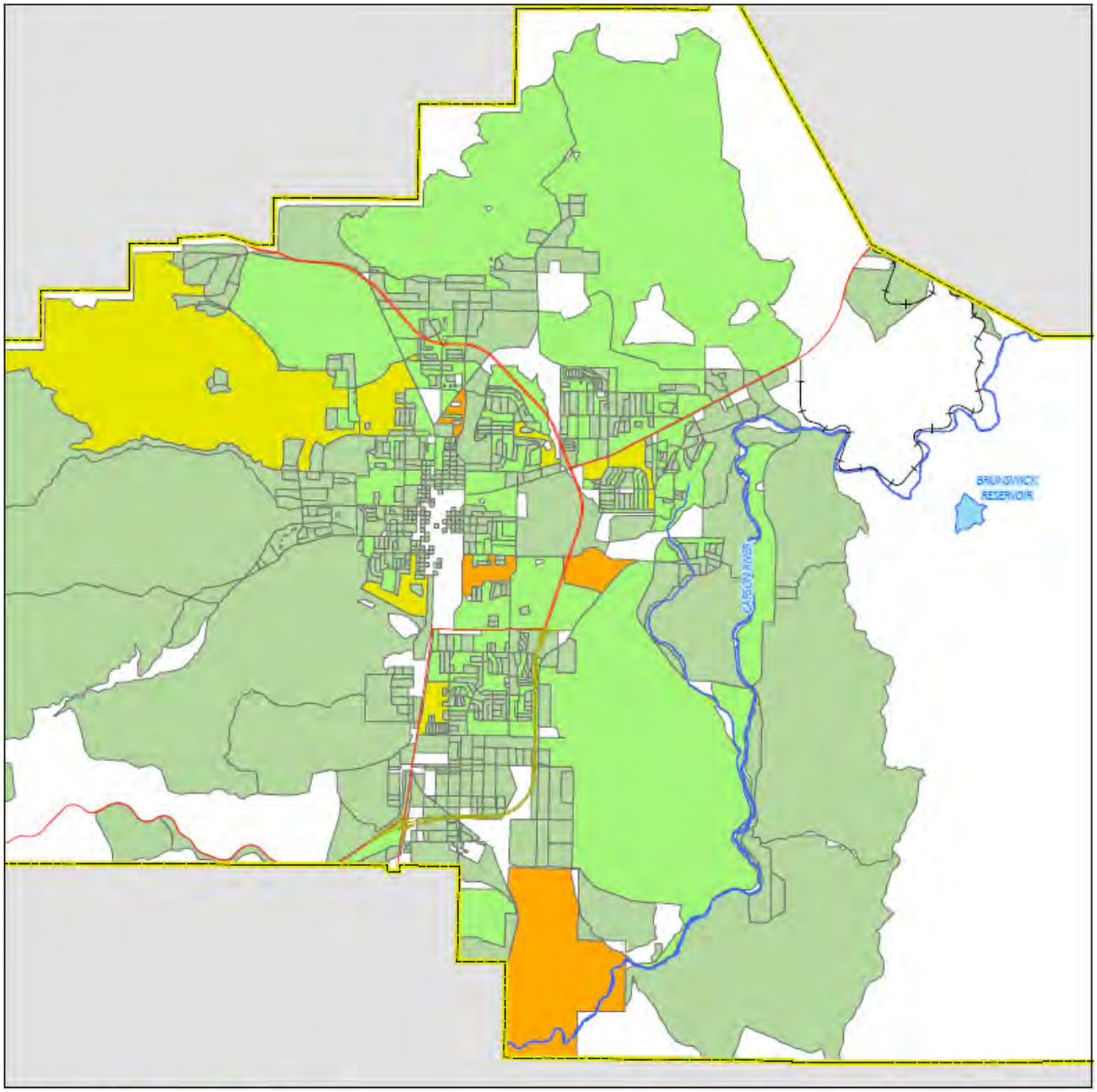
0 0.5 1 2 Miles

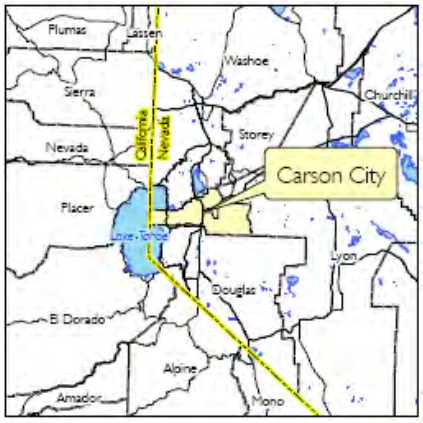
FINAL - 1/19/2010

N

Carson City
Hazard Mitigation Plan


Plumas
Lassen
Washoe
Sierra
Churchill
Storey
Nevada
California
Nevada
Carson City
Placer
Lake Tahoe
Lyon
Douglas
El Dorado
Alpine
Amador
Mono
Potential Winter Storm Areas
Figure: B-5
Legend
Carson City Boundary
Winter Storm Area
Arterial Route
Collector Route
Local Route
Carson City Parks
Proposed Freeway
N
Carson City
Hazard Mitigation Plan
0
0.5
1
2 Miles
FINAL - 1/19/2010





Population Density Areas

Figure: B-6

Legend

- Arterial Route
- Proposed Freeway
- Proposed V&T Railroad
- Water Bodies

2000 US Census Block Data
Population Count (Per Square Mile)

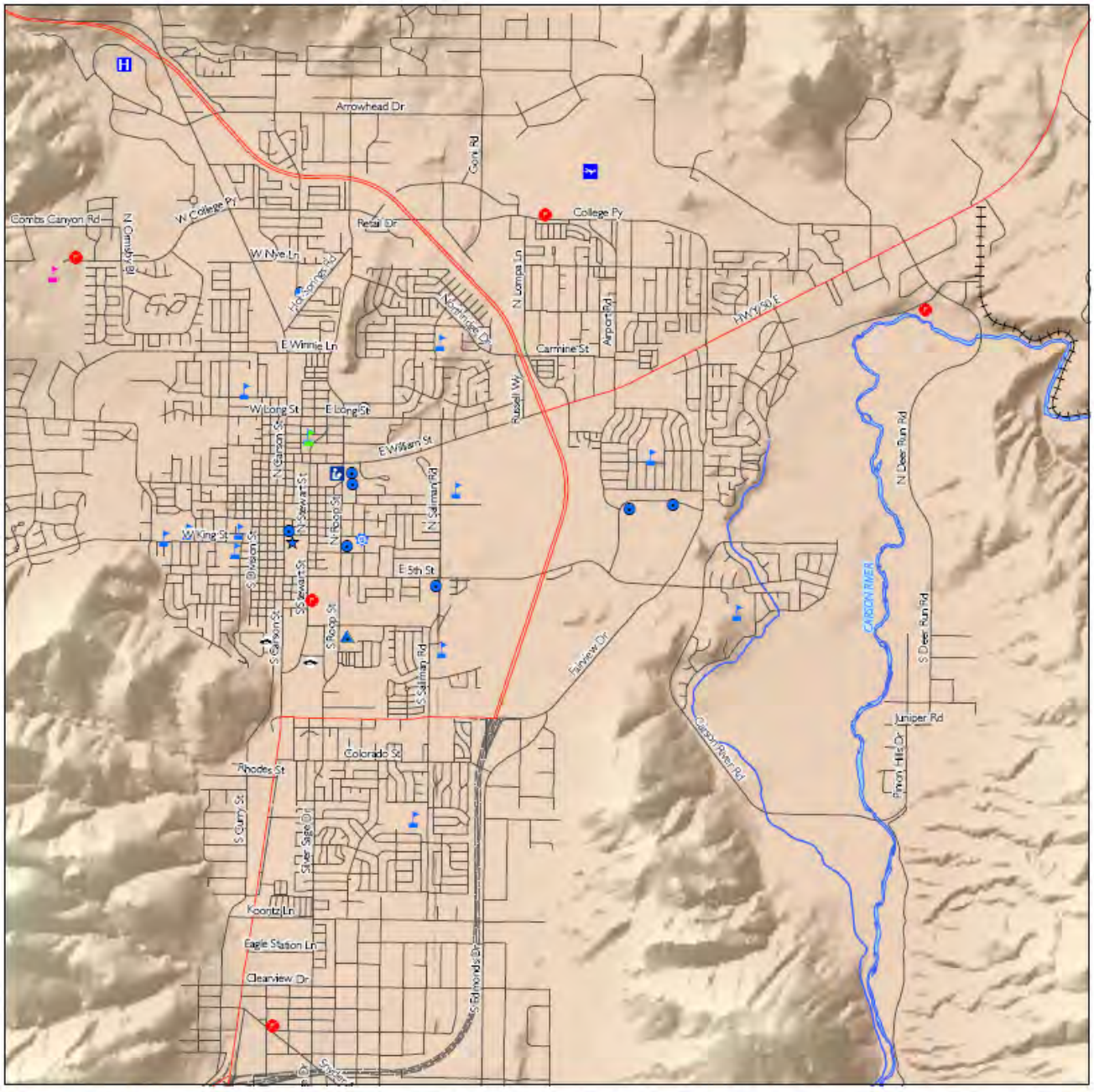
- 1 - 100.0
- 100.0 - 400.0
- 400.0 - 800.0
- 800.0 - 1484.0

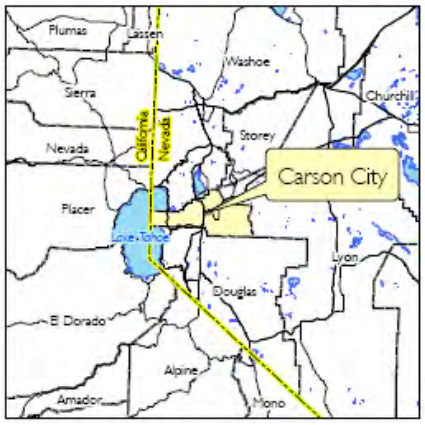
0 0.5 1 2 Miles

FINAL - 1/19/2010

N

Carson City
Hazard Mitigation Plan





Critical Facilities and Infrastructure

Figure: B-7

Legend

Street Centerline
- Arterial Route
- Collector Route
- Local Route
- Proposed Freeway
- Proposed V&T Railroad
- Water Bodies

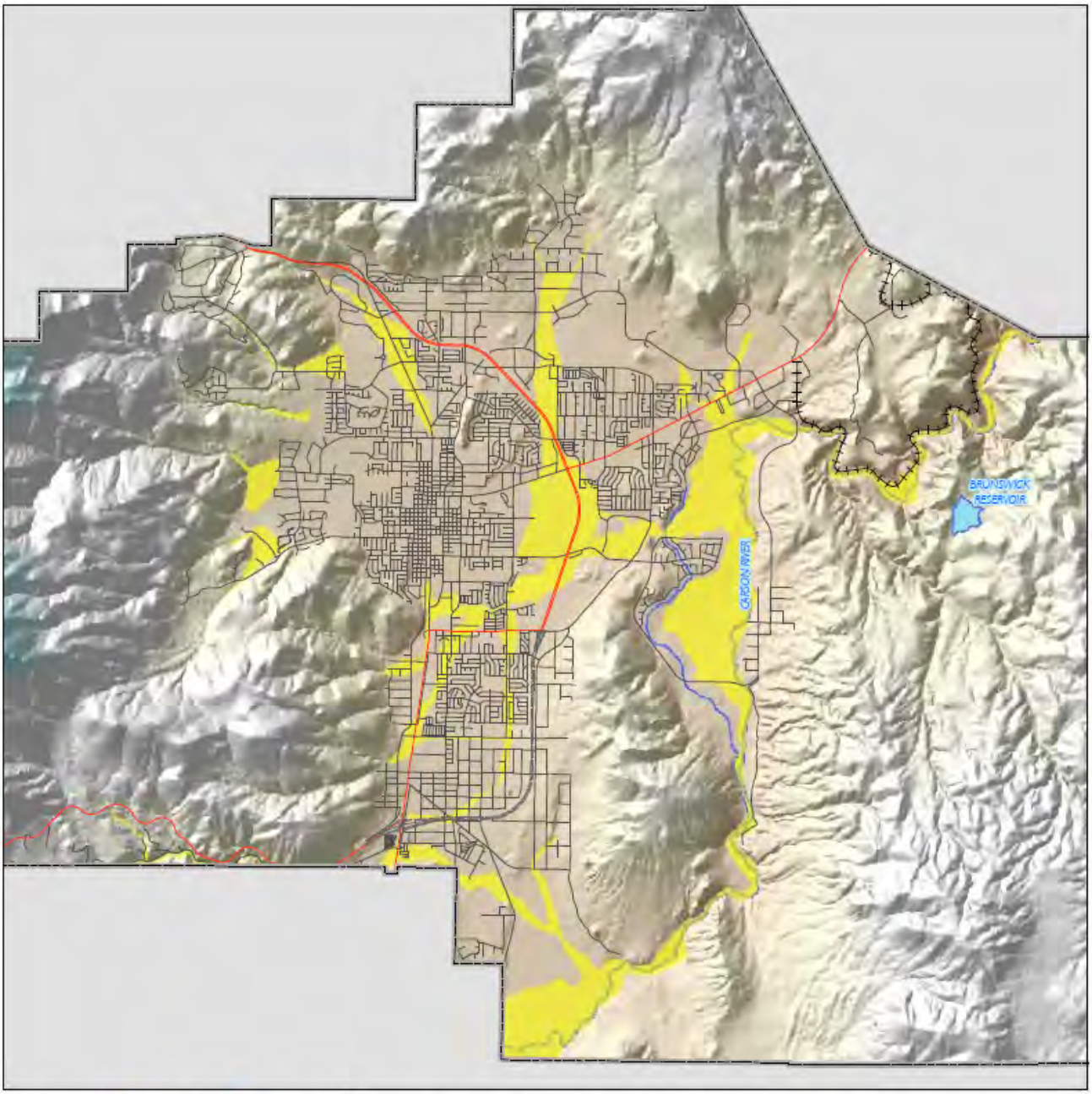
- Carson City Airport
- Carson City Facilities
- Carson City Capital Building
- Carson City Library
- Carson City Sheriff's Department
- Carson City Fire Stations
- Nevada Highway Patrol Offices
- Carson Tahoe Regional Medical Center
- United States Post Office
- Pioneer High School - Alternative Education
- Western Nevada College
- CCSchools

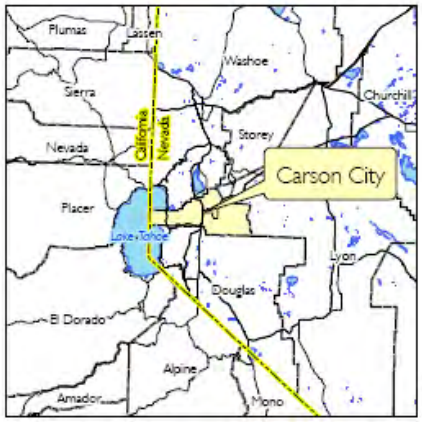
0 0.5 1 Miles

FINAL - 1/19/2010

N

Carson City
Hazard Mitigation Plan





FEMA 100 Year Flood Zone Areas

Figure: B-8

Legend

Proposed Freeway
Proposed V&T Railroad

Street Centerline
Arterial Route
Collector Route
Local Route

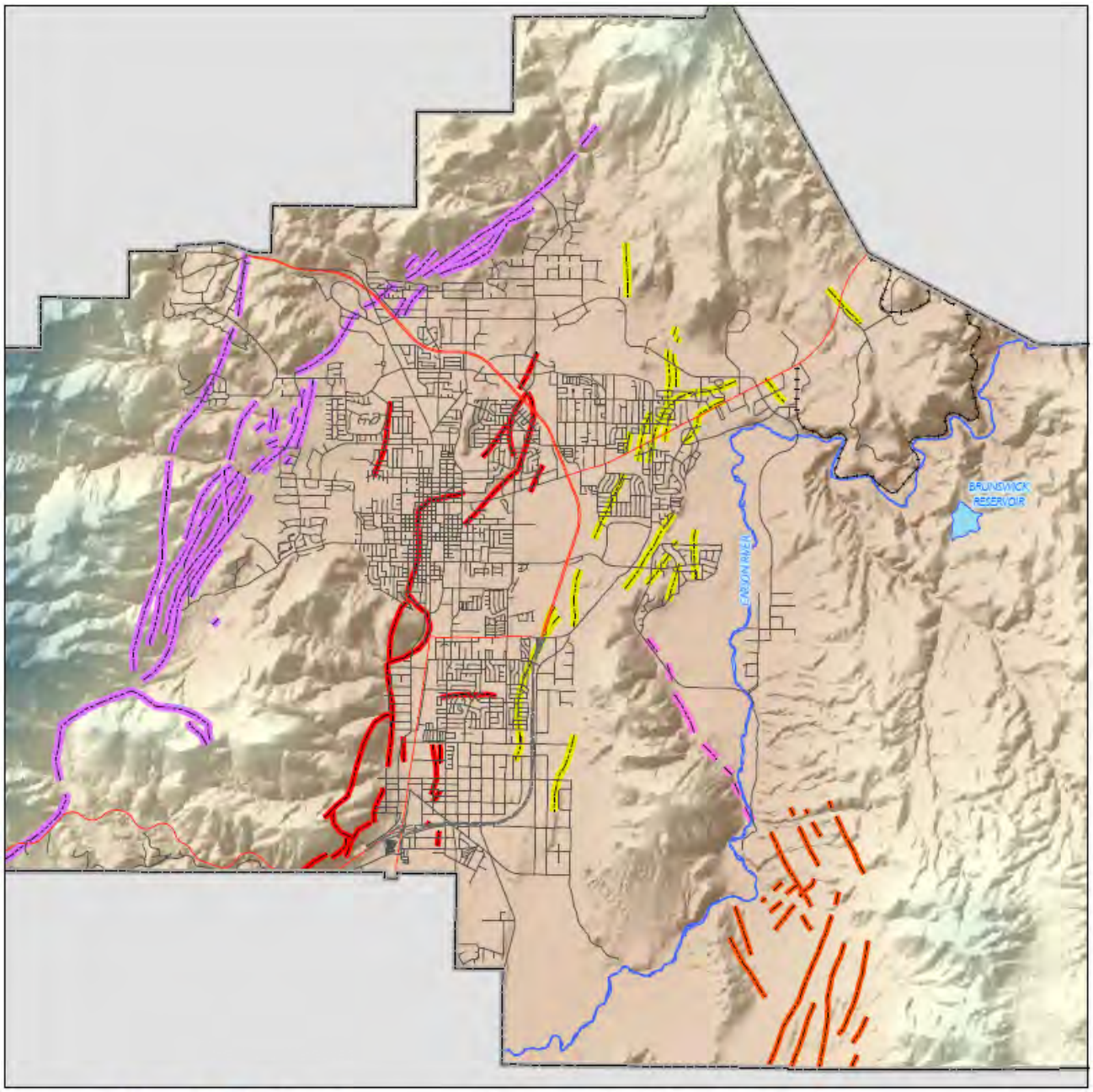
FEMA Floodzone
100 Year Zone
Water Bodies

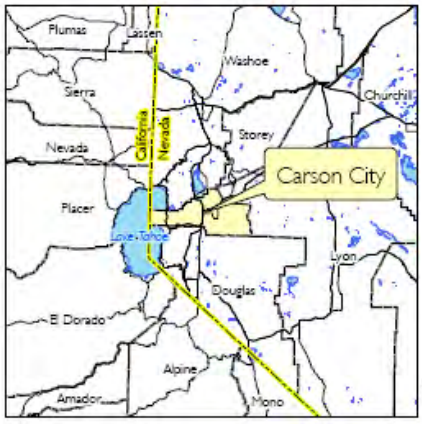
0 0.5 1 2 Miles

FINAL - 1/19/2010

N

Carson City
Hazard Mitigation Plan





Earthquake-Magnitude 6.5

Figure: B-9

Legend

Fault Line Name

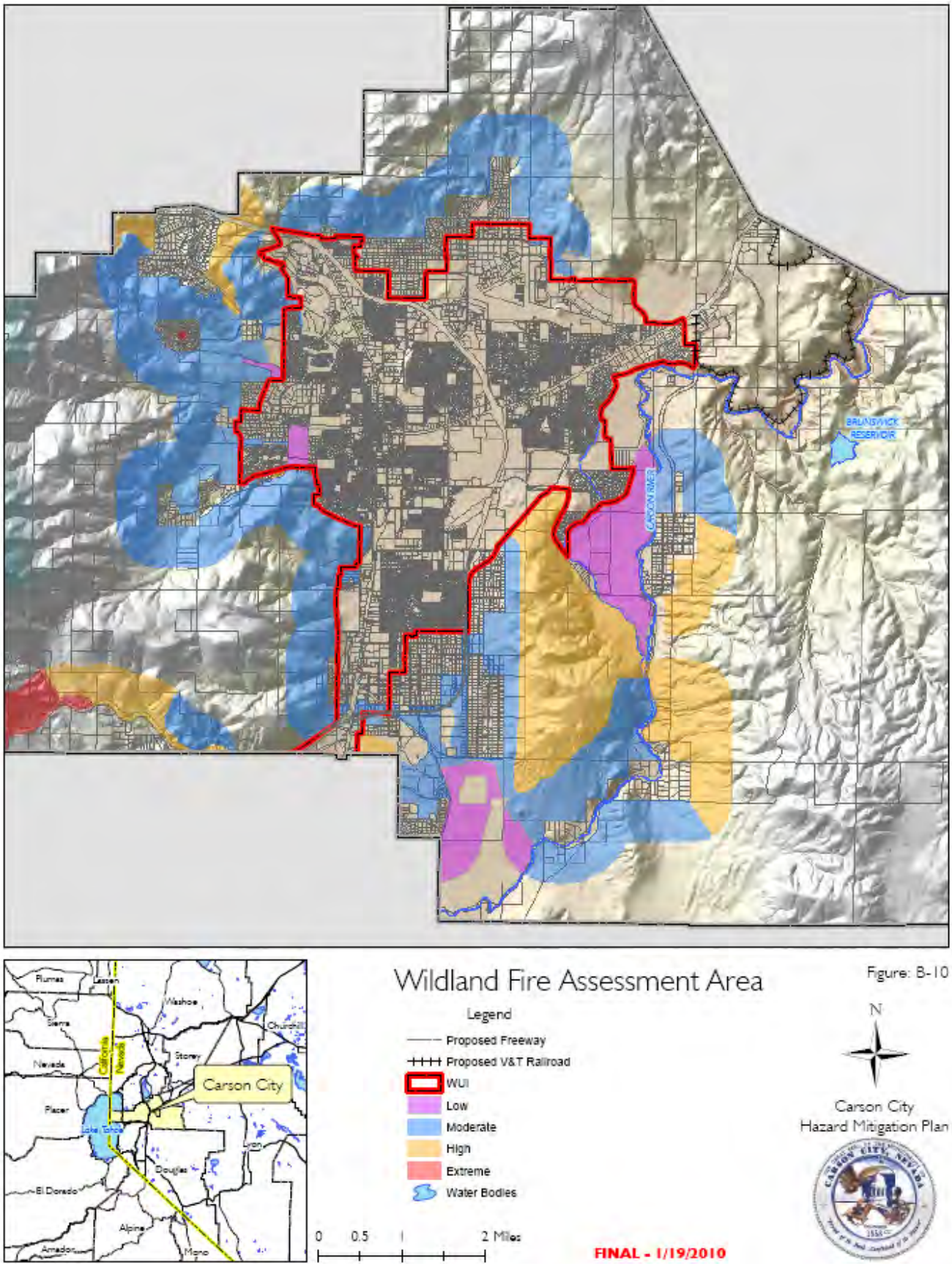
- Carson City fault
- East Carson Valley fault zone
- Eastern Prison Hill fault zone
- Kings Canyon fault zone
- New Empire fault zone
- Proposed Freeway
- Arterial Route
- Collector Route
- Local Route

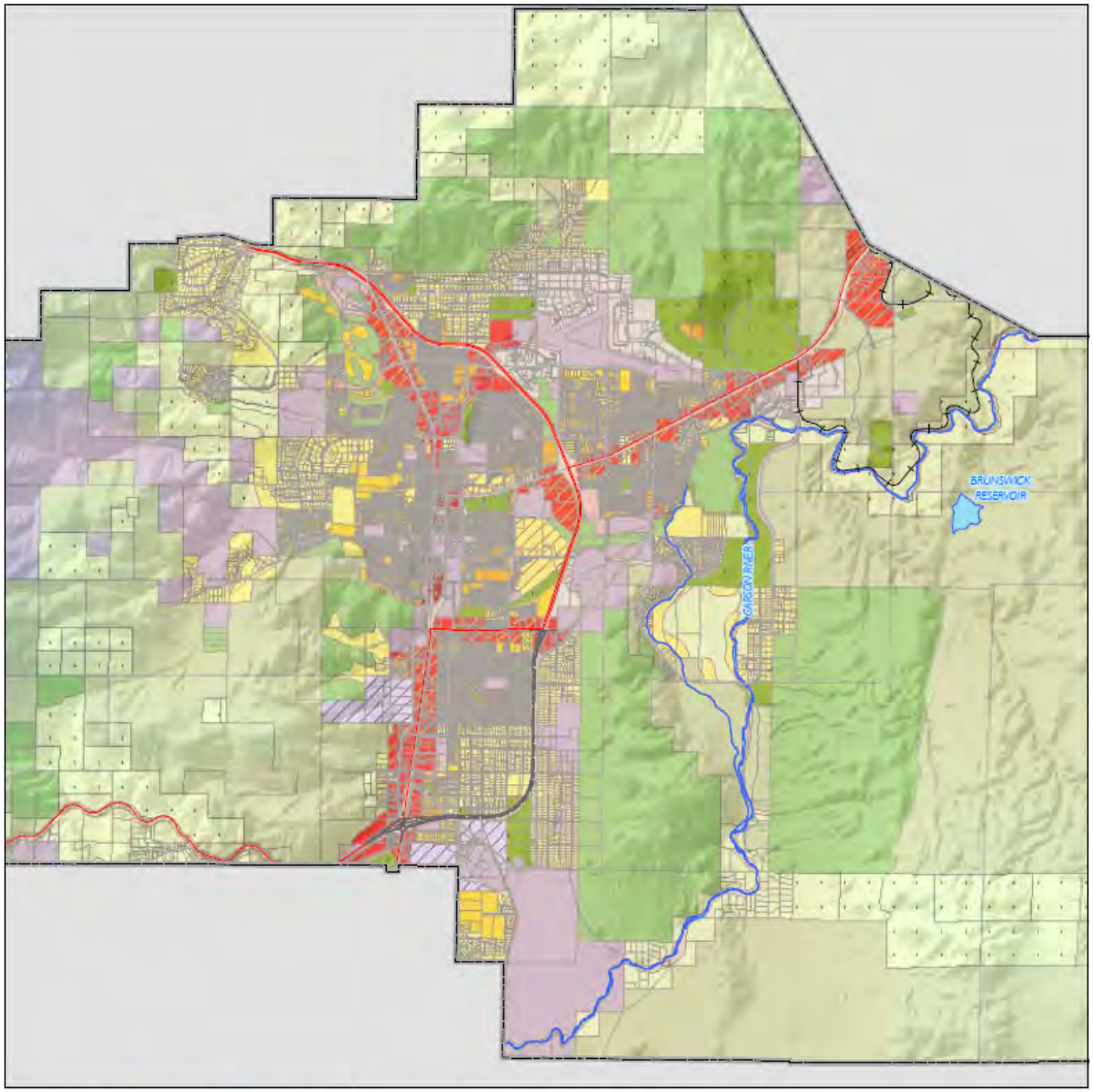
0 0.5 1 2 Miles

FINAL - 1/19/2010

N

Carson City
Hazard Mitigation Plan


BRUNSWICK RESERVOIR
CARSON RIVER
Carson City
Lake Tahoe
California
Nevada
Plumas
Lassen
Washoe
Sierra
Churchill
Storey
Nevada
Placer
Douglas
Lyon
El Dorado
Alpine
Amador
Mono
Wildland Fire Assessment Area
Legend
Proposed Freeway
Proposed V&T Railroad
WUI
Low
Moderate
High
Extreme
Water Bodies
0
0.5
1
2 Miles
FINAL - 1/19/2010
Figure: B-10
N
Carson City
Hazard Mitigation Plan



Carson City Landuse

Legend

- Mixed-Use Employment
- Mixed-Use Residential Neighborhood
- Downtown Mixed-Use
- Mixed-Use Commercial
- Community/Regional Commercial
- Neighborhood Commercial
- Office
- Industrial
- CR
- Rural Residential
- Low Density Residential
- Medium Density Residential
- High Density Residential
- Public Conservation
- Open Space
- Parks and Recreation
- Public/Quasi-Public
- Vacant Private Land
- Washoe Tribe

0 0.5 1 2 Miles

FINAL - 2/9/2010

Figure: B-11

N

Carson City
Hazard Mitigation Plan

Appendix C

Planning Team Meeting Minutes

- ***August 2009***

During the kick-off meeting, at the Carson City Fire Station the Committee discussed the objectives of the DMA 2000, the hazard mitigation planning process, the public outreach process, and the steps involved in updating the HMP and achieving the City's goals. The planning process was discussed including the purpose of the plan and the previous plans tasks, goals and objectives and new goals and objectives were considered. The Committee approved the committee By-Laws. The 20 potential hazards from the original HMP (as shown in Section 5.2), were reviewed and modifications to the hazards list were discussed. A hazard identification table was completed for the update. The exercise identified the specific hazards that the Planning Committee wanted to address in the HMP. See Appendix E for agenda, handouts and minutes.

- ***September 2009***

Briefed the Planning Committee on progress made to date, including a press release and notification letter to neighboring communities and relevant agencies of the HMP preparation. The Committee completed the Incorporation of Existing Plans/Study table to identify all the plans/studies available (as shown in section 4.4). The Planning Committee used the hazards identified in the previous meeting and completed a Hazard Profiling Worksheet. The exercise used group averaging to prioritize the hazards into high, medium and low categories. See Appendix E for meeting agenda, handouts and minutes.

- ***October 2009***

Coordinated with Carson City Public Works and the Planning Department to gather data, to include copies of their Land Use Map and Flood Plain Map. Coordinated with UNR, Bureau of Mines and Geology to gather earthquake data. As information was gathered, additions were made to the developing plan.

- ***November 2009***

Continued to gather information. Began formation of the Risk Assessment and Vulnerability Analysis. The outline of the draft plan was coming together, maintained communication and update status with Carson City HMP Project Manager.

- ***December 2009***

Met with Public Works to initiate the risk assessment. Met with Planning Department to review the master plan, city building codes and reviewed previous plan's mitigation actions and new actions. Met with Floodplain Manager, Sherriff's Department, Fire Department to review previous plan's mitigation actions and new actions.

- ***January 2010***

Presented the Planning Committee with the initial analysis of the risk assessment, describing which assets were analyzed and how values were estimated. The Planning Committee reviewed past goals and actions, identified completed actions and drafted new actions. Planning

Committee used STAPLE+E form to prioritize actions. See Appendix E for a list of attendees, meeting handouts and minutes.

- ***February 2010***

With the information from the prioritization process the Planning Committee selected the top actions they felt were feasible and realistic to be completed during this iteration of the HMP. With this information they completed the Mitigation Action matrix.

- ***April 2010***

The completed plan was distributed to the Planning Committee for their review. The plan was provided to the NV State Hazard Mitigation Officer for review and submission to FEMA.

Appendix D
Public Information

Community/Regional Letter

CARSON CITY FIRE DEPARTMENT

"Service with Pride, Commitment, Compassion"

July 14, 2009

Dear Community Member,

Over the next few months, Carson City will review and update its Multi-Hazard Mitigation Plan, and I am requesting your participation in this process.

In 2005 Carson City developed a comprehensive Multi-Hazard Mitigation Plan. This plan was developed with the intention of complying with federal requirements and to also provide a tool to local government, industry, and private individuals. The plan examines the potential threats that residents of our community may face. It also addresses mitigation efforts that can take place in both public and private venues that can help reduce the impact of the individual threats.

To date, the development of this plan has helped our community develop infrastructure to lessen damage caused by flooding, wildland fires, and earthquakes, as well as other potential disasters.

The federal government requires that this plan be updated and resubmitted for federal approval every five years, so we are at a point where we need to form a committee to begin updating our plan. One of the major components of plan development is having a good cross-section of community input, and that is the reason for this invitation. I am hoping that you will agree to be included on the planning team. The level of commitment will involve a few meetings, plus a review of the components of the plan as they are rewritten. I anticipate averaging a meeting a month, but generally the work can be done via e-mail after our introductory meeting. That meeting will be held on August 6, 2009, at 1:30 PM at Fire Station 1.

I am hoping that you can participate as a representative of your profession. If you are willing to join our group, please RSVP to Judy Dietrich at her e-mail address of jdietrich@ci.carson-city.nv.us.

Sincerely yours,

R. Stacey Giomi
Fire Chief/Emergency Management Director

777 S. Stewart Street, Carson City, Nevada 89701
Business Phone (775) 887-2210 • Fax (775) 887-2209 • www.carsonfire.org

Press Release

CARSON CITY FIRE DEPARTMENT

"Service with Pride, Commitment, Compassion"

PRESS RELEASE
For
Local Media and Website
July 27, 2009

In recent years nature has been restless in Nevada. There has been a swarm of earthquakes rattling the western portion of the State immediately adjacent to Carson City as well as the Truckee levee breech just north of Carson City. There have also been ravaging wildland fires throughout the State, including fires surrounding the Reno area. All of these emergency events have demonstrated that Carson City can be vulnerable to disasters, including earthquakes, floods, severe winter storms, and wildland fires. The risks posed by these hazards will continue to increase as the City's population continues to grow.

Carson City, Nevada, has launched a planning effort, known as the *Carson City Hazard Mitigation Plan*, to assess risks posed by natural and manmade disasters and identify ways to reduce those risks. This plan is required under the Federal Disaster Mitigation Act of 2000 as a prerequisite for receiving certain forms of Federal disaster assistance.

Carson City began this planning process in July 2009 and is sending out a questionnaire with the August utility bill for public input. The City anticipates submittal of the draft plan to the Board of Supervisors for adoption during early spring and then expects to submit the final version of this plan to FEMA by next summer.

Public comments and participation are welcomed. For additional information, to request to participate, or to submit comments, please contact Gary Dunn, Carson City Emergency Management, at (775) 887-2210 or gdunn@ci.carson-city.nv.us .

777 S. Stewart Street, Carson City, Nevada 89701
Business Phone (775) 887-2210 • Fax (775) 887-2209 • www.carsonfire.org

Questionnaire

CARSON CITY HAZARD MITIGATION QUESTIONNAIRE

This questionnaire is designed to help the Carson City Hazard Mitigation Steering Committee identify the community's concerns about natural and human-caused hazards. The questionnaire should be completed by an adult, preferably the homeowner or the head of the household. All individual responses are strictly confidential and for research purposes only. ***If you have any questions call (775) 887-2210, ext.1050.***

GENERAL HOUSEHOLD INFORMATION

1. ZIP CODE _____ INTERNET ACCESS? Y/N _____ OWN or RENT? _____ # YEARS IN CITY? _____

2. How concerned are you about the following disasters affecting your community? Please give each hazard a priority rating as follows: ***0 = Not concerned; 1 = Somewhat concerned; 2 = Moderately concerned; 3 = Very concerned***

	Natural		Health Alert/Mass Disease		Telecommunications Failure
	Floods		Landslide/Mudslide		Radiological Incident
	Fire		Earthquake		Terrorism
	Levee Failure		Biological plant or animal		Utilities Interruption
	High Winds		**Human Caused**		
	Dam Failure		Transportation Loss		

3. What is the most effective way for you to receive information about how to make your home safer from natural disasters? ***(Check all that apply)***

□ Newspaper □ Internet □ Radio □ Public Meetings
□ Television □ Utility Bill □ Mail □ Billboard

4. In the following list, please check those activities that apply.

Have you or someone in your household:	Have done	Plan to do	Not done	Unable to do
Attended meetings or received written information on natural disasters or emergency preparedness?				
Talked with family members about what to do in case of a disaster or emergency?				
Developed a "Household/Family Emergency Plan" in order to decide what everyone would do in the event of a disaster?				
Prepared a "Disaster Supply Kit" (extra food, water, medications, batteries, first aid items and other emergency supplies)?				
In the last year, has anyone in your household been trained in First Aid or Cardio-Pulmonary Resuscitation (CPR)?				

5. Building a disaster supply kit, receiving First Aid training and developing a household/family emergency plan are all inexpensive activities that require a personal time commitment. How much time (per year) are you willing to spend on disaster/emergency preparedness? ***(Check only one)***

□ 0-1 hour □ 2-3 hours □ 4-7 hours □ 8-15 hours □ 16+ hours □ Other _____

6. Did you consider the possible occurrence of a natural hazard when you bought/moved into your current home?_____

7. Would you be willing to spend more money on a home that has features that make it more disaster resistant?_____

8. Do you carry flood insurance?_____ If yes what is the annual cost? $_____ If no was it available _____

9. Would you be willing to make your home more resistant to natural disasters? **Y/N** _____

10. What modifications for earthquakes and floods have you made to your home? (***Check all that apply)***

	Nonstructural		Structural
	Anchor bookcases, cabinets to wall		Secure home to foundation
	Secure water heater to wall		Brace inside of cripple wall with sheathing
	Install latches on drawers/cabinets		Brace unreinforced chimney
	Fit gas appliances with flexible connections		Brace unreinforced masonry & concrete walls and foundations
	Flood proof		Elevate home
	Other _____		

MAIL OR DROP OFF @ CARSON CITY FIRE DEPT., 777 SOUTH STEWART ST., CARSON CITY, NV 89701
By September 30, 2009

Carson City Hazard Mitigation Questionnaire (Cont'd)

11. Natural & human caused disasters can have a significant impact on a community but planning for these events can help lessen the impact. The following statement will help us determine community priorities for planning for those hazards.

Statement	Very Important	Somewhat Important	Neutral	Not Very Important	Not Important
Protecting private property					
Protecting critical facilities (hospitals, transportation, fire stations)					
Preventing development in hazard areas					
Protecting natural environment					
Protecting historical and cultural landmarks					
Promoting cooperation among public agencies, citizens, non-profit organizations and businesses					
Protecting and reducing damage to utilities					
Strengthening emergency services (police, fire, ambulance)					

12. Please check the box that best represents your opinion of the following strategies to reduce the risk and loss associated with natural disasters.

Communitywide Strategies	Agree	Neutral	Disagree	Not Sure
I support a regulatory approach to reducing risk.				
I support a non-regulatory approach to reducing risk.				
I support policies to prohibit development in areas subject to natural hazards.				
I support the use of local tax dollars to reduce risks and losses from natural disasters.				
I support protecting historical and cultural structures.				
I would be willing to make my home more disaster-resistant.				
I support steps to safeguard the local economy following a disaster event.				
I support improving the disaster preparedness of schools.				

13. To the best of your knowledge, is your property located in a designated floodplain? Y/N _____

14. The term mitigation means to make something become less harsh or severe, to alleviate. Mitigation activities are those types of actions you can take to protect your home and property from natural hazard events such as floods. Carson City is preparing an All-Natural Hazard Mitigation Plan to formulate and document mitigation strategies that will aid our community in protecting life and property from the impacts of future natural disasters.

If your property were located in a designated "high hazard" area, or had received repeated damages from a natural hazard event, would you consider a "buyout", elevation of the structure, or relocation offered by a public agency?
Y/N _____

15. Please rank how prepared you feel you and your household are for the probable impacts of natural hazard events likely to occur within Carson City. Rank on a scale of 1 to 5 with 5 being the most prepared. _____

Other Comments:

MAIL OR DROP OFF @ CARSON CITY FIRE DEPT., 777 SOUTH STEWART ST., CARSON CITY, NV 89701
By September 30, 2009

Carson City Hazard Mitigation Questionnaire

General Comments:

1. The Carson City Hazard Mitigation Questionnaire was designed to help the Carson City Hazard Mitigation Steering Committee identify the community's concerns about natural and human-caused hazards. The questionnaire was considered an essential developmental element of the City's 2010 Hazard Mitigation Plan.

2. During July and August, 2009, approximately 17,000 questionnaires were sent to Carson City residents along with their utility bills. Approximately 900 questionnaires were returned to the Carson City Fire Department. Questionnaire responses were tallied and written commends were reviewed.

3. Written comments specifically involving hazard mitigation concerns were given to the various departments (Public Works, Fire, Sheriffs, etc.) for review and action.

4. The concerns (rated at **very** and **moderate**) of citizens residing in the Municipality of Carson City are, in highest to least order:

- Fire
- Earthquake
- High Winds
- Utility Loss
- Telecommunication Loss
- Health Alert/Mass Disease
- Terrorism
- Floods
- Transportation
- Radiological

5. The questionnaire revealed that the majority of Carson City citizens wish to receive information about how to make their homes safer from natural disasters via television, newspaper, utility bills, internet and mail. Billboards, public meetings and radio were concerned to be less effective.

6. Although many families have developed a Household/Family Emergency Plan and Disaster Supply Kit, many have not and more public education in preparing for a disaster needs to be considered.

7. The questionnaire provided excellent feedback from the community concerning hazard mitigation issues and was used during the development of the Carson City Hazard Mitigation Plan.

Questionnaire Responses

The responses are listed below. All questionnaire comments were provided to Planning Committee and taken into consideration when developing and prioritizing actions, however they are not listed in this plan.

1. Number of responses by Zip Code

89701	394
89702	6
89703	259
89706	222
Total:	881

Do you have internet access?	**Yes**	**No**
89701	328	80
89702	5	1
89703	206	53
89706	160	60
Total:	699	194

Number that own or rent:	**Own**	**Rent**
89701	339	12
89702	6	0
89703	254	5
89706	216	5
Total:	815	22

Average number of years in the City?	**89701**	**89702**	**89703**	**89706**	**Total**
1-5	22	0	23	21	66
5-10	47	0	42	37	126
10-20	92	0	47	45	184
20+	157	6	121	104	388

Levee Failure	89701	89702	89703	89706	Total
0	265	5	234	213	717
1	27	1	20	5	53
2	21	0	12	3	36
3	14	0	4	1	19
High Winds					
0	33	0	36	34	103
1	88	3	79	47	217
2	126	2	88	64	280
3	93	1	48	62	204
Dam Failure					
0	268	5	119	211	603
1	30	1	28	5	64
2	17	0	11	3	31
3	11	0	5	1	17
Health Alert/Mass Disease					
0	50	2	58	45	155
1	123	0	86	58	267
2	81	3	65	65	214
3	69	1	33	46	149
Landslide/Mudslide					
0	182	5	112	111	410
1	74	0	73	65	212
2	60	1	51	30	142
3	22	0	12	7	41
Earthquake					
0	34	0	28	25	87
1	101	3	68	59	231
2	125	1	98	69	293
3	84	2	53	57	196
Biological Plant or Animal					
0	151	4	133	109	397
1	94	1	85	68	248
2	62	0	29	31	122
3	24	1	9	12	46
Transportation					
0	130	2	117	68	317
1	93	2	78	62	235
2	62	2	43	43	150
3	40	0	25	29	94
Telecommunication					
0	65	2	49	48	164
1	111	1	67	62	241
2	95	2	63	73	233
3	69	1	48	39	157

Radiological					
0	123	3	116	94	336
1	111	2	77	66	256
2	62	1	34	39	136
3	40	0	19	23	82
Terrorism					
0	92	0	101	90	283
1	103	1	78	71	253
2	80	3	47	64	194
3	67	2	32	37	138
Utilities					
0	29	0	44	26	99
1	118	2	75	61	256
2	110	2	86	71	269
3	89	1	49	49	188
3. What is the most effective way for you to receive information about how to make your home safer from natural disasters?					
Newspaper	164	2	153	99	418
Internet	111	3	110	87	311
Radio	115	4	87	71	277
Public Meeting	33	1	27	19	80
Television	220	5	166	111	502
Utility Bill	173	2	126	108	409
Mail	169	5	151	98	423
Billboard/Other	21	1	13	12	47
4. Have you or someone in your household: Attended meetings or received written information on natural disasters or emergency preparedness?					
Have done:					
Plan to do:	138	3	134	83	358
Not done:	19	0	11	5	35
Unable to do:	174	3	115	112	404
Talked with family members about what to do in case of a disaster or emergency?	13	0	3	5	21
Have done:					
Plan to do:	179	4	150	109	442
Not done:	47	0	34	21	102
Unable to do:	107	2	68	64	241
	12	0	3	10	25

Developed a "Household/Family Emergency Plan" in order to decide what everyone would do in the event of a disaster?	**89701**	**89702**	**89703**	**89706**	**Total**
Have done:	111	2	95	78	286
Plan to do:	81	2	70	46	199
Not done:	135	2	85	60	282
Unable to do:	14	0	2	8	24
Prepared a "Disaster Supply Kit" (extra food, water, medications, batteries, first aid items and other emergency supplies)?					
Have done:	130	1	81	90	302
Plan to do:	82	3	69	45	199
Not done:	129	2	105	60	296
Unable to do:	3	0	0	6	9
In the last year, has anyone in your household been trained in First Aid or Cardio-Pulmonary Resuscitation (CPR)?					
Have done:	84	0	61	51	196
Plan to do:	16	0	14	11	41
Not done:	226	6	177	145	554
Unable to do:	20	0	6	6	32
5. Building a disaster supply kit, receiving First Aid training and developing a household/family emergency plan are all inexpensive activities that require a personal time commitment. How much time (per year) are you willing to spend on disaster/emergency preparedness?					
0-1 hour:	74	1	37	43	155
2-3 hours:	104	1	83	58	246
4-7 hours:	69	1	60	44	174
8-15 hours:	36	1	26	21	84
16+ hours:	33	0	18	21	72
Other:	22	1	12	17	52
6. Did you consider the possible occurrence of a natural hazard when you bought/moved into your current home?					
Yes:	177	2	145	108	432
No:	179	4	108	95	386

7. Would you be willing to spend more money on a home that has features that make it more disaster resistant?					
Yes:	169	5	143	101	418
No:	125	1	89	94	309
8. Do you carry flood insurance?					
Yes:	38	1	32	27	98
No:	292	5	201	162	660
9. Would you be willing to make your home more resistant to natural disasters?	**89701**	**89702**	**89703**	**89706**	**Total**
Yes:	249	3	183	135	570
No:	64	3	39	55	161
10. What modifications for earthquakes and floods have you made to your home?					
Anchor bookcases, cabinets to wall:	87	2	89	63	241
Secure water heater to wall:	197	4	167	133	501
Install latches on drawers/cabinets:	30	1	21	14	66
Fit gas appliances with flexible connections:	177	3	130	97	407
Flood proof:	17	1	24	20	62
Secure home to foundation:	107	2	79	69	257
Brace inside of cripple wall with sheathing:	43	0	27	21	91
Brace unreinforced chimney:	20	1	28	6	55
Brace unreinforced masonry & Concrete walls and foundations:	17 34	0 1	20 24	13 17	50 76
Elevate home:	8	0	3	4	15
Other (drainage trench, French drains, cleared brush, various upgrades):					
11. Natural and human caused disasters can have a significant impact on a community but planning for these events can help lessen the impact. The following statement will help us determine community priorities for those hazards.					
Protecting private property:					
Very important:	238	6	171	160	575
Somewhat important:	80	0	52	48	180
Neutral:	20	0	14	20	54
Not very important:	2	0	1	1	4
Not important:	2	0	0	1	3

Protecting critical facilities (hospitals, transportation, fire stations):					
Very important:	317	5	219	184	725
Somewhat important:	21	1	18	27	67
Neutral:	3	0	2	12	17
Not very important:	0	0	1	0	1
Not important:	2	0	0	1	3
Preventing development in hazard areas:	**89701**	**89702**	**89703**	**89706**	**Total**
Very important:	228	1	157	125	511
Somewhat important:	79	4	62	49	194
Neutral:	28	0	25	30	83
Not very important:	6	0	1	2	9
Not important:	2	0	0	3	5
Protecting the natural environment:					
Very important:	179	1	137	90	407
Somewhat important:	87	3	70	72	232
Neutral:	40	1	19	35	95
Not very important:	13	0	7	6	29
Not important:	7	0	4	3	14
Protecting historical and cultural landmarks:					
Very important:	143	0	106	85	334
Somewhat important:	122	2	108	65	297
Neutral:	50	2	36	32	120
Not very important:	18	0	6	1	25
Not important:	4	1	3	8	16
Promoting cooperation among public agencies, citizens, non-profit organizations and businesses:					
Very important:	216	2	153	125	496
Somewhat important:	95	3	61	36	195
Neutral:	23	1	18	34	76
Not very important:	8	0	4	0	12
Not important:	2	0	2	4	8
Protecting and reducing damage to utilities:					
Very important:	256	5	177	153	591
Somewhat important:	70	1	57	44	172
Neutral:	12	0	11	11	34
Not very important:	4	0	0	0	4
Not important:	2	0	0	0	2

Strengthening emergency services (police, fire, ambulance):					
Very important:	227	4	156	158	545
Somewhat important:	71	1	56	50	178
Neutral:	32	1	21	7	61
Not very important:	4	0	2	0	6
Not important	3	0	0	4	7

12. Please check the box that best represents your opinion of the following strategies to reduce the risk and loss associated with natural disasters:	**89701**	**89702**	**89703**	**89706**	**Total**
I support a regulatory approach to reducing risk:					
Agree:	111	2	93	82	288
Neutral:	90	1	63	71	225
Disagree:	86	2	54	53	195
Not sure:	38	1	26	23	88
I support a non-regulatory approach to reducing risk:					
Agree:	157	4	126	5	289
Neutral:	95	1	70	66	232
Disagree:	34	0	26	24	84
Not sure:	38	1	18	18	75
I support policies to prohibit development in areas subject to natural hazards:	258	3	192	140	593
Agree:	51	0	35	40	126
Neutral:	14	2	8	7	31
Disagree:	13	1	5	7	26
Not sure:					
I support the use of local tax dollars to reduce risks and losses from natural disasters:	166	2	130	87	385
Agree:	114	2	62	56	234
Neutral:	45	1	31	42	119
Disagree:	24	1	9	12	46
Not sure:					

I support protecting historical and cultural structures:					
Agree:	167	2	128	104	401
Neutral:	128	2	95	83	308
Disagree:	35	2	11	15	63
Not sure:	11	0	5	11	27
I would be willing to make my home more disaster-resistant:					
Agree:	187	3	160	124	474
Neutral:	93	1	61	58	213
Disagree:	16	2	8	6	32
Not sure:	27	0	9	16	52
I support steps to safeguard the local economy following a disaster event:					
Agree:	228	3	168	153	552
Neutral:	76	2	50	49	177
Disagree:	14	0	8	7	29
Not sure:	25	1	16	4	46
I support improving the disaster preparedness of schools:					
Agree:	266	3	87	156	512
Neutral:	56	2	42	45	145
Disagree:	12	1	10	8	31
Not sure:	7	1	3	2	13
13. To the best of your knowledge, is your property located in a designated floodplain?					
Yes:	53	0	61	13	127
No:	262	4	185	195	646

14. The term mitigation means to make something become less harsh or severe, to alleviate. Mitigation activities are those types of actions you can take to protect your home and property from natural hazard events such as floods. Carson City is preparing an All-Natural Hazard Mitigation Plan to formulate and document mitigation strategies that will aid our community in protecting life and property from the impacts of future natural disasters. ***If your property were located in a designated "high hazard" area, or had received repeated damages from a natural hazard event, would you consider a "buyout", elevation of the structure, or***

relocation offered by a public agency?					
Yes:	209	5	108	152	474
No:	75	0	66	57	198
15. Please rank how prepared you feel you and your household are for the probable impacts of natural hazard events likely to occur within Carson City. Rank on a scale of 1 to 5, with 5 being the most prepared:					
1:	28	1	21	18	68
2:	75	1	36	37	149
3:	132	2	92	85	311
4:	62	2	71	57	192
5:	25	0	12	13	50

Appendix E

Meeting Agendas & Handouts

AGENDA No. 1

Carson City Hazard Mitigation Planning Committee

1:30 to 4:00 pm, Wednesday, **August 12, 2009**
Carson City Fire Department
777 S. Stewart Street
Carson City, NV 89701

1. **WELCOME & INTRODUCTIONS** – *Stacey Giomi, Emergency Management Director - Carson City*

2. **PLANNING PROCESS OVERVIEW** – *Karen Johnson, Nevada Division of Emergency Management (NDEM)*
   a. General Information
   b. Carson City Fire Department's Role
   c. Purpose of the Plan
   d. Hazard Mitigation Planning Committee Bylaws
   e. Hazard Mitigation Tasks
   f. Hazard Mitigation Goals & Objectives

3. **PLANNING COMMITTEE** – *Stacey Giomi or Gary Dunn*

4. **INCORPORATION OF EXISTING PLANS** – *Karen Johnson*

5. **SUMMARY OF FINDINGS** – *Karen Johnson*

6. **HAZARD IDENTIFICATION TABLE** – *Karen Johnson*

7. **ANNOUNCEMENT OF FUTURE MEETINGS** – *Gary Dunn*
   Future meetings are scheduled for the second Wednesday of every month at 1:30 pm.

   1. September 9, 2009 – 1:30 pm
   2. October 14, 2009 – 1:30 pm

8. **ADJOURNMENT**

The Planning Committee may take action on items marked by an asterisk (*). Items may be taken out of order presented on the agenda at the discretion of the chairperson.

For further information, please contact Judy Dietrich, Carson City Fire Department, by email at jdietrich@ci.carson-city.nv.us or telephone at (775) 887-2210. We are pleased to make reasonable accommodations for members of the public who are disabled. If special arrangements are necessary, please notify the Planning Committee at (775) 887-2210. Twenty-four hours advance notice is requested.

Meeting No. 1 Sign In Sheet

HAZARD MITIGATION PLANNING TEAM
August 12, 2009, Meeting

NAME	AGENCY / DEPARTMENT	PHONE NO.	E-MAIL	KEY INPUT
Casey Pullman	Carson City Airport	775-841-2255	cxp-mgr@att.net	Airport Manager
Tom Tarulli	Carson Fire	887-2210	ttarulli@ci.carson-city.nv.us	Operations Chief
Marena Works	Carson City Health/Human Svc	887-2190	mworks@ci.carson-city.nv.us	Health Dept. Rep.
Edwin James	CWSD	887-7456	edjames@cwsd.org	Water Planning
Linda Hurst	Carson-Tahoe Regional Medical Center	445-8129	lindahurst@carsontahoe.org	Manager Emergency Dept.
Henry Lucas	Carson Tahoe Regional Med. Center	445 8023	Henry.Lucas@CTRH.org	Healthcare Emergency Operations
LEE RADTKE	LEPC, CERT, COMMUNITY	885-8166	LEE-RADTKE@ATT.NET	GENERAL
Karen Johnson	DEM-	687-0393	KJohnson@dps.state.nv.us	
E. Ashby	DEM-	687-0314	eashby@dps.state.nv.us	
Craig Marshall	SPWB	684-4127	cmarshall@spwb.state.nv.us	
Darren Selby	CCPW	887-2355 x30483	DSelby@ci.carson-city.nv.us	Operations Manager
Gary Dunn	CC Fire	887-2210 * 1050	gdunn@ci.carson-city.nv.us	Info. Coord.
Robert Fellows	CC Public Works	887-2355 30370	RFellows@ci.carson-city.nv.us	Flood Risk
Stacey Giomi	C.C. Fire	887-2210 X1005	SGiomi@ci.carson-city.nv.us	CHAIR

Meeting No. 1 Handouts

General Information

Mitigation Planning "How-To" Guides

http://www.fema.gov/plan/mitplanning/planning_resources.shtm#1

Plan Update
Karen Johnson, NDEM
775-687-0373
kijohnson@dps.state.nv.us

State Hazard Mitigation Officer
Elizabeth Ashby, NDEM
775-687-0314
eashby@dps.state.nv.us

Nevada State Flood Plain Manager
Kim Groenewold, NDWR
775-684-2884
Groenewd@water.nv.gov

Information Coordinator
Gary Dunn, Carson City Fire Dept.
775-887-2210
gdunn@ci.carson-city.us

Emergency Manager
Stacey Giomi, Carson City Fire Dept.
775-887-2210
sgiomi@ci.carson-city.us

Meeting Coordinator
Judy Dietrich, Carson City Fire Dept.
775-887-2210
JDietrich@ci.carson-city.nv.us

Handouts

Hazard Mitigation is any sustained action taken to eliminate or reduce long term risk to human life, property and the environment posed by a hazard.

Hazard Mitigation Planning is the process of making any sustained plan or course of action taken to reduce or eliminate long-term risk to people and property from both natural and technological hazards and their effects. The planning process includes establishing goals and recommendations for mitigation strategies.

Hazard Mitigation may occur during any phase of a threat, emergency or disaster. Mitigation can and should take place during the preparedness (before), response (during), and recovery (after) phases.

The process of hazard mitigation involves evaluating the hazard's impact and identification and implementation of actions to minimize the impact.

***Unreinforced Masonry (URM)*:** Buildings constructed prior to 1973. These structures may be of stone, brick or concrete block bearing wall materials that contain no reinforcing rods.

Carson City Fire Department

The Carson City Fire Department Emergency Management Division is the lead agency and chair in coordinating the efforts of the Carson City Planning Committee and the Carson City Fire Department will support the Planning Committee in formulating and supporting the Carson City Hazard Mitigation Strategy Identification and Plan promulgation and maintenance.

Purpose of the Plan

1. The purpose of this plan is to integrate Hazard Mitigation strategies into the activities and programs of the City, and to the extent practical, into the activities of private sector organizations.
2. The plan identifies and evaluates specific Carson City Hazard Mitigation strategies to be considered by Carson City and its agencies and offers a City support documents as well as planning support for those strategies developed by its political subdivisions, agencies, special districts and organizations.

It is understood that the mitigation strategies adopted in this plan will be recommendations only, and they must be approved and funded in order to be implemented as official Hazard Mitigation Strategies. They must be implemented by Carson City Departments and Agencies and approved by the Carson City Board of Supervisors (BOS).

Reviewing Hazard Mitigation Planning Committee By-Laws

1. Members from the Planning Committee agree to meet on a monthly basis to identify hazard priorities, develop a risk assessment and review, identify and implement Carson City hazard mitigation strategy recommendations.

2. The Carson City Hazard Mitigation Planning Committee agrees to make and pass policy recommendations by a vote of a simple majority of those members present at the monthly meeting.

3. Any single Hazard Mitigation Planning Committee member may petition the Carson City Hazard Mitigation Planning Committee as a whole to request an adoption of/or amendment to the plan or process. No action will be taken until the next subsequent meeting of the Planning Committee.

4. The Planning Committee will form sub-committees to review and to develop those hazard mitigation strategy recommendations identified and to be reviewed by the Planning Committee as a whole.

5. The sub-committees will identify and bring forward hazard mitigation strategies from existing recommendations contained in plans and documents, the local political subdivisions, and from the input of regional jurisdictions and the input of private citizens and private organization sector.

6. The Planning Committee will facilitate City wide and community input through the following methods:

- Questionnaire given to the citizens of Carson City with their monthly utility bills.
- Press Release
- Announcement at Chamber of Commerce Meeting

Reviewing Hazard Mitigation Planning Tasks

1. Coordinate multi-hazard mitigation planning tasks and activities with the Carson City Fire Department to up date the all-hazards disaster mitigation plan adopted December 2004 and support the Carson City Fire Department's oversight of the planning process.

2. Assist in carrying out the goals and objectives of the Carson City Hazard Mitigation Plan in compliance with FEMA DMA 2000 Hazard Mitigation Act.

3. Prioritize Risks for implementing mitigation strategies.

4. Select designated Critical Facilities and ascertain risk exposure analysis for those facilities.

5. Select highest and best mitigation recommendations and develop those recommendations for further action by the City of Carson.

6. Review mitigation planning drafts, recommendations and updates.

7. Develop and implement long and short term goals.

8. Integrate the plan with all phases of Comprehensive Emergency Management Planning.

9. Provide for the implementation of committee decisions.

10. Encourage, coordinate and provide a methodology for the implementation of public input.

11. _____

12. _____

Reviewing Hazard Mitigation Planning Goals and Objectives

Goals

1. Maintain and enhance Carson City's capacity to continuously make Carson City less vulnerable to hazards.

2. Support the priorities of the Carson City Government, citizens and the business community.

3. Build and support local capacity and commitment to continuously become less vulnerable to hazards.

4. Promote economic development consistent with seismic, floodplain and risk management guidance as developed by the Carson City, its agencies and political subdivisions.

5. Provide for an effective public awareness program for natural and technological hazards present in Carson City.

6. Encourage scientific study and the development of data to support mitigation strategies for those hazards that are a threat to Carson City.

7. Promote the recognition of the real value of hazard mitigation to public facilities, public safety and welfare of all citizens of Carson City.

8. Support the mitigation efforts of the City's agencies, private citizens, non-profit organizations and private businesses throughout

9. _____
_____

10. _____
_____

2 & 8, 5 & 7 Similar Goals

Objectives

1. Identify mitigation actions to reduce loss of lives and property.

2. Implement mitigation actions to reduce loss of lives and property.

3. Identify mitigation opportunities for short and long range planning considerations.

4. Adopt safe building and zoning codes that support scientific findings of a known risk.

5. Identify lead agencies that have an interest in mitigation of specific hazards.

6. Develop a standard mitigation program utilizing authorities, policies and programs of each agency.

7. Organize, train and maintain an effective Carson City Hazard Mitigation Team which will facilitate implementation of the Carson City Mitigation Plan.

8. Review and update other agencies' programs to identify current and future mitigation goals and objectives in compliance with all City, State and Federal requirements.

9. Gain support of the City's administration for the City Multi-Hazard Mitigation Plan implementation.

10. Achieve the overall goal of developing a comprehensive mitigation program with Federal, State, City and local jurisdictions.

11. Establish an on going Hazard Mitigation Planning Committee.

12. Support and expand on identified hazard mitigation strategies as set forth in Carson City Safety Element of the City Master Plan, Flood Hazard Mitigation Plan and all other City Hazard Mitigation Strategies.

13. _____
_____
_____

14. _____
_____
_____

Local Mitigation Plan Review Crosswalk

New plan format. See Crosswalk attached.

Element 4E

Incorporation of Existing Plans/Study Table	
Plan / Study	**Findings / Incorporation**
Carson City Master Plan – Safety Element	
Carson City Building Code	
FEMA Flood Insurance Study for Carson City, Nevada (FEMA 1998):	
State of Nevada Multi-Hazard Mitigation Plan	
Carson Subconservancy Plan	
HazMat Plan	

Element 4F

Summary of Initial Findings Table				
Original HMP Section	**Findings From Evaluation**	**Items to be Updated**	**Items to be Added**	**Items to be Deleted**
Section 1 –Adoption	Minimal Updating			
Section 2 –Background	Minimal Updating			
Section 3 – Community	Update Demographics Any Land Use/Dvlpmt Changes?	Demographics Land Use Maps		
Section 4 – Planning Process	Public Outreach New plans studies reports?	Planning Committee Members Public Outreach Building Codes Erosion Control program		
Section 5 – Risk Assessment Identify Hazards	Review Hazards Listed	Add Disasters occurring over last 5 years RE-prioritize Identify URM Repetitive Flood/Severe Repetitive Loss – GIS		
Section 6 –Capability Assessment	New Format	Update Tables		
Section 7 – Mitigation Strategy, goals, objectives	Review past goals/objectives	Identify new goals/objectives		
Section 8 – Plan Maintenance	Minimal Updating			

Hazard Identification Table				
Hazard Type	**Hazard Identified in State HMP (Y/N)**	**State or Presidential Declaration in Community (Y/N)**	**Is Hazard Identified in Other Local Planning Documents (Y/N)**	**If Updating is Hazard to be Profiled in HMP Update (Y/N)**
Avalanche	**Yes**	No		
Drought	**Yes**	No		
Earthquake	**Yes**	No		
Epidemic	**Yes**	No		
Extreme Heat / Cold	**Yes**	No		
Expansive Soil	**Yes**	No		
Flood / Mudslide	**Yes**	**FEMA 1629- 2006 New Years Flood**		
Hurricane / Cyclone	**Yes**	No		
Infestation	**Yes**	No		
Landslide	**Yes**	No		
Monsoon	No	No		
Snow / Ice	**Yes**	**FEMA 3202, 3204 2005**		
Thunderstorm	**Yes**	No		
Tornado	**Yes**	No		
Tsunami	**Yes**	No		
Volcano	**Yes**	No		
Windstorm	**Yes**	No		
Wildfire	**Yes**	**FEMA 1540- 2005 Waterfall Fire**	**Included in 2005 HM Plan**	
Other				
Hazardous Materials	**Yes**	No		
Terrorism	**Yes**	No		
Utility Loss	No	No		

HIGH PRIORITY RISKS

- Flood
- Earthquake
- Wildland Fires
- Severe Weather
- WMD/Terrorism (Capital/Supreme Court/Legislative Bldg, State Facilities, Military Risks)

MODERATE PRIORITY RISKS

- Hazardous Materials (Transportation of Hazardous Materials & Air Transportation)
- Drought
- Special Events
- Biological/Disease
- Utility Loss
- Water/Waste Water Loss
- Radon Gas
- Communication Loss
- Economic Loss

LOW PRIORITY RISKS

- Landslides
- Prison Riots
- Air Crash
- Transportation Loss- Excluding Air
- Volcanic Activity
- Avalanche

Highlighted items are not listed in the State Hazard Mitigation Plan

Next Month

Profile Hazards
Identify subcommittees
Review updates to Section 1 & 2 of the plan

Mitigation Project	PDM	FMA	RFC	SRL
PROPERTY ACQUISITION AND DEMOLITION OR RELOCATION ACTIVITIES				
Property Acquisition and Demolition or Relocation	✔	✔	✔	✔
CONSTRUCTION ACTIVITIES				
Property Elevation	✔	✔	✔	✔
Mitigation Reconstruction[1]				✔
Localized Minor Flood Reduction Projects	✔*	✔	✔	✔
Dry Floodproofing of Residential Properties[2]		✔		✔
Dry Floodproofing of Non-Residential Structures		✔	✔	
Stormwater Management	✔	✔		
Infrastructure Protection Measures	✔			
Vegetative Management/Soil Stabilization	✔			
Retrofitting Existing Buildings and Facilities	✔			
Safe Room Construction	✔			
NON-CONSTRUCTION ACTIVITIES				
All Hazard/Flood Mitigation Planning	✔	✔		

1. The SRL program allows mitigation reconstruction projects located OUTSIDE the regulatory floodway as identified on the effective Flood Insurance Rate Map (FIRM). Mitigation reconstruction is only permitted if traditional elevation cannot be implemented.

2. The residential structure must meet the definition of "Historic Structure" in 44 CFR § 59.1.

* Critical facilities only.

State Contacts

HMGP & PDM
Elizabeth Ashby
(775) 687-0314
eashby@state.dps.nv.us

FMA, RFC, & SRL
Kim Groenewold
(775) 684-2884
groenewd@water.nv.gov

Deadlines

June 24, 2009	Notice of Interest due to Division of Emergency Management/Division of Water Resources
August 12, 2009	Scope of Work due to Division of Emergency Management/Division of Water Resources
August 26, 2009	NHMPC's Quarterly Meeting
October 7, 2009	Benefit Cost Analysis and backup documentation due to Division of Emergency Management/Division of Water Resources
October 21, 2009	Full Application Package due to Division of Emergency Management/Division of Water Resources

November 4/5, 2009
NHMPC Prioritization meeting
(4 Southern Nevada; 5 Northern Nevada)

Unified Hazard Mitigation Assistance Program in Nevada

FEMA

Hazard Mitigation Assistance (HMA)

HMA under FEMA's Mitigation Directorate unifies the pre-disaster grant programs to better support the overall goal of reducing the loss of life and property due to natural hazards.

The HMA programs: Pre-Disaster Mitigation (PDM), Flood Mitigation Assistance (FMA), Repetitive Flood Claims (RFC), and Severe Repetitive Loss (SRL) provide mitigation grants ***annually*** on an allocation and competitive basis to State, Territory, Tribal, and local entities. The new unified process achieves economies of scale and portfolio management for Federal, State, and local officials by aligning program requirements in a unified HMA guidance document. The intent of this alignment is to enhance the quality and efficiency of grant awards.

In addition, under the unified process, eligible subapplications submitted but not funded under a specific grant program may also be considered for another mitigation grant program(s).

Post-Disaster Hazard Mitigation Grant Program (HMGP)

The Hazard Mitigation Grant Program (HMGP) provides grants to States and local governments to implement long-term hazard mitigation measures after a major disaster declaration. Authorized under Section 404 of the Stafford Act and administered by FEMA, HMGP was created to reduce the loss of life and property due to natural disasters. The program enables mitigation measures to be implemented during the immediate recovery from a disaster.

http://www.fema.gov/government/grant/hmgp/

Pre-Disaster Mitigation (PDM) Program

The PDM program provides funds to States, Territories, Federally recognized Indian Tribal governments, and communities for hazard mitigation planning and the implementation of mitigation projects prior to a disaster event. The goal of the PDM Program is to reduce overall risks to the population and structures, while also reducing reliance on funding from actual disaster declarations.

www.fema.gov/government/grant/pdm/index.shtm

Flood Mitigation Assistance (FMA) Program

The FMA grant program provides funding to States, federally recognized Indian Tribal governments, and communities so that cost-effective measures can be taken to reduce or eliminate the long-term risk of flood damage to buildings, manufactured homes, and other structures insured under the National Flood Insurance Program (NFIP). The long-term goal of FMA is to reduce or eliminate claims under the NFIP through mitigation activities.

www.fema.gov/government/grant/fma/index.shtm

Repetitive Flood Claims (RFC) Program

The RFC grant program was created with the goal of reducing flood damages to individual properties for which one or more claim payments for losses have been made under flood insurance coverage and that will result in the greatest savings to the NFIF (National Flood Insurance Fund) in the shortest period of time.

The RFC program is subject to the availability of appropriation funding. RFC grants will be awarded on a national basis without reference to State allocations, quotas, or other formula-based allocations of funds. The funding source for the RFC grant program is the NFIF.

www.fema.gov/government/grant/rfc/index.shtm

Severe Repetitive Loss (SRL) Program

The SRL program provides funding to reduce or eliminate the long-term risk of flood damage to severe repetitive residential structures insured under the NFIP. The definition of severe repetitive loss as applied to this program is a *residential property* that is covered under an NFIP flood insurance policy, and:

(a) That has at least four NFIP claim payments (including building and contents) over $5,000 each, and the cumulative amount of such claims payments exceeds $20,000; or
(b) For which at least two separate claims payments (building payments only) have been made with the cumulative amount of the building portion of such claims exceeding the market value of the building.

For both (a) and (b) above, at least two of the referenced claims must have occurred within any 1-year period, and must be greater than 10 days apart. The long-term goal of the SRL program is to reduce or eliminate claims under the NFIP through project activities that will result in the greatest savings to the NFIF in the shortest period of time.

www.fema.gov/government/grant/srl/index.shtm

the hazard mitigation planning process

Hazard mitigation planning is the process of determining how to reduce or eliminate the loss of life and property damage resulting from natural and human-caused hazards. Four basic phases are described for the hazard mitigation planning process as shown in this diagram.

For illustration purposes, this diagram portrays a process that appears to proceed sequentially. However, the mitigation planning process is rarely a linear process. It is not unusual that ideas developed while assessing risks should need revision and additional information while developing the mitigation plan, or that implementing the plan may result in new goals or additional risk assessment.

organize resources

From the start, communities should focus on the resources needed for a successful mitigation planning process. Essential steps include identifying and organizing interested members of the community as well as the technical expertise required during the planning process.

assess risks

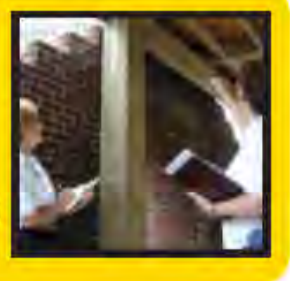
Next, communities need to identify the characteristics and potential consequences of hazards. It is important to understand how much of the community can be affected by specific hazards and what the impacts would be on important community assets.

develop a mitigation plan

Armed with an understanding of the risks posed by hazards, communities need to determine what their priorities should be and then look at possible ways to avoid or minimize the undesired effects. The result is a hazard mitigation plan and strategy for implementation.

implement the plan and monitor progress

Communities can bring the plan to life in a variety of ways ranging from implementing specific mitigation projects to changes in the day-to-day operation of the local government. To ensure the success of an on-going program, it is critical that the plan remains relevant. Thus, it is important to conduct periodic evaluations and make revisions as needed.



MINUTES Meeting #1

CARSON CITY HAZARD MITIGATION PLANNING COMMITTEE MEETING

August 12, 2009, 1:30 PM

A. WELCOME & INTRODUCTIONS

The meeting was called to order by Stacey Giomi, and the participants introduced themselves. Among those present were:

Elizabeth Ashby (State Division of Emergency Management - Mitigation Officer)
Gary Dunn (Carson City Fire Department)
Robb Fellows (Carson City Floodplain Manager)
Stacey Giomi (Carson City Fire Department)
Linda Hurst (Carson Tahoe Regional Medical Center)
Ed James (Carson Water Subconservancy District)
Karen Johnson (State DEM – Planner for the Carson City Hazard Mitigation Plan)
Hank Lucas (Carson Tahoe Regional Medical Center)
Craig Marshall (State Public Works Board)
Casey Pullman (Carson City Airport Manager)
Lee Radtke (Carson City LEPC and CERT)
Darren Selby (Carson City Public Works)
Tom Tarulli (Carson City Fire Department)
Marena Works (Carson City Health/Human Services Department)

Stacey informed the committee that Carson City currently has a hazard mitigation plan in place, and because the federal government requires this plan to be updated every five years and the City's plan was last updated in 2005, its next update must be approved by FEMA in 2010. The Hazard Mitigation Plan is basically a way for local governments to have a roadmap of how to mitigate the natural and potentially manmade-caused hazards that occur in a community. Part of this process is the development of a broad-based team, and approximately 30 people had been invited to participate in this process. Stacey then thanked those who were in attendance and hoped they would commit to attend future meetings, as it was important for those developing the plan to receive input from a broad range of stakeholders.

B. PLANNING PROCESS OVERVIEW

Karen Johnson handed out a packet of information regarding the planning process overview, which was then discussed as follows:

1. General Information

The general information section included contact information, planning information, and some definitions. Karen said that she will be tasking certain individuals to obtain information that will be needed for the plan.

2. Carson City Fire Department's Role

Karen said that the Carson City Fire Department will be leading the hazard mitigation planning effort and that Gary Dunn will be working with her to gather information and Stacey Giomi will be the committee chair.

3. Purpose of the Plan

The purpose of the plan will be to integrate hazard mitigation strategies into actual activities or projects that can be done within the city through different funding methods. Robb Fellows mentioned that a possible mitigation project could be in regard to the 100-year floodplain, where you made some improvements to mitigate that floodplain and reduce the effects of the flood, such as piping, a detention basin, moving homes, etc., and that they were currently seeking FEMA funding for some of those projects. Stacey said that other examples of mitigation efforts would be state laws and local ordinances relative to protecting and constructing homes in wildfire-prone areas with ignition-resistance materials (and that there was a current city ordinance in this regard). Other mitigation examples mentioned were fuel reduction for wildfires and structural changes to buildings in regard to earthquakes.

Karen said that any projects the committee addressed in the plan would be recommendations only and ones they believed the community would benefit from. Once the plan was finished, those projects would ultimately have to be approved and funded in order to be implemented. However, as one of the requirements for FEMA funding was that the project must be specified in the plan, the committee should include anything they might want to accomplish or the reference should at least be broad enough to encompass what they want to accomplish.

4. Hazard Mitigation Planning Committee Bylaws

The committee reviewed the bylaws that had been developed in 2004 for the 2005 committee. In regard to #1 about meeting on a monthly basis, Karen said that it was hoped the committee would wrap up around March or April and that they might hold some subcommittee meetings on a monthly basis rather than having the whole committee meet. In discussing #6 in regard to seeking community input, it was stated that a questionnaire has been developed and will be sent out in the monthly utility bills; a press release has been drafted and sent to the City Manager's Office for distribution; and an announcement was scheduled to be made at a Chamber of Commerce meeting. The office will follow up on these matters to determine if they have been done.

It was moved by Gary Dunn, seconded by Lee Radtke, with motion carried, that the committee accept the bylaws as written in 2004.

5. Hazard Mitigation Tasks

The committee reviewed the planning tasks which had been developed during the last planning session. In regard to #4, Stacey asked whether it was a requirement to select designated critical facilities and ascertain risk exposure analysis for them. He mentioned that there was currently a statewide effort by DPS and one of its components—Silver Shield—to do critical infrastructure assessment and he was a bit concerned about developing a document that might be contrary to theirs. After discussing this matter further, it was decided that Stacey would e-mail Karen with a listing of what that group has developed in regard to critical infrastructure so that she could extract whatever data would be appropriate for the City's plan (along with the current definition of what critical infrastructure encompassed). Elizabeth Ashby mentioned that facilities did not need to be specifically named in the plan, but just the types and number of facilities could be referenced. Karen then asked the committee to e-mail her with any additional tasks that might occur to them at a later time.

6. Hazard Mitigation Goals & Objectives

Karen believed that the eight goals developed during the last planning process were slightly excessive and that #2 and #8 were quite similar as well as #5 and #7 and that some of these goals could be consolidated. Gary said that he and Stacey could work together on these goals to reduce them to no more than five and bring them back to the next meeting—to which the committee had no objection. Stacey mentioned that the Board of Supervisors has set citywide goals (which he will forward to Karen).

The committee then reviewed and discussed the objectives that had previously been established. In regard to #4, it was decided to add "within applicable law" at the end of the statement, so that it would now read "Adopt safe building and zoning codes that support scientific findings of a known risk within applicable law." Stacey mentioned that #7 and #11 were basically the same and that #11 could be eliminated. Then, the words "and updating" could be added to #7, which would then read "Organize, train and maintain an effective City Hazard Mitigation Team which will facilitate implementation and updating of the Carson City Mitigation Plan." As #10 was addressed under #7, it was decided that #10 could be eliminated (with wording combined with #7). Also, Hank Lucas mentioned that the Local Emergency Planning Committee (LEPC) could be involved in regard to carrying out Goal #7.

It was mentioned that the previous plan was quite large and that it was planned to reduce its size and make it more succinct and also change its formatting to match the standard state formatting. Karen said that she plans on taking the information from the old plan and cutting and pasting it into the new format, which she has already done for the first three sections. She will e-mail out these sections to the committee prior to the next meeting so they can be discussed at that time—and members could e-mail her with any suggestions prior to that meeting. Karen will also prepare the

updated goals (after receiving input from Stacey and Gary) and objectives as discussed and send them out to the committee.

7. Local Mitigation Plan Review Crosswalk

Karen distributed a copy of the Local Mitigation Plan Review Crosswalk to show the committee what answers needed to be submitted to FEMA with the plan. Although the committee will not be involved in the form's preparation, Karen wanted the members to be aware of the FEMA requirements and why certain things needed to be done in the planning process. Elizabeth mentioned that this crosswalk was what FEMA used in ultimately approving or disapproving the plan. She then went over the few basic changes in the crosswalk since the last plan was submitted, including new portions regarding the floodplain, repetitive loss properties, and unreinforced masonry properties.

Elizabeth further mentioned that the plan will need to include either how the updates made in the plan were processed or why certain sections were not updated.

C. PLANNING COMMITTEE

Karen said that the Planning Team Table included in the handout was a way of identifying the key inputs that would be provided by committee members. She will complete the table after receiving the sign-in sheet from this meeting which asked for that information (and which table will be included in the plan).

D. INCORPORATION OF EXISTING PLANS

Karen said that she listed some of the plans of which she had been aware but that she was not familiar with every plan and study conducted in Carson City. She therefore asked the committee to let her know what plans and/or studies should be referenced in the plan (which would be those containing specifics having impact on the hazard mitigation plan). Stacey then asked what information would be placed in the column next to the name of the Plan/Study under Findings/Incorporation. Elizabeth replied that this would be how we were linking the hazard mitigation plan with other ongoing planning efforts (and Karen will e-mail an example of other how other jurisdictions filled out this section).

E. SUMMARY OF INITIAL FINDINGS

Karen said that she was the evaluator for the plan and has filled out the columns titled Findings from Evaluation and Items to be Updated in regard to all sections of the plan. She has completed minimal updating to Sections 1 and 2, and now needed the new demographics and any new land use maps in order to complete Section 3. Robb mentioned that the maps would be on the city website in PDF format, and Karen said that she could use the 2008 demographics which she downloaded from the census bureau website. She said these first three sections required minimal work, but that Sections 3 through 7 would compose the bulk of the work needing to be accomplished by committee members.

F. HAZARD IDENTIFICATION TABLE

Karen said that the hazards identified in this table were taken from the current plan and were in alphabetical order and not in order of severity. She then went over the other columns, stating that the column asking whether the hazard was identified in other local planning documents would need to be filled out, and it was mentioned that many of these would be mentioned in both the City's Master Plan and the Emergency Operations Plan as well as those relating to hazardous materials being identified in the Hazardous Materials Response Plan.

There was then discussion regarding the hazards listed, and it was agreed to eliminate "monsoon" and that most of the weather-related items could be grouped under the one category of "severe weather."

In regard to the priority rating of these hazards from the last plan, Karen mentioned that some of these hazards (which she had highlighted) were not included in the state plan and asked whether the committee wanted to retain them. Stacey mentioned that they wanted to mitigate risks on a community-wide scale rather than individualized events. The committee then discussed the various hazards listed and felt that the low priority risks could be listed but that no mitigation efforts would be proposed for them. It was also mentioned that mass illness should be addressed and that the current "biological/disease" risk should be renamed "epidemic" (which terminology was included in the Hazard Identification Table) and moved to high priority from moderate. Also, "water/wastewater loss" could be included under "utility loss" (which would include such things as water, sewer, gas, communications, etc.).

Two other handouts were distributed, with Elizabeth explaining that one listed the various grants for which the community would be eligible with an approved plan in place and the other described what FEMA expected of the community in the hazard mitigation planning process.

G. ANNOUNCEMENT OF FUTURE MEETINGS

Future meetings are scheduled for the second Wednesday of every month at 1:30 p.m., with the next two meetings scheduled for September 9 and October 14, 2009.

Karen said that at next month's meeting, the hazards will be profiled and a determination made as to whether they'll need any subcommittees for any specific hazards and who would be on those subcommittees.

H. ADJOURNMENT

The meeting was adjourned at 2:55 p.m.

Recorder: Judy Dietrich

AGENDA – Meeting No. 2

Carson City Hazard Mitigation Planning Committee
1:30 to 4:00 pm, Wednesday, September 9, 2009
Carson City Fire Department
777 S. Stewart Street
Carson City, NV 89701

1. **CALL TO ORDER & INTRODUCTIONS** – *Chairman, Stacey Giomi,*

2. **APPROVAL OF MINUTES FROM** August 12, 2009 (Action) – *Karen Johnson,*
3. **UPDATE TO HAZARD MITIGATION PLAN** *Karen Johnson*
   - **Comments/approval of Executive Summary, Section 1 & 2**
   - **Review of Hazard Identification Table**
   - **Hazard Profiling and Categorization by Committee Members**
4. **ANNOUNCEMENT OF FUTURE MEETINGS** – *Gary Dunn*
   Future meetings are scheduled for the second Wednesday of every month at 1:30 pm.
   1. October 15, 2009 Thursday – 1:30 pm
   2. Holiday so November 12th (Thursday) or 18th (Friday) at 1:30
5. **ADJOURNMENT**

The Planning Committee may take action on items marked by an asterisk (*). Items may be taken out of order presented on the agenda at the discretion of the chairperson.
For further information, please contact Judy Dietrich, Carson City Fire Department, by email at jdietrich@ci.carson-city.nv.us or telephone at (775) 887-2210. We are pleased to make reasonable accommodations for members of the public who are disabled. If special arrangements are necessary, please notify the Planning Committee at (775) 887-2210. Twenty-four hours advance notice is requested.

Sign In Sheet - Meeting No. 2

HAZARD MITIGATION PLANNING COMMITTEE

NAME	AGENCY/DEPARTMENT	KEY INPUT	PHONE NO.	E-MAIL
Bergquist, William	Washoe Tribe of Nevada & California	Environmental/Tribal Liaison	265-8695	william.bergquist@washoetribe.us
Crowe, Brian	Western Nevada College	College	445-3327	crowebr@wnc.edu
Curnes, Kevin	Carson City School District	School District	283-2171	kcurnes@carson.k12.nv.us
Dunn, Gary	CC Emergency Management	Coordinating Information	887-2210 x1050	gdunn@ci.carson-city.nv.us
Fellows, Robb	CC Public Works	City Floodplain Manager	887-2355 x30370	rfellows@ci.carson-city.nv.us
Giomi, Stacey	CC Emergency Management	Heading Update/Committee Chair	887-2210 x1005	sgiomi@ci.carson-city.nv.us
Groenewold, Kim	Nevada Division of Water Resources	State Floodplain Manager	684-2884	groenewd@water.nv.gov
Harrison, Phillip	Taiyo America (Private Industry/Manufacturing) & CC Chamber of Commerce	HazMat/Chamber of Commerce	885-9959 x122	philh@taiyo-america.com
Hurst, Linda	Carson Tahoe Regional Healthcare	Hospital (Manager, Emergency Dept.)	445-8729	linda.hurst@ctrh.org
James, Ed	Carson Water Subconservancy District	Water Planning	887-7456	ediames@cwsd.org
Lucas, Hank	Carson Tahoe Regional Healthcare	Hospital (Healthcare Emergency Ops)	445-8023	henry.lucas@ctrh.org
Marshall, Craig	State Public Works Board	SPWB	684-4127	cmarshall@spwb.state.nv.us
Milne, Rhett	National Weather Service	NWS	673-8100 x223	rhett.milne@noaa.gov
Pullman, Casey	Carson City Airport	Airport Manager	841-2255	exp-mgr@att.net
Radtke, Lee	CC Community Emergency Response Team	Community Service Group	885-8166	lee.radtke@att.net
Saylo, Ray	CC Sheriff's Office	Law Enforcement	887-2020 x41903	rsaylo@ci.carson-city.nv.us
Selby, Darren	CC Public Works	PW Operations	887-2355 x30403	dselby@ci.carson-city.nv.us
Tarulli, Tom	CC Fire Department	Fire Operations Chief	887-2210 x1002	ttarulli@ci.carson-city.nv.us
Walker, Jim	Nevada Department of Transportation	NDOT	888-7862	jwalker2@dot.state.nv.us
Werner, Larry	CC City Manager	City Manager	887-2100	lwerner@ci.carson-city.nv.us
Wilkinson, Don	Citizen	Citizen	841-2772	wdonw@pyramid.net
Works, Marena	CC Health/Human Services	Health Director / Animal Control	887-2190 x30235	mworks@ci.carson-city.nv.us

Planner: Karen Johnson, DPS – Division of Emergency Management, kjohnson@dps.state.nv.us – 687-0373
Mitigation Officer: Elizabeth Ashby, DPS - DEM, eashby@dps.state.nv.us – 687-0314

Meeting Recorder: Judy Dietrich, Carson City Fire Department
jdietrich@ci.carson-city.nv.us – 887-2210 x1014 c/o Heading Rachel Milne at NSO

Handouts – Meeting No. 2

Incorporation of Existing Plans/Study Table	
Plan / Study	**Findings / Incorporation**
Carson City Master Plan- Land Use Element	Updated in April of 2006. Guiding principle includes a stewardship section which addresses Hazard Mitigation..
Carson City Building Code	Updated in January 2008, including the recommended 2006 US building codes. Adoption process is on a three year process.
Carson City Mass Illness Plan	Currently being used in draft form. It addresses the City's response to a pandemic/influenza outbreak.
FEMA Flood Insurance Study for Carson City, Nevada:	This study addresses flood plain issues and was last updated January 16, 2009.
State of Nevada Multi-Hazard Mitigation Plan	The state MHMP is updated every three years by the SHMO and includes all hazards to be addressed in the Carson City HMP.
Carson River Regional Floodplain Management Plan	Provides strategies for floodplain management that can be applied regionally as well as locally Updated _____.
Carson City Fire Code	The fire code is revised every 3 years by the Fire Department. This document includes a wildland/urban interface section that delineates regulations for building and maintaining homes in wildland fire prone areas.
Community Wildfire Protection Plan	This document was revised in August of 2009 and includes findings and recommendations for mitigating the threat to property from wildland fires
Emergency Operations Plan	This document is the main reference source for managing disasters and large scale emergencies in Carson City.
Carson River Geographic Response Plan	This is a regional plan covering five counties in two states. The plan was developed to protect the health, safety, environment, and property (both public and private) from the effects of hazardous materials incidents in or near the Carson River
Carson City Hazardous Materials Response Plan	This plan provides guidance to emergency response personnel on the general plan of action for a response to a hazardous materials emergency and provides for a resource directory.
Emergency Response Plan Brunswick Canyon Reservoir	Dated March 30, 2005, this plan provides a tool for development service personnel and public safety agencies to ensure public safety & minimize property damage.
Emergency Response Plan – Eagle Valley Dam	Dated January 2009,, this plan provides a tool for development service personnel and public safety agencies to ensure public safety & minimize property damage.

Hazard Identification Table				
Hazard Type	**Hazard Identified in State HMP (Y/N)**	**State or Presidential Declaration in Community (Y/N)**	**Is Hazard Identified in Other Local Planning Documents (Y/N)**	**If Updating is Hazard to be Profiled in HMP Update (Y/N)**
Avalanche	**Yes**	No	Yes Master Plan/EOP	Yes
Drought	**Yes**	No	No	Yes
Earthquake	**Yes**	No	Yes - EOP	Yes
Epidemic	**Yes**	No	Yes – mass illness plan	Yes
Expansive Soil	**Yes**	No	No	No
Flood / Mudslide	**Yes**	Yes,FEMA 1629-2006 New Years Flood	Yes	Yes
Hurricane / Cyclone	**Yes**	No	No	No
Infestation	**Yes**	No	No	No
Landslide	**Yes**	No	No	No
Monsoon	No	No	No	No
Severe Weather Snow / Ice/Windstorm	**Yes**	Yes FEMA 3202, 3204 2005	Yes - EOP	Yes
Tornado	**Yes**	No	No	No
Tsunami	**Yes**	No	No	No
Volcano	**Yes**	No	No	Yes
Wildfire	**Yes**	Yes FEMA 1540-2005 Waterfall Fire	Yes EOP	Yes
Other				
Hazardous Materials	**Yes**	No	Yes – Haz Mat Plan, EOP	Yes
Terrorism	**Yes**	No	EOP	Yes
Utility Loss	No	No	Yes - EOP	Yes

Name:_____ Date:_____

Agency:_____

Hazard Profiling Worksheet

Legend: 1 = lowest; 5 = highest

Hazard Type	Magnitude	Duration	Economic	Area Affected	Frequency	Degree of Vulnerability	State & Community Priorities	Total
Natural								
Avalanche								
Drought								
Earthquakes								
Epidemic								
Flood (Includes dam failure, canal failure, and mudslides)								
Infestations								
Landslide								
Severe Weather								
Tsunami/seiche								
Volcano								
Wildfire								
Human-caused								
Hazmat								
Terrorism/WMD								
Utility Loss								

Mitigation Profiling Criteria

These criteria will be used to categorize the identified hazards into high, medium and low risk hazards.
Criterion One: Magnitude

Magnitude refers to the physical and economic impact of the event. Magnitude factors are represented by:

1. Size of event
2. Life threatening nature of the event
3. Economic impact of the event
4. Threat to property
    a. Public Sector
    b. Private Sector
    c. Business and Manufacturing
    d. Tourism
    e. Agriculture

Value:

1. Very Low — Handled by community
2. Low — Handled at city/town level
3. Medium — Handled at county level
4. High — State must be involved
5. Very High — Federal declaration needed
6.

Criterion Two: Duration

Duration refers to the length of time the disaster affects the State and its citizens. Some disaster incidents have far-reaching impact beyond the actual event occurrence such as the September 11, 2001 event. Duration factors include the following:

1. Length of physical duration during emergency phase
2. Length of threat to life and property
3. Length of physical duration during recovery phase
4. Length of time affecting individual citizens and community recovery

5. Length of time affecting economic recovery, tax base, business and manufacturing recovery, tourism, threat to tax base and threat to employment

Value:

1	Very Low	Critical facilities and/or services lost for 1 to 3 days
2	Low	Critical facilities and/or services lost for 4 to 7 days
3	Medium	Critical facilities and/or services lost for 8 to 14 days
4	High	Critical facilities and/or services lost for 15 to 20 days
5	Very High	Critical facilities and/or services lost for more than 20 days

11.1.1 Criterion Three: Economic Impact

Distribution of the event refers to the depth of the effects among all sectors of the community and State, including both the geographic area affected as well as distribution of damage and recovery of the economy, health and welfare, and the State/community infrastructure. Distribution factors include the following:

1. How widespread across the state are the effects of the disaster?
2. Are all sectors of the community affected equally or disproportionately?
3. How will the distribution of the effects prolong recovery from the disaster event?

Value:

1	Very Low	Community –Only the immediate community or part of a town/city is affected
2	Low	City/Town – entire town/city is affected
3	Medium	County – effects are felt at the county level
4	High	State – the entire state will be affected by the event
5	Very High	Federal effects are felt nationwide (e.g. Hurricane Katrina-sized)

11.1.2 Criterion Four: Area Affected

Area affected refers to how much area is physically threatened and potentially impaired by a disaster risk. Area affected factors include of the following:

1. Geographic area affected by primary event
2. Geographic, physical, and economic areas affected by primary risk and potential secondary effects.

Value:

1	Very Low	Community
2	Low	City/Town
3	Medium	County
4	High	State
5	Very High	Federal

11.1.3 Criterion Five: Frequency

The frequency of the risk refers to the historic and predicted rate of recurrence of a hazardous event (generally expressed in years, such as the 100 year flood).

Value:

1	Very Low	Occurs less than once in 1,000 years
2	Low	Occurs less than once in 100 to once in 1,000 years
3	Medium	Occurs less than once in 10 to once in 100 years
4	High	Occurs less than once in 5 to once in 10 years
5	Very High	Occurs more frequently than once in 5 years

11.1.4 *Criterion Six: Degree of Vulnerability*

The degree of vulnerability refers to how susceptible the population, community infrastructure and state resources are to the effects of the risk. Vulnerability factors include the following:

1. History of the impact of similar events

2. Mitigation steps taken to lessen impact
3. Community and State preparedness to respond to and recover from the event

Value:

1	Very Low	1 to 5% of property in affected area severely damaged
2	Low	6 to 10% of property in affected area severely damaged
3	Medium	11 to 25% of property in affected area severely damaged
4	High	26 to 35% of property in affected area severely damaged
5	Very High	36 to 50% of property in affected area severely damaged

11.1.5 Criterion Seven: State and Community Priorities

State and community priorities refer to the importance placed on a particular risk by the citizens and their elected officials. Priorities factors consist of the following:

1. Long term economic impact on portions of the State or community
2. Willingness of the State or community to prepare for and respond to a particular risk
3. More widespread concerns over one particular risk than other risks
4. Cultural significance of the threat associated with a risk.
5. Potential for long term community or cultural disruption presented by the hazard
6. Matrix Prioritization of Hazards Results

Value:

1	Very Low	Advisory
2	Low	Considered for further planning in the future
3	Medium	Prompt action necessary
4	High	Immediate action necessary
5	Very High	Utmost immediacy

Vulnerability Ratings

- **High Risk Hazard:** Event has most likely occurred in the past and/or is likely to occur in the future. Of substantial magnitude, with loss and financial impact to the State considered beyond the State's available resources and ability to respond.
- **Moderate Risk Hazard:** Event has most likely occurred in the past and/or is likely to occur in the future. Of moderate magnitude, may be considered beyond the State's available resources and ability to respond.
- **Low Risk Hazard:** Event has a very low occurrence rating and not likely to cause major damage to property or loss of lives in the future. Not likely to exceed the State's available resources or ability to respond.
- **No Substantial Risk Category:** Event would be considered a State/local emergency incident within the jurisdiction's response capability and needing no additional resources to respond.
- **Special Risk Category:** A hazard with an identified mitigation plan or lead agency that provides the expertise to provide mitigation strategies.

MINUTES Meeting # 2

CARSON CITY HAZARD MITIGATION PLANNING COMMITTEE

MEETING

September 9, 2009

1:30 PM

A. CALL TO ORDER AND INTRODUCTIONS

The meeting was called to order by Stacey Giomi. Among those present were:

Brian Crowe (Western Nevada College)
Kevin Curnes (Carson City School District)
Gary Dunn (Carson City Emergency Management)
Stacey Giomi (Carson City Emergency Management)
Rhett Milne (National Weather Service)
Lee Radtke (Carson City Community Emergency Response Team)
Ray Saylo (Carson City Sheriff's Office)
Marena Works (Carson City Health/Human Services)

B. APPROVAL OF MINUTES

The minutes from the August 12, 2009, meeting were approved as written by those present on September 9, 2009.

C. UPDATE TO HAZARD MITIGATION PLAN

A short discussion was held regarding the FEMA Flood Insurance Act, and Karen is in the process of getting the actual date for this Act. During the discussion, two other dam response plans were identified aside from the Eagle Valley Dam, Brunswick Canyon, and Shenandoah Heights. Gary Dunn is to provide the map information to Karen Johnson.

Stacey was able to get copies of the Health and Identification tables to Karen to include in the plan.

Karen was able to get a copy of the Master Mitigation Plan. By doing this, the Master Plan will not need to be updated each time the City's plan is updated. The existing study table will be included in the plan.

The Executive Summary, Sections 1 & 2 were approved as written.

The Hazard Profiling Worksheet was completed by those members present. The hazard types were prioritized based on the total score of elements within each hazard.

The breakdown is as follows based on the scores of the members present:

Avalanche	79	
Drought	157	
Earthquake	224	
Epidemic	199	
Flood	186	(Includes dam failure, canal failure, and mudslides)
Infestation	97	
Landslide	107	
Severe Weather	172	

Tsunami/Seiche	91
Volcano	133
Wildfire	222
Hazmat	165
Terrorism/WMD	199
Utility Loss	151

The scores determined the priority to be set in the plan. Even though an incident has a low priority rating, the agency is still entitled to money with it being addressed within the plan.

High Priority

Earthquake
Wildfire
Terrorist Threat
Epidemic
Severe Weather

Moderate Priority

Volcano
Drought
Hazmat
Utility Loss

Low Priority

Avalanche
Infestation
Tsunami/Seiche
Landslide

It was decided that Karen will send out the results from this exercise to all members prior to the next meeting for review. A discussion was held in regards to the upcoming meetings, to have only those attend that the topic pertains to. This will enable the meetings to have better topic-specific input. This was agreed to by the members that were present.

4. ANNOUNCEMENT OF FUTURE MEETINGS

The next meeting is scheduled for Thursday, October 15, 2009, at 1:30 PM at the same location.

5. ADJOURNMENT

The meeting was adjourned at 2:30 PM.

Recorder: Rachel Albee

AGENDA – Meeting No. 3
Carson City Hazard Mitigation Planning Committee

1:30 to 4:00 pm, Tuesday, January 19, 2010
Carson City Fire Department
777 S. Stewart Street
Carson City, NV 89701

1. **CALL TO ORDER & INTRODUCTIONS** – *Chairman, Stacey Giomi,*
2. **APPROVAL OF MINUTES FROM** September 2009 (Action) – *Karen Johnson,*
3. **REVIEW QUESTIONAIRE RESULTS-** *Gary Dunn*
4. **REVIEW VULNERABILITY ASSESSMENT –** *Ken Shannon*
5. **REVIEW GOALS & ACTIONS** *Karen Johnson*
   - STAPLE + E Prioritize Actions
   - Discuss HMGP & PDM Grant Programs – Elizabeth Ashby
6. **ANNOUNCEMENT OF FUTURE MEETINGS** – *Gary Dunn*
   Future meetings are scheduled for the second Wednesday of every month at 1:30 pm.
7. **ADJOURNMENT**

The Planning Committee may take action on items marked by an asterisk (*). Items may be taken out of order presented on the agenda at the discretion of the chairperson.

For further information, please contact Judy Dietrich, Carson City Fire Department, by email at jdietrich@ci.carson-city.nv.us or telephone at (775) 887-2210. We are pleased to make reasonable accommodations for members of the public who are disabled. If special arrangements are necessary, please notify the Planning Committee at (775) 887-2210. Twenty-four hours advance notice is requested.

HAZARD MITIGATION PLANNING COMMITTEE
SIGN-IN SHEET
1/19/10

CHECK IF PRESENT	NAME	AGENCY/DEPARTMENT	KEY INPUT	PHONE NO.	E-MAIL
✓	Elizabeth Ashby	Nevada DEM	Mitigation Officer	687-0314	eashby@dps.state.nv.us
✓	Bergquist, William	Washoe Tribe of Nevada & California	Environmental/Tribal Liaison	265-8695	william.bergquist@washoetribe.us
✓	Crowe, Brian	Western Nevada College	College	445-3327	crowebj@wnc.edu
✓	Cumes, Kevin	Carson City School District	School District	283-2171	kcurnes@carson.k12.nv.us
✓	Dunn, Gary	CC Emergency Management	Coordinating Information	887-2210 x1050	gdunn@ci.carson-city.nv.us
✓	Fellows, Robb	CC Public Works	City Floodplain Manager	887-2355 x30370	rfellows@ci.carson-city.nv.us
✓	Giomi, Stacey	CC Emergency Management	Heading Update/Committee Chair	887-2210 x1005	sgiomi@ci.carson-city.nv.us
	Groenewold, Kim	Nevada Division of Water Resources	State Floodplain Manager	684-2884	groenewd@water.nv.gov
	Harrison, Phillip	Taiyo America (Private Industry/Manufacturing) & CC Chamber of Commerce	HazMat/Chamber of Commerce	885-9959 x122	phil@taiyo-america.com
	Hurst, Linda	Carson Tahoe Regional Healthcare	Hospital (Manager, Emergency Dept.)	445-8729	linda.hurst@ctrh.org
✓	James, Ed	Carson Water Subconservancy District	Water Planning	887-7456	edjames@cwsd.org
✓	Karen Johnson CO	Nevada DEM	Planner	687-0373	kjjohnson@dps.state.nv.us
✓	Lucas, Hank	Carson Tahoe Regional Healthcare	Hospital (Healthcare Emergency Ops)	445-8023	henry.lucas@ctrh.org
✓	Marshall, Craig CM	State Public Works Board	SPWB	684-4127	cmarshall@spwb.state.nv.us
✓	Milne, Rhett	National Weather Service	NWS	673-8100 x223	rhett.milne@noaa.gov
	Pullman, Casey	Carson City Airport	Airport Manager	841-2255	cap-mgr@sti.net
	Radtke, Lee	CC Community Emergency Response Team	Community Service Group	885-8166	lee.radtke@att.net
	Saylo, Ray	CC Sheriff's Office	Law Enforcement	887-2020 x41903	rsaylo@ci.carson-city.nv.us
✓	Selby, Darren	CC Public Works	PW Operations	887-2355 x30403	dselby@ci.carson-city.nv.us
	Tarulli, Tom	CC Fire Department	Fire Operations Chief	887-2210 x1002	ttarulli@ci.carson-city.nv.us
	Walker, Jim	Nevada Department of Transportation	NDOT	888-7862	jwalker2@dot.state.nv.us
	Werner, Larry	CC City Manager	City Manager	887-2100	lwerner@ci.carson-city.nv.us
	Wilkinson, Don	Citizen	Citizen	841-2772	wdonw@pyramid.net
	Works, Marena	CC Health/Human Services	Health Director / Animal Control	887-2190 x30235	mworks@ci.carson-city.nv.us
✓	KEN SHANNON	CC PUBLIC WORKS, G	GIS	887-2355 x 30404	kshannon@ci.carson-city.nv.us
✓	Dustin Boothe	CC Health/Human Services	Health	887-2190 x 30225	jboothe@ci.carson-city.nv.us
	Angela Bennett	11	11		abennett@

Handout – Meeting No. 3

STAPLE + E Evaluation Table

	S		T			A			P			L			E				E					PT
	(Social)		(Technical)			(Administrative)			(Political)			(Legal)			(Economic)				(Environmental)					
Considerations ⇨ / Mitigation Actions ⇩	Community Acceptance	Effect on Segment of Population	Technical Feasibility	Long-term Solution	Secondary Impacts	Staffing	Funding Allocated	Maintenance/ Operations	Political Support	Local Champion	Public Support	State Authority	Existing Local Authority	Potential Legal Challenge	Benefit of Action	Cost of Action	Contributes to Economic Goals	Outside Funding Required	Effect on Land/ Water	Effect on Endangered Species	Effect on HAZMAT/Waste Sites	Consistent with Native Habitat	Consistent with Local / Federal Laws	Priority Total
1.A. Update Master Plan																								
1.B ID/Ed City Personnel																								
1.C GIS ID Hazards																								
1.D Dev. Data sets to test Haz																								
1.E Internet																								
2.A Dev Evac Plans																								
2.B Annual Review of EOP																								
2.C Disaster Drill																								
2.D Est. Budget ID funding PO																								

STAPLE + E Evaluation Table

	S		T			A			P			L			E				E					PT
	(Social)		(Technical)			(Administrative)			(Political)			(Legal)			(Economic)				(Environmental)					
Considerations ⇨ / Mitigation Actions ⇩	Community Acceptance	Effect on Segment of Population	Technical Feasibility	Long-term Solution	Secondary Impacts	Staffing	Funding Allocated	Maintenance/ Operations	Political Support	Local Champion	Public Support	State Authority	Existing Local Authority	Potential Legal Challenge	Benefit of Action	Cost of Action	Contributes to Economic Goals	Outside Funding Required	Effect on Land/ Water	Effect on Endangered Species	Effect on HAZMAT/Waste Sites	Consistent with Native Habitat	Consistent with Local / Federal Laws	Priority Total
2.E School Districts PO																								
2.F BICEP																								
2.G PO City Events																								
3.A IBC Enforce																								
3.B URM Critical Facility ID																								
3.C ID Structures w GIS																								
3.D New Fire Suppression Sys																								
4.A Update Mass Illness Plan																								
4.B Training & Exercise																								
4.C Medical Supplies/Equip																								
5.A ID Flood Prone Areas w																								

STAPLE + E Evaluation Table

	S		T			A			P			L			E				E					PT
	(Social)		(Technical)			(Administrative)			(Political)			(Legal)			(Economic)				(Environmental)					
Considerations ⇨ / Mitigation Actions ⇩	Community Acceptance	Effect on Segment of Population	Technical Feasibility	Long-term Solution	Secondary Impacts	Staffing	Funding Allocated	Maintenance/ Operations	Political Support	Local Champion	Public Support	State Authority	Existing Local Authority	Potential Legal Challenge	Benefit of Action	Cost of Action	Contributes to Economic Goals	Outside Funding Required	Effect on Land/ Water	Effect on Endangered Species	Effect on HAZMAT/Waste Sites	Consistent with Native Habitat	Consistent with Local / Federal Laws	Priority Total
GIS																								
5.B Adopt or up growth policies																								
5.C Up Plans to coordinate w/Co																								
5.D Sandbag Plan Update																								
5.E New Flood Facilities																								
6.F Land Transf Slope Stability																								
5.G Eagle Valley Facilities																								
5.H Plan & Facility for New Empire																								
5.I Protect Enhance Treatment																								
5.J Goni Wash																								
5.K Eagle Valley																								
6.A. Retrofit Buildings Snow																								

STAPLE + E Evaluation Table

	S		T			A			P			L			E				E					PT
	(Social)		(Technical)			(Administrative)			(Political)			(Legal)			(Economic)				(Environmental)					
Considerations ⇨ / Mitigation Actions ⇩	Community Acceptance	Effect on Segment of Population	Technical Feasibility	Long-term Solution	Secondary Impacts	Staffing	Funding Allocated	Maintenance/ Operations	Political Support	Local Champion	Public Support	State Authority	Existing Local Authority	Potential Legal Challenge	Benefit of Action	Cost of Action	Contributes to Economic Goals	Outside Funding Required	Effect on Land/ Water	Effect on Endangered Species	Effect on HAZMAT/Waste Sites	Consistent with Native Habitat	Consistent with Local / Federal Laws	Priority Total
6.B Storm water mgmt plan for Snow																								
7.A Building Codes																								
7.B Terrorist Event Plan																								
7.C Retrofit Public Buildings																								
8.A ID Enforce UWIC																								
8.B Update fire code weed abate																								
8.C Fuel Mgmt Programs incl Watershed area																								
8.D Outreach For Wildland Fire																								
8.E Partnerships Veg Mgmt/Chip																								
8.F Utilize GIS & Internet as tools																								
8.G Estab. Wildland Fire																								

STAPLE + E Evaluation Table

	S		T			A			P			L			E				E					PT
	(Social)		(Technical)			(Administrative)			(Political)			(Legal)			(Economic)				(Environmental)					
Considerations ⇨ / Mitigation Actions ⇩	Community Acceptance	Effect on Segment of Population	Technical Feasibility	Long-term Solution	Secondary Impacts	Staffing	Funding Allocated	Maintenance/ Operations	Political Support	Local Champion	Public Support	State Authority	Existing Local Authority	Potential Legal Challenge	Benefit of Action	Cost of Action	Contributes to Economic Goals	Outside Funding Required	Effect on Land/ Water	Effect on Endangered Species	Effect on HAZMAT/Waste Sites	Consistent with Native Habitat	Consistent with Local / Federal Laws	Priority Total
Tech Group																								
8.H Slope Stabilization Projects																								
8.I Retrofit Build for Wild Fire																								

Implementation Actions Strategy Table						
Action #	**Action Description**	**Administering Department**	**Benefits of Project vs. Costs of Project**	**Estimated Project Timeframe**	**Potential Funding Source**	**Estimated Cost**

MINUTES

CARSON CITY HAZARD MITIGATION PLANNING COMMITTEE

MEETING #3

January 19, 2010

1:30 PM

1. CALL TO ORDER AND INTRODUCTIONS

The meeting was called to order by Chair Stacey Giomi. Among those present were:

Elizabeth Ashby (Nevada Division of Emergency Management)
Angela Barosso (Carson City Health & Human Services)
William Bergquist (Washoe Tribe)
Dustin Boothe (Carson City Health & Human Services)
Brian Crowe (Western Nevada College)
Kevin Curnes (Carson City School District)
Gary Dunn (Carson City Emergency Management)
Robb Fellows (Carson City Public Works)
Stacey Giomi (Carson City Emergency Management)
Ed James (Carson Water Subconservancy District)
Karen Johnson (Nevada Division of Emergency Management)
Hank Lucas (Carson Tahoe Regional Healthcare)
Craig Marshall (State Public Works Board)
Rhett Milne (National Weather Service)
Darren Selby (Carson City Public Works)
Ken Shannon (Carson City Public Works – GIS)

2. APPROVAL OF MINUTES

The September 9, 2009, meeting minutes were approved as submitted.

3. REVIEW QUESTIONNAIRE RESULTS

Gary Dunn distributed the data he had compiled from the results of the questionnaires that had been sent out with the utility bills. Three handouts contained the individual citizen comments submitted (separated by zip code), one handout indicated the breakdown of all the responses to the questionnaire, and one handout was a general comment sheet related to the questionnaire. Gary mentioned that city departments might want to note the areas he had highlighted in regard to the citizen comments as some of them might warrant some type of action. 17,000 questionnaires had been distributed, with about 900 being returned.

Karen Johnson mentioned that the committee needed to consider public opinion as to what the public felt was of very high concern versus what the committee felt. Although it appeared the committee and the public were in close agreement, she said that the committee needed to review their priorities in view of this public input.

4. REVIEW VULNERABILITY ASSESSMENT

Ken Shannon distributed maps of the area that he had prepared along with a vulnerability assessment for the critical structures within Carson City. He said that this information was gathered from various sources, including the University, the Assessor's Office, and the 2000 Census population data.

The committee then reviewed and discussed this data. Some of the changes suggested were:

- In regard to the maps, indicate that the numbers corresponding to the colored areas in the legend referred to the number of people in each voting precinct contained in a given area (as each area contained numerous precincts).
- In regard to the vulnerability assessment:
    - Change the data source from the 2000 Census population data to the State Demographer's 2009 data.
    - Because various hazards would not affect all the buildings, the values should be decreased substantially (hazardous materials event and utility loss to 10% of stated values and severe weather and terrorism to 25% of stated values) on Table 5-9. Also, total population should be added to the Epidemic line, although no buildings would be affected.
    - On Table 5-10, add the hospital as being affected by volcano/ash at a damage estimate of $200,000.

The committee was then asked to e-mail Karen if they later had any issues or questions regarding the maps and she would, in turn, work with Ken to resolve those issues.

5. REVIEW GOALS & ACTIONS

- **STAPLE + E Prioritize Actions**
  Karen Johnson distributed the overview of the process for preparing a mitigation strategy, developing mitigation goals and objectives, identifying and analyzing potential actions, prioritizing mitigation actions, and implementing an action plan (which had been e-mailed to the committee for its review prior to the meeting). She said that she had previously met with representatives from each of the departments about the mitigation actions they wanted to take in order to reduce the effects of hazardous events occurring.

  She asked the committee to fill out the form at the end of the document, ranking each consideration for each action item from "1" to "3" (with 3 being the highest). Karen mentioned that she will be meeting with the individuals who provided the actions for the plan in order to complete the Implementation Actions Strategy Table that

followed this form. This table will list the top ten to twelve priorities, going into more depth on each of them. She said, however, that funds could still be received for the lower priorities as long as they were listed in the mitigation plan as a goal, objective, and action.

- **Discuss HMPG & PDM Grant Programs**
  Elizabeth Ashby distributed a brochure on the Unified Hazard Mitigation Assistance Program in Nevada which listed the various grant programs available under this new unified process. She said that this process allows for the same application opening and closing dates for all grant programs and that all of the guidelines were now contained in one book.

  Elizabeth mentioned that the only program not dealt with in Nevada was the Severe Repetitive Loss Program and that the Flood Mitigation Assistance and Repetitive Flood Claims Programs were handled by the State Division of Water Resources. The Division of Emergency Management handled the remaining two programs—the Post-Disaster Hazard Mitigation and the Pre-Disaster Mitigation Programs. The Post-Disaster funds are applied for under a Presidential Declaration of Disaster while the Pre-Disaster funds can be applied for on a yearly basis for activities contained within the entity's Mitigation Plan. She mentioned that the dates and deadlines listed on the brochure would also be listed on the state website under both DEM and the Division of Water Resources, along with their being posted on the website of the Nevada Bureau of Mines and Geology at UNR.

  It was stated that if anyone wanted to apply for any of these grants, the guidance was on an electronic system from FEMA and access to this system needed to be requested through DEM. Elizabeth suggested that if anyone was thinking of a project for the upcoming cycle, they should start working on it now because the documentation for the application (particularly the cost/benefit analysis) was quite detailed. Karen then mentioned that if anyone was thinking of a project prior to the Mitigation Plan being completed that was not currently listed as a goal, this would be the time to add it. Elizabeth then reminded the group that there was a cost share involved—75/25—with the applicant being allowed to provide either a hard or an in-kind match for its 25 percent. She said that anyone with any questions regarding this grant process should contact either her or Kim Groenewold (contact information listed on brochure).

6. ANNOUNCEMENT OF FUTURE MEETINGS

The next meeting was scheduled for Wednesday, March 10, at 1:30 p.m. in the meeting room of Fire Station #1.

7. ADJOURNMENT

The meeting was adjourned at 3:25 p.m.

Recorder: Judy Dietrich

STAPLE + E RESULTS							Top 10								
Action	Each Participants Total Score														
1.A.1	17	19	18	10	18	13	14	15	13	12	14	15	18	15	211
1.A.2	13	18	14	17	18	11	9	15	21	13	9	13	20	14	205
1.B.1	14	16	13	12	21	16	10	15	14	12	14	12	18	15	202
1.B.2	14	15	13	12	17	14	12	15	17	11	13	13	14	13	193
1.B.3	19	13	14	17	10	17	13	18	17	16	10	15	16	13	208
2.A.1	21	17	16	15	16	21	13	18	11	17	18	14	17	17	231
2.B.1	21	16	17	17	20	21	14	19	21	16	14	9	18	11	234
2.B.2	21	16	16	18	16	14	20	18	19	9	15	11	16	12	221
2.C.1	15	16	11	14	16	16	9	16	14	14	15	15	12	15	198
2.C.2	2	18	5	12	10	16	8	18	15	16	12	15	17	12	176
2.C.3	10	17	3	14	13	12	8	18	16	12	12	13	12	12	172
2.C.4	16	18		16	19	13	18	18	16	18	12	15	15	10	204
3.A.1	12	12	8	17	21	16	16	18	14	16	12	14	18	17	211
3.A.2	10	19	11	14	15	11	10	12	10	14	9	15	16	14	180
3.A.3	11	15	7	15	17	10	14	19	19	13	10	11	14	14	189
3.A.4	11	15	5	9	11	17		11	19	17	11	12	12	13	163
4.A.1	19	17	9	16	18	21	10	17	19	15	15	12	16	13	217
4.A.2	18	17	8	17	17	19	13	16	21	12	14	13	13	10	208
4.A.3	20	15	18	14	14	19	14	15	21	14	15	19	12	13	223
5.A.1	21	18	11	11	19	20	14	15	20	12	18	19	19	17	234
5.A.2	18	19	9	14	17	14	16	15	21	12	14	13	16	14	212
5.A.3	21	17	8	18	21	15	11	17	21	20	18	19	18	15	239
5.A.4	21	18	15	10	12	12	14	16	21	13	16	15	16	10	209
5.A.5	21	16	13	19	17	13	14	18	18	13	13	12	14	14	215
5.A.6	20	17		12	15	13	7	12	15	11	12	12	13	11	170
5.A.7	16	17		11	14	9	7	12	15	13	10	13	15	13	165
5.A.8	14	17		11	18	16	7	14	19	7	14	18	16	11	182
5.A.9	21	16		13	20	18	17	15	21	13	18	17	17	16	222
6.A.1	9	16		16	19	13	10	18	19	15	14	8	11	11	179
6.A.2	17	16		13	15	15	12	12	10	14	10	7	16	13	170
7.A.1	7	16		14	17	14	11	14	21	10	11	12	9	14	170
7.A.2	20	17	19	19	19	13	16	13	14	13	13	13	14	17	220
7.A.3	12	16		10	19	13	16	13	7	14	12	15	9	15	171
8.A.1	18	16		16	19	20	13	16	21	15	14	16	15	17	216
8.A.2	21	17		14	17	17	12	16	16	14	12	13	15	11	195
8.A.3	21	17		15	18	20	12	19	20	14	14	19	17	13	219
8.A.4	21	19		15	19	20	10	16	20	9	14	13	13	14	203
8.A.5	21	18		12	13	20	14	19	20	12	13	14	14	13	203
8.A.6	21	18		14	10	20	8	15	21	9	9	9	12	14	180
8.A.7	20	14		14	18	19	8	13	16	8	12	9	19	14	184
8.A.8	21	16		18	18	15	8	16	16	16	16	15	14	13	202
8.A.9	16	16		12	11	13	8	18	11	12	12	10	10	11	160

AGENDA – Meeting No. 4
Carson City Hazard Mitigation Planning Committee

1:30 to 4:00 pm, Thursday, May 13, 2010
Carson City Fire Department
777 S. Stewart Street
Carson City, NV 89701

1. **CALL TO ORDER & INTRODUCTIONS** – *Chairman, Stacey Giomi*

2. **APPROVAL OF MINUTES FROM** January 2010 (Action) – *Karen Johnson*

3. **DISCUSS CARSON CITY HAZARD MITIGATION PLAN & APPROVE SUBMITTING TO FEMA & BOARD OF SUPERVISORS FOR APPROVAL –** *Karen Johnson*

4. **NV HAZARD MITIGATION PROGRAM –** *Elizabeth Ashby*

5. **ADJOURNMENT**

The Planning Committee may take action on items marked by an asterisk (*). Items may be taken out of order presented on the agenda at the discretion of the chairperson.

For further information, please contact Judy Dietrich, Carson City Fire Department, by email at jdietrich@ci.carson-city.nv.us or telephone at (775) 887-2210. We are pleased to make reasonable accommodations for members of the public who are disabled. If special arrangements are necessary, please notify the Planning Committee at (775) 887-2210. Twenty-four hours advance notice is requested.

HAZARD MITIGATION PLANNING COMMITTEE
SIGN-IN SHEET
5/13/10

CHECK IF PRESENT	NAME	AGENCY/DEPARTMENT	KEY INPUT	PHONE NO.	E-MAIL
✓	Ashby, Elizabeth	Nevada DEM	Mitigation Officer	687-0314	eashby@dps.state.nv.us
	Barosso, Angela	CC Health & Human Services	Health	887-2190	abarosso@ci.carson-city.nv.us
	Bergquist, William	Washoe Tribe of Nevada & California	Environmental/Tribal Liaison	265-8695	william.bergquist@washoetribe.us
	Boothe, Dustin	CC Health & Human Services	Health	887-2190 x30225	jboothe@ci.carson-city.nv.us
✓	Crowe, Brian	Western Nevada College	College	445-3327	croweb@wnc.edu
✓	Cuzza, Kevin	Carson City School District	School District	283-2171	kcuzza@carson.k12.nv.us
✗	Dunn, Gary	CC Emergency Management	Coordinating Information	887-2210 x1050	gdunn@ci.carson-city.nv.us
	Fellows, Robb	CC Public Works	City Floodplain Manager	887-2355 x30370	rfellows@ci.carson-city.nv.us
✓	Giomi, Stacey	CC Emergency Management	Heading Update/Committee Chair	887-2210 x1005	sgiomi@ci.carson-city.nv.us
	Groenewold, Kim	Nevada Division of Water Resources	State Floodplain Manager	684-2884	groenewk@water.nv.gov
	Harrison, Philip	Taiyo America (Private Industry/Manufacturing) & CC Chamber of Commerce	HazMat/Chamber of Commerce	885-9959 x122	phil@taiyo-america.com
	Hurst, Linda	Carson Tahoe Regional Healthcare	Hospital (Manager, Emergency Dept.)	445-8729	linda.hurst@ctrh.org
	James, Ed	Carson Water Subconservancy District	Water Planning	887-7456	ejames@cwsd.org
✓	Johnson, Karen	Nevada DEM	Planner	687-0373	kljohnson@dps.state.nv.us
	Lucas, Hank	Carson Tahoe Regional Healthcare	Hospital (Healthcare Emergency Ops)	445-8023	henry.lucas@ctrh.org
✗	Marshall, Craig	State Public Works Board	SPWB	684-4127	cmarshall@spwb.state.nv.us
	Milne, Rhett	National Weather Service	NWS	673-8100 x223	rhett.milne@noaa.gov
	Pullman, Casey	Carson City Airport	Airport Manager	841-2255	cup-rapr@att.net
✗	Radtke, Lee	CC Community Emergency Response Team	Community Service Group	885-8166	lee.radtke@att.net
✗	Sayle, Ray	CC Sheriff's Office	Law Enforcement	887-2020 x41903	rsayle@ci.carson-city.nv.us Carson.org
	Selby, Darren	CC Public Works	PW Operations	887-2355 x30403	dselby@ci.carson-city.nv.us
	Shannon, Ken	CC Public Works	GIS	887-2355 x30404	kshannon@ci.carson-city.nv.us
	Tarulli, Tom	CC Fire Department	Fire Operations Chief	887-2210 x1002	ttarulli@ci.carson-city.nv.us
	Walker, Jim	Nevada Department of Transportation	NDOT	888-7862	jwalker2@dot.state.nv.us
	Werner, Larry	CC City Manager	City Manager	887-2100	lwerner@ci.carson-city.nv.us
	Wilkinson, Don	Citizen	Citizen	841-2772	wdonw@pyramid.net
✓	Works, Marena	CC Health/Human Services	Health Director / Animal Control	887-2190 x30235	mworks@ci.carson-city.nv.us Carson.org
✗	Radtke, Mary Ellen		Citizen	720-196/ cell	me.radtke@att.net

MINUTES
CARSON CITY HAZARD MITIGATION PLANNING COMMITTEE
MEETING
May 13, 2010
1:30 PM

1. CALL TO ORDER AND INTRODUCTIONS

The meeting was called to order by Chair Stacey Giomi. Among those present were:
Elizabeth Ashby (Nevada Division of Emergency Management)
Brian Crowe (Western Nevada College)
Kevin Curnes (Carson City School District)
Gary Dunn (Carson City Fire Department/Emergency Management)
Stacey Giomi (Carson City Fire Department/Emergency Management)
Karen Johnson (Nevada Division of Emergency Management)
Craig Marshall (State Public Works Board)
Lee Radtke (Carson City Community Emergency Response Team)
Mary Ellen Radtke (Citizen)
Ray Saylo (Carson City Sheriff's Office)
Marena Works (Carson City Health & Human Services)

2. APPROVAL OF MINUTES

The January 19, 2010, meeting minutes were approved as submitted.

3. DISCUSS CARSON CITY HAZARD MITIGATION PLAN AND APPROVE SUBMITTING TO FEMA AND BOARD OF SUPERVISORS FOR APPROVAL

Karen Johnson said that she had e-mailed the plan out to all committee members asking for comments and that those comments have been incorporated into the plan. She then asked if anyone had any questions in regard to the plan.

Gary Dunn asked about the maintenance of the plan, and Karen replied that the last section of the plan dealt with this matter. She said that the committee was to meet once a year to review the plan. Also, if there were to be a disaster during that timeframe, the committee could meet after the disaster to review the actions that needed to take place to mitigate that particular hazard. Karen said that Appendix F of the plan contained an annual review questionnaire as well as an action progress report which should be filled out at the meetings so that any items needing to be addressed would be listed there.

Karen mentioned that one critical area of the plan was in regard to the mitigation actions that could be taken over the next five years—and that those actions could change each time the plan was reviewed.

Stacey Giomi felt that it would be more beneficial to hold meetings twice a year to ensure they stayed on task. This would help keep their projects and actions in the forefront so they could better consider the mitigation components of any ongoing project.

In response to a question by Gary Dunn as to whether any of this review process should be reported to the DEM, Elizabeth Ashby said only if there were changes to a strategy's goals & objectives and actions. These changes would, in turn, be forwarded to FEMA so that applications could be made for projects not originally in the plan. Karen mentioned that one of the meetings should be held in March so that if someone came up with a project, there would be time to submit a letter of interest to Elizabeth for that project.

Karen said that after the committee approves this plan, it will be submitted to FEMA for a courtesy review. If after this review, any changes are needed, those changes will be made, and if not, FEMA will submit a letter of approval contingent upon adoption, and the plan will then be submitted to the Board of Supervisors for adoption. Stacey said that once adopted, the plan will be posted on the City's website and can be linked to the DEM's website.

It was then moved by Kevin Curnes, seconded by Craig Marshall, with motion carried, that the committee approve the plan as presented today by Karen Johnson.

4. NEVADA HAZARD MITIGATION PROGRAM

Elizabeth Ashby distributed a flyer explaining five FEMA programs related to mitigation funding that would be available to Carson City once its plan was approved. The Flood Mitigation Assistance, Repetitive Flood Claims, and Severe Repetitive Loss Programs were all funded through the National Flood Insurance Program and managed by the Division of Water & Resources by Kim Groenewold, the Flood Plain Manager. The DEM then managed the remaining two—the Post-Disaster Hazard Mitigation Grant and Pre-Disaster Mitigation Programs. All these programs were combined and on the same cycle, with identical beginning and ending dates.

She mentioned, however, that Post-Disaster funding was only received following a Presidentially Declared Disaster, while Pre-Disaster funding opened every June (closing in December) and was a nationally competitive program. She then presented a PowerPoint presentation in regard to these two programs, which included examples of eligible projects. Both programs will require a benefit/cost analysis, with the benefits outweighing the cost of the project, and all applications will need to comply with environmental, historical, etc., requirements. These grants are a 75/25 cost share, with FEMA providing 75 percent of the money and the applicant providing 25 percent (in either a hard match or in-kind contributions).

Elizabeth then explained both the state and national process for reviewing the applications. She said that once an application was approved and funding allocated by FEMA, the DEM and the Division of Water Resources would quickly get the funding out to the applicant and that the project could then begin (with a three-year time period for completion). She mentioned that extensions of time were difficult to obtain and that no changes to the scope of work have ever been approved.

The deadlines for the 2011 cycle were listed in the flyer, and Elizabeth said that they will be conducting some training regarding this process in May and June, with the first training being held May 20 in Carson City. The Notice of Intent is due June 10, and the process itself is electronically accessed through the Internet, with no paper documents being accepted.

Elizabeth then mentioned that there were several programs available other than the ones covered here—and that available funding sources were listed in the State Plan.

5. ADJOURNMENT

Stacey thanked committee members for their time in participating in this process and expressed his appreciation to Karen and Elizabeth for their assistance, and adjourned the meeting at 2:16 p.m.

Recorder: Judy Dietrich

Appendix F
Plan Maintenance Documents

Sample Press Release for

Annual Maintenance Meeting

Carson City, Nevada is meeting to review and maintain its Hazard Mitigation Plan to assess risks posed by natural and manmade disasters and identify ways to reduce those risks. This plan is required under the Federal Disaster Mitigation Act of 2000 as a prerequisite for receiving certain forms of Federal disaster assistance. The plan can be found on the City's website at www.carson-city.nv.us .

Public comments and participation are welcomed. For additional information or to request to participate, or to submit comments, please contact Gary Dunn, Carson City Emergency Management, at (775) 887-2210 or gdunn@ci.carson-city.nv.us .

Annual Review Questionnaire

PLAN SECTION	QUESTIONS	YES	NO	COMMENTS
PLANNING PROCESS	Are there internal or external organizations and agencies that have been invaluable to the planning process or to mitigation action?			
	Are there procedures (e.g., meeting announcement, plan updates) that can be done more efficiently?			
	Has the Steering committee undertaken any public outreach activities regarding the HMP or implementation of mitigation actions?			
HAZARD PROFILES	Has a natural and/or human-caused disaster occurred in this reporting period?			
	Are there natural and/or human-caused hazards that have not bee addressed in this HMP and should be?			
	Are additional maps or new hazards studies available? If so, what have they revealed?			
VULNERABILITY ANALYSIS	Do any new critical facilities or infrastructure need to be added to the asset lists?			
	Have there been changes in development patterns that could influence the effects of hazards or create additional risks?			
MITIGATION STRATEGY	Are there different or additional resources (financial, technical, and human) that are now available for mitigation planning?			
	Are the goals still applicable?			
	Should new mitigation actions be added to a community's Mitigation Action Plan?			
	Do existing mitigation actions listed in a community's Mitigation Action Plan need to be reprioritized?			
	Are the mitigation actions listed in a community's Mitigation Action Plan appropriate for available resources?			

Mitigation Action Progress Report

Progress Report Period:_____ to _____
(date) (date)

Project Title:_____ Project ID#_____

Responsible Agency:

Address:_____

City:_____

Contact Person:_____

Phone # (s): _____ email address:_____

List Supporting Agencies and Contacts:

_____

_____

Total Project Cost: _____

Anticipated Cost Overrun/Underrun: _____

Date of Project Approval: _____ Start date of the project: _____

Anticipated completion date: _____

Description of the Project (include a description of each phase, if applicable, and the time frame for completing each phase): _____

_____

_____

Milestones	Complete	Projected Date of Completion

Plan Goal(s) Address

Goal: _____

Indicator of Success: _____

_____

_____

_____

Project Status

☐ Project on schedule

☐ Project completed

☐ Project delayed*

*explain _____

_____

☐ Project Cancelled

Project Cost Status

☐ Cost unchanged

☐ Cost overrun*

*explain_____

_____

☐ Cost underrun*

*explain_____

_____

Summary of progress on project for this report:

A. what was accomplished during this reporting period?

_____

_____

_____

B. What obstacles, problems, or delays did you encounter, if any?

_____

_____

_____

C. How was each problem resolved?

_____

_____

_____

Next Steps: What are the next step(s) to be accomplished over the next reporting period?

Other Comments:

Appendix G
Plan Maintenance Documents

Previous Plans Goals & Actions

Goal	Action	Description	Current Status/ New Action #
1	Promote disaster-resistant future development		
	1.1.1	Update General Plan every 10 years	Completed 2006, Update Action 1.A
	1.1.2	Attract & retain qualified, profession and experienced staff	Ongoing, not mitigation, removed
	1.1.3	Identify high hazard areas	Ongoing, Update Action 1.B
	1.1.4	Review codes every 3 years	Completed 2008, Update Action 1.A
	1.1.5	Establish emergency review procedures for codes	Vague, Update Action 1.F
	1.3.1	Development should be in harmony with exiting topography	Vague, Update Action 1.A, & 5.B
	1.3.2	Development patterns should respect environmental characteristics	Vague, Update Action 1.A
	1.3.3	Development should be limited in areas of known geologic hazards	Master Plan 2006, Update Action 1.A, 1.F, 3.C, 5.B
	1.3.4	Development in floodplains shall be limited to protect lives & prop.	Master Plan 2006, Update Action 5.B
	1.3.5	High fire hazard areas shall have adequate access for emergency vehicles	Not mitigation, removed
	1.4.1	Coordinate existing GIS capabilities	Ongoing, Action 1.C, 2.G
	1.4.2	Develop the data sets that are necessary to test hazard scenarios and mitigation tools including HAZUS	No funding, UNR is providing this for Earthquake & Flood Update Action 1.D
	1.4.3	Utilize the Internet as a communication tool	Ongoing, Update Action 1.E
	1.5.1	Gain public acceptance for avoidance policies in high hazard areas	No funding, Update Action 1.B, 2.E, 2.F, 2.G, 8.D
2	Increase public understanding & support for effective HM		
	2.1.1	Publicize & encourage the adoption of appropriate HM actions	Wildfire community outreach Ongoing, Limited Funding, Update Action 1.B, 1.E, 2.E, 2.F, 2.G, 8.D
	2.1.2	Provide information to the public on the City's website	Update Action 1.E & 2.G. 2005 HM Plan on website
	2.1.3	Heighten public awareness of hazards by using the City Media & PA office	No funding, Update Action 1.B
	2.1.4	Gain public acceptance for avoidance policies in high hazard areas	Not specific, public awareness actions address this. Removed
	2.2.1	ID hazard specific issues and needs	HM Plan 2005, Update Action 1.B
	2.2.2	Help create demand for hazard resistant construction and site planning	No funding, Update Action 1.B
	2.3.1	Develop, Maintain, and improve lasting partnerships	Vague but ongoing, Update Action 1.B, 2.E, 2.F, 2.G
	2.3.2	Support the County Fire Safe Council	Limited funding, UNR Extension currently providing support not a mitigation action, removed
	2.3.3	ID hazard specific issues and needs	HM Plan 2005, Update Action 1.B
	2.4.1	Utilize BICEP to increase awareness and knowledge of HM principles & practices	No funding, Update Action 2.F

Previous Plans Goals & Actions

Goal	Action	Description	Current Status/ New Action #
	2.4.2	Encourage businesses to develop and implement hazard mitigation actions	No funding, Update Action 2.F
	2.4.3	ID hazard specific issues and needs	HM Plan 2005, Update Action 1.B
	2.5.1	Use the CC Fire Dept. Emergency Management website to publicize mitigation actions	No funding, Fire Dept website used for fuels reduction information Update Action 1.E
	2.5.2	Utilize existing risk data and create a marketing campaign	No funding, Update Action 2.G
	2.5.3	Develop and distribute brochures, CDs and other publications	Ongoing for flood and wildfire, Update Action 2.G
	2.5.4	Develop and distribute brochures, CDs and other publications	Ongoing for flood and wildfire, Update Action 2.G
	2.6.1	Support public and private sector symposiums	No funding, Update Action 2.G
	2.6.2	Coordinate production of brochures, informational packets and other handouts	Repetitive, Update Action 2.G
3	**Enhance HM coordination and communication with federal, state, local and tribal governments**		
	3.1.1	Develop multi-jurisdictional/multi-functional training and exercises to enhance hazard mitigation	No funding, Update Action 1.B
4	**Enhance HM coordination and communication with federal, state, local and tribal governments**		
	4.1.1	Leverage resources and expertise that will further HM efforts	Not specific, not mitigation, removed
	4.1.2	Update the City HM plan regularly	Update 2010
	4.1.3	Encourage all local and tribal governments to formulate a HM Plan	Being coordinated by State HM Officer
	4.1.4	Establish & Maintain lasting partnerships through City organizations and EM Council	Ongoing, Update Action 1.B
	4.1.5	Streamline policies to eliminate conflicts and duplication of effort where feasible	Not mitigation, removed
	4.2.1	Maintain coordination, communication and cooperation with the State in administering recovery programs	Not mitigation, removed
	4.2.2	Continue to exchange resources and work with local and regional partners	Ongoing but not mitigation, removed
5	**Reduce the possibility of damage and losses to existing assets, including people, critical facilities/infrastructure, and public facilities due to catch basin or dam failure-**		Included in Floods Update Goal 5
	5.1.1	Update inundation maps every 10 years as feasible	EM Action Plans for Dams updated 2005, 2006 2009, Update Action 5.A
	5.1.2	Participate in community awareness meetings when feasible	Ongoing, Update Action 2.G
	5.1.3	Develop distribute printed publications to the communities	Repetitive, Update Action 2.G
	5.1.4	ID hazard prone structures	Ongoing, Update Action 5.A
	5.2.1	Incorporate and maintain valuable wetlands in open space preservation programs	No funding, Update Action 5.L
	5.2.2	Review and revise, when appropriate necessary, sediment and erosion control regulations	Update Action 1.A
	5.3.1	Strengthen existing development regulations to discourage land uses and activities that create hazards	Repetitive, Update Action 1.A
	5.3.2	Plan and zone for open space, recreational, agricultural, or other	Master Plan 2006, Update

Previous Plans Goals & Actions

Goal	Action	Description	Current Status/ New Action #
		low intensity uses within floodway fringes.	Action 5.B
6		**Reduce the possibility of damage and losses to existing assets due to drought**	
	6.1.1	Encourage and require water conservation where feasible	No funding, Update Action 9.B
	6.1.2	Explore the development of new water resources	No funding, not mitigation, removed
	6.1.3	Encourage the recharge of underground aquifers	No funding, Update Action 9.A
	6.1.4	Encourage the Federal Gov. to complete the decontamination of all underground water resources currently identified as Superfund sites	Ongoing, not mitigation, removed
	6.2.1	Implement public information programs on water conservation and drought resistant landscaping	No funding, Update Action 2.G
7		**Reduce the possibility of damage and looses to existing assets due to earthquakes**	
	7.1.1	Maintain building codes to reflect current earthquake standards	Adopted IBC 2006, Update Action 3.A
	7.1.2	Encourage and participate in community awareness meetings	Repetitive, Update Action 2.G
	7.1.3	Distribute printed publications to communities concerning hazards	Repetitive, Update Action 2.G
	7.2.1	ID hazard prone structures through GIS modeling	Ongoing by UNR, Update Action 3.C
	7.2.2	Build critical facilities to ensure that they function after a major earthquake	IBC 2006 Adopted, Update Action 1.A, 3.G
	7.2.3	Encourage and continue to the study of ground motion, landslide and liquefaction	Ongoing by UNR, No personnel or funding in City, Not mitigation
	7.3.1	ID projects for pre-disaster mitigation funding	Ongoing not mitigation
	7.3.2	Design and implement an ongoing public seismic risk assessment program	Ongoing by UNR, HM Plan on website, Update Action 1.E
	7.3.3	Collaborate with Federal State, universities and local agencies mapping efforts	Ongoing, Update Action 1.C
	7.4.1	Assess countywide utility infrastructure with regard to earthquake risk	No funding, Update Action 3.B & 3.C
	7.4.2	Encourage the public to prepare and maintain a 3-day preparedness kit	Not mitigation, Update Action 2.B 2.C
8		**Reduce the possibility of damage and losses to existing assets due to landslide**	
	8.1.1	ID potential areas based upon historical data	HM Plan Update, Update Action 5.F & 10.A
	8.1.2	Participate in community awareness meetings	Repetitive, Update Action 2.G
	8.1.3	Distribute printed publications to communities concerning hazards	Repetitive, Update Action 2.G
	8.2.1	Study and improve storm drains for landslide prone areas	Ongoing, Update Action 5.A
	8.2.2	Develop, adopt and enforce effective bldg codes and standards	Adopted IBC 2006, Update Action 1.A
	8.2.3	Seek pre-disaster mitigation funding for landslide prevention	Not mitigation, removed
	8.3.1	Review and update plans that would include coordination with special districts and City agencies	Ongoing, Update Action 1.B
	8.3.2	Streamline policies to eliminate conflicts and duplication of effort	Ongoing, not mitigation
	8.3.3	Develop and publish evacuation procedures to the public	No funding, Update Action 2.A

Previous Plans Goals & Actions

Goal	Action	Description	Current Status/ New Action #
	8.4.1	ID hazard prone structures through GIS modeling	Ongoing, Update Action 5.A
	8.4.2	Develop and implement hazard awareness program	No funding, Update Action 2.G
9		**Reduce the possibility of damage and losses to existing assets due to floods**	
	9.1.1	Review and compare existing flood control standards, zoning and building requirements	Ongoing, Update Action 5.A, 5.B, 1.A, 1.F
	9.1.2	ID & update flood prone areas using GIS	Ongoing, Update Action 5.A
	9.1.3	Adopt or Update policies that discourage growth in flood prone areas	Master Plan 2006, Update Action 5.B
	9.2.1	Assure adequate funding where feasible to restore damaged facilities to 100-year flood design	Ongoing, Update Action 5.A, 5.E
	9.2.2	Update storm water systems plans and improve storm water facilities in high-risk areas	Ongoing as funding is available, Update Action 5.A, 5.C, 5.E, 5.G, 5.H, 5.J
	9.2.3	Ensure adequate evacuation time in case of major hazard event	No funding, Update Action 2.A
	9.3.1	Develop a flood control strategy that ensures coordination with Fed, State and local agencies	Repetitive, Update Action 2.A
	9.3.2	Seek pre-disaster mitigation funding	Not mitigation, removed
	9.4.1	ID those communities that have recurring losses	Ongoing, Update Action 5.A
	9.4.2	Develop project proposals to reduce flooding and improve control in flood prone areas	Repetitive, Update Action 5.C
	9.4.3	Seek pre-disaster mitigation funding	Repetitive, vague, removed
	9.5.1	Encourage the public to prepare and maintain a 3-day preparedness kit	Repetitive, Preparedness not mitigation, Update Action 2.B
	9.5.2	Increase participation and improve compliance with NFIP	CRS upgraded to 6, Ongoing, Update Action 1.A, 5.A, 5.B, 5.C
	9.5.3	Maintain, develop and implement hazard awareness	Repetitive, Update Action 2.G
10		**Reduce the possibility of damage and losses to existing assets due to flooding and erosion**	
	10.1.1	Coordinate with adjacent cities to develop comprehensive plan	Carson River Watershed Regional Floodplain Mgmt Plan 2008, Carson River Geographic Response Plan 2008
	10.1.2	Participate in community awareness meetings	Repetitive
	10.1.3	Distribute printed publications to the communities	Repetitive
	10.2.1	Seek pre-disaster mitigation funding	Repetitive
	10.3.1	Review and update plans that would include coordination with adjacent counties and cities	Repetitive
	10.3.2	Streamline policies to eliminate conflicts and duplication efforts	Not mitigation, removed
	10.3.3	Develop and publish evacuation procedures to the public	Repetitive
	10.4.1	ID hazard prone structures through GIS modeling	Repetitive
	10.4.2	Incorporate information and recommendations from communities in HM plan	HM Plan 2005, Update HM Plan 2010
11		**Reduce the possibility of damage and losses to existing assets due to structural fire/wildfire**	
	11.1.1	Update CC Fire Code every 3 years	Updated Fire Code 2008, Update Action 1.A, 8.B
	11.1.2	Update CC model weed abatement and fuel modification ordinances	Updated Fire Code 2008, Update Action 1.A, 8.B

Previous Plans Goals & Actions

Goal	Action	Description	Current Status/ New Action #
	11.1.3	Utilize GIS and the internet as information tools	Ongoing, Update Action 1.C, 8.A
	11.2.1	Enforce Standardized defensible space clearance distances	Ongoing, Update Action 8.A
	11.2.2	Establish community-based groups to promote chipping	Ongoing, Update Action 8.E
	11.2.3	Research options to provide low cost insurance to cover landowners who allow prescribed burning on their lands	Researched - not available, removed
	11.3.1	Establish a continuing wildland fire technical working group	No funding, Update Action 8.G
	11.3.2	Develop partnerships for a countywide vegetation management program	Ongoing, Update Action 8.E
	11.3.3	Report annually to the Board of Supervisors on progress of fire mitigation strategies	Ongoing, not mitigation, removed
	11.4.1	Continue to ID and update Urban/wildland fire interface areas	Ongoing, Update Action 8.A
	11.4.2	Use GIS to map fire risk areas	Ongoing, 8.A, I.C
	11.4.3	Implement public education program to address fire dangers and corrective measures	Not funded, Update Action 8.D