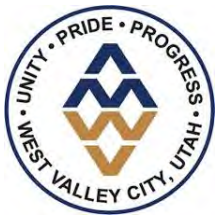
Salt Lake County Multi-Jurisdictional Multi-Hazard Mitigation Plan —Individual Annexes



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TOWN OF ALTA

RESOLUTION NO. 2015-R-1

A RESOLUTION ADOPTING THE SALT LAKE COUNTY MULTI-JURISDICTION MULTI-HAZARD MITIGATION PLAN (THE "PLAN") AS REQUIRED BY THE FEDERAL DISASTER MITIGATION ACT OF 2000.

WHEREAS, the Disaster Mitigation Act of 2000, Public Law 106-390, was enacted to establish a national disaster hazard mitigation program to reduce the loss of life and property, human suffering, economic disruption, and disaster assistance costs resulting from natural disasters, and to assist state, local and Indian tribal governments in implementing effective hazard mitigation measures designed to ensure the continuation of critical services and facilities after a natural disaster; and,

WHEREAS, the Disaster Mitigation Act requires such governments to develop hazard mitigation plans to identify the natural hazards that could impact their jurisdictions, identify actions and activities to mitigate the effects of those hazards, and establish a coordinated process to implement such plans; and

WHEREAS, the *Plan* has been prepared in accordance with FEMA requirements at 44 C.F.R. 201.6; and,

WHEREAS, the Town of Alta is a local unit of government that has afforded its citizens an opportunity to comment and provide input in the *Plan* and the actions in the *Plan*; and,

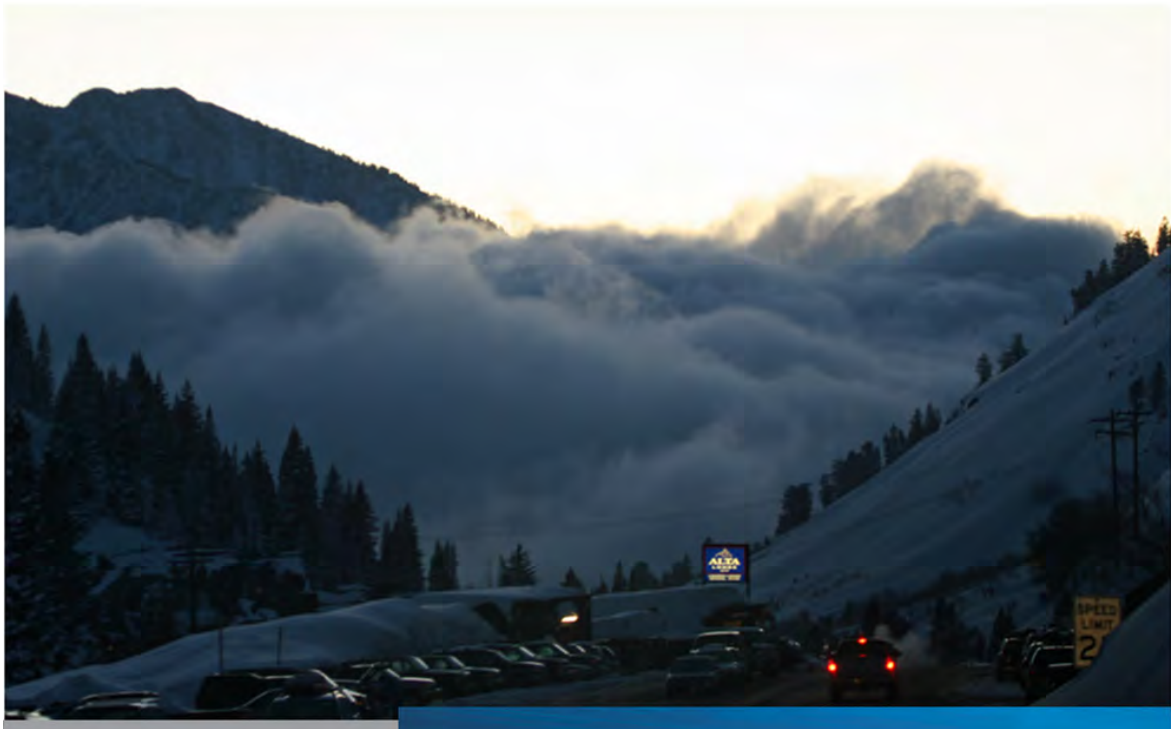
WHEREAS, the Town of Alta is concerned about mitigating potential losses and has determined that it would be in the best interest of the community to adopt the *Plan,*

NOW THEREFORE, BE IT RESOLVED by the Alta Town Council that the Town of Alta adopt the *Plan* as this jurisdiction's Multi-Hazard Mitigation Plan.

Adopted this 12 day of February, 2015.

Tom Pollard, Mayor

Katherine S.W. Black, Town Clerk



October, 2014

Town of Alta, Utah

Pre-Hazard Mitigation Plan

Hazard Mitigation Plan (2014)

Town of Alta Emergency Management Contacts

Chris Cawley
Assistant Town Administrator,
Emergency Manager
Chris@townofalta.com
801-363-5105

Mike Morey
Town of Alta Marshal
mmorey@townofalta.com
801-363-5105

John Guldner
Town Administrator
jhg@townofalta.com
801-363-5105

To access the 2005 Town of Alta General Plan and the official Town Code, please visit www.townofalta.com/gov_plan.php and www.townofalta.com/gov_ordinances.php.

ANNEX A: TOWN OF ALTA

1 Introduction

1.1 Background

This document is based in part on existing documents such as the 2009 "WASATCH FRONT NATURAL HAZARDS PRE-DISASTER MITIGATION PLAN," as well as several documents prepared by Salt Lake County Emergency Management Staff. These documents assist the 16 municipalities and partner agencies within Salt Lake County in reducing the costs of natural disasters by providing comprehensive hazards identification, risk assessment, vulnerability analysis, mitigation strategies, and an implementation schedule.

This document reflects elements of the Town of Alta Emergency Operations Plan, regional pre-hazard and emergency management plans and strategies, and mitigation needs and strategies identified in previous hazard mitigation planning exercises. This plan reflects Town of Alta policy as stated in the 2005 Town of Alta General Plan, as well as the Town of Alta, Utah Code.

1.2 Purpose

The purpose of this plan is to enumerate hazards, which could affect the Town of Alta, describe mitigation strategies for each of those hazards, and provide a framework for revision of hazard mitigation strategies. This document was created by Town of Alta staff with significant guidance from Salt Lake County Emergency Management staff, and it is based on guidelines for local hazard mitigation strategies prescribed by the Federal Emergency Management Agency (FEMA). This plan will be submitted alongside similar documents from other municipalities in Salt Lake County to the State of Utah, which will submit all county documents to FEMA. Completing a pre-hazard mitigation plan allows Salt Lake County as well as local jurisdictions to receive financial disaster assistance from the federal government.

1.3 Scope

The Town of Alta Pre-Hazard Mitigation Plan includes identification and assessment of hazards within the Town of Alta's jurisdiction. This document reflects elements of the Town of Alta Emergency Operations Plan, regional pre-hazard and emergency management plans and strategies, and hazard mitigation needs and strategies identified in previous hazard mitigation planning exercises.

2 Community Profile

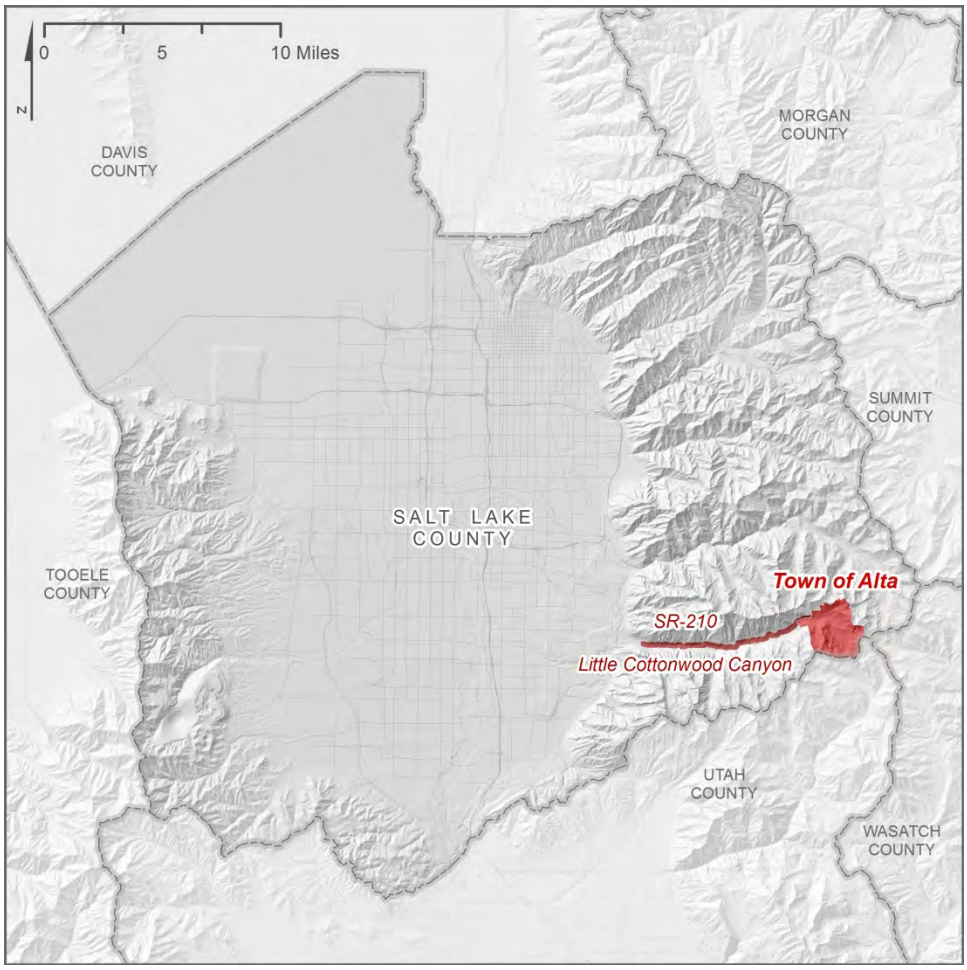


Figure A.1 Town of Alta within Salt Lake County

2.1 Geography and Environment

The Town of Alta is located in the southeastern corner of Salt Lake County, at the top of Little Cottonwood Canyon in the central Wasatch Mountains. The boundaries of this tiny municipality generally traverse the alpine ridgelines at the head of a deep cleft in the Wasatch Front, encompassing 4.1 square miles of rugged mountainous terrain. Alta is most notably home to Alta Ski Area, and much of the land within the Town's jurisdiction is open space used by the ski area for commercial skiing. The western boundary of Alta is directly east of Snowbird Ski and Summer Resort, in unincorporated Salt Lake County. The highest elevation in the Town of Alta is 11,068' atop Mt. Baldy, and the center of town is roughly 8600' above sea level.

Climate in Alta is characterized by a long snowy season between November and May, during which time an annual average of 500" of snowfall is measured at 9600' above sea level. Day-time temperatures during this elongated "winter" season average °__F, and severe storm cycles often persist for several days, featuring heavy snowfall, strong winds, and temperatures near 0°F. Snow cover can linger on upper elevation slopes until August, although the months of June, July, August

and September sometimes feature daytime high temperatures approaching 80°F. Summer weather in Alta is generally sunny and mild, although periods of monsoonal thunderstorm activity are not uncommon.

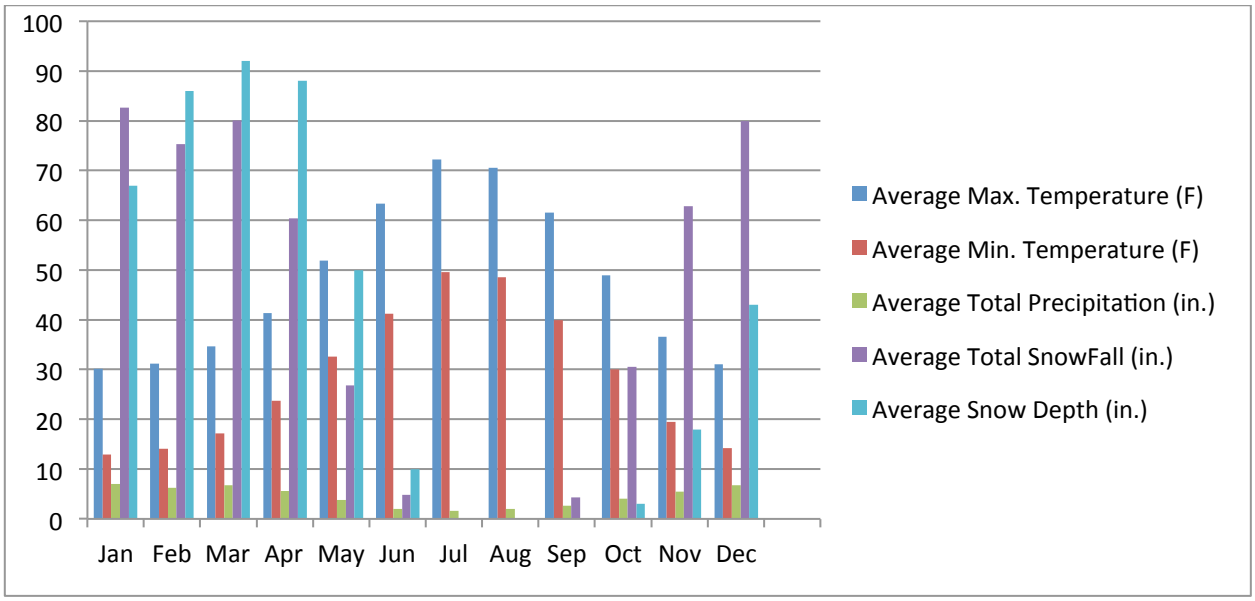


Figure A.2: Town of Alta Temperature, Precipitation, and Snow Depth
Source: "Seasonal Temperature and Precipitation Information". Western Regional Climate Center. Retrieved April 6, 2013.

2.2 Community Facts

Alta is known primarily as a recreation destination, as it is home to Alta Ski Area, one of the world's most iconic winter sports destinations, as well as several privately-owned lodging facilities and several neighborhoods of single-family homes. During a winter season which often lasts from mid-November to early May, deep, natural snow blankets the Town of Alta, turning steep mountain slopes into an economic resource, which supports our local economy and constitutes a major attraction for tourists to visit the State of Utah.

During the non-ski season, many businesses in the Town of Alta close for the summer, making Alta a very quiet place. It is during this season, when snowpack recedes and Alta's vast open landscape bursts with wildflowers, that another important aspect of Alta's identity is perhaps more apparent: Alta encompasses the headwaters of Little Cottonwood Creek, a vital culinary watershed for the burgeoning population of the Salt Lake Valley. Many businesses in the Town of Alta are not open for service during the non-ski season, and dispersed recreation destinations such as hiking trails to Cecret Lake and Catherine's Pass, as well as a United States Forest Service Campground in Albion Basin, are primary attractions for locals of Alta and the Salt Lake Valley, as well as tourists.

The Town of Alta was formally incorporated in 1970, with municipal services developing throughout the 1970's and 1980's. William "Bill" Levitt was mayor of Alta from 1972 to 2006, and today Alta looks much like it did throughout Bill's service as Mayor.

2.3 Population and Demographics

In 2010, the official population for the Town of Alta was 386. During ski season, a few hundred seasonal workers populate employee residences at various businesses throughout Alta, and when the hotels and other lodging business in Alta are at capacity, there may be over one thousand additional persons staying in Alta on a transient basis. Alta Ski Area can host 4500 skiers on a busy day, and can sometimes experience high volumes of summer-time dispersed recreation use, meaning that the number of people present in Alta at any point in time is difficult to estimate, and often far exceeds the official population.

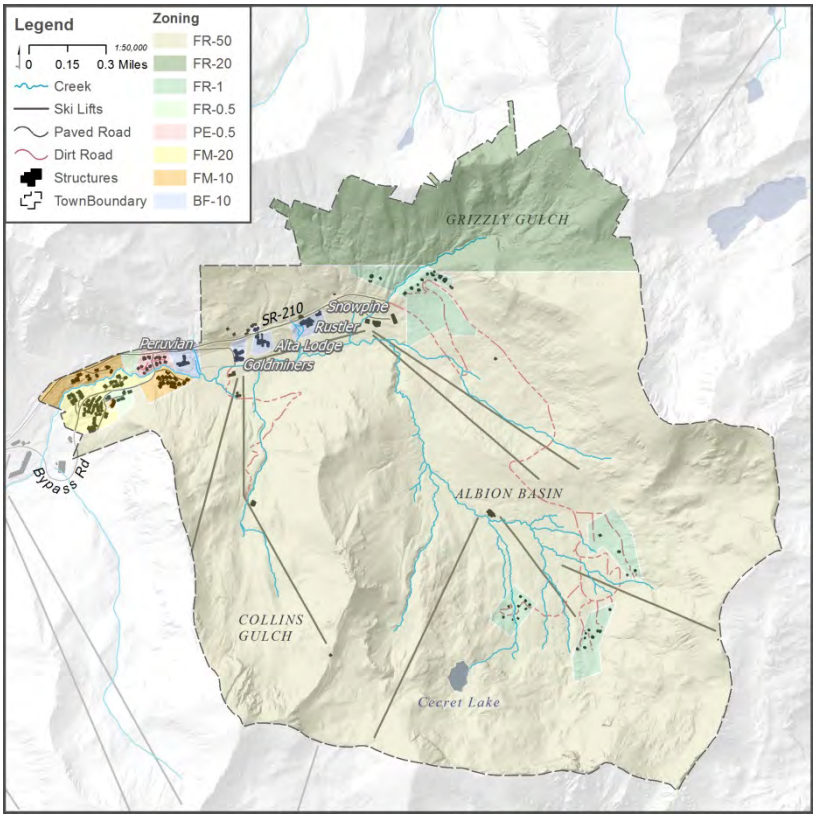


Figure A.3: Town of Alta Zoning

2.4 Land Use and Development

The 2005 Town of Alta General Plan and the official Town of Alta, Utah Code guide Land use and development. The United States Forest Service (USFS) is the primary landowner in Alta, with over 80 percent of land within Alta's boundaries in public ownership, and Alta Ski Lifts Company is the largest private landowner. Recreation and open space is the primary land use designation in Alta, although there are distinct areas of town, primarily along state highway 210, in which commercial and/or residential uses are permitted. There are three distinct clusters of single family homes in upper Albion Basin, although the Town of Alta sewer or water systems do not serve these homes, and they are accessible only by over-snow vehicles during winter.

The Town of Alta supports additional development following our land use ordinances. The only major development currently approved for construction is the 25.16 acre Patsy Marley

subdivision, which holds 10 lots zoned for single family residential use. Under current land use and administrative restrictions, Alta can expect the development of 34 single family homes and roughly 140 additional hotel rooms within existing hotel properties.

It is possible that Alta Ski Area will pursue expansion of its ski area operations by constructing new ski lifts and altering natural terrain features; such development would constitute a significant change to the Alta landscape and land-use characteristics of any associated open space, and it would be required to conform to Town of Alta zoning regulations. The 2005 Town of Alta General Plan states that future development in the Town of Alta should be focused in the "Commercial Core," an area which stretches from the Alta Ski Area Albion Base, near the east end of state highway 210, to the Alta Peruvian Lodge, just west of the Alta Ski Area Wildcat Base.

2.5 Data Sources and Limitations

Town of Alta staff consulted various sources of information in the preparation of this document, including Salt Lake County; the State of Utah; Wasatch Front Regional Council; FEMA; Utah Department of Transportation; US Census Bureau; The 2005 Town of Alta General Plan; Alta, Utah Town Code; Town of Alta GIS resources; the USFS Utah Avalanche Center, and others.
The Town of Alta is a very small municipal organization, with limited financial and human resources to devote to hazard mitigation planning. This document, and the process it represents, reflects collaboration between Town of Alta staff and various Salt Lake County agencies such as SL County Emergency Management and the Unified Fire Authority, as well as input from members of the public. In the case of an emergency or disaster related to the hazards outlined in this document, Alta will rely on assistance from outside response agencies for assistance.

3 Planning Process

3.1 Update Process & Participation Summary

The Town of Alta will await input on this plan from County, State, and Federal emergency Management authorities, and make updates as recommended. As resources become available, the Town will take reasonable measures to implement updated hazard mitigation strategies.

3.2 The Planning Team

This hazard mitigation plan was prepared by Town of Alta Emergency Manager and Assistant Town Administrator Chris Cawley, with significant assistance from Town Marshal Mike Morey, as well as Town Administrator John Guldner. The Town would like to thank Roger Kehr, Salt Lake County Hazard Mitigation Specialist, for his guidance on this matter.

3.3 Meetings and Documentation

This planning process was discussed at public, regular Alta Town Council meetings in August, September, and October 2014. The plan contains hazard assessments and mitigation strategies identified during the Salt Lake County hazard mitigation planning effort that took place between 2007 and 2009, and formally adopted by the Town of Alta as part of the Town of Alta Emergency Operations Plan on July 14, 2011. On September 17th, 2014, a meeting was held to discuss this plan between the Town of Alta Hazard Mitigation Planning Team, Salt Lake County Hazard Mitigation Specialist Roger Kehr, and representatives of Unified Fire Authority Station #113, located at Snowbird Ski and Summer Resort less than one mile from the Town of Alta. A copy of this document is available for review on the Town of Alta website: townofalta.com/about_new.php. Emergency Management-related issues are reported on to the Alta community regularly at monthly Town Council meetings, and in the Town Newsletter.

4 Risk Assessment

4.1 Hazard Analysis Summary

Numerous hazards exist in the Town of Alta, which can cause injury, loss of life, damage to infrastructure, restrict access to and from the community, and impair outside agencies' ability to respond and assist the Town of Alta.

Hazard	Location	Magnitude, Strength	Probability of Future Events	Overall Significance
Avalanche	Extensive	Severe	Highly Likely	High
Dam Failure	Negligible	Weak	Unlikely	Low
Drought	Negligible	Weak	Occasional	Low
Earthquake	Significant	Moderate	Occasional	Moderate
Flood	Limited	Moderate	Unlikely	Moderate
Infestation	Limited	Weak	Likely	Moderate
Landslide	Significant	Moderate	Occasional	Moderate
Pandemic	Limited	Moderate	Unlikely	Low
Problem Soils	Negligible	Weak	Unlikely	Low
Radon	Negligible	Weak	Unlikely	Low
Severe Weather	Significant	Severe	Highly Likely	High
Wildfire	Significant	Severe	Occasional	Moderate

Figure A.4: Town of Alta Hazard Analysis Table

Guidelines for Hazard Rankings

Location (Geographic Area Affected):
Limited—Less than 10% of planning area
Significant—10-50% of planning area
Extensive—50-100% of planning area

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

Probability of Future Events:
Highly Likely—Near 100% probability in next year
Likely—Between 10 and 100% probability in next year or at least one chance in ten years
Occasional—Between 1 and 10% probability in next year or at least one chance in next 100 years

Unlikely—Less than 1% probability in next 100 years

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

4.2 Hazard Identification

4.2.1 Avalanche

Exposure to snow avalanches is the Town of Alta's defining natural hazard. Significant portions of the Town of Alta's commercial core exist in the run-out zone of historic avalanche paths. Furthermore, Alta's only transportation corridor, Utah State Highway 210, carries the highest avalanche hazard-rating index of any major roadway in the country, and it is not uncommon for avalanches to bury the roadway, closing all vehicular access to Alta.

The history of human settlement in upper Little Cottonwood Canyon is rife with stories of destruction by large avalanches. Several times during the period of mining that occurred in Alta during the 19th and early 20th centuries, avalanches wiped out entire villages and mining infrastructure. In the 1940's, Alta was the birthplace of American avalanche science, and it was in Alta that the practice of using explosives to intentionally trigger avalanches—instead of allowing them to release naturally—was first used in the United States.

In 1949, Alta avalanche scientists borrowed a European technique for avalanche hazard mitigation that, although it has been refined significantly in the ensuing years, remains the primary mitigation strategy for the Town of Alta: the use of military-style artillery to fire explosives into avalanche starting zones, for the purpose of triggering avalanches intentionally, rather than allowing them to run unpredictably.

Today, the Town of Alta relies on a partnership between the Utah Department of Transportation Avalanche Safety Program (UDOT), the Alta Ski Lifts Company, Snowbird Ski and Summer Resort, and the Salt Lake County Unified Police Department (UPD) to conduct avalanche hazard mitigation with military artillery. UDOT and the two ski areas are responsible for avalanche hazard forecasting, and when those entities agree that hazard is sufficient for mitigation to take place, the Alta Marshal's Office and UPD enact a closure of highway 210, along with the restriction of "interlodge" travel, meaning that all persons must remain inside a building while hazard mitigation is conducted. Personnel from the ski areas and from UDOT are responsible for firing military artillery at avalanche starting zones, and when a firing mission is completed, public safety officials

often conclude that it is safe for highway traffic and interlodge travel to resume. In some circumstances, such as a hazard mitigation mission conducted during a prolonged storm cycle, interlodge travel restrictions may remain in place even after a mission, until hazard abates, or until another mission is advisable. In some circumstances, UDOT contracts with a local business, Wasatch Powderbird Guides, to provide helicopter-assisted avalanche hazard mitigation services, but this option is only viable when weather conditions allow for the operation of helicopters.

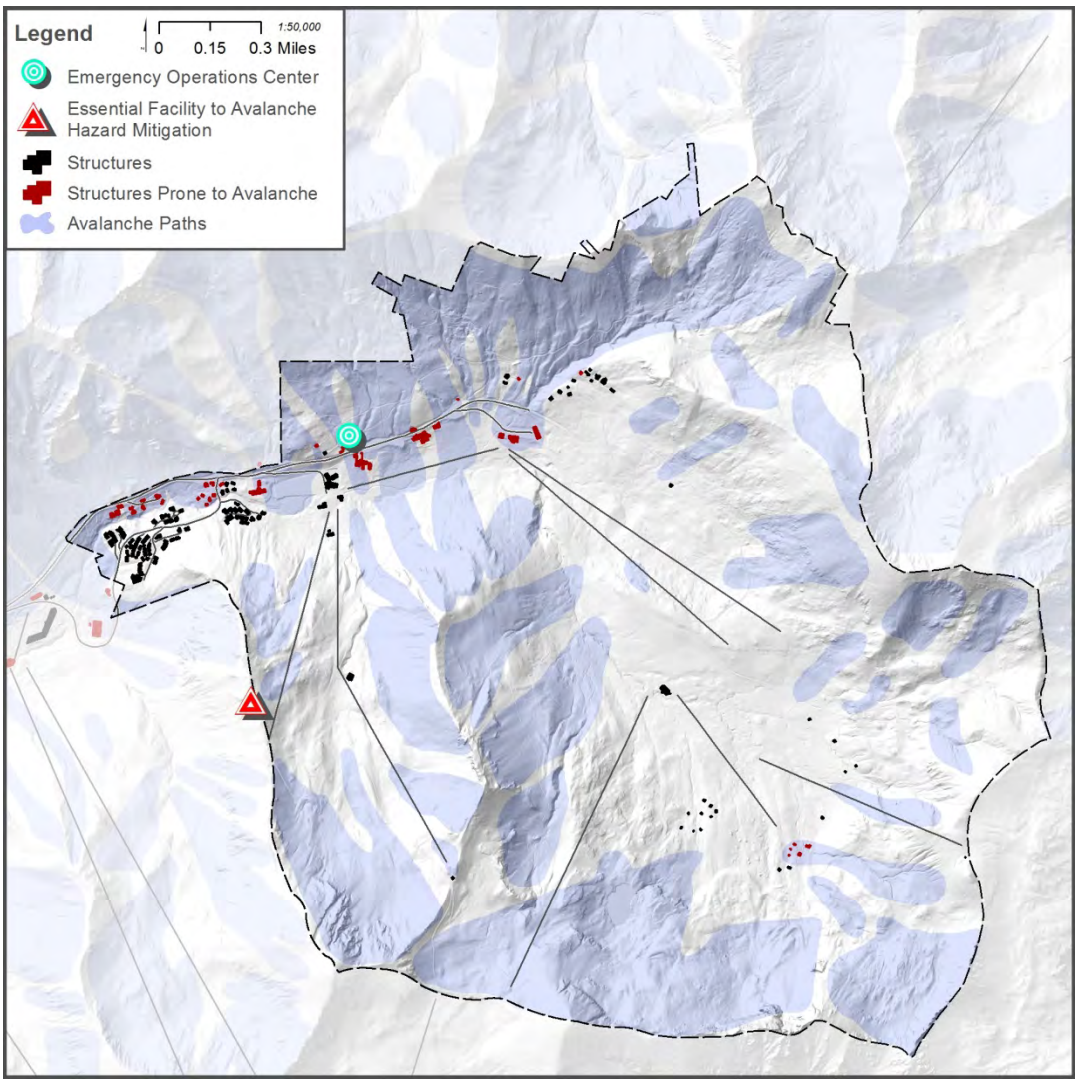


Figure A.5 Avalanche Exposure in the Town of Alta

The last event in which property in the Town of Alta was damaged by an avalanche was in March of 2002, when an avalanche hit the Alta Peruvian Lodge, a hotel on the west end of Town, burying 14 vehicles, removing a fire escape, and inundating lower level hotel rooms with avalanche debris.

4.2.2 Dam Failure

Salt Lake City Public Utilities owns and maintains an earthen embankment dam at the outlet of Cecret Lake, which is the headwaters of Little Cottonwood Creek, in the southeastern portion of the Town of Alta. The Town is in possession of the Utah Division of Water Rights Simplified

Emergency Action Plan for the Cecret Lake Dam, which includes maps showing inundation areas and possible structures affected in any kind of dam failure-related flooding event.

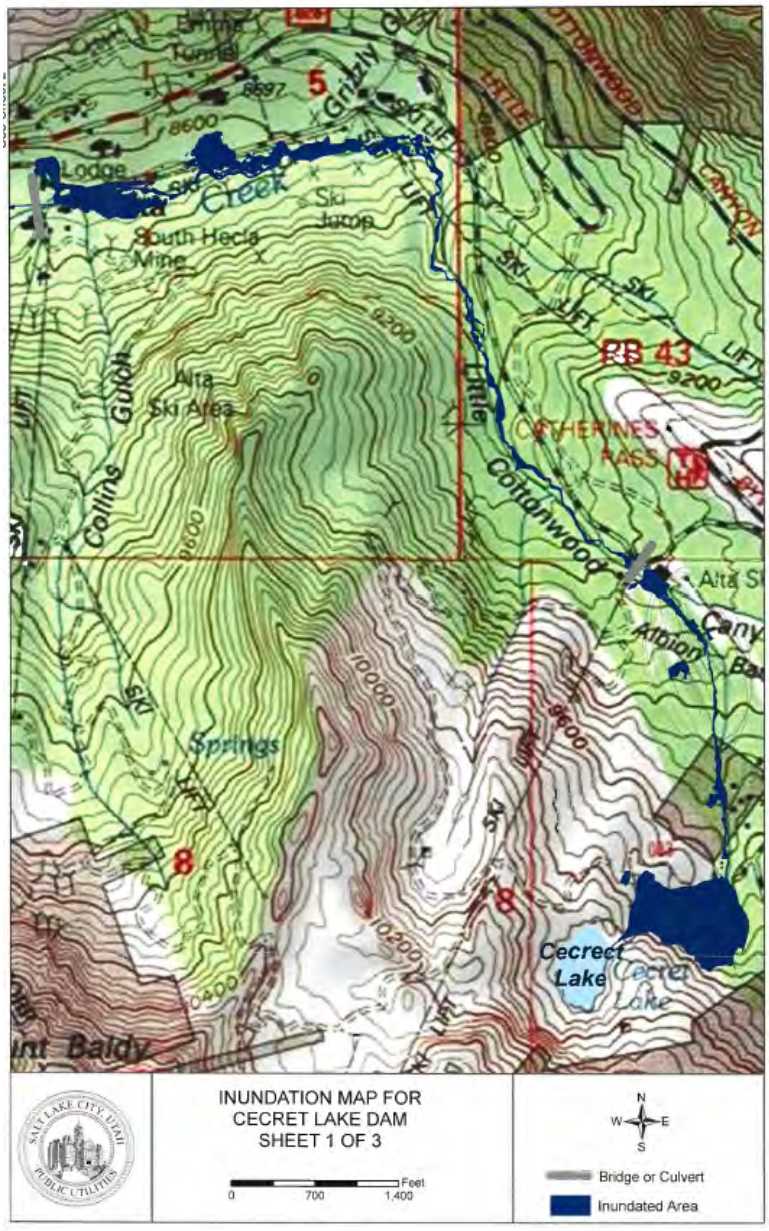


Figure A.6 Cecret Lake Dam Inundation Map

4.2.3 Drought

Alta is a tiny municipality with limited residential or commercial water usage, and thanks to its location at high elevation, near the source of an abundant watershed, Alta's direct susceptibility to drought is fairly low. However, prolonged, year round drought sufficient to limit the quantity of natural snowfall in Alta could have a serious effect on Alta's economy, which depends on cold temperatures and regular snow storms to attract local and destination skiers. Furthermore, as all

of Alta lies within municipal watershed controlled by Salt Lake City, the Town purchases water as part of a surplus water agreement with SLC, which stipulates that the contract may be cancelled for various reasons, including the need for SLC to supply water to its own local customers.

4.2.4 Earthquake

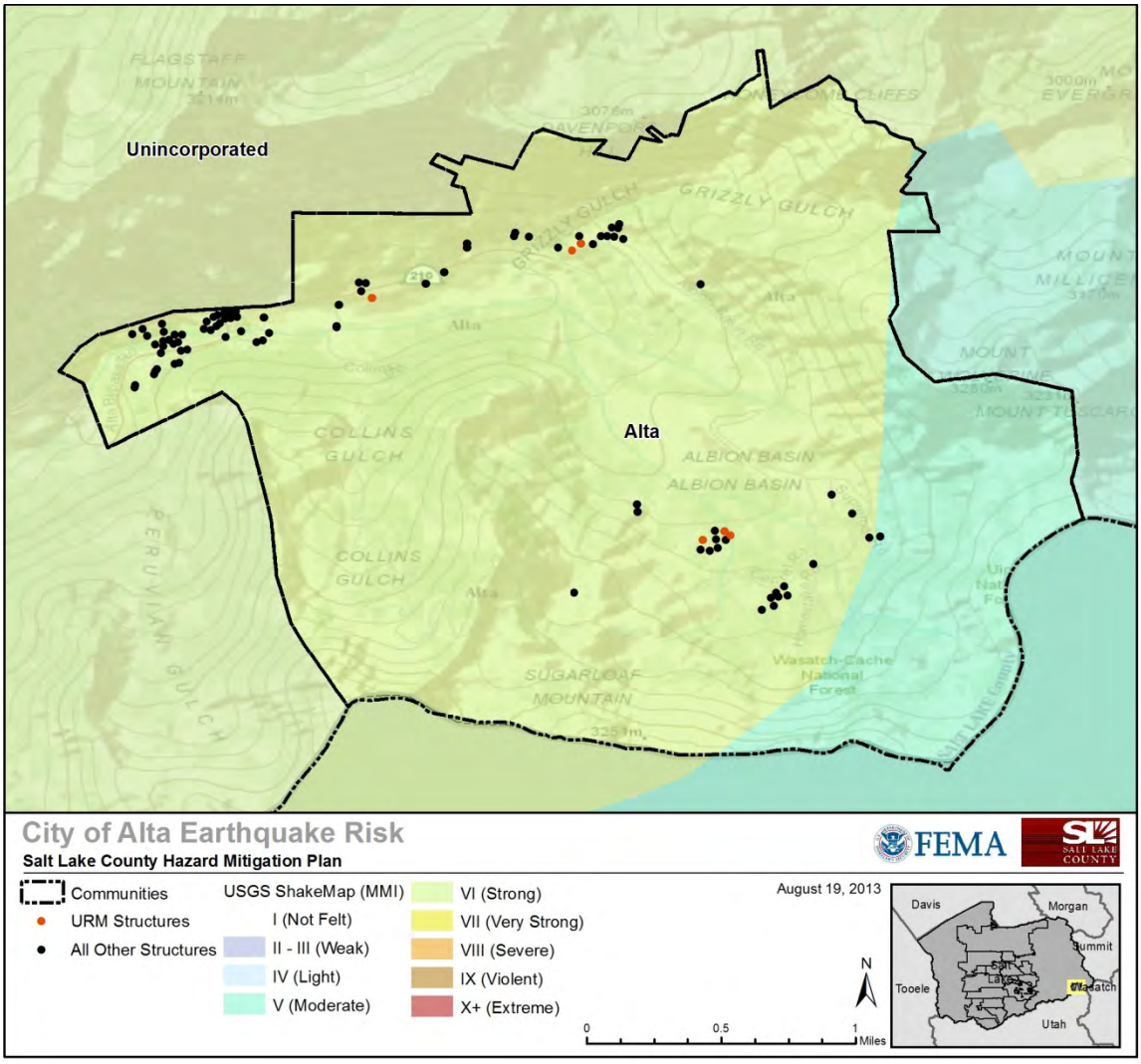


Figure A.7 Town of Alta Earthquake Risk

(earthquakes, cont.) The Wasatch Front urban corridor is considered to be at risk of a major earthquake, with the most likely culprit being the Wasatch Fault, which runs north to south along the foot of the western slope of the Wasatch Mountains. Although a major earthquake originating in the Wasatch Fault would cause significant ground shaking in Alta, information provided by Salt Lake County and the United States Geologic Survey indicates that major earthquakes along the Wasatch Fault or other active regional faults would not be felt as strongly in Alta as in other areas of Salt Lake County (see figure A.2). Soil liquefaction potential has not been mapped rigorously in

the Town of Alta, but it is estimated that liquefaction potential is limited to areas near Little Cottonwood Creek, which are largely undeveloped.

Secondary hazards possibly associated with a major earthquake in Alta are numerous. A major earthquake occurring during a period of high avalanche hazard could trigger numerous destructive avalanches at once. If this were to take place when interlodge travel was not restricted, as it is when avalanche hazard mitigation is being conducted, property damage and loss of life could be severe. A large earthquake could easily trigger landslides that would affect the highway 210 corridor, which is Alta's only point of access for outside emergency response agencies.

4.2.5 Flood

The Town of Alta has a minute area of identified floodplain (see figure A.3), and there is no development permissible in that area due to it being directly adjacent to Little Cottonwood Creek. Nevertheless, minor property damage has occurred during periods of rapid snowmelt, or when small landslides have obstructed drainage culverts along minor tributaries to Little Cottonwood Creek. The unlikely event of a failure of Cecret Lake dam could cause inundation of high recreational use areas as well as a small quantity of structures.

4.2.6 Infestation

Bark beetle infestation has not yet arrived in the Town of Alta to the dramatic extent it has elsewhere in the American West, but Spruce Bark Beetle and Mountain Pine Beetle are both present in Alta trees and tree stands. Several native conifer species in Alta are susceptible to beetle infestation, and a large scale infestation could dramatically diminish the scenic value of Alta's forests, and cause them to be more susceptible to wildfire.

4.2.7 Landslide/Problem Soils

Steep mountain slopes surround the Town of Alta, and this topography lends itself to the phenomenon of downslope movement of earthen material. Rock falls and topples are downslope movements of loosened blocks or boulders from a bedrock area. These generally occur along steep canyons with cliffs, deeply incised stream channels in bedrock, and steep bedrock road cuts**.** Areas of the Town of Alta in which very steep slopes or cliffs abut inhabited structures or high use recreation areas include Alta Ski Area and the Hellgate Cliffs, which loom above a condominium development along highway 210 at the western extent of town.

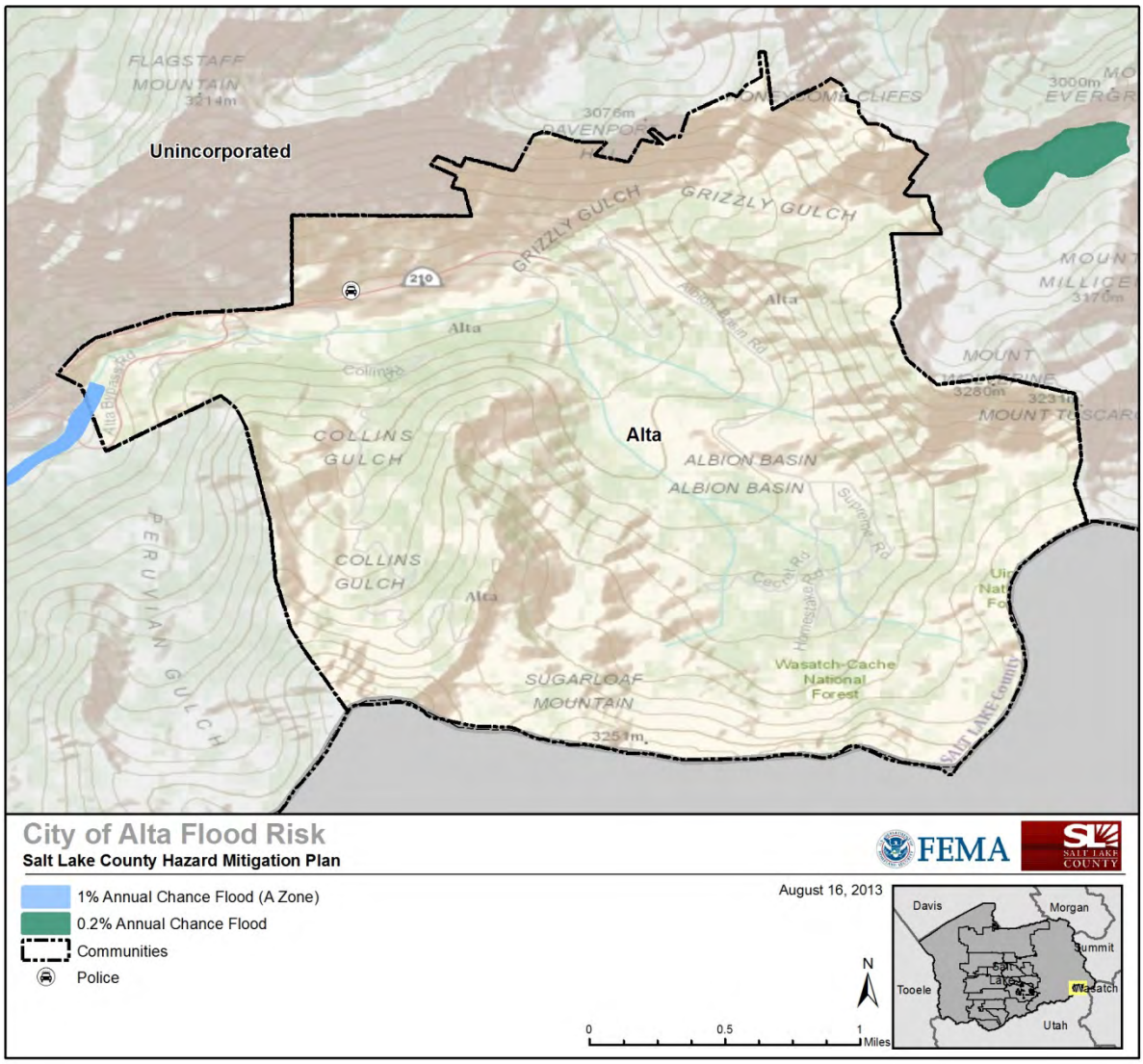
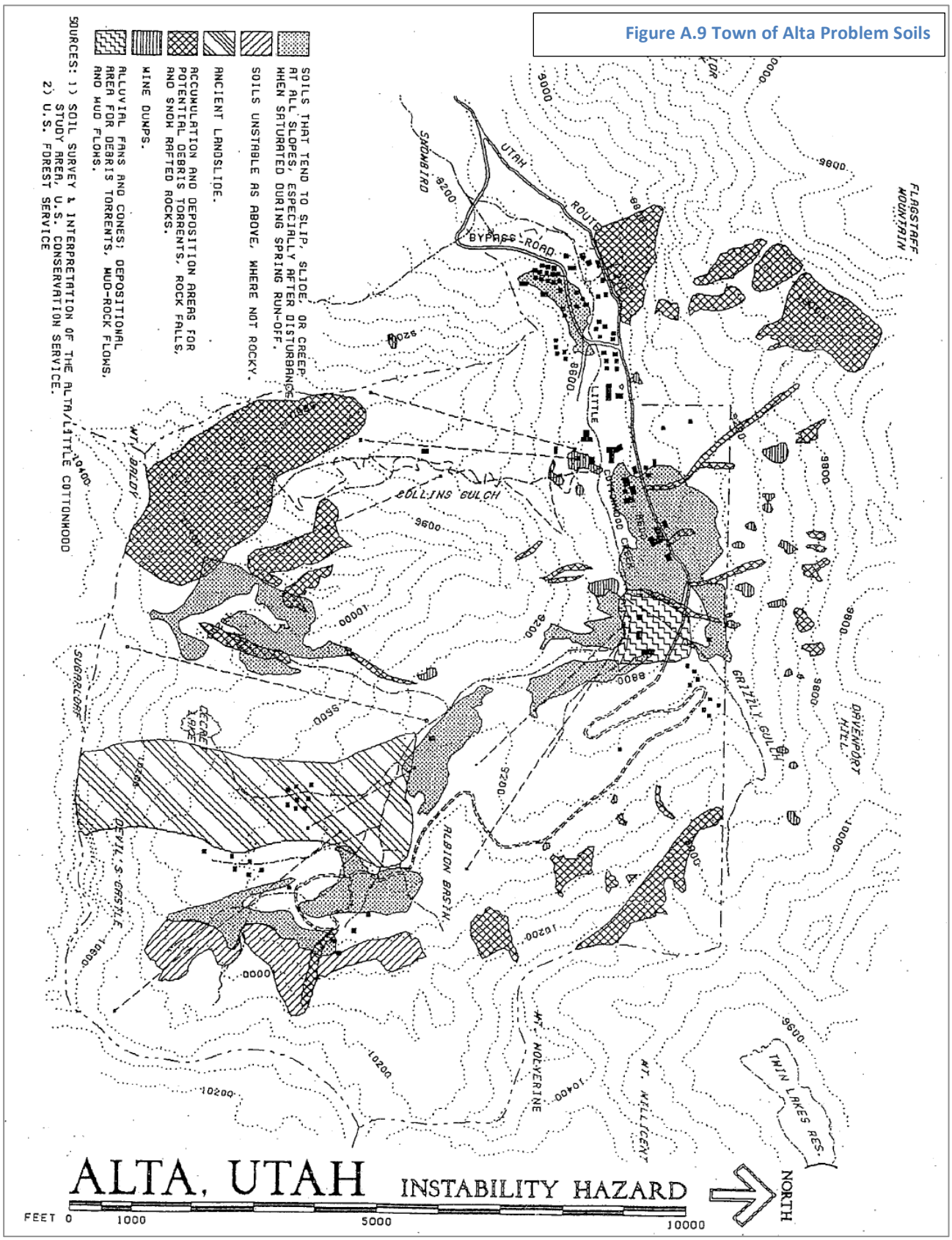


Figure A.8 Town of Alta Flood Risk

(landslides/problem soils, cont.) Debris slides and flows occur in steep mountainous areas and involve the relatively rapid, viscous flow of coarse-grained soil, rock, vegetation and other surface materials. Debris flows contain more water than slides and are potentially more dangerous because they can form quickly, move at high speeds, and travel long distances. Debris flows generally remain in stream channels but can flow out from canyon mouths for a considerable distance. Such incidents frequently cause significant damage to highway 210, Alta's only transportation corridor, and in some cases debris flows in drainages adjacent to the highway have caused the road to be closed to vehicular traffic. See figure A.4 for the location of problem soils which may lead to landslide.

Figure A.9 Town of Alta Problem Soils



4.2.8 Pandemic

On a regular basis, potentially catastrophic public health issues are raised in the mainstream media and there is a possibility of a regional or national pandemic arriving in Alta, where visiting guests arrive from around the world and may have been exposed to contagious conditions elsewhere. The Town of Alta has not made formal plans for response to an outbreak of infectious disease, but if an outbreak were to occur, the Town will work with outside agencies to communicate essential information and acquire assistance. The Town of Alta has limited medical capabilities, with a small, seasonal, private clinic and a regional fire authority outpost providing the only local response capabilities, so as in many other cases, resources for quarantine or evacuation will have to come from elsewhere.

4.2.9 Radon

The Town of Alta has not identified areas in which exposure to radon gas is likely, and current information from outside agencies indicating regional radon prevalence do not provide specific information regarding Alta's likely radon gas exposure. However, regional geologic conditions are consistent with the likely presence of radon gas, and many households in Salt Lake County have tested positive for high levels of radon gas.

4.2.10 Severe Weather

The most common severe weather events in Alta are significant winter storms, which often result in periods of elevated avalanche hazard. Alta is world-renowned as a place where winter storms deposit enormous snow totals, and those storms are often accompanied by sustained winds near hurricane-force, with gusts over 100 mph. Although many Alta skiers prefer to be skiing during a major snow storm, sometimes weather is so severe that ski lifts cannot run, and when avalanche hazard becomes too high as a result of heavy snow and high wind, the ski area closes operations and the public is required by the Town of Alta Marshal to remain indoors until avalanche hazard is mitigated. The Alta landscape is often transformed by massive winter storms, with rows of parked cars and even unattended structures occasionally completely entombed in snow.

Severe winter storms often result in hazardous roadway conditions on the steep, winding, narrow highway 210, and when road surface conditions deteriorate at the end of a busy day at Alta and Snowbird, traffic accidents can cause epic backups. When such backups take place during times of escalating avalanche hazard, the possibility that natural avalanches will affect the roadway and potentially bury vehicles and their occupants can be a critical situation. The Town of Alta supports past, currently ongoing, and future studies of alternative transportation solutions and roadway improvement strategies, in the interest of reducing possible roadway avalanche incidents, and in reducing the need to close highway 210 to perform avalanche hazard mitigation.

Alta is also susceptible to non-winter weather events, such as rain, hail, and lightning storms. Significant rain events can cause landslides in ravines and stream channels which can damage highway 210, and which have occasionally caused property damage in the Town of Alta. Because of Alta's high elevation, extreme heat is not considered a likely hazard.

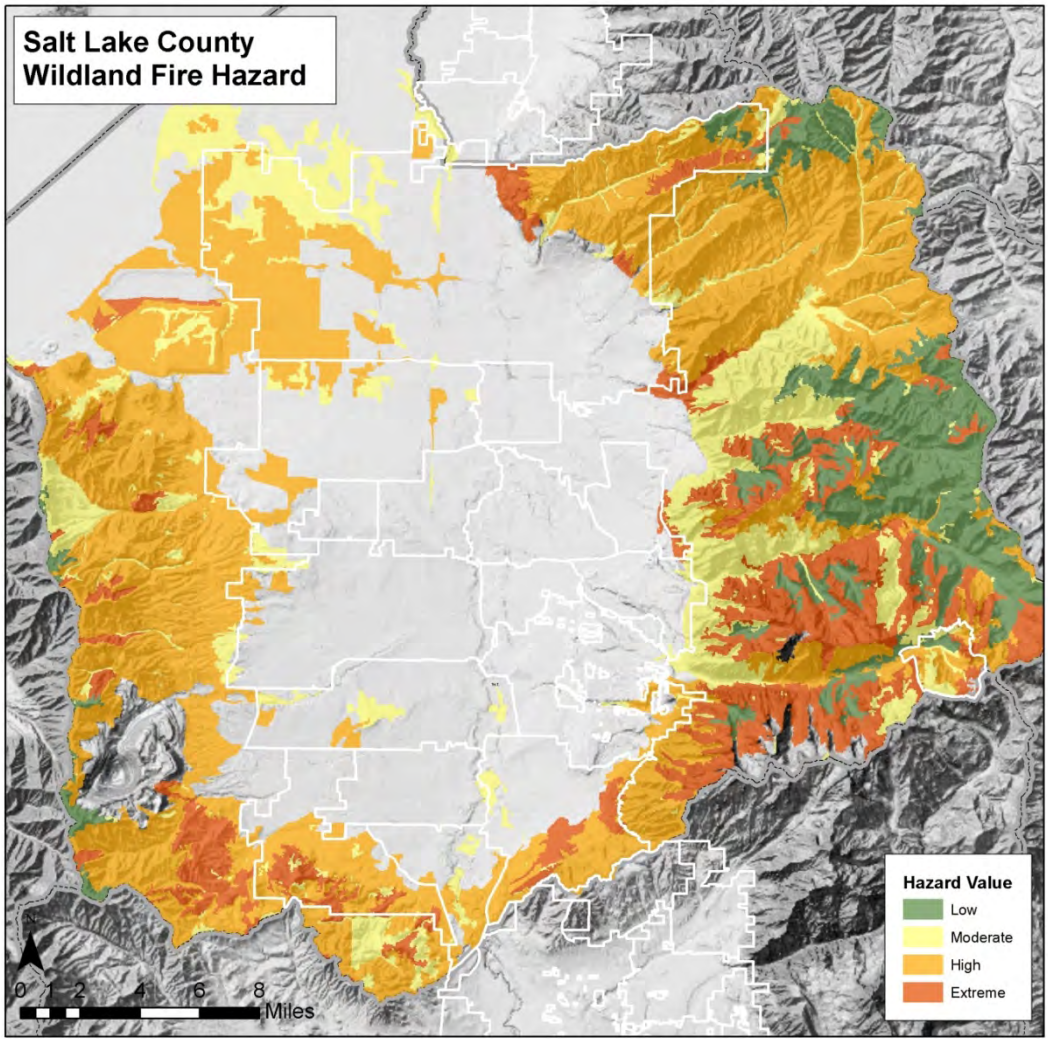


Figure A.10 Salt Lake County Wildland Development Areas

4.2.11 Wildfire

The Town of Alta has not experienced significant wildfire in its modern history, although in 1878 a large wildfire destroyed the historic mining village that existed near the current Alta Ski Area Albion Base. Typically, relatively cool summer temperatures and abundant soil moisture remnant from deep winter snowpack prevents critical wildfire conditions from developing in Alta. However, significant private property exists within forested areas of the Town, and in a prolonged, severe drought, wildfire could potentially affect significant private property in the Town of Alta. Additionally, the loss of forested acreage within Alta Ski Area would constitute a significant economic loss to the Town of Alta, as ski operations could be compromised.

5 Vulnerability Assessment

This vulnerability assessment analyzes the population, property, and other assets at risk to hazards.

5.1 Assets at Risk

This section considers The Town of Alta's assets at risk, including values at risk, critical facilities and infrastructure, economic assets, and growth and development trends.

Town of Alta	Real Property Value	Personal Property Value	Central Assessed Value	Total
TOTAL VALUE	$280,496,992	$13,687,415	$297,148,915	$3,866,169,907

Figure A.12 Town of Alta Total Property Value, Tax Year 2014

Values at Risk

Figure A.12 shows the 2014 assessed property value data from the State of Utah and the Salt Lake County Assessor for the Town of Alta. Assets directly owned and controlled by the Town include office and utility facilities, totaling $4,740,883.

Critical Facilities and Infrastructure

A critical facility may be defined as one that is essential in providing utility or direction either during the response to an emergency or during the recovery operation. *The only critical facility located in the designated Town of Alta Emergency Operations Center, in the Town of Alta is the Town of Alta Office Building, located at 10201 East Highway 210.* **Essential facilities** are those that if damaged would have devastating impacts on disaster response and recovery. **High potential loss facilities** are those that would have a high loss or impact on the community. While transportation and lifeline facilities are formally considered high potential loss facilities, the status of highway 210 as the Town of Alta's only transportation corridor elevates it the status of an essential facility.

Name of Facility	Address	City	Facility Status
Town of Alta Offices (EOC)	10201 E. Highway 210	Alta	Critical
Alta Central-Marshal's Office & Dispatch Center	10221 E. Highway 210	Alta	Essential
Utah State Highway 210	Little Cottonwood Canyon, Salt Lake County	Sandy, Alta, SLCo	Essential
Bay City Tunnel-Town of Alta Water System	10481 E. Highway 210	Alta	Essential
Peruvian Ridge Artillery Installation—property of Alta Ski Lifts Company & UDOT	Upper Collins Gulch—GPS coordinates N 40° 34.767, W 111° 38.566	Alta	Essential

Figure A.13 Important Emergency Response and Hazard Mitigation Facilities

5.2 Regulatory Mitigation Capabilities

Figure A.9 details regulatory mitigation capabilities, including planning and land management tools typically used by local jurisdictions to implement hazard mitigation activities. The *2005 Town of Alta General* Plan contains significant elements related to mitigation of the effects of local hazards; please see sections 3.3, 3.4, 3.10, 3.12. Due to Alta's location in a high alpine drainage, where extreme topography and climate are elements of daily life, local planning will always prioritize hazard mitigation.

Regulatory Tool	Yes/No	Comments
General plan	Yes	Adopted 2005
Zoning ordinance	Yes	
Subdivision ordinance	Yes	
Site plan review requirements	Yes	
Floodplain ordinance	Yes	
Other special purpose ordinance	Yes	Avalanche hazard design and site review
Building code	Yes	
Fire department ISO rating	Yes	
Erosion or sediment control program	Yes	
Stormwater management program	No	
Capital improvements plan	No	
Economic development plan	Yes	
Local emergency operations plan	Yes	Adopted 2011
Flood Insurance Study or other study for streams	Yes	

Figure A.14 Regulatory Mitigation Capabilities

5.3 Administrative Mitigation Capabilities

The Town of Alta maintains a fulltime administrative staff of five individuals. These positions include: Town Manager, Assistant Town Administrator, Town Clerk, Assistant Town Clerk, and Town Marshal. The Assistant Town Administrator is the Town's designated Emergency Manager, and hazard mitigation planning efforts are led from that position. Like many aspects of municipal operations in Alta, limited human and financial resources are available for hazard mitigation planning activities, and the Town of Alta depends heavily on outside agencies for communication, information, technical assistance, and ultimately for response assistance in any cases of large-scale emergency.

Significant staff and funding limitations have prevented Town of Alta staff from conducting rigorous assessments of vulnerability to individual hazards. The values contained in the following assessments are all derived from Salt Lake County Assessor's Office website information regarding 2014 assessed property values. Staff has prioritized assessment of vulnerability to specific hazards.

5.4 Hazard-Specific Vulnerability

5.4.1 Avalanche

Figure A.5 indicates the debris run-out areas that affect the Town of Alta, and it indicates which structures in Alta are vulnerable to avalanches. The "Avalanche Path" graphic included in A.5 illustrates the maximum observed extent of avalanche debris flows, meaning that, since observations of avalanche activity in Alta have been recorded, avalanche debris has reached the extent thus indicated on at least one occasion. Of the structures indicated in those areas, 23 are single family homes or condominium structures, ranging in assessed value from under $.5 million to over $3.5 million. There are 5 hotel properties exposed to avalanche hazard in Alta, ranging in assessed value from less than $1 million to over $6.5 million. There are four government facilities in Alta, ranging in value from $119,000 to $683,000. There are three significant Alta Ski Area facilities located at the Albion Base Area in historic avalanche run-out areas each worth over $1 million, and there are four other structures of mixed commercial and residential use extent in historic avalanche run-outs, although these structures are each worth less than $.5 million in assessed value.

5.4.2 Earthquake

According to a Salt Lake County Emergency Management vulnerability assessment conducted in 2013, there are 9 unreinforced masonry buildings in the Town of Alta. All but one of these buildings are single family homes or seasonal cabins. Assessed values of these properties vary wildly, from less than $100,000 to $1.2 million. There is a small portion of one of Alta's hotel properties comprising original portions of that structure which is built of unreinforced masonry, but an estimate for the value of that portion of the structure is not available.

5.4.3 Wildfire

Nearly all of Alta's 101 residential properties exist in Wildland Development Areas and could be susceptible to loss from wildfire. There are 101 residential properties in the Town of Alta, although many of those are part of contiguous condominium structures. The assessed value of these properties ranges from less than $100,000 to $3.7 million. Alta's hotel properties are generally removed from contiguous areas and are considered unlikely to be susceptible to total loss from wildfire. Ski area facilities are present in areas of contiguous forest, and values of those structures range from roughly $500,000 to over $3 million.

5.4.4 Dam Failure

Utah Division of Water Rights Simplified Emergency Action Plan for the Cecret Lake Dam indicates that a total of 43 structures exist in the inundation area estimated for a sudden, catastrophic failure of Cecret Lake Dam. However, this inundation area extends well downstream of the Town of Alta boundaries into unincorporated Salt Lake County, and a review of the inundation area map (A.6) indicates there are only 2 structures within the Town of Alta which exist in that inundation

area. One of these structures is a hotel property with $2.7 million in assessed structural value, and the other is an Alta Ski Area facility worth less than $1 million. The Cecret Lake Dam inundation area is not considered a threat to Highway 210. Loss from general flood risk is not anticipated to be significant as there is very limited identified floodplain in Alta, and there is no development within it.

5.4.5 Severe Weather

Although severe winter weather is a significant concern in Alta, but as it is a nearly constant element of daily life in Alta for much of the year, structures and other material assets are not considered vulnerable to those conditions, as maintenance of those structures is performed to standards sufficient to withstand severe weather.

5.4.6 Flood

As stated in 5.4.4, the Town of Alta contains a very small area of identified floodplain, and currently there is no development in that area. However, the Town of Alta does participate in the National Flood Insurance Program (NFIP) because of the identification of floodplain within Town boundaries. There are no repetitive loss properties located in the Town of Alta.

The City's Assistant City manager oversees enforcement of floodplain management requirements adopted by the City but as previously stated there is no development in that area.

6 Mitigation Strategies

6.1 Mitigation Strategies—Alta

The planning team for the Town of Alta identified and prioritized the following mitigation actions based on hazard identification and risk assessment. Additional mitigation actions will be added in the future as needed. Background information and information on how each action will be implemented and administered, such as details regarding implementation, potential funding, estimated cost, and timeline are also included.

6.1.1 Avalanche:

Support Current Avalanche Hazard Mitigation Interagency Partnerships

Issue/Background: The Alta community has relied on a partnership of agencies to conduct avalanche hazard forecasting, mitigation, and related public safety enforcement strategies since long before the Town of Alta's formal incorporation in 1970. Currently, UDOT, Alta Ski Area, and Snowbird Ski and Summer Resort conduct forecasting and mitigation activities, while the Alta

Marshal's Office and the Salt Lake County Unified Police Department communicate information about interlodge travel restrictions, and enforce penalties for violation of those restrictions.
Alternatives: It is assumed that current avalanche hazard mitigation techniques, which depend almost solely on the use of military artillery for the purposes of protecting highway 210 and the Town of Alta Commercial Core, will not be available indefinitely. UDOT has studied a range of options for alternative avalanche control techniques on slopes affecting the Town of Alta, including:

- Establishment of lift-served skiing on open slopes on the north side of Little Cottonwood Canyon in the Town of Alta.
- Installation of Gaz-ex remote detonation devices, 9 of which are currently in place on Mt. Superior above the Snowbird Village, outside of the Town of Alta boundaries. Gaz-ex devices cost roughly $200,000 each for materials and installation, and a large number of individual devices would be required to provide the same level of hazard mitigation currently provided by artillery.
- Installation of snow fences in avalanche path starting zones above the Town of Alta. Many of the paths that affect the Town of Alta originate uphill and outside of the Town of Alta boundaries.

Priority: High
Cost: Staff time for communications and enforcement of interlodge travel restrictions.
Funding: Town of Alta General Fund
Benefits: Protection from loss of life and property is inestimable.

6.1.2 Dam Failure:

Coordinate with Salt Lake City Public Utilities maintenance to and inspection of Cecret Lake Dam

Issue/Background: The Cecret Lake Dam is owned by Salt Lake City Corporation, which conducts regular maintenance inspections and work projects. Salt Lake City is a critical partner to the Town of Alta in management of various watershed issues in Alta and Little Cottonwood Canyon.
Alternatives: No Action
Priority: Medium
Cost: No cost to the Town of Alta
Funding: Salt Lake City Public Utilities
Benefits: Cecret Lake is one of numerous artificially dammed water sources in the Wasatch Mountains maintained by SLC Public Utilities as important water resources for a large metropolitan area. The benefits of maintenance to the Cecret Lake Dam are of inestimable value.

6.1.3 Drought:

Enforce Salt Lake City Regulations Regarding Outdoor Water Use Limitations in Watershed Areas

Issue/Background: All of the Town of Alta is protected watershed controlled by Salt Lake City. As such, outdoor use of water for irrigation is restricted such that only irrigation of recently re-vegetated areas is allowed.
Alternatives: No Action

Priority: Medium
Cost: No cost to the Town of Alta
Funding: N/A
Benefits: Alta carries significant responsibility to protect the vital culinary watershed within its boundaries. Mitigation of the effects of likely future regional drought conditions will rely on strict enforcement of watershed regulations and water use efficiency measures.

6.1.4 Earthquake:

Continue Utah Shakeout Activities to Promote Earthquake Awareness

Issue/Background: The Town of Alta has participated in Utah Shakeout activities on an annual basis, although staffing shortages prevented participation in 2014. Utah Shakeout is a valuable opportunity to raise awareness of best practices for earthquake hazard mitigation, institutionalize earthquake response protocols, and practice communication strategies. This event also allows the Town to practice activating its Emergency Operation Center.
Alternatives: no action
Priority: High
Cost: Staff time
Funding: General Fund
Benefits: Utah Shakeout is a valuable opportunity to raise awareness of best practices for earthquake hazard mitigation, and to institutionalize earthquake response.

6.1.5 Flood:

Continue Participation in the National Flood Insurance Program. Floodplain management in the Town of Alta is accomplished through ordinances restricting development near streams, and all of Alta's floodplain is along Little Cottonwood Creek in a single isolated area; please see figure A.8 to view the location and extent of the Town's identified floodplain.

Issue/Background: Property owners in the Town of Alta are eligible to purchase flood insurance through the National Flood Insurance Program.
Alternatives: No action
Priority: Low
Cost: According to *www.floodsmart.gov*, the average flood insurance policy costs $650 per year.
Funding: Property ownership
Benefits: Flood Risk in Alta is minimal, although runoff from rapid spring snowmelt can occasionally inundate structures.

6.1.6 Infestation:

Coordinate with Alta Ski Lifts Company, USFS, and Other Agencies to Monitor and Manage Beetle Infestation

Issue/Background: Spruce Bark Beetle and Mountain Pine Beetle have ravaged western forests, although as of 2014, large scale infestation has yet to impact the central Wasatch Mountains. The Alta Environmental Center, a department of Alta Ski Lifts company, works closely with the USFS to monitor forest health within the Alta Ski Area special use permit boundary, which contains a significant portion of the Town of Alta. Alta Ski Lifts employees harvest infected trees strategically and employ other measures of deterring infestation by problem species.
Alternatives: No action
Priority: Medium
Cost: No cost to the Town of Alta
Funding: Alta Ski Lifts Company, USFS
Benefits: Alta's forest health is paramount to its attraction as a scenic destination, and to its resistance to wildfire. Alta's entire economy depends on the attractiveness of its natural landscape, and large-scale die-off of the forest canopy would be a significant loss.

6.1.7 Pandemic:

Support Current Salt Lake Valley and State of Utah Health Department Pandemic Response Plans

Issue/Background: Alta is an international destination on the margins of a large metropolitan area in which millions of people interact on a daily basis. The potential for infectious disease to affect the Town of Alta is significant.
Alternatives: No Action
Priority: Low
Cost: No cost to the Town of Alta
Funding: N/A
Benefits: As in many scenarios, Alta's potential to respond to regional pandemic will hinge on support from outside agencies. Communicating with those agencies and implementing their procedures is vital to the Town of Alta.

6.1.8 Landslide/Problem Soils:

Enforce Alta Building Codes and Land Use Regulations Regarding Slope Requirements, Erosion Control, Revegetation and Drainage

Issue/Background: For the purpose of avoiding watershed and other environmental impacts related to land use and development, the Town of Alta General Plan and Town Code includes regulations preventing development on slope over %30, and enforcing best practices regarding erosion control, Revegetation, and drainage.
Alternatives: No action
Priority: High
Cost: Staff time
Funding: General fund
Benefits: The health of the culinary watershed that surrounds Alta is vital to the wellbeing of a large and growing metropolitan area. Any efforts to reduce the likelihood that development will

lead to landslides or problem soil events, which could compromise stream channel integrity, are widely beneficial.

6.1.9 Radon:

Collaborate with Salt Lake County Health Department to Educate Property Owners about Radon Detection and Mitigation Opportunities

Issue/Background: The Town of Alta has not formally adopted code or policy regarding radon detection and mitigation. The Town will coordinate with local health officials to establish communication strategies for radon awareness and mitigation options.
Alternatives: No action
Priority: Low
Cost: Staff Time
Funding: General Fund
Benefits: Modest

6.1.10 Severe Weather:

Coordinate with Local Authorities through the Little Cottonwood Canyon Road Committee to address public safety issues and communication strategies regarding weather related roadway issues

Issue/Background: In 1999, the Town of Alta established the Little Cottonwood Canyon Road Committee, a broad coalition of entities responsible for highway 210, the Town of Alta's only transportation corridor. A significant aspect of the Alta Marshal's Office Public Safety operation is the monitoring and management of hazardous weather conditions throughout the Town and along highway 210, but the success of the Alta Marshal's Office efforts in this regard depends significantly on collaboration with outside entities.
Alternatives: no action
Priority: High
Cost: Significant staff time
Funding: General fund
Benefits: Alta's winter economy depends on excellent preparedness and response to hazardous weather conditions.

6.1.11 Wildfire:

Work with Unified Fire Authority Station #113 and with local residents to establish Firewise Communities program

Issue/Background: Firewise Communities is a program sponsored by the USFS, the US Department of Interior, and the National Association of State Foresters, which helps communities work across property lines to minimize collective risk of wildfire in areas along the urban/wildland interface.

Firewise Communities participation provides communities access to grant funding for wildfire safety and fuel mitigation.
Alternatives: No action
Priority: High
Cost: Staff time
Funding: General fund
Benefits: Firewise Communities participation not only helps communities implement their own mitigation strategies; it provides communities access to grant funding for wildfire safety and fuel mitigation. Firewise Communities has been broadly adopted by other Salt Lake County and regional communities.

6.2 Actions Taken Based on 2009 Wasatch Front All-Hazards Mitigation Plan

2009 Mitigation Strategies Progress & Summary

The following mitigation strategies were formulated by the Salt Lake County Mitigation Strategies Working Group for inclusion in the 2009 *Wasatch Front Region Natural Hazard Pre-Disaster Mitigation Plan*. The following summary highlights the Town of Alta's implementation of those goals where applicable and practical as part of the Town's overall mitigation planning efforts and general operations, and it describes the extent to which the Town has been able to integrate data, information and hazard mitigation goals into broader planning practice.
Please note that the Town of Alta is a very small municipality with a limited general fund budget and a four-person administrative staff; as such, the Town relies heavily on cooperation with local governments and other public and private agencies to carry out hazard mitigation activities.

Category	Goal / Objective	Action	Status	Comments
All Hazards	1 – Improve and maintain communications capabilities for emergency operations 1.1 – Improve communication capabilities	1 – Conduct an inventory and assessment of communications equipment and systems and identify needs	Complete	
All Hazards	1 – Improve and maintain communications capabilities for emergency operations 1.1 – Improve communication capabilities	2 – Conduct Training and awareness activities on communication equipment, tools, and systems	Complete	
All Hazards	1 – Improve and maintain communications capabilities for emergency operations 1.1 – Improve communication capabilities	3 – Establish agreements to share communications equipment between agencies involved in emergency operations	Complete	

Category	Goal / Objective	Action	Status	Comments
All Hazards	1 – Improve and maintain communications capabilities for emergency operations 1.1 – Improve communication capabilities	4 – Establish notification capabilities and procedures for emergency personnel	Complete	
All Hazards	1 – Improve and maintain communications capabilities for emergency operations 1.2 – Maintain communications capabilities for critical facilities	1 – Evaluate vulnerability of critical communications systems	Complete	
All Hazards	1 – Improve and maintain communications capabilities for emergency operations 1.2 – Maintain communications capabilities for critical facilities	2 – Establish redundancy for dispatch centers and other critical communications	Complete	
All Hazards	1 – Improve and maintain communications capabilities for emergency operations 1.3 – Conduct communications Strategic Planning	1 – Establish a coordinating group to address long-term communication needs and implementation strategies	Complete	
All Hazards	1 – Improve and maintain communications capabilities for emergency operations 1.3 – Conduct communications Strategic Planning	2 – Acquire, upgrade, and/or integrate communications equipment and systems as determined by coordinating group	Ongoing	The Town of Alta makes necessary communications upgrades as needs arise and budget/other funding sources allow
All Hazards	2 – Improve awareness and analysis of hazards 2.1 – Improved Quality and Access to digital geographic (GIS) hazards data	1 – Establish a coordinating group to address geographic data issues	Incomplete	Staff time and financial resources for GIS are limited in the Town of Alta.
All Hazards	2 – Improve awareness and analysis of hazards 2.1 – Improved Quality and Access to digital geographic (GIS) hazards data	2 – Examine current data availability and sharing capabilities, evaluate needs, and identify shortcomings	Incomplete	See above
All Hazards	2 – Improve awareness and analysis of hazards 2.1 – Improved Quality and Access to digital geographic (GIS) hazards data	3 – Update and expand data on hazards, critical facilities, and critical infrastructure according to assessed needs	Incomplete	See above

Category	Goal / Objective	Action	Status	Comments
All Hazards	2 – Improve awareness and analysis of hazards 2.1 – Improved Quality and Access to digital geographic (GIS) hazards data	4 – Provide centralized access to geographic data to emergency planners and responders	Incomplete	See above
All Hazards	2 – Improve awareness and analysis of hazards 2.2 – Improve and expand hazard monitoring capabilities	1 – Integrate existing hazard monitoring networks in emergency operations centers. Utilize sensors such as weather stations, stream gages, seismograph stations, road conditions, etc.	Ongoing	Installation of fiber optic cable along SR210 in summer 2014 will increase options for the Town to implement remote weather and roadway conditions monitoring equipment along SR210 and through the Town.
All Hazards	2 – Improve awareness and analysis of hazards 2.2 – Improve and expand hazard monitoring capabilities	2 – Identify and implement additional hazard monitoring capabilities.	Ongoing	See above
All Hazards	3 – Ensure critical facilities can sustain operations for emergency response and recovery 3.1 – Prevent damage to critical facilities and infrastructure	1 – Utilize GIS to identify facilities and infrastructure at risk	Complete	
All Hazards	3 – Ensure critical facilities can sustain operations for emergency response and recovery 3.1 – Prevent damage to critical facilities and infrastructure	2 – Assess critical facilities for hazard exposure, structural weaknesses, power, communications and equipment resources and redundancy, and adequate emergency procedures	Complete	
All Hazards	3 – Ensure critical facilities can sustain operations for emergency response and recovery 3.1 – Prevent damage to critical facilities and infrastructure	3 – Implement improvements to address identified in assessment	Incomplete	Staff time and financial resources are extremely limited in the Town of Alta.
All Hazards	4 – Improve response capabilities through mutual-aid agreements 4.1 – Utilize mutual-aid agreements in accordance with National Incident Management System (NIMS) requirements	1 – Compile inventory of mutual-aid agreements and memoranda of understanding (MOU) and identify deficiencies	Ongoing	The Town works closely with SLCo UPD and UFA to maintain current mutual aid agreements

Category	Goal / Objective	Action	Status	Comments
All Hazards	4 – Improve response capabilities through mutual-aid agreements 4.1 – Utilize mutual-aid agreements in accordance with National Incident Management System (NIMS) requirements	2 – Pursue and implement needed mutual-aid agreements	Ongoing	See above
All Hazards	5 – Increase citizen safety through improved hazard awareness 5.1 – establish a comprehensive public education program	1 – Provide education regarding all natural hazards through live trainings, as well as web-based, print and broadcast media	Incomplete	Staff time and financial resources are extremely limited in the Town of Alta.
All Hazards	5 – Increase citizen safety through improved hazard awareness 5.1 – Establish a comprehensive public education program	2 – Incorporate information about cascading effects of hazards in education programs	Incomplete	See above
All Hazards	5 – Increase citizen safety through improved hazard awareness 5.1 – Establish a comprehensive public education program	3 – Develop education programs to target specific groups including homeowners, developers, schools and people with special needs	Incomplete	See above
All Hazards	5 – Increase citizen safety through improved hazard awareness 5.1 – Establish a comprehensive public education program	4 – Utilize maps and similar products on County EM website and other media to educate public on areas at risk to hazards	Incomplete	See above
All Hazards	5 – Increase citizen safety through improved hazard awareness 5.1 – Establish a comprehensive public education program	5 – Coordinate with existing public education programs such as the American Red Cross, Utah Living with Fire, be Ready Utah, the National Weather Service, etc.	Ongoing	Town staff is planning a "shake-out" activity for 2015, pursing neighborhood "Firewise" programs, and works constantly with other agencies responsible for avalanche hazard mitigation to forecast avalanche hazard and execute communication regarding avalanche hazard mitigation activities and related public safety issues.
All Hazards	6 – Improve public safety through preventative regulations 6.1 – Minimize hazard impacts through the adoption of appropriate prevention measures	1 – Establish and enforce appropriate planning, zoning, and building code ordinances	Complete	

Category	Goal / Objective	Action	Status	Comments
All Hazards	6 – Improve public safety through preventative regulations 6.1 – Minimize hazard impacts through the adoption of appropriate prevention measures	2 – Ensure current hazard ordinances are available for viewing online	Complete	
Dam Failure	1 – Include dam failure inundation in future County and City planning efforts 1.1 – Review current State dam safety information on all identified high hazard dams in the County	1 – Include dam inundation maps in current County, City and Special Service District Emergency Operations Plans	Complete	
Dam Failure	1 – Include dam failure inundation in future County and City planning efforts 1.1 – Review current State dam safety information on all identified high hazard dams in the County	2 – Utilize inundation maps to identify potential evacuation areas and routes	Complete	
Drought	1 – Reduce and prevent hardships associated with water shortages 1.1 – Limit unnecessary consumption of water throughout the County	1 – Continue to encourage water conservation utilizing and promoting outreach material from all water districts in the County	Ongoing	Water conservation will always be prioritized as planning and ordinance review continues in Alta.
Drought	1 – Reduce and prevent hardships associated with water shortages 1.1 – Limit unnecessary consumption of water throughout the County	2 – Emergency Managers will coordinate with local water districts/public utilities to support ongoing conservation efforts	Ongoing	See above
Drought	1 – Reduce and prevent hardships associated with water shortages 1.1 – Limit unnecessary consumption of water throughout the County	3 – Investigate feasibility of implementing an incentive program to encourage the use of low-flow appliances and fixtures in homes and businesses	Incomplete	See above
Drought	1 – Reduce and prevent hardships associated with water shortages 1.1 – Limit unnecessary consumption of water throughout the County	4 – Implement water-saving devices and practices in public facilities	Complete	
Drought	1 – Reduce and prevent hardships associated with water shortages 1.1 – Limit unnecessary consumption of water throughout the County	5 – Repair, maintain and improve water distribution infrastructure to prevent loss from leakage, breaks, etc.	Ongoing	The Town contracts with Salt Lake County staff for maintenance of its water system.

Category	Goal / Objective	Action	Status	Comments
Drought	1 – Reduce and prevent hardships associated with water shortages 1.1 – Limit unnecessary consumption of water throughout the County	6 – Coordinate public safety water use, such as hydrant testing	Complete	
Drought	1 – Reduce and prevent hardships associated with water shortages 1.1 – Limit unnecessary consumption of water throughout the County	7 – Provide information on landscaping alternatives for persons subject to green area requirements	N/A	
Drought	1 – Reduce and prevent hardships associated with water shortages 1.2 – Address agricultural water shortages in the County	1 – Set up livestock water rotation in areas of agricultural use	N/A	
Drought	1 – Reduce and prevent hardships associated with water shortages 1.3 – Encourage development of secondary water systems	1 – Coordinate with water districts to plan for, develop and/or expand secondary water	Incomplete	Such a system has been evaluated in the Town of Alta but it was deemed to be not cost effective.
Earthquake	1 – Reduce earthquakes losses to infrastructure 1.1 – Encourage retrofit and rehabilitation of highly susceptible infrastructure	1 – Identify structures at risk to earthquake damage	Incomplete	Insufficient staff time and financial resources
Earthquake	1 – Reduce earthquakes losses to infrastructure 1.1 – Encourage retrofit and rehabilitation of highly susceptible infrastructure	2 – Research feasibility of an incentive program for retrofitting privately-owned buildings, particularly unreinforced masonry	Incomplete	See above
Earthquake	1 – Reduce earthquakes losses to infrastructure 1.1 – Encourage retrofit and rehabilitation of highly susceptible infrastructure	3 – Complete seismic rehabilitation/retrofitting projects of public buildings at risk	Incomplete	See above
Earthquake	1 – Reduce earthquakes losses to infrastructure 1.2 – Improve public education regarding earthquake risks to unreinforced masonry buildings	1 – Provide educational materials to unreinforced masonry home and business owners	Incomplete	See above

Category	Goal / Objective	Action	Status	Comments
Earthquake	1 – Reduce earthquakes losses to infrastructure 1.3 – Improve Seismic Hazard understanding and seismic resistance of CUWCD Red Butte Dam in Salt Lake County.	1 – Procure Engineering Consultant to perform the nonstructural design and geotechnical assessment and review.	Incomplete	Not applicable to local jurisdictions.
Flooding	1 – Protection of life and property before, during and after a flooding event 1.1 – Provide 100% availability of the National Flood Insurance Program	1 – Assist Cities with NFIP application	Complete	
Flooding	1 – Protection of life and property before, during and after a flooding event 1.1 – Provide 100% availability of the National Flood Insurance Program	2 – Encourage Communities to actively participate in NFIP	Complete	
Flooding	1 – Protection of life and property before, during and after a flooding event 1.2 – Encourage appropriate flood control measures, particularly in new developments	1 – Determine potential flood impacts and identify areas in need of additional flood control structures	Complete	
Flooding	1 – Protection of life and property before, during and after a flooding event 1.2 – Encourage appropriate flood control measures, particularly in new developments	2 – Address identified problems through construction of debris basins, flood retention ponds, energy dissipaters or other flood control structures	Ongoing	The Town of Alta works with other local service providers to identify drainage culverts in need of maintenance and repair.
Flooding	1 – Protection of life and property before, during and after a flooding event 1.3 – Provide maintenance, repairs and improvements to drainage structures, storm water systems and flood control structures	1 – Establish maintenance and repair programs to remove debris, improve resistance and otherwise maintain effectiveness of storm water and flood control systems	Ongoing	See above
Flooding	2 – Reduce threat of unstable or inadequate flood control structures 2.1 – Reduce potential for failure of flood control structures	1 – Identify and assess structures for deficiencies	Ongoing	See above
Flooding	2 – Reduce threat of unstable or inadequate flood control structures 2.1 – Reduce potential for failure of flood control structures	2 – Modify structures as needed to address deficiencies	Ongoing	See above

Category	Goal / Objective	Action	Status	Comments
Severe Weather	1 – Reduce threat of loss of life or property due to extreme weather events 1.1 – Maintain status as a StormReady Community	1 – Maintain Hazardous Weather Operations Plan according to StormReady requirements	Incomplete	The Town has not incorporated StormReady specifications; however, severe weather is an aspect of daily life in Alta, and much of Alta Public Safety Operations revolves around monitoring and managing roadway conditions during winter storms
Severe Weather	1 – Reduce threat of loss of life or property due to extreme weather events 1.1 – Maintain status as a StormReady Community	2 – Maintain Contact with NWS prior to re-application in 2010	Complete	
Severe Weather	1 – Reduce threat of loss of life or property due to extreme weather events 1.2 – Increase awareness of information services provided by NWS	1 – Meet with NWS representative on an annual basis to receive information on new services and alerts available	Complete	
Severe Weather	1 – Reduce threat of loss of life or property due to extreme weather events 1.2 – Increase awareness of information services provided by NWS	2 – Assist NWS in making other agencies and departments aware of available resources	Complete	
Severe Weather	1 – Reduce threat of loss of life or property due to extreme weather events 1.3 – Encourage safe practices in avalanche prone areas	1 – Assist Forest Service Utah Avalanche Forecast Center and other organizations in promoting avalanche hazard awareness for backcountry users	Ongoing	Next to severe weather, avalanche hazard is our most prevalent natural hazard in the Town of Alta. Promoting public safety and reducing exposure to avalanche hazard is one of our foremost challenges.. Alta does not publicize UAC forecasts, but much of our winter-season public safety program hinges on UDOT Avalanche Safety forecasts and necessary access closures relating to the UDOT program.

Category	Goal / Objective	Action	Status	Comments
Severe Weather	1 – Reduce threat of loss of life or property due to extreme weather events 1.4 – Examine the vulnerability of patrons at large event venues to extreme weather events	1 – Work with NWS to develop large event venue weather safety and evacuation procedures	N/A	
Slope Failure	1 – Reduce or eliminate the threat of slope failure damage 1.1 – Reduce the threat of slope failures following wildfires	1 – Develop protocol for working with State and Federal agencies in reducing the impact of post-fire debris flow hazard	Incomplete	Insufficient staff time and financial resources
Slope Failure	1 – Reduce or eliminate the threat of slope failure damage 1.2 – Monitor historic landslide areas	1 – Coordinate with the Utah Geological Survey and other agencies to understand current slope failure threats/potential	Ongoing	Building official consults with UGS as needed
Slope Failure	1 – Reduce or eliminate the threat of slope failure damage 1.3 – Address landslide hazards in new sub-divisions	1 – Utilize recommendations provided by the State Geological Hazards Working Group to address land-use and planning for new developments	Ongoing	See above
Wildland Fire	1 – Community education on wildfire hazard 1.1 – Reduce risk from wildfire through education programs	1 – Increase public awareness through “Firewise” program	Incomplete	Staff has identified a “Fire Wise” program as an appropriate mitigation strategy in the 2014 Town of Alta Hazard Mitigation Plan. Staff will pursue implementation as time and resources allow.
Wildland Fire	1 – Community education on wildfire hazard 1.1 – Reduce risk from wildfire through education programs	2 – Educate homeowners on the need to create defensible space near structures in WUI	Incomplete	See above
Wildland Fire	2 – Improve safety from wildfire hazards through planning, protective actions and improved fire response capabilities 2.1 – Assist homeowners with creating defensible space near structures in WUI areas	1 – Designate and promote county-wide annual initiative for clearing fuels	Incomplete	See above

Category	Goal / Objective	Action	Status	Comments
Wildland Fire	2 – Improve safety from wildfire hazards through planning, protective actions and improved fire response capabilities 2.1 – Assist homeowners with creating defensible space near structures in WUI areas	2 – Provide waste removal, such as chipping of green waste by public works, following designated fuel clearing day/week	Incomplete	Insufficient staff time and financial resources
Wildland Fire	2 – Improve safety from wildfire hazards through planning, protective actions and improved fire response capabilities 2.2 – Improve evacuation capabilities for WUI areas	1 – Work with experts and communities to develop or update evacuation plans	Ongoing	Local evacuation plans hinge on whether or not SR210 is operable; plans for major transportation improvements will dictate future changes in our evac plans.
Wildland Fire	2 – Improve safety from wildfire hazards through planning, protective actions and improved fire response capabilities 2.2 – Improve evacuation capabilities for WUI areas	2 – Evaluate transportation network and address needed improvements to facilitate evacuation and emergency response	Ongoing	See above
Wildland Fire	2 – Improve safety from wildfire hazards through planning, protective actions and improved fire response capabilities 2.3 – Improve addressing system in WUI areas to facilitate emergency response	1 – Identify all facilities, businesses, and residences, particularly in the canyons, and assign addresses according to current county addressing standards	Incomplete	Insufficient staff time and financial resources
Wildland Fire	2 – Improve safety from wildfire hazards through planning, protective actions and improved fire response capabilities 2.3 – Improve addressing system in WUI areas to facilitate emergency response	2 – Incorporate improved addresses in fire-dispatch and other databases	Incomplete	Insufficient staff time and financial resources
Wildland Fire	2 – Improve safety from wildfire hazards through planning, protective actions and improved fire response capabilities 2.4 – Complete wildfire protection projects	1 – Reduce fuels around publically owned structures	Incomplete	Insufficient staff time; imminent conveyance of land on which Town of Alta public structures exist from USFS to Town of Alta will simplify fuel management around Town facilities

Category	Goal / Objective	Action	Status	Comments
Wildland Fire	2 – Improve safety from wildfire hazards through planning, protective actions and improved fire response capabilities 2.4 – Complete wildfire protection projects	2 – Implement fire breaks and other protective measures	Incomplete	Insufficient staff time and financial resources
Wildland Fire	2 – Improve safety from wildfire hazards through planning, protective actions and improved fire response capabilities 2.4 – Complete wildfire protection projects	3 – Assess existing water flow capabilities, both public and private, and address deficiencies	Complete	
Wildland Fire	2 – Improve safety from wildfire hazards through planning, protective actions and improved fire response capabilities 2.4 – Complete wildfire protection projects	4 – Assist communities in developing Community Wildfire Protection Plans or similar plans	Incomplete	Insufficient staff time and financial resources
Wildland Fire	2 – Improve safety from wildfire hazards through planning, protective actions and improved fire response capabilities 2.5 – Encourage proper development practices in the WUI	1 – Adopt the Utah Wildland-Urban Interface Code	Incomplete	Insufficient staff time and financial resources
Wildland Fire	2 – Improve safety from wildfire hazards through planning, protective actions and improved fire response capabilities 2.5 – Encourage proper development practices in the WUI	2 – Define wildland-urban interface and develop digital maps of the WUI	Incomplete	Insufficient staff time and financial resources

7 Plan Implementation & Maintenance

7.1 Implementation

Mitigation is most successful when it is incorporated into the day-to-day functions and priorities of government and development.

Integration of data, information, and mitigation goals and action plans

Alta will integrate mitigation strategies into its building codes, the planning commission, and the actions of the City Council and other relevant agencies by education by the Emergency Manager during daily, weekly, and monthly city and public meetings.

7.2 Maintenance Schedule

Periodic monitoring and updates of this plan are required to ensure that goals and objectives for the city are current and that local mitigation strategies are being carried out. This portion of the plan outlines the procedures for completing revisions and updates. The plan will be revised following emergencies or disasters related to hazards identified in this document or other hazards.

Annual Review Procedures

The Town of Alta will be responsible to annually review the mitigation strategies described in this Plan, as required by the Utah Division of Emergency Management (UDEM), or as situations dictate such as following a disaster declaration. Progress toward the completion of the strategies will be assessed and revised as warranted. The Town of Alta Emergency Manager will be primarily responsible for maintenance to this plan.

Five Year Plan Review

This hazard mitigation plan shall be revised and updated as needed every five years by the Town of Alta. Increased development, increased exposure to certain hazards, the development of new mitigation capabilities or techniques and changes to Federal or State legislation will all be considered in regular review and maintenance of this document.

7.3 Maintenance Evaluation Process

It will be the responsibility of the designated Emergency Manager, City Manager, Mayor and Town Council Members to assure hazard mitigation plan maintenance efforts are carried out according to internal and extra-jurisdictional timelines, unless reasonable circumstances prevent their implementation (i.e. lack of funding availability).

Funding Sources

Although a fundamental aspect of hazard mitigation planning is the avoidance of costs associated with natural disasters or other emergencies, implementing new hazard mitigation solutions could require sources of funding much greater than general Town of Alta revenue sources provide. The Town of Alta shall seek outside funding assistance for mitigation projects in both pre-disaster and post-disaster environments, subject to budget constraints and the availability of staff resources.

Federal Programs

The following federal grant programs have been identified as funding sources which specifically target hazard mitigation projects:

Title: Pre-Disaster Mitigation Program
Agency: Federal Emergency Management Agency

Through the Disaster Mitigation Act of 2000, Congress approved the creation of a national program to provide a funding mechanism that is not dependent on a Presidential Disaster Declaration. The Pre-Disaster Mitigation (PDM) program provides funding to states and communities for cost-effective hazard mitigation activities that complement a comprehensive mitigation program and reduce injuries, loss of life, and damage and destruction of property.
This funding is based upon a 75% federal share and 25% non-federal share. The non-federal match can be fully in-kind or cash, or a combination. Special accommodations will be made for "small and impoverished communities", who will be eligible for a 90% federal /10% non-federal arrangement. FEMA provides PDM grants to states that, in turn, can provide sub-grants to local governments for accomplishing the following eligible mitigation activities:

- State and local Natural Hazard Pre-Disaster Mitigation Planning
- Technical assistance (e.g. risk assessments, project development)
- Mitigation Projects
- Acquisition or relocation of vulnerable properties
- Hazard retrofits
- Minor structural hazard control or protection projects
- Community outreach and education (up to 10% of State allocation)

Title: Hazard Mitigation Grant Program
Agency: Federal Emergency Management Agency

The Hazard Mitigation Grant Program (HMGP) was created in November 1988 through Section 404 of the Robert T. Stafford Disaster Relief and Emergency Assistant Act. The HMGP assists states and local communities in implementing long-term mitigation measures following a Presidential disaster declaration.
To meet these objectives, FEMA can fund up to 75% of the eligible costs of each project. The state or local cost-share match does not need to be cash; in-kind services or materials may also be used. With the passage of the Hazard Mitigation and Relocation Assistance Act of 1993, federal funding under the HMGP is now based on 15% of the federal funds spent on the Public and Individual Assistance programs (minus administrative expenses) for each disaster.

The HMGP can be used to fund projects to protect either public or private property, so long as the projects in question fit within the state and local governments overall mitigation strategy for the disaster area, and comply with program guidelines. Examples of projects that may be funded include the acquisition or relocation of structures from hazard-prone areas, the retrofitting of existing structures to protect them from future damages; and the development of state or local standards designed to protect buildings from future damages.
Eligibility for funding under the HMGP is limited to state and local governments, certain private nonprofit organizations or institutions that serve a public function, Indian tribes and authorized tribal organizations. These organizations must apply for HMPG project funding on behalf of their

citizens. In turn, applicants must work through their state, since the state is responsible for setting priorities for funding and administering the program.

Title: Public Assistance (Infrastructure) Program, Section 406
Agency: Federal Emergency Management Agency

FEMA's Public Assistance Program, through Section 406 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act, provides funding to local governments following a Presidential Disaster Declaration for mitigation measures in conjunction with the repair of damaged public facilities and infrastructure.
The mitigation measures must be related to eligible disaster related damages and must directly reduce the potential for future, similar disaster damages to the eligible facility. These opportunities usually present themselves during the repair/replacement efforts.
Proposed projects must be approved by FEMA prior to funding. They will be evaluated for cost effectiveness, technical feasibility and compliance with statutory, regulatory and executive order requirements. In addition, the evaluation must ensure that the mitigation measures do not negatively impact a facility's operation or risk from another hazard.
Public facilities are operated by state and local governments, Indian tribes or authorized tribal organizations and include:

- Roads, bridges & culverts
- Draining & irrigation channels
- Schools, city halls & other buildings
- Water, power & sanitary systems
- Airports & parks

Private nonprofit organizations are groups that own or operate facilities that provide services otherwise performed by a government agency and include, but are not limited to the following:

- Universities and other schools
- Hospitals & clinics
- Volunteer fire & ambulance
- Power cooperatives & other utilities
- Custodial care & retirement facilities
- Museums & community centers

Title: Small Business Administration (SBA) Disaster Assistance Program
Agency: U.S. SBA

The SBA Disaster Assistance Program provides low-interest loans to businesses following a Presidential disaster declaration. The loans target businesses to repair or replace uninsured disaster damages to property owned by the business, including real estate, machinery and equipment, inventory and supplies. Businesses of any size are eligible, along with non-profit organizations.

SBA loans can be utilized by their recipients to incorporate mitigation techniques into the repair and restoration of their business.

Title: Community Development Block Grants
Agency: US Department of Housing and Urban Development

The Community Development Block Grant (CDBG) program provides grants to local governments for community and economic development projects that primarily benefit low- and moderate-income people. The CDBG program also provides grants for post-disaster hazard mitigation and recovery following a Presidential disaster declaration.
Funds can be used for activities such as acquisition, rehabilitation or reconstruction of damaged properties and facilities and for the redevelopment of disaster areas.

State Programs

Local

Local governments depend upon local property taxes as their primary source of revenues, and the Town of Alta depends heavily on a resort community sales tax. These taxes are typically used to finance services that must be available and delivered on a routine and regular basis to the general public. If local budgets allow, these funds can be used to match Federal or State grant programs when required for large-scale projects.

Non-Governmental

Another potential source of revenue for implementing local mitigation projects are monetary contributions from non-governmental organizations, such as private sector companies, churches, charities, community relief funds, the American Red Cross, hospitals, land trusts and other non-profit organizations.

7.5 Continued Public Involvement

As this hazard mitigation plan is reviewed by county, state, and federal agencies, it will be reported on at regular public meetings and in Town of Alta newsletter publications.

Participation

The public is encouraged to participate in this planning process. All hearings, forums, and meetings in which this plan is discussed will be adequately publicized. Citizens, public jurisdictions, agencies and other interested parties will have the opportunity to receive information and submit comments on any aspect of this plan.
Hearings and meeting concerning the plan will be conveniently timed for people who might benefit most from mitigation programs. Hearings and meeting will be accessible to people with disabilities (accommodations must be requested in advance according to previously established policy).
Hearings and meeting will be adequately publicized. Hearings and meetings may be held for a number of purposes or functions including to: Identify and profile hazards, develop mitigation strategies, and review plan goals, performance and future plans.

Future Revisions

Future revisions of the Hazard Mitigation Plan shall include:

- Expanded vulnerability assessments to include specific property loss estimates given possible events
- Continue the search for more specific mitigation actions.
- An analysis of progress of the Plan as it is revised.
- Expanded look into how the identified natural hazards will affect certain populations including the young and elderly.

Implementation and maintenance of the plan is critical to the overall success of hazard mitigation planning.

8 Hazard Mitigation Plan Adoption

It is the intent of the Town of Alta that this Hazard Mitigation Plan will be adopted by Town Council resolution after it is approved by the State of Utah and FEMA, which approval should be within five years of the previous Salt Lake County Hazard Mitigation Plan's approval date. The Town of Alta will maintain a record of the official adoption of this plan, and of any amendments to the plan.

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CITY OF BLUFFDALE, UTAH
RESOLUTION NO. 2015-13

A RESOLUTION OF THE BLUFFDALE CITY COUNCIL ADOPTING A HAZARD MITIGATION PLAN.

WHEREAS several hazards, whether natural or man-made, exist and have a potential influence on the citizens and residents of the City of Bluffdale ("City");

WHEREAS the City desires to adopt a Hazard Mitigation Plan to guide future decisions regarding hazards, mitigation, and future responses;

NOW, THEREFORE, BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF BLUFFDALE:

Section 1. **Adoption of Hazard Mitigation Plan.** The City Council hereby adopts the attached Bluffdale City Hazard Mitigation Plan as an official City policy.

Section 2. **Effective Date.** This Resolution shall become effective immediately upon its passage and authorizes and directs the Mayor to execute and cause to be delivered the same.

PASSED, ADOPTED AND APPROVED this 25th day of February, 2015.

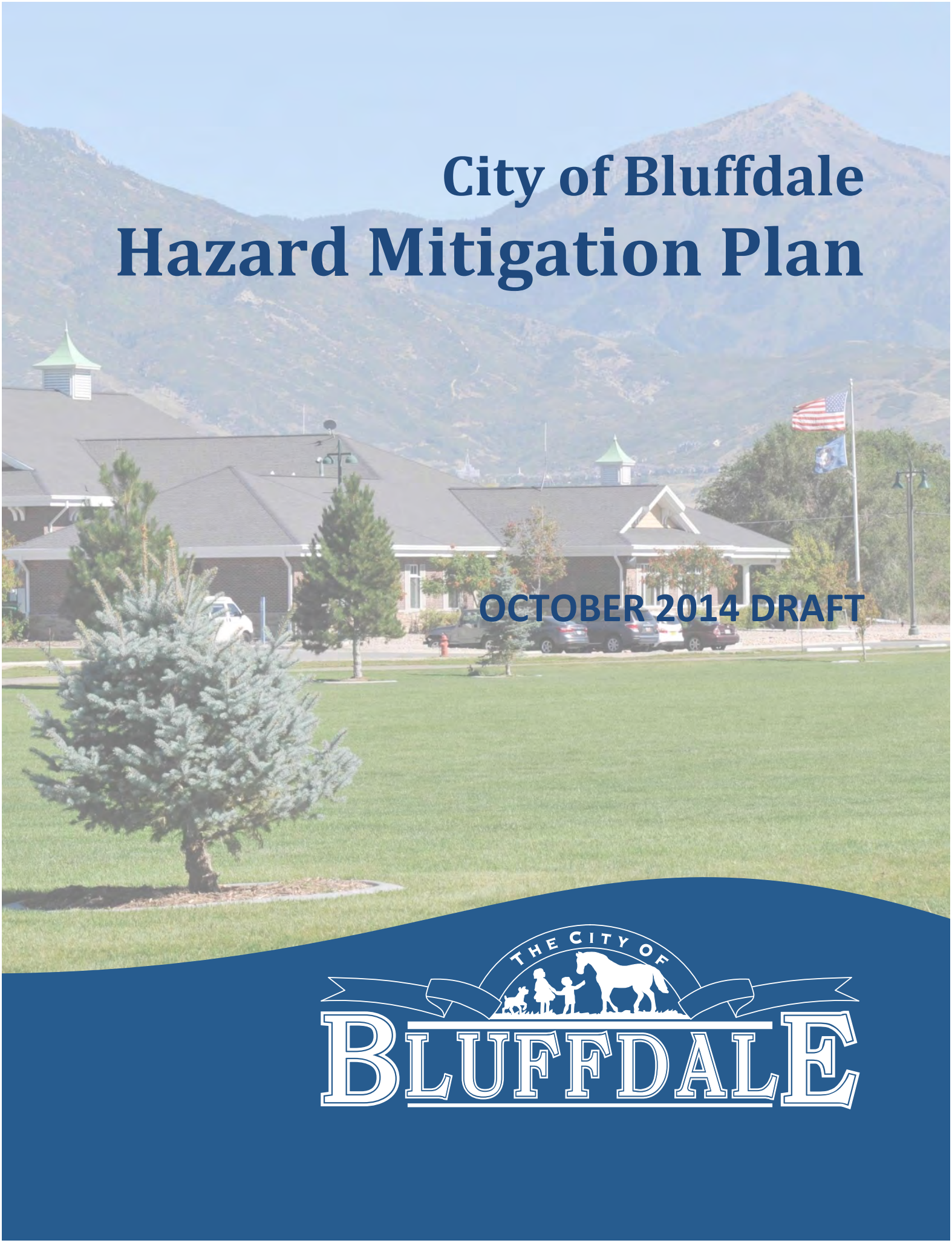
By: _____
Mayor Derk P. Timothy

ATTEST:

_____
Teddie K. Bell, City Recorder

CITY OF BLUFFDALE CORPORATE SEAL UTAH

Voting by the City Council:	Aye	Nay
Councilmember Jackson	X	
Councilmember Kartchner	X	
Councilmember Nielsen	X	
Councilmember Pehrson	X	
Councilmember Westwood	X	



City of Bluffdale
Hazard Mitigation Plan

OCTOBER 2014 DRAFT

THE CITY OF
BLUFFDALE

ANNEX B: CITY OF BLUFFDALE

1. Introduction

1.1. Background

The City of Bluffdale is located at the south end of Salt Lake County and is home to wide open spaces, dramatic mountain views of the Wasatch Range, and a significant stretch of the Jordan River. Bluffdale is only 20 miles south of Salt Lake City and 25 miles north of Provo, giving it a unique location between Utah's two largest counties.

Incorporated in 1978, the city now consists of 10.22 sq. mi. of land and as for the 2010 census, the city population was 7,598. That number is much higher today as a result of rapid population growth as residents come to Bluffdale to enjoy the City's unique semi-rural lifestyle and excellent location.

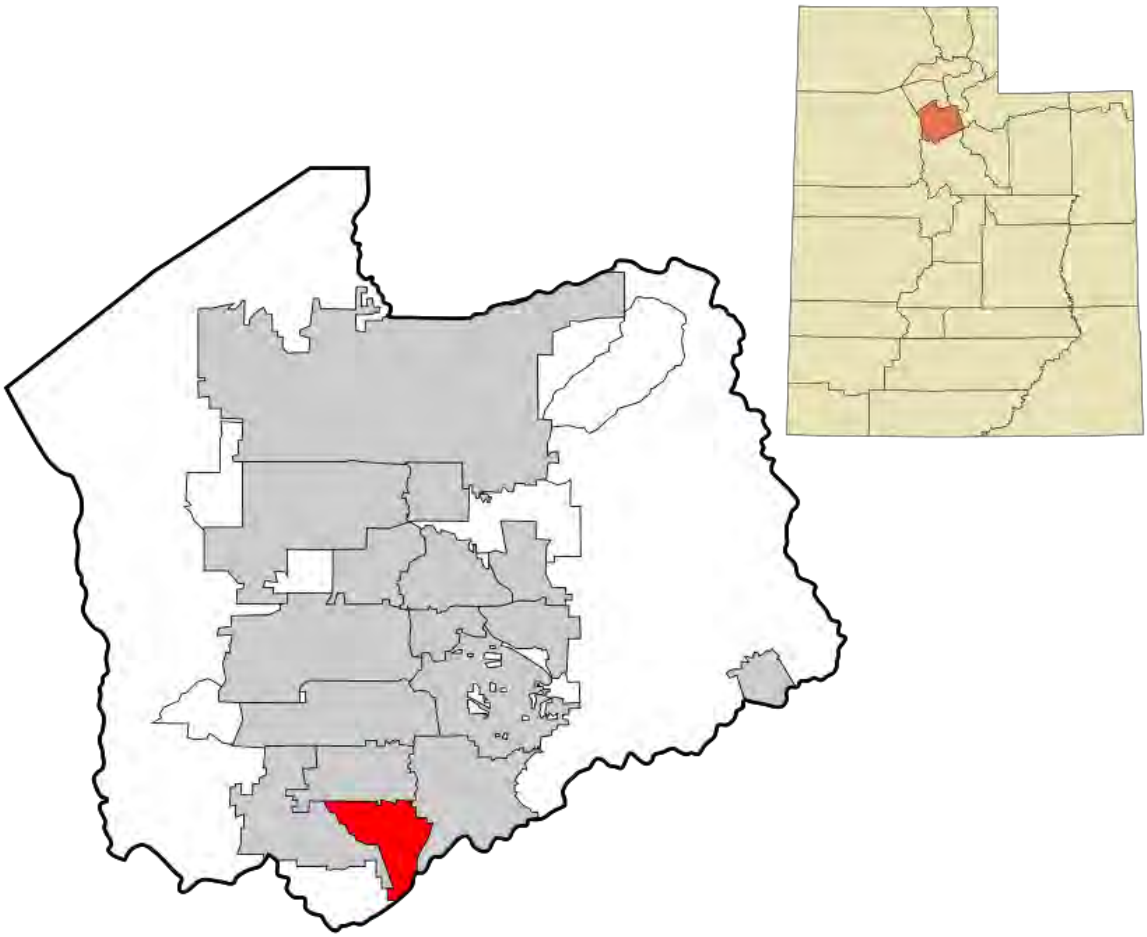


Figure 1.1. Location of Bluffdale within the State of Utah and Salt Lake County

1.2. Community Profile

Bluffdale, named for its geography of bluffs and dales, was first settled in 1848–1849 when the area was originally part of West Jordan. On July 29, 1858, Orrin Porter Rockwell paid five- hundred dollars to Evan M. Green for sixteen acres of land near to the Crystal Hot Lakes (adjacent to the present Utah State Prison). This land included a hotel with dining facilities, stable, brewery, and pony express station. As the community expanded, the Bluffdale area became part of South Jordan, then Riverton.

In 1883 the Bluffdale School Precinct was formed from parts of Herriman, South Jordan and Draper. On August 1, 1886, the Bluffdale Ward of The Church of Jesus Christ of Latter-day Saints was organized with Lewis H. Mousley as Bishop. For a short time the town was called Mousley. Some of the early buildings included an adobe church, built in 1887–1888, a tithing house, and a three-room schoolhouse constructed in 1893.

Bluffdale is bounded by Lehi to the south, Herriman to the west, Riverton to the north, and Draper to the east. The Jordan River is the city's most prominent natural feature, cutting approximately

through the center of the community. The west side of the city sits on a high bluff above the Jordan River. The Jordan River provides a physical division and a geographic challenge to the city's provision of services.

Because Bluffdale lies at the narrowest point between the Wasatch and Oquirrh mountain ranges, many utilities are located here. These utilities and other infrastructure significantly influence the City's land uses. These include a heavily used Union Pacific Railroad and UTA rail line running north–south; Camp Williams Road (also running north–south); Interstate-15 and Bangerter Highways; and a major canal that is the effective western boundary of the community. In addition, six other canals, several aqueducts, two major power corridors, regional arterials and highways, and a major gas line corridor create obstacles and shape land use opportunities.

1.3 Land Use & Growth

In 2000, the Census reported a population of 4,700 people in Bluffdale, a 118.4% increase over the previous decade, compared with a 23.8% increase countywide during the same period. In 2014, Bluffdale's population included about 8,000 people living in approximately 2,100 housing units. This yields one of Utah's largest average household sizes (3.86 persons per household in 2010). The U.S. Census Bureau also indicates that the population of the City is fairly young but aging, with a median age of 26.6 in 2010 compared with 22.3 years in 1990. The 65 years and older segment of the population has been increasing over the past decade, from 4.6 to 5.3 percent. As far as race or ethnic groups are concerned, the Census in 2010 reports that the city was 95.8 percent white, and 4.2 percent of the population identified as Latino or Hispanic.

The entire Wasatch Front is under tremendous growth pressure, with the Wasatch Front Regional Council projecting a 67% increase in population by 2040. Bluffdale's 2014 Capital Facilities Plan (CFP) uses a detailed methodology to project population in connection with projected future land use in the City. Based on the CFP, Bluffdale's population will grow to nearly 40,000 by the year 2035. At this point, the City will be at full build-out (given its current future land use planning and the associated dwelling densities). More detailed information about population projections is included in the CFP document. Population growth is expected to increase dramatically with the new housing developments presently under construction. The major population growth center in Bluffdale will be the east side of the City, between I-15 and the railroad tracks, where the heaviest growth is expected to occur between approximately 2015 and 2025, and then tapering off as Bluffdale nears build-out.

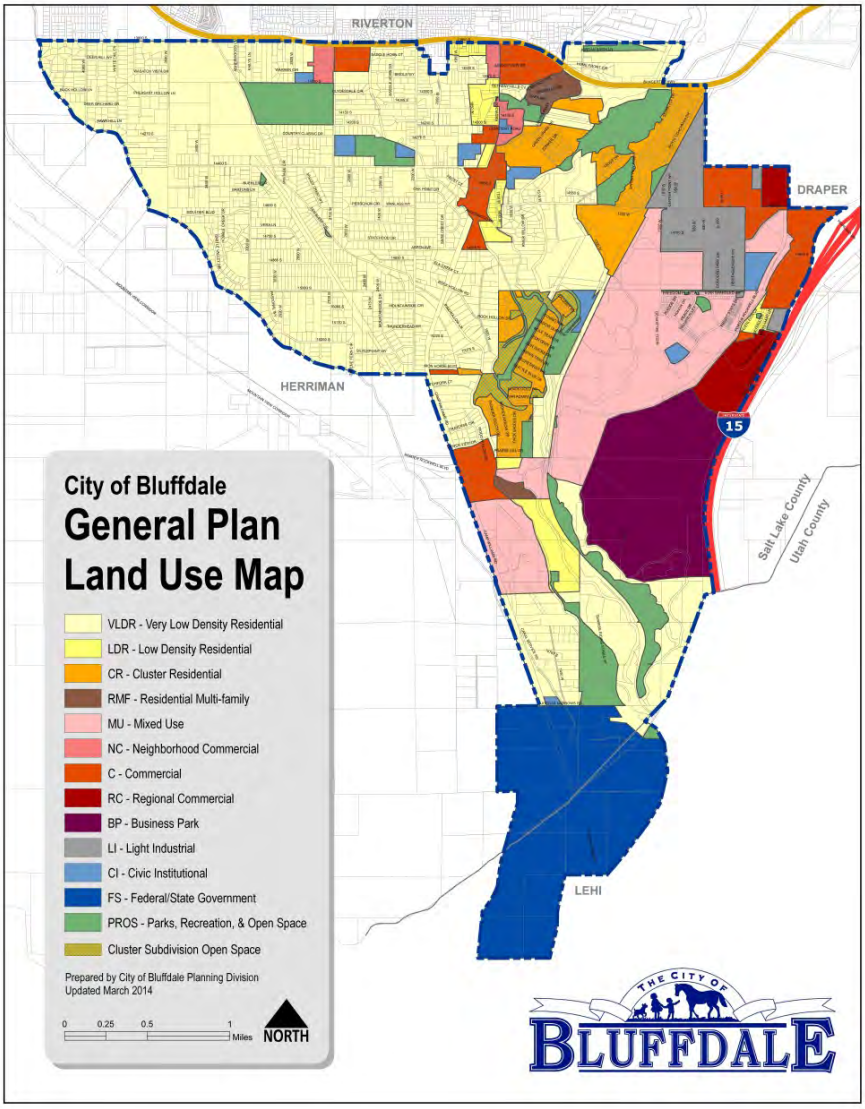


Figure 1.2. Bluffdale's General Plan Land Use Map

Bluffdale's General Plan Land Use Map shows how Bluffdale might appear at build out, if the General Plan principles are executed and development proceeds as projected. The plan would retain the city's focus on residential uses and a feeling of openness, and would ensure excellent mobility patterns are realized over the long term. It also balances the future need for retail and commercial services with the desire to protect residential values and functions.

1.4. Authority and Reference

Bluffdale City's form of government is Council / Manager. Bluffdale has a part-time Mayor and five part-time City Council members. The City Manager is full-time and works under the direction of the Mayor and Council.

In the state of Utah, Bluffdale is currently classified as a fifth class city.

2. Planning Process

2.1. Update Process and Participation Summary

The City of Bluffdale anticipates making regular updates to the City of Bluffdale Hazard Mitigation Plan and defines the processes by which continued public participation will be guaranteed in the sections below.

2.2. Planning Team

Members of the City of Bluffdale Mitigation Planning Team are listed here:

Connie Jones	Emergency Program Manager
John Roberts	Fire Chief
Mark Reid	City Manager
Vaughn Pickell	City Attorney
Michael Fazio	City Engineer
Matt Chadwick	Assistant City Engineer
Grant Crowell	City Planner/ Economic Development Director
Delbert Swensen	Building Official
Alan Peters	Associate Planner
Jennifer Robison	Associate Planner
Blain Dietrich	Public Works Manager
Michele Doxey	Volunteer

Members of the Salt Lake County Mitigation Planning Team are listed below:

Kate Smith	Salt Lake County Emergency Management, Mitigation Planner
Cathy Bodily	Salt Lake County Emergency Management, Grant applicant and Planner
Roger Kehr	Salt Lake County Emergency Management, Mitigation Planner
Steve Sautter	Salt Lake County Emergency Management, Public Outreach
Matt Morrison	Salt Lake County Emergency Management, Planner
Bret Fossum	Salt Lake County Emergency Management, Mitigation Planner
Val Greensides	Unified Fire Authority, administrative support
Joan Welch	Unified Fire Authority, administrative support
Clint Mecham	Unified Fire Authority
Aaron Nelson	Unified Fire Authority
Dirk Andersen	Taylorsville City
Mike Barrett	Salt Lake County Emergency Services
Brent Beardall	Salt Lake County Flood Control
Leon Berrett	Salt Lake County
Dawn Black	Cottonwood Heights
David Chisholm	Holladay City
Eldon Farnsworth	South Salt Lake City

Bob Fitzgerald	West Valley City
Sheril Garn	Riverton City
Tina Giles	Herriman City
Jeff Graviet	Salt Lake County Emergency Services
Jon Harris	Murray City
Matt Jarman	South Jordan City
Connie Jones	Bluffdale City
Scott Jones	Salt Lake Community College
Jeff King	Jordan Valley Water Conservancy District
Ken Kraudy	Sandy City
Bart LeCheminant	Draper City
Dustin Lewis	South Jordan City
Cory Lyman	Salt Lake City
Kade Moncur	Salt Lake County Flood Control
Reed Scharman	West Jordan City
Lisa Schwartz	Taylorsville City/Midvale City
Marty Shaub	University of Utah
Garth Smith	Draper City
Jared Smith	Sandy City
Justin Stoker	Salt Lake City Flood Control
Claire Woodman	Town of Alta

2.3. Meetings, Documentation, and Stakeholder Participation

The Bluffdale Emergency Manager discussed the Mitigation Plan at the following meetings:

September 4, 2014 – First CERT class. Participants heard a short review of the Plan.

October 1, 2014 – Public Meeting—Bluffdale City Emergency Committee, where public is welcome and where our City Neighborhood Plan volunteers come to discuss the development of the City Neighborhood Plan.

October 15, 2014 – The Hazard Mitigation Plan was presented at a public meeting of the Bluffdale City Council on this date. Members of the community were invited to comment and make suggestions/additions to the Mitigation Plan. Residents of Bluffdale were made aware of this through the monthly newsletter and the City's official website. See figure 2.1 for notice in October newsletter.

Business Spotlight

123Stitch.com 123Stitch.com is an online craft supply retailer founded by a brother and sister, Jim Schlachter and Joanne Schlachter. As a long time cross stitcher, Joanne was frustrated by not being able to find the supplies she wanted in local stores. Jim had the idea of starting their own business, and so it began. The business was founded in California in 1997 when the concept of internet shopping began to appeal to more people. In 2006, 123Stitch.com bought a warehouse and moved to Bluffdale, where it began to really take off. 123Stitch.com primarily focuses on cross stitch, crochet, needlepoint, and scrapbooking.

Now, they are one of the largest online craft businesses, with a very large inventory that can be shipped to anywhere in the world. If they prefer it, local customers can pick up their orders directly from the warehouse as opposed to having it shipped to them. When asked what makes 123Stitch special, Jim Schlachter said, "We have the most wonderful customers, from all over the world. They love the convenience of being able to order supplies without leaving their homes." If you like crafts, you will love the huge selection and fantastic service you find at 123stitch.com.

Citizen Spotlight
Kinzie Campbell

Kinzie Campbell, daughter of Richard and Gail Campbell of Bluffdale, was awarded Youth Champion at the Utah State Fair for the Home Arts Foods division. Her entries included homemade Raspberry Jam and 4 varieties of cookies. She was awarded three Blue Ribbons for 1st place, including the C&H Sugar award for her sugar cookies. She also received one 3rd place ribbon and one 4th place ribbon. She says that she had a lot of fun entering the fair, learned a lot and will keep entering the Utah State Fair! Kinzie is a student at Bluffdale Elementary.

CERT Drill on October 11

The final drill for our current CERT class will be on Saturday, October 11. Any previously trained CERT volunteer in Bluffdale is welcome to participate. It will be held from 9:00 am until about 11:30 am at the Fire Station. Bring your CERT gear and come!

Notice
Bluffdale Hazard Mitigation Plan Public Hearing and Presentation to City Council

On October 15 the Bluffdale Hazard Mitigation Plan will be presented to the City Council. It includes mitigation strategies for hazards that would affect Bluffdale, including fire, floods, earthquakes, severe weather, etc. The residents of Bluffdale are invited to come and listen to the presentation and ask questions.

For more information, contact
Connie Jones, 801-419-6278, cjones@bluffdale.com.

Election Day is November 4
Are you registered to vote?

You can check you registration status online with the county. If you have moved within the county, you can change your address online. You can also *find your polling location, *view a sample ballot, *find out about early voting and vote by mail and *see election results all online at https://secure.slco.org/clerk/elections/.

Happy Haunting Halloween

Bluffdale City Park - 14350 South 2200 West

Bluffdale Trunk Or Treat will be Haunted!
Friday, October 31st 6:15 pm – 8:00 pm
Bring your Goblins, Ghosts, & Ghouls
Decorate your "Trunk"

Friday - October 31st

6:00 – 6:30
Park & Decorate your Car ..... Northwest Parking Lot
$25 – Prize for best Décor!
6:15 –6:30
Costume Parade & Contest ..... Pavilion
Prizes for Best Costume :
Under 5yr.; K-6th Grade; Teen-Adult
6:30 – 8:00
Trunk or Treat!..... Northwest Parking Lot
Spooky Fun..... Trading Post
Drinks & Cookies..... Chuck Wagon
Look for Haunting Ghouls!

Bring your Trunk & Participate ~ The little gobblins are counting on you!

Website: www.bluffdale.com page 3 City Hall: 801-254-2200 | Fax: 801-253-3270

Figure 2.1. Residents received notice of the public hearing about the Bluffdale Hazard Mitigation Plan through the City's newsletter and other channels.

2.4. Multi-Jurisdictional Planning

Bluffdale City has worked with the Salt Lake County Emergency Management team to prepare this document. The Bluffdale Emergency Manager has met with a representative of the County Mitigation Team and has attended the monthly Salt Lake County Emergency Manager's meetings where information has been dispersed regarding the Mitigation Planning Process. Some of the information from Salt Lake County's plan has been included in this plan.

3 Hazard Identification & Risk Assessment

3.1. Historical Hazard Events

There have been no significant hazard events in Bluffdale in the past five years.

3.2. Actions taken based on the 2009 Wasatch Front Mitigation Plan

Category	Goal / Objective	Action	Status	Comments
All Hazards	1 – Improve and maintain communications capabilities for emergency operations 1.1 – Improve communication capabilities	1 – Conduct an inventory and assessment of communications equipment and systems and identify needs	Completed / Ongoing	Bluffdale continues to improve and maintain its communication capabilities.
All Hazards	1 – Improve and maintain communications capabilities for emergency operations 1.1 – Improve communication capabilities	2 – Conduct Training and awareness activities on communication equipment, tools, and systems	Completed / Ongoing	Bluffdale participates in training and exercises designed to practice using communication tools and equipment. Example: City uses its amateur radio volunteers
All Hazards	1 – Improve and maintain communications capabilities for emergency operations 1.1 – Improve communication capabilities	3 – Establish agreements to share communications equipment between agencies involved in emergency operations	Ongoing	
All Hazards	1 – Improve and maintain communications capabilities for emergency operations 1.1 – Improve communication capabilities	4 – Establish notification capabilities and procedures for emergency personnel	Ongoing	Bluffdale continues to work on notification tools and procedures to be in harmony with changing technology and equipment

Category	Goal / Objective	Action	Status	Comments
All Hazards	1 – Improve and maintain communications capabilities for emergency operations 1.2 – Maintain communications capabilities for critical facilities	1 – Evaluate vulnerability of critical communications systems	Completed	Bluffdale evaluates areas of vulnerability and develops solutions to ensure communication systems or alternate solutions are viable Example: The development of a second / redundant radio system for the Police, Fire, and Public Works Departments
All Hazards	1 – Improve and maintain communications capabilities for emergency operations 1.2 – Maintain communications capabilities for critical facilities	2 – Establish redundancy for dispatch centers and other critical communications	Completed / Ongoing	Bluffdale relies on the Valley Emergency Communications Center (VECC) for dispatch services. They coordinate with other PSAPS to provide redundancy.
All Hazards	1 – Improve and maintain communications capabilities for emergency operations 1.3 – Conduct communications Strategic Planning	1 – Establish a coordinating group to address long-term communication needs and implementation strategies	Ongoing	
All Hazards	1 – Improve and maintain communications capabilities for emergency operations 1.3 – Conduct communications Strategic Planning	2 – Acquire, upgrade, and/or integrate communications equipment and systems as determined by coordinating group	Ongoing	Bluffdale has upgraded existing equipment and purchased new equipment to maintain operability
All Hazards	2 – Improve awareness and analysis of hazards 2.1 – Improved Quality and Access to digital geographic (GIS) hazards data	1 – Establish a coordinating group to address geographic data issues	Completed / Ongoing	Bluffdale GIS personnel actively participate in several coordinating groups that address issues associated with geographic data
All Hazards	2 – Improve awareness and analysis of hazards 2.1 – Improved Quality and Access to digital geographic (GIS) hazards data	2 – Examine current data availability and sharing capabilities, evaluate needs, and identify shortcomings	Completed / Ongoing	
All Hazards	2 – Improve awareness and analysis of hazards 2.1 – Improved Quality and Access to digital geographic (GIS) hazards data	3 – Update and expand data on hazards, critical facilities, and critical infrastructure according to assessed needs	Completed / Ongoing	Bluffdale GIS personnel continue to develop and add to the geographic data as part of the City's overall geographic information systems

Category	Goal / Objective	Action	Status	Comments
All Hazards	2 – Improve awareness and analysis of hazards 2.1 – Improved Quality and Access to digital geographic (GIS) hazards data	4 – Provide centralized access to geographic data to emergency planners and responders	Completed / Ongoing	Bluffdale GIS personnel make data available to first responders and others involved in emergency management efforts
All Hazards	2 – Improve awareness and analysis of hazards 2.2 – Improve and expand hazard monitoring capabilities	1 – Integrate existing hazard monitoring networks in emergency operations centers. Utilize sensors such as weather stations, stream gages, seismograph stations, road conditions, etc.	Ongoing	
All Hazards	2 – Improve awareness and analysis of hazards 2.2 – Improve and expand hazard monitoring capabilities	2 – Identify and implement additional hazard monitoring capabilities.	Completed / Ongoing	
All Hazards	3 – Ensure critical facilities can sustain operations for emergency response and recovery 3.1 – Prevent damage to critical facilities and infrastructure	1 – Utilize GIS to identify facilities and infrastructure at risk	Completed	In 2012 Bluffdale GIS, Fire and Emergency and Risk Management personnel did an extensive hazard and risk assessment on all structures in the city to evaluate their level of risk.
All Hazards	3 – Ensure critical facilities can sustain operations for emergency response and recovery 3.1 – Prevent damage to critical facilities and infrastructure	2 – Assess critical facilities for hazard exposure, structural weaknesses, power, communications and equipment resources and redundancy, and adequate emergency procedures	Completed	In 2012 Bluffdale GIS, Fire and Emergency and Risk Management personnel did an extensive hazard and risk assessment on all structures in the city to evaluate their level of risk
All Hazards	3 – Ensure critical facilities can sustain operations for emergency response and recovery 3.1 – Prevent damage to critical facilities and infrastructure	3 – Implement improvements to address identified in assessment	In Process	

Category	Goal / Objective	Action	Status	Comments
All Hazards	4 – Improve response capabilities through mutual-aid agreements 4.1 – Utilize mutual-aid agreements in accordance with National Incident Management System (NIMS) requirements	1 – Compile inventory of mutual-aid agreements and memoranda of understanding (MOU) and identify deficiencies	Completed / Ongoing	Bluffdale has formal agreements for Police, Fire, and Water
All Hazards	4 – Improve response capabilities through mutual-aid agreements 4.1 – Utilize mutual-aid agreements in accordance with National Incident Management System (NIMS) requirements	2 – Pursue and implement needed mutual-aid agreements	Completed / Ongoing / In Process	
All Hazards	5 – Increase citizen safety through improved hazard awareness 5.1 – establish a comprehensive public education program	1 – Provide education regarding all natural hazards through live trainings, as well as web-based, print and broadcast media	Completed / Ongoing	Bluffdale Emergency Management provides several public education classes for groups to discuss the hazards in the community and what residents can do to be prepared
All Hazards	5 – Increase citizen safety through improved hazard awareness 5.1 – Establish a comprehensive public education program	2 – Incorporate information about cascading effects of hazards in education programs	Completed	Information is included in all presentations on the effects of cascading hazards
All Hazards	5 – Increase citizen safety through improved hazard awareness 5.1 – Establish a comprehensive public education program	3 – Develop education programs to target specific groups including homeowners, developers, schools and people with special needs	Completed / Ongoing	Bluffdale's education programs are customizable for all kinds of groups and available to all members of the community
All Hazards	5 – Increase citizen safety through improved hazard awareness 5.1 – Establish a comprehensive public education program	4 – Utilize maps and similar products on County EM website and other media to educate public on areas at risk to hazards	Completed	Bluffdale GIS personnel have compiled and made available hazard maps to help educate the public on potential hazards in the city
All Hazards	5 – Increase citizen safety through improved hazard awareness 5.1 – Establish a comprehensive public education program	5 – Coordinate with existing public education programs such as the American Red Cross, Utah Living with Fire, be Ready Utah, the National Weather Service, etc.	Completed / Ongoing	Bluffdale has worked with Be Ready Utah, American Red Cross and other groups to present to the citizens of our community

Category	Goal / Objective	Action	Status	Comments
All Hazards	6 – Improve public safety through preventative regulations 6.1 – Minimize hazard impacts through the adoption of appropriate prevention measures	1 – Establish and enforce appropriate planning, zoning, and building code ordinances	Completed / Ongoing	Bluffdale enforces all current ordinances and building codes including ordinances like our Flood Damage Prevention and Land Disturbance ordinances.
All Hazards	6 – Improve public safety through preventative regulations 6.1 – Minimize hazard impacts through the adoption of appropriate prevention measures	2 – Ensure current hazard ordinances are available for viewing online	Completed	All current Bluffdale ordinances are available online at: http://www.sterlingcodifiers.com/codebook/index.php?book_id=974&keywords=bluffdale
Dam Failure	1 – Include dam failure inundation in future County and City planning efforts 1.1 – Review current State dam safety information on all identified high hazard dams in the County	1 – Include dam inundation maps in current County, City and Special Service District Emergency Operations Plans	Completed	
Dam Failure	1 – Include dam failure inundation in future County and City planning efforts 1.1 – Review current State dam safety information on all identified high hazard dams in the County	2 – Utilize inundation maps to identify potential evacuation areas and routes	Completed	
Drought	1 – Reduce and prevent hardships associated with water shortages 1.1 – Limit unnecessary consumption of water throughout the County	1 – Continue to encourage water conservation utilizing and promoting outreach material from all water districts in the County	Completed / Ongoing	
Drought	1 – Reduce and prevent hardships associated with water shortages 1.1 – Limit unnecessary consumption of water throughout the County	2 – Emergency Managers will coordinate with local water districts/public utilities to support ongoing conservation efforts	Completed / Ongoing	
Drought	1 – Reduce and prevent hardships associated with water shortages 1.1 – Limit unnecessary consumption of water throughout the County	3 – Investigate feasibility of implementing an incentive program to encourage the use of low-flow appliances and fixtures in homes and businesses	Completed / Ongoing	Bluffdale has a variety of incentive programs that it offers to its residents related to water conservation. We have a tiered pricing structure to promote conservation

Category	Goal / Objective	Action	Status	Comments
Drought	1 – Reduce and prevent hardships associated with water shortages 1.1 – Limit unnecessary consumption of water throughout the County	4 – Implement water-saving devices and practices in public facilities	Completed / Ongoing	Bluffdale has implemented several projects including using secondary and reuse water to irrigate public parks instead of culinary water
Drought	1 – Reduce and prevent hardships associated with water shortages 1.1 – Limit unnecessary consumption of water throughout the County	5 – Repair, maintain and improve water distribution infrastructure to prevent loss from leakage, breaks, etc.	Completed / Ongoing	The Bluffdale Water Division responds immediately to all reports of leaks and performs regular system maintenance, including actively monitoring for leaks, theft of services, etc.
Drought	1 – Reduce and prevent hardships associated with water shortages 1.1 – Limit unnecessary consumption of water throughout the County	6 – Coordinate public safety water use, such as hydrant testing	Completed / Ongoing	The Bluffdale Water Division coordinates all water use, including the testing of hydrants in partnership with the fire department
Drought	1 – Reduce and prevent hardships associated with water shortages 1.1 – Limit unnecessary consumption of water throughout the County	7 – Provide information on landscaping alternatives for persons subject to green area requirements	Completed / Ongoing	
Drought	1 – Reduce and prevent hardships associated with water shortages 1.2 – Address agricultural water shortages in the County	1 – Set up livestock water rotation in areas of agricultural use	Not applicable	This is not applicable to Bluffdale
Drought	1 – Reduce and prevent hardships associated with water shortages 1.3 – Encourage development of secondary water systems	1 – Coordinate with water districts to plan for, develop and/or expand secondary water	Completed / Ongoing	Bluffdale continues to encourage the development of secondary water, where feasible. With every road project we add reuse lines.
Earthquake	1 – Reduce earthquakes losses to infrastructure 1.1 – Encourage retrofit and rehabilitation of highly susceptible infrastructure	1 – Identify structures at risk to earthquake damage	Completed	In 2012 Bluffdale GIS, Fire and Emergency and Risk Management personnel did an extensive hazard and risk assessment on all structures in the city to evaluate their level of risk

Category	Goal / Objective	Action	Status	Comments
Earthquake	1 – Reduce earthquakes losses to infrastructure 1.1 – Encourage retrofit and rehabilitation of highly susceptible infrastructure	2 – Research feasibility of an incentive program for retrofitting privately-owned buildings, particularly unreinforced masonry	Not Applicable	Bluffdale does not have funding to support this type of program.
Earthquake	1 – Reduce earthquakes losses to infrastructure 1.1 – Encourage retrofit and rehabilitation of highly susceptible infrastructure	3 – Complete seismic rehabilitation/retrofitting projects of public buildings at risk	Not Completed	We are working to replace the Public Works Building
Earthquake	1 – Reduce earthquakes losses to infrastructure 1.2 – Improve public education regarding earthquake risks to unreinforced masonry buildings	1 – Provide educational materials to unreinforced masonry home and business owners	Not Completed	There are very few URM homes and businesses located in Bluffdale that would make this activity cost effective for the City to engage in. Bluffdale supports county level efforts to share this type of information
Earthquake	1 – Reduce earthquakes losses to infrastructure 1.3 – Improve Seismic Hazard understanding and seismic resistance of CUWCD Red Butte Dam in Salt Lake County.	1 – Procure Engineering Consultant to perform the nonstructural design and geotechnical assessment and review.	Not Completed / Not Applicable	Not applicable to Bluffdale as the referenced dam is located in another jurisdiction.
Flooding	1 – Protection of life and property before, during and after a flooding event 1.1 – Provide 100% availability of the National Flood Insurance Program	1 – Assist Cities with NFIP application	Not Applicable	
Flooding	1 – Protection of life and property before, during and after a flooding event 1.1 – Provide 100% availability of the National Flood Insurance Program	2 – Encourage Communities to actively participate in NFIP	Completed / Ongoing	Bluffdale actively participates in the NFIP
Flooding	1 – Protection of life and property before, during and after a flooding event 1.2 – Encourage appropriate flood control measures, particularly in new developments	1 – Determine potential flood impacts and identify areas in need of additional flood control structures	Completed / Ongoing	The City Engineer and Public Works Director regularly review the impact of development and the need for flood control infrastructure and make recommendations as needed

Category	Goal / Objective	Action	Status	Comments
Flooding	1 – Protection of life and property before, during and after a flooding event 1.2 – Encourage appropriate flood control measures, particularly in new developments	2 – Address identified problems through construction of debris basins, flood retention ponds, energy dissipaters or other flood control structures	Completed / Ongoing	The City Engineer and Public Works Director oversee the construction of flood control structures
Flooding	1 – Protection of life and property before, during and after a flooding event 1.3 – Provide maintenance, repairs and improvements to drainage structures, storm water systems and flood control structures	1 – Establish maintenance and repair programs to remove debris, improve resistance and otherwise maintain effectiveness of storm water and flood control systems	Completed / Ongoing	The Division of Public Works Department continues to maintain and repair all drainage systems in the City
Flooding	2 – Reduce threat of unstable or inadequate flood control structures 2.1 – Reduce potential for failure of flood control structures	1 – Identify and assess structures for deficiencies	Completed / Ongoing	
Flooding	2 – Reduce threat of unstable or inadequate flood control structures 2.1 – Reduce potential for failure of flood control structures	2 – Modify structures as needed to address deficiencies	Completed / Ongoing	The City Engineering Division in cooperation with the Public Works Department make repairs as needed to deficient structures
Severe Weather	1 – Reduce threat of loss of life or property due to extreme weather events 1.1 – Maintain status as a StormReady Community	1 – Maintain Hazardous Weather Operations Plan according to StormReady requirements	Not Completed / Not Applicable	Bluffdale does not have a Weather Operations Plan and does not participate in the StormReady program. This is a Salt Lake County level program
Severe Weather	1 – Reduce threat of loss of life or property due to extreme weather events 1.1 – Maintain status as a StormReady Community	2 – Maintain Contact with NWS prior to re-application in 2010	Not Completed / Not Applicable	Bluffdale does not have a Weather Operations Plan and does not participate in the StormReady program. This is a Salt Lake County level program
Severe Weather	1 – Reduce threat of loss of life or property due to extreme weather events 1.2 – Increase awareness of information services provided by NWS	1 – Meet with NWS representative on an annual basis to receive information on new services and alerts available	Completed / Ongoing	

Category	Goal / Objective	Action	Status	Comments
Severe Weather	1 – Reduce threat of loss of life or property due to extreme weather events 1.2 – Increase awareness of information services provided by NWS	2 – Assist NWS in making other agencies and departments aware of available resources	Completed / Ongoing	Bluffdale supports the NWS efforts for education and outreach and makes internal departments aware of NWS resources
Severe Weather	1 – Reduce threat of loss of life or property due to extreme weather events 1.3 – Encourage safe practices in avalanche prone areas	1 – Assist Forest Service Utah Avalanche Forecast Center and other organizations in promoting avalanche hazard awareness for backcountry users	Completed / Ongoing	Bluffdale supports the efforts for education and outreach
Severe Weather	1 – Reduce threat of loss of life or property due to extreme weather events 1.4 – Examine the vulnerability of patrons at large event venues to extreme weather events	1 – Work with NWS to develop large event venue weather safety and evacuation procedures	Not Completed	Bluffdale has not developed a large event venue weather safety plan and/or evacuation procedures with the NWS
Slope Failure	1 – Reduce or eliminate the threat of slope failure damage 1.1 – Reduce the threat of slope failures following wildfires	1 – Develop protocol for working with State and Federal agencies in reducing the impact of post-fire debris flow hazard	Not Completed / Not Applicable	This is a very low probability event for the City and not applicable
Slope Failure	1 – Reduce or eliminate the threat of slope failure damage 1.2 – Monitor historic landslide areas	1 – Coordinate with the Utah Geological Survey and other agencies to understand current slope failure threats/potential	Not Completed / Not Applicable	This is a very low probability event for the City and not applicable
Slope Failure	1 – Reduce or eliminate the threat of slope failure damage 1.3 – Address landslide hazards in new sub-divisions	1 – Utilize recommendations provided by the State Geological Hazards Working Group to address land-use and planning for new developments	Completed / Ongoing	Bluffdale Engineering and Planning reviews recommendations as provided pertaining to development within the City
Wildland Fire	1 – Community education on wildfire hazard 1.1 – Reduce risk from wildfire through education programs	1 – Increase public awareness through “Firewise” program	Not Completed / Not Applicable	This is a very low probability event for the City and not applicable
Wildland Fire	1 – Community education on wildfire hazard 1.1 – Reduce risk from wildfire through education programs	2 – Educate homeowners on the need to create defensible space near structures in WUI	Not Completed / Not Applicable	

Category	Goal / Objective	Action	Status	Comments
Wildland Fire	2 – Improve safety from wildfire hazards through planning, protective actions and improved fire response capabilities 2.1 – Assist homeowners with creating defensible space near structures in WUI areas	1 – Designate and promote county-wide annual initiative for clearing fuels	Not Completed / Not Applicable	
Wildland Fire	2 – Improve safety from wildfire hazards through planning, protective actions and improved fire response capabilities 2.1 – Assist homeowners with creating defensible space near structures in WUI areas	2 – Provide waste removal, such as chipping of green waste by public works, following designated fuel clearing day/week	Not Completed / Not Applicable	
Wildland Fire	2 – Improve safety from wildfire hazards through planning, protective actions and improved fire response capabilities 2.2 – Improve evacuation capabilities for WUI areas	1 – Work with experts and communities to develop or update evacuation plans	Ongoing	
Wildland Fire	2 – Improve safety from wildfire hazards through planning, protective actions and improved fire response capabilities 2.2 – Improve evacuation capabilities for WUI areas	2 – Evaluate transportation network and address needed improvements to facilitate evacuation and emergency response	Completed	Bluffdale has an adequate transportation network to support evacuation and emergency response
Wildland Fire	2 – Improve safety from wildfire hazards through planning, protective actions and improved fire response capabilities 2.3 – Improve addressing system in WUI areas to facilitate emergency response	1 – Identify all facilities, businesses, and residences, particularly in the canyons, and assign addresses according to current county addressing standards	Completed	Addressing of structures in Bluffdale is complete
Wildland Fire	2 – Improve safety from wildfire hazards through planning, protective actions and improved fire response capabilities 2.3 – Improve addressing system in WUI areas to facilitate emergency response	2 – Incorporate improved addresses in fire-dispatch and other databases	Completed	Addressing of structures in Bluffdale is complete

Category	Goal / Objective	Action	Status	Comments
Wildland Fire	2 – Improve safety from wildfire hazards through planning, protective actions and improved fire response capabilities 2.4 – Complete wildfire protection projects	1 – Reduce fuels around publically owned structures	/ Not Applicable	
Wildland Fire	2 – Improve safety from wildfire hazards through planning, protective actions and improved fire response capabilities 2.4 – Complete wildfire protection projects	2 – Implement fire breaks and other protective measures	/ Not Applicable	
Wildland Fire	2 – Improve safety from wildfire hazards through planning, protective actions and improved fire response capabilities 2.4 – Complete wildfire protection projects	3 – Assess existing water flow capabilities, both public and private, and address deficiencies	Completed	The Bluffdale water system meets and/or exceeds requirements for providing water flow for firefighting purposes in the City
Wildland Fire	2 – Improve safety from wildfire hazards through planning, protective actions and improved fire response capabilities 2.4 – Complete wildfire protection projects	4 – Assist communities in developing Community Wildfire Protection Plans or similar plans	Not Applicable	
Wildland Fire	2 – Improve safety from wildfire hazards through planning, protective actions and improved fire response capabilities 2.5 – Encourage proper development practices in the WUI	1 – Adopt the Utah Wildland-Urban Interface Code	Not Completed / Not Applicable	This is a very low probability event for the City and not applicable
Wildland Fire	2 – Improve safety from wildfire hazards through planning, protective actions and improved fire response capabilities 2.5 – Encourage proper development practices in the WUI	2 – Define wildland-urban interface and develop digital maps of the WUI	Not Completed / Not Applicable	This is a very low probability event for the City and not applicable

3.3. Hazard Analysis

A disaster can occur at any time within Bluffdale City. Rather than attempt to prepare for every potential disaster, the intent of Bluffdale City is to identify the most likely situations and concentrate efforts and resources on the education, preparation, and mitigation for emergencies and disasters with a higher likelihood of occurrence. The four natural hazards that pose the greatest threat to our community are earthquake, flood, fire, and severe weather. However, the list below includes all the hazards that are of significance in the Salt Lake Valley, and therefore will be included in our Mitigation Plan.

- Avalanche
- Dam Failure
- Drought
- Earthquake
- Flood
- Infestation
- Landslide and Problem Soils
- Pandemic
- Radon
- Severe weather
- Wildfire

3.2.1 Avalanche

The likelihood of avalanches impacting Bluffdale is extremely minimal. There are no adjacent mountains steep enough to be of concern and no historical avalanche activity in our community.

3.2.2 Dam Failure

The Jordan River flows through Bluffdale from south to north. In this area, several diversion structures (small dams) direct part of the river flow into irrigation canals that supply water for farming and irrigation in Salt Lake County. The risk of flooding from the failure of one of these dams is low because the dam is less than 20 feet high. Salt Lake County Flood Control District should have information on the flooding risk of these structures.

A diversion dam failure will affect the delivery of irrigation water to farmers and homes increasing the risk of crop failure if the dam breaks in the summer months.

The diversion dams and canals are owned and managed privately. Each canal company has a risk assessment for their canals.

3.2.3 Drought

Bluffdale City has large swings in temperature and in precipitation amounts during any year and is susceptible to drought. Drought affects especially the cultivated and farmland areas in Bluffdale. If drought conditions occur the City would restrict the use of water for outdoor landscaping.

The cost benefit for reducing or restricting the use of water during a drought is the prolonged use of water for more beneficial use as farming to produce crops and sustain animal life.

3.2.4 Earthquake

Utah's earthquake hazard is greatest within the Intermountain Seismic Belt (ISB), which extends 800 miles from Montana to Nevada and Arizona, and trends from north to south through the center of Utah (The Wasatch Fault, UGS PIS 40). The ISB contains the Wasatch fault; one of the longest and most active normal faults in the world, with a potential for earthquake with a magnitude up to 7.5. The largest earthquakes in Utah occur in the ISB, where at least 35 earthquakes of magnitude 5.0 or greater have occurred since 1850. (UNHH 2008)

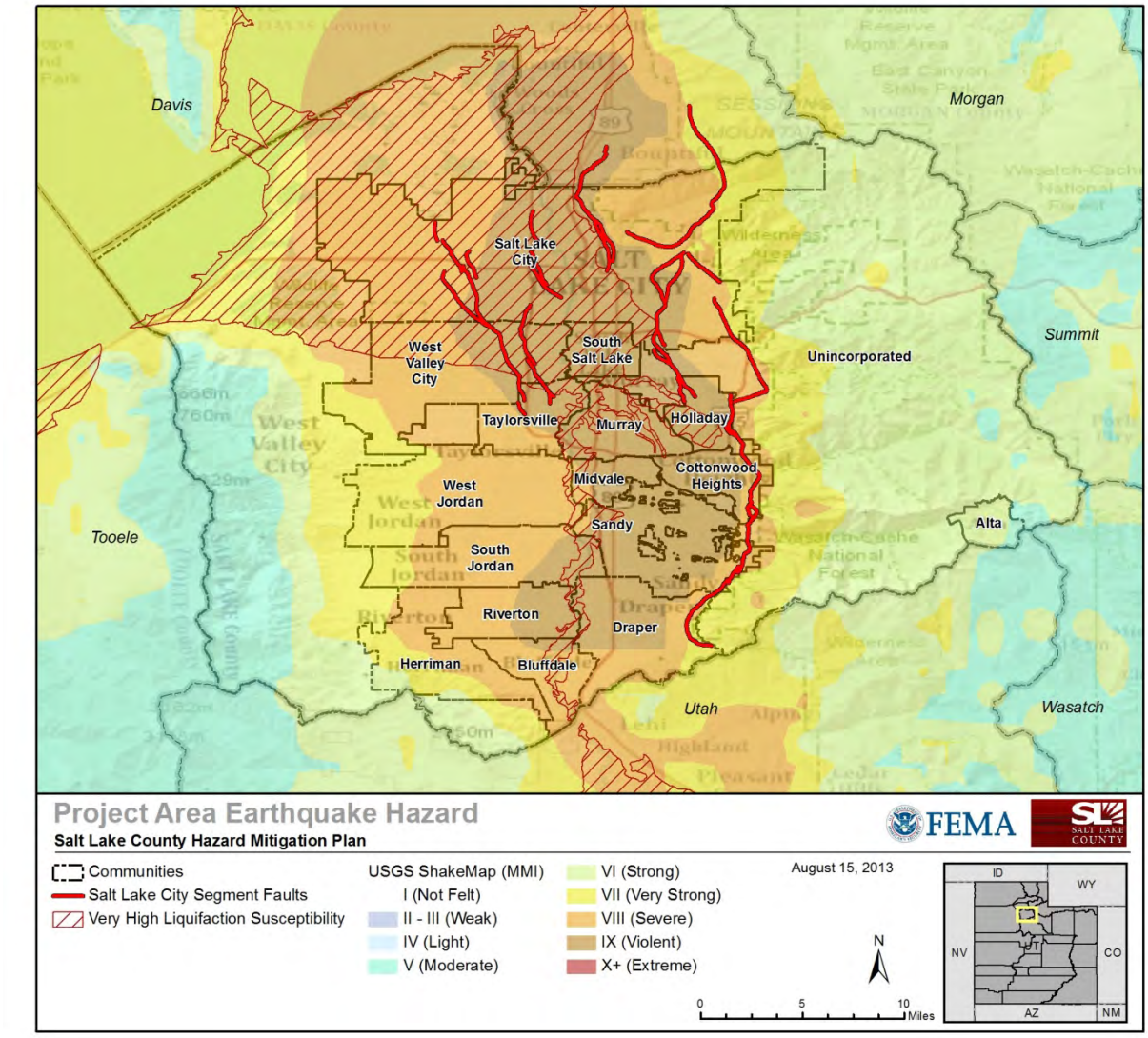


Figure 3.1. Bluffdale's Earthquake Hazard ranges from Very Strong to Violent

The segment of the Wasatch Fault that most clearly affects Bluffdale lies at the base of the foothills to the east, commonly referred to as the "Point of the Mountain." The faulting of this segment would be felt most strongly in the eastern section of Bluffdale, which lies just west of I-15 and south of 14600 South. The increase in new building at this location means more homes will be affected if this fault ruptures.

Of significant concern in Bluffdale are the many critical infrastructure facilities, which serve both Salt Lake and Utah Counties. Those facilities include very large water lines, large irrigation canals, utilities, power, railroads, major transportation routes, and a major natural gas line.

Large areas of ground surrounding the Jordan River are at risk for soil liquefaction during an earthquake. Liquefaction can occur when water-saturated, cohesionless, sandy soils are subjected to ground shaking. The soils "liquefy" or become like quicksand, lose bearing capacity and shear

strength, and readily flow on the gentlest of slopes. Liquefaction is common in areas of shallow ground water and sandy or silty sediments. Liquefaction can produce lateral spreading and flows, where surface soil layers break up and move independently. Displacement of up to 3 feet may occur, accompanied by ground cracking and differential vertical displacement. Soil may move downhill, pulling apart roads, buildings, pipelines and buried utilities. Bearing capacity will lessen and can cause buildings to settle or tip, while lightweight buoyant structures such as empty storage tanks may "float" upward. Liquefaction can also cause foundation materials beneath earth fill dams to liquefy and fail, flooding by ground water in low-lying areas, the backup of gravity fed systems, and possible sand boils. Sand boils are deposits of sandy sediment ejected to the surface during an earthquake along fissures. Liquefaction can occur during earthquakes of magnitude 5.0 or greater. (UNHH 2008)

Bluffdale City requires a geotechnical investigation for any structure or home built. The liquefaction potential is shown in this investigation.

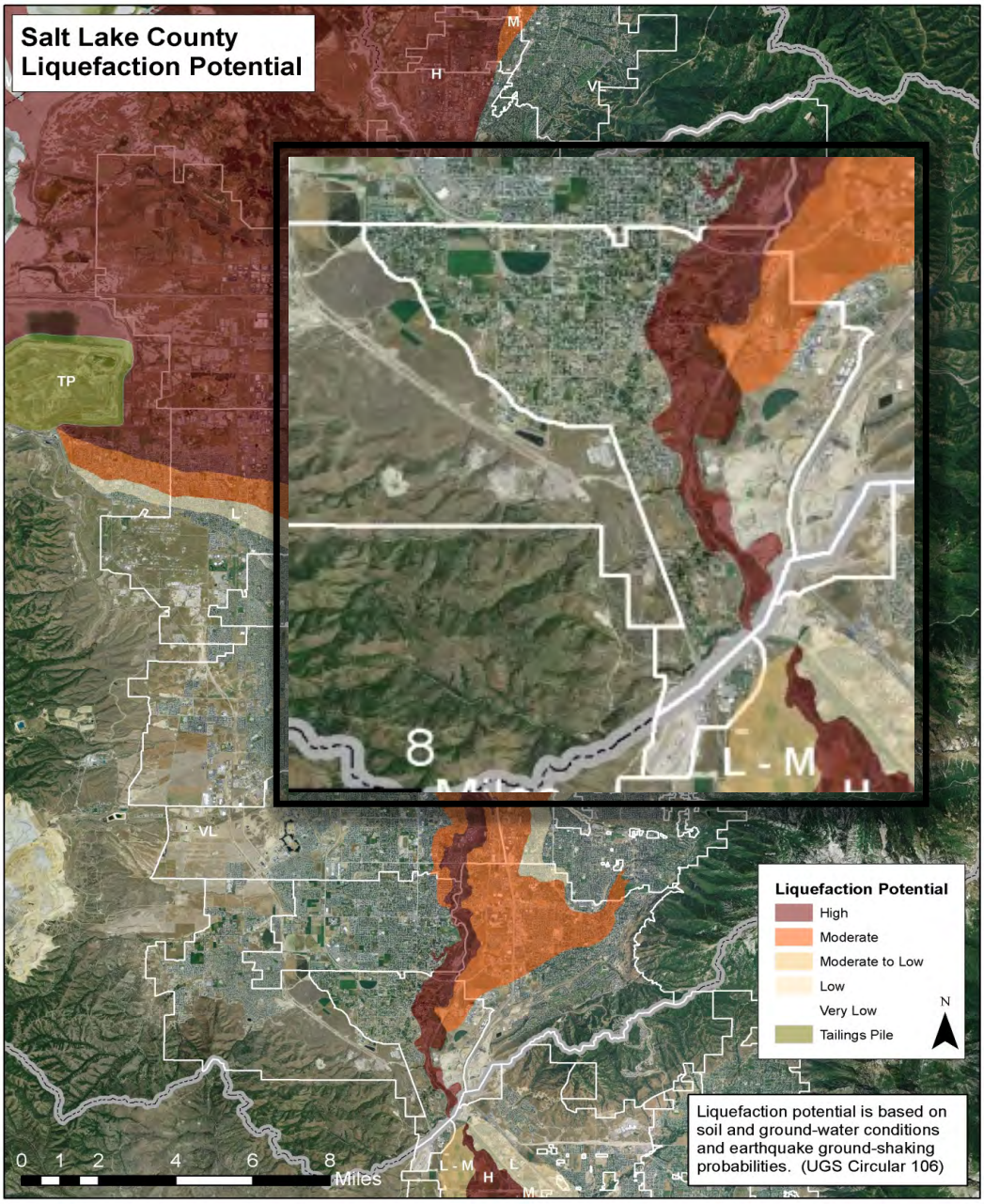


Figure 3.2. Bluffdale's Liquefaction Potential

3.2.5 Flooding

Floods are related to an excess of snowmelt, rainfall, or failure of natural or engineered impoundments onto riverbanks and adjacent floodplains. Floodplains are lowland areas near rivers, lakes, reservoirs, and low terrain urban areas that are subject to recurring floods. Flooding occurs when the peak discharge, or rate of flow in cubic feet per second (cfs) is larger than the channel of the river or storm sewer capacity.

In Bluffdale, as in many other communities, floods are typically localized events. Possible causes in Bluffdale include:

1. Run off from heavy rain on the hills west of Bluffdale such as Wood Hollow as shown in figure 3.3
2. Breaching of one of the canals that run through Bluffdale
3. Obstructed or clogged storm drains
4. Jordan River overflowing its banks

Flood damage includes saturation of land and property, erosion, deposition of mud and debris, and property damage from fast flowing water. Most injuries and deaths occur from fast moving floodwaters, while most property damage results from inundation by sediment-filled water.

The main potential flood source in Bluffdale is the Jordan River. There are three residential structures in the 0.2% annual chance flood zone that are located near this river.

The City of Bluffdale has no repetitive loss properties identified in the National Flood Insurance Program (NFIP).

3.2.5.1 National Flood Insurance Program (NFIP)

Insurance Coverage, Claims Paid, and Repetitive Losses

Bluffdale City participates in the National Flood Insurance Program (NFIP). In order to continue to comply with the program, the city adopts floodplain management requirements and enforces those requirements by issuing certificates for new construction. The certificates allow the city to regulate construction in Special Flood Hazard Areas (SFHAs). The GIS and the engineering division department in the city has updated floodplain identification and mapping in order to facilitate issuing certificates or responding to any public requests for information. The city coordinates with Salt County during flood events and monitors current snow pack to evaluate the possibility of flooding conditions.

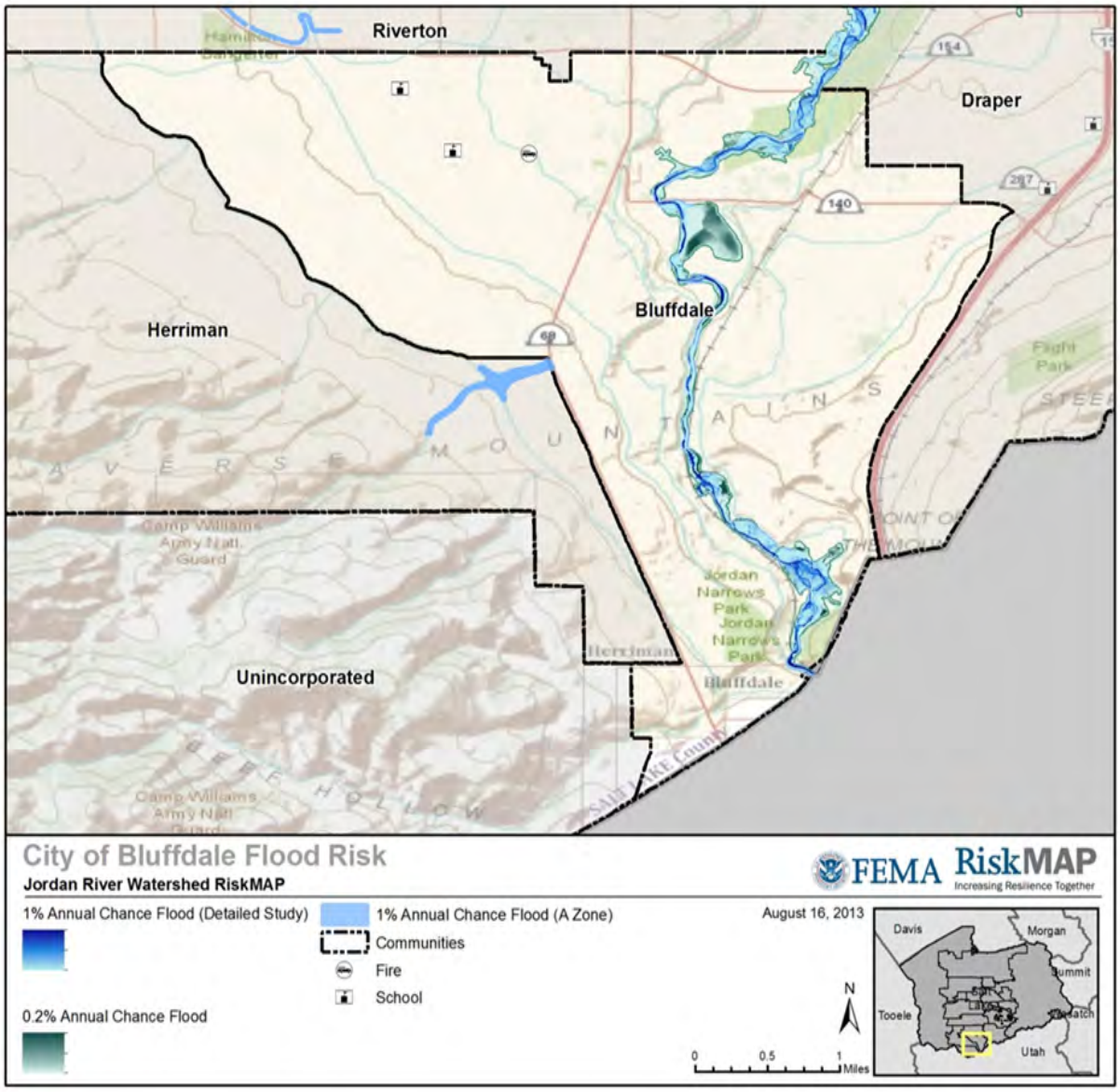


Figure 3.3. City of Bluffdale FEMA Flood Risk Map

Structure Occupancy Type	11% Annual Chance Structure Exposure	1% Annual Chance Building and Contents Loss	0.2% Chance Structure Exposure	0.2% Chance Building and Contents Loss
Residential	0	0	3	$2,070,290.00
Total	0	0	3	$2,070,290.00

Table 3.1. Bluffdale Flood Loss Estimates

The Welby-Jacobs Canal was not designed for stormwater collection. Flood discharge from upstream drainages and recent developments enters the canal system.
The Welby-Jacobs Canal is elevated and could be impacted by ground shaking associated with earthquakes.
Wood Hollow is a drainage that currently has no SFHA depicted on the FIRM. However, the City recognizes the potential impacts of current and future development pressures and would like to have the drainage studied to ensure flood conveyance to the Jordan River.

Table 3.2. Areas of Risk and Mitigation Interest

3.2.6 Infestation

The probability of the infestation of insects or rodents in Bluffdale is negligible. There may be individual property owners impacted, but the likelihood of a citywide infestation is very low.

Landslide and Problem Soils (Geologic Hazard)
Numerous geologic hazards exist in Bluffdale and throughout the Salt Lake Valley that could result in an emergency situation or disaster. Earthquake hazards are likely to include ground shaking, ground rupture, tectonic deformation, liquefaction, seismically induced slope failures and phenomena related to ground-water effects. Wildfires can remove necessary vegetation, which can result in unstable soils for extended periods of time. The most proactive approach to minimize geologic hazard is to avoid development in inappropriate areas. The potential for geologic events can be partially mitigated through proper placement of development. Each incident may require a unique response from Bluffdale City.

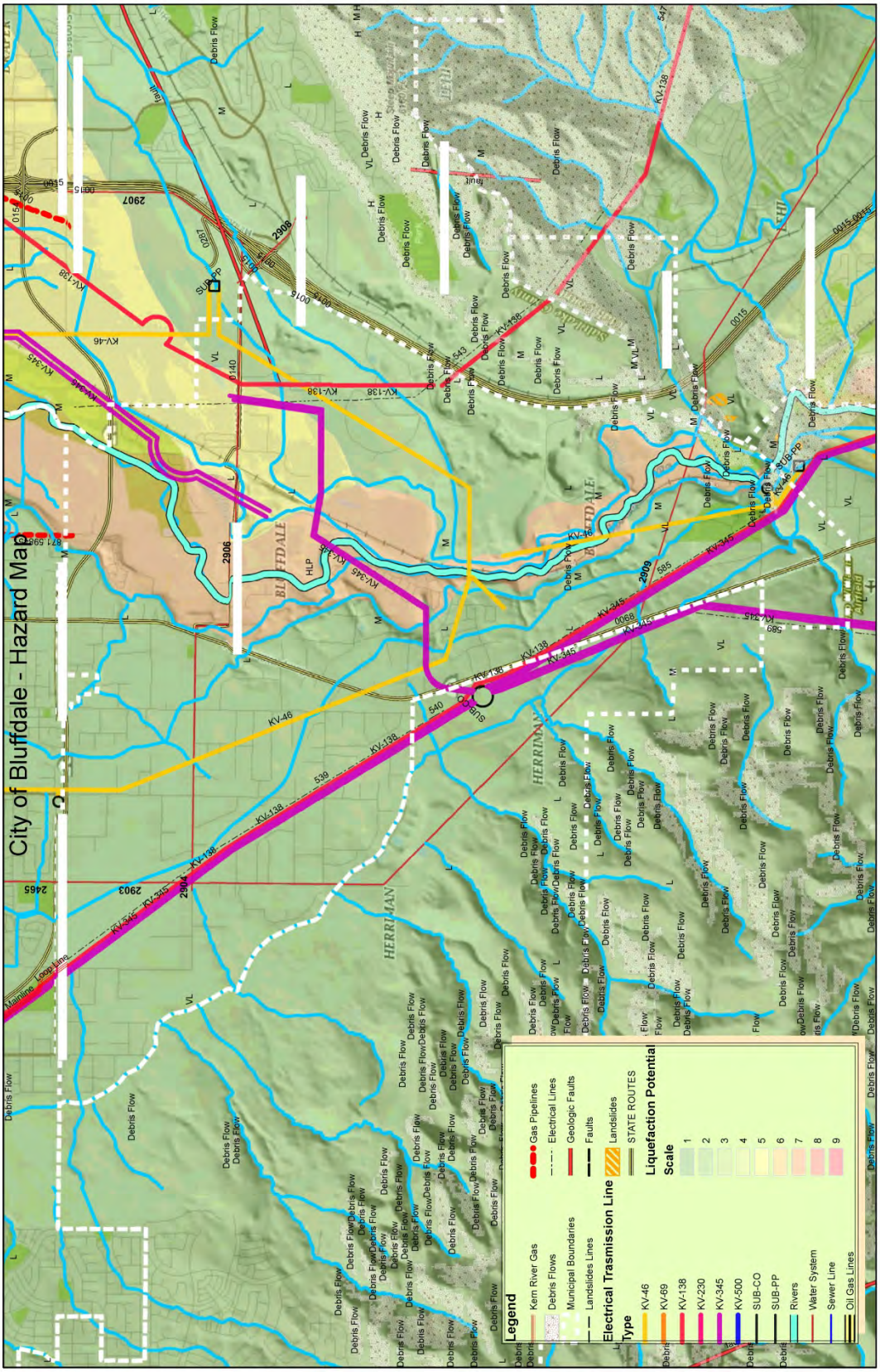

City of Bluffdale - Hazard Map
Legend
Kern River Gas
Debris Flows
Municipal Boundaries
Landslides Lines
Electrical Trasmission Line
Type
KV-46
KV-69
KV-138
KV-230
KV-345
KV-500
SUB-CO
SUB-PP
Rivers
Water System
Sewer Line
Oil Gas Lines
Gas Pipelines
Electrical Lines
Geologic Faults
Faults
Landslides
STATE ROUTES
Liquefaction Potential
Scale
1
2
3
4
5
6
7
8
9
BLUFFDALE
HERRIMAN

Figure 3.4. City of Bluffdale Hazards Map

3.2.7 Pandemic (Public Health Emergencies)

On a regular basis, potentially catastrophic public health issues are raised in the mainstream media and the possibility of a national pandemic, local epidemic such as the Hantavirus, or a wide array of other health-related matters is real. Planning for these events is well beyond the ability of Bluffdale City, but if an outbreak were to occur, the City will be expected to provide accurate information in an immediate fashion. In the event of a public health emergency, the City Manager will determine the appropriate measure of municipal response. The City Manager may choose to activate the EOC and use all means necessary to inform residents and business owners.

In partnership with local and state public health officials, other federal agencies, medical and public health professional associations, infectious disease experts from academia and clinical practice, and international and public service organizations, Bluffdale City will incorporate all reasonable strategies to educate its residents and prepare for a measured response in the instance of a public health emergency.

3.2.8 Radon

Radon is a radioactive gas that has no smell, taste, or color. It comes from the natural decay of uranium that is found in nearly all rock and soil. When geologic conditions are favorable, the potential increases for high indoor levels of radon.

Outdoor radon levels never reach dangerous concentrations because air movement scatters radon into the atmosphere. Radon is a hazard in buildings because the gas collects in enclosed spaces. Radon decays into radioactive particles that can be trapped in the lungs when inhaled. These particles release small bursts of energy that damage lung tissue and may lead to lung cancer. Radon is the second leading cause of lung cancer in the United States.

3.2.9 Severe Weather

The potential for severe weather is a reality in Bluffdale City and the surrounding region. These weather events are not isolated to any climatic season, but rather can occur at any time during the year. During the spring and summer months, heavy rains can fall upon soils in a desert climate that may not readily percolate creating surface runoff, mudslides, debris flow, flooding, and other water-related damage. During the winter months, heavy snowfall is possible. While Bluffdale City is typically self-reliant in weather-related events, severe weather may require assistance from outside agencies.

Winter weather systems and snowstorms over northern Utah can have a dramatic effect on regional commerce, transportation, and daily activity and are a major forecast challenge for local

meteorologists. Bluffdale City will continue to identify new methods to minimize the impact of winter storms, but it is not possible to prepare for all winter storm events.

Although infrequent, Bluffdale City is subject to severe damage resulting from tornadoes and extremely high winds often called microburst winds. As recent as August 11, 1999, a category F2 tornado touched down in the downtown Salt Lake City area, killing one person and injuring at least 100 people. The tornado caused widespread power outages as well as large-scale debris mainly from downed tree limbs. The community needs to be prepared and ready to respond to wind-related weather.

3.2.10 Wildfire (Fire Hazard)

Perhaps the most likely hazard in Bluffdale is the potential for damage and loss of life and property through fire events. Fires can occur within the urban fabric of the community or as wildfires in the hillside areas south and west of the community. Each incident may require a unique response.

The potential for structure and wildfires is increased by lightning events. When severe electrical storms are anticipated, the City Manager may request a heightened level of observation by city personnel.

Utah's fire season typically occurs during the warmer and drier months between May and October. Although traditionally a majority of wildfires have been caused naturally, mostly by lightning, as development encroaches on the hillsides and lower slopes of the Wasatch and Oquirrh Mountains, wildfires caused by humans will likely increase. Education and careful preparation is necessary to protect life and personal property in vulnerable areas. Bluffdale works continually to incorporate a Wildland Interface Zone mitigation plan. Other programs such as the Firewise Communities program may be used to educate residents about the dangers of wildfire and help them prepare for these types of disasters.

3.3. Hazard Assessment

Salt Lake County and Bluffdale City have conducted an all-hazards assessment of potential vulnerabilities within Bluffdale. This assessment assisted with prioritization and outlined a direction for planning efforts. Salt Lake County and Bluffdale City recognizes the pre-disaster mitigation plan developed by the Wasatch Front Regional Council. This pre-disaster mitigation plan serves to reduce the region's vulnerability to natural hazards. The pre-disaster mitigation plan is intended to promote sound public policy and protect or reduce the vulnerability of the citizens, critical facilities, infrastructure, private property, and the natural environment within the region.

The hazard analysis table provides information to understand risks and their corresponding likelihood and consequences in Bluffdale City.

Hazard	Location (Geographic Area Affected)	Magnitude, Strength (Maximum Probable Extent)	Probability of Future Events	Overall Significance
Avalanche	Negligible	Weak	Unlikely	Low
Dam Failure	Negligible	Weak	Unlikely	Low
Drought	Limited	Moderate	Occasional	Moderate
Earthquake	Extensive	6.0-7.0+ Extreme	Occasional	High
Flood	Limited	Moderate	Occasional	Low
Infestation	Negligible	Weak	Unlikely	Low
Landslide	Limited	Moderate	Occasional	Low
Pandemic	Extensive	Weak	Occasional	Low
Problem Soils	Negligible	Weak	Occasional	Low
Radon	Extensive	Weak	Occasional	Low
Severe Weather	Extensive	Moderate	Occasional	High
Wildfire	Significant	Severe	Likely	High

Table 3.3. Bluffdale City Hazard Analysis Table

Definitions for Classifications

Location (Geographic Area Affected)

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

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

Weak: Limited classification on scientific scale, slow speed of onset or short duration of event, resulting in little to no damage

Moderate: Moderate classification on scientific scale, moderate speed of onset or moderate duration of event, resulting in some damage and loss of services for days
Severe: Severe classification on scientific scale, fast speed of onset or long duration of event, resulting in devastating damage and loss of services for weeks or months
Extreme: Extreme classification on scientific scale, immediate onset or extended duration of event, resulting in catastrophic damage and uninhabitable conditions

Hazard	Scale/Index	Weak	Moderate	Severe	Extreme
Drought	Palmer Drought Severity Index	-1.99 to 1.99	-2.00 to -2.99	-3.00 to -3.99	-4.00 and below
Earthquake	Modified Mercalli Scale	I to IV	V to VII	VIII	IX to XII
	Richter Magnitude	2,3	4,5	6	7,8
Tornado	Fujita Tornado Damage Scale	F0	F1, F2	F3	F4, F5

Table 3.4. Examples

Probability of Future Events

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

Overall Significance

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

4. Vulnerability Assessment

This vulnerability assessment analyzes the population, property, and other assets at risk to hazards.

4.1. Assets at Risk

This section considers Bluffdale's assets at risk, including values at risk, critical facilities and infrastructure, economic assets, and growth and development trends.

Values at Risk
The following table shows the 2014 assessed property data from Salt Lake County for the City of Bluffdale.

Parcel Count	Land Value	Building Value	Total Value
3,453	$776,681,410	$516,602,100	$1,293,283,510

Table 4.1. Bluffdale's Risk Values

Critical Facilities and Infrastructure

A critical facility may be defined as one that is essential in providing utility or direction either during the response to an emergency or during the recovery operation. Essential facilities are those that if damaged would have devastating impacts on disaster response and recovery. High potential loss facilities are those that would have a high loss or impact on the community. Transportation and lifeline facilities are the third category.

Essential Facilities

The following table shows essential facilities that are located within Bluffdale.

Facility	Address
Bluffdale Elementary	14323 S 2700 W
Bluffdale Fire Station (Police & Fire)	14350 S 2200 W
Bluffdale Public Works Building	14175 S Redwood Rd
Camp Williams	17800 S Camp Williams Rd
North Star Academy	2920 W 14010 S
South Valley Sewer District	1253 W Jordan Basin Ln
Summit Academy Elementary	15327 S Noell Nelson Dr
Summit Academy High School	14942 S Porter Rockwell Blvd

Table 4.2. Bluffdale's Essential Facilities

Transportation and Lifeline Facilities

Several important transportation and lifeline facilities are located within Bluffdale. I-15, though not located within the City's boundaries, makes up the vast majority of Bluffdale's eastern boundary. Redwood Rd and Bangerter Hwy, both significant state highways, run through the City. Several miles of a major freight and passenger rail line operated by Union Pacific and UTA also run through Bluffdale.

Because of Bluffdale's unique location, seven major canals, several aqueducts, two major power corridors, and a major gas line corridor are located in Bluffdale.

4.2. Regulatory Mitigation Capabilities

This table outlines regulatory mitigation capabilities, including planning and land management tools, typically used by local jurisdictions to implement hazard mitigation activities and indicates those that exist in Bluffdale.

Regulatory Tool	*Yes/No*	*Comments*
General plan	*Yes*	*Adopted 2014*
Zoning ordinance	*Yes*	*Adopted 2000, as amended*
Subdivision ordinance	*Yes*	*Adopted 2001, as amended*
Site plan review requirements	*Yes*	*Adopted 2008, as amended*
Floodplain ordinance	*Yes*	*Adopted 2009*
Other special purpose ordinance (stormwater, water conservation, wildfire)	*Yes*	*Adopted 2013*
Building code	*Yes*	*Adopted 2002, as amended*
Fire department ISO rating	*Yes*	*6*
Erosion or sediment control program	*Yes*	*Adopted 2013*
Stormwater management program	*Yes*	*Adopted 2013*
Capital improvements plan	*Yes*	*Adopted 2013*
Economic development plan	*Yes*	*Adopted 2013*
Local emergency operations plan	*Yes*	*Adopted 2011*

Table 4.3. Bluffdale's Regulatory Mitigation Capabilities

5. Mitigation Strategy

5.1 Mitigation Actions

The mitigation priorities in Bluffdale are based on the risk assessment, and therefore focus on earthquakes, floods, severe weather, and wildfires. Each hazard listed on the hazard analysis will, however, be included. As needs in Bluffdale change, strategies and additional actions will be developed. Below are the strategies now in place and planned for the future.

5.1.1 Earthquakes:

- Continue to work toward our goal of having a completely operational Emergency Operations Center in Bluffdale, including training staff, securing equipment, gathering supplies, and exercise.
- Continue to improve our communications system. Much progress has been made in this area, including a repeater for Public Works radios.
- Continue to update and enforce State building codes that require structures to be built with earthquake resistant construction methods.
- Work toward relocating our Public Works Department to an earthquake-safe building—this is in the planning stages and will occur sometime in the future.
- Help property owners identify privately owned buildings and encourage them to retrofit those that are determined to be substandard.
- Continue to educate the public regarding emergency preparedness. This includes:
  1. Emergency preparedness articles written in the monthly newsletter
  2. Promoting September as Emergency Preparedness Month
  3. Continuing to establish our Bluffdale City Neighborhood Emergency Plan
  4. Involving the whole city in Utah Shakeout events, including neighborhood drills and POD exercise where residents bring a clean gallon-sized container to get their water for their meal from the Jordan Valley Water Conservancy District water trailer. This exercise also includes lunch, teddy bear first aid station, emergency and HAM radio information, and prize giveaways.

Responsible offices: Emergency Management, Public Works, Planning, and Engineering
Priority: High
Schedule: Now and on-going
Cost Estimate: $40,000.00 (EMPG Grant and city budget) does not include cost for new earthquake-safe building for Public Works Department.

5.1.2 Flood:

- Determine potential flood impacts and identify areas in need of additional flood control infrastructure.

- Address identified problems through construction of debris basins, flood retention ponds, energy dissipaters or other flood control structures.
- Provide maintenance, repairs, and improvements to drainage structures, storm water systems, and flood control structures.
- Establish maintenance and repair programs to remove debris, improve resistance and otherwise maintain effectiveness of storm water and flood control systems.
- Reduce threat of unstable or inadequate flood control structures. Identify, assess, and modify as needed.
- Educate home and property owners regarding the risks of flooding.
- Identify potential flooding of Wood Hollow, Beef Hollow, and Rose Creek drainages.
- Continue to enforce floodplain regulations as they apply to new housing developments.

Responsible Offices: Public Works, Planning, Engineering
Priority: Medium and High
Schedule: Now and ongoing
Cost Estimate: $35,000.00 (city budget)

5.1.3 Severe Weather:

- Continue our work toward preparing our community to be storm ready, including:
  1. Receive information from NWS annually of new services and alerts as available.
  2. Include in our Neighborhood Emergency Plan the importance of caring for our older residents who will need help during severe weather.
  3. Continue to educate all residents about how to prepare for severe weather.

Responsible Offices: Emergency Management, Public Works, Fire Department
Priority: Medium and High
Schedule: Now and ongoing
Cost Estimate: $11,000.00 (City Budget)

5.1.4 Wildfires:

- Continue to urge resident preparation through seasonal articles in the monthly newsletter
- Create evacuation plans for high risk areas
- Continue to assess existing water flow capabilities and address deficiencies.
- Continue to keep Wildland-Urban Interface as an important element to our development and insure that developers follow our city code for road accessibility and availability of water flow for fire response.

Responsible Offices: Emergency Management, Public Works, Police, Fire
Priority: Medium
Schedule: Now and ongoing.
Cost Estimate: $15,000.00 (city budget)

5.1.5 Dam Failure:

- As indicated in B.3.2, Hazard Analysis, there are several diversion structures that direct the Jordan River water into canals. These diversion dams and canals are owned and managed privately. Each canal company has a risk assessment for their canals. Salt Lake County Flood Control District should have information on the flooding risk of these structures. The mitigation responsibility lies with these organizations, and not with Bluffdale City, and therefore the overall significance is low and there is no Responsible Office or no Cost Estimate assigned.

Responsible Offices: Individual canal companies
Priority: Low

5.1.6 Pandemic:

- Bluffdale City will respond to a pandemic issue as directed by the Salt Lake County Health Department and will, when directed, incorporate all reasonable strategies. At this time there are no strategies and no cost estimate.

5.1.7 Avalanche, Infestation, Landslide, Problem Soils, Radon:

- The overall significance to Bluffdale for these hazards is Low. This means that these have a minimal or unknown record of occurrences or have minimal mitigation potential. For this reason, Bluffdale has no current strategies to mitigate these hazards. Therefore, there is no Responsible Office or no Cost Estimate assigned.

Integration of data, information, and mitigation goals and action plans:

Bluffdale will integrate mitigation strategies into its building codes, the planning commission, and the actions of the City Council and other relevant agencies by education by the Emergency Manager during daily, weekly, and monthly city and public meetings.

6. Plan Review, Evaluation, Implementation & Maintenance

6.1. Annual Review Process

The Emergency Manager will be responsible for monitoring the Plan and making revisions and updates. This responsibility will include meeting yearly with the Hazards Mitigation Planning Committee (agency directors or designees from Public Works, Fire, Police, Planning, and Engineering) to ensure that the goals and objectives for the city are kept current and that local mitigation strategies are being carried out.

If it becomes necessary to revise the Plan more often than yearly due to lessons learned from a specific disaster or as required by the Utah Division of Emergency Management, the Emergency Manager may call the Committee together to make the necessary changes.

The Plan will be amended and updated as needed.

6.2. Five Year Plan Review

The entire Mitigation Plan including any background studies and analysis shall be revised and updated as needed every five years by Bluffdale City to determine if there have been any significant changes in the city that would affect the Plan. Increased development, increased exposure to certain hazards, the development of new mitigation capabilities or techniques, and changes to Federal or State legislation are examples of changes that may affect the condition of the Plan

6.3. Maintenance Evaluation Process

It will be the responsibility of the designated Emergency Manager, City Manager, Mayor and City Council Members to ensure these actions are carried out no later than the target dates unless reasonable circumstances prevent their implementation (i.e. lack of funding availability.)

6.4. Funding Sources

Although all mitigation techniques will likely save money by avoiding losses, many projects are costly to implement. Bluffdale City shall continue to seek outside funding assistance for mitigation projects in both the pre-disaster and post-disaster environment, subject to budget constraints and available funding sources.

The following federal grant programs have been identified as funding sources which specifically target hazard mitigation projects:

Title: Pre-Disaster Mitigation Program
Agency: Federal Emergency Management Agency

Through the Disaster Mitigation Act of 2000, Congress approved the creation of a national program to provide a funding mechanism that is not dependent on a Presidential Disaster Declaration. The Pre-Disaster Mitigation (PDM) program provides funding to states and communities for cost-effective hazard mitigation activities that complement a comprehensive mitigation program and reduce injuries, loss of life, and damage and destruction of property. The funding is based upon a 75% Federal share and 25% non-Federal share. The non-Federal match can be fully in-kind or cash, or a combination. Special accommodations will be made for "small and impoverished communities", who will be eligible for 90% Federal share/10% non-Federal. FEMA provides PDM grants to states that, in turn, can provide sub-grants to local governments for accomplishing the following eligible mitigation activities:

- *State and local Natural Hazard Pre-Disaster Mitigation Planning*
- *Technical assistance (e.g. risk assessments, project development)*
- *Mitigation Projects*
- *Acquisition or relocation of vulnerable properties*
- *Hazard retrofits*
- *Minor structural hazard control or protection projects*
- *Community outreach and education (up to 10% of State allocation)*

Title: Flood Mitigation Assistance Program
Agency: Federal Emergency Management Agency

FEMA's Flood Mitigation Assistance program (FMA) provides funding to assist states and communities in implementing measures to reduce or eliminate the long-term risk of flood damage to buildings, manufactured homes and other structures insurable under the National Flood Insurance Program (NFIP). FMA was created as part of the National Flood Insurance Reform Act of 1994 (42 USC 4101) with the goal of reducing or eliminating claims under the NFIP.

FMA is a pre-disaster grant program, and is available to states on an annual basis. This funding is available for mitigation planning and implementation of mitigation measures only, and is based upon a 75% Federal share/25% non-Federal share. States administer the FMA program and are responsible for selecting projects for funding from the applications submitted by all communities within the state. The state then forwards selected applications to FEMA for an eligibility determination. Although individuals cannot apply directly for FMA funds, their local government may submit an application on their behalf.

Title: Hazard Mitigation Grant Program
Agency: Federal Emergency Management Agency

The Hazard Mitigation Grant Program (HMGP) was created in November 1988 through Section 404 of the Robert T. Stafford Disaster Relief and Emergency Assistant Act. The HMGP assists states and local communities in implementing long-term mitigation measures following a Presidential disaster declaration.

To meet these objectives, FEMA can fund up to 75% of the eligible costs of each project. The state or local cost-share match does not need to be cash; in-kind services or materials may also be used. With the

passage of the Hazard Mitigation and Relocation Assistance Act of 1993, federal funding under the HMGP is now based on 15% of the federal funds spent on the Public and Individual Assistance programs (minus administrative expenses) for each disaster.

The HMGP can be used to fund projects to protect either public or private property, so long as the projects in question fit within the state and local governments overall mitigation strategy for the disaster area, and comply with program guidelines. Examples of projects that may be funded include the acquisition or relocation of structures from hazard-prone areas, the retrofitting of existing structures to protect them from future damages; and the development of state or local standards designed to protect buildings from future damages.

Eligibility for funding under the HMGP is limited to state and local governments, certain private nonprofit organizations or institutions that serve a public function, Indian tribes and authorized tribal organizations. These organizations must apply for HMPG project funding on behalf of their citizens. In turn, applicants must work through their state, since the state is responsible for setting priorities for funding and administering the program.

Title: Public Assistance (Infrastructure) Program, Section 406
Agency: Federal Emergency Management Agency

FEMA's Public Assistance Program, through Section 406 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act, provides funding to local governments following a Presidential Disaster Declaration for mitigation measures in conjunction with the repair of damaged public facilities and infrastructure.

The mitigation measures must be related to eligible disaster related damages and must directly reduce the potential for future, similar disaster damages to the eligible facility. These opportunities usually present themselves during the repair/replacement efforts.

Proposed projects must be approved by FEMA prior to funding. They will be evaluated for cost effectiveness, technical feasibility and compliance with statutory, regulatory and executive order requirements. In addition, the evaluation must ensure that the mitigation measures do not negatively impact a facility's operation or risk from another hazard.

Public facilities are operated by state and local governments, Indian tribes or authorized tribal organizations and include:

- *Roads, bridges & culverts*
- *Draining & irrigation channels*
- *Schools, city halls & other buildings*
- *Water, power & sanitary systems*
- *Airports & parks*

Private nonprofit organizations are groups that own or operate facilities that provide services otherwise performed by a government agency and include, but are not limited to the following:

- *Universities and other schools*
- *Hospitals & clinics*
- *Volunteer fire & ambulance*
- *Power cooperatives & other utilities*

- *Custodial care & retirement facilities*
- *Museums & community centers*

Title: Small Business Administration (SBA) Disaster Assistance Program
Agency: U.S. SBA
The SBA Disaster Assistance Program provides low-interest loans to businesses following a Presidential disaster declaration. The loans target businesses to repair or replace uninsured disaster damages to property owned by the business, including real estate, machinery and equipment, inventory and supplies. Businesses of any size are eligible, along with non-profit organizations.

SBA loans can be utilized by their recipients to incorporate mitigation techniques into the repair and restoration of their business.

Title: Community Development Block Grants
Agency: US Department of Housing and Urban Development
The Community Development Block Grant (CDBG) program provides grants to local governments for community and economic development projects that primarily benefit low- and moderate-income people. The CDBG program also provides grants for post-disaster hazard mitigation and recovery following a Presidential disaster declaration.

Funds can be used for activities such as acquisition, rehabilitation or reconstruction of damaged properties and facilities and for the redevelopment of disaster areas.

Besides the above-mentioned programs, funding may be available from these sources:

Local
Local governments depend upon local property taxes as their primary source of revenue. These taxes are typically used to finance services that must be available and delivered on a routine and regular basis to the general public. If local budgets allow, these funds are used to match Federal or State grant programs when required for large-scale projects.

Non-Governmental
Another potential source of revenue for implementing local mitigation projects are monetary contributions from non-governmental organizations, such as private sector companies, churches, charities, community relief funds, the American Red Cross, hospitals, land trusts and other non-profit organizations.

Paramount to having a Plan deemed to be valid is its implementation. There is currently no new fiscal note attached to the implementation of this Plan.

6.5 Continued Public Involvement

Throughout the planning process, public involvement has been and will be critical to the development of the Hazard Mitigation Plan and its updates. The Plan will be available on the

Bluffdale City website to provide opportunities for public participation and comment. The Plan will also be available for review at the offices of Bluffdale City.

Participation
All citizens of the region are encouraged to participate in the planning process, especially those who may reside within identified hazard areas. Adequate and timely notification to all area residents will be given as outlined above to all hearings, forums, and meetings.

Access to Information
Citizens, public jurisdictions, agencies and other interested parties will have the opportunity to receive information and submit comments on any aspect of the Natural Hazards Pre-Disaster Mitigation Plan.

Technical Assistance
Residents as well as local jurisdictions may request assistance in accessing the program and interpretation of mitigation projects.

Public Hearings and Meetings Concerning the Plan
Hearings and meetings concerning the plan will be conveniently timed for people who might benefit most from mitigation programs. Hearings and meeting will be accessible to people with disabilities (accommodations must be requested in advance according to previously established policy).
Hearings and meetings will be adequately publicized. Hearings and meetings may be held for a number of purposes or functions including to: Identify and profile hazards, develop mitigation strategies, and review plan goals, performance and future plans.

Future Revisions
Future revisions of the Hazard Mitigation Plan shall include:

- Expanded vulnerability assessments to include flood inundation.
- Continue the search for more specific mitigation actions.
- An analysis of progress of the Plan as it is revised.
- Expanded look into how the identified natural hazards will affect certain populations including the young and elderly.

Implementation and maintenance of the plan is critical to the overall success of hazard mitigation planning.

7. Hazard Mitigation Plan Adoption

It is the intent of Bluffdale City that this Hazard Mitigation Plan will be adopted by resolution once approved by the State of Utah and FEMA, which approval should be within five years of the previous Hazard Mitigation Plan's approval date. This process will be documented through the Bluffdale City Recorder's office.

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COTTONWOOD HEIGHTS

RESOLUTION 2015-48

A RESOLUTION ADOPTING A NATURAL HAZARD MITIGATION PLAN

WHEREAS, each year in the United States, natural disasters such as earthquakes, tornados, hurricanes, floods, landslides, avalanches, and forest or range fires (collectively, "*natural disasters*") kill hundreds and injure thousands of people and cause billions of dollars in property damage; and

WHEREAS, the future occurrence of natural disasters could have a material, adverse effect on the health, safety and welfare of the residents of the city of Cottonwood Heights (the "*City*"); and

WHEREAS, many natural disasters are predictable, and much of the damage caused by such events can be alleviated or even eliminated through natural hazard mitigation planning, which is the process by which natural hazards that threaten communities are identified, the likely impacts of those hazards are determined, and appropriate strategies to lessen those impacts are identified, prioritized and implemented; and

WHEREAS, the City desires to protect the persons and property of City residents from the adverse impacts of natural disasters to the extent reasonably possible, and therefore has developed a natural hazard mitigation plan (the "*Plan*") which identifies relevant natural hazards and risks as well as the strategy the City will use to decrease its--and its residents'--vulnerability and increase its, and their, resiliency and sustainability; and

WHEREAS, the City's municipal council (the "*Council*") met on 28 July 2015 to consider, among other things, approving, adopting and implementing the Plan; and

WHEREAS, the Council has reviewed the Plan, a copy of which is attached to this resolution; and

WHEREAS, after careful consideration, the Council has determined that it is in the best interests of the health, safety and welfare of the City's residents to approve, adopt and implement the Plan as proposed;

WHEREAS, after careful consideration of the Plan and the recommendations of City's staff and advisors, the Council has determined that it is in the best interest of the health, safety and welfare of the City's residents to so approve, adopt and implement the Plan;

NOW, THEREFORE, BE IT RESOLVED by the city council of the city of Cottonwood Heights that the Council hereby approves, adopts and implements the Plan as proposed, pending any future amendment to or revocation of the Plan; and be it

FURTHER RESOLVED that all actions of the officers, agents and employees of the City that are in conformity with the purpose and intent of this resolution, whether taken before or after the adoption hereof, are hereby ratified, confirmed and approved.

This resolution, assigned no. 2015-48, shall take effect immediately upon passage and posting, or such later date as may be required by Utah statute.

PASSED AND APPROVED this 28th day of July 2015.

ATTEST:

By: _____
Kory Solorio, Recorder

COTTONWOOD HEIGHTS CITY COUNCIL

By _____
J. Scott Bracken, ~~Mayor Pro Tempore~~

VOTING:

Kelvyn H. Cullimore, Jr	Yea ___	Nay ___
Michael L. Shelton	Yea X	Nay ___
J. Scott Bracken	Yea X	Nay ___
Michael J. Peterson	Yea X	Nay ___
Tee W. Tyler	Yea X	Nay ___

DEPOSITED in the office of the City Recorder this 28th day of July 2015.

RECORDED this 28 day of July 2015.

Annex C:
Cottonwood Heights

Hazard Mitigation Plan
October 2014

Developed in compliance with the Disaster Mitigation Act of 2000

Executive Summary

The purpose of hazard mitigation and this plan is to reduce or eliminate long-term risk to people and property from natural hazards and their effects in Cottonwood Heights, Utah. This plan has been prepared to meet the Disaster Mitigation Act of 2000 (DMA 2000) requirements in order to maintain the city's eligibility for FEMA Pre-Disaster Mitigation (PDM) and Hazard Mitigation Grant Programs (HMGP).

The process followed a methodology prescribed by FEMA. It began with the formation of a Emergency Planning Committee (EPC) comprised of key city departments and stakeholder representatives. The planning process examined the recorded history of losses resulting from natural hazards, and analyzed the future risks posed to the city by these hazards. Cottonwood Heights is vulnerable to several natural hazards that are identified, profiled, and analyzed in the plan. Floods, wildfires, and severe weather are some of the hazards that can have a significant impact on the city.

The plan identifies several mitigation goals and objectives that are based on the results of the risk assessment. The plan includes specific actions that the city can implement over time to reduce future losses from hazards. The plan also includes a review of the city's current capabilities to reduce hazard impacts. This plan has been formally adopted by the Cottonwood Heights City Council and is required to be a minimum of every five years.

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ANNEX C: COTTONWOOD HEIGHTS
1 Introduction

1.1 Purpose

The Cottonwood Heights Hazard Mitigation Plan demonstrates the city's commitment to reducing risks from hazards and serves as a tool to help decision makers direct mitigation activities and resources. This plan was also developed to make Cottonwood Heights eligible for certain federal disaster assistance, specifically, the Federal Emergency Management Agency's (FEMA) Hazard Mitigation Grant Program (HMGP), Hazard Mitigation Assistance (HMA) grant program, and Pre-Disaster Mitigation (PDM) program.

1.2 Background and Scope

Each year in the United States, natural disasters take the lives of hundreds of people and injure thousands more. Nationwide, taxpayers pay billions of dollars annually to help communities, organizations, businesses, and individuals recover from disasters. These monies only partially reflect the true cost of disasters, because additional expenses to insurance companies and nongovernmental organizations are not reimbursed by tax dollars. Many natural disasters are predictable, and much of the damage caused by these events can be alleviated or even eliminated.

Hazard mitigation is defined by FEMA as "any sustained action taken to reduce or eliminate long-term risk to human life and property from a hazard event." The results of a three-year, congressionally mandated independent study to assess future savings from mitigation activities provides evidence that mitigation activities are highly cost-effective. On average, each dollar spent on mitigation saves society an average of $4 in avoided future losses in addition to saving lives and preventing injuries (National Institute of Building Science Multi-Hazard Mitigation Council 2005).

Hazard mitigation planning is the process through which natural hazards that threaten communities are identified, likely impacts of those hazards are determined, mitigation goals are set, and appropriate strategies to lessen impacts are determined, prioritized, and implemented. This plan documents Cottonwood Height's natural hazards mitigation planning process, identifies relevant natural hazards and risks, and identifies the strategy the city will use to decrease its vulnerability and increase its resiliency and sustainability.

The Cottonwood Heights Multi-Hazard Mitigation Plan documents the city's natural hazards mitigation planning process, identifies natural hazards and associated risks to the city, and develops a hazards mitigation strategy to lessen vulnerability and improve resiliency to natural disasters, thereby enhancing the city's long-term sustainability.

The city prepared this multi-hazard mitigation plan pursuant to the requirements of the Disaster Mitigation Act of 2000 (Public Law 106-390) and the implementing regulations set forth by the Interim Final Rule published in the Federal Register on February 26, 2002 (44 CFR §201.6), finalized on October 31, 2007, and d in 2014. Hereafter, these requirements and regulations will be referred to collectively as the DMA. While the act emphasized the need for mitigation plans and more coordinated mitigation planning and implementation efforts, the regulations established the requirements that local hazard mitigation plans must meet in order for a local jurisdiction to be eligible for certain federal disaster assistance and hazard mitigation funding under the Robert T. Stafford Disaster Relief and Emergency Act (Public Law 93-288). Because Cottonwood Heights is subject to many kinds of natural hazards, access to these programs is vital.

This plan addresses natural hazards only. Although the Emergency Planning Committee (EPC) recognizes that FEMA encourages communities to address manmade and technological as well as natural hazards, the scope of this effort was limited to natural hazards.

Information in this plan will be used to help guide and coordinate mitigation activities and decisions for local land use policy in the future. Proactive mitigation planning will help reduce the cost of disaster response and recovery to the city and its property owners by protecting critical community facilities, reducing liability exposure, and minimizing overall community impacts and disruption.

1.3 Plan Organization

The Cottonwood Heights Multi-Hazard Mitigation Plan is organized as follows:

Chapter 1: Introduction
Chapter 2: Community Profile
Chapter 3: Planning Process
Chapter 4: Risk Assessment
Chapter 5: Mitigation Strategy
Chapter 6: Plan Adoption
Chapter 7: Plan Implementation and Maintenance

2 Community Profile

Cottonwood Heights is located on the southeast side of the Salt Lake Valley. It is a home-rule municipality with a council-manager form of government. The elected City Council, which consists of the mayor and four council members, sets the policies for the operation of the city government and appoints the city manager, who is tasked with the administrative responsibilities of the city.

2.1 Geography and Climate

At an elevation of 4,900 feet above sea level, the city is located along the foothills of the Wasatch Mountains.

The climate is generally semiarid with a series of extremes occurring throughout the winter and summer seasons. Most precipitation occurs during the winter and spring months with an average annual precipitation of 9 inches of rain and 48.4 inches of snow. In winter, temperatures can plunge to minus 10°F. Winter also brings snowstorms that regularly result in a foot or more of snow

In summer, temperatures can be in the upper 90s. These hot temperatures are moderated by low humidity that can drop into the single digits at times.

Figure 2.1 City of Cottonwood Heights

2.2 History

Big Cottonwood Canyon was the main source of logs and lumber for the homes of the pioneers in the Salt Lake Valley, and this area became an overnight stopping point for the lumber wagons. The area also became an overnight stop for the wagons bringing granite out of Little Cottonwood Canyon for the building of the Salt Lake Temple and many other buildings. Soon there was a store, post office, brewery and tavern along Big Cottonwood Creek near the place where the Old Mill stands today.

Among the earliest settlers of the area were six colorful brothers, the "Butler Brothers" who were lumbermen – complete with wagons, teams and sawmills. There were also four McGhie brothers and their families. Legend has it that they called a town meeting to organize their community and there was one more Butler than McGhie at the meeting, therefore the community was named "Butler" rather than "McGhie". Natives differ on this name; some say it was named "Butlerville" and other say the "ville" was just a nickname. Officially the area is called "Cottonwood Heights" by Salt Lake County, but it is still called Butler or Butlerville by some.

Lumber wasn't the only natural resource taken out of the canyon. Millions of dollars worth of gold, lead and silver have been mined. Underground water, the high cost of production and diminishing veins all contributed to the closure of the mines. The communities in the canyons are flourishing today as recreation areas. Picnic and camp areas abound.

The Butler region has been a fine area for fruit growing as well as dairy feed. There was also some poultry and (later) mink farming. These have almost entirely given way to homes and families.

One of the highlights of this area's history was the Deseret Paper Mill – the "Old Mill" situated along Big Cottonwood Creek about a mile below the mouth of the canyon. It was built in 1861 to make paper for the Deseret News. The paper was made with wood pulp taken from the canyons and rags gathered by families in the valley.

One area of Cottonwood Heights is located on a large sandbar left over from the ancient Lake Bonneville that filled the Salt Lake Valley centuries ago. It is located between the two most majestic features along the Wasatch Front – Big and Little Cottonwood Canyons. This sandbar rises hundreds of feet above the valley floor. On the North it tapers gently to the valley floor allowing a gradual, nearly nondescript access from the lower to the higher ground.

Because it was high and very dry, the earliest settlements in the area were located along the Little Cottonwood Creek, which lay will below the South and West bluff sides. It was along this creek that the old Union Fort was built to accommodate the first day's travel for wagons carrying block from the quarry in Little Cottonwood Canyon to build the Salt Lake Temple.

Since water is always critical to the development of an area, the top flatland of the sandbar was too dry and desolate to attract settlers. And while the Little Cottonwood creek was the closest, it

was also the least available because of the high bluff. It was apparently this problem that earned this particular portion of Cottonwood Heights its first name – "Poverty Flats." Water was then brought from Big Cottonwood creek down from the mouth of the canyon to enable farms and orchards to be established. Early settlers established small farms producing hay, wheat and a variety of vegetable crops. Yet, the area was most widely known for its fruit production.

While the name "Poverty Flats" continues, the undaunted families who settled here went on to produce an inordinate number of college graduates in law, business, medicine, engineering and education. The name was changed from Poverty Flats to Butlerville and then changed when the area became a part of a larger community now known as Cottonwood Heights.

Our neighborhood is in a highly unique location. We have ready access to medical facilities, fire, police and a vast variety of business establishments. We can readily access the freeway system, the major ski resorts and we are only about 15 to 20 minutes away from major events and destinations anywhere in the valley.

2.3 Economy

The City serves as a sub-regional market to the Greater Salt Lake Metropolitan area, providing class A office, world-class outdoor, recreational amenities and well-established residential neighborhoods.

Currently, the City's five largest employers are Blue Cross & Blue Shield (Finance and Insurance), Home Depot (Retail Trade), Jet Blue (Leisure & Hospitality), Canyons School District (Educational Services), Overstock.com (Retail Trade), and Target (Retail Trade). The City has a high concentration of office parks with limited industry users. As with many other communities in Salt Lake County, the City has not been immune from the effects of the domestic and international economic slowdown. Economic development in the City has been very active in recent years but still struggles in the highly competitive recruitment of some major businesses.

2.4 Demographics

According to the U.S. Census Bureau, Cottonwood Heights' 2010 population was estimated at 34,017.

Demographic	
Gender/Age	
Male	48.9%
Female	51.1%
Under 5 years	4%
65 years and over	9.9%
Race	
White	94.0%
Black or African American	0.7%
American Indian and Alaska native	0.3%
Asian	2.3%
Native Hawaiian or Pacific Islander	1.1%
Other	3.2%
Two or more races	2.6%
Other	
Average household size	2.92
Population with a disability	4.8%
Median family income, 2010	$70,083
Per capita income, 2010	$26,935
Families below poverty level, 2010	3.9%
Individuals below poverty level, 2010	21.1%
Median home value	$391,300

Source: U.S. Census Bureau, 2010

Table 2.1. Census 2010 Demographic Characteristics for Cottonwood Heights

3 Planning Process

Requirements §201.6(b) and §201.6(c)(1):
An open public involvement process is essential to the development of an effective plan. 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.
[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.

3.1 Background

Mitigation Planning in Cottonwood Heights

The planning process and development of Cottonwood Heights Multi-Hazard Mitigation Plan has its roots in meetings and activities that began in 2005 and continues today.

3.2 Local Government Participation

The DMA planning regulations and guidance stress that each local government seeking FEMA approval of their mitigation plan must participate in the planning effort in the following ways:

Participate in the process,
Detail areas within the planning area where the risk differs from that facing the entire area, identify specific projects to be eligible for funding, and have the governing board formally adopt the plan.

For Cottonwood Heights EPC members, “participation” meant:

Attending and participating in the EPC meetings, providing available data requested of the EPC, reviewing and providing comments on the plan drafts, advertising, coordinating, and participating in the public input process.

3.3 The Planning Process

The planning process for Cottonwood Heights plan used the DMA planning requirements and FEMA's guidance. This guidance is structured around a four-phase process:

Organize Resources
Assess Risks
Develop the Mitigation Plan
Implement the Plan and Monitor Progress

3.3.1 Phase 1: Organize Resources

Planning Step 1: Organize the Planning Effort

Cottonwood Heights' commitment to participate in the DMA planning process, resulted in the establishment of a team approach for development of the plan. The EPC, which was comprised of key city, county, and other local government and stakeholder representatives, developed the plan with leadership from the city's emergency manager. The list of participating EPC individuals is provided below:

City Staff

Communications Specialist Emergency Management
Finance
Information Technology/Geographic Information Systems
Emergency Management
Planning - Engineering
Police Department
Public Works

Other Government and Stakeholder Representatives:

American Red Cross
Salt Lake County Office of Emergency Management
Salt Lake Valley Cities and Towns
Salt Lake County Public Health

During the planning process, the EPC communicated through face-to-face meetings, e-mail, and a file transfer protocol (FTP) site with participating agencies. Draft documents were posted on this FTP site so that the EPC members could easily access and review them.

Planning Step 2: Involve the Public

At the kick-off meeting, the EPC discussed options for public involvement and agreed to an approach using established public information mechanisms and resources within the community.

Early in the process a Public Participation Plan (PPP) was developed. The purpose of the PPP was to outline the public participation requirements of the DMA and CRS program and identify ways to best engage the public.

Planning Step 3: Coordinate with Other Departments and Agencies

Early in the planning process, the EPC determined that data collection, mitigation strategy development, and plan approval would be greatly enhanced by inviting state and federal agencies and organizations to participate in the process. Based on their involvement in hazard mitigation planning, their landowner status in the county, and/or their interest as a neighboring jurisdiction, representatives from the following agencies were invited to participate on the EPC:

American Red Cross
FEMA Region VIII

Other Community Planning Efforts and Hazard Mitigation Activities

Hazard mitigation planning involves identifying existing policies, tools, and actions that will reduce a community's risk and vulnerability from natural hazards. As such, this plan was coordinated with, and builds off of, other related planning efforts that help reduce hazard losses. Cottonwood Heights uses a variety of comprehensive planning mechanisms, such as a master plan, an emergency response plan, and city policies, to guide growth and development. Integrating existing planning efforts and mitigation policies and action strategies into this multi- hazard mitigation plan establishes a credible and comprehensive plan that ties into and supports other community programs.

Other documents were reviewed and considered, as appropriate, during the collection of data to support.

3.3.2 Phase 2: Assess Risks

Salt Lake County led the EPC in a comprehensive research effort to identify and document all the natural hazards that have, or could, impact the city. Where data permitted, geographic information systems (GIS) were used to display, analyze, and quantify hazards and vulnerabilities. The EPC also completed a mitigation capability assessment to review and document the city's current capabilities to mitigate risk and reduce vulnerability from natural hazards. By collecting information about existing government programs, policies, regulations, ordinances, and emergency plans, the EPC can assess those activities and measures already in place that contribute to mitigating some of the risks and vulnerabilities previously identified

3.3.3 Phase 3: Develop the Mitigation Plan

Salt Lake County facilitated brainstorming and discussion sessions with the EPC that described the purpose and the process of developing planning goals and objectives, a comprehensive range of mitigation alternatives, and a method of selecting and defending recommended mitigation actions using a series of selection criteria. This information is included in Chapter 5: Mitigation Strategy.

Based on input from the EPC regarding the draft risk assessment and the goals and activities identified in Planning Steps 6 and 7, Salt Lake County produced a complete draft of the plan. This draft was posted for EPC review and comment on the FTP site. Other agencies were invited to comment on this draft as well. EPC and agency comments were integrated into the draft, which was distributed to collect public input and comments.

3.3.4 Phase 4: Implement the Plan and Monitor Progress

In order to secure buy-in and officially implement the plan, the Cottonwood Heights City Council adopted the plan by resolution.

The true worth of any mitigation plan is in the effectiveness of its implementation. Up to this point in the process, all of the EPC's efforts have been directed at researching data, coordinating input from participating entities, and developing appropriate mitigation actions. Each recommended action includes key descriptors, such as a lead manager and possible funding sources, to help initiate implementation. An overall implementation strategy is described in Chapter 7: Plan Implementation and Maintenance.

Finally, there are numerous organizations within the city whose goals and interests interface with hazard mitigation. Coordination with these other planning efforts is paramount to the ongoing success of this plan and mitigation in Cottonwood Heights and is addressed further in Chapter 7. A plan and maintenance schedule and a strategy for continued public involvement are also included in Chapter 7.

4 Risk Assessment

Requirement §201.6(c)(2): [The risk assessment shall provide the] factual basis for activities proposed in the strategy to reduce losses from identified hazards. Local risk assessments must provide sufficient information to enable the jurisdiction to identify and prioritize appropriate mitigation actions to reduce losses from identified hazards.

Risk, as defined by the Federal Emergency Management Agency (FEMA), is a combination of hazard, vulnerability, and exposure. It is the impact that a hazard would have on people, services, facilities, and structures in a community and refers to the likelihood of a hazard event resulting in an adverse condition that causes injury or damage.

The risk assessment process identifies and profiles relevant hazards and assesses the exposure of lives, property, and infrastructure to these hazards. The process allows for a better understanding of a jurisdiction's potential risk to natural hazards and provides a framework for developing and prioritizing mitigation actions to reduce risk from future hazard events.

This risk assessment followed the methodology described in the FEMA publication Understanding Your Risks—Identifying Hazards and Estimating Losses (FEMA 386-2, 2002), which breaks the assessment down to a four-step process:

1) Identify Hazards
2) Profile Hazard Events
3) Inventory Assets
4) Estimate Losses

Data collected through this process has been incorporated into the following sections of this chapter:

Section 4.1: Identifying Hazards identifies the hazards that threaten the planning area and describes why some hazards have been omitted from further consideration.

Section 4.2: Profiling Hazards **discusses** the threat to the planning area and describes previous occurrences of hazard events and the likelihood of future occurrences.

Section 4.3: Assessing Vulnerability assesses the city's total exposure to natural hazards, considering assets at risk, critical facilities, and future development trends.

While not required by FEMA, the Emergency Planning Committee (EPC) also conducted a mitigation capability assessment, which inventoried existing mitigation activities and existing policies, regulations, and plans that pertain to mitigation and can affect net vulnerability. The findings from this undertaking are in ***Section 4.4: Mitigation Capabilities Assessment***.

4.1 Identifying Hazards

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

The EPC conducted a hazard identification study to determine the hazards that threaten the planning area.

Methodology

Using existing natural hazards data and input gained through planning meetings, the EPC agreed upon a list of natural hazards that could affect Cottonwood Heights. Significance of each hazard was measured in general terms and focused on key criteria such as frequency and resulting damage, which includes deaths and injuries and property and economic damage. The natural hazards evaluated as part of this plan include those that have occurred historically or have the potential to cause significant human and/or monetary losses in the future.

Hazards Matrix

Completed By: __Larry Gardner_____ Date:_____06/26/2013_____

Jurisdiction: _Cottonwood Heights_____

Hazard	Location (Geographic Area Affected)	Magnitude, Strength (Maximum Probable Extent)	Probability of Future Events	Overall Significance
Avalanche	Negligible	Weak	Unlikely	Low
Dam Failure	Negligible	Weak	Unlikely	Low
Drought	Extensive	Weak	Occasional	Low
Earthquake	Extensive	Severe	Unpredictable	High
Flood	Negligible	Moderate	Occasional	Low
Infestation				
Landslide	Negligible	Moderate	Unlikely	Low

Pandemic	Negligible	Weak	Unlikely	Low
Problem Soils	Negligible	Weak	Unlikely	Low
Radon				
Severe Weather	Significant	Moderate	Likely	Moderate
Wildfire	Negligible	Moderate	Occasional	Low

Table 4.1. Cottonwood Heights Hazard Matrix

Definitions for Classifications

Location (Geographic Area Affected)

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

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

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

Examples

Hazard	Scale/Index	Weak	Moderate	Severe	Extreme
Drought	Palmer Drought Severity Index	-1.99 to 1.99	-2.00 to -2.99	-3.00 to -3.99	-4.00 and below
Earthquake	Modified Mercalli Scale	I to IV	V to VII	VIII	IX to XII
	Richter Magnitude	2,3	4,5	6	7,8
Tornado	Fujita Tornado Damage Scale	F0	F1, F2	F3	F4, F5

Probability of Future Events

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

Overall Significance

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

4.2 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.

For each hazard, a generic description of the hazard and associated problems is provided along with details specific to Salt Lake County and Cottonwood Heights. Information on past occurrences and the extent or location of the hazard within or near the city and impacts, where known, are also discussed here. To assess the history of natural hazard events in Cottonwood Heights, the EPC evaluated the hazards history for both the city and county. Much of the existing data and statistics are maintained on a countywide basis; therefore, the EPC relied heavily on Salt Lake County data.

The frequency of past events was used to gauge the likelihood of future occurrences. Based on historical data, the frequency of occurrence is categorized into the following classifications:

Highly Likely—Near 100 percent chance of occurrence in next year or happens every year. Likely—Between 10 and 100 percent chance of occurrence in next year or has a recurrence interval of 10 years or less.

Occasional—Between 1 and 10 percent chance of occurrence in the next year or has a recurrence interval of 11 to 100 years.

Unlikely—Less than 1 percent chance of occurrence in next 100 years or has a recurrence interval of greater than every 100 years.

Where possible, frequency was calculated based on existing data. It was determined by dividing the number of events observed by the number of years and multiplying by 100. This gives the percent chance of the event happening in any given year (e.g., three droughts over a 30-year period equates to a 10 percent chance of a experiencing a drought in any given year).

The following sections provide profiles of the natural hazards that the EPC identified in **Section 4.1: Identifying Hazards.**

4.2.1 Avalanche

Hazard/Problem Description

Avalanche hazards occur predominantly in the mountainous regions of Utah. The vast majority of avalanches occur during and shortly after winter storms. Avalanches occur when loading of new snow increases stress at a rate faster than strength develops, and the slope fails. Critical stresses develop more quickly on steeper slopes and where deposition of wind-transported snow is common.

Historically in Utah, avalanches have occurred during the winter and spring months between November and April. The avalanche danger increases with major snowstorms and periods of thaw. The most avalanche-prone months are, in order, February, March, and January. Avalanches caused by thaw occur most often in April.

This hazard generally affects a small number of people, such as snowboarders, backcountry skiers, and climbers who venture into backcountry areas during or after winter storms. Motorists along highways are also at risk of injury and death due to avalanches. Road and highway closures, damaged structures, and destruction of forests are also a direct result of avalanches. Recognizing areas prone to avalanches is critical in determining the nature and type of development allowed in a given area.

Avalanche hazards exist in the canyons of Salt Lake County. The avalanche hazard extent within Cottonwood Heights city limits is considered negligible.

Past Occurrences

There is no history of avalanches in Cottonwood Heights.

Likelihood of Future Occurrences

Unlikely: There is no recorded history of avalanches occurring within city limits. Except within limited areas, the topography of the city is well below the slopes of 25-50 degrees on which data indicate that 98 percent of all avalanches occur.

4.2.2 Dam Failure

Hazard/Problem Description

Dams are manmade structures built for a variety of uses, including flood protection, power, agriculture, water supply, and recreation. Dams typically are constructed of earth, rock, concrete, or mine tailings. Factors that influence the potential severity of a full or partial dam failure are the amount of water impounded and the density, type, and value of development and infrastructure located downstream.

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

Prolonged periods of rainfall and flooding, which result in overtopping
Earthquake
Inadequate spillway capacity resulting in excess overtopping flows
Internal erosion caused by embankment or foundation leakage or piping or rodent activity
Improper design, Improper maintenance, Negligent operation
Failure of upstream dams on the same waterway

Overtopping is the primary cause of earthen dam failure.

Water released by a failed dam generates tremendous energy and can cause a flood that is catastrophic to life and property. A catastrophic dam failure could challenge local response capabilities and require evacuations to save lives. Impacts to life safety will depend on the warning time and the resources available to notify and evacuate the public. Major loss of life could result as well as potentially catastrophic effects to roads, bridges, and homes. Associated water quality and health concerns could also be an issue.

In general, there are three types of dams: concrete arch or hydraulic fill, earth-rockfill, and concrete gravity. Each type of dam has different failure characteristics. A concrete arch or hydraulic fill dam can fail almost instantaneously: the flood wave builds up rapidly to a peak then gradually declines. An earth-rockfill dam fails gradually due to erosion of the breach: a flood wave will build gradually to a peak and then decline until the reservoir is empty. And, a concrete gravity dam can fail instantaneously or gradually with a corresponding buildup and decline of the flood wave.

Past Occurrences

According to historical data, there have been no dam failures in Cottonwood Heights

Likelihood of Future Occurrences

Unlikely: Based on historical data indicating that there have been no dam failures in the past that adversely impacted Cottonwood Heights, the risk of future occurrences is unlikely.

4.2.3 Drought

Hazard/Problem Description

Drought is a gradual phenomenon. Although droughts are sometimes characterized as emergencies, they differ from typical emergency events. Most natural disasters, such as floods or forest fires, occur relatively rapidly and afford little time for preparing for disaster response. Droughts occur slowly, over a multi-year period, and it is often not obvious or easy to quantify when a drought begins and ends.

Past Occurrences

Cottonwood Heights is susceptible to severe drought conditions. Historically the city as well as the county and region have experienced drought conditions.

Likelihood of Future Occurrences

Likely: According to historical data, Cottonwood Heights has experienced several periods of drought.
Given the geographic location of the planning area, it is highly probable the city will experience future drought condition.

4.2.4 Earthquakes

Hazard/Profile Description

An earthquake is caused by a sudden slip on a fault. Stresses in the earth's outer layer push the sides of the fault together. Stress builds up and the rocks slip suddenly, releasing energy in waves that travel through the earth's crust and cause the shaking that is felt during an earthquake. The amount of energy released during an earthquake is usually expressed as a Richter magnitude and is measured directly from the earthquake as recorded on seismographs. Another measure of earthquake severity is intensity. Intensity is an expression of the amount of shaking at any given location on the ground surface as felt by humans and defined in the Modified Mercalli scale (see Table 4.5). Seismic shaking is typically the greatest cause of losses to structures during earthquakes.

Modified Mercalli		Richter
I	Instrumental: detected only by seismographs	3.5
II	Feeble: noticed only by sensitive people	4.2

Modified Mercalli Intensity	Description	Richter Magnitude
III	Slight: like the vibrations due to a passing train; felt by people at rest, especially on upper floors	4.3
IV	Moderate: felt by people while walking; rocking of loose objects, including standing houses	4.8
V	Rather strong: felt generally; most sleepers are awakened and bells ring	4.9-5.4
VI	Strong: trees sway and all suspended objects swing; damage by overturning and falling of loose objects	5.5-6.0
VII	Very strong: general alarm; walls crack; plaster falls	6.1
VIII	Destructive: car drivers seriously disturbed; masonry fissured; chimneys fall; poorly constructed buildings damaged	6.2
IX	Ruinous: some houses collapse where ground begins to crack, and pipes break open	
X	Disastrous: ground cracks badly; many buildings destroyed and railway lines bent; landslides on steep slopes	7.0-7.3
XI	Very disastrous: few buildings remain standing; bridges destroyed; all services (railways, pipes and cables) out of action; great landslides and floods	7.4-8.1
XII	Catastrophic: total destruction; objects thrown into air; ground rises and falls in waves	>

Source: Math/Science Nucleus.Org

Table 4.5. Earthquake Intensities with Approximate Corresponding Magnitudes

Earthquakes can cause structural damage, injury, and loss of life, as well as damage to infrastructure networks, such as water, power, communication, and transportation lines. Other damage-causing effects of earthquakes include surface rupture, fissuring, settlement, and permanent horizontal and vertical shifting of the ground. Secondary impacts can include landslides, seiches, liquefaction, fires, and dam failure.

Utah is considered a region of earthquake activity. Since earthquakes affect large areas the earthquake hazard extent within city limits is considered extensive, potentially impacting 50-100% of the planning area.

Past Occurrences

Utah's earthquake hazard and risk has historically been rated high.

Likelihood of Future Earthquake Occurrences

Occasional: Because the occurrence of earthquakes is probable in Utah and the historical earthquake record identifies earthquake activity along the Wasatch Mountains, it is likely, Cottonwood Heights will experience an earthquake in the future.

4.2.5 Floods

Hazard/Problem Description

Floods can be among the most frequent and costly natural disaster in terms of human hardship and economic loss and can be caused by a number of different weather events. Floods can cause injuries and deaths and substantial damage to structures, landscapes, and utilities. Certain health hazards are also common to flood events. Standing water and wet materials in structures can become a breeding ground for microorganisms such as bacteria, mold, and viruses. This can cause disease, trigger allergic reactions, and damage materials long after the flood. Direct impacts such as drowning can be limited with adequate warning and public education about what to do during floods. Where flooding occurs in populated areas, warning and evacuation will be critical to reduce life and safety impacts. Communities in Salt Lake County, including Cottonwood Heights, are susceptible to various types of flood events. Cottonwood Heights has identified flood prone areas and reviews any potential development in these areas. In addition, the city works with watershed officials to mitigate obstructions during spring runoff to minimize the chance of flooding.

Past Occurrences

Cottonwood Heights has experienced flooding along Cottonwood Creek as recently as 2010. However, the city does not have any repetitive loss properties. It does participate in the NFIP.

The City's Community Development Director/Planning Department oversee enforcement of floodplain management requirements adopted by the City, including regulating new construction in Special Flood Hazard Areas (SFHAs); Floodplain identification and mapping, including any local requests for map updates; and Description of community assistance and monitoring activities.

Likelihood of Future Occurrences

Likely: Localized stormwater flooding at some location in Cottonwood Heights generally occurs on an annual basis. The extent of damage varies.

4.2.6 Human Health Hazards: Pandemic Flu

Hazard/Problem Description

A pandemic is a global disease outbreak. A pandemic flu is a virulent human flu that causes a global outbreak, or pandemic, of serious illness. Flu pandemic occurs when a new influenza virus emerges for which people have little or no immunity, and for which there is no vaccine. This disease spreads easily person-to-person, causes serious illness, and can sweep across the country and around the world in very short time. The U.S. Centers for Disease Control and Prevention has been working closely with other countries and the World Health Organization to strengthen systems to detect outbreaks of influenza that might cause a pandemic and to assist with pandemic planning and preparation.

Most recently, health professionals are concerned by the possibility of an avian (or bird) flu pandemic associated with a highly pathogenic avian H5N1 virus. Since 2003, avian influenza has been spreading through Asia. A growing number of human H5N1 cases contracted directly from handling infected poultry have been reported in Asia, Europe, and Africa, and more than half the infected people have died. There has been no sustained human-to-human transmission of the disease, but the concern is that H5N1 will evolve into a virus capable of human-to-human transmission.

An especially severe influenza pandemic could lead to high levels of illness, death, social disruption, and economic loss. Impacts could range from school and business closings to the interruption of basic services such as public transportation, health care, and the delivery of food and essential medicines. Since the hazard can affect 50-100% of the planning area it was given an extensive geographic extent rating.

Likelihood of Future Occurrences

Occasional: According to historical data, four influenza pandemics have occurred since 1918. This is an average of a pandemic approximately every 24 years or an approximate 4 percent chance of pandemic in any given year.

Although scientists cannot predict when the next influenza pandemic will occur or how severe it will be, wherever and whenever it starts, everyone around the world will be at risk. If an influenza pandemic does occur, it is likely that many age groups would be seriously affected. The greatest risks of hospitalization and death—as seen during the last two pandemics in 1957 and 1968 as well as during annual outbreaks of influenza—will be to infants, the elderly, and those with underlying health conditions. However, in the 1918 pandemic, most deaths occurred in young adults. Few people, if any, would have immunity to the virus.

4.2.7 Human Health Hazards: West Nile Virus

Hazard/Problem Description

The impact to human health that wildlife, and more notably, insects, can have on an area can be substantial. Mosquitoes transmit the potentially deadly West Nile virus to livestock and humans alike. West Nile virus first struck the western hemisphere in Queens, New York, in 1999 and killed four people. Since then, the disease has spread across the United States. In 2003, West Nile virus activity occurred in 46 states and caused illness in over 9,800 people.

Most humans infected by the virus have no symptoms. A small proportion develops mild symptoms that include fever, headache, body aches, skin rash, and swollen lymph glands. Less than 1 percent of those infected develop more severe illness such as meningitis or encephalitis, symptoms of which include headache, high fever, neck stiffness, stupor, disorientation, coma,

tremors, convulsions, muscle weakness, and paralysis. Of the few people who develop encephalitis, fewer than 1 out of 1,000 infections die as a result.

There is no specific treatment for the infection or a vaccine to prevent it. Treatment of severe illness includes hospitalization, use of intravenous fluids and nutrition, respiratory support, prevention of secondary infections, and good nursing care. Medical care should be sought as soon as possible for persons who have symptoms suggesting severe illness. People over 50 years of age appear to be at high risk for the severe aspects of the disease.

Likelihood of Future Occurrences

Occasional: According to the Salt Lake County Health Department, the County and the City of Cottonwood Heights will continue to be at risk to West Nile virus. However, the severity of the virus is expected to change from year to year, depending on variables such as weather patterns, the mosquito population, the bird population, and immunity in humans. The state will continue their surveillance for the disease.

4.2.8 Landslides and Rockfalls

Hazard/Problem Description

Landslides refer to a wide variety of processes that result in the perceptible downward and outward movement of soil, rock, and vegetation under gravitational influence. Although landslides are primarily associated with steep slopes, they may also occur in areas of generally low relief and occur as cut-and-fill failures, river bluff failures, lateral spreading landslides, collapse of waste piles, and failures associated with quarries and open-pit mines. Landslides may be triggered by both natural and manmade changes in the environment resulting in slope instability.

Human activities, such as mining, construction, and changes to surface drainage areas, also affect the landslide potential. Landslides often accompany other natural hazard events, such as floods, wildfires, or earthquakes. They can occur slowly or very suddenly and may damage or destroy structures, roads, utilities, and forested areas and can cause injuries or death.

Rockfalls are the fastest type of landslide and occur most frequently in mountains or other steep areas during early spring when there is abundant moisture and repeated freezing and thawing. The rocks may freefall or carom down in an erratic sequence of tumbling, rolling and sliding. When a large number of rocks plummet downward at high velocity, it is called a rock avalanche. Rockfalls are caused by the loss of support from underneath or detachment from a larger rock mass. Ice wedging, root growth, or ground shaking, as well as a loss of support through erosion or chemical weathering may start the fall.

Past Occurrences

There has been no loss of life or recent damage from landslides and rockfalls in the city limits.

Likelihood of Future Occurrences

Occasional: The eastern edge of the city has the potential for future occurrences. Minor landslides will likely continue in susceptible areas as a result of post-fire conditions or when heavy precipitation occurs.

4.2.9 Severe Weather: General

Severe weather conditions can occur each year in Salt Lake County and Cottonwood Heights.

4.2.10 Severe Weather—Extreme Temperatures

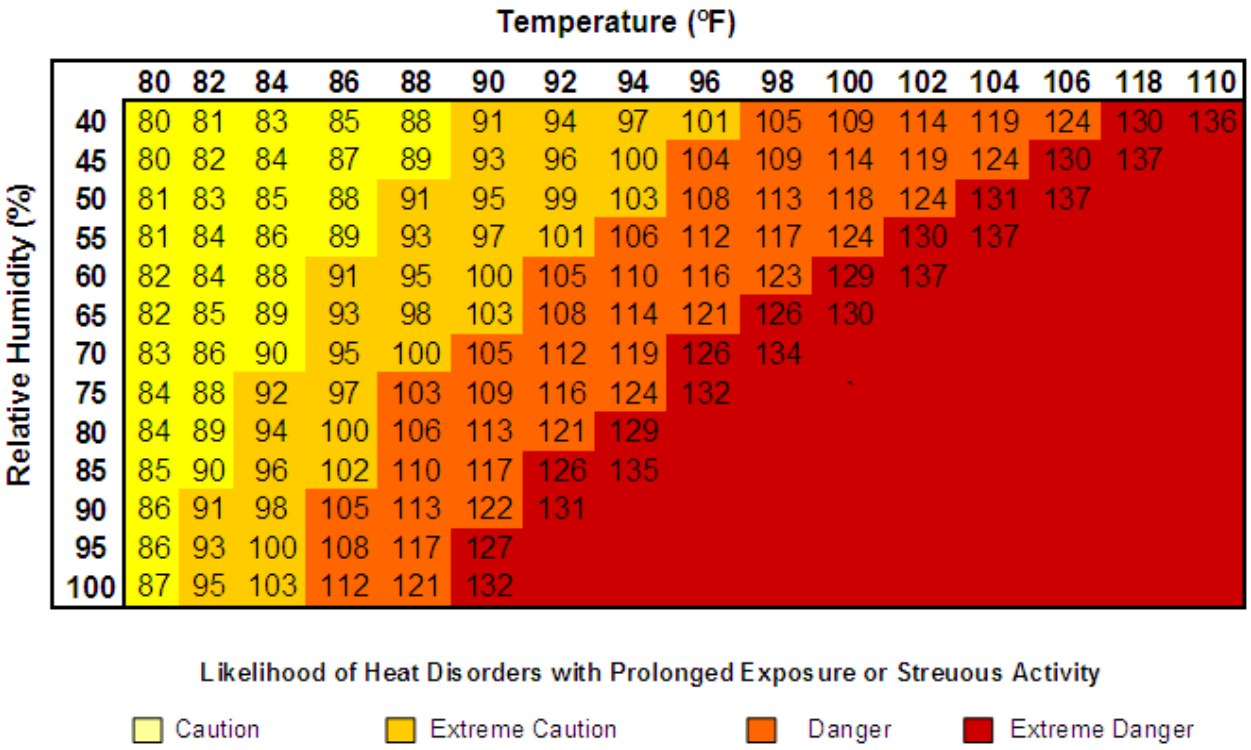
Hazard/Problem Description

Extreme temperature events, both hot and cold, can have severe impacts on human health and mortality, natural ecosystems, agriculture, and the economy. Since extreme temperatures affect large areas the hazard extent within city limits is considered extensive, potentially impacting 100% of the planning area.

Extreme Heat

According to information provided by FEMA, extreme heat is defined as temperatures that hover 10 degrees or more above the average high temperature for the region and last for several weeks. Heat kills by taxing the human body beyond its abilities. In a normal year, about 175 Americans succumb to the demands of summer heat. According to the National Weather Service (NWS), among natural hazards, only the cold of winter—not lightning, hurricanes, tornadoes, floods, or earthquakes—takes a greater toll. In the 40-year period from 1936 through 1975, nearly 20,000 people were killed in the United States by the effects of heat and solar radiation. In the heat wave of 1980, more than 1,250 people died.

Heat disorders generally have to do with a reduction or collapse of the body‘s ability to shed heat by circulatory changes and sweating or a chemical (salt) imbalance caused by too much sweating. When heat gain exceeds the level the body can remove, or when the body cannot compensate for fluids and salt lost through perspiration, the temperature of the body‘s inner core begins to rise and heat-related illness may develop. Elderly persons, small children, chronic invalid, those on certain medications or drugs, and persons with weight and alcohol problems are particularly susceptible to heat reactions, especially during heat waves in areas where moderate climate usually prevails. Figure 4.16 illustrates the relationship of temperature and humidity to heat disorders.



Source: National Weather Service, 2004

Figure 4.16. Relationship of Temperature and Humidity to Heat Disorders

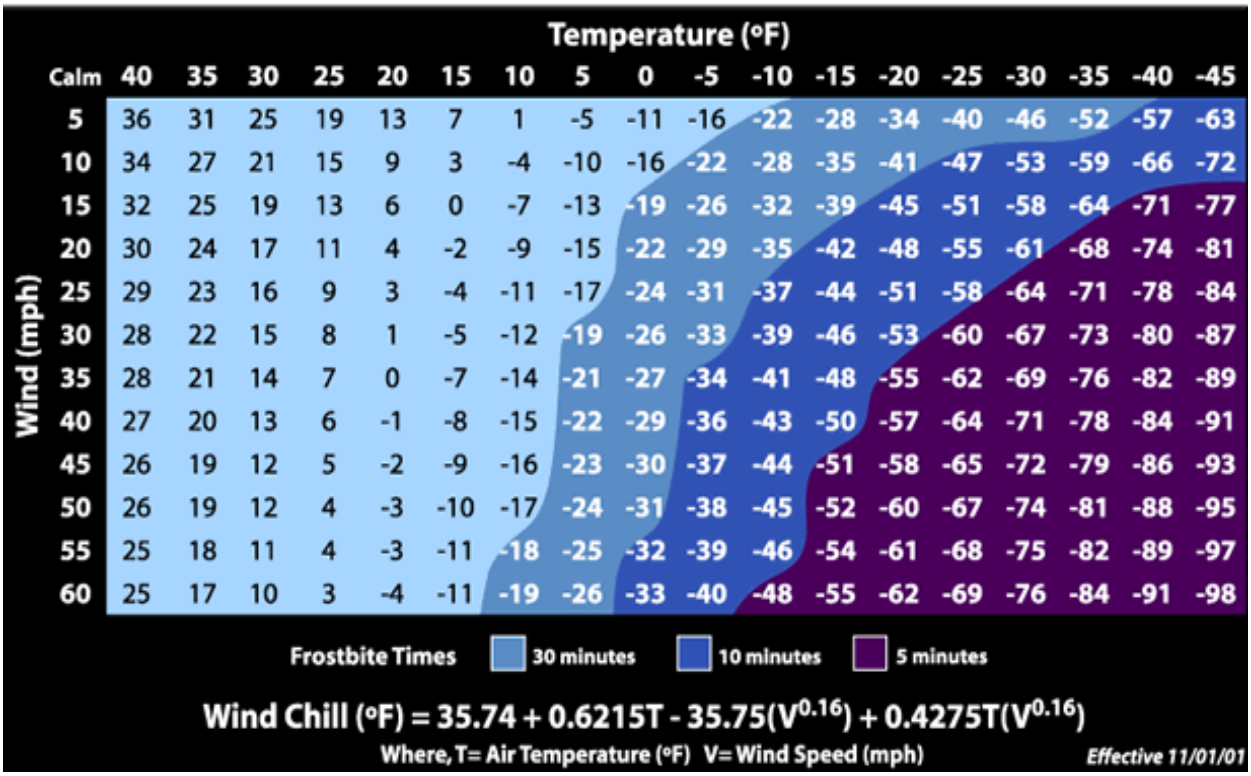
Note: Since HI values were devised for shady, light wind conditions, exposure to full sunshine can increase HI values by up t o 15°F. Also, strong winds, particularly with very hot, dry air, can be extremely hazardous.

The NWS has in place a system to initiate alert procedures (advisories or warnings) when the Heat Index is expected to have a significant impact on public safety. The expected severity of the heat determines whether advisories or warnings are issued. A common guideline for the issuance of excessive heat alerts is when the maximum daytime high is expected to equal or exceed 105°F and a nighttime minimum high of 80°F or above is expected for two or more consecutive days.

Extreme Cold

Extreme cold often accompanies a winter storm or is left in its wake. Prolonged exposure to the cold can cause frostbite or hypothermia and can become life threatening. Infants and the elderly are most susceptible. Pipes may freeze and burst in homes or buildings that are poorly insulated or without heat.

In 2001, NWS implemented a Wind Chill Temperature index (see Figure 4.17). This index was developed to describe the relative discomfort/danger resulting from the combination of wind and temperature. Wind chill is based on the rate of heat loss from exposed skin caused by wind and cold. As the wind increases, it draws heat from the body, driving down skin temperature and eventually the internal body temperature.



Source: National Weather Service, www.nws.noaa.gov/om/windchill/index.shtml

Figure 4.17. National Weather Service Wind Chill Chart

The NWS will issue a Wind Chill Advisory for the Salt Lake County area when wind and temperature combine to produce wind chill values of 18°F below zero to 25°F below zero.

Past Occurrences

Each winter and summer it can be expected that Cottonwood Heights will experience several days of extreme heat or cold events.

Likelihood of Future Occurrences

Highly Likely: Given the history in Salt Lake County and Cottonwood Heights, extreme temperature events will continue to occur annually.

4.2.11 Wildfire

Hazard/Problem Description

Wildfire and urban wildfire are an ongoing concern for Salt Lake County and Cottonwood Heights. Generally, the fire season extends from spring to late fall. Fire conditions arise from a combination of hot weather, an accumulation of vegetation, and low moisture content in air and fuel. These conditions, especially when combined with high winds and years of drought, increase the potential

for wildfire to occur. The wildfire risk is predominantly associated with the wildland-urban interface, areas where development is interspersed or adjacent to landscapes that support wildland fire. A fire along this wildland-urban interface can result in major losses of property and structures. Significant wildfires can also occur in heavily populated areas. Rangeland and grassland fires are a concern in the eastern portion of Cottonwood Heights County, including areas of the city, due to increased residential development in semi urban and rural areas.

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

Fuel—Fuel is the material that feeds a fire and is a key factor in wildfire behavior. Fuel is generally classified by type and by volume. Fuel sources are diverse and include everything from dead tree needles and leaves, twigs, and branches to dead standing trees, live trees, brush, and cured grasses. Also to be considered as a fuel source are manmade structures, such as homes and associated combustibles. The type of prevalent fuel directly influences the behavior of wildfire. Light fuels such as grasses burn quickly and serve as a catalyst for fire spread. In addition, —ladder fuels can spread a ground fire up through brush and into trees, leading to a devastating crown fire that burns in the upper canopy and cannot be controlled. The volume of available fuel is described in terms of fuel loading. Certain areas in and surrounding Salt Lake County are extremely vulnerable to fires as a result of dense vegetation combined with a growing number of structures being built near and within rural lands.

Topography—An area‘s terrain and land slopes affect its susceptibility to wildfire spread. Both fire intensity and rate of spread increase as slope increases due to the tendency of heat from a fire to rise via convection. The arrangement of vegetation throughout a hillside can also contribute to increased fire activity on slopes.

Weather—Weather components such as temperature, relative humidity, wind, and lightning also affect the potential for wildfire. High temperatures and low relative humidity dry out the fuels that feed the wildfire creating a situation where fuel will more readily ignite and burn more intensely.

Potential losses from wildfire include human life; structures and other improvements; natural and cultural resources; quality and quantity of the water supply; assets such as timber, range and crop land, and recreational opportunities; and economic losses. Smoke and air pollution from wildfires can be a severe health hazard. In addition, catastrophic wildfire can lead to secondary impacts or losses, such as future increased flooding and landslides debris flows during heavy rains

Past Occurrences

Wildfires are of significant concern throughout Utah. According to Utah Division of Wildland Resources, vegetation fires occur on an annual basis; most are controlled and contained early with limited damage. For those ignitions that are not readily contained and become wildfires, damage can be extensive. There are many causes of wildfire, from naturally caused lightning fires to human-caused fires linked to activities such as smoking, campfires, equipment use, and arson.

Likelihood of Future Occurrences

Likely: Based on historical data, Salt Lake County does experience wildfires every year. Cottonwood Heights is at risk to future fires.

4.3 Assessing Vulnerability

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.

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 areas.

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.

Requirement §201.6(c)(2)(ii)(C):

[The plan should describe vulnerability in terms of] providing a general description of land uses and development trends within the community so that mitigation options can be considered in future land use decisions.

With Cottonwood Heights hazards have been identified and profiled, the EPC will now be conducting a detailed vulnerability assessment to describe the impact that each hazard would have on the Cottonwood Heights. The vulnerability assessment quantifies, to the extent feasible, assets at risk to natural hazards and estimates potential losses.

4.4.1 Cottonwood Heights Mitigation Capabilities

Emergency Management

Emergency preparedness is part of the city's strategy to protect life and property from disasters. The Emergency Manager (EM) coordinates the activities of public, private and volunteer agencies in emergency planning, mobilizing, and direction of emergency preparedness personnel in mitigation, preparing for, responding to and recovery from disasters or emergencies. The EM develops plans, programs, and training for response to emergencies in Cottonwood Heights. The EM obtains assistance and resources from federal, state, local, public, and private sources.

Department of Public Works

The Public Works Department sustains and improves the quality of life in Cottonwood Heights and provides many basic services. The department oversees the city's water resources, maintains the city's infrastructure, completes a variety of street, sewer, and construction projects each year; and keeps roadways safe for passage. The department also serves as first responders in emergency situations where Public Works services are required.

Police Department

The Cottonwood Heights Police Department (CHPD) has adopted a policing philosophy that is built around the provision of service, as represented by proactive problem solving through the establishment of community partnerships. This philosophical shift from the traditional 911-driven, pure reactive approach to the delivery of police services emphasizes community-based, prevention-oriented policing.

Capability Assessment Worksheet - Salt Lake County Mitigation Plan

Local mitigation capabilities are existing authorities, policies, programs, and resources that reduce hazard impacts or that could be used to implement hazard mitigation activities.

Completed By: Dawn Black
Date: Oct 30, 2013
Jurisdiction: Cottonwood Heights

Participants (Name, Title):
James Short, Assistant Building Official

Planning and Regulatory Capabilities
Planning and regulatory capabilities are the plans, policies, codes, and ordinances that prevent and reduce the impacts of hazards. Use these questions to identify gaps in community growth

guidance plans. Identify possible improvements that could be made to reduce vulnerability in future development.

Please identify the following your jurisdiction has in place.

Building Code, Permitting, and Inspections	Yes/No	
Building Code(s) that reference hazards: 2012 IBC, 2012 IMC, 2012 IPC, 2012 IRC, 2011 NEC	Yes	Version/Year. Are building codes adequate? 2011, 2012 – Yes
Site plan review requirements		Do site reviews consider natural hazards? Yes

1. Does the building code contain provisions to strengthen or elevate construction to withstand hazard forces?_____

Please indicate which of the following your jurisdiction has in place that reference natural hazards.

Land Use Planning and Ordinances	Yes/No	Is the ordinance an effective measure for reducing hazard impacts? Are there any weaknesses or gaps in the ordinance to be addressed to better improve hazard risk reduction?
Zoning ordinance(s)		To some degree
Subdivision ordinance(s)		Yes
Natural hazard specific ordinances (stormwater, steep slope, wildfire)		Yes
Floodplain ordinance		Yes
Flood insurance rate maps, other floodplain studies		Yes
Policies for acquisition of land for open space and public recreation uses		N/A
Other		

2. Does the future land-use map clearly identify natural hazard areas?
Yes

3. Do land-use policies and zoning ordinances discourage development or redevelopment within natural hazard areas?
Uses control measures and restrictions

4. Do zoning ordinances prohibit development within, or filling of, wetlands, floodways, and floodplains?
Yes

The following regulatory tools are used by communities to implement hazard mitigation activities. Please indicate which of the following plans your jurisdiction has in place.

Plans	Yes/No Year	Does the plan address hazards? Does the plan identify projects to include in the mitigation strategies? Can the plan be used to implement mitigation actions?
Comprehensive/Master Plan		Yes
Capital Improvements Plan		No
Economic Development Plan		No
Local Emergency Operations Plan		Yes revised December 2012
Recovery Plan		
Continuity of Operations Plan		Yes
Transportation Plan		
Stormwater Management Plan		Yes
Community Wildfire Protection Plan		
Other plans or hazard studies (brownfields, redevelopment, disaster recovery, climate change adaptation)		

How can these building codes, planning and zoning ordinances, and other community plans be expanded and improved to reduce risk?
Yes

5. Are goals and policies in the comprehensive plan related to the local hazard mitigation plan? Please specify.
In concept

6. Do economic development or redevelopment strategies include provisions for mitigating natural hazards?
Specify: No

7. Do subdivision regulations restrict the subdivision of land within or adjacent to natural hazard areas?
Yes

8. Do capital improvement or other plans limit expenditures on projects that would encourage development in areas vulnerable to natural hazards?
No

9. Do infrastructure policies limit extension of existing facilities and services that would encourage development in areas vulnerable to natural hazards?
Yes

10. Does the capital improvement or other plan provide funding for hazard mitigation projects?
No

11. Do transportation plans limit access to hazard areas?
Yes

12. Are transportation systems designed to function under disaster conditions (e.g. evacuation)?

Administrative and Technical
Identify whether your community has the following administrative and technical capabilities. These include staff and their skills and tools that can be used for mitigation planning and to implement specific mitigation actions. If there are public resources at the next higher level of government that provide technical assistance or resources, indicate in your comments.

Staff	Yes/No FT/PT	Is staff trained on hazards and mitigation?
Planning Commission		No
Zoning Administrator	Yes	
Chief Building Official	Yes	Jody Hilton
Floodplain Administrator		Yes
Emergency Manager		Yes
Community Planner		Yes
Civil Engineer		Yes
GIS Coordinator		No
Others with understanding of natural hazards or with technical hazard assessment skills		
Administration	Yes/No	Describe capability
Maintenance programs to reduce risk (tree trimming, clearing drainage systems, etc.)	Yes	City Engineer
Mutual aid agreements	Yes	
Technical	Yes/No	Has capability been used to assess/mitigation risk in the past? If so, were needs for improvement
Warning systems/services (Reverse 911, outdoor warning signals)	Yes	Reverse 911
Hazard data and information	Yes	
Grant writing	Yes	
HAZUS or other GIS analysis tools	Yes	
Other		
How can staff, administration or technical capabilities be expanded or improved to reduce risk? Hazard mitigation training.		

Public Education and Outreach
Identify education and outreach programs and methods already in place that could be used to implement mitigation activities and communicate hazard-related information.

Program/Organization	Yes/No	Could the program help implement future mitigation activities?
Local citizen groups, non-profit	Yes	

organizations		
Ongoing public education or information program (e.g. responsible water use, fire safety, household preparedness)	Yes	
Natural disaster or safety related school programs	N/A	
StormReady certification	No	
Firewise Community certification	No	
Public-private partnership initiatives addressing disaster-related issues	No	
Other		
How can public education and outreach capabilities be expanded or improved to reduce risk? Firewise program has been introduced to citizens and will have training Spring of 2014.		

5 Mitigation Strategy

[The plan shall include] a mitigation strategy that provides the jurisdiction's blueprint for reducing the potential losses identified in the risk assessment, based on existing authorities, policies, programs and resources, and its ability to expand on and improve these existing tools.

5.1 2009 WFRC Mitigation Strategies Status

2009 Mitigation Strategies Progress and Summary

The following mitigation strategies were formulated by the Salt Lake County Mitigation Strategies Working Group for inclusion in the 2009 Wasatch Front Region Natural Hazard Pre-Disaster Mitigation Plan, which was adopted by the City of South Jordan on October 6, 2009. The following summary highlights the City of Cottonwood Height's efforts to implement those goals where applicable and practical as part of the County's overall mitigation planning efforts.
For actions not completed or implemented by the City of Cottonwood Heights, a short description is provided as to why it was not relevant or if it is included as part of the updated plan.

Category	Goal / Objective	Action	Status	Comments
All Hazards	1 – Improve and maintain communications capabilities for emergency operations 1.1 – Improve communication capabilities	1 – Conduct an inventory and assessment of communications equipment and systems and identify needs	Completed	Cottonwood Heights continues to enhance communications by outfitting mobile command center
All Hazards	1 – Improve and maintain communications capabilities for emergency operations 1.1 – Improve communication capabilities	2 – Conduct Training and awareness activities on communication equipment, tools, and systems	On going	Monthly radio checks with key staff. Radio club implementation at all planned special events to improve communications
All Hazards	1 – Improve and maintain communications capabilities for emergency operations 1.1 – Improve communication capabilities	3 – Establish agreements to share communications equipment between agencies involved in emergency operations	Not complete	
All Hazards	1 – Improve and maintain communications capabilities for emergency operations 1.1 – Improve communication capabilities	4 – Establish notification capabilities and procedures for emergency personnel	Completed	Multiple avenues to reach staff are in place

Category	Goal / Objective	Action	Status	Comments
All Hazards	1 – Improve and maintain communications capabilities for emergency operations 1.2 – Maintain communications capabilities for critical facilities	1 – Evaluate vulnerability of critical communications systems	On going	Change in Emergency Managers has delayed completion
All Hazards	1 – Improve and maintain communications capabilities for emergency operations 1.2 – Maintain communications capabilities for critical facilities	2 – Establish redundancy for dispatch centers and other critical communications	On going	Mobile command center will have redundant systems for communication within city
All Hazards	1 – Improve and maintain communications capabilities for emergency operations 1.3 – Conduct communications Strategic Planning	1 – Establish a coordinating group to address long-term communication needs and implementation strategies	On going	
All Hazards	1 – Improve and maintain communications capabilities for emergency operations 1.3 – Conduct communications Strategic Planning	2 – Acquire, upgrade, and/or integrate communications equipment and systems as determined by coordinating group	On going	As grant funding is available communications systems are enhanced
All Hazards	2 – Improve awareness and analysis of hazards 2.1 – Improved Quality and Access to digital geographic (GIS) hazards data	1 – Establish a coordinating group to address geographic data issues	On going	GIS specialist is assigned to lead this effort
All Hazards	2 – Improve awareness and analysis of hazards 2.1 – Improved Quality and Access to digital geographic (GIS) hazards data	2 – Examine current data availability and sharing capabilities, evaluate needs, and identify shortcomings	On going	
All Hazards	2 – Improve awareness and analysis of hazards 2.1 – Improved Quality and Access to digital geographic (GIS) hazards data	3 – Update and expand data on hazards, critical facilities, and critical infrastructure according to assessed needs	On going	
All Hazards	2 – Improve awareness and analysis of hazards 2.1 – Improved Quality and Access to digital geographic (GIS) hazards data	4 – Provide centralized access to geographic data to emergency planners and responders	On going	

Category	Goal / Objective	Action	Status	Comments
All Hazards	2 – Improve awareness and analysis of hazards 2.2 – Improve and expand hazard monitoring capabilities	1 – Integrate existing hazard monitoring networks in emergency operations centers. Utilize sensors such as weather stations, stream gages, seismograph stations, road conditions, etc.	On going	City relies on multiple agencies for this information
All Hazards	2 – Improve awareness and analysis of hazards 2.2 – Improve and expand hazard monitoring capabilities	2 – Identify and implement additional hazard monitoring capabilities.	On going	
All Hazards	3 – Ensure critical facilities can sustain operations for emergency response and recovery 3.1 – Prevent damage to critical facilities and infrastructure	1 – Utilize GIS to identify facilities and infrastructure at risk	On going	
All Hazards	3 – Ensure critical facilities can sustain operations for emergency response and recovery 3.1 – Prevent damage to critical facilities and infrastructure	2 – Assess critical facilities for hazard exposure, structural weaknesses, power, communications and equipment resources and redundancy, and adequate emergency procedures	On going	Grant funding dependent
All Hazards	3 – Ensure critical facilities can sustain operations for emergency response and recovery 3.1 – Prevent damage to critical facilities and infrastructure	3 – Implement improvements to address identified in assessment	On going	New City Hall will include features to sustain emergency operations
All Hazards	4 – Improve response capabilities through mutual-aid agreements 4.1 – Utilize mutual-aid agreements in accordance with National Incident Management System (NIMS) requirements	1 – Compile inventory of mutual-aid agreements and memoranda of understanding (MOU) and identify deficiencies	On going	New Emergency Manager is identifying MOU's for renewal

Category	Goal / Objective	Action	Status	Comments
All Hazards	4 – Improve response capabilities through mutual-aid agreements 4.1 – Utilize mutual-aid agreements in accordance with National Incident Management System (NIMS) requirements	2 – Pursue and implement needed mutual-aid agreements	On going	
All Hazards	5 – Increase citizen safety through improved hazard awareness 5.1 – establish a comprehensive public education program	1 – Provide education regarding all natural hazards through live trainings, as well as web-based, print and broadcast media	On going	This is one of 5 strategic goals for the emergency operations program
All Hazards	5 – Increase citizen safety through improved hazard awareness 5.1 – Establish a comprehensive public education program	2 – Incorporate information about cascading effects of hazards in education programs	On going	Community events incorporate EM into program
All Hazards	5 – Increase citizen safety through improved hazard awareness 5.1 – Establish a comprehensive public education program	3 – Develop education programs to target specific groups including homeowners, developers, schools and people with special needs	On going	Community events incorporate EM into program
All Hazards	5 – Increase citizen safety through improved hazard awareness 5.1 – Establish a comprehensive public education program	4 – Utilize maps and similar products on County EM website and other media to educate public on areas at risk to hazards	On going	Community events incorporate EM into program
All Hazards	5 – Increase citizen safety through improved hazard awareness 5.1 – Establish a comprehensive public education program	5 – Coordinate with existing public education programs such as the American Red Cross, Utah Living with Fire, be Ready Utah, the National Weather Service, etc.	On going	Community events incorporate EM into program
All Hazards	6 – Improve public safety through preventative regulations 6.1 – Minimize hazard impacts through the adoption of appropriate prevention measures	1 – Establish and enforce appropriate planning, zoning, and building code ordinances	On going	

Category	Goal / Objective	Action	Status	Comments
All Hazards	6 – Improve public safety through preventative regulations 6.1 – Minimize hazard impacts through the adoption of appropriate prevention measures	2 – Ensure current hazard ordinances are available for viewing online	On going	Updated city webpage will have easy access to information
Dam Failure	1 – Include dam failure inundation in future County and City planning efforts 1.1 – Review current State dam safety information on all identified high hazard dams in the County	1 – Include dam inundation maps in current County, City and Special Service District Emergency Operations Plans	NA	This is an unlikely event in Cottonwood Heights
Dam Failure	1 – Include dam failure inundation in future County and City planning efforts 1.1 – Review current State dam safety information on all identified high hazard dams in the County	2 – Utilize inundation maps to identify potential evacuation areas and routes	NA	
Drought	1 – Reduce and prevent hardships associated with water shortages 1.1 – Limit unnecessary consumption of water throughout the County	1 – Continue to encourage water conservation utilizing and promoting outreach material from all water districts in the County	On going	City promotes green activities including water conservation
Drought	1 – Reduce and prevent hardships associated with water shortages 1.1 – Limit unnecessary consumption of water throughout the County	2 – Emergency Managers will coordinate with local water districts/public utilities to support ongoing conservation efforts	On going	
Drought	1 – Reduce and prevent hardships associated with water shortages 1.1 – Limit unnecessary consumption of water throughout the County	3 – Investigate feasibility of implementing an incentive program to encourage the use of low-flow appliances and fixtures in homes and businesses	Not completed	
Drought	1 – Reduce and prevent hardships associated with water shortages 1.1 – Limit unnecessary consumption of water throughout the County	4 – Implement water-saving devices and practices in public facilities	On going	

Category	Goal / Objective	Action	Status	Comments
Drought	1 – Reduce and prevent hardships associated with water shortages 1.1 – Limit unnecessary consumption of water throughout the County	5 – Repair, maintain and improve water distribution infrastructure to prevent loss from leakage, breaks, etc.	On going	
Drought	1 – Reduce and prevent hardships associated with water shortages 1.1 – Limit unnecessary consumption of water throughout the County	6 – Coordinate public safety water use, such as hydrant testing	On going	
Drought	1 – Reduce and prevent hardships associated with water shortages 1.1 – Limit unnecessary consumption of water throughout the County	7 – Provide information on landscaping alternatives for persons subject to green area requirements	On going	
Drought	1 – Reduce and prevent hardships associated with water shortages 1.2 – Address agricultural water shortages in the County	1 – Set up livestock water rotation in areas of agricultural use	NA	
Drought	1 – Reduce and prevent hardships associated with water shortages 1.3 – Encourage development of secondary water systems	1 – Coordinate with water districts to plan for, develop and/or expand secondary water	On going	
Earthquake	1 – Reduce earthquakes losses to infrastructure 1.1 – Encourage retrofit and rehabilitation of highly susceptible infrastructure	1 – Identify structures at risk to earthquake damage	On going	
Earthquake	1 – Reduce earthquakes losses to infrastructure 1.1 – Encourage retrofit and rehabilitation of highly susceptible infrastructure	2 – Research feasibility of an incentive program for retrofitting privately-owned buildings, particularly unreinforced masonry	On going	
Earthquake	1 – Reduce earthquakes losses to infrastructure 1.1 – Encourage retrofit and rehabilitation of highly susceptible infrastructure	3 – Complete seismic rehabilitation/retrofitting projects of public buildings at risk	On going	New city hall will meet 2014 requirements

Category	Goal / Objective	Action	Status	Comments
Earthquake	1 – Reduce earthquakes losses to infrastructure 1.2 – Improve public education regarding earthquake risks to unreinforced masonry buildings	1 – Provide educational materials to unreinforced masonry home and business owners	On going	
Earthquake	1 – Reduce earthquakes losses to infrastructure 1.3 – Improve Seismic Hazard understanding and seismic resistance of CUWCD Red Butte Dam in Salt Lake County.	1 – Procure Engineering Consultant to perform the nonstructural design and geotechnical assessment and review.	Not completed	
Flooding	1 – Protection of life and property before, during and after a flooding event 1.1 – Provide 100% availability of the National Flood Insurance Program	1 – Assist Cities with NFIP application	On going	
Flooding	1 – Protection of life and property before, during and after a flooding event 1.1 – Provide 100% availability of the National Flood Insurance Program	2 – Encourage Communities to actively participate in NFIP	On going	
Flooding	1 – Protection of life and property before, during and after a flooding event 1.2 – Encourage appropriate flood control measures, particularly in new developments	1 – Determine potential flood impacts and identify areas in need of additional flood control structures	Completed	
Flooding	1 – Protection of life and property before, during and after a flooding event 1.2 – Encourage appropriate flood control measures, particularly in new developments	2 – Address identified problems through construction of debris basins, flood retention ponds, energy dissipaters or other flood control structures	Completed	
Flooding	1 – Protection of life and property before, during and after a flooding event 1.3 – Provide maintenance, repairs and improvements to drainage structures, storm water systems and flood control structures	1 – Establish maintenance and repair programs to remove debris, improve resistance and otherwise maintain effectiveness of storm water and flood control systems	On going	

Category	Goal / Objective	Action	Status	Comments
Flooding	2 – Reduce threat of unstable or inadequate flood control structures 2.1 – Reduce potential for failure of flood control structures	1 – Identify and assess structures for deficiencies	On going	
Flooding	2 – Reduce threat of unstable or inadequate flood control structures 2.1 – Reduce potential for failure of flood control structures	2 – Modify structures as needed to address deficiencies	On going	
Severe Weather	1 – Reduce threat of loss of life or property due to extreme weather events 1.1 – Maintain status as a StormReady Community	1 – Maintain Hazardous Weather Operations Plan according to StormReady requirements	On going	
Severe Weather	1 – Reduce threat of loss of life or property due to extreme weather events 1.1 – Maintain status as a StormReady Community	2 – Maintain Contact with NWS prior to re-application in 2010	On going	
Severe Weather	1 – Reduce threat of loss of life or property due to extreme weather events 1.2 – Increase awareness of information services provided by NWS	1 – Meet with NWS representative on an annual basis to receive information on new services and alerts available	On going	
Severe Weather	1 – Reduce threat of loss of life or property due to extreme weather events 1.2 – Increase awareness of information services provided by NWS	2 – Assist NWS in making other agencies and departments aware of available resources	On going	
Severe Weather	1 – Reduce threat of loss of life or property due to extreme weather events 1.3 – Encourage safe practices in avalanche prone areas	1 – Assist Forest Service Utah Avalanche Forecast Center and other organizations in promoting avalanche hazard awareness for backcountry users	NA	
Severe Weather	1 – Reduce threat of loss of life or property due to extreme weather events 1.4 – Examine the vulnerability of patrons at large event venues to extreme weather events	1 – Work with NWS to develop large event venue weather safety and evacuation procedures	On going	

Category	Goal / Objective	Action	Status	Comments
Slope Failure	1 – Reduce or eliminate the threat of slope failure damage 1.1 – Reduce the threat of slope failures following wildfires	1 – Develop protocol for working with State and Federal agencies in reducing the impact of post-fire debris flow hazard	On going	State Wildfire Pre – attack plan
Slope Failure	1 – Reduce or eliminate the threat of slope failure damage 1.2 – Monitor historic landslide areas	1 – Coordinate with the Utah Geological Survey and other agencies to understand current slope failure threats/potential	NA	
Slope Failure	1 – Reduce or eliminate the threat of slope failure damage 1.3 – Address landslide hazards in new sub-divisions	1 – Utilize recommendations provided by the State Geological Hazards Working Group to address land-use and planning for new developments	On going	
Wildland Fire	1 – Community education on wildfire hazard 1.1 – Reduce risk from wildfire through education programs	1 – Increase public awareness through “Firewise” program	On going	Spring efforts will include information for residents and businesses
Wildland Fire	1 – Community education on wildfire hazard 1.1 – Reduce risk from wildfire through education programs	2 – Educate homeowners on the need to create defensible space near structures in WUI	On going	
Wildland Fire	2 – Improve safety from wildfire hazards through planning, protective actions and improved fire response capabilities 2.1 – Assist homeowners with creating defensible space near structures in WUI areas	1 – Designate and promote county-wide annual initiative for clearing fuels	On going	
Wildland Fire	2 – Improve safety from wildfire hazards through planning, protective actions and improved fire response capabilities 2.1 – Assist homeowners with creating defensible space near structures in WUI areas	2 – Provide waste removal, such as chipping of green waste by public works, following designated fuel clearing day/week	On going	As funding allows these strategies can be implemented

Category	Goal / Objective	Action	Status	Comments
Wildland Fire	2 – Improve safety from wildfire hazards through planning, protective actions and improved fire response capabilities 2.2 – Improve evacuation capabilities for WUI areas	1 – Work with experts and communities to develop or update evacuation plans	Completed	Wildfire pre-attack plan has designated routes
Wildland Fire	2 – Improve safety from wildfire hazards through planning, protective actions and improved fire response capabilities 2.2 – Improve evacuation capabilities for WUI areas	2 – Evaluate transportation network and address needed improvements to facilitate evacuation and emergency response	Completed	
Wildland Fire	2 – Improve safety from wildfire hazards through planning, protective actions and improved fire response capabilities 2.3 – Improve addressing system in WUI areas to facilitate emergency response	1 – Identify all facilities, businesses, and residences, particularly in the canyons, and assign addresses according to current county addressing standards	Completed	
Wildland Fire	2 – Improve safety from wildfire hazards through planning, protective actions and improved fire response capabilities 2.3 – Improve addressing system in WUI areas to facilitate emergency response	2 – Incorporate improved addresses in fire-dispatch and other databases	Completed	
Wildland Fire	2 – Improve safety from wildfire hazards through planning, protective actions and improved fire response capabilities 2.4 – Complete wildfire protection projects	1 – Reduce fuels around publically owned structures	Completed	
Wildland Fire	2 – Improve safety from wildfire hazards through planning, protective actions and improved fire response capabilities 2.4 – Complete wildfire protection projects	2 – Implement fire breaks and other protective measures	On going	

Category	Goal / Objective	Action	Status	Comments
Wildland Fire	2 – Improve safety from wildfire hazards through planning, protective actions and improved fire response capabilities 2.4 – Complete wildfire protection projects	3 – Assess existing water flow capabilities, both public and private, and address deficiencies	On going	
Wildland Fire	2 – Improve safety from wildfire hazards through planning, protective actions and improved fire response capabilities 2.4 – Complete wildfire protection projects	4 – Assist communities in developing Community Wildfire Protection Plans or similar plans	On going	
Wildland Fire	2 – Improve safety from wildfire hazards through planning, protective actions and improved fire response capabilities 2.5 – Encourage proper development practices in the WUI	1 – Adopt the Utah Wildland-Urban Interface Code	Under discussion	
Wildland Fire	2 – Improve safety from wildfire hazards through planning, protective actions and improved fire response capabilities 2.5 – Encourage proper development practices in the WUI	2 – Define wildland-urban interface and develop digital maps of the WUI	Completed	

Mitigation Strategies

The following mitigation strategies were formulated by the Salt Lake County Mitigation Strategies Working Group on November 20, 2007, at Holladay City Hall. The Working Group sought to refine and expand on efforts already in place. Additional information was provided in October 2008 by the Central Utah Water Conservancy District in regards to the Red Butte Dam in Salt Lake County that was developed through the course of an ongoing Hazard Mitigation Planning effort, which began in July 2007 and is scheduled to be completed in February 2009. Information on Working Group members can be found in Part IV. “Emergency Services” for the purpose of this section is defined as County and City emergency management and may include relevant emergency response agencies.

Cottonwood Heights will identify responsible authorities within the city or partnerships with other entities and a timeframe for implementation of mitigation strategies during FY2015/16. Development of cost estimates and funding sources will also be identified during FY2015/16.

Problem Identification: One of the pivotal aspects of disaster response is communication. Without effective communication, relief and rescue operations become chaotic and disorganized, as evidenced by the 2005 Hurricane Katrina event. During that event, communication systems often were inoperable, incompatible or merely went unused because of lack of training (Peterson 2005).

Goal 1 – Improve and maintain communications capabilities for emergency operations
Objective 1.1 (Priority HIGH): Improve communications capabilities

Action 1: Conduct an inventory and assessment of communications equipment and systems and identify needs.

Comments: Satellite Phones — We have communications redundancy through VECC.

Action 2: Conduct training and awareness activities on communications equipment, tools, and systems.

VECC provides monthly communications drills. This activity is ongoing.

Action 3: Establish agreements to share communications equipment between agencies involved in emergency operations.

P.C. communications agreements with VECC in place.

Action 4: Establish notification capabilities and procedures for emergency personnel.

Ongoing — Department Policy

Objective 1.2 (Priority HIGH): Maintain communications capabilities for critical facilities

Action 1: Evaluate vulnerability of critical communications systems.

Internet, landlines and cellphones highly vulnerable.

Action 2: Establish redundancy for dispatch centers and other critical communications systems.

Yes — dispatch redundancy

Objective 1.3 (Priority HIGH): Conduct Communications Strategic Planning

Action 1: Establish a coordinating group to address long-term communication needs and implementation strategies.

No

Action 2: Acquire, upgrade, and/or integrate communications equipment and systems as determined by coordinating group.

No

Problem Identification: Without sufficient knowledge of hazards affecting a jurisdiction, effective and efficient mitigating actions cannot be properly applied. Information on critical and high value infrastructure is also important. Advances in mapping technology and observational techniques have given a significantly clearer vision of hazards and vulnerability. This technology is only effective if utilized with up-to-date data.

Goal 2 – Improve awareness and analysis of hazards
Objective 2.1 (Priority MEDIUM): Improved quality and access to digital geographic (GIS) hazards data

Action 1: Establish a coordinating group to address geographic data issues.

No

Action 2: Examine current data availability and sharing capabilities, evaluate needs, and identify shortcomings.

Ongoing — not specific to mitigation

Action 3: Update and expand data on hazards, critical facilities, and critical infrastructure according to assessed needs.

Data exits, needs not assessed

Action 4: Provide centralized access to geographic data to emergency planners and responders.

Ongoing

Objective 2.2 (Priority MEDIUM): Improve and expand hazard-monitoring capabilities.

Action 1: Integrate existing hazard monitoring networks in emergency operations centers. Utilize sensors such as weather stations, stream gauges, seismograph stations, road conditions, etc.

No

Action 2: Identify and implement additional hazard monitoring capabilities.

Unknown

Problem Identification: Certain infrastructure must be able to withstand the most extreme hazard event expected in order to provide coordinated response operations, shelter, and evacuation, if necessary. Some examples of critical infrastructure include police stations, fire stations, schools, water systems, emergency operations centers and major transportation routes.

Goal 3 – Ensure critical facilities can sustain operations for emergency response and recovery
Objective 3.1 (Priority HIGH): Prevent damage to critical facilities and infrastructure.

Action 1: Utilize GIS to identify facilities and infrastructure at risk.

No

Action 2: Assess critical facilities for hazard exposure, structural weaknesses, power, communications and equipment resources and redundancy, and adequate emergency procedures.

Unknown

Action 3: Implement Improvements to address needs identified in assessment.

Unknown

Problem Identification: Hazardous events often overcome the resources of any one jurisdiction. An effective measure, which ensures adequate response to a hazardous event, is mutual-aid agreements specifying resources and assistance from adjoining jurisdictions or state and federal agencies.

Goal 4 – Improve response capabilities through mutual-aid agreements
Objective 4.1 (Priority MEDIUM): Utilize mutual-aid agreements in accordance with National Incident Management System (NIMS) requirements.

Action 1: Compile inventory of current mutual-aid agreements and memoranda of understanding (MOU) and identify deficiencies.

Public Safety Mutual Aid

Action 2: Pursue and implement needed mutual-aid agreements.

Points of Distribution MOU with schools.

Problem Identification: One of the most cost-effective means of mitigating hazards is through public education. This allows citizens to make informed choices to themselves mitigate hazards affecting them. Education can be especially effective when tied to grant programs.

Goal 5 – Increase citizen safety through improved hazard awareness
Objective 5.1 (Priority HIGH): Establish a comprehensive public education program.

Action 1: Provide education regarding all natural hazards through live trainings, as well as web-based, print and broadcast media.

Ongoing

Action 2: Incorporate information about cascading effects of hazards in education programs.

Unknown

Action 3: Develop education programs to target specific groups including homeowners, developers, schools and people with special needs.

Firewise and Weather Watcher programs

Action 4: Utilize maps and similar products on County EM website and other media to educate public on areas at risk to hazards.

Cottonwood Heights provides city maps with exit routes and earthquake, liquefaction areas.

Action 5: Coordinate with existing public education programs such as the American Red Cross, Utah Living with Fire, Be Ready Utah, the National Weather Service, etc.

Ongoing

Problem Identification: Sometimes hazards require mandated mitigation in the form of ordinances, codes, laws or regulations. Zoning ordinances and building codes are the most common form of mitigation.

Goal 6 – Improve public safety through preventative regulations
Objective 6.1 (Priority HIGH): Minimize hazard impacts through the adoption of appropriate prevention measures.

Action 1: Establish and enforce appropriate planning, zoning, and building code ordinances.

Ongoing

Action 2: Ensure current hazard ordinances are available for viewing online.

Floodplain Hazard Regulations

5.1.1 Dam Failure

Problem Identification: The failure of dams and irrigation impoundments will result in a severe impact on residents and infrastructure in Salt Lake County.

Goal 1 – Include dam failure inundation in future planning efforts.
Objective 1.1 (Priority MEDIUM): Review current State dam safety information on all identified high hazard dams in the County.

Action 1: Include dam inundation maps in current County, City and Special Service District Emergency Operations Plans.

N/A

Action 2: Utilize inundation maps to identify potential evacuation areas and routes.

Yes

5.1.2 Drought

Problem Identification: Because the Great Salt Lake Valley is a desert climate, there have always been periods of intermittent drought. Measures must be taken to conserve water and to address water shortages for both culinary and agricultural use.

Goal 1 – Reduce and prevent hardships associated with water shortages
Objective 1.1 (Priority HIGH): Limit unnecessary consumption of water throughout the County

Action 1: Continue to encourage water conservation utilizing and promoting outreach material from all water districts in the County.

Ongoing with provider

Action 2: Emergency Managers will coordinate with local water districts/public utilities to support ongoing conservation efforts.

Ongoing

Action 3: Investigate feasibility of implementing an incentive program to encourage the use of low-flow appliances and fixtures in homes and businesses.

N/A

Action 4: Implement water-saving devices and practices in public facilities.

N/A

Action 5: Repair, maintain and improve water distribution infrastructure to prevent loss from leakage, breaks, etc.

N/A

Action 6: Coordinate public safety water use, such as hydrant testing.

N/A

Action 7: Provide information on landscaping alternatives for persons subject to green area requirements.

N/A

Objective 1.2 (Priority HIGH): Address agricultural water shortages in the County

Action 1: Set up livestock water rotation in areas of agricultural use.

N/A

Objective 1.3 (Priority MEDIUM): Encourage development of secondary water systems

Action 1: Coordinate with water districts to plan for, develop and/or expand secondary water systems.

N/A

5.1.3 Earthquake

Problem Identification: Numerous geologic hazards exist in the Salt Lake City metropolitan area, which can constrain land use. Active fault zones pose the threat of large earthquakes. The major earthquake risk present throughout the Salt Lake County metropolitan area confronts planners with a variety of safety and economic issues that must always be considered prior to land use development.

Goal 1 – Reduce earthquakes losses to infrastructure

Objective 1.1 (Priority HIGH): Encourage retrofit and rehabilitation of highly susceptible infrastructure

Action 1: Identify structures at risk to earthquake damage.

Unknown

Action 2: Research feasibility of an incentive program for retrofitting privately owned buildings, particularly unreinforced masonry.

Unknown

Action 3: Complete seismic rehabilitation/retrofitting projects of public buildings at risk.

Unknown

Objective 1.2 (Priority MEDIUM): Improve public education regarding earthquake risks to unreinforced masonry buildings

Action 1: Provide educational materials to unreinforced masonry home and business owners.

Unknown

Objective 1.3 (Priority MEDIUM): Improve seismic hazard understanding and seismic resistance of Central Utah Water Conservancy District's (CUWCD) Red Butte Dam in Salt Lake County. Perform geotechnical assessment and review of Red Butte Dam to determine seismic hazard risk of slope failure on the outlet control structure and cyclic softening failure in the dam foundation soils. Perform a structural engineering analysis and design of nonstructural bracing/anchoring of piping and ancillary equipment in Red Butte Dam's flow control structure." Improve public education regarding earthquake risks to unreinforced masonry buildings

Action 1: Procure an Engineering Consultant to perform the nonstructural design and geotechnical assessment and review. CUWCD staff will procure contractor and/or install nonstructural bracing per consultant's design.

Complete

5.1.4 Flooding

Problem Identification: Although located in a semi-arid region, Salt Lake City is subject to flash flooding due to heavy rainfall and rapid snowmelt. The Jordan River's four major northern tributaries (City, Red Butte, Emigration and Parley's Creeks) are diverted into storm sewers beneath the city. These storm sewers have sufficient capacity to handle the excessive runoff, but must be continually maintained to prevent debris from accumulating. Public works agencies have built debris basins, installed stream-bank protection, and regularly dredge stream channels to reduce flood hazards. The Federal Emergency Management Agency (FEMA) has rated floodplains along the Jordan River and its tributaries for expected flood heights and areas susceptible to 100-year flood-frequency inundation have been delineated on County-wide FEMA Flood Insurance Rate Maps (FIRMs). Salt Lake County ordinances require the lowest flood grades (including basements) in new construction to be a minimum of 1 foot (0.3 m) above the appropriate FEMA flood elevation.

Goal 1 – Protection of life and property before, during and after a flooding event

Objective 1.1 (Priority MEDIUM): Provide 100% availability of the National Flood Insurance Program (NFIP).

Action # 1: Assist cities with NFIP application.

Ongoing/Working with SL County Flood Control

Action # 2: Encourage communities to actively participate in NFIP.

Ongoing

Objective 1.2 (Priority MEDIUM): Encourage appropriate flood control measures, particularly in new developments.

Action 1: Determine potential flood impacts and identify areas in need of additional flood control structures.

Ongoing

Action 2: Address identified problems through construction of debris basins, flood retention ponds, energy dissipaters or other flood control structures.

Ongoing

Objective 1.3 (Priority HIGH): Provide maintenance, repairs and improvements to drainage structures, storm water systems and flood control structures.

Action: Establish maintenance and repair programs to remove debris, improve resistance and otherwise maintain effectiveness of storm water and flood control systems.

Ongoing

Goal 2 – Reduce threat of unstable or inadequate flood control structures
Objective 2.1 (Priority HIGH): Reduce potential for failure of flood control structures.

Action 1: Identify and assess structures for deficiencies.

Ongoing

Action 2: Modify structures as needed to address deficiencies.

Ongoing

5.1.5 Severe Weather

Problem Identification: Severe weather over northern Utah can have a dramatic impact on regional commerce, transportation and daily activity and is a major forecast challenge for local meteorologists. The region is characterized by intense vertical relief with the Great Salt Lake and surrounding lowlands located near 4,300 ft above mean sea level (MSL) while the adjoining Wasatch Mountains to the east reach as high as 11,000 ft MSL. This relief has major impact on winter storms and results in large contrasts in average annual precipitation.

Goal 1: Reduce threat of loss of life or property due to extreme weather events
Objective 1.1 (Priority LOW): Maintain status as a StormReady Community
Action 1: Maintain Hazardous Weather Operations Plan according to StormReady requirements.

N/A

Action 2: Maintain contact with NWS prior to re-application in 2010.

N/A

Objective 1.2 (Priority MEDIUM): Increase awareness of information services provided by NWS.

Action 1: Meet with NWS representative on an annual basis to receive information on new services and alerts available.

Representative at monthly county LEPC meetings and have invited him to emergency planning meetings. Conducted weather watcher training 2012.

Action 2: Assist NWS in making other agencies and departments aware of available resources.

Ongoing

Objective 1.3 (Priority MEDIUM): Encourage safe practices in avalanche prone areas.

Action: Assist Forest Service Utah Avalanche Forecast Center (FSUAC) and other organizations in promoting avalanche hazard awareness for backcountry users.

N/A

Objective 1.4 (Priority HIGH): Examine the vulnerability of patrons' at large event venues to extreme weather events.

Action: Work with the NWS to develop large event venue weather safety and evacuation procedures.
N/A

5.1.6 Slope Failure

Problem Identification: Slope instability has not been a major problem in the Salt Lake area. Yet, as development moves higher into the foothills and nearby canyons, slope stability is becoming a major issue affecting future development. Types of slope instability in the Salt Lake area include rock fall, debris flow and debris flood, rotational and transitional slumps, and earth flows. During the unusually wet springs of 1983 and 1984, numerous slope failures in the Wasatch Range resulted in debris flows and floods that caused extensive damage to urban areas north of Salt Lake City (Anderson and others, 1984). Similar failures occurred in canyons adjacent to Salt Lake City, but none reached developed areas.

In Salt Lake County, 56 percent of all slope failures have occurred on hillsides where slopes range between 31 and 60 percent. That statistic prompted Salt Lake County in 1986 to lower the maximum allowable buildable slope from 40 percent to 30 percent. Even so, 23 percent of observed slope failures have occurred on slopes of 30 percent or less.

Goal 1 – Reduce or eliminate the threat of slope failure damage
Objective 1.1 (Priority MEDIUM): Reduce the threat of slope failures following wild fires.

Action 1: Develop protocol for working with State and Federal agencies in reducing the impact of post-fire debris flow hazard.

N/A

Objective 1.2 (Priority MEDIUM): Monitor historic landslide areas.

Action 1: Coordinate with Utah Geological Survey and other agencies to understand current slope failure threats/potential.

N/A

Objective 2.1 (Priority HIGH): Address landslide hazards in new sub-divisions.

Action 1: Utilize recommendations provided by State Geologic Hazards Working Group to address land-use and planning for new developments.

N/A

5.1.7 Wildland Fire

Problem Identification: Utah's typical fire season is the dry period from May through October. Lightning causes the largest numbers of wildfires.
Recent large western states wildfires; the 1991 Oakland Hills fires, 1994 Tyee fire in Washington, the 1993 and 2007 Southern California fire sieges are examples of the growing fire threat which occurs in the Wildland/Urban Interface (WUI). The WUI is defined as the area where structures and other human development meet or intermingle with undeveloped wildland or vegetative fuels. Since 1985, approximately 9,000 homes have been lost to urban/wildland interface fires across the United States.

In 1990, Salt Lake County created a wildland program shortly after a wildland fire threatened Emigration Canyon, a major urban interface area at the county's eastern boundaries. The fire

began in the Affleck Park day use picnic area, possibly the result of an unattended campfire. The fire quickly spread to the west and up the side of the mountain, with only one ridge between it and Emigration Canyon. The incident lasted for five days, in which time 5,500 acres were burned. Fortunately, no one was injured and no structures were lost.

Goal 1 – Community education on wildfire hazard
Objective 1.1 (Priority HIGH): Reduce risk from wild fire through education programs

Action 1: Increase public awareness through "Fire Wise" program.

Working with Salt Lake County—UFA Riley Pilgrim with Firewise Program

Action 2: Educate homeowners on the need to create defensible space near structures in WUI.

Firewise Representative spoke with community group 10.3.2013. Will return April 2014 to begin training with citizens.

Goal 2 – Improve safety from wildfire hazards through planning, protective actions and improved fire response capabilities

Objective 2.1 (Priority HIGH): Assist homeowners with creating defensible space near structures in WUI areas.

Action 1: Designate and promote countywide annual initiative for clearing fuels.

N/A

Action 2: Provide waste removal, such as chipping of green waste by Public Works, following designated fuel clearing day/week.

Ongoing

Objective 2.2 (Priority HIGH): Improve evacuation capabilities for WUI areas.

Action 1: Work with experts and communities to develop or update evacuation plans.

Ongoing

Action 2: Evaluate transportation network and address needed improvements to facilitate evacuation and emergency response.

N/A

Objective 2.3 (Priority HIGH): Improve addressing system in WUI areas to facilitate emergency response.

Action 1: Identify all facilities, businesses, and residences, particularly in the canyons, and assign addresses according to current county addressing standards.

Ongoing

Action 2: Incorporate improved addresses in fire-dispatch and other databases.

Ongoing

Objective 2.4 (Priority HIGH): Complete wildfire protection projects

Action 1: Reduce fuels around publicly owned structures.

N/A

Action 2: Implement firebreaks and other protective measures.

N/A

Action 3: Assess existing water flow capabilities, both public and private, and address deficiencies.

N/A

Action 4: Assist communities in developing Community Wildfire Protection Plans or similar plans.

Will begin April 2014

Objective 2.5 (Priority HIGH): Encourage proper development practices in the WUI.

Action 1: Adopt the Utah Wildland-Urban Interface Code (Code addresses proper road accessibility, availability of water flow for fire response, etc.)

N/A

Action 2: Define wildland-urban interface and develop digital maps of the WUI.

Fire Map available online

Know Evacuation Routes

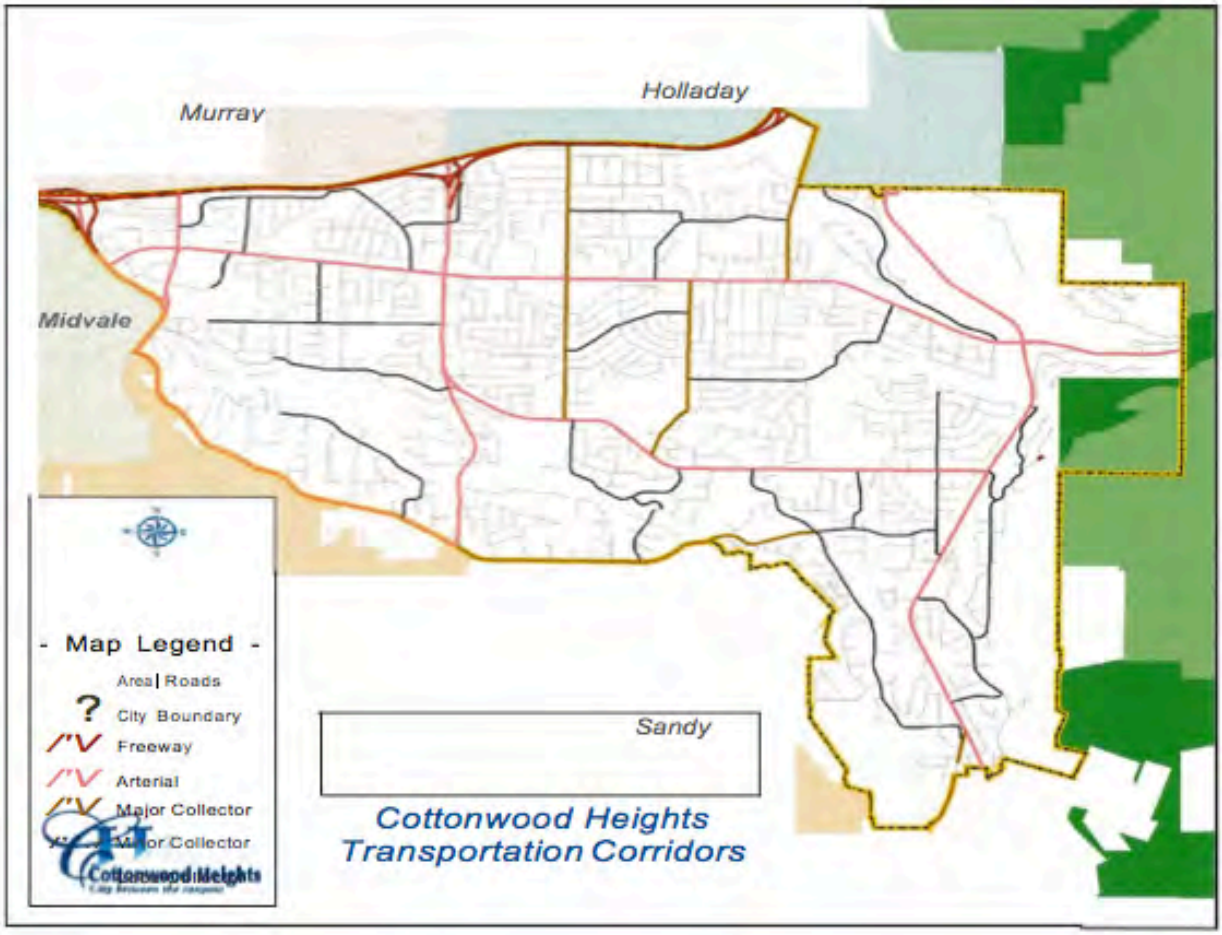
Cottonwood Heights' snow removal priority list can also be utilized for and serves well as a map of designated evacuation routes. They are well maintained and prioritized according to access, size and traffic capabilities. Below is the snow removal policy.

This policy is intended for streets located within the boundaries of Cottonwood Heights. The city maintains more than 320 lane miles of arterial, secondary and residential streets that have been divided into four (4) priorities:

PRIORITY 1, Major Arterials- Fort Union Boulevard, Highland Drive, Creek Road, Bengal Boulevard, Union Park, 1300 East, 2700 East, and 3000 East. These streets are first priority because they are essential to the movement of public safety vehicles in the city and will be cleared first in any storm event or disaster.

PRIORITY 2, Minor Arterials - 2300 East, Park Centre Drive, 7200 South, Danish Road, Oak Creek Drive, 2325 East, Nantucket Drive, 3500 East, Nye Drive, 1700 East, Whitmore Way, Portsmouth Avenue, and Big Cottonwood Canyon Road. Streets in this priority are based on volume and the need to provide access to schools, bus routes and other essential services.

PRIORITY 3 and 4, Collector Roads and Local Residential Roads- These priorities cover all additional collector and local streets. Priority 3 will include street networks that serve areas that are major traffic volume generators and areas with trouble spots such as busy intersections and roads on steep slopes or other critical features.


Murray
Holladay
Midvale
Sandy
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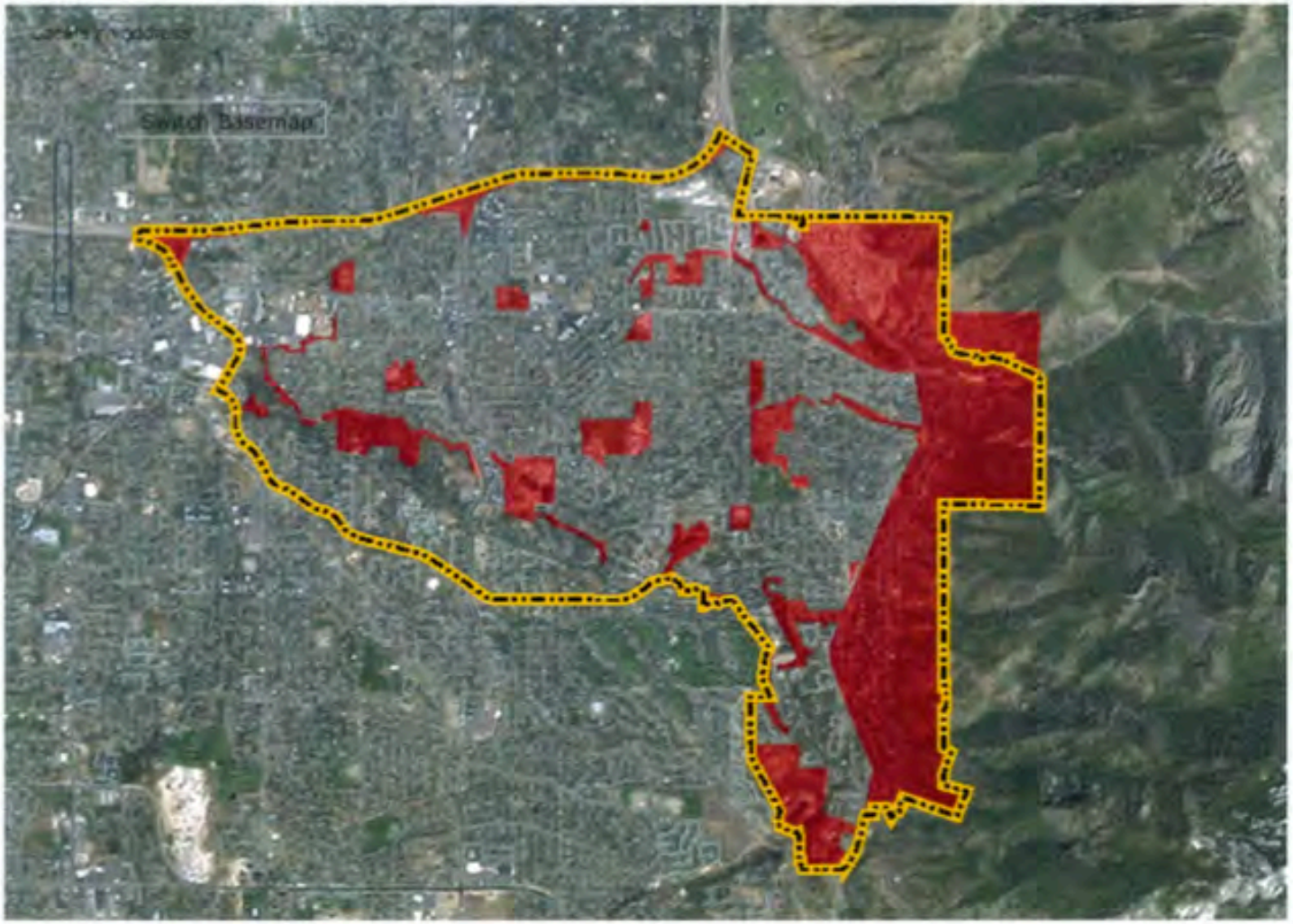
Area | Roads
City Boundary
Freeway
Arterial
Major Collector
Cottonwood Heights
Cottonwood Heights
Transportation Corridors

Cottonwood Heights Public Map Gallery

Restricted Fires Area

Areas where fires and fireworks are restricted in Cottonwood Heights



Legend | About

Layers

- Addresses
- Cottonwood Heights
- Fire Restricted Areas

Legend

Cottonwood Heights
Cottonwood Heights

Fire Restricted Areas
FireRestrictedAreas

Integration of data, information, and mitigation goals and action plans

Cottonwood Heights will integrate mitigation strategies into its building codes, the planning commission, and the actions of the City Council and other relevant agencies by education by the Emergency Manager during daily, weekly, and monthly city and public meetings.

6 Plan Adoption

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

The purpose of formally adopting this plan is to secure buy-in from the City of Cottonwood Heights, raise awareness of the plan, and formalize the plan's implementation. The adoption of this plan completes Planning Step 9 of the 10-step planning process: Adopt the Plan. The Cottonwood Heights City Council, will adopt this multi-hazard mitigation plan by passing a resolution.

7 Plan Implementation & Maintenance

Requirement §201.6(c)(4):
[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.

Implementation and maintenance of the plan is critical to the overall success of hazard mitigation planning. This is Planning Step 10 of the 10-step planning process. This chapter provides an overview of the overall strategy for plan implementation and maintenance and outlines the method and schedule for monitoring, updating, and evaluating the plan. The chapter also discusses incorporating the plan into existing planning mechanisms and how to address continued public involvement.

7.1 Implementation

This plan is designed to be implemented over time so that the city's vulnerability to natural hazards can be reduced. The city is making progress towards this goal as discussed in Chapter 5. This plan contains many worthwhile mitigation actions, and while some are already completed or underway, the EPC will need to decide which new actions to focus on. Two factors will help with making that decision: the priority assigned the actions in the planning process and funding availability. Low or no-cost projects can sometimes most easily demonstrate progress toward successful plan implementation. Implementation will also be accomplished through adherence to the schedules identified for each action in Chapter 5.

Another important implementation mechanism that is highly effective and low-cost is incorporation of the hazard mitigation plan recommendations and their underlying principles into other city and county plans and mechanisms, such as the Comprehensive Flood and Stormwater Utility Master Plan and the Salt Lake County Comprehensive Plan. The city has and continues to implement policies and programs to reduce losses to life and property from natural hazards. This plan builds upon the momentum developed through previous and related planning efforts and mitigation programs and recommends implementing projects, where possible, through these other program mechanisms.

Mitigation is most successful when it is incorporated into the day-to-day functions and priorities of government and development. This integration is accomplished by constant, pervasive, and energetic efforts to network, identify, and highlight the multi-objective, win-win benefits to each program, the Cottonwood Heights community, and its stakeholders. This effort is achieved through the routine actions of monitoring agendas, attending meetings, and promoting a safe, sustainable community. Additional mitigation strategies could include consistent and ongoing

enforcement of existing policies and vigilant review of city and county programs for coordination and multi- objective opportunities.

Simultaneous to these efforts, it is important to maintain a constant monitoring of funding opportunities that can be leveraged to implement some of the more costly recommended actions. This will include creating and maintaining a bank of ideas on how any required local match requirements of state or federal grants can be met. When funding does become available, the EPC will be in a position to capitalize on the opportunity. Funding opportunities to be monitored include special pre- and post-disaster funds, capital improvement budgeted funds, state or federal earmarked funds, and grant programs, including those that can serve or support multi-objective applications.

7.1.1 Role of Emergency Planning Committee in Implementation and Maintenance

With adoption of this plan, the Emergency Planning Committee (EPC) will be tasked with plan implementation and maintenance. The EPC agrees to:

- Act as a forum for hazard mitigation issues;
- Disseminate hazard mitigation ideas and activities to all participants;
- Pursue the implementation of high-priority, low/no-cost recommended actions;
- Keep the concept of mitigation in the forefront of community decision making by identifying plan recommendations when other community goals, plans, and activities overlap, influence, or directly affect increased community vulnerability to disasters;
- Maintain a vigilant monitoring of multi-objective cost-share opportunities to help the community implement the plan's recommended actions for which no current funding exists; Monitor and assist in implementation and of this plan;
- Report on plan progress and recommended changes to the Cottonwood Heights City Council; and
- Inform and solicit input from the public.

The EPC will not have any powers over city staff; it will be purely an advisory body. Its primary duty is to see the plan successfully carried out and to report to the community governing board and the public on the status of plan implementation and mitigation opportunities for the city. Other duties include reviewing and promoting mitigation proposals, considering stakeholder concerns about hazard mitigation, passing concerns on to appropriate entities, and posting relevant information on the city website.

7.2 Maintenance

Plan maintenance implies an ongoing effort to monitor and evaluate plan implementation and to the plan as progress, roadblocks, or changing circumstances are recognized.

7.2.1 Maintenance Schedule

In order to track progress and the mitigation strategies identified in the action plan, the city will revisit this plan annually and after a significant hazard event or disaster declaration. The Emergency Manager for Cottonwood Heights is responsible for initiating this review and will consult with members of the EPC. The review may occur in concert with CRS review and recertification. The suggested time frame for the annual review is in the spring, prior to flood and wildfire season. This will also position the city for grant and CRS review cycles that occur in the fall. A five-year written to be submitted to the state and FEMA Region VIII, unless disaster or other circumstances (e.g., changing regulations) require a change to this schedule.

This plan will be re-approved by the state and FEMA, and re-adopted within a five-year cycle as per Requirement §201.6(c)(4)(i) of the Disaster Mitigation Act of 2000. Efforts to begin should begin no later than January 2019. The city will inquire with the Utah Office of Emergency Management (UOEM) and FEMA for funds to assist. Funding sources may include the Emergency Management Performance Grants, Pre-Disaster Mitigation, Hazard Mitigation Grant Program (if a presidential disaster has been declared), and Flood Mitigation Assistance grant funds. Should a Pre-Disaster Mitigation planning grant be sought, the application should be submitted in 2014, as there is a three year performance period to expend the funds, plus there is no guarantee that the grant will be awarded the when initially submitted. This allows time to resubmit the grant in 2015 or 2016 if needed. The next plan is anticipated to be completed and reapproved by UOEM and FEMA Region VIII by November 2019.

7.2.2 Maintenance Evaluation Process

Evaluation of progress can be achieved by monitoring changes in vulnerabilities identified in the plan. Changes in vulnerability can be identified by noting:

Decreased vulnerability as a result of implementing recommended actions, Increased vulnerability as a result of failed or ineffective mitigation actions, and/or Increased vulnerability as a result of new development (and/or annexation).

Changes to this plan will follow the most current FEMA, UOEM and Salt Lake County planning guidance and consider the following:

- Consider changes in vulnerability due to project implementation, Document success stories where mitigation efforts have proven effective, Document areas where mitigation actions were not effective,
- Document any new hazards that may arise or were previously overlooked, Incorporate

new data or studies on hazards and risks,
- Incorporate new capabilities or changes in capabilities,
- Incorporate growth and development-related changes to city inventories, and incorporate new project recommendations or changes in project prioritization. Document continued public involvement,
- Document changes to the planning process, which may include new or additional stakeholder involvement,
- Include a public involvement process to receive public comment on the d plan prior to submitting the d plan to UOEM/FEMA, and
- Include re-adoption by all participating entities following UOEM/FEMA approval.

In order to best evaluate any changes in vulnerability as a result of plan implementation, the EPC will follow the following process:

A representative from the responsible office identified in each mitigation measure will be responsible for tracking and reporting on an annual basis to the EPC on project status and provide input on whether the project as implemented meets the defined objectives and is likely to be successful in reducing vulnerabilities.

If the project does not meet identified objectives, the EPC will determine what additional measures may be implemented and an assigned individual will be responsible for defining project scope, implementing the project, monitoring success of the project, and making any required modifications to the plan.

Changes will be made to the plan to accommodate for projects that have failed or are not considered feasible after a review for their consistency with established criteria, the time frame, city priorities, and/or funding resources. Priorities that were not ranked high but were identified as potential mitigation strategies will be reviewed as well during the monitoring and of this plan to determine feasibility of future implementation. Updating of the plan will be by written changes and submissions, as the EPC deems appropriate and necessary, and as approved by the Cottonwood Heights City Council. In keeping with the process of adopting the plan, a public involvement process to receive public comment on plan maintenance and updating will be held during the annual review period, and the final product will be re-adopted by City Council.

7.2.3 Incorporation into Existing Planning Mechanisms

The mitigation strategy in Section 5.3 Mitigation Strategy of this plan recommends using existing plans and/or programs to implement hazard mitigation in the city, where possible. This point is also emphasized previously in this chapter. Based on this plan's capability assessment, the city has and continues to implement policies and programs to reduce losses to life and property from natural hazards. This plan builds upon the momentum developed through previous and related planning efforts and mitigation programs and recommends implementing projects, where possible, through the following mechanisms:

- Flood mitigation plans
- Cottonwood Heights Community Wildfire Protection Plan
- Cottonwood Heights Recovery Plan (in development)
- Capital improvement plans and budgets Comprehensive Flood and Stormwater Master Plan Facilities and Asset Management Master Plan
- Greenways Master Plan Structure Protection Plan Transportation Master Plan
- Other plans, regulations, and practices with a hazard mitigation or loss prevention element

7.2.4 Continued Public Involvement

Continued public involvement is also imperative to the overall success of the plan's implementation. The process provides an opportunity to publicize success stories from the plan implementation and seek additional public comment. At least one public meeting or workshop to receive public input will be held during the next period. When the EPC reconvenes for the, they will coordinate with all stakeholders participating in the planning process-including those that joined the committee since the planning process began-to and revise the plan. The plan maintenance and process will include continued public and stakeholder involvement and input through attendance at designated committee meetings, web postings, and press releases to local media.

8 Hazard Mitigation Plan Adoption

It is the intent of Cottonwood Heights City that this Hazard Mitigation Plan will be adopted by resolution once approved by the State of Utah and FEMA, which approval should be within five years of the previous Hazard Mitigation Plan's approval date. This process will be documented through the Cottonwood Heights City Recorder's office.

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RESOLUTION NUMBER 15-14

A RESOLUTION OF THE DRAPER CITY COUNCIL ADOPTING THE SALT LAKE COUNTY MULTI-JURISDICTIONAL MULTI-HAZARD MITIGATION PLAN

WHEREAS, the Disaster Mitigation Act of 2000, Public Law 106-390, was enacted to establish a national disaster hazard mitigation program to reduce the loss of life and property, human suffering, economic disruption, and disaster assistance costs resulting from natural disasters, and to assist state, local and Indian tribal governments in implementing effective hazard mitigation measures designed to ensure the continuation of critical services and facilities after a natural disaster; and

WHEREAS, the Disaster Mitigation Act requires such governments to develop hazard mitigation plans to identify the natural hazards that could impact their jurisdictions, identify actions and activities to mitigate the effects of those hazards, and establish a coordinated process to implement such plans; and

WHEREAS, Draper City has been and continues to be committed to reducing the loss of life and property, alleviating human suffering and economic disruption, and controlling disaster assistance costs resulting from natural hazards and accelerating the County's recovery after the occurrence of any such hazard; and

WHEREAS, such Salt Lake County Multi-Jurisdictional Multi-Hazard Mitigation Plan, has been approved by the Federal Emergency Management Agency ("FEMA") subject to adoption by Draper City and other participating entities;

NOW, THEREFORE, be it resolved by the City Council of Draper City, State of Utah as follows:

Section 1. The Salt Lake County Multi-Jurisdictional Multi-Hazard Mitigation Plan. The Salt Lake County Multi-Jurisdictional Multi-Hazard Mitigation Plan is hereby adopted. Annex "D" of the plan is attached hereto as Exhibit "A". The full plan is on file with the Draper City Recorder.

Section 2. Severability. If any section, part or provision of this Resolution is held invalid or unenforceable, such invalidity or unenforceability shall not affect any other portion of this Resolution, and all sections, parts and provisions of this Resolution shall be severable.

Section 3. Effective Date. This resolution shall become effective immediately upon passage by the City Council.

PASSED AND ADOPTED BY THE CITY COUNCIL OF DRAPER CITY, STATE OF UTAH, THIS 3rd DAY OF MARCH, 2015.

DRAPER CITY

BY: _____
Draper City Mayor

ATTEST:

_____
Draper City Recorder

CITY OF DRAPER CORPORATE Seal 1978 State of Utah

DRAPER CITY

Hazard Mitigation Plan (2014)

For questions or information about this plan, please contact:

Garth Smith
Draper City Director HR and Emergency Srvs.
(801) 576-6560
Garth.smith@draper.ut.us

Maridene Alexander
Public Information Officer
(801) 576-6527
Maridene.alexander@draper.ut.us

ANNEX D: CITY OF DRAPER

1 Introduction

1.1 Background

Draper City is strategically located in the southeast corner of the Salt Lake Valley, with the Wasatch Mountain Range on the east and the Traverse Mountain Range on the south. The city is 18 miles south of Salt Lake City and 28 miles north of Provo. The Salt Lake International Airport is 21 miles north of the city. Draper is located 20 minutes from world-class skiing at Alta, Snowbird, Brighton and Solitude and 30 minutes to Park City and Deer Valley ski areas.

The city owns more than 3,200 acres of open space in Corner Canyon and SunCrest. This pristine mountain land is located in the foothills and canyons of Draper and on top of the Traverse Ridge Mountain Range. Draper City has more than 90+ miles of cycling, hiking and equestrian trails, with easy access trails from residential neighborhoods. At the Point of the Mountain in Draper you can experience hang gliding or paragliding at one of the top sites in the country.

The city is known for high-quality, single family neighborhoods and a robust economy. The city has more than 14,000 households. The population of Draper according to the US Census in 2013 is 45,285. Draper is the 10th largest city in the state in land area, encompassing 30.3 square miles.

1.2 Purpose

Draper City is a community that preserves its unique identity and heritage, and provides protection and services for its citizens.

When the Mayor and City Council make decisions, they base these decisions on the following values:

- **Unity** - Neighbors work together to build a strong community.
- **Respect** - Citizens have tolerance, understanding and sensitivity to one another's differences.
- **Quality of Life** - Citizens of all ages feel safe, have places to gather, and enjoy traditions, events, and culture.
- **Environment** - Draper is clean, pleasant, pastoral, has a small-town feeling and sense of identity.
- **Pride** - Citizens are proud to call Draper home and are involved in community well being.

1.3 Authority and Reference

Draper City's form of government is Council / Manager. Draper has a part-time Mayor and five part-time City Council members. The City Manager is full-time and works under the direction of the Mayor and Council. In the state of Utah, Draper is currently classified as a third class city.

2 Community Profile

2.1 Geography, Environment & Climate

Draper is located in the southeast quadrant of Salt Lake County and in the northwest quadrant of Utah County. Draper covers 30.3 square miles.

Adjacent to Draper City on its east are the Wasatch Mountains and the base of those mountains is within the boundaries of Draper. Adjacent to Draper City on its west is the Jordan River, which is the city boundary line between Draper and Riverton / South Jordan. Included within Draper is the Traverse Ridge Mountain area, which separates Salt Lake and Utah counties. Draper is characterized by a mixture of land uses. Draper has commercial, industrial, residential, agricultural, vacant land and 4,500 acres of open space areas within its boundaries. The open space area is used for recreational purposes by residents of Draper and the surrounding communities and has many multi-use trails and areas within.
Draper has an average annual temperature of 53.7°F and receives 15.69 inches of rain.

Figure 1 displays a Draper City map. Figure 2 displays a map showing the location of Draper City within Salt Lake County.

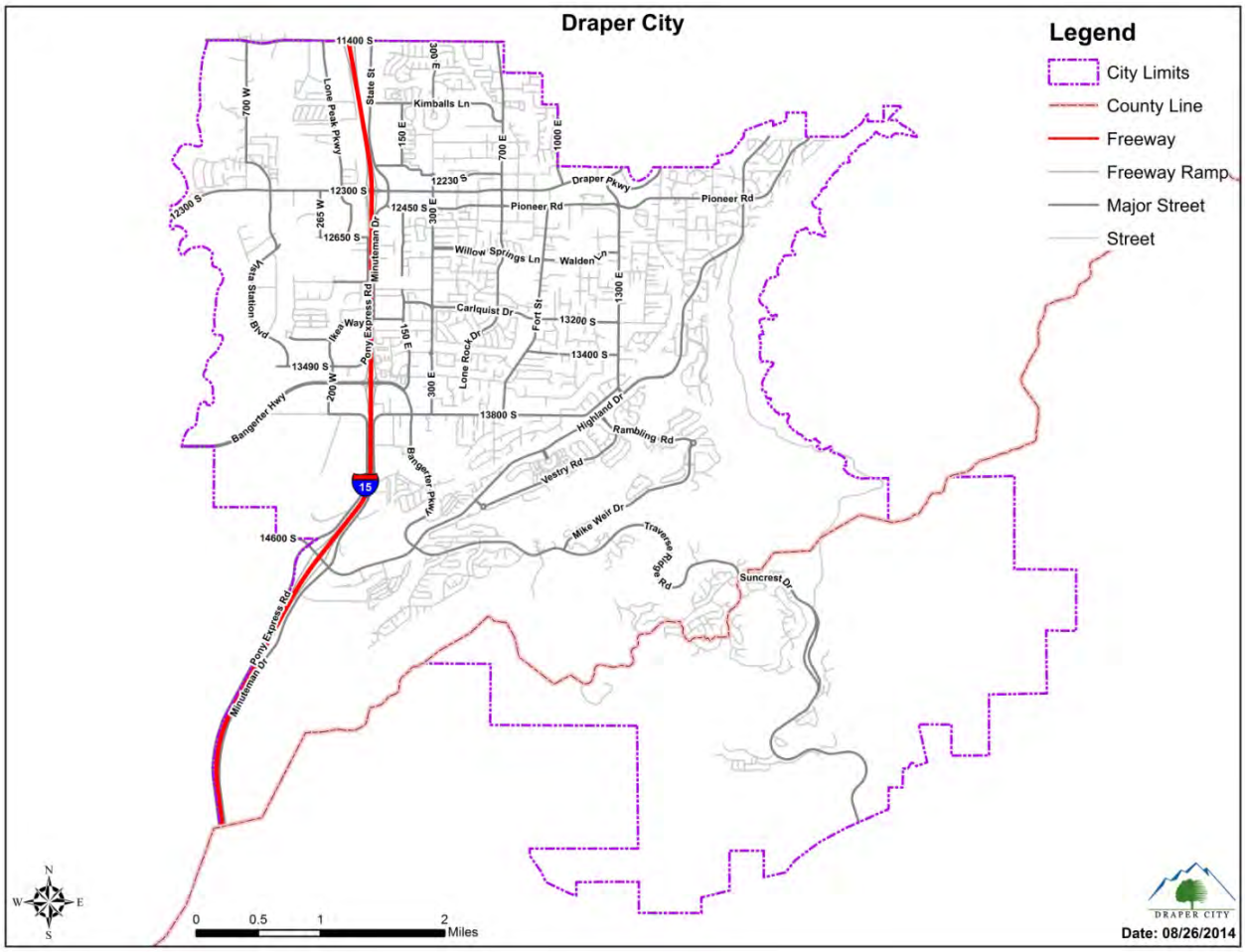

Figure 1. The City of Draper

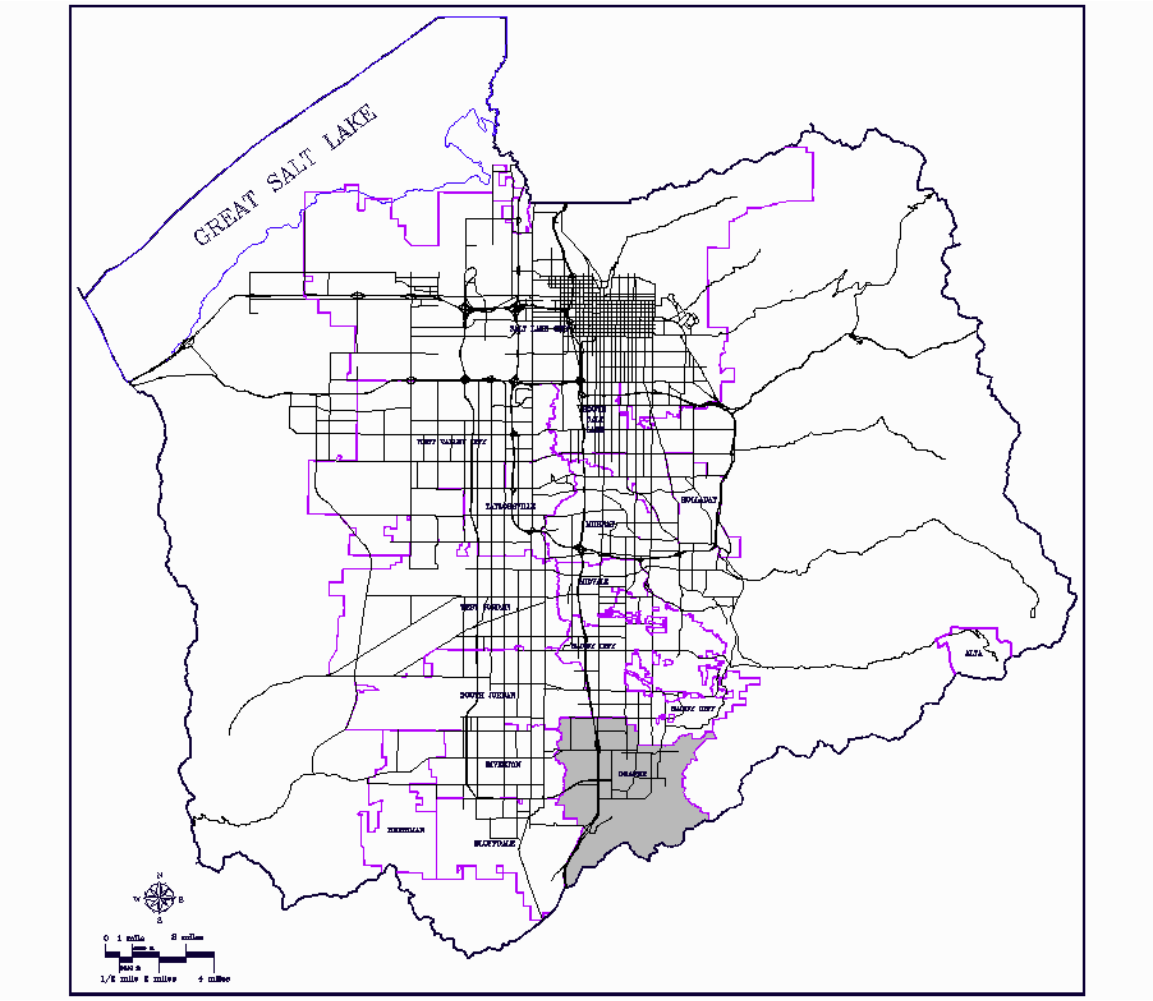

Figure 2. The City of Draper's Location within Salt Lake County

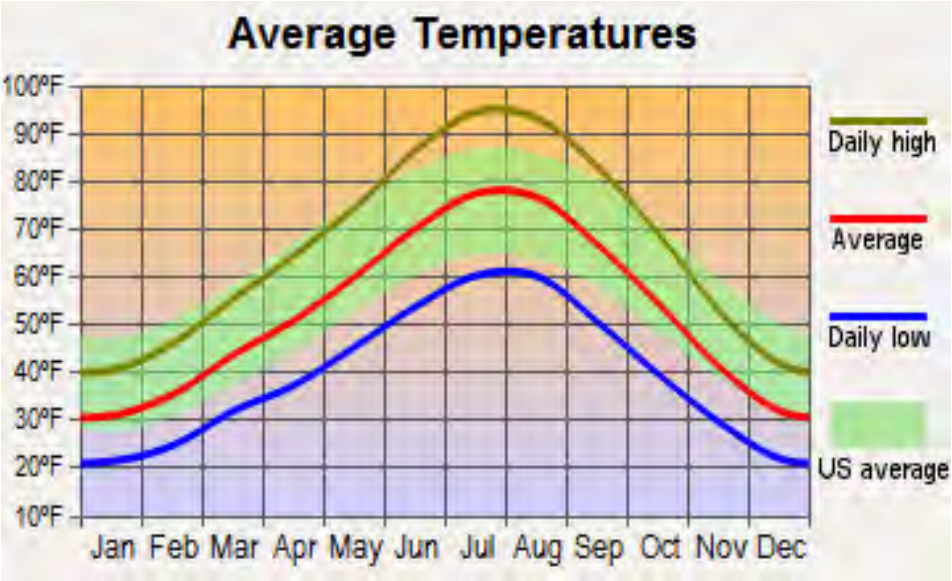

Figure 3. The City of Draper's Average Temperatures

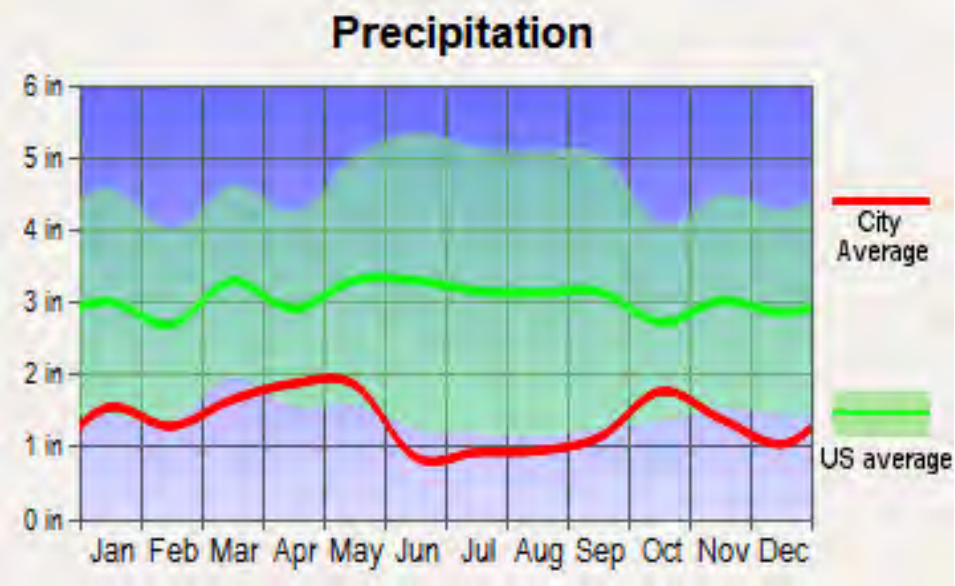

Figure 4. The City of Draper's Average Precipitation

2.2 Community Facts and History

When incorporated in1978 as a City, Draper was a small farming community of 4,500 residents situated on two square miles, but the area had been settled much earlier by Mormon pioneers under the direction of Brigham Young.

In the fall of 1849, under the direction of Mormon Pioneer leader Brigham Young, Ebenezer Brown, the son of Scottish immigrants brought his cattle to graze the tall grass fed by mountain streams in the unsettled area known as South Willow Creek. The following spring, Ebenezer brought his wife Phoebe and their large family. Together they raised and fattened cattle to sell to immigrants heading to the gold fields of California. That same year the Browns invited Phoebe's brother, William Draper III, his wife Elizabeth, a midwife / doctor, and their seven children to join in farming the area.

The area grew rapidly and by the end of 1852, 20 families called South Willow Creek home. In 1854, the first post office was established. The town was named Draperville in honor of William Draper III, who was also the first presiding elder of the small Mormon congregation in town.

2.3 Population and Demographics

In 2013, the total population for the City of Draper was estimated at 45,285 by the U.S. Census. Draper City's Mean Household Income is $108,276 and Median Household Income is $89,935. Draper City has more than 14,000 households. The median age is 30.7 years.

2.4 Economy

Draper is home to the main customer service center and campus of eBay, the tech call center of PGP Corporation, the call center of Musician's Friend, and the headquarters of 1-800 Contacts. Draper is also home to Utah's first Ikea store located in the intermountain west, which opened in spring 2007. The Church of Jesus Christ of Latter-day Saints (Mormons) constructed a temple in Draper that was dedicated on March 20, 2009.

Draper City has a reputation as a great place to live. Draper has maintained a small town community spirit, which is exemplified by such community events as the annual Draper Days celebration. Draper's unique growth opportunities and outdoor recreational venues, continues to attract new residents, developers, businesses, and industries to the City.

The breakdown of the Draper residential employment sector is as follows:

Management, business, finance	22.00%
Engineering, computers, science	8.11%
Community, social services	1.47%
Legal	2.15%
Education, library	6.09%
Arts, design, media, sports, entertainment	1.87%
Healthcare practitioners and technology	5.41%
Healthcare support	1.88%
Firefighters, law enforcement	1.50%
Food preparation, serving	3.12%
Building maintenance	0.93%
Personal care	2.95%
Sales, office, administrative support	30.79%
Construction, extraction, maintenance/repair	5.12%
Production, transportation, material moving	6.63%

Table 1. Draper Residential Employment Sector

2.5 Land Use and Development

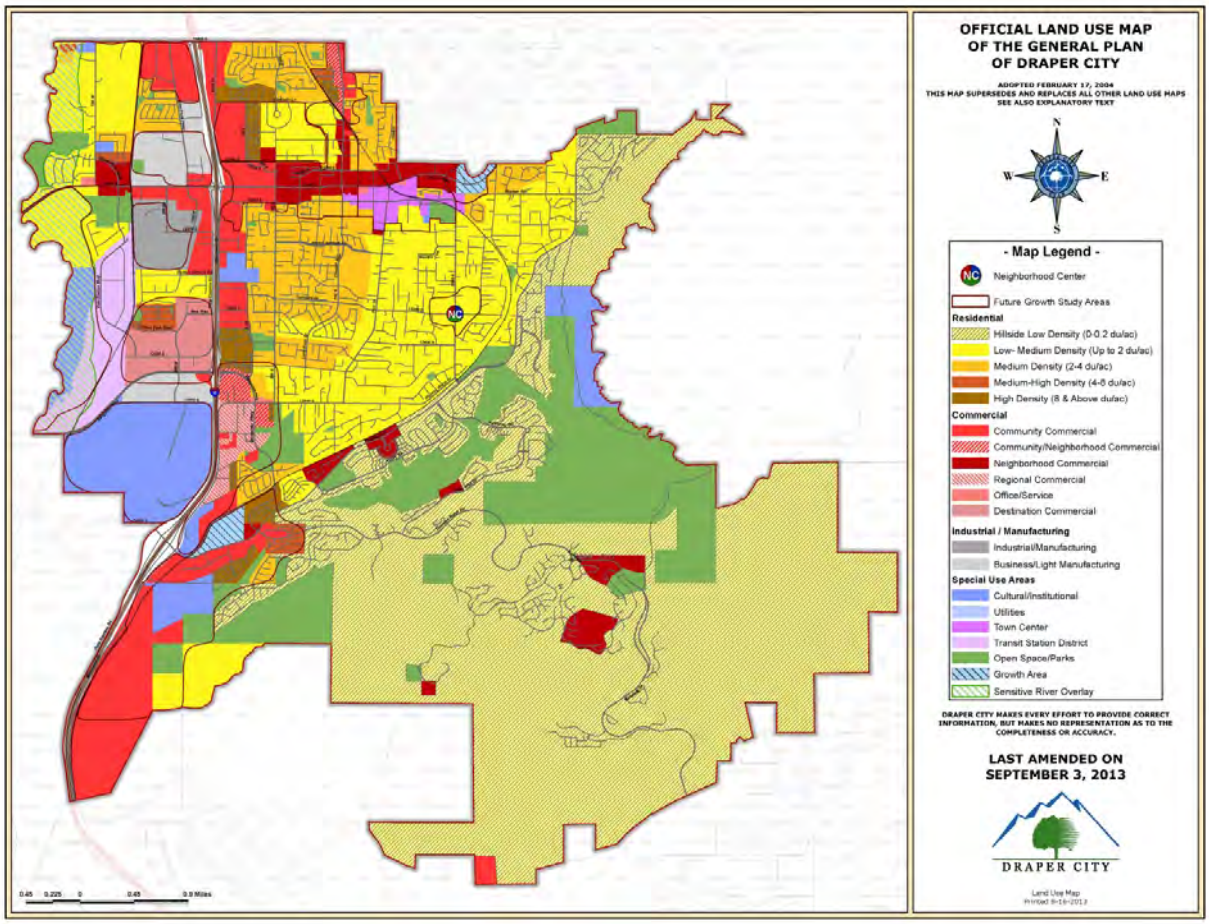

Figure 4. Draper City Land Use Map

2.6 Growth and Development Trends

The growth surge that Draper has experienced from 1990 to the present is the largest in volume and geographic extent the city has ever experienced. This growth period occurred when the city quickly changed from a rural, agricultural town into a full-fledged suburban city. During this time the city has experienced strong surges of relatively unrestrained growth.

In 1980 the population of the city was 5,670, the total amount of housing was 1,383 and the size of the city was 22.8 square miles. By the end of 2000 the population of the city grew to 25,297 (a 445% increase), the total housing number grew to 7,418 (a 535% increase) and the size of the city became 30.3 square miles (a 24% change). Of the 535% increase in housing units in the city, 5,414 (73%) were single-family dwellings and 2,004 (27%) were multi-family and townhouse dwellings. The average increase in the number of dwelling units during this most recent growth period has been 8.2% per year.

In terms of the geographic location of this growth, 75% of the new housing units have been built in the southeastern part of the city. Increasingly the new housing is being built in the fringe areas as

properties near central city are nearing build-out. A very large portion of this growth has been focused on a series of medium to large master planned developments spread across the southern parts of the city.

The growth in business facilities (office, warehousing, retail, and manufacturing) has been concentrated in areas both east and west of the I-15 freeway and along 123rd south corridor. This growth has included redevelopment, greater diversity in users and building types, more expensive construction and both the import of new businesses as well as the growth of existing businesses. The current projections for growth suggest a future population of 55,000 in 2020.

The strongest future business growth areas are expected to be in the vicinity of the major north/south corridors (along the I-15 Freeway corridor from Sandy to the Point of the Mountain) and the major east/west corridors (114th South, 118th South State, and 123rd South and the Bangerter Highway), and the Town Center area. The mix of businesses will probably continue to diversify and the demand for more services to fulfill the needs of both the local population and business communities will increase.

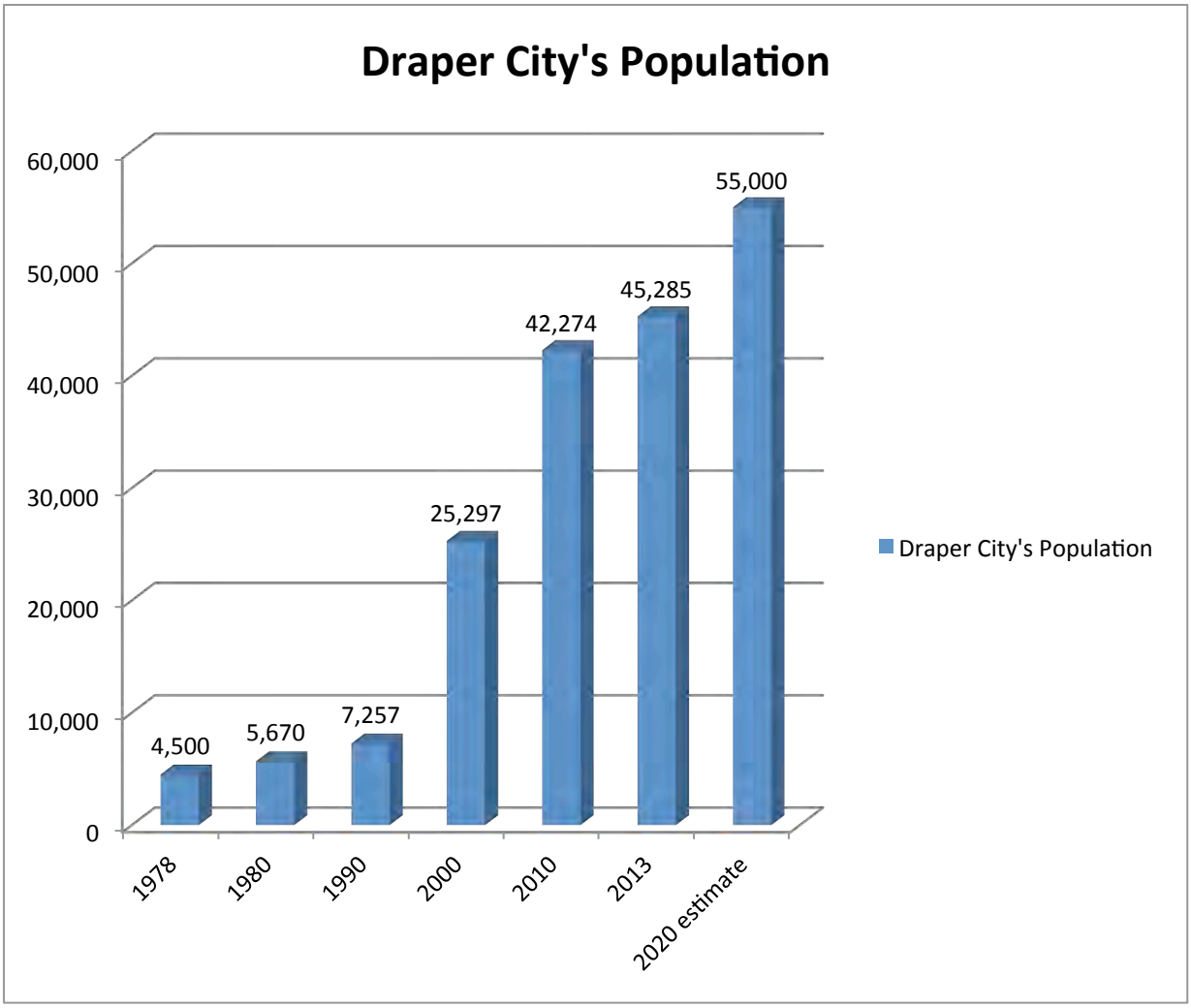

Figure 5. Population Growth Draper City\

2.7 Data Sources and Limitations

Draper City utilized the following sources to provide data for this report:
Draper City GIS
Draper City Community Development
Draper City General Plan
Salt Lake County
State of Utah
US Census Bureau
National Weather Service

3 Planning Process

3.1 Update Process and Participation Summary

Draper City plans to make updates to this Hazard Mitigation Plan and defines the processes by which continued public participation will be guaranteed in the sections below.

3.2 The Planning Team

Members of the Draper City Mitigation Planning Team are listed in the table below.

Garth Smith	Draper City HR Director / Emergency Manager
David Dobbins	Draper City Manager
Russell Fox	Assistant City Manager
Keith Morey	Community Development Director
Keith Collier	Chief Building Official
Maridene Hancock	Public Information Officer
Karen Burnett	GIS Manager
Glade Robbins	Public Works Director
Brad Watson	Public Works - Streets
Nolan Wootton	WaterPro

Members of the Salt Lake County Mitigation Planning Team are listed in the table below.

Kate Smith	Salt Lake County Emergency Management, Mitigation Planner
Cathy Bodily	Salt Lake County Emergency Management, Grant applicant and Planner
Roger Kehr	Salt Lake County Emergency Management, Mitigation Planner
Steve Sautter	Salt Lake County Emergency Management, Public Outreach
Matt Morrison	Salt Lake County Emergency Management, Planner
Bret Fossum	Salt Lake County Emergency Management, Mitigation Planner
Val Greensides	Unified Fire Authority, administrative support
Joan Welch	Unified Fire Authority, administrative support
Clint Mecham	Unified Fire Authority
Aaron Nelson	Unified Fire Authority
Dirk Andersen	Taylorsville City
Mike Barrett	Salt Lake County Emergency Services
Brent Beardall	Salt Lake County Flood Control
Leon Berrett	Salt Lake County
Dawn Black	Cottonwood Heights
David Chisholm	Holladay City
Eldon Farnsworth	South Salt Lake City

Bob Fitzgerald	West Valley City
Sheril Garn	Riverton City
Tina Giles	Herriman City
Jeff Graviet	Salt Lake County Emergency Services
Jon Harris	Murray City
Matt Jarman	South Jordan City
Connie Jones	Bluffdale City
Scott Jones	Salt Lake Community College
Jeff King	Jordan Valley Water Conservancy District
Ken Kraudy	Sandy City
Bart LeCheminant	Draper City
Dustin Lewis	South Jordan City
Cory Lyman	Salt Lake City
Kade Moncur	Salt Lake County Flood Control
Reed Scharman	West Jordan City
Lisa Schwartz	Taylorsville City/Midvale City
Marty Shaub	University of Utah
Garth Smith	Draper City
Jared Smith	Sandy City
Justin Stoker	Salt Lake City Flood Control
Claire Woodman	Town of Alta

Please refer to Salt Lake County for further details regarding specific meeting dates of the County's Mitigation Planning Team.

3.3 Meetings and Documentation

Members of the Draper City Mitigation Planning Team and the members of the Draper City Emergency Preparedness Committee were in attendance and discussed the Mitigation Plan at the following meetings:

September 3, 2014 – Public Meeting – Draper City Emergency Preparedness Committee

September 11, 2014 – Mitigation Meeting with Salt Lake County and key representatives from Draper City, WaterPro, Draper City Police Department and Unified Fire Authority.

October 1, 2014 – Public Meeting – Draper City Emergency Preparedness Committee

3.4 Public and Stakeholder Participation

Members of the community are invited to attend the Draper City Emergency Preparedness meetings that are held monthly. There are several members of the public who attend these meetings and participate in the discussion. Draper City also has a District Representative

Committee made up of representatives from each of the nine regions / areas in the city of Draper. These representatives are in contact with the area reps and neighborhood block captains in their particular district.

The Mitigation Plan will be presented at a public meeting of the Draper City Council in the next few months. Members of the public will be invited to comment and make suggestions /additions to the Mitigation Plan.

Draper City will also post information about the Mitigation Plan on the city's website as well as in the Draper City newsletter *"Draper Forward."* This publication is mailed to every household in Draper six times per year.

3.5 Multi-Jurisdictional Planning

Draper City has been in contact with Salt Lake County and representatives from the county attended the meeting that was held on September 11, 2014 with key members of Draper City's. The City's designated Emergency Manager has attended the monthly Salt Lake County Emergency Manager's meetings where information has been dispersed regarding the Mitigation Planning Process. Some of the information from Salt Lake County's plan has been included in this plan.

4 Hazard Identification, Analysis & Summary

4.1 Historical Hazard Events

The following are recent hazard events that have impacted Draper City:

- Corner Canyon Fire, August 8, 2008
- Debris Flow, July 21, 2009
- Flood and Debris Flow, August 19 2010
- Spring Flooding along Willow Creek and throughout City 2011
- Bell Canyon Fire, August 15, 2011
- Orson Smith Trailhead Fire, June 12, 2014

4.2 Hazard Analysis

A disaster can occur at anytime within Draper City. Rather than attempt to prepare for every potential disaster, the intent of Draper City is to identify the most likely situations and concentrate efforts and resources on the education, preparation, and mitigation for emergencies and disasters with a higher likelihood of occurrence. Numerous natural hazards exist in Draper City and surrounding communities. Active fault zones pose the threat of earthquakes, while steep mountains adjacent to the city create a potential for landslides, debris flows, rock falls, and snow avalanches. The natural hazards identified for Draper City in this section are as follows:

- Avalanche
- Dam Failure
- Drought
- Earthquake
- Flood
- Infestation
- Landslide and Problem Soils
- Pandemic
- Radon
- Severe weather
- Wildfire

4.2.1 Avalanche

The likelihood of avalanches impacting Draper City is limited. The area on the east side of the City is adjacent to the Wasatch Mountains, but there has been no historical avalanche activity in that area of the City.

4.2.2 Dam Failure

The Draper Irrigation Company has a storage reservoir located at the mouth of Corner Canyon, which is classified as a dam by the State of Utah. The impacts of the failure of this storage reservoir could have impacts on residential areas within the City. Any dam failures in other areas of Utah would have little impact on Draper, except for the potential impact on water supplies.

4.2.3 Drought

Draper City has large swings in temperature and in precipitation amounts during any year and is susceptible to drought. The City encourages landscaping that is friendly to the desert climate of Utah and when drought conditions occur the City would restrict the use of water for outdoor landscaping. Table 2 below shows average temperatures and precipitation amount for Draper City by month.

Month	Temp. (min)	Temp. (max)	Temp. (avg)	Precipitation
January	-2°F	58°F	29°F	1.3"
February	5°F	66°F	35°F	1.1"
March	15°F	74°F	43°F	1.9"
April	21°F	90°F	50°F	2.1"
May	30°F	93°F	61°F	1.3"
June	39°F	100°F	70°F	1.4"
July	54°F	105°F	82°F	0.2"
August	46°F	103°F	78°F	0.5"
September	35°F	96°F	66°F	1.2"

October	27°F	86°F	52°F	1.4"
November	4°F	75°F	42°F	0.9"
December	0°F	59°F	29°F	1.4"

Table 2. Draper City Average Temperature Table

4.2.4 Earthquake (Seismic Hazard)

Perhaps the most feared incident in Draper is the potential for a large earthquake. Reports indicate that thousands of deaths, billions of dollars of damage to private property, extended loss of utility services, overwhelmed medical facilities, and other catastrophic incidents will occur if a major earthquake occurs in the Salt Lake and/or Utah Valley.

Of significant concern, many high priority public and private buildings and many critical infrastructure facilities are located within or across the major fault zones in the region. These facilities include very large waterlines, large irrigation canals, utilities, railroads and major transportation routes. However, potential damage is not limited to fault zone areas. Fine-grained, lake-bottom sediments are common in western Draper and are susceptible to liquefaction-induced ground failure during a large earthquake. Each incident may require a unique response from Draper City and in the instance of a major earthquake outside assistance will be necessary.

Utah's earthquake hazard is greatest within the Intermountain Seismic Belt (ISB), which extends 800 miles from Montana to Nevada and Arizona, and trends from north to south through the center of Utah (The Wasatch Fault, UGS PIS 40). The ISB contains the Wasatch fault; one of the longest and most active normal faults in the world, with a potential for earthquake with a magnitude up to 7.5. The largest earthquakes in Utah occur in the ISB, where at least 35 earthquakes of magnitude 5.0 or greater have occurred since 1850. (UNHH 2008)

4.2.5 Flooding

Although located in a semi-arid region, Draper City is subject to thunderstorms and snowmelt flooding. Significant flooding occurred in the Salt Lake Valley in 1983 and to a lesser extent in 1984, and again in 2011 resulted in the construction of some sediment basins, installation of stream-bank protection, and the cleaning of stream channels to reduce flood hazards. Flood plains along the Jordan River and its tributaries have been rated for expected flood heights by the Federal Emergency Management Agency (FEMA) and areas susceptible to flooding have been delineated on the Federal Insurance Rate Maps (FIRM). These maps are updated as development occurs and channel obstructions, culvert modifications, and other changes alter potential flood heights and velocities.

The development ordinances of the city require geotechnical studies to identify areas of shallow ground water, artesian wells, and other water hazards. During high snow and rain fall years, the

groundwater table can move closer to the surface. Flooding can also result from leakage of unlined irrigation canals, flood irrigation practices, and septic tank drain fields.

Several streams run through the City of Draper and converge with the Jordan River that runs along the western border. Thirty-seven (37) structures are vulnerable to the 1% annual chance event and there is additional development planned in the 1% annual chance floodplain.

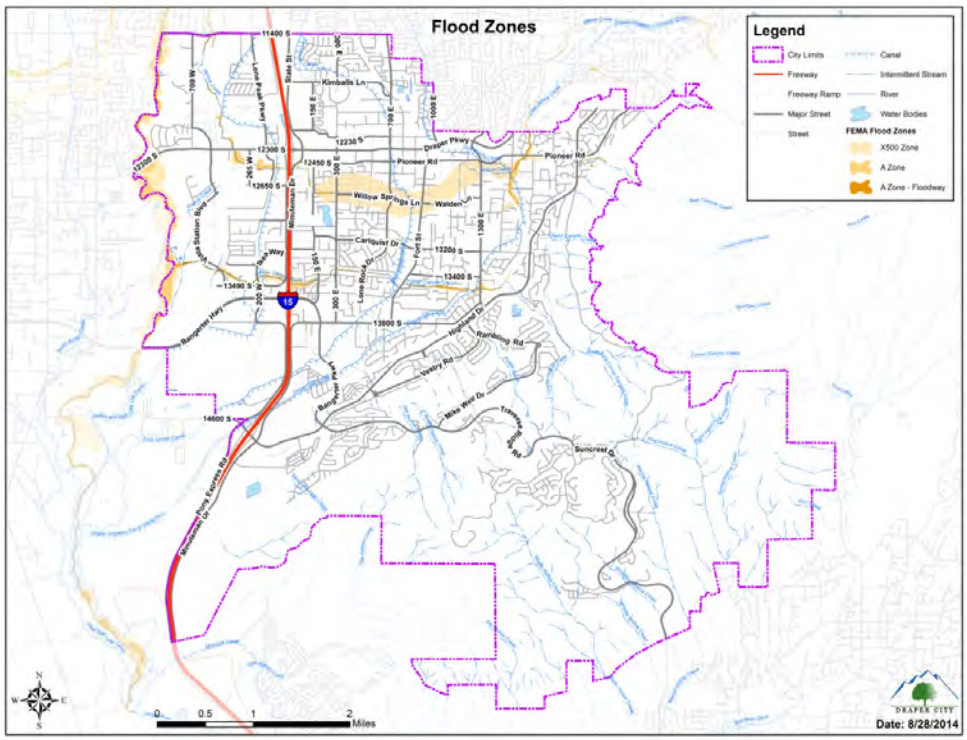

Figure 6. The City of Draper's Flood Zones

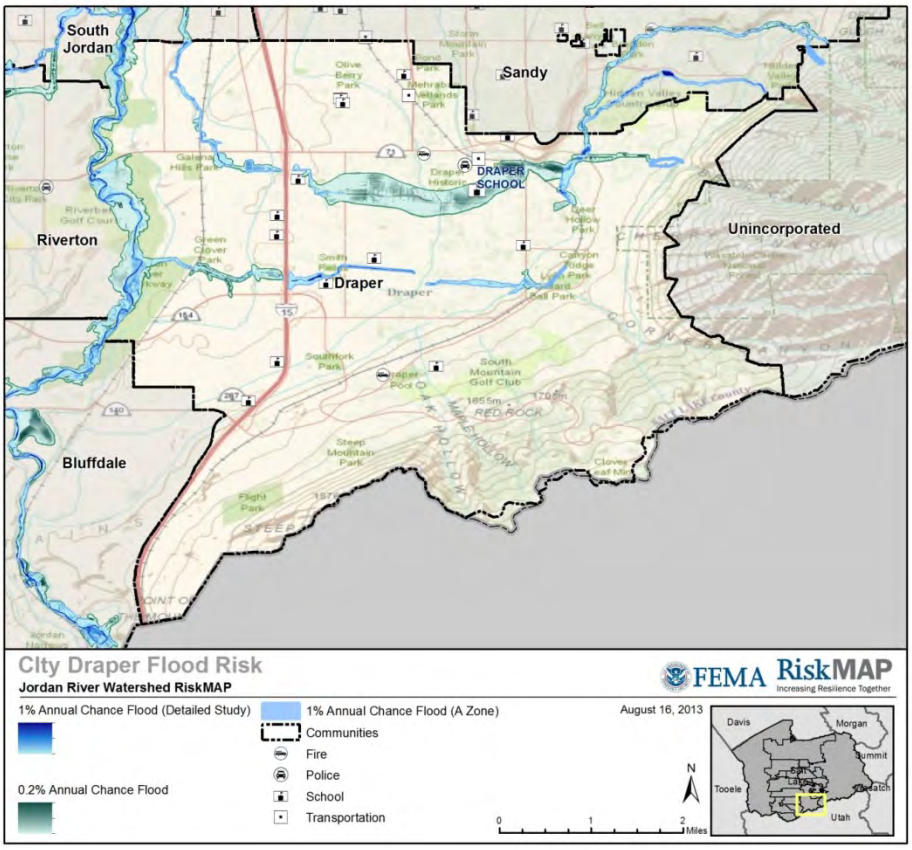

Figure 7. FEMA Risk Map: Draper City Flood Risk

4.2.5.1 Jordan Watershed

Salt Lake County created a Flood Risk Report for each city in the county in 2014. This report includes the flood risk assessment results of the Jordan Watershed Risk MAP Project. The Jordan River runs along the west border of Draper City. A flood rick is defined as an accumulation of water over normally dry areas. Floods become hazards to people and property by inundating developed areas. Flood losses range from damage to landscaping and debris generation to building damage and injury or death.

Structure Occupancy Type	1% Annual Chance Structure Exposure	1% Annual Chance Building and Contents Loss	0.2% Chance Structure Exposure	0.2% Chance Building and Contents Loss
Commercial	-	-	23	$ 260,858
Residential	37	$ 541,815	447	$ 7,912,175
Total	**37**	**$ 541,815**	**470**	**$ 8,173,033**

Table 3. City of Draper – Estimated Flood Loss Information

4.2.5.2 Areas of Risk and Mitigation Interest

The following Areas of Mitigation Interest were identified by the City of Draper and through FEMA's GIS flood exposure analysis:

- The Bear Canyon neighborhood encroaches into the natural floodplain. During high flows, certain parts of the neighborhood experience flooding along historic flow paths.
- In 2011, houses along Springdale Way near the foothills experienced mudflows, flooding, and debris flow from small drainages coming off the foothills.
- Along Corner Canyon Creek, downstream of I-15, there is planned commercial development in the SFHA. The City is considering flood detention and an irrigation facility as well as a culvert or channelization for Corner Canyon Creek at 1100 East.
- The Draper School is vulnerable to the 0.2% annual chance flood.

Draper does not have any repetitive loss properties identified under the National Flood Insurance Program (NFIP).

The City's Community Development Director oversees enforcement of floodplain management requirements adopted by the City, including regulating new construction in Special Flood Hazard Areas (SFHAs); floodplain identification and mapping, including any local requests for map updates; description of community assistance and monitoring activities.

4.2.6 Infestation

The probability of the infestation of insects or rodents in Draper is negligible. The may be individual property owners that may be impacted, but the likelihood of a citywide infestation is very low.

4.2.7 Landslide and Problem Soils (Geologic Hazard)

Numerous geologic hazards exist in Draper and throughout the Salt Lake Valley that could result in an emergency situation or disaster. Steep mountains adjacent to the city create a potential for landslides, debris flows, rock falls, and snow avalanches. Earthquake hazards are likely to include ground shaking, ground rupture, tectonic deformation, liquefaction, seismically induced slope failures and phenomena related to ground-water effects. Wildfires can remove necessary vegetation, which can result in unstable soils for extended periods of time. The most proactive approach to minimizing geologic hazard is to avoid development in inappropriate areas. The potential for geologic events can be partially mitigated through proper placement of development. Each incident may require a unique response from Draper City, and in the instance of a major mudslide or debris flow, outside assistance will be necessary.

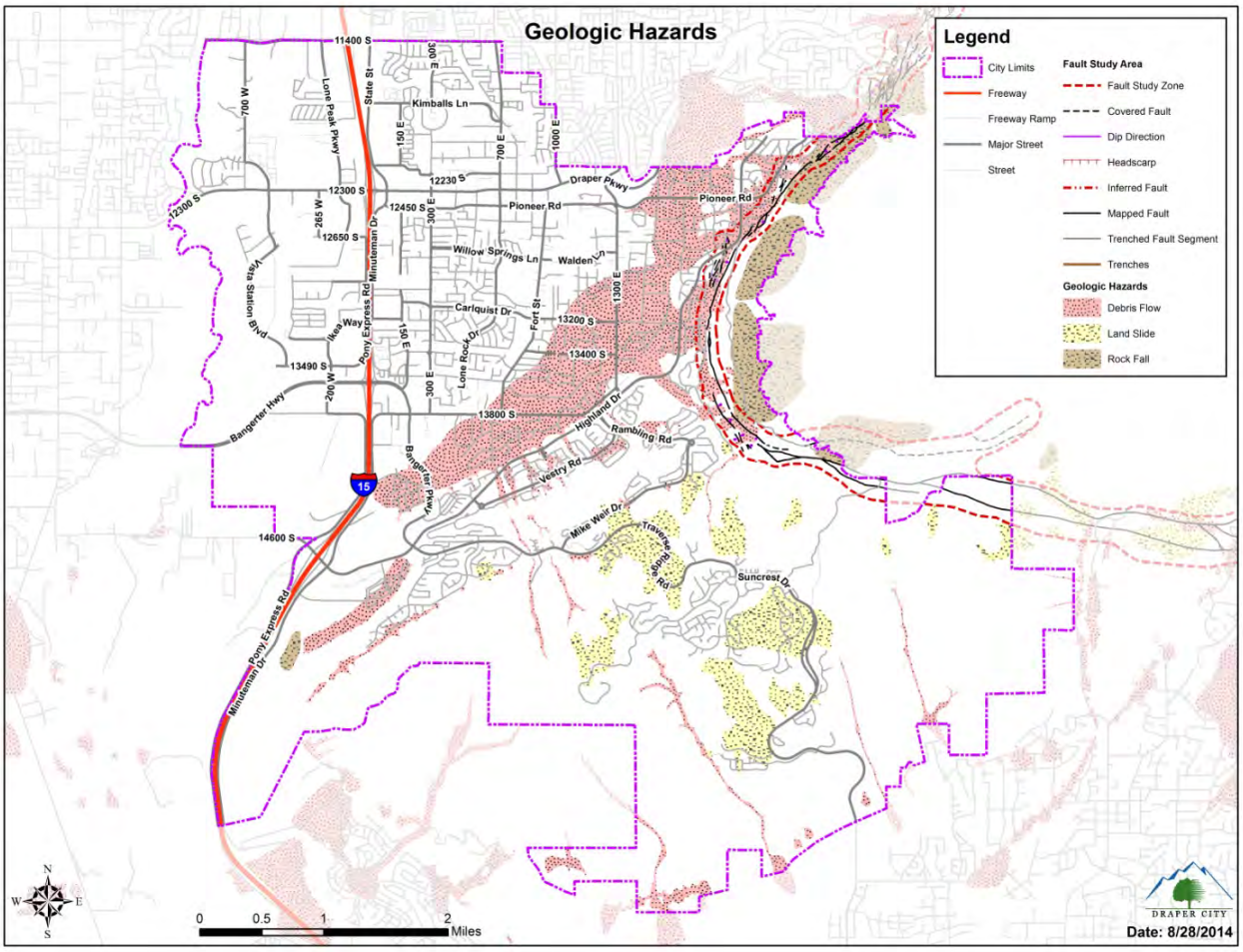

Figure 8. The City of Draper's Geologic Hazards

4.2.8 Pandemic (Public Health Emergencies)

On a regular basis, potentially catastrophic public health issues are raised in the mainstream media and the possibility of a national pandemic, local epidemic such as the Hantavirus, or a wide array of other health-related matters is real. Planning for these events is well beyond the ability of Draper City, but if an outbreak were to occur, the City will be expected to provide accurate information in an immediate fashion. In the event of a public health emergency, the City Manager will determine the appropriate measure of municipal response. The City Manager may choose to activate the EOC and use all means necessary to inform residents and business owners.

In partnership with local and state public health officials, other federal agencies, medical and public health professional associations, infectious disease experts from academia and clinical practice, and international and public service organizations, Draper City will incorporate all reasonable strategies to educate its residents and prepare for a measured response in the instance of a public health emergency.

4.2.9 Radon

Radon is a radioactive gas that has no smell, taste, or color. It comes from the natural decay of uranium that is found in nearly all rock and soil. When geologic conditions are favorable, the potential increases for high indoor levels of radon.

Outdoor radon levels never reach dangerous concentrations because air movement scatters radon into the atmosphere. Radon is a hazard in buildings because the gas collects in enclosed spaces. Radon decays into radioactive particles that can be trapped in the lungs when inhaled. These particles release small bursts of energy that damage lung tissue and may lead to lung cancer. Radon is the second leading cause of lung cancer in the United States.

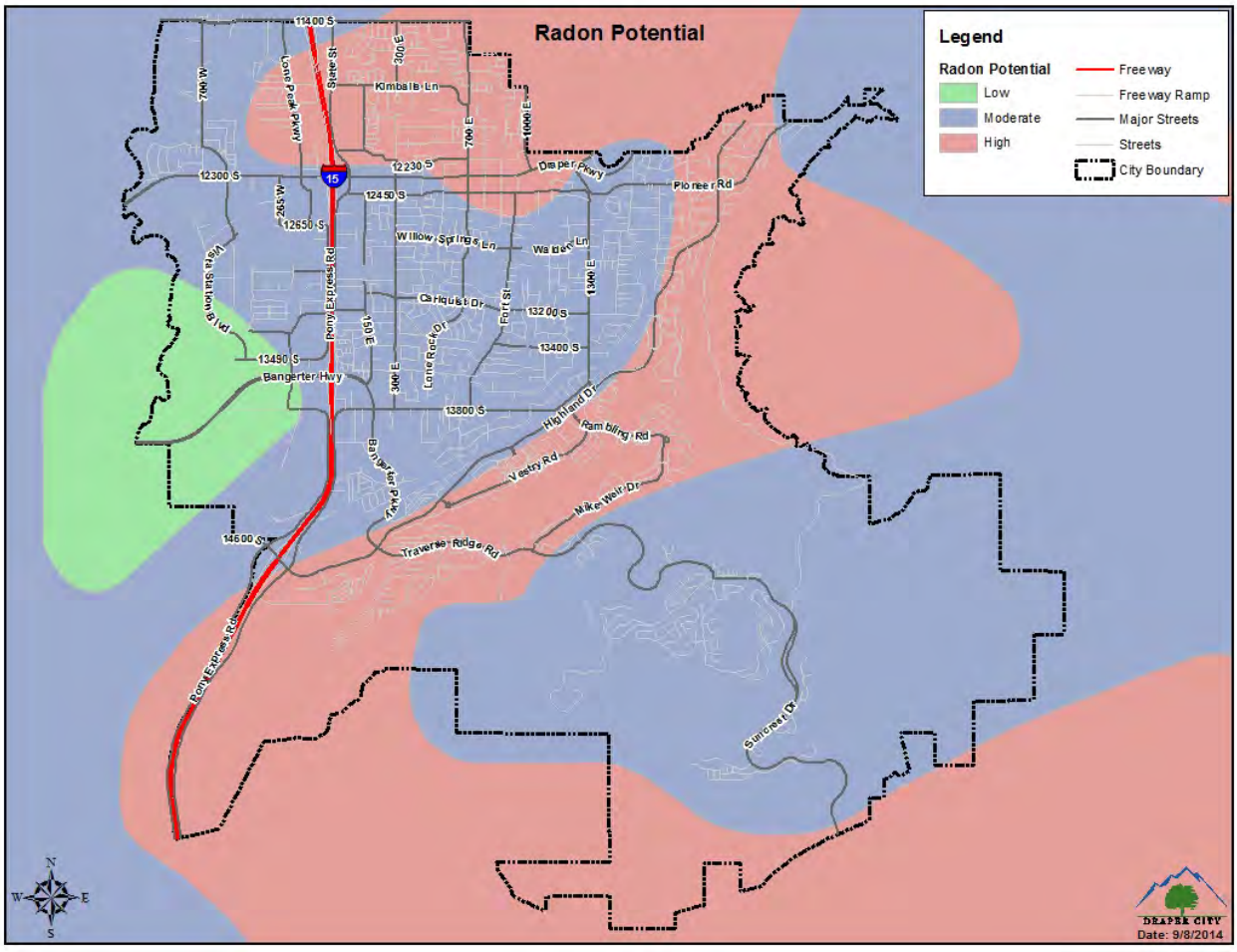

Figure 9. The City of Draper's Radon Potential

4.2.10 Severe Weather

The potential for severe weather is a reality in Draper City and the surrounding region. These weather events are not isolated to any climatic season, but rather can occur at any time during the year. During the spring and summer months, heavy rains can fall upon soils in a desert climate that may not readily percolate creating surface runoff, mudslides, debris flow, flooding, and other water-related damage. During the winter months, heavy snowfall is possible, especially in higher

elevations of the community. While Draper City is typically self reliant in weather-related events, severe weather may require assistance from outside agencies.

Winter weather systems and snowstorms over northern Utah can have a dramatic effect on regional commerce, transportation, and daily activity and are a major forecast challenge for local meteorologists. This challenge is heightened in Draper City because of the wide variety of local climatic features, such as significant elevation changes, atypical wind patterns, and mountainous slopes located immediately adjacent to city boundaries. These local features can impact the severity of winter storms. For example, the Salt Lake City International Airport receives an average annual snowfall of 65 inches, while just a few miles away, the Alta ski area receives more than 500 inches of snow annually. Snowfall is also influenced by the Great Salt Lake, which can produce localized snow bands or lake effect accumulations several times each winter.

Draper City will continue to identify new methods to minimize the impact of winter storms, but it is not possible to prepare for all winter storm events.

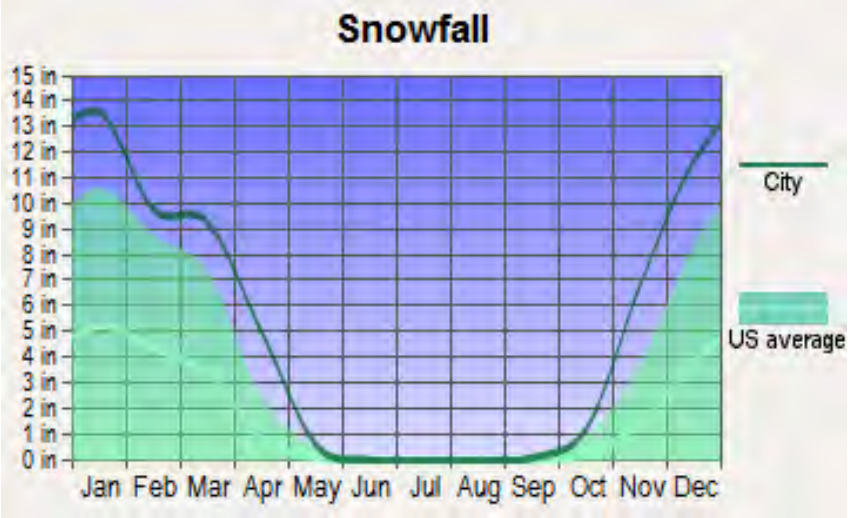

Figure 10. The City of Draper's Average Snowfall

Although infrequent, Draper City is subject to severe damage resulting from tornadoes and extremely high winds often called microburst winds. As recent as August 11, 1999, a category F2 tornado touched down in the downtown Salt Lake City area, killing one person and injuring at least 100 people. The tornado caused widespread power outages as well as large-scale debris mainly from downed tree limbs. The community needs to be prepared and ready to respond to wind-related weather.

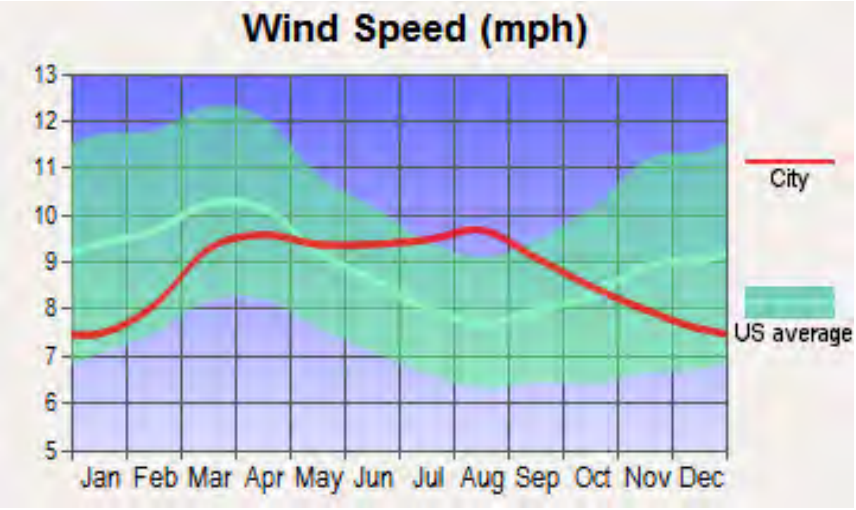

Figure 11. The City of Draper's Average Wind Speed

4.2.11 Wildfire (Fire Hazard)

Perhaps the most likely hazard in Draper City is the potential for damage and loss of life and property through fire events. Fires can occur within the urban fabric of the community or as wildfires in the hillside areas of the community and mountainous areas adjacent to the city. Each incident may require a unique response from Draper City.

The potential for structure and wildfires is increased by lightning events. When severe electrical storms are anticipated, the City Manager may request a heightened level of observation by city personnel.

Utah's fire season typically occurs during the warmer and drier months between May and October. Although traditionally a majority of wildfires have been caused naturally, mostly by lightning, as development encroaches on the hillsides and lower slopes of the Wasatch Mountains, wildfires caused by humans will likely increase. Education and careful preparation is necessary to protect life and personal property in vulnerable areas. Draper City will work with the Unified Fire Authority to complete a fire policy referred to as a Wildland Interface Zone. Other programs such as the Firewise Communities program will be used to educate residents about the dangers of wildfire and help them prepare for these types of disasters.

4.3 Hazard Assessment

Salt Lake County and Draper City have conducted an all-hazards assessment of potential vulnerabilities within Draper City. This assessment assisted with prioritization and outlined a direction for planning efforts. Salt Lake County and Draper City recognizes the pre-disaster mitigation plan developed by the Wasatch Front Regional Council. This pre-disaster mitigation plan serves to reduce the region's vulnerability to natural hazards. The pre-disaster mitigation plan is intended to promote sound public policy and protect or reduce the vulnerability of the citizens, critical facilities, infrastructure, private property, and the natural environment within the region.

The hazard analysis Table 4 provides information to understand risks and their corresponding likelihood and consequences in Draper City.

Hazard	Location (Geographic Area Affected)	Magnitude, Strength (Maximum Probable Extent)	Probability of Future Events	Overall Significance
Avalanche	Limited	Weak	Unlikely	Low
Dam Failure	Limited	Weak	Unlikely	Low
Drought	Extensive	Moderate	Occasional	Moderate
Earthquake	Extensive	6.0-7.0+ Extreme	Occasional	High
Flood	Limited	Moderate	Occasional	Low
Infestation	Negligible	Weak	Unlikely	Low
Landslide	Significant	Severe	Occasional	Moderate
Pandemic	Extensive	Weak	Unlikely	Low
Problem Soils	Limited	Weak	Occasional	Moderate
Radon	Extensive	Weak	Occasional	Moderate
Severe Weather	Extensive	Moderate	Occasional	High
Wildfire	Significant	Severe	Likely	High

Table 4. Draper City Hazard Analysis Table

Definitions for Classifications

Location (Geographic Area Affected)

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

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

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

Examples

Hazard	Scale/Index	Weak	Moderate	Severe	Extreme
Drought	Palmer Drought Severity Index	-1.99 to 1.99	-2.00 to -2.99	-3.00 to -3.99	-4.00 and below
Earthquake	Modified Mercalli Scale	I to IV	V to VII	VIII	IX to XII
	Richter Magnitude	2,3	4,5	6	7,8
Tornado	Fujita Tornado Damage Scale	F0	F1, F2	F3	F4, F5

Probability of Future Events

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

Overall Significance

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

5 Vulnerability Assessment

This vulnerability assessment analyzes the population, property, and other assets at risk to hazards.

5.1 Assets at Risk

This section considers Draper's assets at risk, including values at risk, critical facilities and infrastructure, economic assets, and growth and development trends.

Values at Risk

Table D.4. shows the 2014 assessed property data from the State of Utah for Draper City and includes data for the portions of Draper in Salt Lake County and Utah County.

Draper City	Real Property Value	Personal Property Value	Central Assessed Value	Total
Salt Lake County Portion of Draper	$3,572,233,860	$188,886,397	$105,049,650	$3,866,169,907
Utah County Portion of Draper	$159,186,324	$11,864	$581,581	$159,779,769
TOTAL VALUE	**$3,731,420,184**	**$188,898,261**	**$105,631,231**	**$4,025,949,676**

Table 4. Assessed Property Value Data for Draper City

Assets directly owned and controlled by the Draper City include a range of properties and equipment from each department. The value of the City's total capital assets in 2013 was $399,932,080.

Critical Facilities and Infrastructure

A critical facility may be defined as one that is essential in providing utility or direction either during the response to an emergency or during the recovery operation. Essential facilities are those that if damaged would have devastating impacts on disaster response and recovery. High potential loss facilities are those that would have a high loss or impact on the community. Transportation and lifeline facilities are the third category.

Essential Facilities

Figure D.12 shows essential facilities that are located within Draper.

Name of Facility	Address	City
Lone Peak Hospital	11925 S. State Street	Draper
Draper City Hall	1020 E. Pioneer Road	Draper
Draper City Hall (EOC and Police Dept.)	1020 E. Pioneer Road	Draper
Utah State Prison	14425 Bitterbrush Lane	Draper
Northern Utah Interagency Fire Center	14324 S. Pony Express Dr.	Draper
Unified Fire Authority Station	760 E. 12300 S.	Draper

Unified Fire Authority Station	14324 Fire House Rd.	Draper
Unified Fire Authority Station	14903 S. Deer Ridge Dr.	Draper
Utah National Guard	12953 Minuteman Dr.	Draper
Draper City Public Works	72 E. Sigovah Ct.	Draper
Water Pro Inc.	12421 S. 800 E.	Draper
South Valley Sewer District	874 E. Pioneer Road	Draper
Draper Rehabilitation & Care Center	12702 S. Fort Street	Draper
Juan Diego Catholic High School	300 E. 11800 S.	Draper
Corner Canyon High School	12943 S. 700 E.	Draper
Draper Park Middle School	13133 S. 1300 E.	Draper
Granger Medical Clinic	11724 S. State Street	Draper
After Hours Medical	1126 Draper Parkway	Draper
Workcare	12422 S. 450 E.	Draper
IHC Medical Facility	12473 S. Minuteman Dr.	Draper
Draper Senior Center	1148 Pioneer Rd.	Draper
Draper City Animal Control	12375 S. 550 W. Galena Park Blvd.	Draper
Draper Library	1136 Pioneer Rd.	Draper

Figure 12. Essential Facilities Draper City

High Potential Loss Facilities

High potential loss facilities as identified by FEMA HAZUS-MH are located throughout Draper. Draper works closely other government entities and private property owners in monitoring and assessing facilities that fall into this category that are not owned by the City.

Transportation and Lifeline Facilities

Transportation and lifeline facilities are located within the boundaries of Draper. I-15 is the major freeway thoroughfare through Draper that runs north to south through the State of Utah. There are major freight and a passenger rail lines that goes through the City near its west boundary that are used by the Union Pacific Railroad and the Utah Transit Authority. There are two major high-pressure gas lines operated by Questar that are located on the west and east sides of the City. The Salt Lake Aqueduct and Point of the Mountain Aqueduct also go through the City and are operated by the Metropolitan Water District.

5.2 Regulatory Mitigation Capabilities

Table 5 lists regulatory mitigation capabilities, including planning and land management tools, typically used by local jurisdictions to implement hazard mitigation activities and indicates those that are in place in Draper.

Regulatory Tool	Yes/No	Comments
General plan	Yes	Adopted 2005,as amended
Zoning ordinance	Yes	Adopted 2002, as amended
Subdivision ordinance	Yes	Adopted 2002, as amended
Site plan review requirements	Yes	Adopted 2002, as amended
Floodplain ordinance	Yes	Adopted 2005, Updated 2009
Other special purpose ordinance (stormwater, water conservation, wildfire)	Yes	Adopted 1993, as amended

Building code	Yes	Adopted 1978, as amended
Fire department ISO rating	Yes	4.9 Valley area – 9 Mountain
Erosion or sediment control program	Yes	Adopted 1998, as amended
Stormwater management program	Yes	Adopted 1993, as amended
Capital improvements plan	Yes	Adopted 2007, as amended
Economic development plan	Yes	Adopted 2005, as amended
Local emergency operations plan	Yes	Adopted 2012, as amended
Flood Insurance Study or other engineering study for streams	Yes	Adopted 2005, Updated 2009

Table 5. Draper City's Regulatory Mitigation Capabilities

6 Mitigation Strategy

6.1 Action Plan Progress from the 2009 Wasatch Front Salt Lake County Plan

Draper City has made progress in mitigating the hazards identified in the 2009 Wasatch Front Salt Lake County Mitigation Plan that impact the area within its jurisdiction. Improvement has been made in reducing the potential hazard associated with drought and wildland fires in the Traverse Mountain/SunCrest area, through the education of residents of fire danger, enactment of ordinances restricting open fires and fireworks and working towards implementing a FireWise Program for the area as outlined as a mitigation action in this plan. Steps have also been taken to reduce the potential damage of flooding and/or landslides to residential neighborhoods which are located at the base of the Wasatch Mountain Range on the east side of the City, through the placement of cement embankments.

2009 Mitigation Strategies Progress and Summary

The 2009 Wasatch Front Salt Lake County Plan, which Draper City was a participating city, identified the following hazards. The information below outlines what the goals, objectives and status of the 2009 Wasatch Front Salt Lake County Plan, as of the date of this updated mitigation plan for Draper City. The following summary highlights the Draper City's efforts to implement those goals where applicable and practical as part of the County's overall mitigation planning efforts.

For actions not completed or implemented by the Draper City, a short description is provided as to why it was not relevant or if it is included as part of the updated plan.

Category	Goal / Objective	Action	Status
All Hazards	1 – Improve and maintain communications capabilities for emergency operations 1.1 – Improve communication capabilities	1 – Conduct an inventory and assessment of communications equipment and systems and identify needs	Completed / On going

Category	Goal / Objective	Action	Status
All Hazards	1 – Improve and maintain communications capabilities for emergency operations 1.1 – Improve communication capabilities	2 – Conduct Training and awareness activities on communication equipment, tools, and systems	Completed / On going
All Hazards	1 – Improve and maintain communications capabilities for emergency operations 1.1 – Improve communication capabilities	3 – Establish agreements to share communications equipment between agencies involved in emergency operations	Completed / On going
All Hazards	1 – Improve and maintain communications capabilities for emergency operations 1.1 – Improve communication capabilities	4 – Establish notification capabilities and procedures for emergency personnel	Completed / On going
All Hazards	1 – Improve and maintain communications capabilities for emergency operations 1.2 – Maintain communications capabilities for critical facilities	1 – Evaluate vulnerability of critical communications systems	In progress
All Hazards	1 – Improve and maintain communications capabilities for emergency operations 1.2 – Maintain communications capabilities for critical facilities	2 – Establish redundancy for dispatch centers and other critical communications	Completed / On going
All Hazards	1 – Improve and maintain communications capabilities for emergency operations 1.3 – Conduct communications Strategic Planning	1 – Establish a coordinating group to address long-term communication needs and implementation strategies	In progress

Category	Goal / Objective	Action	Status
All Hazards	1 – Improve and maintain communications capabilities for emergency operations 1.3 – Conduct communications Strategic Planning	2 – Acquire, upgrade, and/or integrate communications equipment and systems as determined by coordinating group	Not completed
All Hazards	2 – Improve awareness and analysis of hazards 2.1 – Improved Quality and Access to digital geographic (GIS) hazards data	1 – Establish a coordinating group to address geographic data issues	Not applicable
All Hazards	2 – Improve awareness and analysis of hazards 2.1 – Improved Quality and Access to digital geographic (GIS) hazards data	2 – Examine current data availability and sharing capabilities, evaluate needs, and identify shortcomings	Completed / On going
All Hazards	2 – Improve awareness and analysis of hazards 2.1 – Improved Quality and Access to digital geographic (GIS) hazards data	3 – Update and expand data on hazards, critical facilities, and critical infrastructure according to assessed needs	Completed / On going
All Hazards	2 – Improve awareness and analysis of hazards 2.1 – Improved Quality and Access to digital geographic (GIS) hazards data	4 – Provide centralized access to geographic data to emergency planners and responders	In progress
All Hazards	2 – Improve awareness and analysis of hazards 2.2 – Improve and expand hazard monitoring capabilities	1 – Integrate existing hazard monitoring networks in emergency operations centers. Utilize sensors such as weather stations, stream gages, seismograph stations, road conditions, etc.	Not completed
All Hazards	2 – Improve awareness and analysis of hazards 2.2 – Improve and expand hazard monitoring capabilities	2 – Identify and implement additional hazard monitoring capabilities.	Not completed

Category	Goal / Objective	Action	Status
All Hazards	3 – Ensure critical facilities can sustain operations for emergency response and recovery 3.1 – Prevent damage to critical facilities and infrastructure	1 – Utilize GIS to identify facilities and infrastructure at risk	Completed / On going
All Hazards	3 – Ensure critical facilities can sustain operations for emergency response and recovery 3.1 – Prevent damage to critical facilities and infrastructure	2 – Assess critical facilities for hazard exposure, structural weaknesses, power, communications and equipment resources and redundancy, and adequate emergency procedures	Completed / On going
All Hazards	3 – Ensure critical facilities can sustain operations for emergency response and recovery 3.1 – Prevent damage to critical facilities and infrastructure	3 – Implement improvements to address identified in assessment	Completed / On going
All Hazards	4 – Improve response capabilities through mutual-aid agreements 4.1 – Utilize mutual-aid agreements in accordance with National Incident Management System (NIMS) requirements	1 – Compile inventory of mutual-aid agreements and memoranda of understanding (MOU) and identify deficiencies	In progress
All Hazards	4 – Improve response capabilities through mutual-aid agreements 4.1 – Utilize mutual-aid agreements in accordance with National Incident Management System (NIMS) requirements	2 – Pursue and implement needed mutual-aid agreements	In progress
All Hazards	5 – Increase citizen safety through improved hazard awareness 5.1 – establish a comprehensive public education program	1 – Provide education regarding all natural hazards through live trainings, as well as web-based, print and broadcast media	Completed / On going

Category	Goal / Objective	Action	Status
All Hazards	5 – Increase citizen safety through improved hazard awareness 5.1 – Establish a comprehensive public education program	2 – Incorporate information about cascading effects of hazards in education programs	Not completed
All Hazards	5 – Increase citizen safety through improved hazard awareness 5.1 – Establish a comprehensive public education program	3 – Develop education programs to target specific groups including homeowners, developers, schools and people with special needs	Not completed
All Hazards	5 – Increase citizen safety through improved hazard awareness 5.1 – Establish a comprehensive public education program	4 – Utilize maps and similar products on County EM website and other media to educate public on areas at risk to hazards	In progress
All Hazards	5 – Increase citizen safety through improved hazard awareness 5.1 – Establish a comprehensive public education program	5 – Coordinate with existing public education programs such as the American Red Cross, Utah Living with Fire, be Ready Utah, the National Weather Service, etc.	Completed / On going
All Hazards	6 – Improve public safety through preventative regulations 6.1 – Minimize hazard impacts through the adoption of appropriate prevention measures	1 – Establish and enforce appropriate planning, zoning, and building code ordinances	Completed / On going
All Hazards	6 – Improve public safety through preventative regulations 6.1 – Minimize hazard impacts through the adoption of appropriate prevention measures	2 – Ensure current hazard ordinances are available for viewing online	Completed / On going
Dam Failure	1 – Include dam failure inundation in future County and City planning efforts 1.1 – Review current State dam safety information on all identified high hazard dams in the County	1 – Include dam inundation maps in current County, City and Special Service District Emergency Operations Plans	Not completed

Category	Goal / Objective	Action	Status
Dam Failure	1 – Include dam failure inundation in future County and City planning efforts 1.1 – Review current State dam safety information on all identified high hazard dams in the County	2 – Utilize inundation maps to identify potential evacuation areas and routes	Not completed
Drought	1 – Reduce and prevent hardships associated with water shortages 1.1 – Limit unnecessary consumption of water throughout the County	1 – Continue to encourage water conservation utilizing and promoting outreach material from all water districts in the County	Completed / On going
Drought	1 – Reduce and prevent hardships associated with water shortages 1.1 – Limit unnecessary consumption of water throughout the County	2 – Emergency Managers will coordinate with local water districts/public utilities to support ongoing conservation efforts	Not completed
Drought	1 – Reduce and prevent hardships associated with water shortages 1.1 – Limit unnecessary consumption of water throughout the County	3 – Investigate feasibility of implementing an incentive program to encourage the use of low-flow appliances and fixtures in homes and businesses	Completed
Drought	1 – Reduce and prevent hardships associated with water shortages 1.1 – Limit unnecessary consumption of water throughout the County	4 – Implement water-saving devices and practices in public facilities	Not completed
Drought	1 – Reduce and prevent hardships associated with water shortages 1.1 – Limit unnecessary consumption of water throughout the County	5 – Repair, maintain and improve water distribution infrastructure to prevent loss from leakage, breaks, etc.	Completed / On going
Drought	1 – Reduce and prevent hardships associated with water shortages 1.1 – Limit unnecessary consumption of water throughout the County	6 – Coordinate public safety water use, such as hydrant testing	In progress

Category	Goal / Objective	Action	Status
Drought	1 – Reduce and prevent hardships associated with water shortages 1.1 – Limit unnecessary consumption of water throughout the County	7 – Provide information on landscaping alternatives for persons subject to green area requirements	Completed / On going
Drought	1 – Reduce and prevent hardships associated with water shortages 1.2 – Address agricultural water shortages in the County	1 – Set up livestock water rotation in areas of agricultural use	Not applicable
Drought	1 – Reduce and prevent hardships associated with water shortages 1.3 – Encourage development of secondary water systems	1 – Coordinate with water districts to plan for, develop and/or expand secondary water	Not Completed
Earthquake	1 – Reduce earthquakes losses to infrastructure 1.1 – Encourage retrofit and rehabilitation of highly susceptible infrastructure	1 – Identify structures at risk to earthquake damage	Completed / On going
Earthquake	1 – Reduce earthquakes losses to infrastructure 1.1 – Encourage retrofit and rehabilitation of highly susceptible infrastructure	2 – Research feasibility of an incentive program for retrofitting privately-owned buildings, particularly unreinforced masonry	Not completed
Earthquake	1 – Reduce earthquakes losses to infrastructure 1.1 – Encourage retrofit and rehabilitation of highly susceptible infrastructure	3 – Complete seismic rehabilitation/retrofitting projects of public buildings at risk	In progress
Earthquake	1 – Reduce earthquakes losses to infrastructure 1.2 – Improve public education regarding earthquake risks to unreinforced masonry buildings	1 – Provide educational materials to unreinforced masonry home and business owners	Completed / On going

Category	Goal / Objective	Action	Status
Earthquake	1 – Reduce earthquakes losses to infrastructure 1.3 – Improve Seismic Hazard understanding and seismic resistance of CUWCD Red Butte Dam in Salt Lake County.	1 – Procure Engineering Consultant to perform the nonstructural design and geotechnical assessment and review.	Completed / On going
Flooding	1 – Protection of life and property before, during and after a flooding event 1.1 – Provide 100% availability of the National Flood Insurance Program	1 – Assist Cities with NFIP application	Not applicable
Flooding	1 – Protection of life and property before, during and after a flooding event 1.1 – Provide 100% availability of the National Flood Insurance Program	2 – Encourage Communities to actively participate in NFIP	Not applicable
Flooding	1 – Protection of life and property before, during and after a flooding event 1.2 – Encourage appropriate flood control measures, particularly in new developments	1 – Determine potential flood impacts and identify areas in need of additional flood control structures	Completed / On going
Flooding	1 – Protection of life and property before, during and after a flooding event 1.2 – Encourage appropriate flood control measures, particularly in new developments	2 – Address identified problems through construction of debris basins, flood retention ponds, energy dissipaters or other flood control structures	Completed / On going

Category	Goal / Objective	Action	Status
Flooding	1 – Protection of life and property before, during and after a flooding event 1.3 – Provide maintenance, repairs and improvements to drainage structures, storm water systems and flood control structures	1 – Establish maintenance and repair programs to remove debris, improve resistance and otherwise maintain effectiveness of storm water and flood control systems	Completed / On going
Flooding	2 – Reduce threat of unstable or inadequate flood control structures 2.1 – Reduce potential for failure of flood control structures	1 – Identify and assess structures for deficiencies	Completed / On going
Flooding	2 – Reduce threat of unstable or inadequate flood control structures 2.1 – Reduce potential for failure of flood control structures	2 – Modify structures as needed to address deficiencies	On going
Severe Weather	1 – Reduce threat of loss of life or property due to extreme weather events 1.1 – Maintain status as a StormReady Community	1 – Maintain Hazardous Weather Operations Plan according to StormReady requirements	Not completed
Severe Weather	1 – Reduce threat of loss of life or property due to extreme weather events 1.1 – Maintain status as a StormReady Community	2 – Maintain Contact with NWS prior to re-application in 2010	Not applicable
Severe Weather	1 – Reduce threat of loss of life or property due to extreme weather events 1.2 – Increase awareness of information services provided by NWS	1 – Meet with NWS representative on an annual basis to receive information on new services and alerts available	Not completed
Severe Weather	1 – Reduce threat of loss of life or property due to extreme weather events 1.2 – Increase awareness of information services provided by NWS	2 – Assist NWS in making other agencies and departments aware of available resources	Not Completed

Category	Goal / Objective	Action	Status
Severe Weather	1 – Reduce threat of loss of life or property due to extreme weather events 1.3 – Encourage safe practices in avalanche prone areas	1 – Assist Forest Service Utah Avalanche Forecast Center and other organizations in promoting avalanche hazard awareness for backcountry users	Not Applicable
Severe Weather	1 – Reduce threat of loss of life or property due to extreme weather events 1.4 – Examine the vulnerability of patrons at large event venues to extreme weather events	1 – Work with NWS to develop large event venue weather safety and evacuation procedures	Not Completed
Slope Failure	1 – Reduce or eliminate the threat of slope failure damage 1.1 – Reduce the threat of slope failures following wildfires	1 – Develop protocol for working with State and Federal agencies in reducing the impact of post-fire debris flow hazard	In Progress
Slope Failure	1 – Reduce or eliminate the threat of slope failure damage 1.2 – Monitor historic landslide areas	1 – Coordinate with the Utah Geological Survey and other agencies to understand current slope failure threats/potential	Completed / On going
Slope Failure	1 – Reduce or eliminate the threat of slope failure damage 1.3 – Address landslide hazards in new sub-divisions	1 – Utilize recommendations provided by the State Geological Hazards Working Group to address land-use and planning for new developments	Completed / On going
Wildland Fire	1 – Community education on wildfire hazard 1.1 – Reduce risk from wildfire through education programs	1 – Increase public awareness through “Firewise” program	In progress
Wildland Fire	1 – Community education on wildfire hazard 1.1 – Reduce risk from wildfire through education programs	2 – Educate homeowners on the need to create defensible space near structures in WUI	In progress

Category	Goal / Objective	Action	Status
Wildland Fire	2 – Improve safety from wildfire hazards through planning, protective actions and improved fire response capabilities 2.1 – Assist homeowners with creating defensible space near structures in WUI areas	1 – Designate and promote county-wide annual initiative for clearing fuels	Not applicable
Wildland Fire	2 – Improve safety from wildfire hazards through planning, protective actions and improved fire response capabilities 2.1 – Assist homeowners with creating defensible space near structures in WUI areas	2 – Provide waste removal, such as chipping of green waste by public works, following designated fuel clearing day/week	Not completed
Wildland Fire	2 – Improve safety from wildfire hazards through planning, protective actions and improved fire response capabilities 2.2 – Improve evacuation capabilities for WUI areas	1 – Work with experts and communities to develop or update evacuation plans	Completed / On going
Wildland Fire	2 – Improve safety from wildfire hazards through planning, protective actions and improved fire response capabilities 2.2 – Improve evacuation capabilities for WUI areas	2 – Evaluate transportation network and address needed improvements to facilitate evacuation and emergency response	On going
Wildland Fire	2 – Improve safety from wildfire hazards through planning, protective actions and improved fire response capabilities 2.3 – Improve addressing system in WUI areas to facilitate emergency response	1 – Identify all facilities, businesses, and residences, particularly in the canyons, and assign addresses according to current county addressing standards	Not applicable

Category	Goal / Objective	Action	Status
Wildland Fire	2 – Improve safety from wildfire hazards through planning, protective actions and improved fire response capabilities 2.3 – Improve addressing system in WUI areas to facilitate emergency response	2 – Incorporate improved addresses in fire-dispatch and other databases	Not applicable
Wildland Fire	2 – Improve safety from wildfire hazards through planning, protective actions and improved fire response capabilities 2.4 – Complete wildfire protection projects	1 – Reduce fuels around publically owned structures	Completed / On going
Wildland Fire	2 – Improve safety from wildfire hazards through planning, protective actions and improved fire response capabilities 2.4 – Complete wildfire protection projects	2 – Implement fire breaks and other protective measures	Not completed
Wildland Fire	2 – Improve safety from wildfire hazards through planning, protective actions and improved fire response capabilities 2.4 – Complete wildfire protection projects	3 – Assess existing water flow capabilities, both public and private, and address deficiencies	Completed / On going
Wildland Fire	2 – Improve safety from wildfire hazards through planning, protective actions and improved fire response capabilities 2.4 – Complete wildfire protection projects	4 – Assist communities in developing Community Wildfire Protection Plans or similar plans	In progress
Wildland Fire	2 – Improve safety from wildfire hazards through planning, protective actions and improved fire response capabilities 2.5 – Encourage proper development practices in the WUI	1 – Adopt the Utah Wildland-Urban Interface Code	Not completed

Category	Goal / Objective	Action	Status
Wildland Fire	2 – Improve safety from wildfire hazards through planning, protective actions and improved fire response capabilities 2.5 – Encourage proper development practices in the WUI	2 – Define wildland-urban interface and develop digital maps of the WUI	Not completed

6.2 Mitigation Actions

The planning team for Draper City identified and prioritized the following mitigation actions based on the risk assessment. The potential natural hazards identified by Draper City are avalanche, dam failure, drought, earthquake, flood, infestation, landslide, problem soils, pandemic, radon, severe weather and wildfire. These potential natural hazards are addressed by these mitigation actions. Additional mitigation actions may be added in the future as needed. Background information and information on how each action will be implemented and administered, such as ideas for implementation, responsible office, potential funding, estimated cost, and timeline are also included.

Hazard	Mitigation 1	Mitigation 2	Mitigation 3	Mitigation 4	Mitigation 5	Mitigation 6
Avalanche			X		X	X
Dam Failure				X		X
Drought	X					X
Earthquake			X	X		X
Flood		X	X	X	X	X
Infestation				X		X
Landslide			X		X	X
Pandemic				X		X
Problem Soils			X			X
Radon			X			X
Severe Weather				X	X	X
Wildfire	X				X	X

1. Establish Firewise Community Program for SunCrest

Issue/Background: The SunCrest residential community area located on Traverse Ridge, which divides Utah and Salt Lake County and is a Wildland Interface Zone, has a high potential for wildland fires. The City has worked with the community, Unified Fire Authority and the State of

Utah in putting a program in place to educate residents and measures to reduce wild land fires in the area. Potential natural hazards covered by this mitigation action are wildfires and drought.

Other Alternatives: No action
Responsible Office: Draper City Emergency Preparedness, Draper City Public Works, Unified Fire Authority and State of Utah
Priority (High, Medium, Low): High
Cost Estimate: $200,000 to $250,000
Potential Funding: $216,000 Grant from the State of Utah
Benefits (avoided Losses): This will prevent the loss of human life and economic and property losses.
Schedule: Now and Long term
Other Alternatives: No action

2. Continue to Enforce Master Drainage Plan Requirements

Issue/Background: The Draper City requires drainage plans as part of the approval process for all specific plans and large development projects as determined by the City's Public Works Director and City Engineer. The master drainage plan should consider cumulative regional drainage and flooding mitigation. The intent of a master drainage plan is to ensure that the overall rate of runoff from a project does not exceed pre-development levels. If necessary, this objective shall be achieved by incorporating run-off control measures to minimize peak flows and/or assistance in financing or otherwise implementing comprehensive drainage plans. Potential natural hazard covered by this mitigation action is flooding.

Other Alternatives: No action
Responsible Office: Draper City Engineering Division and Draper City Public Works Department
Priority (High, Medium, Low): Medium
Cost Estimate: Developer-based funding under specific plan requirements
Potential Funding: Developer-based funding under specific plan requirements
Benefits (avoided Losses): This will prevent the loss of human life and economic and property losses.
Schedule: Now and long term

3. Continue to Enforce Building Codes, Development Codes and Zoning Ordinance

Issue/Background: The Draper City requires that construction complies with the adopted building codes and the zoning and development ordinances adopted by the City. The City has experienced tremendous growth during since incorporation in 1978 and will continue to grow in future years. Potential natural hazards covered by this mitigation action are avalanche, earthquake, flood, landslide, problem soils and radon.

Other Alternatives: No action
Responsible Office: Draper City Building Inspection Division, Draper City Community Development Department and Draper City Engineering Division.
Priority (High, Medium, Low): Medium

Cost Estimate: Developer-based funding under specific plan requirements
Potential Funding: Developer-based funding under specific plan requirements
Benefits (avoided Losses): This will prevent the loss of human life and economic and property losses.
Schedule: Now and long term

4. Continue Utah Shakeout Activities to Promote Earthquake Awareness

Issue/Background: Draper City participates in the Utah Shakeout activities annually. This event promotes earthquake awareness of the residents, businesses and City employees. This annual event allows the City to practice setting up its Emergency Operation Center and its process of communicating with neighborhoods and businesses throughout the City for other hazard events such as a dam failure, infestation, pandemic, floods and severe weather conditions. Potential natural hazards covered by this mitigation action are earthquakes, a dam failure, infestation, pandemic, floods and severe weather conditions.

Other Alternatives: No action
Responsible Office: Emergency Manager, Police Department and the City's Emergency Preparedness Committee
Priority (High, Medium, Low): High
Cost Estimate: $5,000 to $10,000 annually

Potential Funding: City budget
Benefits (avoided Losses): This will help to prevent the loss of human life and property losses when a major earthquake event occurs.
Schedule: Now and long term

5. Purchase Hazard Mitigation Public Notification Boards

Issue/Background: Consider purchase additional mobile self-contained changeable message signs to pre-alert motorists to avoid "real time" traffic, weather, fire or other hazard events. Potential natural hazards covered by this mitigation action are severe weather conditions, wildfires, flooding, avalanche and landslides.

Other Alternatives: Rely on contract service providers who may not be able to respond with adequate resources in a timely fashion.
Responsible Office: Draper City Public Works Department and Police Department
Priority (High, Medium, Low): Low
Cost Estimate: 1 signs @ $35,000 each = $35,000
Potential Funding: Departmental operational budgets or grant funding
Benefits (Avoided Losses): The City currently has one mobile sign that has been beneficial in notifying the public of potential hazards. These mobile signs provide the ability for City forces to aid emergency response crews by dispatching mobile sign units to be stationed at critical locations to alert motorists and citizens of potential hazard areas. Purchasing an additional sign will allow for better routing of nonessential vehicle traffic that may impede the delivery of critical health and safety services and ultimately result in quicker overall response delivery times.

Schedule: Fiscal year 2015/2016

6. Educate Residents and Businesses through the Draper City Website and Twitter

Issue/Background: Draper City's website is an excellent tool to educate and notify residents, businesses and the general public of potential natural hazards and how to mitigate them. The City's twitter account is also a tool that can be used to inform residents, businesses and the general public of hazard events in progress. The City will update its website as needed with documents, maps and information regarding potential natural hazards that could impact Draper City. Potential natural hazards covered by this mitigation action are avalanche, dam failure, drought, earthquake, flood, infestation, landslide, problem soils, pandemic, radon, severe weather conditions and wildfires.

Other Alternatives: No action
Responsible Office: Public Relation Officer, Emergency Manager, Draper City Building Inspection Division and Draper City Community Development Department
Priority (High, Medium, Low): High
Cost Estimate: $5,000 annually
Potential Funding: City budget
Benefits (avoided Losses): This will prevent the loss of human life and economic and property losses.
Schedule: Now and Long term

7 Plan Implementation & Maintenance

7.1 Implementation

Mitigation is most successful when it is incorporated into the day-to-day functions and priorities of government and development. Draper City will utilize the information in the Hazards Mitigation Plan to prepare for future events and plan accordingly.

7.2 Maintenance Schedule

Periodic monitoring and updates of this Plan are required to ensure that the goals and objectives for the city are kept current and that local mitigation strategies are being carried out. This Plan has been designed to be user-friendly in terms of maintenance and implementation. This portion of the Plan outlines the procedures for completing revisions and updates. The Plan will also be revised to reflect lessons learned or to address specific hazard incidents arising out of a disaster as needed.

Annual Review Procedures

Draper City will be responsible to annually review the mitigation strategies described in this Plan, as required by the Utah Division of Emergency Management (UDEM), or as situations dictate such as following a disaster declaration. The process will include the city organizing a Hazards Mitigation Planning committee comprised of individuals from organizations responsible to implement the described mitigation strategies. Progress toward the completion of the strategies will be assessed and revised as warranted. The city emergency manager will regularly monitor the Plan and is responsible to make revisions and updates.

Five-Year Plan Review

The entire Mitigation Plan including any background studies and analysis shall be revised and updated as needed every five years by Draper City to determine if there have been any significant changes in the city that would affect the Plan. Increased development, increased exposure to certain hazards, the development of new mitigation capabilities or techniques and changes to Federal or State legislation are examples of changes that may affect the condition of the Plan.

7.3 Hazard Mitigation Plan Amendments

Draper City will amend and update its Hazard Mitigation Plan as needed.

7.4 Maintenance Evaluation Process

It will be the responsibility of the designated Emergency Manager, City Manager, Mayor and City Council Members to ensure these actions are carried out no later than the target dates unless reasonable circumstances prevent their implementation (i.e. lack of funding availability).

7.4.1 Funding Sources

Although all mitigation techniques will likely save money by avoiding losses, many projects are costly to implement. Draper City shall continue to seek outside funding assistance for mitigation projects in both the pre-disaster and post-disaster environment, subject to budget constraints and available funding sources.

Federal Programs

The following federal grant programs have been identified as funding sources which specifically target hazard mitigation projects:

Title: Pre-Disaster Mitigation Program
Agency: Federal Emergency Management Agency
Through the Disaster Mitigation Act of 2000, Congress approved the creation of a national program to provide a funding mechanism that is not dependent on a Presidential Disaster Declaration. The Pre-Disaster Mitigation (PDM) program provides funding to states and communities for cost-effective hazard mitigation activities that complement a comprehensive mitigation program and reduce injuries, loss of life, and damage and destruction of property.

The funding is based upon a 75% Federal share and 25% non-Federal share. The non-Federal match can be fully in-kind or cash, or a combination. Special accommodations will be made for "small and impoverished communities", who will be eligible for 90% Federal share/10% non-Federal. FEMA provides PDM grants to states that, in turn, can provide sub-grants to local governments for accomplishing the following eligible mitigation activities:

- State and local Natural Hazard Pre-Disaster Mitigation Planning
- Technical assistance (e.g. risk assessments, project development)
- Mitigation Projects
- Acquisition or relocation of vulnerable properties
- Hazard retrofits
- Minor structural hazard control or protection projects
- Community outreach and education (up to 10% of State allocation)

Title: Flood Mitigation Assistance Program
Agency: Federal Emergency Management Agency
FEMA's Flood Mitigation Assistance program (FMA) provides funding to assist states and communities in implementing measures to reduce or eliminate the long-term risk of flood damage

to buildings, manufactured homes and other structures insurable under the National Flood Insurance Program (NFIP). FMA was created as part of the National Flood Insurance Reform Act of 1994 (42 USC 4101) with the goal of reducing or eliminating claims under the NFIP.

FMA is a pre-disaster grant program, and is available to states on an annual basis. This funding is available for mitigation planning and implementation of mitigation measures only, and is based upon a 75% Federal share/25% non-Federal share. States administer the FMA program and are responsible for selecting projects for funding from the applications submitted by all communities within the state. The state then forwards selected applications to FEMA for an eligibility determination. Although individuals cannot apply directly for FMA funds, their local government may submit an application on their behalf.

Title: Hazard Mitigation Grant Program
Agency: Federal Emergency Management Agency

The Hazard Mitigation Grant Program (HMGP) was created in November 1988 through Section 404 of the Robert T. Stafford Disaster Relief and Emergency Assistant Act. The HMGP assists states and local communities in implementing long-term mitigation measures following a Presidential disaster declaration.

To meet these objectives, FEMA can fund up to 75% of the eligible costs of each project. The state or local cost-share match does not need to be cash; in-kind services or materials may also be used. With the passage of the Hazard Mitigation and Relocation Assistance Act of 1993, federal funding under the HMGP is now based on 15% of the federal funds spent on the Public and Individual Assistance programs (minus administrative expenses) for each disaster.

The HMGP can be used to fund projects to protect either public or private property, so long as the projects in question fit within the state and local governments overall mitigation strategy for the disaster area, and comply with program guidelines. Examples of projects that may be funded include the acquisition or relocation of structures from hazard-prone areas, the retrofitting of existing structures to protect them from future damages; and the development of state or local standards designed to protect buildings from future damages.

Eligibility for funding under the HMGP is limited to state and local governments, certain private nonprofit organizations or institutions that serve a public function, Indian tribes and authorized tribal organizations. These organizations must apply for HMPG project funding on behalf of their citizens. In turn, applicants must work through their state, since the state is responsible for setting priorities for funding and administering the program.

Title: Public Assistance (Infrastructure) Program, Section 406
Agency: Federal Emergency Management Agency

FEMA's Public Assistance Program, through Section 406 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act, provides funding to local governments following a Presidential Disaster Declaration for mitigation measures in conjunction with the repair of damaged public facilities and infrastructure.

The mitigation measures must be related to eligible disaster related damages and must directly reduce the potential for future, similar disaster damages to the eligible facility. These opportunities usually present themselves during the repair/replacement efforts.

Proposed projects must be approved by FEMA prior to funding. They will be evaluated for cost effectiveness, technical feasibility and compliance with statutory, regulatory and executive order requirements. In addition, the evaluation must ensure that the mitigation measures do not negatively impact a facility's operation or risk from another hazard.

Public facilities are operated by state and local governments, Indian tribes or authorized tribal organizations and include:

- Roads, bridges & culverts
- Draining & irrigation channels
- Schools, city halls & other buildings
- Water, power & sanitary systems
- Airports & parks

Private nonprofit organizations are groups that own or operate facilities that provide services otherwise performed by a government agency and include, but are not limited to the following:

- Universities and other schools
- Hospitals & clinics
- Volunteer fire & ambulance
- Power cooperatives & other utilities
- Custodial care & retirement facilities
- Museums & community centers

Title: Small Business Administration (SBA) Disaster Assistance Program
Agency: U.S. SBA

The SBA Disaster Assistance Program provides low-interest loans to businesses following a Presidential disaster declaration. The loans target businesses to repair or replace uninsured disaster damages to property owned by the business, including real estate, machinery and equipment, inventory and supplies. Businesses of any size are eligible, along with non-profit organizations.

SBA loans can be utilized by their recipients to incorporate mitigation techniques into the repair and restoration of their business.

Title: Community Development Block Grants
Agency: US Department of Housing and Urban Development

The Community Development Block Grant (CDBG) program provides grants to local governments for community and economic development projects that primarily benefit low- and moderate-income people. The CDBG program also provides grants for post-disaster hazard mitigation and recovery following a Presidential disaster declaration.

Funds can be used for activities such as acquisition, rehabilitation or reconstruction of damaged properties and facilities and for the redevelopment of disaster areas.

State Programs

Local

Local governments depend upon local property taxes as their primary source of revenue. These taxes are typically used to finance services that must be available and delivered on a routine and regular basis to the general public. If local budgets allow, these funds are used to match Federal or State grant programs when required for large-scale projects.

Non-Governmental

Another potential source of revenue for implementing local mitigation projects are monetary contributions from non-governmental organizations, such as private sector companies, churches, charities, community relief funds, the American Red Cross, hospitals, land trusts and other non-profit organizations.

Paramount to having a Plan deemed to be valid is its implementation. There is currently no new fiscal note attached to the implementation of this Plan.

7.5 Continued Public Involvement

Throughout the planning process, public involvement has been and will be critical to the development of the Hazard Mitigation Plan and its updates. The Plan will be available on the Draper City website to provide opportunities for public participation and comment. The Plan will also be available for review at the offices of Draper City.

Participation

All citizens of the region are encouraged to participate in the planning process, especially those who may reside within identified hazard areas. Adequate and timely notification to all area residents will be given as outlined above to all hearings, forums, and meetings.

Access to Information

Citizens, public jurisdictions, agencies and other interested parties will have the opportunity to receive information and submit comments on any aspect of the Natural Hazards Pre-Disaster Mitigation Plan.

Technical Assistance

Residents as well as local jurisdictions may request assistance in accessing the program and interpretation of mitigation projects.

Public Hearings and Meetings Concerning the Plan

Hearings and meeting concerning the plan will be conveniently timed for people who might benefit most from mitigation programs. Hearings and meeting will be accessible to people with

disabilities (accommodations must be requested in advance according to previously established policy).

Hearings and meeting will be adequately publicized. Hearings and meetings may be held for a number of purposes or functions including to: Identify and profile hazards, develop mitigation strategies, and review plan goals, performance and future plans.

Future Revisions

Future revisions of the Hazard Mitigation Plan shall include:

Expanded vulnerability assessments to include flood and dam failure inundation.
Continue the search for more specific mitigation actions.
An analysis of progress of the Plan as it is revised and the progress made in reaching mitigation goals and implementation of the plan.
Expanded look into how the identified natural hazards will affect certain populations including the young and elderly.
Implementation and maintenance of the plan is critical to the overall success of hazard mitigation planning.

Integration of data, information, and mitigation goals and action plans:

Draper will integrate mitigation strategies into its building codes, the planning commission, and the actions of the City Council and other relevant agencies by education by the Emergency Manager during daily, weekly, and monthly city and public meetings.

8 Hazard Mitigation Plan Adoption

It is the intent of Draper City that this Hazard Mitigation Plan will be adopted by resolution once approved by the State of Utah and FEMA, which approval should be within five years of the previous Hazard Mitigation Plan's approval date. This process will be documented through the Draper City Recorder's office.

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HERRIMAN, UTAH
RESOLUTION NO. R11-2015

A RESOLUTION OF THE CITY COUNCIL OF HERRIMAN ADOPTING A HAZARD MITIGATION PLAN

WHEREAS, the Herriman City Council ("*Council*") met in regular meeting on April 22, 2015, to consider, among other things, adopting a Hazard Mitigation Plan (the "*Plan*"); and

WHEREAS, a copy of the executive summary of the Plan is attached hereto as exhibit "A"; and,

WHEREAS, the Disaster Mitigation Act of 2000, Public Law 106-390 was enacted to establish a national disaster hazard mitigation program to reduce the loss of life and property, human suffering, economic disruption, and disaster assistance costs resulting from natural disasters, and to assist state, local and Indian tribal governments in implementing effective hazard mitigation measures designed to ensure the continuation of critical services and facilities after a natural disaster into law on October 30, 2000; and,

WHEREAS, the Disaster Mitigation Act of 2000 and 44 C.F.R. 201.6 requires among other things that the Plan has been formally adopted by the governing body of the jurisdiction requesting approval of the plan; and

WHEREAS, the Plan has been prepared in accordance with FEMA requirements at; and

NOW, THEREFORE, BE IT RESOLVED that the Council adopts the Plan and shall take effect immediately on passage and acceptance as provided herein.

ADOPTED by the Council this 22nd day of April, 2015.

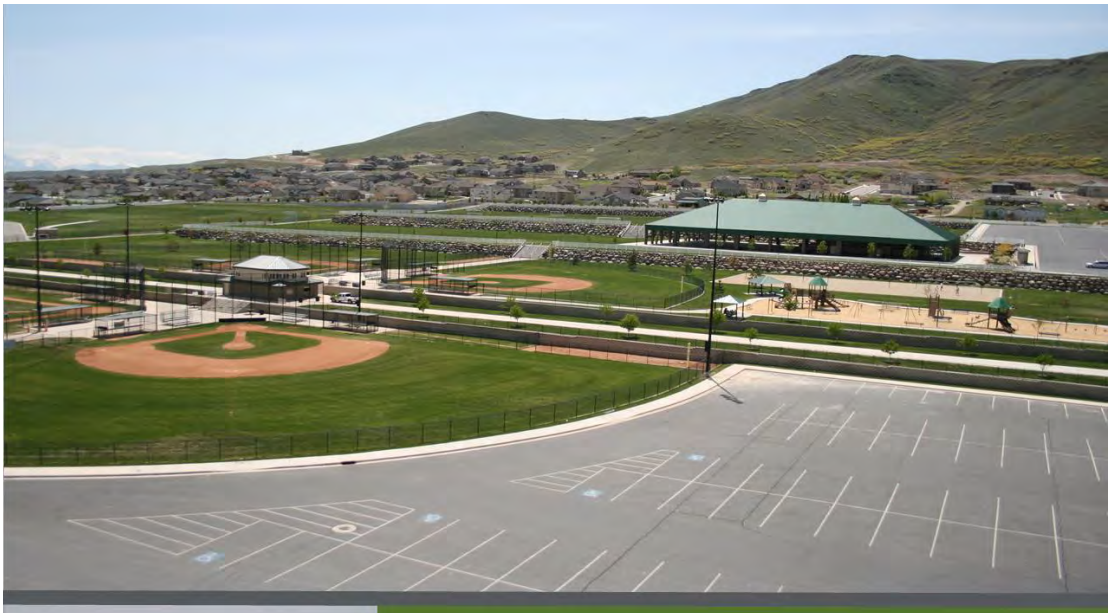
HERRIMAN

Carmen Freeman, Mayor

ATTEST:

Jackie Nostrom, City Recorder

Corporate Seal Incorporated HERRIMAN CITY 1999 State of Utah



Herriman City

Hazard Mitigation Plan 2014

HERRIMAN CITY

Hazard Mitigation Plan (2014)

For questions or information about this plan, please contact:

Brett Wood
City Manager/ Emergency Manager
(801) 446-5323
bwood@herriman.org

Tina Giles
Operations Admin Coordinator/Emergency C
(801) 446-5323
tgiles@herriman.org

ANNEX E: HERRIMAN CITY
1 Introduction

1.1 Background

Herriman City is strategically located in the southwest corner of the Salt Lake Valley, with the Wasatch Mountain Range on the east and the Oquirrh Mountain Range on the west. The city is 20 miles southwest of Salt Lake City. Salt Lake International Airport is 21 miles north of the city. Herriman is located immediately east of the Bingham Canyon/Rio Tinto Copper Mine.

We are dedicated to creating a community; not just building a city. This attitude is shown by our recreational system that includes 794.92 acres of open space, 21 miles of improved trails, fishing and swimming reservoir, a 64-acre equestrian park and the largest recreational center in Salt Lake County.

The city is known for high-quality, single family neighborhoods and open space. The city has more than 8,600 households. The 2014 population of Herriman in is 30,816. Herriman is the 28th largest city in the state in land area, encompassing 13274.90 Ac.

1.2 Purpose

Herriman City is a community dedicated to preserving its unique identity and heritage, and providing its citizens a safe and highly functional environment.

The decisions and direction from the Mayor and City Council are based on those values.

Herriman City is dedicated to provide courteous and efficient service to the public, preserve community identity, and promote a high quality of life.

The four purposes of this Plan are:

1. To identify threats to the community
2. To create mitigation strategies to address those threats
3. To develop long-term mitigation planning goals and objectives
4. To fulfill federal, state and local hazard mitigation planning obligations.

Mitigation actions in particular would serve to minimize conditions that have an undesirable impact on our citizens, the economy, environment and the well-being of Herriman . This Mitigation Plan is intended to enhance awareness for elected officials, agencies and the public of these hazards and their associated threat to life and property. The Plan also details what actions can be taken to help prevent or reduce hazard vulnerability.

Herriman, coupled with it's respective citizens, prepared this local hazard mitigation plan to guide hazard mitigation planning to better protect people and property from the hazardous events. This plan demonstrates the community's commitment to reducing risks and serves as a tool to help decision makers direct mitigation activities and resources. This plan was also developed to help Herriman qualify for certain federal disaster assistance, specifically, the Federal Emergency Management Agency's (FEMA) Hazard Mitigation Grant Program and Pre-Disaster Mitigation program, and to earn points for the National Flood Insurance Program's Community Rating System (CRS).

1.3 Authority and Reference

Herriman City has a traditional form of government, with a part-time Mayor and four part-time City Council members. The City Manager is a full-time employee and works under the direction of the Mayor and Council. In the state of Utah, Herriman is currently classified as a third class city.

Local

Local governments play an essential role in implementing effective mitigation. For the purposes of this plan, local government includes not only cities and counties, but also special service districts with elected boards. Herriman will review all present or potential damages, losses and related impacts associated with natural hazards to determine the need or requirement for mitigation action and planning. Herriman is prepared to participate in the post-disaster hazard mitigation team process and pre-mitigation planning as outlined in this document in order to effectively protect their citizens. Herriman city and it's citizens participated in the development of this plan.

2 Community Profile

2.1 Geography, Environment & Climate

Herriman is located in the southwest quadrant of Salt Lake County.

Adjacent to Herriman City on the west are the Oquirrh Mountains and the Bingham Canyon/Rio Tinto Copper Mine. To the south is Camp Williams nestled in the South Hills which separates Herriman from Utah County. Adjacent to Herriman on the east is Riverton; to the north is South Jordan. Herriman has developed commercial and residential areas as well as significant agricultural holdings and 793.92 acres of open space within its boundaries. This open space is reserved for recreational purposes and currently has many multi-use trails.

Herriman has an average annual temperature of 53.7°F and receives 15.69 inches of rain.

Figure 1 displays a City map, location of Herriman City within Salt Lake County.

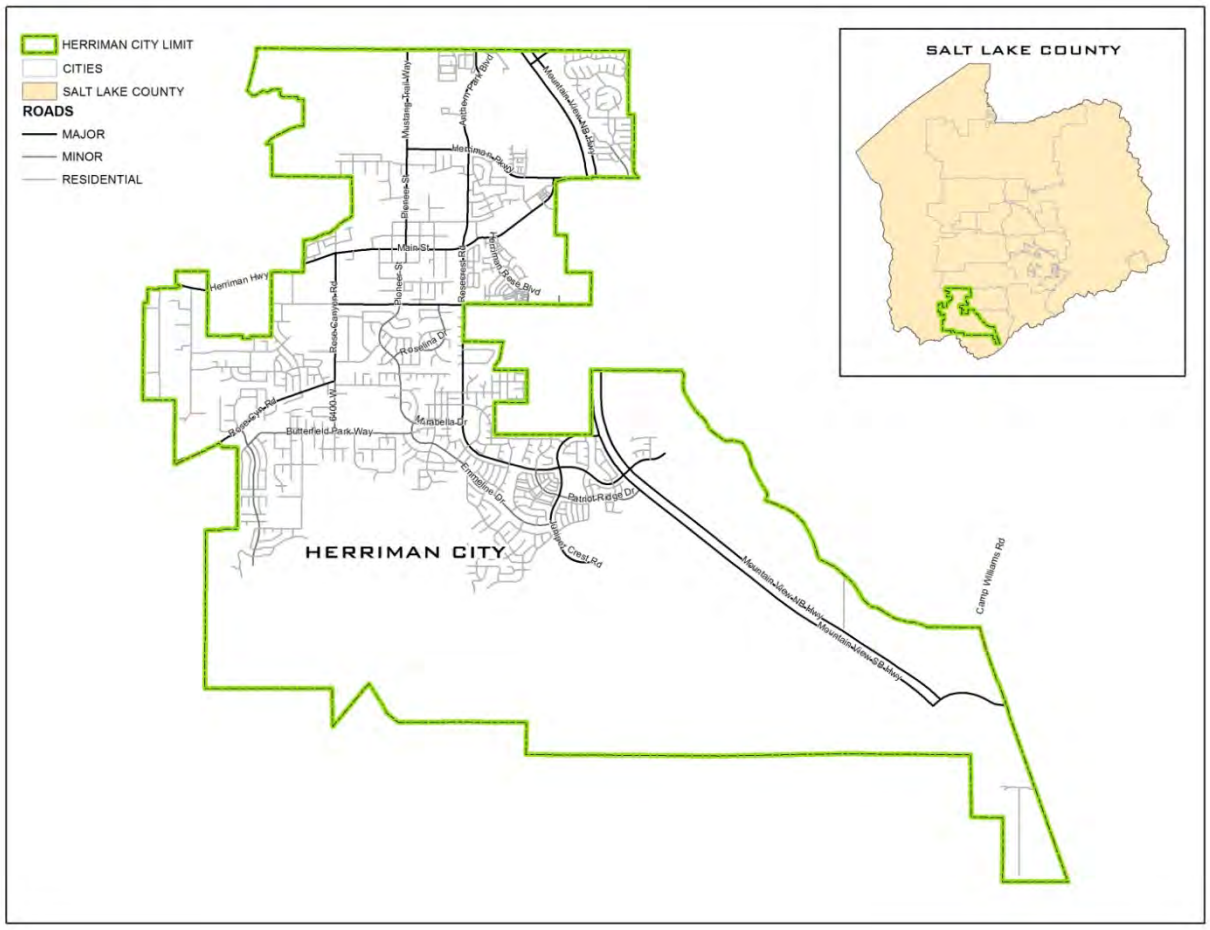
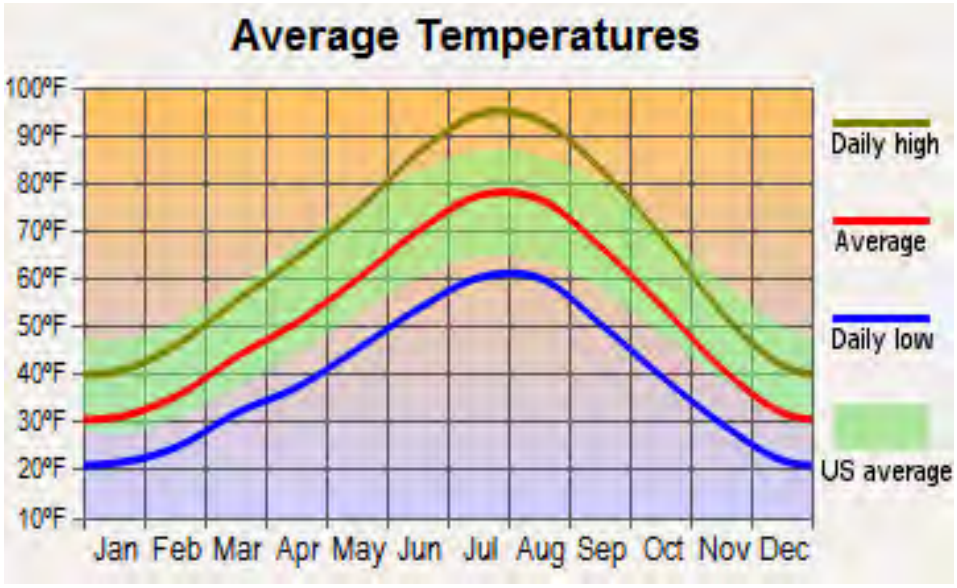


Figure 1. The City of Herriman Location within Salt Lake County



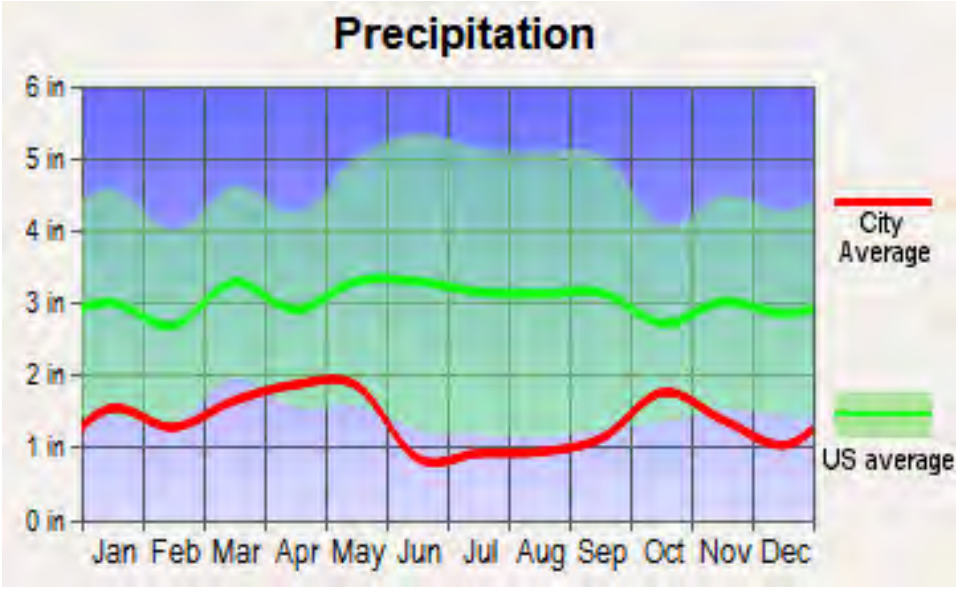


Figure 3. The City of Herriman's Average Temperatures and Precipitation

2.2 Community Facts and History

Herriman is located in the southwest corner of the Salt Lake County, 22 miles from Salt Lake City near the foothills of the Oquirrh Mountains once considered an isolated and far-flung locale; Herriman has emerged as one of the most desirable and fastest-growing communities in the region.

Originally called Butterfield, the town was established in 1849 by Thomas Jefferson Butterfield, John Jay Stocking, Robert Cowan Petty and Henry Harriman. In 1854 an adobe Fort was constructed in the area, in order to protect settlers from hostile native tribes. Fort Herriman, as it was called, was soon disbanded, yet the small settlement remained for more than 130 years.

Local residents earned a living through dry land farming, sheep and cattle ranching, and as employees at the nearby mines and smelters. Many people who did not live in Herriman grazed their livestock here. For a period of time, Herriman became home to some of the largest sheep operations west of the Mississippi River.

In the 1980's and 1990's development pressure suddenly increased, resulting in the town's incorporation in 1999. Between 2000 and 2010 the pace of change and development was particularly furious, as Herriman went from being the 111th-largest incorporated place in Utah to the 32nd-largest.

2.3 Population and Demographics

In 2011, the total population for the City of Herriman was estimated at 26,025 by the U.S. Census. Herriman City's Median Household Income is $76,509. Currently Herriman City has 8,658.00 households. The median age is 24.7 years.

2.4 Economy

As Herriman grows, it will maintain a dedication to;community synergy for residents, businesses development, providing a wide range of housing options, a job-creation focus, retail variety, a higher education institution, and recreational amenities. This progressive planning approach, combined with close proximity to downtown Salt Lake City has proven to be a recipe for growth

Herriman City is a great place to live. Herriman has maintained a small town community spirit, which is exemplified by such community events as the annual Herriman Town Days celebration. Herriman's unique growth opportunities and outdoor recreational venues, continues to attract new residents, developers, businesses, and industries to the City.

2.5 Land Use and Development

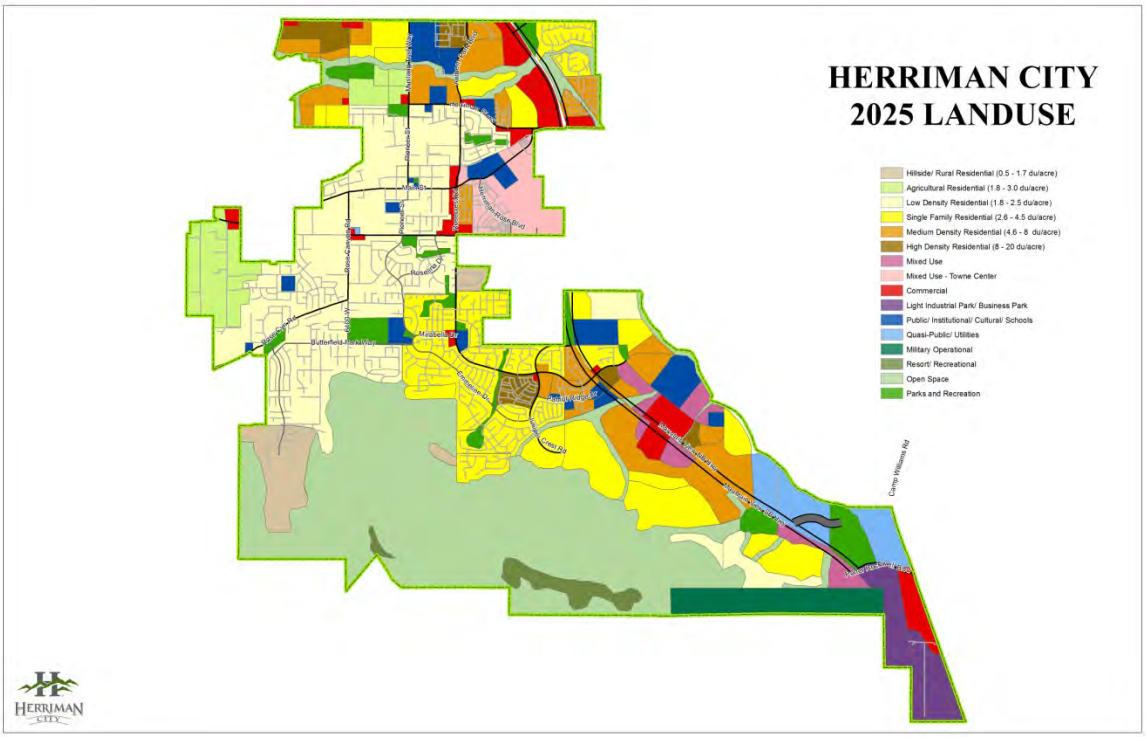


Figure 4. Herriman City Land Use Map

2.6 Growth and Development Trends

The City's fast growth in recent years makes projecting population particularly challenging. With a total population of only 1,523 in 2000, the population increased to 21,785 by the 2010 Census, which is a 245% annual growth rate and a thirteen-fold increase in population during the period. More recent estimates put the City's 2014 population at just over 31,000. Conservative estimates by the Governor's Office of Planning and Budget (GOPB) project continued growth at the highest rate of any city in Salt Lake County. The City has quickly changed from a rural, agricultural town into a full fledged suburban city with the dominant residential market of large lot homes giving way to a more diversified housing type and retail and business centers beginning to take shape. The City still has hundreds of contiguous acres available for future development.

Utah Governor's Office of Planning and Budget

	Census	Census Projected Population				
	2010	2020	2030	2040	2050	2060
Herriman	21,785	45,002	68,002	91,002	114,002	137,002

2.7 Data Sources and Limitations

Herriman City utilized the following sources to provide data for this report:

- Herriman City GIS
- Herriman City Community Development
- Herriman City General Plan
- Salt Lake County
- State of Utah
- US Census Bureau
- National Weather Service

3 Planning Process

3.1 Update Process & Participation Summary

Herriman City plans to make continuous updates to this Hazard Mitigation Plan and in the following sections, defines the processes by which continued public participation will be guaranteed.

3.2 The Planning Team

Members of the Herriman City Mitigation Planning Team are listed in the table below.

Brett Geo. Wood	**Herriman City Manager / Emergency Manager**
Gordon Haight	Herriman City Assistant Manager
Bryn McCarty	Planning Supervisor
Cathryn Nelson	Chief Building Official
Tami Moody	Public Information Officer
Steve Brown	GIS Manager
Monte Johnson	Director of Operations
Tina Giles	Operations Admin Coordinator/ Emergency Coordinator
Ed Blackett	Public Works - Streets
Justin Edwards	Director of Water Services

3.3 Meetings and Documentation

Members of the Herriman City Mitigation Planning Team and the members of the Herriman City Emergency Preparedness Committee were in attendance and discussed the Mitigation Plan at the following meetings:

September 9, 2014 – Public Meeting – Herriman City Emergency Preparedness Committee

September 11, 2014 – Mitigation Meeting with Salt Lake County and key representatives from Herriman City, and Unified Fire Authority

October 6, 2014 – Public Meeting – Herriman City Emergency Preparedness Committee

3.4 Public and Stakeholder Participation

Members of the community are invited to attend the Herriman City Emergency Preparedness meetings that are held monthly. There are several members of the public who attend these meetings and participate in the discussion. Herriman City also has a District Representative Committee made up of representatives from each of nine regions within the city. These representatives are in contact with the area reps and neighborhood block captains in their particular district.

The Mitigation Plan will be presented at a public meeting of the Herriman City Council for adoption. Members of the public will be invited to comment and make suggestions /additions to the Mitigation Plan.

Herriman City will also post information about the Mitigation Plan on the city's website as well as in the Herriman City newsletter.

3.5 Multi-Jurisdictional Planning

Herriman City has been in contact with Salt Lake County and representatives from the county attended themitigation meeting that was held on September 11, 2014 with key members of Herriman City's. The City's designated Emergency Coordinator has attended the monthly Salt Lake County Emergency Manager's meetings where shared information has helped in the Herriman Mitigation Planning Process.

4 Hazard Identification, Analysis & Summary

4.1 Historical Hazard Events

The following are recent hazard events that have impacted Herriman City:

- Machine Gun Fire, September 19, 2010
- Pinyon Fire,
- Rose crest Fire
- Thunderstorm flooding, 2008, 2010, 2013, 2014

4.2 Hazard Analysis

A disaster from a variety of hazards may occur at any time and over time there are two or three that are likely to happen. However, on any given day all are very unlikely. Rather than attempt to prepare for every potential disaster, the intent of Herriman City is to identify the most likely situations and concentrate efforts and resources on the education, preparation, and mitigation for emergencies and disasters with a higher likelihood of occurrence. The natural hazards of concern in Herriman City are those common to surrounding communities and areas of similar climate and configuration. The natural hazards identified in this section, for Herriman City, are as follows:

- Dam Failure
- Drought
- Earthquake
- Flood
- Infestation
- Landslide
- Pandemic
- Severe weather
- Wildfire

4.2.1 Dam Failure

Herriman has a 20 million gallon open irrigation reservoir located at, 14940 south 5390 west Herriman, which is classified as a dam by the State of Utah. The unlikely catastrophic failure of this storage reservoir would impact a residential area with the loss of property and the potential loss of life . Any dam failures in other areas of Utah would have little impact on Herriman, except for the potential impact on water supplies.

4.2.2 Drought

Herriman City's semi-arid climate has large swings in temperature and in precipitation amounts during any year and is susceptible to drought. Table H.2. below shows average temperatures and precipitation amount for Herriman City by month.

Month	Temp. (min)	Temp. (max)	Temp. (avg)	Precipitation
January	-2°F	58°F	29°F	1.3"
February	5°F	66°F	35°F	1.1"

March	15°F	74°F	43°F	1.9"
April	21°F	90°F	50°F	2.1"
May	30°F	93°F	61°F	1.3"
June	39°F	100°F	70°F	1.4"
July	54°F	105°F	82°F	0.2"
August	46°F	103°F	78°F	0.5"
September	35°F	96°F	66°F	1.2"
October	27°F	86°F	52°F	1.4"
November	4°F	75°F	42°F	0.9"
December	0°F	59°F	29°F	1.4"

Table 2. Herriman City Average Temperature Table

4.2.3 Earthquake (Seismic Hazard)

Perhaps the natural hazard with the potential for the most deadly outcome in Herriman is a high magnitude earthquake. Reports indicate that thousands of deaths, billions of dollars of damage to private property, extended loss of utility services, overwhelmed medical facilities, and other catastrophic incidents will occur if a major earthquake occurs in Salt Lake and/or Utah Valley.

Of significant concern, many high priority public and private buildings and many critical infrastructure facilities are located within or across the major fault zones in the region. These facilities include very large waterlines, large irrigation canals, utilities, railroads and major transportation routes. However, potential damage is not limited to fault zone areas. Fine-grained, lake-bottom and sediments is common throughout the Salt Lake Valley and are susceptible to liquefaction-induced ground failure during a large earthquake. Each incident may require a unique response from Herriman City and in the instance of a major earthquake, outside assistance will be necessary.

Utah's earthquake hazard is greatest within the Intermountain Seismic Belt (ISB), which extends 800 miles from Montana to Nevada and Arizona, and trends from north to south through the center of Utah (The Wasatch Fault, UGS PIS 40). The ISB contains the Wasatch fault; one of the longest and most active normal faults in the world, with a potential for earthquake with a

magnitude up to 7.5. The largest earthquakes in Utah occur in the ISB, where at least 35 earthquakes of magnitude 5.0 or greater have occurred since 1850. (UNHH 2008)

4.2.4 Flooding

Although located in a semi-arid region, Herriman City is subject to thunderstorm and snowmelt flooding. Herriman has a history of small scale flooding almost annually, however, these flood sites are not typically in the Federal Emergency Management Agency (FEMA) defined flood hazard area, but rather, as sheet flow from significant storm events. These flood events generally follow areas of transition from open farm field or hill side to new development. Herriman has a significant area of foothills that also have a history of wildfires. These sloped burn scars are vulnerable to debris loaded high intensity storm runoff

Herriman City does not have any repetitive loss properties due to flooding identified under the National Flood Insurance Program (NFIP). The city's Community Development Director oversees enforcement of floodplain management requirements adopted by the City, including regulating new construction in Special Flood Hazard Areas (SFHAs); floodplain identification and mapping, including any local requests for map updates; and description of community assistance and monitoring activities.

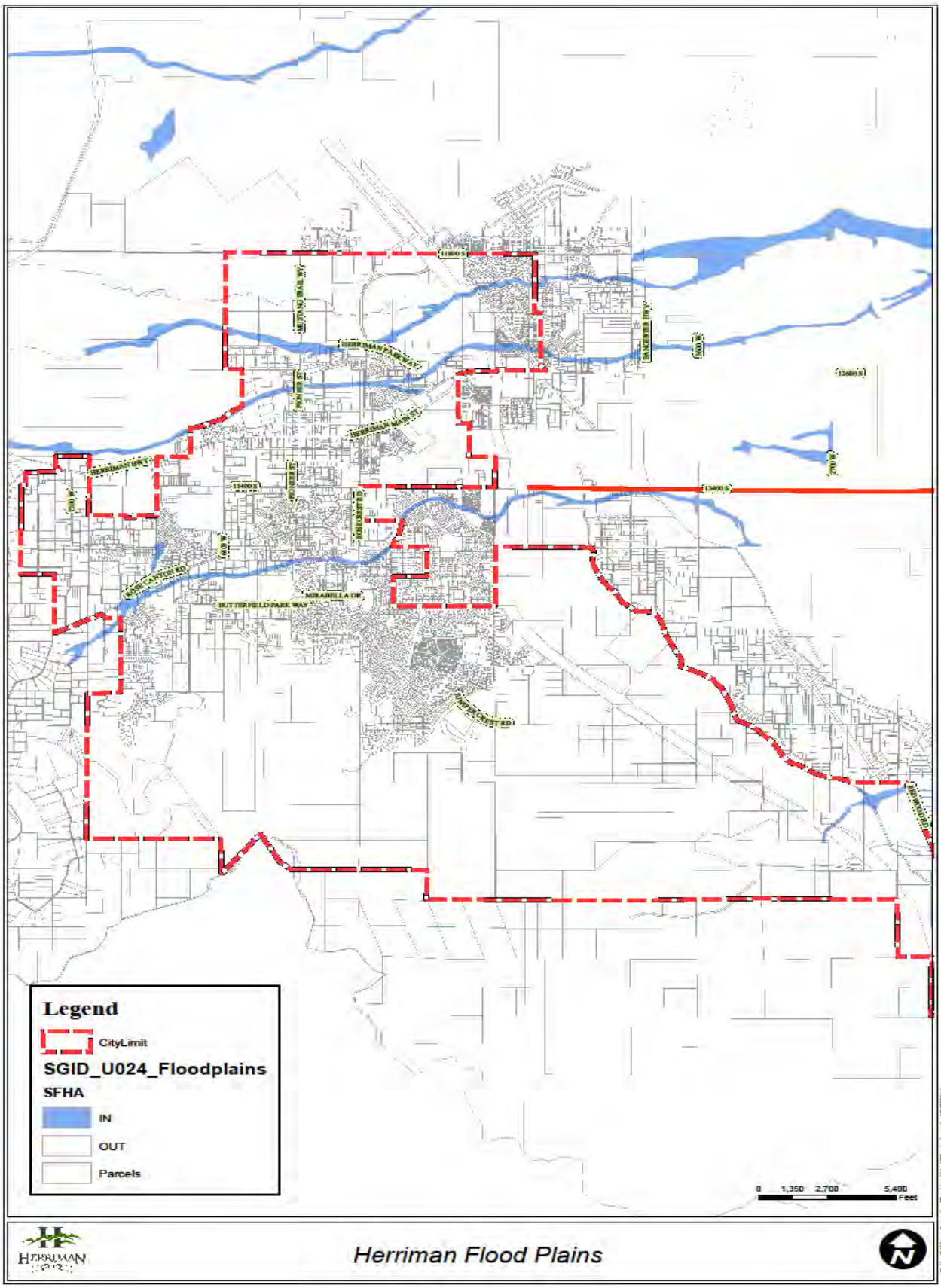


Figure 6. The City of Herriman's Flood Zones

4.2.5 Infestation

The probability of an infestation of insects or rodents in Herriman is negligible. There may be individual property owners impacted short term because of specific property conditions, but the likelihood of a city wide infestation is very low.

4.2.6 Landslide (Geologic Hazard)

"Firm as the mountains around us" is a notion that applies to the Herriman geologic makeup. Although Herriman has steep sloped hills within its boundaries and within close proximity to its residents, the physical configuration internal to these features is largely soil impacted binding rock on top of solid rock. Therefore, the probability of a Landslide in Herriman is negligible.

4.2.7 Pandemic (Public Health Emergencies)

On a regular basis, potentially catastrophic public health issues are raised in the mainstream media and the possibility of a national pandemic, local epidemic such as the hantavirus, or a wide array of other health-related matters is real. These types of health concerns know no municipal boundaries and Herriman has no known health threats of this type specific to this area.

4.2.8 Severe Weather

The potential for severe weather is a reality in Herriman City and the surrounding region. Some weather events may be specific to a season, however, through the variety of possible weather conditions, a destructive event can occur at any time during the year. Heavy rains can fall upon non-percolating soils or sloped terrain creating high surface runoff and resulting flood damage.

Intense, snowstorms can have a dramatic effect on regional commerce, transportation, and daily activity and negatively impact all emergency response.

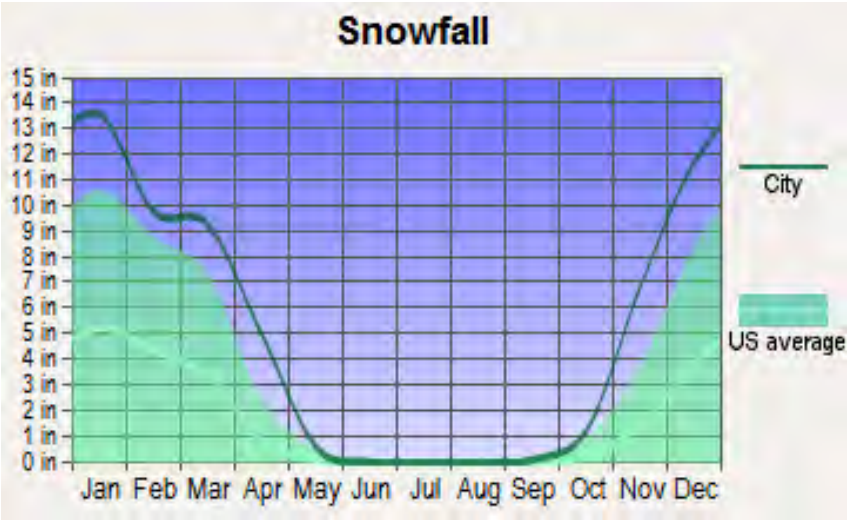


Figure 10. The City of Herriman's Average Snowfall

Although very infrequent, Herriman City is subject to damage resulting from tornadoes. More commonly the city incurs damage from extremely high winds often called microburst winds. As recent as August 11, 1999, a category F2 tornado touched down in the downtown Salt Lake City area, killing one person and injuring at least 100 people. The tornado caused widespread power outages as well as large-scale debris mainly from downed tree limbs. The community needs to be prepared and ready to respond to wind-related weather.

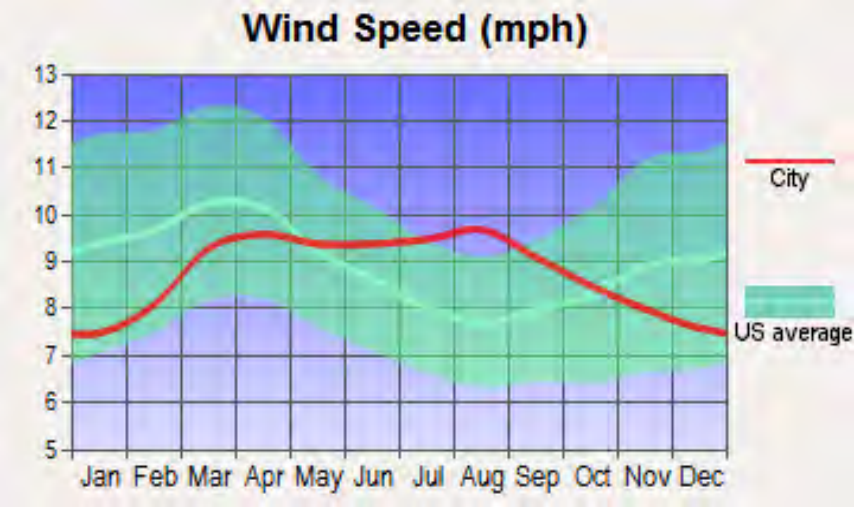


Figure 11. The City of Herriman's Average Wind Speed

4.2.9 Wildfire (Fire Hazard)

Perhaps the most likely hazard in Herriman City is the potential for loss of life and property through fire events. Fires can occur within the urban fabric of the community or as wildfires in the hillside areas of the community and mountainous areas adjacent to the city. Each incident type will require a unique response. Obviously the most feared and damaging is a large scale wildfire. Unfortunately, Herriman has a history of wildfires occurring every few years.

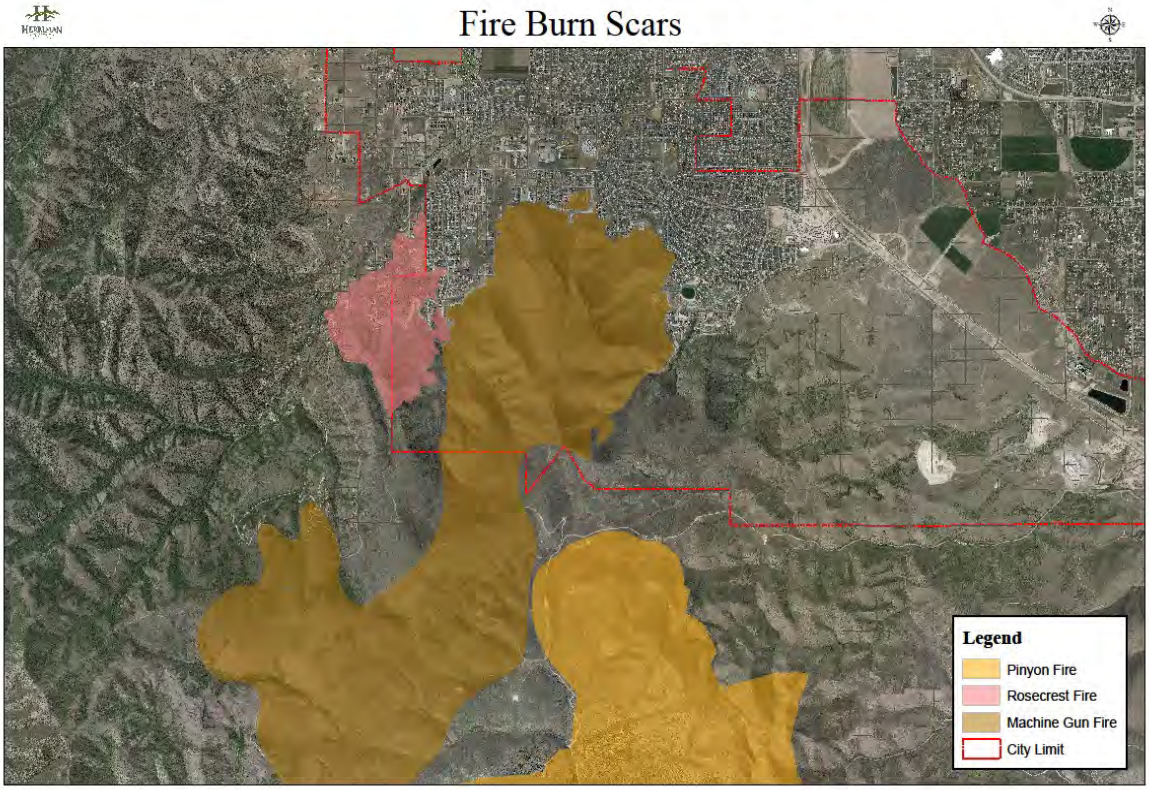


Figure H.The City of Herriman's Wildfire map

4.3 Hazard Assessment

Salt Lake County and Herriman City have conducted an all-hazards assessment of potential vulnerabilities within Herriman City. This assessment assisted with prioritization and outlined a direction for planning efforts. Salt Lake County and Herriman City recognizes the pre-disaster mitigation plan developed by the Wasatch Front Regional Council. This pre-disaster mitigation plan serves to reduce the region's vulnerability to natural hazards. The pre-disaster mitigation plan is intended to promote sound public policy and protect or reduce the vulnerability of the citizens, critical facilities, infrastructure, private property, and the natural environment within the region.

The hazard analysis Table H.4 provides information helpful to understanding risks and their corresponding likelihood and consequence in Herriman City.

Hazard	Location (Geographic Area Affected)	Magnitude, Strength (Maximum Probable Extent)	Probability of Future Events	Overall Significance
Dam Failure	Limited	Weak	Unlikely	Low

Hazard	Location (Geographic Area Affected)	Magnitude, Strength (Maximum Probable Extent)	Probability of Future Events	Overall Significance
Drought	Extensive	Moderate	Occasional	Moderate
Earthquake	Extensive	6.0-7.0+ Extreme	Occasional	High
Flood	Limited	Moderate	Occasional	High
Infestation	Negligible	Weak	Unlikely	Low
Landslide	Limited	Weak	Unlikely	Low
Pandemic	Extensive	Weak	Unlikely	Low
Problem Soils	Limited	Weak	Occasional	Low
Severe Weather	Extensive	Moderate	Occasional	High
Wildfire	Significant	Severe	Likely	High

Table 4 Herriman City Hazard Analysis Table

Definitions for Classifications

Location (Geographic Area Affected)

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

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

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

Examples

Hazard	Scale/Index	Weak	Moderate	Severe	Extreme
Drought	Palmer Drought Severity Index	-1.99 to 1.99	-2.00 to -2.99	-3.00 to -3.99	-4.00 and below

Hazard	Scale/Index	Weak	Moderate	Severe	Extreme
Earthquake	Modified Mercalli Scale	I to IV	V to VII	VIII	IX to XII
	Richter Magnitude	2,3	4,5	6	7,8
Tornado	Fujita Tornado Damage Scale	F0	F1, F2	F3	F4, F5

Probability of Future Events

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

Overall Significance

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

5 Vulnerability Assessment

This vulnerability assessment analyzes the population, property, and other assets at risk to hazards.

5.1 Assets at Risk

This section considers Herriman's assets at risk, including values at risk, critical facilities and infrastructure, economic assets, and growth and development trends.

Values at Risk

Table 4 shows the 2014 assessed property data from the State of Utah for Herriman City and includes data for the portions of Herriman in Salt Lake County and Utah County.

Herriman City	Real Property Value	Personal Property Value	Central Assessed Value	Total
Salt Lake County Portion of Herriman	$3,572,233,860	$188,886,397	$105,049,650	$3,866,169,907
Utah County Portion of Herriman	$159,186,324	$11,864	$581,581	$159,779,769
TOTAL VALUE	$3,731,420,184	$188,898,261	$105,631,231	$4,025,949,676

Table 4. Assessed Property Value Data for Herriman City

Assets directly owned and controlled by Herriman City include a range of properties and equipment from each department. The value of the City's total capital assets in 2013 was $399,932,080.

Critical Facilities and Infrastructure

A critical facility may be defined as one that is essential in providing utility or direction either during the response to an emergency or during the recovery operation. Essential facilities are those that if damaged would have devastating impacts on disaster response and recovery. High potential loss facilities are those that would have a high loss or impact on the community. Transportation and lifeline facilities are the third category.

Essential Facilities

Figure 12 shows essential facilities that are located within Herriman.

Name of Facility	Address	City
Herriman City Hall (EOC)	13100 S Pioneer Street	Herriman
Unified Fire Authority Station (Back up EOC)	4850 W. Mt. Ogden Peak Dr. (146th S.	Herriman
Unified Fire Authority Station	5916 W. 13050 S.	Herriman

Name of Facility	Address	City
JL Sorenson Recreation Center	5350 W Main St,	Herriman
Salt Lake County Herriman Library	5380 W Main St,	Herriman
Unified Police Dept	13272 South 5600 West	Herriman

Figure 12. Essential Facilities Herriman City

High Potential Loss Facilities

High potential loss facilities as identified by FEMA HAZUS-MH are located throughout Herriman. Herriman works closely with other government entities and private property owners in monitoring and assessing facilities that fall into this category that are not owned by the City.

Transportation and Lifeline Facilities

The Mountain View Corridor, 11800 South, 12600 South, and 13400 South roadways serve as a means to get access in and out of the City in the event of an emergency. There are no major freight or passenger rail lines within Herriman City. There are a total of five connections to potable water sources that provide water service to the entire city. The Rosecrest Water Tank provides water service to the majority of Herriman City residents. There are several major gas transmission lines that are maintained by Questar Gas.

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5.2 Regulatory Mitigation Capabilities

Table H.5. lists regulatory mitigation capabilities, including planning and land management tools, typically used by local jurisdictions to implement hazard mitigation activities and indicates those that are in place in Herriman.

Regulatory Tool
General plan
Zoning ordinance
Subdivision ordinance
Site plan review requirements
Floodplain ordinance
Other special purpose ordinance water conservation, wildfire)
Building code
Fire department ISO rating
Erosion or sediment control program
Stormwater management program
Capital improvements plan
Economic development plan
Local emergency operations plan
Flood Insurance Study or other study for streams

Table 5. Herriman City's Regulatory Mitigation Capabilities

5.3 Actions taken based on the 2009 Wasatch Front Mitigation Plan

2009 Mitigation Strategies Progress and Summary

The following mitigation strategies were formulated by the Salt Lake County Mitigation Strategies Working Group for inclusion in the 2009 *Wasatch Front Region Natural Hazard Pre-Disaster Mitigation Plan*.

For actions not completed or implemented by the City of Herriman, a short description is provided as to why it was not relevant or if it is included as part of the updated plan.

Category	Goal / Objective	Action	Status	Comments
All Hazards	1 – Improve and maintain communications capabilities for emergency operations 1.1 – Improve communication capabilities	1 – Conduct an inventory and assessment of communications equipment and systems and identify needs	Completed /On going	Herriman continues to improve and maintain its communications capabilities. Example: Upgrade and purchase 30 new radios and 12 HAM radios during the planning period
All Hazards	1 – Improve and maintain communications capabilities for emergency operations 1.1 – Improve communication capabilities	2 – Conduct Training and awareness activities on communication equipment, tools, and systems	Completed /On going	Herriman participates in training and exercises designed to practice using communication tools and equipment. Example: City uses its amateur radio volunteers to support special events like the PRCA Rodeo Town Days to exercise its communication trailer and other equipment as well as to train and practice.
All Hazards	1 – Improve and maintain communications capabilities for emergency operations 1.1 – Improve communication capabilities	3 – Establish agreements to share communications equipment between agencies involved in emergency operations	On going	No formal agreements exist to share communications equipment, but communications equipment can be shared as part of other mutual aid agreements that are in place
All Hazards	1 – Improve and maintain communications capabilities for emergency operations 1.1 – Improve communication capabilities	4 – Establish notification capabilities and procedures for emergency personnel	On going	Herriman continues to work on notification tools and procedures to be in harmony with changing technology and equipment

Category	Goal / Objective	Action	Status	Comments
All Hazards	1 – Improve and maintain communications capabilities for emergency operations 1.2 – Maintain communications capabilities for critical facilities	1 – Evaluate vulnerability of critical communications systems	Completed	Herriman evaluates areas of vulnerability and develops solutions to ensure communication systems or alternate solutions are viable Example: The development of a second / redundant radio system for the Police, Fire, and Public Works Departments
All Hazards	1 – Improve and maintain communications capabilities for emergency operations 1.2 – Maintain communications capabilities for critical facilities	2 – Establish redundancy for dispatch centers and other critical communications	Completed / Ongoing	Herriman relies on the Valley Emergency Communications Center (VECC) for dispatch services. They coordinate with other PSAPS to provide redundancy.
All Hazards	1 – Improve and maintain communications capabilities for emergency operations 1.3 – Conduct communications Strategic Planning	1 – Establish a coordinating group to address long-term communication needs and implementation strategies	Ongoing	No formal coordinating group exists yet, but Herriman engages in discussions with other jurisdictions and the county regarding this issue
All Hazards	1 – Improve and maintain communications capabilities for emergency operations 1.3 – Conduct communications Strategic Planning	2 – Acquire, upgrade, and/or integrate communications equipment and systems as determined by coordinating group	Ongoing	Herriman has upgraded existing equipment and purchased new equipment to maintain operability
All Hazards	2 – Improve awareness and analysis of hazards 2.1 – Improved Quality and Access to digital geographic (GIS) hazards data	1 – Establish a coordinating group to address geographic data issues	Completed / Ongoing	Herriman GIS personnel actively participate in several coordinating groups that address issues associated with geographic data
All Hazards	2 – Improve awareness and analysis of hazards 2.1 – Improved Quality and Access to digital geographic (GIS) hazards data	2 – Examine current data availability and sharing capabilities, evaluate needs, and identify shortcomings	Completed / Ongoing	Herriman GIS personnel actively participate in several coordinating groups that address issues associated with geographic data
All Hazards	2 – Improve awareness and analysis of hazards 2.1 – Improved Quality and Access to digital geographic (GIS) hazards data	3 – Update and expand data on hazards, critical facilities, and critical infrastructure according to assessed needs	Completed / Ongoing	Herriman GIS personnel continue to develop and add to the geographic data as part of the City's overall geographic information systems

Category	Goal / Objective	Action	Status	Comments
All Hazards	2 – Improve awareness and analysis of hazards 2.1 – Improved Quality and Access to digital geographic (GIS) hazards data	4 – Provide centralized access to geographic data to emergency planners and responders	Completed / Ongoing	Herriman GIS personnel make data available to first responders and others involved in emergency management efforts
All Hazards	2 – Improve awareness and analysis of hazards 2.2 – Improve and expand hazard monitoring capabilities	1 – Integrate existing hazard monitoring networks in emergency operations centers. Utilize sensors such as weather stations, stream gages, seismograph stations, road conditions, etc.	Completed / Ongoing	Herriman has implemented the use of monitoring equipment such as stream gages, seismographs, SNOTEL sites to provide situational awareness and forecasting capabilities Example: Herriman emergency manager receives alerts from the USGS and NWS via text message and email
All Hazards	2 – Improve awareness and analysis of hazards 2.2 – Improve and expand hazard monitoring capabilities	2 – Identify and implement additional hazard monitoring capabilities.	Completed / Ongoing	Example: Herriman emergency manager receives alerts from the USGS and NWS via text message and email
All Hazards	3 – Ensure critical facilities can sustain operations for emergency response and recovery 3.1 – Prevent damage to critical facilities and infrastructure	1 – Utilize GIS to identify facilities and infrastructure at risk	On going	Herriman GIS, Fire and Emergency personnel are doing a general hazard and risk assessment on all structures in the city to evaluate their level of risk
All Hazards	3 – Ensure critical facilities can sustain operations for emergency response and recovery 3.1 – Prevent damage to critical facilities and infrastructure	2 – Assess critical facilities for hazard exposure, structural weaknesses, power, communications and equipment resources and redundancy, and adequate emergency procedures	On going	Herriman GIS, Fire and Emergency and personnel are doing a general hazard and risk assessment on all structures in the city to evaluate their level of risk
All Hazards	3 – Ensure critical facilities can sustain operations for emergency response and recovery 3.1 – Prevent damage to critical facilities and infrastructure	3 – Implement improvements to address identified in assessment	In Process	Herriman is identifying options and opportunities to address issues identified during the hazard and risk assessment

Category	Goal / Objective	Action	Status	Comments
All Hazards	4 – Improve response capabilities through mutual-aid agreements 4.1 – Utilize mutual-aid agreements in accordance with National Incident Management System (NIMS) requirements	1 – Compile inventory of mutual-aid agreements and memoranda of understanding (MOU) and identify deficiencies	Completed / Ongoing	Herriman has formal agreements for Police, Fire, and Water
All Hazards	4 – Improve response capabilities through mutual-aid agreements 4.1 – Utilize mutual-aid agreements in accordance with National Incident Management System (NIMS) requirements	2 – Pursue and implement needed mutual-aid agreements	Completed / Ongoing / In Process	Herriman is currently working on participation in a new public works MAA
All Hazards	5 – Increase citizen safety through improved hazard awareness 5.1 – establish a comprehensive public education program	1 – Provide education regarding all natural hazards through live trainings, as well as web-based, print and broadcast media	Completed / Ongoing	Herriman Emergency Management provides several public education classes for groups to discuss the hazards in the community and what residents can do to be prepared
All Hazards	5 – Increase citizen safety through improved hazard awareness 5.1 – Establish a comprehensive public education program	2 – Incorporate information about cascading effects of hazards in education programs	On going	Information is included in all presentations on the effects of cascading hazards
All Hazards	5 – Increase citizen safety through improved hazard awareness 5.1 – Establish a comprehensive public education program	3 – Develop education programs to target specific groups including homeowners, developers, schools and people with special needs	Completed / Ongoing	Herriman education programs are customizable for all kinds of groups and available to all members of the community
All Hazards	5 – Increase citizen safety through improved hazard awareness 5.1 – Establish a comprehensive public education program	4 – Utilize maps and similar products on County EM website and other media to educate public on areas at risk to hazards	On going	Herriman GIS personnel have compiled and made available hazard maps to help educate the public on potential hazards in the city
All Hazards	5 – Increase citizen safety through improved hazard awareness 5.1 – Establish a comprehensive public education program	5 – Coordinate with existing public education programs such as the American Red Cross, Utah Living with Fire, be Ready Utah, the National Weather Service, etc.	Completed / Ongoing	Herriman has worked with Be Ready Utah and other programs to make presentations in Herriman and will continue to invite them to events and other activities in the community

Category	Goal / Objective	Action	Status	Comments
All Hazards	6 – Improve public safety through preventative regulations 6.1 – Minimize hazard impacts through the adoption of appropriate prevention measures	1 – Establish and enforce appropriate planning, zoning, and building code ordinances	Completed / Ongoing	Herriman enforces all current ordinances and building codes including ordinances like our Flood Damage Prevention and Land Disturbance ordinances.
All Hazards	6 – Improve public safety through preventative regulations 6.1 – Minimize hazard impacts through the adoption of appropriate prevention measures	2 – Ensure current hazard ordinances are available for viewing online	On going	Herriman is working on having the current hazard ordinances for viewing online
Dam Failure	1 – Include dam failure inundation in future County and City planning efforts 1.1 – Review current State dam safety information on all identified high hazard dams in the County	1 – Include dam inundation maps in current County, City and Special Service District Emergency Operations Plans	On going	The inundation map for the dam at Black Ridge Reservoir is included in the City's Emergency Management Plans
Dam Failure	1 – Include dam failure inundation in future County and City planning efforts 1.1 – Review current State dam safety information on all identified high hazard dams in the County	2 – Utilize inundation maps to identify potential evacuation areas and routes	Completed	The inundation map for the dam at Black Ridge Reservoir is included in the City's Emergency Management Plans
Drought	1 – Reduce and prevent hardships associated with water shortages 1.1 – Limit unnecessary consumption of water throughout the County	1 – Continue to encourage water conservation utilizing and promoting outreach material from all water districts in the County	Completed / Ongoing	Herriman is working with Jordan Valley Water Conservancy District to provide materials on this topic
Drought	1 – Reduce and prevent hardships associated with water shortages 1.1 – Limit unnecessary consumption of water throughout the County	2 – Emergency Managers will coordinate with local water districts/public utilities to support ongoing conservation efforts	Ongoing	Herriman is coordinating with the Jordan Valley Water Conservancy District and leads the City's programs for water conservation
Drought	1 – Reduce and prevent hardships associated with water shortages 1.1 – Limit unnecessary consumption of water throughout the County	3 – Installing secondary water to all the residents	Ongoing	Herriman is installing secondary water to all the residents.
Drought	1 – Reduce and prevent hardships associated with water shortages 1.1 – Limit unnecessary consumption of water throughout the County	4 – Implement water-saving devices and practices in public facilities	Ongoing	Herriman has implemented several projects including using secondary water to irrigate public parks instead of culinary water

Category	Goal / Objective	Action	Status	Comments
Drought	1 – Reduce and prevent hardships associated with water shortages 1.1 – Limit unnecessary consumption of water throughout the County	5 – Repair, maintain and improve water distribution infrastructure to prevent loss from leakage, breaks, etc.	Completed / Ongoing	Herriman Water Division responds immediately to all reports of leaks and performs regular system maintenance, including actively monitoring for leaks, theft of services, etc.
Drought	1 – Reduce and prevent hardships associated with water shortages 1.1 – Limit unnecessary consumption of water throughout the County	6 – Coordinate public safety water use, such as hydrant testing	Completed / Ongoing	Herriman Water Division coordinates all water use, including the testing of hydrants in partnership with the fire department
Drought	1 – Reduce and prevent hardships associated with water shortages 1.1 – Limit unnecessary consumption of water throughout the County	7 – Provide information on landscaping alternatives for persons subject to green area requirements	Completed / Ongoing	Herriman offers a variety of information and training classes on topics ranging from proper sprinkler use and maintenance to alternative plants and other vegetation that can be used.
Drought	1 – Reduce and prevent hardships associated with water shortages 1.2 – Address agricultural water shortages in the County	1 – Set up livestock water rotation in areas of agricultural use	On going	Herriman is working with the agricultural groups on this issue
Drought	1 – Reduce and prevent hardships associated with water shortages 1.3 – Encourage development of secondary water systems	1 – Coordinate with water districts to plan for, develop and/or expand secondary water	Completed / Ongoing	Herriman continues to encourage the development of secondary water, where feasible. Several areas have been added to the secondary water system in the last 5 years.
Earthquake	1 – Reduce earthquakes losses to infrastructure 1.1 – Encourage retrofit and rehabilitation of highly susceptible infrastructure	1 – Identify structures at risk to earthquake damage	On going	Herriman GIS, Fire and Emergency and Risk Management personnel are working on hazard and risk assessment on all structures in the city to evaluate their level of risk
Earthquake	1 – Reduce earthquakes losses to infrastructure 1.1 – Encourage retrofit and rehabilitation of highly susceptible infrastructure	2 – Research feasibility of an incentive program for retrofitting privately-owned buildings, particularly unreinforced masonry	Not Completed	Herriman does not have funding to support this type of program

Category	Goal / Objective	Action	Status	Comments
Earthquake	1 – Reduce earthquakes losses to infrastructure 1.1 – Encourage retrofit and rehabilitation of highly susceptible infrastructure	3 – Complete seismic rehabilitation/retrofitting projects of public buildings at risk	Not Completed	Due to the age of the City's public buildings (most having been built in the last 15 years) there are no major retrofit or rehabilitation projects needed at this time in Herriman
Earthquake	1 – Reduce earthquakes losses to infrastructure 1.2 – Improve public education regarding earthquake risks to unreinforced masonry buildings	1 – Provide educational materials to unreinforced masonry home and business owners	Not Completed	There are very few URM homes and businesses located in Herriman that would make this activity cost effective for the City to engage in. Herriman supports county level efforts to share this type of information
Earthquake	1 – Reduce earthquakes losses to infrastructure 1.3 – Improve Seismic Hazard understanding and seismic resistance of CUWCD Red Butte Dam in Salt Lake County.	1 – Procure Engineering Consultant to perform the nonstructural design and geotechnical assessment and review.	Not Completed / Not Applicable	Not applicable to Herriman as the referenced dam is located in another jurisdiction.
Flooding	1 – Protection of life and property before, during and after a flooding event 1.1 – Provide 100% availability of the National Flood Insurance Program	1 – Assist Cities with NFIP application	Not Completed / Not Applicable	Herriman has been a participating community in the NFIP since 2008
Flooding	1 – Protection of life and property before, during and after a flooding event 1.1 – Provide 100% availability of the National Flood Insurance Program	2 – Encourage Communities to actively participate in NFIP	Completed / Ongoing	Herriman actively participates in the NFIP
Flooding	1 – Protection of life and property before, during and after a flooding event 1.2 – Encourage appropriate flood control measures, particularly in new developments	1 – Determine potential flood impacts and identify areas in need of additional flood control structures	Completed / Ongoing	The City Engineer and Public Works Director regularly review the impact of development and the need for flood control infrastructure and make recommendations as needed

Category	Goal / Objective	Action	Status	Comments
Flooding	1 – Protection of life and property before, during and after a flooding event 1.2 – Encourage appropriate flood control measures, particularly in new developments	2 – Address identified problems through construction of debris basins, flood retention ponds, energy dissipaters or other flood control structures	Completed / Ongoing	The City Engineer and Public Works Director oversee the construction of flood control structures Example: Significant construction efforts to ensure all the debris basins, flood retention ponds, energy dissipaters or other flood control structures are functioning
Flooding	1 – Protection of life and property before, during and after a flooding event 1.3 – Provide maintenance, repairs and improvements to drainage structures, storm water systems and flood control structures	1 – Establish maintenance and repair programs to remove debris, improve resistance and otherwise maintain effectiveness of storm water and flood control systems	Completed / Ongoing	The Stormwater Division of the Public Works Department continues to maintain and repair all drainage systems in the City
Flooding	2 – Reduce threat of unstable or inadequate flood control structures 2.1 – Reduce potential for failure of flood control structures	1 – Identify and assess structures for deficiencies	Completed / Ongoing	The City Engineering Division in cooperation with the Public Works Department regularly review and inspect City-owned infrastructure and make recommendations as needed
Flooding	2 – Reduce threat of unstable or inadequate flood control structures 2.1 – Reduce potential for failure of flood control structures	2 – Modify structures as needed to address deficiencies	Completed / Ongoing	The City Engineering Division in cooperation with the Public Works Department make repairs as needed to deficient structures
Severe Weather	1 – Reduce threat of loss of life or property due to extreme weather events 1.1 – Maintain status as a StormReady Community	1 – Maintain Hazardous Weather Operations Plan according to StormReady requirements	Not Completed / Not Applicable	Herriman does not have a Weather Operations Plan and does not participate in the StormReady program. This is a Salt Lake County level program
Severe Weather	1 – Reduce threat of loss of life or property due to extreme weather events 1.1 – Maintain status as a StormReady Community	2 – Maintain Contact with NWS prior to re-application in 2010	Not Completed / Not Applicable	Herriman does not have a Weather Operations Plan and does not participate in the StormReady program. This is a Salt Lake County level program

Category	Goal / Objective	Action	Status	Comments
Severe Weather	1 – Reduce threat of loss of life or property due to extreme weather events 1.2 – Increase awareness of information services provided by NWS	1 – Meet with NWS representative on an annual basis to receive information on new services and alerts available	Completed / Ongoing	Herriman participates in briefings provided by NWS representatives on an annual basis
Severe Weather	1 – Reduce threat of loss of life or property due to extreme weather events 1.2 – Increase awareness of information services provided by NWS	2 – Assist NWS in making other agencies and departments aware of available resources	Completed / Ongoing	Herriman supports the NWS efforts for education and outreach and makes internal departments aware of NWS resources
Severe Weather	1 – Reduce threat of loss of life or property due to extreme weather events 1.3 – Encourage safe practices in avalanche prone areas	1 – Assist Forest Service Utah Avalanche Forecast Center and other organizations in promoting avalanche hazard awareness for backcountry users	Completed / Ongoing	Herriman supports the efforts for education and outreach
Severe Weather	1 – Reduce threat of loss of life or property due to extreme weather events 1.4 – Examine the vulnerability of patrons at large event venues to extreme weather events	1 – Work with NWS to develop large event venue weather safety and evacuation procedures	Not Completed	Herriman has not developed a large event venue weather safety plan and/or evacuation procedures with the NWS
Slope Failure	1 – Reduce or eliminate the threat of slope failure damage 1.1 – Reduce the threat of slope failures following wildfires	1 – Develop protocol for working with State and Federal agencies in reducing the impact of post-fire debris flow hazard	On going	Herriman is working with State and Federal agencies in reducing the impact of post-fire debris flow hazard
Slope Failure	1 – Reduce or eliminate the threat of slope failure damage 1.2 – Monitor historic landslide areas	1 – Coordinate with the Utah Geological Survey and other agencies to understand current slope failure threats/potential	On going	Herriman Coordinate with the Utah Geological Survey and other agencies to understand current slope failure threats/potential
Slope Failure	1 – Reduce or eliminate the threat of slope failure damage 1.3 – Address landslide hazards in new sub-divisions	1 – Utilize recommendations provided by the State Geological Hazards Working Group to address land-use and planning for new developments	Completed / Ongoing	Herriman Engineering and Planning reviews recommendations as provided pertaining to development within the City
Wildland Fire	1 – Community education on wildfire hazard 1.1 – Reduce risk from wildfire through education programs	1 – Increase public awareness through “Firewise” program	On going	Herriman is working with the “Firewise” programs to ensure the public’s safety in this matter

Category	Goal / Objective	Action	Status	Comments
Wildland Fire	1 – Community education on wildfire hazard 1.1 – Reduce risk from wildfire through education programs	2 – Educate homeowners on the need to create defensible space near structures in WUI	On going	Herriman is – Educating homeowners on the need to create defensible space near structures in WUI
Wildland Fire	2 – Improve safety from wildfire hazards through planning, protective actions and improved fire response capabilities 2.1 – Assist homeowners with creating defensible space near structures in WUI areas	1 – Designate and promote county-wide annual initiative for clearing fuels	On going	Herriman promotes county-wide annual initiative for clearing fuels
Wildland Fire	2 – Improve safety from wildfire hazards through planning, protective actions and improved fire response capabilities 2.1 – Assist homeowners with creating defensible space near structures in WUI areas	2 – Provide waste removal, such as chipping of green waste by public works, following designated fuel clearing day/week	On going	Herriman Provide waste removal, such as chipping of green waste by public works, following designated fuel clearing day/week
Wildland Fire	2 – Improve safety from wildfire hazards through planning, protective actions and improved fire response capabilities 2.2 – Improve evacuation capabilities for WUI areas	1 – Work with experts and communities to develop or update evacuation plans	On going	Herriman works with experts and communities to develop or update evacuation plans
Wildland Fire	2 – Improve safety from wildfire hazards through planning, protective actions and improved fire response capabilities 2.2 – Improve evacuation capabilities for WUI areas	2 – Evaluate transportation network and address needed improvements to facilitate evacuation and emergency response	On going	Herriman is working on an adequate transportation network to support evacuation and emergency response
Wildland Fire	2 – Improve safety from wildfire hazards through planning, protective actions and improved fire response capabilities 2.3 – Improve addressing system in WUI areas to facilitate emergency response	1 – Identify all facilities, businesses, and residences, particularly in the areas, and assigned addresses according to current county addressing standards	On going	Addressing of structures in Herriman has not been completed yet

Category	Goal / Objective	Action	Status	Comments
Wildland Fire	2 – Improve safety from wildfire hazards through planning, protective actions and improved fire response capabilities 2.3 – Improve addressing system in WUI areas to facilitate emergency response	2 – Incorporate improved addresses in fire-dispatch and other databases	On going	Addressing of structures in Herriman has not been completed yet
Wildland Fire	2 – Improve safety from wildfire hazards through planning, protective actions and improved fire response capabilities 2.4 – Complete wildfire protection projects	1 – Reduce fuels around publically owned structures	On going	Herriman is working on completing this
Wildland Fire	2 – Improve safety from wildfire hazards through planning, protective actions and improved fire response capabilities 2.4 – Complete wildfire protection projects	2 – Implement fire breaks and other protective measures	On going	Herriman Implements fire breaks and other protective measures
Wildland Fire	2 – Improve safety from wildfire hazards through planning, protective actions and improved fire response capabilities 2.4 – Complete wildfire protection projects	3 – Assess existing water flow capabilities, both public and private, and address deficiencies	Completed	Herriman's water system meets and/or exceeds requirements for providing water flow for firefighting purposes in the City
Wildland Fire	2 – Improve safety from wildfire hazards through planning, protective actions and improved fire response capabilities 2.4 – Complete wildfire protection projects	4 – Assist communities in developing Community Wildfire Protection Plans or similar plans	On going	Herriman is assisting communities in developing Community Wildfire Protection Plans or similar plans
Wildland Fire	2 – Improve safety from wildfire hazards through planning, protective actions and improved fire response capabilities 2.5 – Encourage proper development practices in the WUI	1 – Adopt the Utah Wildland-Urban Interface Code	On going	Herriman is in the process of Adopting the Utah Wildland-Urban Interface Code
Wildland Fire	2 – Improve safety from wildfire hazards through planning, protective actions and improved fire response capabilities 2.5 – Encourage proper development practices in the WUI	2 – Define wildland-urban interface and develop digital maps of the WUI	On going	Herriman is working to define wildland-urban interface and develop digital maps of the WUI

6 Mitigation Strategy

6.1 Mitigation Actions

The planning team for Herriman City identified the following mitigation actions based on the risk assessment. Additional mitigation actions may be added in the future as needed. Background information and information on how each action will be implemented and administered, the responsible office, potential funding, estimated cost, and timeline are also included.

6.1.1 Emergency Response

The main component of all mitigation effort is preparation and the more first responders are prepared for the emergencies associated with all disasters or hazardous events the more loss of property and life can be prevented. Therefore, in Herriman, emergency response preparation and training are high on the list of mitigation actions common to all potential hazards.

CERT

Herriman City has CERT teams and great volunteer who are well organized, eager and ready to respond at any time when activated.
They participate in exercise and drills twice a year. Herriman has had a lot of disasters including fire, flooding and search and rescue of a missing child.

Emergency Operations Exercises

The state of Utah has a drill once a year which is called the Great ShakeOut Earthquake Drill. Herriman City participates in this drill along with coordinating their own drills and exercise.

Drinking Water Trailer

Issue/Background: Consider purchasing a mobile self-contained drinking water trailer. The trailer will be used to accommodate the residents emergency needs for water.
Other Alternatives: Rely on contract service providers who may not be able to respond with adequate resources in a timely fashion.
Responsible Office: Herriman City Public Works Department and Police Department
Priority (High, Medium, Low): Low
Cost Estimate: 1 trailer @ $20,000 each = $20,000
Potential Funding: Departmental water budget or grant funding
Benefits (Avoided Losses): The city will be providing the residents with the necessary water they will need for a time while other resources can help.
Schedule: Fiscal year 2015/2016

6.1.2 Dam Failure

There is one dam in Herriman and it holds back up to 20 million gallons of irrigation water. This facility was constructed and is monitored per the regulations of the Utah Division of Water Rights, Dam Safety Program.

6.1.3 Drought

No specific or local mitigation actions outlined, beyond the option to put water use restrictions in place.

6.1.4 Earthquake

Continue to Enforce Building Codes, Development Codes and Zoning Ordinance

Issue/Background: The Herriman City requires that construction complies with the adopted building codes and the zoning and development ordinances adopted by the City. The City has experienced tremendous growth during since incorporation in 1999 and will continue to grow in future years.
Other Alternatives: No action
Responsible Office: Herriman City Building Inspection Division, Herriman City Community Development Department and Herriman City Engineering Division.
Priority (High, Medium, Low): Medium
Cost Estimate: Developer-based funding under specific plan requirements
Potential Funding: Developer-based funding under specific plan requirements
Benefits (avoided Losses): This will prevent the loss of human life and economic and property losses.
Schedule: Long term

Continue Utah Shakeout Activities to Promote Earthquake Awareness

Issue/Background: Herriman City participates in the Utah Shakeout activities annually. This event promotes earthquake awareness of the residents, businesses and City employees. This annual event allows the City to practice setting up its Emergency Operation Center and its process of communicating with neighborhoods throughout the City.
Other Alternatives: No action
Responsible Office: Emergency Manger, Police Department and the City's Emergency Preparedness Committee
Priority (High, Medium, Low): High
Cost Estimate: $3,000 to $8,000 annually
Potential Funding: City budget
Benefits (avoided Losses): This will help to prevent the loss of human life and property losses when a major earthquake event occurs.
Schedule: Long term

6.1.5 Flood

Continue to Enforce Storm Drain Master Plan Requirements

Issue/Background: The Herriman City requires drainage plans as part of the approval process for all specific plans and large development projects as determined by the City's Public Works Director and City Engineer. The master drainage plan should consider cumulative regional drainage and flooding mitigation. The intent of a master drainage plan is to ensure that the overall rate of runoff from a project does not exceed pre-development levels. If necessary, this objective shall be achieved by incorporating run-off control measures to minimize peak flows and/or assistance in financing or otherwise implementing comprehensive drainage plans.
Other Alternatives: No action
Responsible Office: Herriman City Engineering Division and Herriman City Public Works Department

Priority (High, Medium, Low): Medium
Cost Estimate: Developer-based funding under specific plan requirements
Potential Funding: Developer-based funding under specific plan requirements
Benefits (avoided Losses): This will prevent the loss of human life and economic and property losses.
Schedule: Long term

Participate in the Emergency Watershed Protection program

As a result of fires in 2010 and 2012, Herriman participated in the Federal Emergency Watershed Protection program, constructing diversion channels, debris catchments and sediment basins that remain as storm water protection to homes in that area. Herriman would apply for the same resources for flood mitigation under similar future conditions.

Participate in the National Flood Insurance Program - NFIP

Flood plains within the city have been defined by the Federal Emergency Management Agency (FEMA) and these areas susceptible to flooding have been delineated on the Federal Insurance Rate Maps (FIRM). These maps are updated as development occurs and channel obstructions, culvert modifications, and other changes alter potential flood heights and flow velocities. As a participant in the NFIP, Herriman has defined restrictions for development in any of the special flood hazard areas.

Herriman City does not have any repetitive loss properties identified under the National Flood Insurance Program (NFIP)

The City's Community Development Director oversees enforcement of floodplain management requirements adopted by the City, including regulating new construction in Special Flood Hazard Areas (SFHAs); Floodplain identification and mapping, including any local requests for map updates; and Description of community assistance and monitoring activities.

6.1.6 Infestation

No specific mitigation measures in place.

6.1.7 Landslide

No mitigation measures specific to landslide hazard are defined or planned for.

6.1.8 Pandemic

No pandemic mitigation efforts are outlined beyond emergency response capabilities. The City Manager may choose to activate the EOC and use all means necessary to inform residents and business owners.

In partnership with local and state public health officials, other federal agencies, medical and public health professional associations, infectious disease experts from academia and clinical practice, and international and public service organizations, Herriman City will incorporate all reasonable strategies to educate its residents and prepare for a measured response in the instance of a public health emergency.

6.1.9 Severe Weather

Public Works weather response – equipment
Weather station information

6.1.10 Wildfire

Establish Firewise Community Program for Herriman

Issue/Background: The Herriman residential area located next to Camp Williams is a Wildland Interface Zone,and has a high potential for wildland fires. The City has worked with the community, Unified Fire Authority and the State of Utah to put a program in place to educate residents and measures to reduce wild land fires in the area.
Other Alternatives: No action
Responsible Office: Herriman City Emergency Preparedness, Herriman City Public Works, Unified Fire Authority and State of Utah
Priority (High, Medium, Low): High
Cost Estimate: $100,000 to $150,000
Potential Funding: $216,000 Grant from the State of Utah
Benefits (avoided Losses): This will prevent the loss of human life and economic and property losses.
Schedule: Now and Long term
Other Alternatives: No action

7 Plan Implementation & Maintenance

7.1 Implementation

Mitigation is most successful when it is incorporated into the day-to-day functions and priorities of government and development. Herriman City will utilize the information in the Hazards Mitigation Plan to prepare for future events and plan accordingly.

7.2 Maintenance Schedule

Periodic monitoring and updates of this Plan are required to ensure that the goals and objectives for the city are kept current and that local mitigation strategies are being carried out. This Plan has been designed to be user-friendly in terms of maintenance and implementation. This portion of the Plan outlines the procedures for completing revisions and updates. The Plan will also be revised to reflect lessons learned or to address specific hazard incidents arising out of a disaster as needed.

7.2.1 Integration of data, information, and mitigation goals and action plans:

Herriman will integrate mitigation strategies into its building codes, the planning commission, and the actions of the City Council and other relevant agencies by education by the Emergency Manager during daily, weekly, and monthly city and public meetings.

Annual Review Procedures

Herriman City will be responsible to annually review the mitigation strategies described in this Plan, as required by the Utah Division of Emergency Management (UDEM), or as situations dictate such as following a disaster declaration. The process will include the city organizing a Hazards Mitigation Planning committee comprised of individuals from organizations responsible to implement the described mitigation strategies. Progress toward the completion of the strategies will be assessed and revised as warranted. The city emergency manager will regularly monitor the Plan and is responsible to make revisions and updates.

Five Year Plan Review

The entire Mitigation Plan including any background studies and analysis shall be revised and updated as needed every five years by Herriman City to determine if there have been any significant changes in the city that would affect the Plan. Increased development, increased exposure to certain hazards, the development of new mitigation capabilities or techniques and

changes to Federal or State legislation are examples of changes that may affect the condition of the Plan.

7.3 Hazard Mitigation Plan Amendments

Herriman City will amend and update its Hazard Mitigation Plan as needed.

7.4 Maintenance Evaluation Process

It will be the responsibility of the designated Emergency Manager, City Manager, Mayor and City Council Members to ensure these actions are carried out no later than the target dates unless reasonable circumstances prevent their implementation (i.e. lack of funding availability).

Funding Sources

Although all mitigation techniques will likely save money by avoiding losses, many projects are costly to implement. Herriman City shall continue to seek outside funding assistance for mitigation projects in both the pre-disaster and post-disaster environment, subject to budget constraints and available funding sources.

Federal Programs

The following federal grant programs have been identified as funding sources which specifically target hazard mitigation projects:

Title: Pre-Disaster Mitigation Program
Agency: Federal Emergency Management Agency

Through the Disaster Mitigation Act of 2000, Congress approved the creation of a national program to provide a funding mechanism that is not dependent on a Presidential Disaster Declaration. The Pre-Disaster Mitigation (PDM) program provides funding to states and communities for cost-effective hazard mitigation activities that complement a comprehensive mitigation program and reduce injuries, loss of life, and damage and destruction of property.

The funding is based upon a 75% Federal share and 25% non-Federal share. The non-Federal match can be fully in-kind or cash, or a combination. Special accommodations will be made for “small and impoverished communities”, who will be eligible for 90% Federal share/10% non-Federal. FEMA provides PDM grants to states that, in turn, can provide sub-grants to local governments for accomplishing the following eligible mitigation activities:

- State and local Natural Hazard Pre-Disaster Mitigation Planning
- Technical assistance (e.g. risk assessments, project development)
- Mitigation Projects
- Acquisition or relocation of vulnerable properties
- Hazard retrofits

- Minor structural hazard control or protection projects
- Community outreach and education (up to 10% of State allocation)

Title: Flood Mitigation Assistance Program
Agency: Federal Emergency Management Agency

FEMA's Flood Mitigation Assistance program (FMA) provides funding to assist states and communities in implementing measures to reduce or eliminate the long-term risk of flood damage to buildings, manufactured homes and other structures insurable under the National Flood Insurance Program (NFIP). FMA was created as part of the National Flood Insurance Reform Act of 1994 (42 USC 4101) with the goal of reducing or eliminating claims under the NFIP.

FMA is a pre-disaster grant program, and is available to states on an annual basis. This funding is available for mitigation planning and implementation of mitigation measures only, and is based upon a 75% Federal share/25% non-Federal share. States administer the FMA program and are responsible for selecting projects for funding from the applications submitted by all communities within the state. The state then forwards selected applications to FEMA for an eligibility determination. Although individuals cannot apply directly for FMA funds, their local government may submit an application on their behalf.

Title: Hazard Mitigation Grant Program
Agency: Federal Emergency Management Agency

The Hazard Mitigation Grant Program (HMGP) was created in November 1988 through Section 404 of the Robert T. Stafford Disaster Relief and Emergency Assistant Act. The HMGP assists states and local communities in implementing long-term mitigation measures following a Presidential disaster declaration.

To meet these objectives, FEMA can fund up to 75% of the eligible costs of each project. The state or local cost-share match does not need to be cash; in-kind services or materials may also be used. With the passage of the Hazard Mitigation and Relocation Assistance Act of 1993, federal funding under the HMGP is now based on 15% of the federal funds spent on the Public and Individual Assistance programs (minus administrative expenses) for each disaster.

The HMGP can be used to fund projects to protect either public or private property, so long as the projects in question fit within the state and local governments overall mitigation strategy for the disaster area, and comply with program guidelines. Examples of projects that may be funded include the acquisition or relocation of structures from hazard-prone areas, the retrofitting of existing structures to protect them from future damages; and the development of state or local standards designed to protect buildings from future damages.

Eligibility for funding under the HMGP is limited to state and local governments, certain private nonprofit organizations or institutions that serve a public function, Indian tribes and authorized tribal organizations. These organizations must apply for HMPG project funding on behalf of their

citizens. In turn, applicants must work through their state, since the state is responsible for setting priorities for funding and administering the program.

Title: Public Assistance (Infrastructure) Program, Section 406
Agency: Federal Emergency Management Agency

FEMA's Public Assistance Program, through Section 406 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act, provides funding to local governments following a Presidential Disaster Declaration for mitigation measures in conjunction with the repair of damaged public facilities and infrastructure.

The mitigation measures must be related to eligible disaster related damages and must directly reduce the potential for future, similar disaster damages to the eligible facility. These opportunities usually present themselves during the repair/replacement efforts.

Proposed projects must be approved by FEMA prior to funding. They will be evaluated for cost effectiveness, technical feasibility and compliance with statutory, regulatory and executive order requirements. In addition, the evaluation must ensure that the mitigation measures do not negatively impact a facility's operation or risk from another hazard.

Public facilities are operated by state and local governments, Indian tribes or authorized tribal organizations and include:

- Roads, bridges & culverts
- Draining & irrigation channels
- Schools, city halls & other buildings
- Water, power & sanitary systems
- Airports & parks

Private nonprofit organizations are groups that own or operate facilities that provide services otherwise performed by a government agency and include, but are not limited to the following:

- Universities and other schools
- Hospitals & clinics
- Volunteer fire & ambulance
- Power cooperatives & other utilities
- Custodial care & retirement facilities
- Museums & community centers

Title: Small Business Administration (SBA) Disaster Assistance Program
Agency: U.S. SBA

The SBA Disaster Assistance Program provides low-interest loans to businesses following a Presidential disaster declaration. The loans target businesses to repair or replace uninsured disaster damages to property owned by the business, including real estate, machinery and

equipment, inventory and supplies. Businesses of any size are eligible, along with non-profit organizations.
SBA loans can be utilized by their recipients to incorporate mitigation techniques into the repair and restoration of their business.
Title: Community Development Block Grants
Agency: US Department of Housing and Urban Development

The Community Development Block Grant (CDBG) program provides grants to local governments for community and economic development projects that primarily benefit low- and moderate-income people. The CDBG program also provides grants for post-disaster hazard mitigation and recovery following a Presidential disaster declaration.

Funds can be used for activities such as acquisition, rehabilitation or reconstruction of damaged properties and facilities and for the redevelopment of disaster areas.

State Programs

Local

Local governments depend upon local property taxes as their primary source of revenue. These taxes are typically used to finance services that must be available and delivered on a routine and regular basis to the general public. If local budgets allow, these funds are used to match Federal or State grant programs when required for large-scale projects.

Non-Governmental

Another potential source of revenue for implementing local mitigation projects are monetary contributions from non-governmental organizations, such as private sector companies, churches, charities, community relief funds, the American Red Cross, hospitals, land trusts and other non-profit organizations.

Paramount to having a Plan deemed to be valid is its implementation. There is currently no new fiscal note attached to the implementation of this Plan.

7.5 Continued Public Involvement

Throughout the planning process, public involvement has been and will be critical to the development of the Hazard Mitigation Plan and its updates. The Plan will be available on the Herriman City website to provide opportunities for public participation and comment. The Plan will also be available for review at the offices of Herriman City.

Participation

All citizens of the region are encouraged to participate in the planning process, especially those who may reside within identified hazard areas. Adequate and timely notification to all area residents will be given as outlined above to all hearings, forums, and meetings.

Access to Information

Citizens, public jurisdictions, agencies and other interested parties will have the opportunity to receive information and submit comments on any aspect of the Natural Hazards Pre-Disaster Mitigation Plan.

Technical Assistance

Residents as well as local jurisdictions may request assistance in accessing the program and interpretation of mitigation projects.

Public Hearings and Meetings Concerning the Plan

Hearings and meeting concerning the plan will be conveniently timed for people who might benefit most from mitigation programs. Hearings and meeting will be accessible to people with disabilities (accommodations must be requested in advance according to previously established policy). Hearings and meeting will be adequately publicized. Hearings and meetings may be held for a number of purposes or functions including to: Identify and profile hazards, develop mitigation strategies, and review plan goals, performance and future plans.

Future Revisions

Future revisions of the Hazard Mitigation Plan shall include:

- Expanded vulnerability assessments to include flood and dam failure inundation.
- Continue the search for more specific mitigation actions.
- An analysis of progress of the Plan as it is revised.
- Expanded look into how the identified natural hazards will affect certain populations including the young and elderly.

Implementation and maintenance of the plan is critical to the overall success of hazard mitigation planning.

8 Hazard Mitigation Plan Adoption

It is the intent of Herriman City that this Hazard Mitigation Plan be adopted by resolution once approved by the State of Utah and FEMA, which approval should be within five years of the previous Hazard Mitigation Plan's approval date. This process will be documented through the Herriman City Recorder's office.

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CITY OF HOLLDAY HAZARD MITIGATION PLAN
March 31, 2015

WHEREAS, the Disaster Mitigation Act of 2000, Public Law 106-390, was enacted to establish a national disaster hazard mitigation program to reduce the loss of life and property, human suffering, economic disruption, and disaster assistance costs resulting from natural disasters, and to assist state, local and Indian tribal governments in implementing effective hazard mitigation measures designed to ensure the continuation of critical services and facilities after a natural disaster; and

WHEREAS, the Disaster Mitigation Act requires such governments to develop hazard mitigation plans to identify the natural hazards that could impact their jurisdictions, identify actions and activities to mitigate the effects of those hazards, and establish a coordinated process to implement such plans; and

WHEREAS, The City of Holladay (the "City") has been and continues to be committed to reducing the loss of life and property, alleviating human suffering and economic disruption, and controlling disaster assistance costs resulting from natural hazards and accelerating the City's recovery after the occurrence of any such hazards; and

WHEREAS, the Salt Lake County's Bureau of Emergency Management ("SLCo EM"), in coordination with governmental and non-governmental stakeholders having an interest in reducing the impact of natural hazards throughout the County and with input from the private sector and other members of the public, developed the Salt Lake County Multi-Jurisdictional Multi-Hazard Mitigation Plan, which identifies natural hazards that have the potential to occur in the City and establishes mitigation strategies to address these hazards; and

WHEREAS, such Salt Lake County Multi-Jurisdictional Multi-Hazard Mitigation Plan, has been approved by the Federal Emergency Management Agency ("FEMA") subject to adoption by the City;

NOW, THERFORE, by the power vested in me as the Mayor of The City of Holladay, it is hereby ordered:

Section 1. The Salt Lake County Multi-Jurisdictional Multi-Hazard Mitigation Plan developed by SLCo EM and approved by FEMA is hereby adopted as the City's hazard mitigation plan pursuant to the Disaster Mitigation Act.

2. SLCo EM shall be the agency responsible for monitoring, evaluating and updating the Salt Lake County Multi-Jurisdictional Multi-Hazard Mitigation Plan in accordance with the Disaster Mitigation Act.

3. All agencies shall provide such assistance and cooperation as may be necessary or appropriate to implement the provisions of the Salt Lake County Multi-Jurisdictional Multi-Hazard Mitigation Plan and carry out the City's responsibilities under the Disaster Mitigation Act.

4. This Order shall take effect immediately.

Randy Fitts, City Manager

Hazard Mitigation Plan (2014)

ANNEX F: CITY OF HOLLADAY
1 Introduction

1.1 Community Profile

Nestled at the base of the foothills of the Wasatch Range, Holladay has the feeling of being tucked away like a mountain town, with views of the Salt Lake Valley in every direction. With the natural, mountain environment and close access to Salt Lake City and numerous recreational areas, Holladay offers its residents a country atmosphere full of recreational opportunities with close proximity to all the amenities of a big city.

Bordered by 3900 South, I-215, and Highland Drive, the city encompasses over 5 square miles with approximately half of the area residential and less than one-tenth of the area commercial use. Only an approximate 15% of Holladay is presently classified as vacant land. The intent of the General Plan is to maintain the rural integrity of The City of Holladay and promote an economically healthy and functional city that allows for responsible growth. The existing conditions and the history of Holladay should be taken into consideration. The residents of Holladay love their city and want to maintain a small walkable community with friendly neighbors in a safe and clean environment. By incorporating the history, current Land Use, anticipated future growth, and the input of the residents, Holladay will set precedence in maintaining its identity.

1.2 Purpose

The purpose of this plan is to enumerate hazards that could affect the City of Holladay, describe mitigation strategies for each of those hazards, and provide a framework for revision of hazard mitigation strategies. This document was created by City of Holladay staff with significant guidance from Salt Lake County Emergency Management staff, and it is based on guidelines for local hazard mitigation strategies prescribed by the Federal Emergency Management Agency (FEMA). This plan will be submitted alongside similar documents from other municipalities in Salt Lake County to the State of Utah, which will submit all county documents to FEMA. Completing a pre-hazard mitigation plan allows Salt Lake County as well as local jurisdictions to receive financial disaster assistance from the federal government.

Holladay City border on a relief map produced by Holladay GIS staff (view is facing east; I-15 shown in red)

1.3 Authority and Reference

The City adopted the council-manager form of government established in the Optional Forms of Municipal Government Act (U.C.A. §10-3-1201, et seq.) pursuant to a special election held on August 4, 2003, effective January 5, 2004.

The current City Council is composed of five members whom represent districts and a Mayor who are elected by all Holladay voters. Each Council representative's term of office is four years. Terms are staggered, with three being elected at one time while two are elected two years later and at the same time as the Mayor.

2 Community Profile

2.1 Geography, Environment & Climate

The City of Holladay is bounded South by I-215, on the west by Highland Drive to Van Winkle Expressway, Van Winkle Expressway to 1300 East, 1300 East to Murray-Holladay Road, Murray-Holladay Road, east to Highland Drive, Highland Drive north to 3900 South, 3900 South east to 2700 east, 2700 East south to 4430 South, east to Wasatch Blvd, south on Wasatch Blvd. to about 6710 South, west to Big Cottonwood Canyon Road and about 3000 East, west to I-215. The boundary east of Wasatch Blvd. at approximately 66th South to take in the Heughes Canyon area, which otherwise would have been isolated and landlocked.

Figure 1 displays a map showing the location of Holladay City within Salt Lake County and the State of Utah.

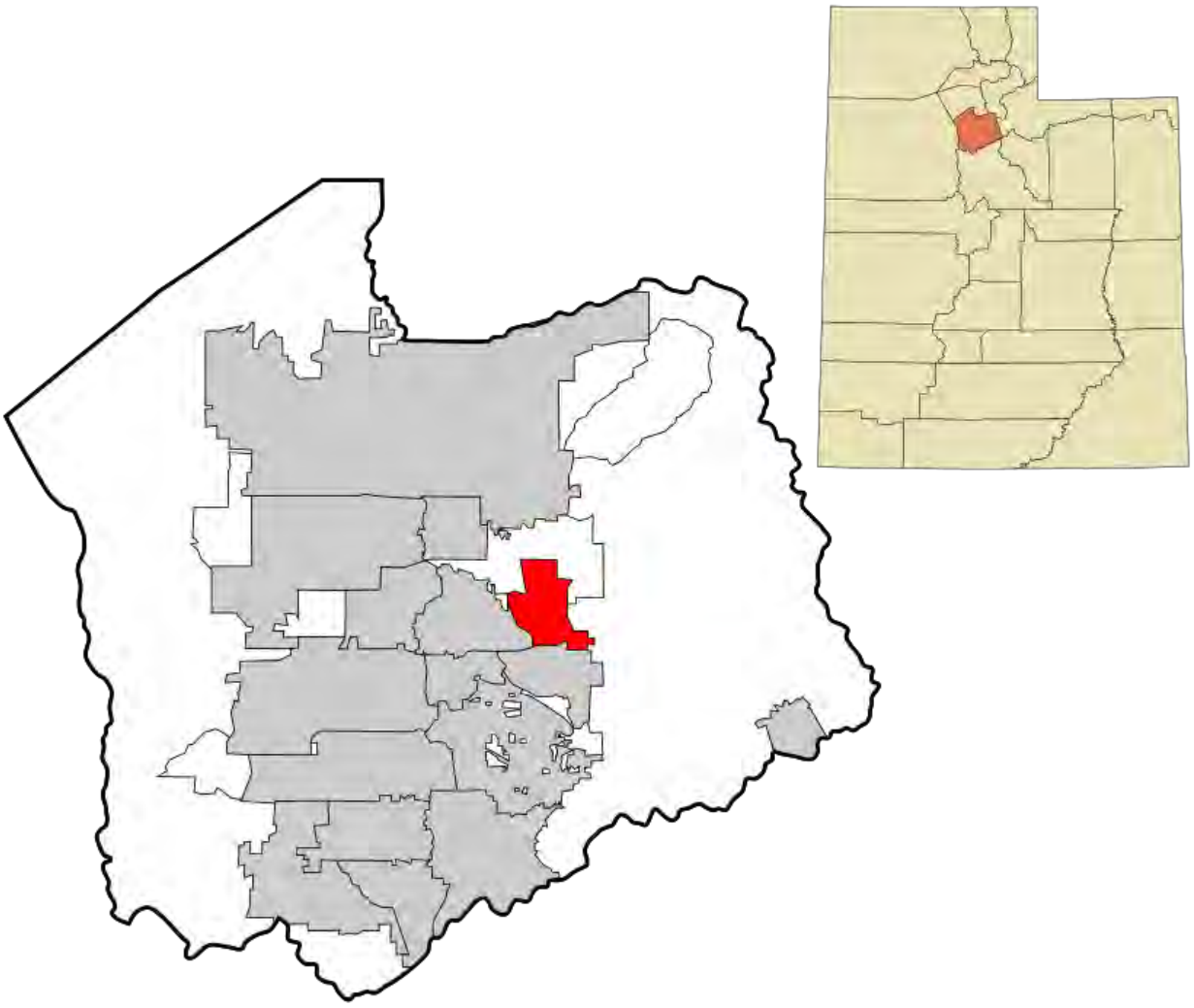
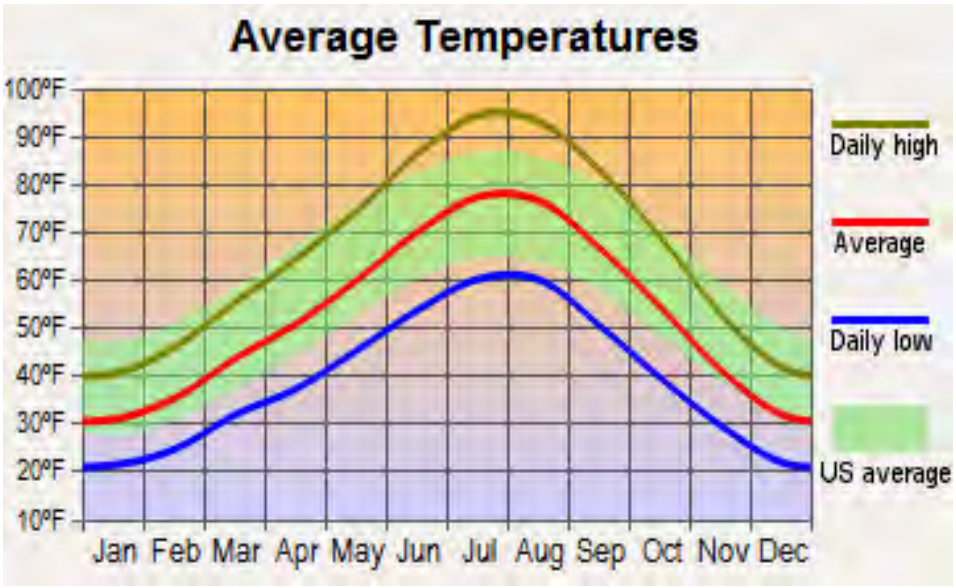


Figure 1. The City of Holladay



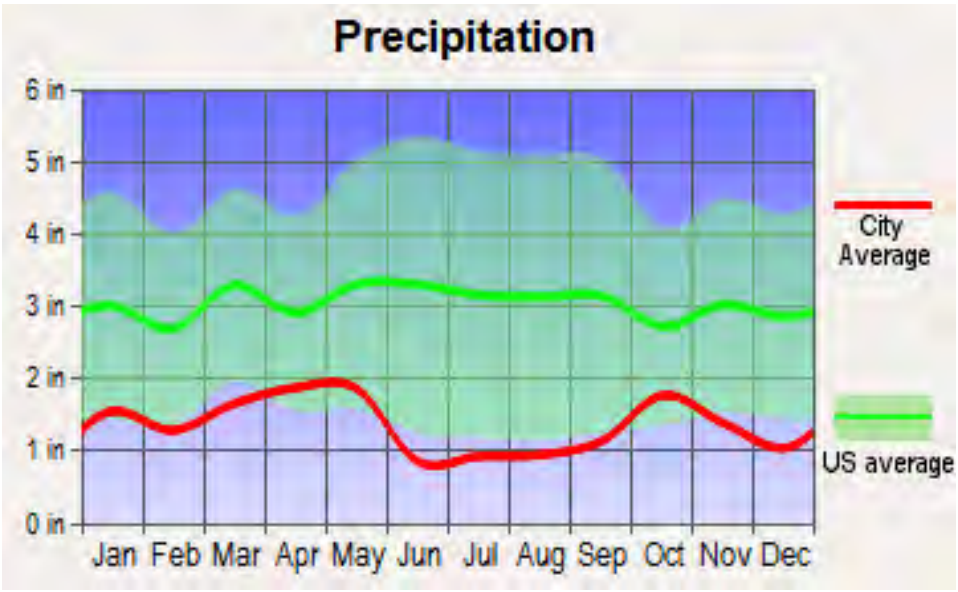


Figure 2. The City of Holladay's Average Temperatures and Precipitation

2.2 Community Facts and History

On July 29, 1847 a group of pioneers known as the Mississippi Company, led by John Holladay, entered the Salt Lake Valley. Within weeks after their arrival, they discovered a free flowing, spring fed stream, which they called Spring Creek (near Kentucky Avenue). While most of the group returned to the Fort in Great Salt Lake for the winter, two or three men built dugouts along this stream and wintered over. Thus, this became the first village established away from Great Salt Lake City itself. In the spring, a number of families hurried out to build homes and tame the land. There were numerous springs and ponds here and grasses and wild flowers were abundant, making this a most desirable area for settlement. When John Holladay was named as a branch

president for the Church of Jesus Christ of Latter-day Saints, the village took upon itself the name of Holladay's Settlement or Holladay's Burgh.

As homes were built, commercial ventures developed, first at the intersection of Highland Drive and Murray-Holladay Road, with David Brinton's Mercantile Co-op and Brinton-Gunderson's Blacksmith Shop. As the community grew, businesses tended to move east of the intersection of Holladay Boulevard and Murray-Holladay Road, where more of the residents lived. Neilson's Store and Harper-Bowthorpe Blacksmith Shop were popular and well-frequented businesses for many years. Favorable conditions for agriculture, orchards and businesses allowed for continued growth over the years.

The Holladay and Cottonwood communities were unincorporated areas of Salt Lake County and about 24 years ago efforts were made by a dedicated group of citizens to incorporate as a separate entity, but area citizens voted against incorporation by a narrow margin. Salt Lake County, the Utah Supreme Court and/or the Utah State Legislature frustrated subsequent efforts and citizens weren't allowed another incorporation vote until May 4, 1999. On that day, a better-informed and smaller citizenry voted by over 83% to approve incorporation and the City of Holladay was officially incorporated on November 30, 1999.

Residents overwhelmingly supported incorporation because of a profound desire to gain control of local planning and zoning. General Plan meetings were attended by a large number of enthusiastic Holladay residents, all excited to finally have a voice in the future of our community. A vast majority – if not all – of those attending wanted Holladay to maintain and even improve its rural atmosphere. Suggestions included:

- Make the central Holladay business area more pedestrian friendly
- Create biking and walking trails through the community
- Curtail downsizing of building lots
- Preserve and increase trees and other vegetation
- Require large parking areas to include landscaping

Subsequently an area north and east of the original boundaries of Holladay were annexed into the City in October of 2002.

2.3 Population and Demographics

POPULATION (*Source: U.S Census Bureau, Census 2010*)
The current population of the City of Holladay is **26,472**
SEX
Male 47.6%
Female 52.4%
Average Household size - 2.61
Average Family size - 3.22
Total households - 10,143
Family households - 6,755
Total housing units - 10,537
Total occupied units - 9,927

owner occupied - 7,306
renter occupied - 2,621

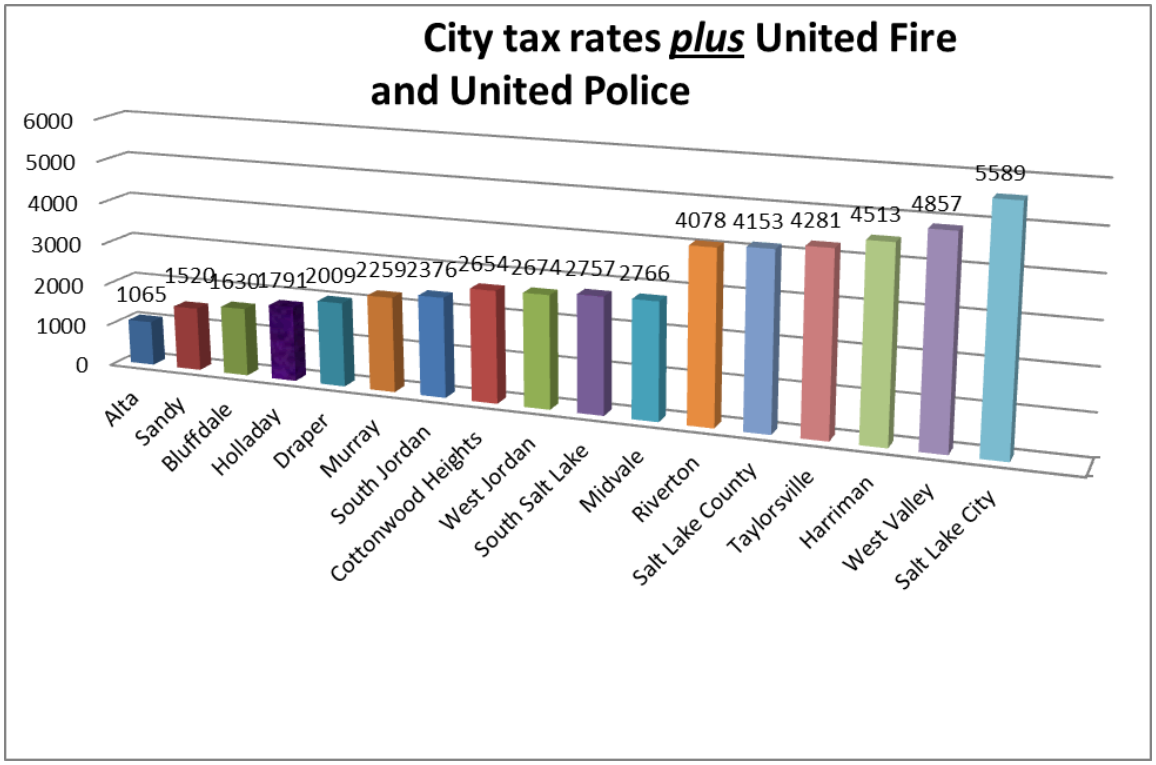
2.4 Economy

History of Holladay Property Tax Rates

Each year the State calculates the certified tax rate for each municipality, which is the tax rate necessary to generate the same amount of property tax revenue as the municipality received the previous year. Since property values change each year, the certified property tax rates in every city also fluctuate slightly each year. A property tax increase occurs when a city chooses to increase the property tax beyond the amount of the certified tax rate.

Comparative Property Tax Rates

Holladay's property tax rate (.001791 for fiscal year 20012-2013) is considerably lower than that of most other municipalities located within Salt Lake County

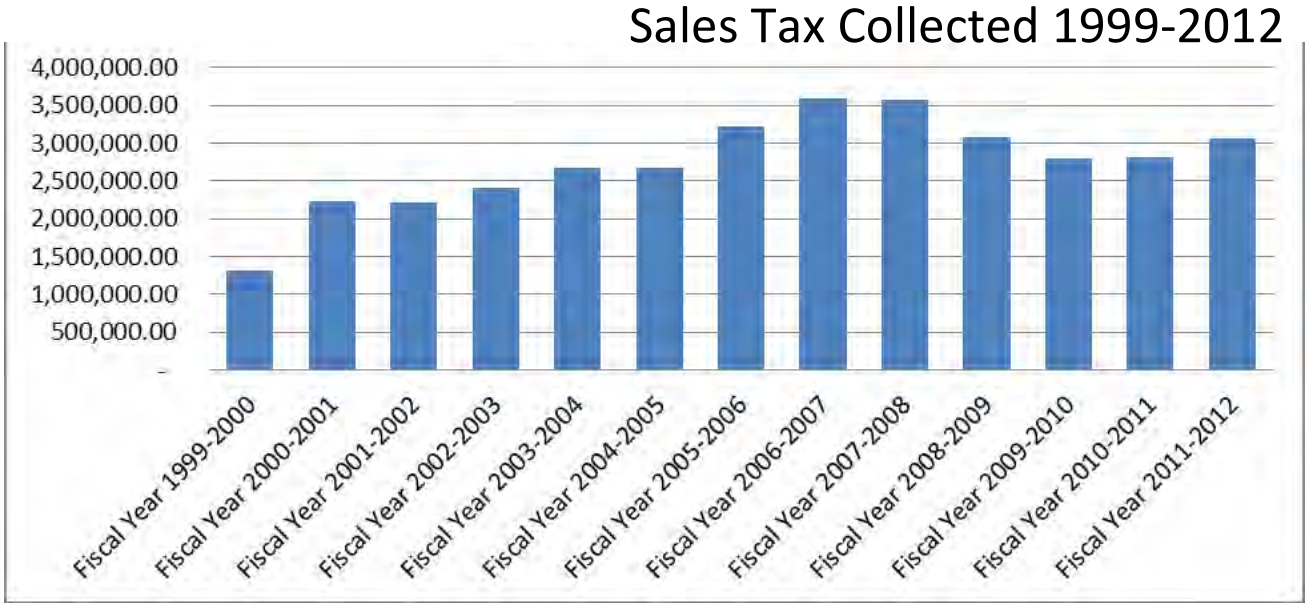


Holladay's Municipal Energy Tax

In 2008 Holladay adopted a municipal energy tax dedicated to pay for road repairs. The tax is a 6% surcharge added onto our monthly electricity and natural gas bills. Most cities in Salt Lake County have also adopted this tax. In fiscal year 2011-2012, that energy tax generated $1.453 million. By comparison, in fiscal year 2011-2012 the Holladay City property tax generated $3.888 million. Extrapolating from these numbers, if the energy tax were added to the city property tax, it would represent a 37% increase, resulting in a net tax rate of approximately .002453 (slightly higher than South Jordan and lower than Cottonwood Heights).

Holladay Sales Tax

Holladay's sales taxes have fluctuated in response to general economic conditions. City sales tax reached its peak in fiscal year 2006-2007 at $3.596 million, but then dropped to $2.790 million (a decrease of 22%) with the downturn in the global economy combined with the loss of the Cottonwood Mall. Virtually all other municipalities also experienced a similar decrease in sales tax. Recently sales taxes have begun again to increase. City sales tax receipts for fiscal year 2011-2012 were $3.054 million.



Holladay Debt

Holladay has excellent credit and a AA bond rating. The City currently has three bond debts. Bonds are used to fund large capital projects, similar to a person taking out a mortgage rather than paying all cash for a home.

2.5 Growth and Development Trends

Ask any Holladay resident and they will tell you the quality of life in the city is second to none in the state, but now they have some data to back them up. Holladay City was recently named the number one “City on the Rise” in Utah by Nerdwallet.com, a personal finance website which is branded as helping consumers make money decisions. Using data collection regarding population, employment and income growth data, Holladay came out on top.

“I found the results surprising,” Holladay Mayor Dahle said. “There was a huge growth in median income which is really driving the whole ranking.”

The increase in median income for full-time workers in Holladay went from $40,640 in 2009 to $53,444 in 2012. The 31.5 percent increase put Holladay at the top of the charts. The working age population growth was only a slight increase of 2.3 percent, and the employment growth was actually in the negative at 1.3 percent.

Dahle attributed the vast income growth to a couple of things. First, he said, there is more wealth in Holladay with retired residents and their investment portfolios. As the economy turned around after 2008, many Holladay residents may have seen a large increase with their investments. Secondly, he suspected that many new Utah residents relocating from other states have chosen to live in Holladay, even though they may work elsewhere.

"Along the Wasatch Front, there is a high growth rate in the tech area and financial services. I certainly think Holladay is a draw for that demographic," Dahle said. "Holladay is on the rise. It is growing. There are now active pockets that were not vibrant that are now developing out and creating a positive energy in the city."
Cottonwood-Holladay Journal 2014

Development trends:

Millrock Economic Development Area (EDA) Bond.

The City has a $8.474 million bond which helped reimburse the Developer to improve the retaining walls and water and sewer lines along the Lion Lane connection to Millrock and to help for the purchase of the Knudsen Park property. The Lion Lane extension allowed Phases III and IV of Millrock Technology Park to be completed prior to the real estate crash in 2008. The bond has a 15-year term, which will be paid off in December 2020. The annual debt payment is $639,000. The entire amount of this debt is paid from the property tax increment generated from the Millrock EDA. (In other words, the EDA Project pays for itself. Without this bond, only Phases I and II would exist today.)

Road Bond

The City has a $9 million bond for road repairs with a 10-year term, which will be paid off in 2018. The annual debt payment on this bond is $1.021 million. The entire amount of this debt is paid from the proceeds of the municipal energy tax.

City Hall and Fire Station Bond

The City has a $9.2 million bond debt from the purchase and remodeling of City Hall (the old Holladay Elementary School) and the construction of a new fire station. It is a 20-year bond, which will be paid off in 2031. The annual debt payment is $627,000. That debt is paid from the City's General Fund.

Impact of the Cottonwood Mall Redevelopment

The redevelopment project has had little impact upon the City's property tax receipts, because of the multi-million dollar investment in infrastructure has increased the assessed value of the land. The old mall was over 40 years old and fully depreciated. Thus, the City is still receiving about the same amount of property tax from the Cottonwood Mall as it did in 2007. As to sales tax, the City has clearly seen a decrease in the amount of sales tax, but it is difficult to determine how much of that decrease was due to the redevelopment of the Cottonwood Mall, and how much was due to the global economic downturn that occurred at the very same time. Macy's Department Store continues to be a major generator of sales tax revenues. City sales tax receipts are still down about 15% from what they were in at the peak in 2007, but the City has always had a balanced budget, and we are seeing a steady increase in sales tax receipts.

2.6 Data Sources and Limitations

Holladay City utilized the following sources to provide data for this report:

- Holladay City GIS

- Holladay City Community Development
- Holladay City General Plan
- Salt Lake County
- State of Utah
- US Census Bureau
- National Weather Service

3 Planning Process

3.1 Update Process and Participation Summary

City of Holladay plans to make updates to this Hazard Mitigation Plan and defines the processes by which continued public participation will be guaranteed in the sections below.

3.1.1 Preparation of the plan – the planning process

The Holladay Hazard Mitigation Update was produced over 2 years by taking the previous Wasatch Front Hazard Mitigation Plan from 2009 and reviewing what was promised by Holladay. What the mitigation priorities were and how they have changed. The plan was produced with cooperation of the County Hazard Mitigation Specialist and in cooperation with the best practices of other jurisdiction that were shared at the many meetings that were held over the two years. Although David Chisholm, the Holladay Emergency Management was the main contact the plan was completed with the cooperation of the entire Holladay City Staff, the Public, and other agencies listed throughout this and the County's documents.

3.2 The Planning Team

Members of the City of Holladay Mitigation Planning Team are listed in the table below.

Randy Fitts	Holladay City Manager/Emergency Manager
David Chisholm	City Emergency Management team member
Paul Allred	Community Development Director
Clarence Kemp	Chief Building Official
Pat Hansen	Community Development department
Jon Teerlink	GIS Manager
Tosh Kano	Public Works Director

Members of the Salt Lake County Mitigation Planning Team are listed in the table below.

Kate Smith	Salt Lake County Emergency Management, Mitigation Planner
Cathy Bodily	Salt Lake County Emergency Management, Grant applicant and Planner
Roger Kehr	Salt Lake County Emergency Management, Mitigation Planner
Steve Sautter	Salt Lake County Emergency Management, Public Outreach
Matt Morrison	Salt Lake County Emergency Management, Planner
Bret Fossum	Salt Lake County Emergency Management, Mitigation Planner
Val Greensides	Unified Fire Authority, administrative support
Joan Welch	Unified Fire Authority, administrative support
Clint Mecham	Unified Fire Authority

Aaron Nelson	Unified Fire Authority
Dirk Andersen	Taylorsville City
Mike Barrett	Salt Lake County Emergency Services
Brent Beardall	Salt Lake County Flood Control
Leon Berrett	Salt Lake County
Dawn Black	Cottonwood Heights
David Chisholm	City of Holladay
Eldon Farnsworth	South Salt Lake City
Bob Fitzgerald	West Valley City
Sheril Garn	Riverton City
Tina Giles	Herriman City
Jeff Graviet	Salt Lake County Emergency Services
Jon Harris	Murray City
Matt Jarman	South Jordan City
Connie Jones	Bluffdale City
Scott Jones	Salt Lake Community College
Jeff King	Jordan Valley Water Conservancy District
Ken Kraudy	Holladay City
Bart LeCheminant	Draper City
Dustin Lewis	South Jordan City
Cory Lyman	Salt Lake City
Kade Moncur	Salt Lake County Flood Control
Reed Scharman	West Jordan City
Lisa Schwartz	Taylorsville City/Midvale City
Marty Shaub	University of Utah
Garth Smith	Draper City
Jared Smith	Holladay City
Justin Stoker	Salt Lake City Flood Control
Claire Woodman	City of Holladay

3.3 Public Meetings, Agency meetings, & Documentation

The Mitigation Planning document was discussed in a public Citizen Corps Council Meeting where the general public is invited to attend. The meeting was held on November 6, 2014.

Year	Date	Activity	Purpose
2012	September	Utah Division of Emergency Management designates Salt Lake County Emergency Management/Unified Fire Authority as sub-grantees of the	

Year	Date	Activity	Purpose
		state to revise the Pre Disaster Mitigation Plan.	
	August 7	Memorandum of Understanding	An MOU was signed by participating jurisdictions committing to participate in the planning process.
	September-October	Phone conferences with UDEM and FEMA Region VIII to discuss the planning process, Risk MAP.	Identified planning team and available resources.
	November 7	Risk MAP Discovery, Mitigation Kickoff	Kick-off to introduce RiskMAP and Mitigation projects to reduce risk from natural hazards and increase disaster resiliency in the Jordan River Watershed/Salt Lake County
	November-December	Identifying Planning Team Members	Establish a contact person from each jurisdiction to participate in the planning process.
	December		Meeting with Salt Lake County Emergency Services to discuss cooperation with other county agencies and participation in mitigation planning process.
2013	January-May	Gather information.	Data collection.
	January 22	Mitigation Planning Team Meeting	Introduce project scope, identified team responsibilities, key terminology, requirements of the planning process, timeline.
	February 11	Mitigation Planning Team Meeting	Review of hazard maps for earthquake, landslide, and dam failure. Worksheets to gather information of areas of concern. Subject matter experts available to answer questions.
	February 27	Sandy City BCDM (Business Continuity Development Meeting)	Outreach effort, presentation/overview of mitigation plan to Sandy City business partners and emergency managers
	March 7	Salt Lake County Council of Government (COG)	Outreach presentation to elected officials to give overview of mitigation planning project.
	March 11	Mitigation Planning Team Meeting	Discussion with subject matter experts on severe weather and

Year	Date	Activity	Purpose
			wildfire.
	April 8	Mitigation Planning Team Meeting	Presentation on pandemic flu and wildfire public education programs.
	May 16	Mitigation Planning Team, Risk MAP Joint Meeting	Presentation of flood and earthquake risk analysis from FEMA Region VIII, presentation from UDEM regarding community Risk MAP meetings to be held over summer, Mitigation team given Capabilities Assessment worksheets and hazard matrix.
	June-Aug	Community Risk MAP Meetings and Work on Worksheets	Risk MAP representatives met with individual communities to discuss flood study needs and areas of concern.
	Sept 11	Mitigation Team Meeting	Recap of Capabilities Assessment, preparing for next stages of plan.
	Oct 21	Salt Lake County Emergency Manager's meeting	Planner reported on mitigation plan progress to emergency managers. Encouraged completion of capabilities assessment worksheets. Provided copy of 2009 mitigation strategies to review and comment on progress.
	Oct-Nov	Risk Assessment Draft and Mitigation Strategies Preparation	Planner reviewed and summarized Capabilities Assessment and Hazard worksheets. Continued Revising Risk Assessment. Summarized responses to 2009 Strategies Review.
	Nov. 19	Mitigation Planning Team Meeting-Mitigation Strategies Part II	Brainstorming meeting to begin identifying possible mitigation strategies. Hazards discussed were flood, wildfire, earthquake, and avalanche. Rough draft of Risk Assessment made available.
	Nov. 20	Planner meeting with SHMO regarding plan progress	Discussed timeline and planning progress
	December	Reviewed Mitigation Strategies.	Planner compiled notes from mitigation strategies brainstorm meeting and worksheets

Year	Date	Activity	Purpose
2014	Jan 14	Mitigation Planning Team Meeting – Mitigation Strategies Part II	Brainstorming meeting to begin identifying possible mitigation strategies. Hazards discussed were earthquake, pandemic, dams, canals, and drought.
	Feb-Mar	Mitigation Strategies Draft, Update Wildfire Risk Assessment.	Planner compiled notes from mitigation strategies brainstorm sessions, continued revision of Risk Assessment as new data became available for Wildfire.
	Apr-June	Mitigation Strategies Review	Create timeline to meet Grant requirements. Complete all elements of Plan.
	June	Review Best Practices SOG for Mitigation	Find a better system for Mitigation planning. Permission to use Salt Lake County's Mitigation SOG
	July 1	Review Progress with EM staff	Prepare Plan for submission to state and FEMA review boards
	July 14	Mitigation Planning Team Prioritization Workshop	Planning Team reviews final mitigation strategies to assign responsibility, estimate costs, and define priority
	August 8	Emergency Managers Meeting HMP explanation and scheduling	Have each individual Jurisdiction complete their plan.
	September 8-24	Emergency Managers Meeting HMP scheduling	Continue one-on-one meetings with each Jurisdiction to complete plan
	October 7	Submit final plan from each Jurisdiction	Salt Lake County to review Jurisdiction plans and assemble entire County HMP
	October 15	Submit Mitigation Plan to State	State Submission requirement prior to FEMA submission
	November 1	State returns Mitigation Plan for submission to FEMA	Submit Final Plan to FEMA for approval
	November 15	FEMA returns plan for corrections	Correct deficiencies
	November 20	Submit Final Plan to FEMA	Plan complete

Table 3-8 Planning Process Timeline

3.3.1 Other Agencies involved in the planning process

As shown in the calendar and in the list below there was ample opportunity for participation in the plan by neighboring communities, agencies who specialize in hazard mitigation, and agencies that are involved with new development in Holladay.

Team Support
Kevin Barjenbruch, National Weather Service
Justin Stoker, Jordan River Commission
Steve Bowman, Utah Geological Survey
Greg McDonald, Utah Geological Survey
Tyre Holfeltz, FFSL
Jeff King, Jordan Valley Water Conservancy District
Steve Bowman, Utah Geological Survey
Jessica Castleton, Utah Geological Survey
Tyre Holfeltz, Utah Forestry, Fire and State Lands
Riley Pilgrim, Unified Fire Authority
Dave Marble, Utah Division of Dam Safety
Brad Bartholomew, Utah Division of Emergency Management
Katie LeLaCheur, Utah DEM
Eric Martineau, Utah DEM
Amisha Lester, Utah DEM
John Crofts, Utah DEM
Julie Baxter, FEMA Region VIII
Shelby Hudson, FEMA Region VIII
Sean McNabb, FEMA Region VIII

3.4 Multi-Jurisdictional Planning

Holladay City has been in contact with Salt Lake County and representatives from the county attended the meeting that was held on September 8, 2014 with key members of Holladay City. The City's designated Emergency Manager has attended the monthly Salt Lake County Emergency Manager's meetings where information has been dispersed regarding the Mitigation Planning Process. Some of the information from Salt Lake County's plan has been included in this plan.

3.5 Incorporation of existing plans and technical information

The Holladay plan relied heavily on technical information provided by the County and the Federal government in working on hazards to mitigate. The Flood Map and Risk Map processes were used extensively to document areas at risk. The Holladay Building department and code enforcement departments have incorporated this data into codes to insure that new development is not placed in areas with unacceptable hazard potential.

3.6 Plan review, Evaluation, and Implementation

- The plan was revised to reflect changes in development since the 2009 Wasatch Front Plan
- The mitigation strategies have changed as those of 2009 have been accomplished.

3.6.1 2009 Wasatch Front Hazard Mitigation Plan suggested future mitigation activities

City of Holladay

Hazard: Dam Failure

The City of Holladay does not have any dams or debris ponds in the City. There are three small dams in Big Cottonwood Canyon that deliver water to the Big Cottonwood Creek that's flows through the City and also a debris basin on the creek just outside of the City in Cottonwood Heights. These three dams and one debris pond are the responsibility Salt Lake County Flood Control and the City does not have any responsibility for them.

Hazard: Drought

The City of Holladay has very little agricultural or irrigation. The agricultural in the City is mostly for hobby purposes and the irrigation supports this hobby.
Problem Identification: Salt Lake County is currently in the fifth year of drought conditions. Measures must be taken to conserve and address water shortages for both culinary and agricultural use.

Goal 1: Reduce hardships associated with water shortages.

Objective 1.1: Priority HIGH, Limit unnecessary consumption of water throughout the City.
Action: Continue to encourage water conservation utilizing and promoting Jordan Valley Water Conservation outreach material, information from Salt Lake City Department of Public Utilities and the State of Utah's "Slow the Flow" program.
Status: Ongoing.
Objective 1.2: Priority MEDIUM. Most of the south end of the city has been converted from flood irrigation to pressurized irrigation to save water and the other areas of the City that still have flood irrigation are being encourage to convert to pressurized systems. There is not a secondary irrigation system available in this area of the valley.

Goal 2: Reduce the amount of fuels that can impact residential homes in urban wildland interface areas.

Objective 2.1: Priority HIGH, Study the areas and determine which fire resistant natural vegetation can be used in these areas of concern.
Action: Develop outreach document specific to fire resistant natural vegetation.
Status: Ongoing.

Hazard: Earthquake

Problem Identification: Some geologic hazards exist in the City of Holladay and surrounding area, which can constrain land use. Active fault zones pose the threat of earthquakes, while steep mountains adjacent to the City create a potential for landslides, debris flows, rock falls, and snow avalanches. Limited communication or lack of communication capabilities is always a shortfall during an emergency.

Goal 1: Increase and harden emergency and non-emergency communication systems.

Objective 1.1: Priority HIGH, Provide redundancies in communication systems.
Action: Assess current communications and interoperable emergency/warning systems.
Status: Ongoing. Valley Emergency Communications Center (VECC) has been working with cities in the county to update communications, focusing on specific systems, which has included some or all of the following capabilities:

- Radio system updated for 800 MHz, Ultra-High Frequency (UHF), Very High Frequency (VHF) and Amateur frequencies.
- Agency listing with gateway devices, which enable disparate communications systems to link.
- VECC paging server capability to text message multiple units/personnel.
- Listing of Public Safety Satellite telephones in the County.
- VECC Dialogic Emergency Notification System, a reverse 911 system used to notify public or for notification of response agencies.
- Promoting narrow banding compliance prior to 2013 deadline.

Objective 1.2: Priority HIGH Ensure adequate coordination of disaster response and recovery activities.
Action: Assess EOC's (countywide).
Status: Completed

Goal 2: The City of Holladay is part of the countywide earthquake loss reduction and safety education programs.

Objective 2.1: Priority MEDIUM. Provide information on earthquake potential effects to homeowners and developers.
Action: Update current earthquake maps (liquefaction and fault) and incorporated into the County GIS system. The City of Holladay has access to the County GIS system.
Status: Accomplished. The information was updated by the Utah Geological Survey and provided to the City. Portions are available in the Statewide Geographic Database rather than on County GIS. The Central Utah Water Conservancy District has developed GIS based maps of the Red Butte Dam area in northeastern Salt Lake County that identifies earthquake hazards from ground shaking (peak ground acceleration), fault rupture, liquefaction, and landslides for both the 500 year and 2,500 year seismic events.

Objective 2.2: Priority HIGH. Improve public education regarding earthquake risks and train Community Emergency Response Teams to improve quality of public response to an earthquake.
Action: Ensure current natural hazard ordinance(s) are online, linked to Emergency Services website, and easily accessible and can be download. Provide personal, CERT and amateur radio training for the citizens of the City.
Status: Ongoing. The City of Holladay ordinances are available online and can be downloaded.

Hazard: Flooding

Problem Identification: Although located in a semi-arid region, The City of Holladay is subject to cloudburst and snowmelt floods.

Goal 1: Protection of life and property before, during, and after a flooding event.

Objective 1.1: Priority MEDIUM. Encourage participation in the National Flood Insurance Program
Action: The City of Holladay is participating in NFIP (National Flood Insurance Program).
Status: Ongoing by assist residents in the City to participates in the NFIP.

Objective 1.2: Priority MEDIUM Provide current FIRMs for emergency planners.
Action: Update & digitize floodplain maps.
Status: Ongoing.

Goal 2: Reduce threat of unstable canals throughout the City.

Objective 2.1: Priority MEDIUM, Identify Citywide canal systems.
Action: Map and assess for structural integrity canal systems in the City.
Status: Completed.

Objective 2.2: Priority LOW, Identify dry dams/reservoirs that may have the potential for failure.
Action: No action.
Status: Not Relevant.

Hazard: Landslide

Problem Identification: Slope instability has not been a major problem in the Salt Lake area, but as development moves higher into the foothills and nearby canyons slope stability is becoming a major issue affecting future development.

Goal 1: Reduce or eliminate the threat of landslide damage.

Objective 1.1: Priority MEDIUM. Reduce the threat of landslides/debris flow following wild fires.
Action: Develop protocol for working with State and Federal agencies in developing impact of post fire debris flow hazard.
Status: Ongoing.
Objective 1.2: Priority MEDIUM Monitor historical landslide areas.

Action: There are no historical landslide areas in the City.
Status: Completed.

Objective 2.2: Priority MEDIUM, Improve public awareness regarding high-risk landslide areas.
Action: Have landslide maps readily available on line through County EM website.
Status: There are no historical or current landslide areas in the City.

Hazard: Severe Weather

Problem Identification: Snowstorms over northern Utah have a dramatic effect on regional commerce, transportation, and daily activity and are a major forecast challenge for local meteorologists.

Goal 1: Reduce the threat of life loss due to severe weather.

Objective 1.1: Priority LOW. Become National Weather Service (NWS) "Storm Ready Community".
Action: Contact NWS/SLC Office and begin process of becoming a Storm Ready Community.
Status: Accomplished. The City of Holladay participates in the Storm Ready Community program. The City qualifies as participating by contracting with unincorporated Salt Lake County as part of their program.

Objective 1.2: Priority LOW. Improve response times to severe weather alerts.
Action: Incorporate NWS on light boards on the I-215 freeway system. Alerts on Radio, Television, Cell phone, and on schools, City, home weather stations
Status: Accomplished. The NWS, national weather system and the Utah Department of Transportation cooperate to provide this information.

Objective 2.1: Priority LOW. Address Citywide needs of special populations that may be impacted by severe weather conditions.
Action: Create outreach materials (what to do when severe weather strikes) specific to this group and insert the information the into City-wide newspaper, and phone books specific to 55+ age group developed by County Aging services.
Status: Ongoing. The City of Holladay is part of Unincorporated Salt Lake County outreach program with materials for severe weather mitigation planning.
Action: Encourage avalanche preparedness for backcountry users.
Status: Accomplished. The City of Holladay does not have avalanches.
Objective 2.2: Priority MEDIUM. , Prevent damage to critical facilities from Lighting.
Action: Assess public property to ensure they are grounded for lightning, to include buildings with towers, etc.
Status: Ongoing. The City's structures have surge protected and are grounded. All new structures will be built to then current standards

Hazard: Wildfire

Problem Identification: Utah's typical fire season is the dry period from May through October. Lightning causes the largest numbers of wildfires. In 1990 Salt Lake County created a wildland

program shortly after a wildland fire threatened Emigration Canyon, a major urban interface area at the county's eastern boundaries.

Goal 1: Wildfire community education.

Objective 1.1: Priority HIGH. Reduce overall risk from wild fire through education programs.
Action: Public awareness through "Fire Wise" programs.
Status: Ongoing. This objective has been partially accomplished by the development and implementation of the Regional Wildfire Protection Plan that the County participated in. The City of Holladay is part of the Unified Fire Authority in Salt Lake County and is included in the "Fire Wise" planning process.

Objective 1.2: Priority HIGH. Educate homeowners on the need to create open space free of burnable fuels near structures in urban wild land areas.
Action: Create defensible space.
Status: Ongoing. The Regional Wildfire Protection Plan has been a catalyst for the City of Holladay's building ordnances in these areas and encourages the creation of a defensible space on all properties next to wildlands.

4.1 Historical Hazard Events

The following are recent hazard events that have impacted Holladay City:

- Some Spring Flooding along Big Cottonwood Creek 2011

4.2 Hazard Analysis

Please refer to the County HMP Plan for a general description of hazards that affect Holladay. The following hazards ARE expected to occur sometime in the future:

- Earthquake
- Flood
- Infestation
- Pandemic
- Radon
- Severe weather
- Wildfire

	Avalanche	Dam Failure	Drought	Earthquake	Flood	Infestation	Landslide	Pandemic	Problem Soils	Radon	Severe Weather	Wildfire
Holladay	Low	Low	Mod	Low	Mod	Low	Mod	Low	Low	Low	Low	Mod

4.2 – Development Audit

Comprehensive Plan	Yes	No
Land Use	Yes	No
1. Does the future land-use map clearly identify natural hazard areas?	X	
2. Do the land-use policies discourage development or redevelopment within natural hazard areas?	X	
3. Does the plan provide adequate space for expected future growth in areas located outside natural hazard areas?	X	
Transportation	Yes	No
1. Does the transportation plan limit access to hazard areas?	X	
2. Is transportation policy used to guide growth to safe locations?		X
Holladay does not have large areas of undeveloped property		
3. Are movement systems designed to function under disaster conditions (e.g., evacuation)?	X	
Environmental Management	Yes	No
1. Are environmental systems that protect development from hazards identified and mapped?		X
Holladay does not have undeveloped areas that have hazards		
2. Do environmental policies maintain and restore protective ecosystems?		
3. Do environmental policies provide incentives to development that is located outside protective ecosystems?	X	
Public Safety	Yes	No
1. Are the goals and policies of the comprehensive plan related to those of the FEMA Local Hazard Mitigation Plan?	X	
2. Is safety explicitly included in the plan's growth and development policies?	X	
3. Does the monitoring and implementation section of the plan cover safe growth objectives?	X	

Zoning Ordinance	Yes	No
1. Does the zoning ordinance conform to the comprehensive plan in terms of discouraging development or redevelopment within natural hazard areas?	X	
2. Does the ordinance contain natural hazard overlay zones that set conditions for land use within such zones?	X	
3. Do rezoning procedures recognize natural hazard areas as limits on zoning changes that allow greater intensity or density of use?	X	
4. Does the ordinance prohibit development within, or filling of, wetlands, floodways, and floodplains?	X	
Subdivision Regulations	Yes	No
1. Do the subdivision regulations restrict the subdivision of land within or adjacent to natural hazard areas?		
2. Do the regulations provide for conservation subdivisions or cluster subdivisions in order to conserve environmental resources?	X	
3. Do the regulations allow density transfers where hazard areas exist?		X
Holladay does not have these areas in the city		
Capital Improvement Program and Infrastructure Policies	Yes	No
1. Does the capital improvement program limit expenditures on projects that would encourage development in areas	X	

Zoning Ordinance	Yes	No
vulnerable to natural hazards?		
2. Do infrastructure policies limit extension of existing facilities and services that would encourage development in areas vulnerable to natural hazards?	X	
3. Does the capital improvement program provide funding for hazard mitigation projects identified in the FEMA Mitigation Plan?		X
The City does not currently have any capital improvement programs for FEMA Mitigation identified projects		
Other	Yes	No
1. Do small area or corridor plans recognize the need to avoid or mitigation natural hazards?	X	
2. Does the building code contain provisions to strengthen or elevate construction to withstand hazard forces?	X	
3. Do economic development or redevelopment strategies include provisions for mitigation natural hazards?		X
The City does not have any projects		
4. Is there an adopted evacuation and shelter plan to deal with emergencies from natural hazards?	X	

4.3 – National Flood Insurance Program (NFIP)

The City of Holladay is part of the NFIP and encourages those residences in the floodplains to participate in the program. Since the City does not have the staff to track the number of participants, it is not know just how many are taking advantage of the service. The current ordnances prohibit additional encroachment into the floodplain.

Continued compliance is assured by a City mandate that no structures may be built in the 100-year floodplain.

NFIP TOPIC	SOURCE OF INFORMATION	COMMENTS
Insurance Summary		
How many NFIP policies are in the community? What is the total premium and coverage?	State NFIP Coordinator or FEMA NFIP Specialist	Do not know
How many claims have been paid in the community? What is the total amount of paid claims? How many of the claims were for substantial damage?	FEMA NFIP or Insurance Specialist	None
How many structures are exposed to flood risk within the community?	Community Floodplain Administrator	Do not have an administrator so this information is not available
Describe any areas of flood risk with limited NFIP policy coverage	Community FPA and FEMA Insurance Specialist	Do not have the information
Staff Resources		
Does the community have a dedicated Floodplain Manager or NFIP Coordinator?	Floodplain Administrator	Use Salt Lake County for this
Is the Floodplain Manager or NFIP Coordinator certified?		Use Salt Lake County for this
Is floodplain management an auxiliary function?	Floodplain Administrator	Use Salt Lake County for this
Provide an explanation of NFIP administration services (e.g., permit review, GIS, education or outreach, inspections, engineering capability)	Floodplain Administrator	Use Salt Lake County for this
What are the barriers to running an effective NFIP program in the community, if any?	Floodplain Administrator	Use Salt Lake County for this
Compliance History		

NFIP TOPIC	SOURCE OF INFORMATION	COMMENTS
Is the community in good standing with the NFIP?	State NFIP Coordinator, FEMA NFIP Specialist, community records	See Salt Lake County for this information
Are there any outstanding compliance issues (i.e., current violations)?		See Salt Lake County for this information
When was the most recent Community Assistance Visit (CAV) or Community Assistance Contact (CAC)?		See Salt Lake County for this information
Is a CAV or CAC scheduled or needed?		See Salt Lake County for this information
Regulation		
When did the community enter the NFIP?	Community Status Book http://www.fema.gov/national-flood-insurance-program/national-flood-insurance-program-community-status-book	See Salt Lake County for this information
Are the FIRMs digital or paper?	Floodplain Administrator	See Salt Lake County for this information
Does the Floodplain Ordinance meet or exceed FEMA or State minimum requirements? If so, in what ways?	Floodplain Administrator	See Salt Lake County for this information
Provide an explanation of the permitting process and include a copy of floodplain permit.	Community FPA, State, FEMA NFIP Flood Insurance Manual http://www.fema.gov/flood-insurance-manual Community FPA, FEMA CRS Coordinator, ISO representative CRS manual http://www.fema.gov/library/viewRecord.do?id=2434	See Salt Lake County for this information
Community Rating System (CRS)		
Does the community participate in CRS?	Community FPA, State, FEMA NFIP	See Salt Lake County for this information
What is the community's CRS Class Ranking?	Flood Insurance Manual http://www.fema.gov/flood-insurance-manual	See Salt Lake County for this information
What categories and activities provide CRS points and how can the class be improved?		See Salt Lake County for this information
Does the plan include CRS planning requirements	Community FPA, FEMA CRS Coordinator, ISO representative CRS manual http://www.fema.gov/library/viewRecord.do?id=2434	See Salt Lake County for this information

As shown above, the City of Holladay has no repetitive flood loss claims identified under the National Flood Insurance Program (NFIP). The City's Community Development Director oversees enforcement of floodplain management requirements adopted by the City, including regulating new construction in Special Flood Hazard Areas (SFHAs); Floodplain identification and mapping, including any local requests for map updates; description of community assistance and monitoring activities.

5 Vulnerability Assessment

This vulnerability assessment analyzes the population, property, and other assets at risk to hazards.

5.1 Assets at Risk

This section considers Holladay's assets at risk, including values at risk, critical facilities and infrastructure, economic assets, and growth and development trends.

Values at Risk

Table 4 shows 2014 assessed property data from the State of Utah for Holladay City and includes data for the portions of Holladay in Salt Lake County.

Holladay City	*Real Property Value*	*Personal Property Value*	*Central Assessed Value*	*Total*
Salt Lake County Portion of Holladay	*$6,572,233,860*	*$388,886,397*	*$205,049,650*	*$7,166,169,907*

Table 4 Assessed Property Value Data for Holladay City

Critical Facilities and Infrastructure

A critical facility may be defined as one that is essential in providing utility or direction either during the response to an emergency or during the recovery operation. Essential facilities are those that if damaged would have devastating impacts on disaster response and recovery. High potential loss facilities are those that would have a high loss or impact on the community. Transportation and lifeline facilities are the third category.

Essential Facilities

Figure 12 shows essential facilities that are located within Holladay.

Name of Facility	Address	City
Holladay Fire Station 104	2210 East Murray-Holladay Road	Holladay
Holladay City Hall, EOC, and Police Dept.	4580 South 1300 East	Holladay
Olympus High School and Police Dept.)	4055 South 2300 East	Holladay
Olympus Jr. High School	2217 East Murray-Holladay Road	Holladay
Bonneville Jr. High School	5330 South 1600 East	Holladay
Cottonwood Elementary School	5205 South Holladay Blvd.	Holladay
Crestview Elementary School	2100 East Lincoln Lane	Holladay
Howard Driggs Elementary School	4340 South 2700 East	Holladay
Oakwood Elementary School	5815 South Highland Drive	Holladay
Spring Lane Elementary School	5315 South 1700 East	Holladay
St Vincent De Paul School	1385 East Spring Lane	Holladay
St Sophia Hellenic Orthodox School	5341 South Highland Drive	Holladay
Intermountain Christen Church & School	6515 South Lion Lane	Holladay

Figure D.12. Essential Facilities Holladay City

High Potential Loss Facilities

High potential loss facilities as identified by FEMA HAZUS-MH are located throughout Holladay. Holladay works closely other government entities and private property owners in monitoring and assessing facilities that fall into this category that are not owned by the City.

Transportation and Lifeline Facilities

Transportation and lifeline facilities are located within the boundaries of Holladay. I-15 is the major freeway thoroughfare through Holladay that runs north to south through the State of Utah. There are major freight and a passenger rail lines that goes through the City near its west boundary that are used by the Union Pacific Railroad and the Utah Transit Authority. There are two major high pressure gas lines operated by Questar Gas Company that are located on the west and east sides of the City. The Salt Lake Aqueduct also resides in the City and is operated by the Metropolitan Water District.

5.1.1– Hazard Descriptions Summary

Hazard	Location (Geographic Area Affected)	Maximum Probable Extent (Magnitude/Strength)	Probability of Future Events	Overall Significance Ranking
Avalanche	N/A			
Dam Failure	N/A			
Drought	N/A			
Earthquake	The complete City	7.5	high	See Salt Lake County plan
Erosion	N/A			
Expansive Soils	N/A			
Extreme Cold	N/A			
Extreme Heat	N/A			
Flood	Along Big Cottonwood Creek	Low	Low	See Salt Lake County plan
Hail	The City	Low	Low	See Salt Lake County plan
Hurricane Wind	The City	Low	Low	See Salt Lake County plan
Landslide	N/A			
Lightning	The City	Low	Low	See Salt Lake County plan
Sea Level Rise	N/A			

Severe Winter Weather	**The City**	**Medium**	**Medium**	**See Salt Lake County plan**
Storm Surge	**N/A**			
Subsidence	**N/A**			
Tornado	**N/A**			
Tsunami	**N/A**			
Wildfire	**East edge of City**	**Low**	**Low**	**See Salt Lake County plan**

Definitions for Classifications

Location (Geographic Area Affected)

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

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

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

Hazard	Scale / Consideration	Limited	Moderate	Severe	Extreme
Drought	Palmer Drought Severity Index[1]	-1.99 to +1.99	-2.00 to -2.99	-3.00 to -3.99	-4.00 and below
Earthquake	Modified Mercalli Scale[2]	I to IV	V to VII	VII	IX to XII
	Richter Magnitude[3]	2, 3	4, 5	6	7, 8
Hurricane Wind/ Storm Surge	Saffir-Simpson Hurricane Wind Scale[4]	1	2	3	4, 5
Tornado	Fujita Tornado Damage Scale[5]	F0	F1, F2	F3	F4, F5

Probability of Future Events

[1] Cumulative meteorological drought and wet conditions: http://ncdc.noaa.gov/

[2] Earthquake intensity and effect on population and structures: http://earthquake.usgs.gov

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

[5] Tornado rating based on wind speed and associated damage: http://spc.noaa.gov

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

Overall Significance

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

5.1.2 – Goals to reduce long-term vulnerabilities

The following plan goals and objectives of the Mitigation plan were maintained from the WFRC plan. These include reducing the risk from natural hazards in Salt Lake County through coordinating with all local governments to develop a countywide planning process. They are shown from highest to lowest priority.

1. Protect life safety.
2. Eliminate and/or reduce property damage.
3. Promote public awareness through education about community hazards and mitigation measures.
4. Protect emergency response services and capabilities, critical infrastructure, critical facilities, communication and warning systems, mobile resources, and other lifelines.
5. Ensure government continuity
6. Protect the cultural fabric of the community, including cultural resources, developed property, homes, businesses, industry, education and other institutions.
7. Combine hazard loss reduction efforts with other environmental, social and economic needs of the community.
8. Preserve and/or restore natural features, natural resources and the environment.
9. Eliminate or reduce long-term risk to human life and property.
10. Aid private and public sectors in understanding the risks they may be exposed to and identify mitigation strategies to reduce those risks.
11. Avoid risk of exposure to natural and technological hazards.
12. Minimize the impacts of risks that cannot be avoided.
13. Mitigate the impacts of damage as a result of identified hazards.
14. Accomplish mitigation strategies in such a way that negative environmental impacts are minimized.
15. Provide a basis for prioritizing and funding mitigation projects.

16. Establish a countywide platform to enable the community to take advantage of shared goals and resources.

Objectives

The following objectives are meant to serve as a measure upon which individual hazard mitigation strategies can be evaluated. These objectives become especially important when two or more projects are competing for limited resources.

1. Address a repetitive problem, or one that has the potential to have a major impact on an area or population.
2. Identify persons, agencies or organizations responsible for implementation.
3. Identify a time frame for implementation.
4. Explain how the project will be financed including the conditions for financing and implementation (as information is available).
5. Identify alternative measures, should financing not be available.
6. Be consistent with, support, and help implement the goals and objectives of hazard mitigation plans already in place.
7. Significantly reduce potential damages to public and/or private property and/or reduce the cost of state and federal recovery for future disasters.
8. Are practical, cost-effective and environmentally and politically sound after consideration of the options.
9. Can meet applicable permit requirements.
10. Benefits should outweigh the costs.
11. Have manageable maintenance and modification costs.
12. Accomplish multiple objectives when possible.
13. Should be implemented using existing resources, agencies and programs when possible.

5.2 Previous Occurrences of Hazardous Events

In the history of the area covered by the City of Holladay there has been only one Hazardous Event. In 1983 the Big Cottonwood Creek flooded in the area of 6200 South and Holladay Blvd. There was no loss of life. There was the loss of one home and a few were flooded. The property where the home was lost is now a city park and the banks of the creek have been built up help mitigate future property damage.

5.3 Regulatory Mitigation Capabilities

Table 5 lists regulatory mitigation capabilities, including planning and land management tools.

Planning and Regulatory

Plans	Yes/No Year	Does the plan address hazards? Does the plan identify projects to include in the mitigation strategy? Can the plan be used to implement mitigation actions?
Comprehensive/Master Plan	Yes	Yes
Capital Improvements Plan	Yes	The capital improvements plan does address hazards
Economic Development Plan	Yes	There is very little much room for development in the city and what is available is not in a Hazard area
Local Emergency Operations Plan	Yes	Yes see Salt Lake County EOP
Continuity of Operations Plan	Yes	Yes
Transportation Plan	Yes	See Salt Lake County EOP
Storm water Management Plan	Yes	This is ongoing and changes with development and redevelopment
Community Wildfire Protection Plan	Yes	See Salt Lake County EOP
Other special plans (i.e., brownfields redevelopment ,disaster recovery, coastal zone management, climate change adaptation)	Yes	The City is working on a disaster recovery plan

Building Code, Permitting, and Inspections	Yes/No	Are codes adequately enforced?
Building Code	Yes	Version/Year: ongoing as state codes are updated
Building Code Effectiveness Grading Schedule (BCEGS) Score	Yes	Score:
Fire department ISO rating	Yes	Rating: See Salt Lake County Unified Fire Authority
Site plan review requirements	Yes	Yes
Land Use Planning and Ordinances	**Yes/No**	**Is the ordinance an effective measure for reducing hazard impacts? Is the ordinance adequately administered and enforced?**
Zoning ordinance	Yes	Yes

Subdivision ordinance	Yes	Yes
Floodplain ordinance	Yes	Yes
Natural hazard specific ordinance (storm water, steep slope, wildfire)	Yes	Yes
Flood insurance rate maps	Yes	See Salt Lake County maps
Acquisition of land for open space and public recreation uses	Yes	Yes
Other	No	
How can these capabilities be expanded and improved to reduce risk?		
The continual review and update of codes, and strict enforcement to insure the least risk possible.		

Administrative and Technical

Administration	**Yes/No**	**Describe capability Is coordination effective?**
Planning Commission	Yes	All new or redevelopment is reviewed by the commission
Mitigation Planning Committee	No	This would be done by the planning committee and City Council
Maintenance programs to reduce risk, e.g., tree trimming, clearing drainage systems	Yes	This is done by Salt Lake County and Salt Lake City for our water ways
Mutual aid agreements	Yes	
Staff	**Yes/No FT/PT6**	**Is staffing adequate to enforce regulations? Is staff trained on hazards and mitigation? Is coordination between agencies and staff effective?**
Chief Building Official	Yes	Yes
Floodplain Administrator	No	This is done by the Community Development Department

[6] Full-time (FT) or part-time (PT) position

Emergency Manager	Yes	Yes
Community Planner	Yes	Yes
Civil Engineer	Yes	Yes
GIS Coordinator	Yes	Yes
Other	Yes	Salt Lake County provides other types of support

Technical	**Yes/No**	**Describe capability** **Has capability been used to assess/mitigate risk in the past?**
Warning systems/services (Reverse 911, outdoor warning signals)	Yes	This is covered by Salt Lake Valley Emergency Communication a shared service for Salt Lake County
Hazard data and information	Yes	See Salt Lake County's plan
Grant writing	Yes	The City has a grant writer
Hazard analysis	Yes	See Salt Lake County's plan
Other	Yes	See Salt Lake County's plan

How can these capabilities be expanded and improved to reduce risk?
Public education and training of hazards in the City and code enforcement the hazard can be mitigated to the extent it is possible.

Financial

Funding Resource	Access/ Eligibility (Yes/No)	Has the funding resource been used in past and for what type of activities? Could the resource be used to fund future mitigation actions?
Capital improvements project funding	No	
Authority to levy taxes for specific purposes	No	
Fees for water, sewer, gas, or electric services	N/A	
Impact fees for new development	Yes	They have not been used in the past but could be uses in the future
Storm water utility fee	No	
Incur debt through general obligation bonds and/or special tax bonds	Yes	Purchase of public buildings and could be used for mitigation in the future
Incur debt through private activities	No	
Community Development Block Grant	Yes	
Other federal funding programs	Yes	
State funding programs	Yes	
Other		

How can these capabilities be expanded and improved to reduce risk?
As the economy improves in the City more money will become available to complete more projects

Education and Outreach

Program/Organization	Yes/No	Describe program/organization and how relates to disaster resilience and mitigation? Could the program/organization help implement future mitigation activities?
Local citizen groups or non-profit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc.	Yes	Citizen Corps Council and CERT Training. This program could help for mitigation activities
Ongoing public education or information program, e.g., responsible water use, fire safety, household preparedness, and environmental education.	Yes	This is done by way of City news paper
Natural disaster or safety related school programs	Yes	This is done through Granite School District and could be used for mitigation activities
StormReady certification	No	
Firewise Communities certification	No	
Public-private partnership initiatives addressing disaster-related issues	No	
Other		

How can these capabilities be expanded and improved to reduce risk?
Create citizens committee to develop and administer educational programs to help the public become aware of activities they can perform to medicate potential hazards in the City.

5.4 Mitigation Prioritization

Mitigation plans will be prioritized based on several factors:

- Availability of Funds
- Implementation ability with ongoing projects
- Benefit – Cost ratio
- Public input
- Other miscellaneous information that when it becomes available will make certain mitigation plans a high priority.

5.5 Integration of mitigation strategies into other planning mechanisms

The City of Holladay has used the previous mitigation plan to update ordinances and zoning. The current plan will be reviewed with all new ordinances and zoning. Each requested variance will be reviewed with the mitigation strategies to make sure they are incompliance. The City uses their GIS system to track most natural hazards.
The plan integrates the mitigation strategies into building codes, ordinances, discussions with the County, the City, and with the Public.

6 Mitigation Strategy

6.1 Mitigation Actions

The planning team for the City identified the following mitigation areas based on the risk assessment. The potential natural hazards identified by the City are earthquake, flood, infestation, pandemic, radon, severe weather and wildfire. These potential natural hazards are addressed by these mitigation actions. Additional mitigation actions may be added in the future as needed. Background information and information on how each action will be implemented and administered such ideas for implementation, responsibility, potential funding, estimated cost, and timeline are also included.

6.2 Mitigation Action Evaluation & Prioritization

- 1= Highly effective or feasible
- 0=Neutral
- -1=Ineffective or not feasible

Example Evaluation Criteria

1. **Life Safety** – How effective will the action be at protecting lives and preventing injuries?
2. **Property Protection** – How significant will the action be at eliminating or reducing damage to structures and infrastructure?
3. **Technical** – Is the mitigation action technically feasible? Is it a long-term solution? Eliminate actions that, from a technical standpoint, will not meet the goals.
4. **Political** – Is there overall public support for the mitigation action? Is there the political will to support it?
5. **Legal** – Does the community have the authority to implement the action?
6. **Environmental** – What are the potential environmental impacts of the action? Will it comply with environmental regulations?
7. **Social** – Will the proposed action adversely affect one segment of the population? Will the action disrupt established neighborhoods, break up voting districts, or cause the relocation of lower income people?
8. **Administrative** – Does the community have the personnel and administrative capabilities to implement the action and maintain it or will outside help be necessary?
9. **Local Champion** – Is there a strong advocate for the action or project among local departments and agencies that will support the action's implementation?
10. **Other Community Objectives** – Does the action advance other community objectives, such as capital improvements, economic development, environmental quality, or open space preservation? Does it support the policies of the comprehensive plan?

6.1.1. Earthquake

6.1.1.1

Continue to support and take part in annual Utah Shakeout exercises to promote earthquake awareness.

Background/Issue: The City continues to enforce building codes on new construction and encourages upgrades on all remodels. The City participates in the annual Utah Shakeout activities. This event promotes earthquake awareness for the residents, businesses community and City employees. The Shakeout allows the City to practice setting up its Emergency Operation Center and its process of communicating with neighborhoods and business throughout the City. The community volunteers are encouraged to practice C.E.R.T. skills and amateur radio license operators are asked to set nets to practice their skills.
Other Alternatives: No Action
Responsible Office: Emergency Manager, Emergency Manage Committee, Police Department, Fire Department, and Citizen Corps.
Priority: 1
Cost Estimate: $2,000 annually
Potential Funding: City budget
Benefits (avoided Losses): This will help to prevent the loss of human life and property losses when a major earthquake occurs.
Schedule: Ongoing

6.1.1.2

Continue to enforce building codes, development of new codes and zoning ordinances as needed or state codes are updated.

Issue/Background: The City requires that construction complies with the adopted building codes and the zoning and development ordinances adopted by the City. A potential natural hazard covered by this mitigation action is earthquake.
Other Alternatives: No action
Responsible Office: City of Holladay Community Development Department.
Priority: 1
Cost Estimate: Developer-base funding under specific plan requirements.
Potential Funding: Developer-base funding under specific plan requirements.
Benefits (Avoided Losses): This will prevent the loss of human life and economic and property losses
Schedule: Now and long term

6.1.1.3

Continue to execute training and exercise programs

Issue/Background: The City of Holladay regularly administers training and participates in exercises. These events provide participants with opportunities to learn of duties and practices

that would be used during a real life major emergency or disaster situation. Coordination of operations would be exercised and allow Holladay Emergency Management to identify the areas of higher and lower performance and how to best improve their efforts.
Other Alternatives: No action
Responsible Office: Emergency Management Committee
Priority: 1
Cost Estimate: Less than $1,000 annually
Potential Funding: City budget
Benefits (Avoided Losses): This will help prevent the loss of human life and property losses
Schedule: Ongoing

6.1.1.4
Educate residents and business through public information and events

Issue/Background: The City of Holladay takes great care to get the appropriate information out to the residents and businesses in the community. Through news media and the City web site information on preparedness distributed. The City also encourages the community to attend one or more of the many emergency preparedness fairs that are held in the valley.
Other Alternatives: No action
Responsible Office: Emergency Management Committee and Citizen Corps Council
Priority: 0 (because of budget constraints)
Cost Estimate: Less than $1,000 annually
Potential Funding: City budget
Benefits (Avoided Losses): This will help prevent the loss of human life and economic and property losses.
Schedule: Ongoing.

6.2.1. Flooding

6.2.1.1
Continue to work Salt Lake County Flood Control.

Background/Issue: The City contracts with Salt Lake County Public Works for flood control. They are the responsible agency for the maintenance of the Big Cottonwood Creek and Salt Lake City Department of Public Utilities is responsible for the maintenance of the Salt Lake Jordan canal. The City is responsible for the maintenance of Upper Canal. The City has staff that maintains the Upper. Salt Lake Public Works under contract work with other potential flooding from heavy rainstorms in the City
Other Alternatives: No Action
Responsible Office: City of Holladay, Salt Lake County Public Works and Salt Lake City Department of Public Works
Priority: 0
Cost Estimate: $10,000 annually
Potential Funding: City budget

Benefits (avoided Losses): This will help to prevent the loss of human life and property losses when a major or minor flooding occurs.
Schedule: Ongoing

6.2.1.2
Continue to enforce building codes/water disposal codes

Issue/Background: The City requires that construction complies with the adopted building codes and the zoning and development ordinances adopted by the City. A potential natural hazard covered by this mitigation action is flooding.
Other Alternatives: No action
Responsible Office: City of Holladay Community Development Department.
Priority: 1
Cost Estimate: Developer-base funding under specific plan requirements.
Potential Funding: Developer-base funding under specific plan requirements.
Benefits (Avoided Losses): This will prevent the loss of human life and economic and property losses
Schedule: Now and long term

6.2.1.3
Continue enforce development codes

Issue/Background: The City of Holladay regularly reviews potential flooding hazards
Other Alternatives: No action
Responsible Office: Community Development Department
Priority: 1
Cost Estimate: Less than $1,000 annually
Potential Funding: City budget
Benefits (Avoided Losses): This will help prevent the loss of human life and property losses
Schedule: Ongoing

6.2.1.4
Educate residents and business through public information

Issue/Background: The City of Holladay takes great care to get the appropriate information out to the residents and businesses in the community. Through news media and the City web site information.
Other Alternatives: No action
Responsible Office: Community Development Department
Priority: 0 (because of budget constraints)
Cost Estimate: Less than $1,000 annually
Potential Funding: City budget

Benefits (Avoided Losses): This will help prevent the loss of human life and economic and property losses.
Schedule: Ongoing.

6.3.1. Infestation

6.3.1.1
Infestation is covered in the Salt Lake County plan for the City of Holladay See Salt Lake County's plan for details

6.4.1. Pandemic

6.4.1.1
Pandemic is covered by the Salt Lake Valley Health Department's plan. See Salt Lake County Health Department plan for details

6.5.1. Wildfire

6.5.1.1
The Salt Lake County Unified Fire Authority covers wildfire. See Salt Lake County's plan for details

6.6.1. Severe Weather

6.6.1.1
The Salt Lake County Public Works department covers Severe Weather. See the County's plan. The City contracts with Salt Lake County Public Works Department for all snow removal, road repair which would include debris removal, and other types of construction and repair work. The utility company would repair utility lines.

7 Plan Implementation & Maintenance

7.1 Implementation

Mitigation is most successful when it is incorporated into the day-to-day functions and priorities of government and development. The City of Holladay will utilize the information in the Hazards Mitigation Plan to prepare for future events and plan accordingly. The mitigation strategies will be incorporated into other plans such as development, police and fire requirements, and city policies and agreements. It is essential that the public be involved in this process in every aspect.

7.2 Maintenance Schedule

Periodic monitoring and updates of this Plan are required to ensure that the goals and objectives for the City are kept current and that local mitigation strategies are being carried out. This Plan has been designed to be user-friendly in terms of maintenance and implementation. This portion of the Plan outlines the procedures for completing revisions and updates. The Plan will also be revised to reflect lessons learned or to address specific hazard incidents arising out of a disaster as needed.

7.2.1 Annual Review Procedures

The City of Holladay will be responsible to annually review the mitigation strategies described in this plan, as required by the Utah Division of Emergency Management (UDEM), or as situations dictate such as following a disaster declaration. The City's Emergency Management Committee will regularly monitor the plan and is responsible to make revisions and updates as needed.

7.2.2 Five Year Plan Review

The entire Mitigation Plan including any background studies and analysis shall be revised and updated as needed every five years by Holladay City to determine if there have been any significant changes in the city that would affect the Plan. Increased development, increased exposure to certain hazards, the development of new mitigation capabilities or techniques and changes to Federal or State legislation are examples of changes that may affect the condition of the Plan.

7.3 Hazard Mitigation Plan Amendments

The City of Holladay will amend and update its Hazard Mitigation Plan as needed.

7.4 Maintenance Evaluation Process

It will be the responsibility of the designated Emergency Manager, City Manager, Mayor and City Council Members to ensure these actions are carried out no later than the target dates unless reasonable circumstances prevent their implementation (i.e. lack of funding availability).

Funding Sources

Although all mitigation techniques will likely save money by avoiding losses, many projects are costly to implement. The City of Holladay shall continue to seek outside funding assistance for mitigation projects in both the pre-disaster and post-disaster environment, subject to budget constraints and available funding sources.

Federal Programs

The following federal grant programs have been identified as funding sources which specifically target hazard mitigation projects:

Title: Pre-Disaster Mitigation Programs
Agency: Federal Emergency Management Agency

Through the Disaster Mitigation Act of 2000, Congress approved the creation of a national program to provide a funding mechanism that is not dependent on a Presidential Disaster Declaration. The Pre-Disaster Mitigation (PDM) program provides funding to states and communities for cost-effective hazard mitigation activities that complement a comprehensive mitigation program and reduce injuries, loss of life, and damage and destruction of property.

The funding is based upon a 75% Federal share and 25% non-Federal share. The non-Federal match can be full in-kind or cash, or a combination. FEMA provides PDM grants to states that, in turn, can provide sub-grants to local governments for accomplishing the following eligible mitigation activities:

- State and local Natural Hazard Pre-Disaster Mitigation Planning
- Technical assistance (e.g. risk assessment, project development).
- Mitigation Projects
- Acquisition or relocation of vulnerable properties
- Hazard retrofits
- Minor structural hazard control or protection projects
- Community outreach and education (up to 10% of State allocation)

Title: Flood Mitigation Assistance Program
Agency: Federal Emergency Management Agency

FEMA's Flood Mitigation Assistance program (FMA) provides funding to assist states and communities in implementing measures to reduce or eliminate the long-term risk of flood damage to buildings, manufactured homes and other structures insurable under the National Flood

Insurance Program (NFIP). FAM was created as part of the National Flood Insurance Reform Act of 1994 (42 USC 4101) with the goal of reducing or eliminating claims under the NFIP.

FMA is a pre-disaster grant program and is available to states on an annual basis. This funding is available for mitigation planning and implementation of mitigation measures only, and is based upon a 75% Federal share/25% non-Federal shares. States administer the FMA program and are responsible for selecting projects for funding from the applications submitted by all communities within the state. The state then forwards selected applications to FEMA for an eligibility determination. Although individuals cannot apply directly for FMA funds, their local government may submit an application on their behalf.

Title: Hazard Mitigation Grant Program
Agency: Federal Emergency Management Agency

The Hazard Mitigation Grand (HMGP) was created in November 1988 through Section 404 of the Robert T. Stafford Disaster Relief and Emergency Assistant Act. The HMGP assists states and local communities in implementing long-term mitigation measures follow a Presidential disaster declaration.

To meet these objectives, FEMA can fund up to 75% of the eligible costs of each project. The state or local cost-share match does not need to be cash; in-kind service or materials may also be used. With the passage of the Hazard Mitigation and Relocation Assistance Act of 1993, federal funding under the HMGP is now based on 15% of the federal funds spent on the Public and Individual Assistance programs (minus administrative expenses) for each disaster.

The HMGP can be used to fund projects to protect either public or private property, so long as the project in question fit within the state and local government overall mitigation strategy for the disaster area, and comply with program guidelines. Examples of projects that may be funded to include the acquisition or relocation of structures from hazard-prone areas, the retrofitting of existing structures to protect them future damages; and the development of state or local standards designed to protect building from future damages.

Eligibility for funding under the HMGP is limited to state and local governments, certain private nonprofit organizations or institutions that serve a public function, Indian tribes and authorized tribal organizations. These organizations must apply for HMPG project funding on behalf of their citizens. In turn, applications must work through their state, since the state is responsible for setting priorities for funding and administering the program.

Title: Public Assistance (Infrastructure) Program, Section 406
Agency: Federal Emergency Management Agency

FEMA's Public Assistance Program, through Section 406 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act, Provides funding to local Governments following a Presidential Disaster Declaration for mitigation measures in conjunction with the repair of damaged public facilities and infrastructure.

The Mitigation measures must be related to eligible disaster related damages and dust directly reduce the potential for future, similar disaster damages to the eligible facility. These opportunities usually present themselves during the repair/replacement efforts.

Public facilities are operated by state and local governments, Indian tribes or authorized tribal organizations and include:

- Roads, Bridges & culverts
- Draining & irrigation channels
- Schools, city halls & other buildings
- Water, power & sanitary systems
- Airports & parks

Private nonprofit organizations are groups that own or operate facilities that provide services otherwise performed by a government agency and include, but not limited to the following:

- Universities and other schools
- Hospitals & clinics
- Volunteer fire and ambulance
- Power cooperatives & other utilities
- Custodial care & community centers

Title: Small Business Administration (SBA) Disaster Assistance Program
Agency: U.S. SBA

The SBA Disaster Assistance Program provides low-interest loans to businesses following a Presidential disaster declaration. The loans target businesses to repair or replace uninsured disaster damages to property owned by business, including real estate, machinery and equipment, inventory and supplies. Businesses of any size are eligible, along with non-profit organizations. SBA loans can be utilized by their recipients to incorporate mitigation techniques into the repairs and restoration of their business

Title: Community Development Block Grants
Agency: US Department of Housing and Urban Development

The Community Development Block Grant (CDBG) program provides grants to local governments for community and economic development projects that primarily benefit low and moderate-income people. The CDBG program also provides grants for post-disaster hazard mitigation and recovery following a Presidential disaster declaration.

Funds can be used for activities such as acquisition, rehabilitation or reconstruction of damaged properties and facilities and for the redevelopment of disaster areas.

State Programs

Local

Local governments depend upon local property taxes as their primary source of revenue. These taxes are typically used to finance services that must be available and delivered on a routine and

regular basis to the general public. If local budgets allow, these funds are to match Federal or state grant programs when required for large-scale projects.

Non-Governmental

Another potential source of revenue for implementing local mitigation projects are monetary contributions from non-government organizations, such as private sector companies, churches, charities, community relief funds, the American Red Cross, Hospitals, land trusts and other non-profit organizations.

Paramount to having a Plan deemed to be valid is its implementation. There is currently no new fiscal note attached to the implementation of this plan.

7.5 Continued Public Involvement

Throughout the planning process, public involvement has been and will be critical to the development of the Hazard Mitigation Plan and its updates. The plan will also be available for review at the offices of the City.

Participation

All citizens of the City are encouraged to participate in the planning process, especially those who may reside within identified hazard areas. Adequate and timely notification to all area residents will be given as outlined above to all hearings, forums, and meetings.

Access to information

Citizens, public jurisdictions, agencies and other interested parties will have the opportunity to receive information and submit comments on any aspect of the Natural Hazards Pre-Disaster Mitigation Plan.

Technical Assistance

Residents as well as local jurisdictions may request assistance in accessing the program and interpretation of mitigation projects.

Public Hearings and Meetings Concerning the Plan

Hearings and meeting concerning the plan will be conveniently timed for people who might benefit most from mitigation programs. Hearings and meeting will be accessible to people with disabilities (accommodations must be requested in advance according to previously established policy). Hearings and meeting will be adequately publicized. Hearings and meetings may be held for a number of purposes or functions including to: Identify and profile hazards, develop mitigation strategies, and review plan goals, performance and future plans.

Future Revisions

Future revisions of the Hazard Mitigation Plan shall include:

- Expanded vulnerability assessments to include flood and dam failure inundation.
- Continue the search for more specific mitigation actions.

- An analysis of progress of the Plan as it is revised.
- Expanded look into how the identified natural hazards will affect certain populations including the young and elderly.

Implementation and maintenance of the plan is critical to the overall success of hazard mitigation planning.

Integration of data, information, and mitigation goals and action plans:

Holladay will integrate mitigation strategies into its building codes, the planning commission, and the actions of the City Council and other relevant agencies by education by the Emergency Manager during daily, weekly, and monthly city and public meetings.

8 Hazard Mitigation Plan Adoption

It is the intent of the City of Holladay that this Hazard Mitigation Plan will be adopted by resolution once approved by the State of Utah and FEMA, which approval should be within five years of the previous Hazard Mitigation Plan's approval date. This process will be documented through the City of Holladay Recorder's office.

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MIDVALE CITY, UTAH
RESOLUTION NO. 2015-R-55

A RESOLUTION APPROVING AND IMPLEMENTING THE MIDVALE CITY HAZARD MITIGATION PLAN

WHEREAS, the City Council understands the importance of being prepared for any emergency situations or disasters; and

WHEREAS, the City Council desires to approve and implement the Midvale City Hazard Mitigation Plan (HMP); and

WHEREAS, the HMP complies with existing federal, state and local statues; and

WHEREAS, the HMP is intended to promote sound public policy and protect or reduce the vulnerability of the citizens, critical facilities, infrastructure, private property and natural environment within the city; and

WHEREAS, the City Council desires to increase public awareness, documenting resources for risk reduction and loss prevention and identifying activities to guide the development of a less vulnerable and more sustainable community;

NOW THEREFORE BE IT RESOLVED, based on the foregoing, the Midvale City Council does hereby approve and implement the Midvale City Hazard Mitigation Plan attached herewith as Exhibit A.

APPROVED AND ADOPTED this 17th day of November, 2015.

JoAnn B. Seghini, Mayor

ATTEST:

Rori L. Andreason, MMC
City Recorder

MIDVALE CITY STATE OF UTAH INCORPORATED JULY 1, 1909 CORPORATE SEAL

Voting by the City Council	"Aye"	"Nay"
Stephen Brown	✓	
Paul Glover	✓	
Paul Hunt	✓	
Wayne Sharp	✓	
Quinn Sperry	✓	

2015

Developed by:

MIDVALE CITY

EMERGENCY MANAGER, JESSE VALENZUELA

AND

GRANT PRO GROUP L.L.C, LIZ KINNE

[HAZARD MITIGATION PLAN]

2015 Hazard Mitigation Plan is to identify policies and actions that can be implemented over the long term to reduce risk and future losses. The purpose of this plan is to form the foundation for Midvale City's long-term strategy to reduce disaster losses and break the cycle of disaster damage, reconstruction, and repeated damage.

APPROVAL AND IMPLEMENTATION

Effective date: 11/10/2015

This document is the updated integrated Hazard Mitigation Plan (HMP) for Midvale City. This HMP supersedes any previous hazard mitigation plans promulgated by Midvale City. This plan provides a framework for Midvale City departments and agencies to plan and perform their respective hazard mitigation functions. This HMP recognizes the need for ongoing hazard mitigation planning by all Midvale City departments and agencies. This plan addresses the four steps identified by the Federal Emergency Management Administration (FEMA):

Step 1: 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.

Step 2: 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.

Step 3: 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.

Step 4: Communities can bring the plan to life in a variety of ways, ranging from implementing specific mitigation projects to changes in day-to-day organizational operations. To ensure the success of an ongoing program, it is critical that the plan remains relevant. Thus, it is important to conduct periodic evaluations and make revisions as needed.

This HMP complies with existing federal, state, and local statutes. It has been approved by the Mayor and City Council, and will be revised and updated as required. All recipients are requested to advise Midvale City Emergency Management of any changes that might improve or increase the usefulness of this HMP.

The HMP is intended to promote sound public policy and protect or reduce the vulnerability of the citizens, critical facilities, infrastructure, private property and the natural environment within the City of Midvale. This can be achieved by increasing public awareness, documenting resources for risk reduction and loss-prevention and identifying activities to guide the development of a less vulnerable and more sustainable community.

Midvale City Corporation: Mayor and City Council

We, as the Midvale City Council, support the planning principles used to develop this document and accept the responsibilities outlined in this plan.

City Mayor

Council Member District 1
QUINN SPERRY

Council Member District 2
Paul C Glover

Council Member District 3
PAUL HUNT

Council Member District 4
WAYNE L. SHARP

Council Member District 5

Midvale City Corporation: Administration and Departmental Leaders

We, as the departmental leaders of the Midvale City Corporation, support the planning principles used to develop this document and accept the responsibilities outlined in this plan.

City Manager

Finance Director
Assistant City Manager

Director, CED
Assistant City Manager

Public Works Director

Human Resource Director

RDA Director

Information & Technology Manager

City Attorney

Emergency Manager

Hazard Mitigation Plan (2014)

ANNEX G: CITY OF MIDVALE
1 Introduction

1.1 Community Profile

Midvale City began the Community-Building-Community Initiative (CBC) in 1998 to improve the general well being of Midvale residents. The CBC is a collaborative effort that brings together the stakeholders in the Midvale community, including the residents, in the planning process.

The CBC has set five goals and committees. Each committee is comprised of community members and service providers who identify barriers, problems, resources, and solutions.

1- HEALTH. Promotes health access for Midvale City Residents

- Mobile Dental Clinic
- GKSD Dental for children
- Mobile Medical Clinic (UPFH)
- MEDICAID/CHIP application Assistance
- Midvale Health Fair
- Diabetes Outreach

2- STABLE FAMILIES. Promotes stable family life, thru prevention classes and workshops.

- Soccer4Parenting/ Soccer for college
- Parenting Classes-Valley Mental H.
- Voices –Cornerstone/VOA (11-15)
- Living Skills –Cornerstone/VOA(7-11)
- Circle of friends-PPHAU (girls 14-18)
- Wise Guys-PPHAU (boys 12 to 18)

- Teen Connection
- Community Garden

3- EDUCATION. Promotes education and academic achievement among children and adults.

- ESL Classes
- Early Intervention Program “La Escuelita”
- Summer Reading Program
- Ballet Classes
- Civil Engagement classes

4- SAFETY. Promote solidarity in the neighborhood, thru workshops of codes of safety behavior.

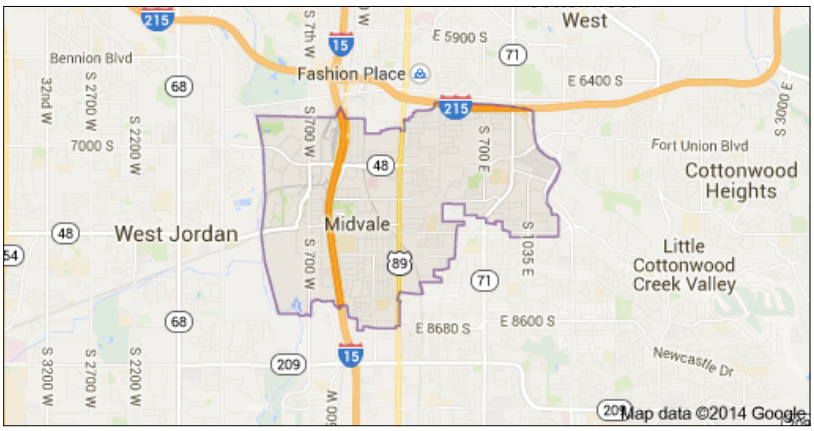
- Cert (Spanish)
- Emergency Preparedness
- Neighborhood watch
- Car seat classes
- CPR/ First aid

5-INCOME. Provide classes and workshops to help families obtain economic independence

- Club de Madres - Sewing for Profit
- Financial/ Budgeting classes.

1.2 Purpose

The purpose of this plan is to enumerate hazards that could affect the City of Midvale, describe mitigation strategies for each of those hazards, and provide a framework for revision of hazard mitigation strategies. This document was created by City of Midvale staff with significant guidance from Salt Lake County Emergency Management staff, and it is based on guidelines for local hazard mitigation strategies prescribed by the Federal Emergency Management Agency (FEMA). This plan will be submitted alongside similar documents from other municipalities in Salt Lake County to the State of Utah, which will submit all county documents to FEMA. Completing a pre-hazard mitigation plan allows Salt Lake County as well as local jurisdictions to receive financial disaster assistance from the federal government.



Midvale City border on a relief map produced by Midvale GIS staff (view is facing east; I-15 shown in red)

1.3 Authority and Reference

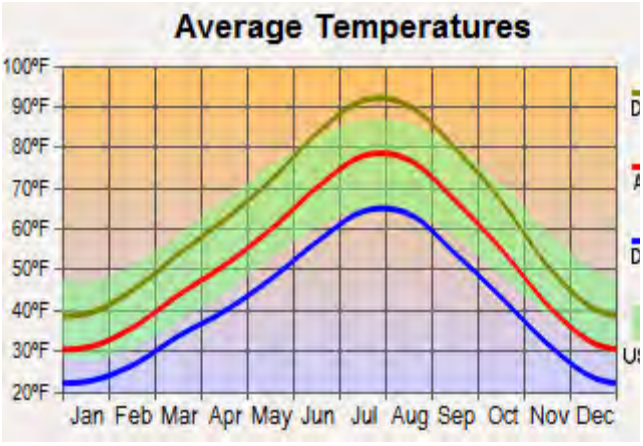
Midvale City operates under a Traditional form of government and is a City of the third class as determined by Utah law. Hence, it is governed by a six-member Council comprised of five Council Members and a Mayor. The Mayor votes only to break a tie-vote of the Council. The Mayor serves as the Chief Executive Officer and the City Manager serves as Chief Administrative Officer overseeing the day- to-day administrative functions of the City.

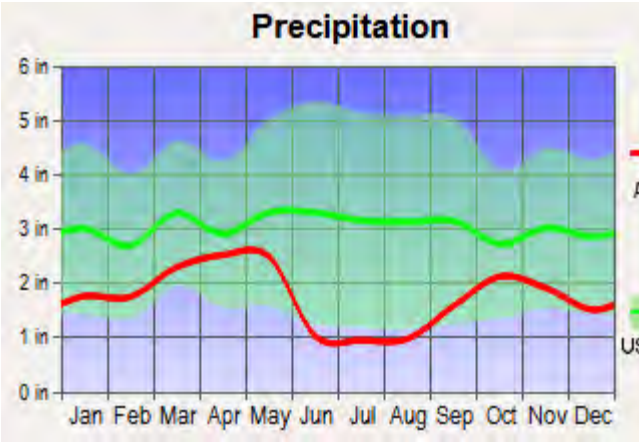
2 Community Profile

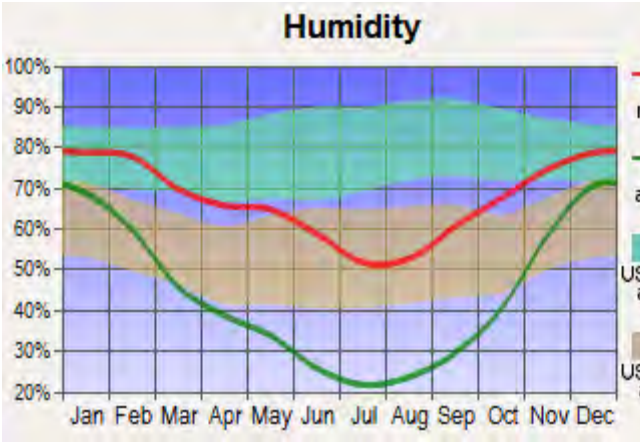
2.1 Population

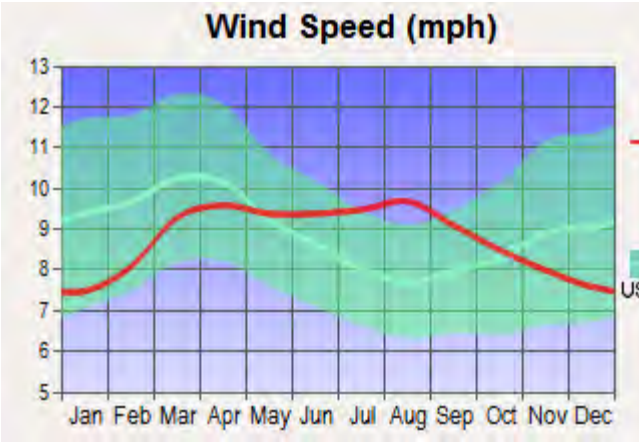
Population in 2012: 30,229 (100% urban, 0% rural). Population change since 2000: +11.8%

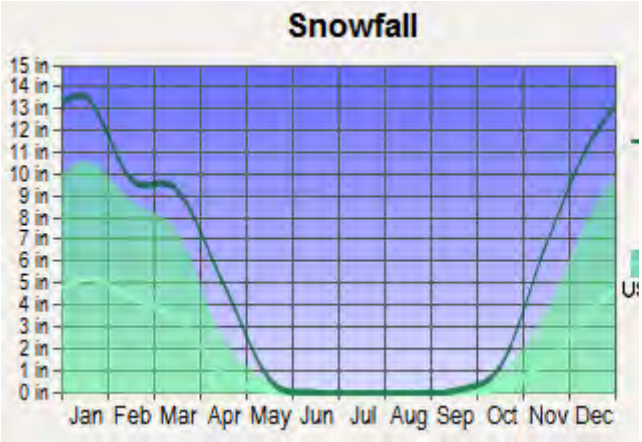
2.2 Geography, Environment & Climate

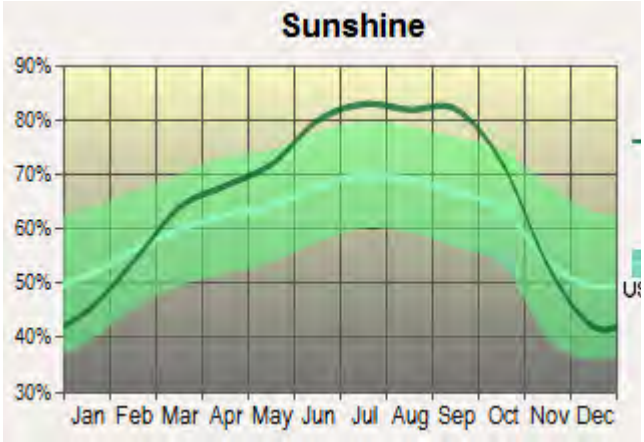


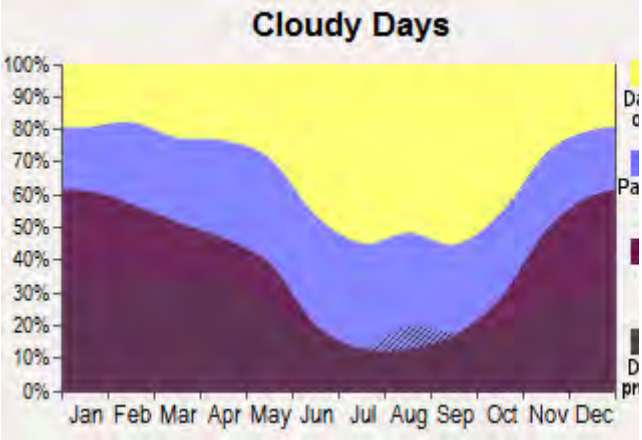












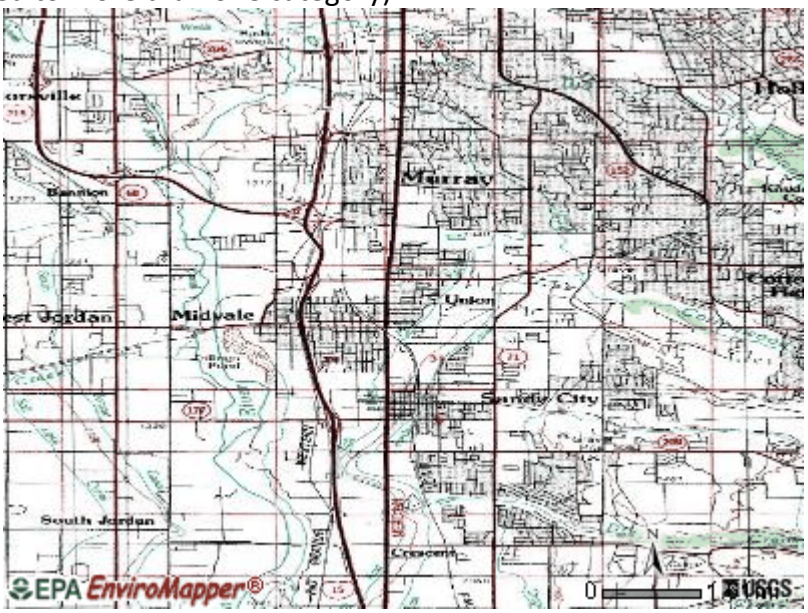
Earthquake activity:

Midvale-area historical earthquake activity is below Utah state average. It is 1% smaller than the overall U.S. average.

On 4/17/2003 at 01:04:19, a magnitude 4.7 (4.7 MB, 4.4 ML, Depth: 0.2 mi, Class: Light, Intensity: IV - V) earthquake occurred 76.0 miles away from the city center
On 3/16/1992 at 14:42:49, a magnitude 4.4 (4.4 MB, 4.2 ML, Depth: 7.6 mi) earthquake occurred 13.1 miles away from Midvale center
On 3/7/2000 at 02:16:04, a magnitude 4.3 (4.3 MB, 4.2 ML, Depth: 1.1 mi) earthquake occurred 81.5 miles away from the city center
On 11/4/1992 at 18:22:09, a magnitude 4.3 (4.3 MB, Depth: 6.2 mi) earthquake occurred 96.0 miles away from the city center
On 8/6/2007 at 08:48:40, a magnitude 4.2 (4.2 MB, 3.9 ML, Depth: 1.0 mi) earthquake occurred 86.6 miles away from Midvale center
On 6/30/1999 at 15:27:32, a magnitude 3.7 (3.5 MB, 3.7 ML, Depth: 7.3 mi, Class: Light, Intensity: II - III) earthquake occurred 16.6 miles away from the city center
Magnitude types: body-wave magnitude (MB), local magnitude (ML)
Natural disasters:

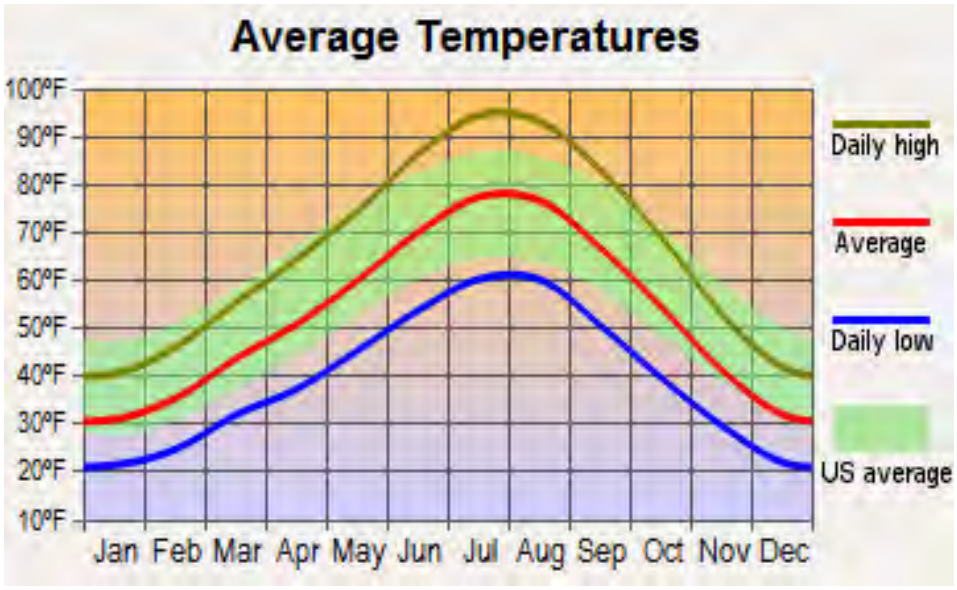
The number of natural disasters in Salt Lake County (4) is a lot smaller than the US average (12).
Major Disasters (Presidential) Declared: 2
Emergencies Declared: 1

Causes of natural disasters: Floods: 2, Landslides: 2, Storms: 2, Mudslide: 1, Fire: 1, Hurricane: 1
(Note: Some incidents may be assigned to more than one category).



Hospitals/medical centers in Midvale:
SUN BROOK HOME HEALTH, LLC (Home Health Center, 193 EAST FORT UNION BLVD, SUITE 100)
CHARTER SUMMIT HOSPITAL (Hospital, provides emergency services, 175 WEST 7200 SOUTH)
CNS COMMUNITY HOSPICE (Hospital, 6949 SOUTH HIGH TECH DRIVE)
Colleges/universities with over 2000 students nearest to Midvale:
University of Phoenix-Utah Campus (about 3 miles; Salt Lake City, UT; Full-time enrollment: 3,097)
Salt Lake Community College (about 5 miles; Salt Lake City, UT; FT enrollment: 11,080)
Western Governors University (about 5 miles; Salt Lake City, UT; FT enrollment: 15,870)
Westminster College (about 9 miles; Salt Lake City, UT; FT enrollment: 2,451)
University of Utah (about 11 miles; Salt Lake City, UT; FT enrollment: 20,534)
Utah Valley University (about 26 miles; Orem, UT; FT enrollment: 15,072)
Brigham Young University (about 29 miles; Provo, UT; FT enrollment: 30,109)
Public high schools in Midvale:
HILLCREST HIGH (Students: 1,532; Location: 7350 SOUTH 900 EAST; Grades: 10 - 12)
MIDVALE MIDDLE (Students: 795; Location: 7852 SOUTH PIONEER ST; Grades: 07 - 12)
JORDAN RESOURCE HS (Location: 332 WEST CENTER; Grades: 10 - 12)
Biggest public elementary/middle schools in Midvale:
MIDVALE SCHOOL (Students: 678; Location: 362 WEST CENTER; Grades: KG - 06)
EAST MIDVALE SCHOOL (Students: 664; Location: 6990 SOUTH 300 EAST; Grades: KG - 06)
COPPERVIEW SCHOOL (Students: 562; Location: 8449 SOUTH 150 WEST; Grades: KG - 06)
MIDVALLEY SCHOOL (Students: 560; Location: 217 EAST 7800 SOUTH; Grades: KG - 06)
PRESCHOOL (SP ED) (Students: 397; Location: 7501 SOUTH 1000 EAST; Grades: PK - KG)
PRESCHOOL (SP ED) (Students: 214; Location: 7501 SOUTH 1000 EAST; Grades: 06 - 06)
JORDAN VALLEY SCHOOL (Students: 114; Location: 7501 SOUTH 1000 EAST; Grades: KG - 12)
JORDAN RESOURCE CENTER (Students: 41; Location: 332 WEST CENTER; Grades: 05 - 12)

JORDAN RESOURCE MIDDLE (Location: 332 WEST CENTER; Grades: 06 - 09)
VALLEY MENTAL HEALTH ARTEC SOUTH (YIC) (Location: 175 WEST 7200 SOUTH; Grades: KG - 12)



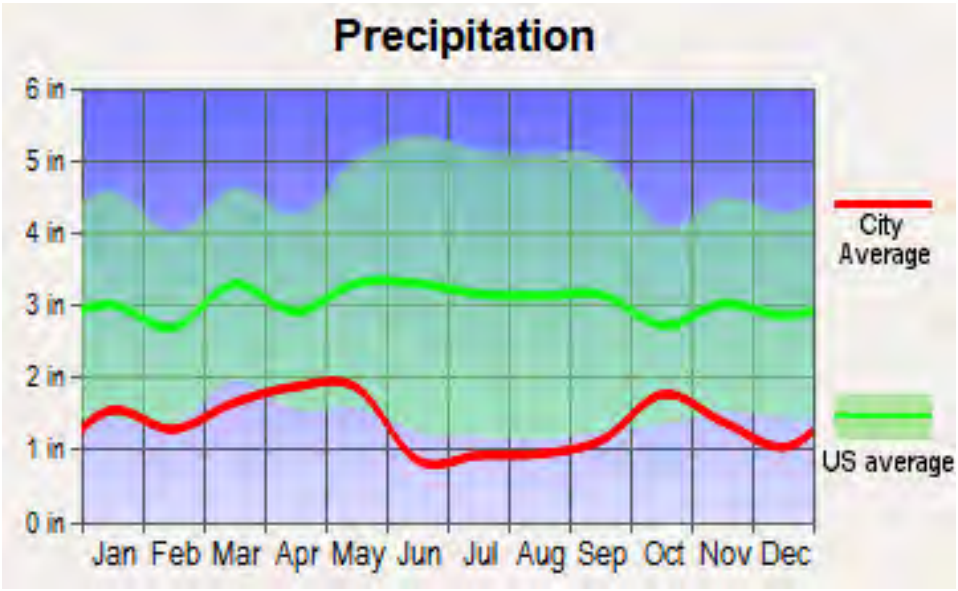


Figure 2 The City of Midvale's Average Temperatures and Precipitation

2.3 Community Facts and History

Just like the wandering Ute bands before them, Utah's Pioneer settlers began with a dependence on the land and the landscape; thus, early pioneers were quick to recognize the richness inherent in the Salt Lake Valley. They saw the abundant creeks and the grassy valley and envisioned farmlands and

fields. They discovered the minerals and ores that envisioned thriving communities of commerce and industry. They came to stay, and their mark was soon upon the landscape.

Such was the beginning of Midvale City. The eastern part of the city forming agricultural neighborhoods, and the western areas forming a mining and milling settlement, each relying on the other for sustenance, protection, social interaction and commerce. The Union Fort area of Midvale City began as a center of agriculture.

The Old Town area of Midvale City began as a center of mining and industry. Pioneer families began arriving in 1851 to start the settlement, which blossomed in the 1870s as a result of mining in Bingham Canyon and the coming of the railroad. The area was then known as Bingham Junction, and was an important midpoint along the rail between mining in Little Cottonwood Canyon to the east and Bingham Canyon to the west. With the discovery of silver in Little Cottonwood Canyon and in Bingham Canyon, new people rushed to be a part of the growing business and industry located in the middle valley in Midvale City. Along with industry came the hotels, boarding houses, saloons, schools, and the people who made Midvale City's Old Town a center of the community.

Some scenes from the mini-series "The Stand" as well as scenes from the movie "The Sandlot" were filmed in downtown Midvale, including the interior of an old fashioned drugstore by the name of Vincent Drug. The store stayed in business and retained products in packaging over 50 years old for this type of display purpose. Vincent Drug was finally shut down in 2003.

2.4 Data Sources and Limitations

Midvale City utilized the following sources to provide data for this report:

- Midvale City GIS
- Midvale City Community Development
- Midvale City General Plan
- Salt Lake County
- State of Utah
- US Census Bureau
- National Weather Service

3 Planning Process

3.1 Update Process and Participation Summary

Midvale City plans to make updates to this Hazard Mitigation Plan and defines the processes by which continued public participation will be guaranteed in the sections below.

3.1.1 Preparation of the plan – the planning process

The Midvale Hazard Mitigation Update was produced over 2 years by taking the previous Wasatch Front Hazard Mitigation Plan from 2009 and reviewing what was promised by Midvale. What the mitigation priorities were and how they have changed. The plan was produced with cooperation of the County Hazard Mitigation Specialist and in cooperation with the best practices of other jurisdiction that were shared at the many meetings that were held over the two years. Although Jess Valenzuela, the Midvale Emergency Manager was the main contact the plan was completed with the cooperation of the entire Midvale City Staff, the Public, and other agencies listed throughout this and the County's documents.

3.2 The Planning Team

Members of the Midvale City Mitigation Planning Team are listed in the table below.

Jesse Valenzuela	Midvale City Emergency Manager

Members of the Salt Lake County Mitigation Planning Team are listed in the table below.

Kate Smith	Salt Lake County Emergency Management, Mitigation Planner
Cathy Bodily	Salt Lake County Emergency Management, Grant applicant and Planner
Roger Kehr	Salt Lake County Emergency Management, Mitigation Planner
Steve Sautter	Salt Lake County Emergency Management, Public Outreach
Matt Morrison	Salt Lake County Emergency Management, Planner
Bret Fossum	Salt Lake County Emergency Management, Mitigation Planner
Val Greensides	Unified Fire Authority, administrative support
Joan Welch	Unified Fire Authority, administrative support
Clint Mecham	Unified Fire Authority
Aaron Nelson	Unified Fire Authority
Dirk Andersen	Taylorsville City
Mike Barrett	Salt Lake County Emergency Services
Brent Beardall	Salt Lake County Flood Control

Leon Berrett	Salt Lake County
Dawn Black	Cottonwood Heights
Jesse Valenzuela	Midvale City
Eldon Farnsworth	South Salt Lake City
Bob Fitzgerald	West Valley City
Sheril Garn	Riverton City
Tina Giles	Herriman City
Jeff Graviet	Salt Lake County Emergency Services
Jon Harris	Murray City
Matt Jarman	South Jordan City
Connie Jones	Bluffdale City
Scott Jones	Salt Lake Community College
Jeff King	Jordan Valley Water Conservancy District
Jesse Valenzuela	Midvale City
Bart LeCheminant	Draper City
Dustin Lewis	South Jordan City
Cory Lyman	Salt Lake City
Kade Moncur	Salt Lake County Flood Control
Reed Scharman	West Jordan City
Ben Gustafson	Taylorsville
Marty Shaub	University of Utah
Garth Smith	Draper City
Jared Smith	Midvale City
Justin Stoker	Salt Lake City Flood Control
Claire Woodman	City of Midvale

3.3 Public Meetings, Agency meetings, and Documentation

The Mitigation Planning document was discussed in a public Community Coalition where the general public is invited to attend. The meetings are held every 2 weeks.

Year	Date	Activity	Purpose
2012	September	Utah Division of Emergency Management designates Salt Lake County Emergency Management/Unified Fire Authority as sub-grantees of the state to revise the Pre Disaster Mitigation Plan.	

Year	Date	Activity	Purpose
	August 7	Memorandum of Understanding	An MOU was signed by participating jurisdictions committing to participate in the planning process.
	September-October	Phone conferences with UDEM and FEMA Region VIII to discuss the planning process, Risk MAP.	Identified planning team and available resources.
	November 7	Risk MAP Discovery, Mitigation Kickoff	Kick-off to introduce RiskMAP and Mitigation projects to reduce risk from natural hazards and increase disaster resiliency in the Jordan River Watershed/Salt Lake County
	November-December	Identifying Planning Team Members	Establish a contact person from each jurisdiction to participate in the planning process.
	December		Meeting with Salt Lake County Emergency Services to discuss cooperation with other county agencies and participation in mitigation planning process.
2013	January-May	Gather information.	Data collection.
	January 22	Mitigation Planning Team Meeting	Introduce project scope, identified team responsibilities, key terminology, requirements of the planning process, timeline.
	February 11	Mitigation Planning Team Meeting	Review of hazard maps for earthquake, landslide, and dam failure. Worksheets to gather information of areas of concern. Subject matter experts available to answer questions.
	February 27	Sandy City BCDM (Business Continuity Development Meeting)	Outreach effort, presentation/overview of mitigation plan to Sandy City business partners and emergency managers
	March 7	Salt Lake County Council of Government (COG)	Outreach presentation to elected officials to give overview of mitigation planning project.
	March 11	Mitigation Planning Team Meeting	Discussion with subject matter experts on severe weather and wildfire.

Year	Date	Activity	Purpose
	April 8	Mitigation Planning Team Meeting	Presentation on pandemic flu and wildfire public education programs.
	May 16	Mitigation Planning Team, Risk MAP Joint Meeting	Presentation of flood and earthquake risk analysis from FEMA Region VIII, presentation from UDEM regarding community Risk MAP meetings to be held over summer, Mitigation team given Capabilities Assessment worksheets and hazard matrix.
	June-Aug	Community Risk MAP Meetings and Work on Worksheets	Risk MAP representatives met with individual communities to discuss flood study needs and areas of concern.
	Sept 11	Mitigation Team Meeting	Recap of Capabilities Assessment, preparing for next stages of plan.
	Oct 21	Salt Lake County Emergency Manager's meeting	Planner reported on mitigation plan progress to emergency managers. Encouraged completion of capabilities assessment worksheets. Provided copy of 2009 mitigation strategies to review and comment on progress.
	Oct-Nov	Risk Assessment Draft and Mitigation Strategies Preparation	Planner reviewed and summarized Capabilities Assessment and Hazard worksheets. Continued Revising Risk Assessment. Summarized responses to 2009 Strategies Review.
	Nov. 19	Mitigation Planning Team Meeting-Mitigation Strategies Part II	Brainstorming meeting to begin identifying possible mitigation strategies. Hazards discussed were flood, wildfire, earthquake, and avalanche. Rough draft of Risk Assessment made available.
	Nov. 20	Planner meeting with SHMO regarding plan progress	Discussed timeline and planning progress
	December	Reviewed Mitigation Strategies.	Planner compiled notes from mitigation strategies brainstorm meeting and worksheets

Year	Date	Activity	Purpose
2014	Jan 14	Mitigation Planning Team Meeting – Mitigation Strategies Part II	Brainstorming meeting to begin identifying possible mitigation strategies. Hazards discussed were earthquake, pandemic, dams, canals, and drought.
	Feb-Mar	Mitigation Strategies Draft, Update Wildfire Risk Assessment.	Planner compiled notes from mitigation strategies brainstorm sessions, continued revision of Risk Assessment as new data became available for Wildfire.
	Apr-June	Mitigation Strategies Review	Create timeline to meet Grant requirements. Complete all elements of Plan.
	June	Review Best Practices SOG for Mitigation	Find a better system for Mitigation planning. Permission to use Salt Lake County's Mitigation SOG
	July 1	Review Progress with EM staff	Prepare Plan for submission to state and FEMA review boards
	July 14	Mitigation Planning Team Prioritization Workshop	Planning Team reviews final mitigation strategies to assign responsibility, estimate costs, and define priority
	August 8	Emergency Managers Meeting HMP explanation and scheduling	Have each individual Jurisdiction complete their plan.
	September 8-24	Emergency Managers Meeting HMP scheduling	Continue one-on-one meetings with each Jurisdiction to complete plan
	October 7	Submit final plan from each Jurisdiction	Salt Lake County to review Jurisdiction plans and assemble entire County HMP
	October 15	Submit Mitigation Plan to State	State Submission requirement prior to FEMA submission
	November 1	State returns Mitigation Plan for submission to FEMA	Submit Final Plan to FEMA for approval
	November 15	FEMA returns plan for corrections	Correct deficiencies
	November 20	Submit Final Plan to FEMA	Plan complete

Table 3-8 Planning Process Timeline

3.3.1 Other Agencies involved in the planning process

As shown in the calendar and in the list below there was ample opportunity for participation in the plan by neighboring communities, agencies who specialize in hazard mitigation, and agencies that are involved with new development in Midvale.

Team Support
Kevin Barjenbruch, National Weather Service
Justin Stoker, Jordan River Commission
Steve Bowman, Utah Geological Survey
Greg McDonald, Utah Geological Survey
Tyre Holfeltz, FFSL
Jeff King, Jordan Valley Water Conservancy District
Steve Bowman, Utah Geological Survey
Jessica Castleton, Utah Geological Survey
Tyre Holfeltz, Utah Forestry, Fire and State Lands
Riley Pilgrim, Unified Fire Authority
Dave Marble, Utah Division of Dam Safety
Brad Bartholomew, Utah Division of Emergency Management
Katie LeLaCheur, Utah DEM
Eric Martineau, Utah DEM
Amisha Lester, Utah DEM
John Crofts, Utah DEM
Julie Baxter, FEMA Region VIII
Shelby Hudson, FEMA Region VIII
Sean McNabb, FEMA Region VIII

3.4 Multi-Jurisdictional Planning

Midvale City has been in contact with Salt Lake County and representatives from the county attended the meeting that was held on October 30, 2014 with key members of Midvale City. The City's designated Emergency Manager has attended the monthly Salt Lake County Emergency Manager's meetings where information has been dispersed regarding the Mitigation Planning Process. Some of the information from Salt Lake County's plan has been included in this plan.

3.5 Incorporation of existing plans and technical information

The Midvale plan relied heavily on technical information provided by the County and the Federal government in working on hazards to mitigate. The Flood Map and Risk Map processes were used extensively to document areas at risk. The Midvale Building department and code enforcement departments have incorporated this data into codes to insure that new development is not placed in areas with unacceptable hazard potential.

3.6 Plan review, Evaluation, and Implementation

- The plan was revised to reflect changes in development since the 2009 Wasatch Front Plan
- The mitigation strategies have changed as those of 2009 have been accomplished.

3.6.1 Hazard: Drought

Problem Identification: Salt Lake County is currently in the fifth year of drought conditions. Measures must be taken to conserve and address water shortages for both culinary and agricultural use.

Goal 1: Reduce hardships associated with water shortages.

Objective 1.1: Priority HIGH, Limit unnecessary consumption of water throughout the County.
Action: Continue to encourage water conservation utilizing and promoting Jordan Valley Water Conservation outreach material with each City in the County.
Status: Accomplished with "Slow the Flow Program".

Objective 1.3: Priority Low, Encourage the development of secondary water systems.
Action: Coordinate with current water systems and develop and secondary waters systems plan for drought.
Status: Not Planned on being Accomplished.

Goal 2: Reduce the amount of fuels that can impact residential homes in urban wild land interface areas.

Objective 2.1: Priority Low, Study the areas and determine which fire resistant natural vegetation can be used in these areas of concern.
Action: Develop outreach document specific to fire resistant natural vegetation.
Status: Accomplished through "Firewise Program" only along the Jordan River.

3.6.2 Hazard: Earthquake

Problem Identification: Numerous geologic hazards exist in the Salt Lake City metropolitan area, which can constrain land use. Active fault zones pose the threat of earthquakes, while steep mountains adjacent to the city create a potential for landslides, debris flows, rock falls, and snow avalanches. Streams and the fluctuating level of the Great Salt Lake create serious flood and ground-water problems. Considered as a whole, geologic hazards in the Salt Lake City metropolitan area confront planners with a variety of safety and economic issues that must be addressed before wise development can take place. Limited communication or lack of communication capabilities is always a shortfall during an emergency.

Goal 1: Increase and harden emergency and non-emergency communication systems.

Objective 1.1: Priority HIGH, Provide redundancies in countywide communication systems.
Action: Assess current countywide communications and interoperable emergency/warning systems.
Status: Ongoing. Valley Emergency Communications Center (VECC) has been working with cities in the county to update communications, focusing on specific systems, which has included some or all of the following capabilities:

- ***Radio system updated for 800 MHz, Ultra-High Frequency (UHF), Very High Frequency (VHF) and Amateur frequencies.***
- ***Agency listing with gateway devices which enable disparate communications systems to link.***
- ***VECC paging server capability to text message multiple units/personnel.***
- ***Listing of Public Safety Satellite telephones in the County.***
- ***VECC Dialogic Emergency Notification System, a reverse 911 system used to notify public or for notification of response agencies.***
- ***Promoting narrow banding compliance prior to 2013 deadline.***
- ***Salt Lake City is seeking grant funding to build and deploy communications trailer.***

Objective 1.2: Priority HIGH Ensure adequate coordination of disaster response and recovery activities.
Action: Assess EOC's (countywide).
Status: Ongoing. The County completed FEMA's Capability Gap Assessment in 2007.

Goal 2: Countywide earthquake loss reduction and safety education.

Objective 2.1: Priority MEDIUM, Provide information on earthquake potential effects to homeowners and developers.
Action: Update current earthquake maps (liquefaction and fault) and incorporated into the County GIS system.
Status: Accomplished. The information was updated by the Utah Geological Survey and provided to the County by request. Portions are available in the Statewide Geographic Database rather

than on County GIS. The Central Utah Water Conservancy District has developed GIS based maps of the Red Butte Dam area in northeastern Salt Lake County that identifies earthquake hazards from ground shaking (peak ground acceleration), fault rupture, liquefaction, and landslides for both the 500 year and 2,500 year seismic events.

Objective 2.2: Priority HIGH, Improve public education regarding earthquake risks to improve quality of construction.
Action: Ensure current natural hazard ordinance(s) are online, linked to Emergency Services website, and easily accessible and can be download.
Status: Ongoing. County ordinances are available online and can be downloaded. However, the County website is not easily searchable to locate relevant ordinances and there needs to be a link established from the Emergency Management website to the County Clerk website.

3.6.3 Hazard: Flooding

Problem Identification: Although located in a semi-arid region, Midvale is subject to cloudburst and snowmelt floods.

Goal 1: Protection of life and property before, during, and after a flooding event.

Objective 1.1: Priority MEDIUM, Encourage 100% participation in the National Flood Insurance Program
Status: Ongoing.

Objective 1.2: Priority MEDIUM Provide current FIRMs for emergency planners.
Action: Update & digitize floodplain maps.
Status: Ongoing. Floodplain maps have been digitized but have not been completely updated.

Objective 1.3: Priority High Cleaning out sediment and retention basins.
Action: Continuous.
Status: Ongoing.

3.6.4 Hazard: Severe Weather

Problem Identification: Snowstorms over northern Utah have a dramatic effect on regional commerce, transportation, and daily activity and are a major forecast challenge for local meteorologists.

Goal 1: Reduce the threat of life loss due to severe weather.

Objective 1.1: Priority LOW, Become National Weather Service (NWS) “Storm Ready Community”.
Action: Contact NWS/SLC Office and begin process of becoming a Storm Ready Community.

Status: Accomplished. County, Salt Lake City, and Sandy participate in the program. Other cities qualify as participating under the County.

Objective 1.2: Priority LOW, Improve response times to severe weather alerts.
Action: Incorporate NWS on light boards on freeway system.
Status: Accomplished. The NWS and the Utah Department of Transportation cooperate to provide this information.

Objective 2.1: Priority LOW, Address Countywide needs of special populations that may be impacted by severe weather conditions.
Action: Create outreach materials (what to do when severe weather strikes) specific to this group and insert the information into countywide phone books, and phone books specific to 55+ age group developed in County Aging services.
Status: Accomplished.
Action: Encourage avalanche preparedness for county backcountry users.
Status: Accomplished. The County participates with the Utah Avalanche Forecast Center to provide this information.

Objective 2.2: Priority MEDIUM, Prevent damage to critical facilities.
Action: Assess EOCs to ensure they are grounded lightning, to include buildings with towers, etc.
Status: Ongoing. The County Emergency Operations Center (EOC) and VECC have been surge protected. County is unsure of the status of other critical facilities.

- The mitigation plans have been revised based on growth in the city and changing priorities and problems since 2009.

4.1 Historical Hazard Events

The following are recent hazard events that have impacted Midvale City:

- **None**

4.2 Hazard Analysis

Please refer to the County HMP Plan for a general description of hazards that affect Midvale. The following hazards ARE expected to occur sometime in the future:

- Avalanche
- Dam Failure
- Drought
- Earthquake
- Flood
- Infestation
- Landslide and Problem Soils

- Pandemic
- Radon
- Severe weather
- Wildfire

	Avalanche	Dam Failure	Drought	Earthquake	Flood	Infestation	Landslide	Pandemic	Problem Soils	Radon	Severe Weather	Wildfire
Midvale	N/A	N/A	Low	High	Low	N/A	N/A	Low	High	Low	Low	Low

4.3 – Development Audit

Comprehensive Plan	Yes	No
Land Use	Yes	No
1. Does the future land-use map clearly identify natural hazard areas?	X	
2. Do the land-use policies discourage development or redevelopment within natural hazard areas?	X	
3. Does the plan provide adequate space for expected future growth in areas located outside natural hazard areas?	X	
Transportation	Yes	No
1. Does the transportation plan limit access to hazard areas?	X	
2. Is transportation policy used to guide growth to safe locations?	X	
3. Are movement systems designed to function under disaster conditions (e.g., evacuation)?	X	
Environmental Management	Yes	No
1. Are environmental systems that protect development from hazards identified and mapped?	X	

Comprehensive Plan	Yes	No
2. Do environmental policies maintain and restore protective ecosystems?	X	
3. Do environmental policies provide incentives to development that is located outside protective ecosystems?	X	
Public Safety	Yes	No
1. Are the goals and policies of the comprehensive plan related to those of the FEMA Local Hazard Mitigation Plan?	X	
2. Is safety explicitly included in the plan's growth and development policies?	X	
3. Does the monitoring and implementation section of the plan cover safe growth objectives?	X	

Zoning Ordinance	Yes	No
1. Does the zoning ordinance conform to the comprehensive plan in terms of discouraging development or redevelopment within natural hazard areas?	X	
2. Does the ordinance contain natural hazard overlay zones that set conditions for land use within such zones?	X	
3. Do rezoning procedures recognize natural hazard areas as limits on zoning changes that allow greater intensity or density of use?	X	
4. Does the ordinance prohibit development within, or filling of, wetlands, floodways, and floodplains?	X	
Subdivision Regulations	Yes	No
1. Do the subdivision regulations restrict the subdivision of land within or adjacent to natural hazard areas?	X	
2. Do the regulations provide for conservation subdivisions or cluster subdivisions in order to conserve environmental resources?	X	
3. Do the regulations allow density transfers where hazard areas exist?		X
	NA	
Capital Improvement Program and Infrastructure Policies	Yes	No
1. Does the capital improvement program limit expenditures on projects that would encourage development in areas vulnerable to natural hazards?		
	UKN	
2. Do infrastructure policies limit extension of existing facilities and services that would encourage development in areas vulnerable to natural hazards?		X
3. Does the capital improvement program provide funding for hazard mitigation projects identified in the FEMA Mitigation Plan?	X	
Other	Yes	No
1. Do small area or corridor plans recognize the need to avoid or mitigation natural hazards?	X	
2. Does the building code contain provisions to strengthen or elevate construction to withstand hazard forces?	X	

Zoning Ordinance	Yes	No
3. Do economic development or redevelopment strategies include provisions for mitigation natural hazards?	X	
4. Is there an adopted evacuation and shelter plan to deal with emergencies from natural hazards?	X	

4.4 – National Flood Insurance Program (NFIP)

NFIP TOPIC	SOURCE OF INFORMATION	COMMENTS
Insurance Summary		
How many NFIP policies are in the community? What is the total premium and coverage?	State NFIP Coordinator or FEMA NFIP Specialist	
How many claims have been paid in the community? What is the total amount of paid claims? How many of the claims were for substantial damage?	FEMA NFIP or Insurance Specialist	
How many structures are exposed to flood risk within the community?	Community Floodplain Administrator	
Describe any areas of flood risk with limited NFIP policy coverage	Community FPA and FEMA Insurance Specialist	
Staff Resources		
Does the community have a dedicated Floodplain Manager or NFIP Coordinator?	Floodplain Administrator	
Is the Floodplain Manager or NFIP Coordinator certified?		
Is floodplain management an auxiliary function?	Floodplain Administrator	
Provide an explanation of NFIP administration services (e.g., permit review, GIS, education or outreach, inspections, engineering capability)	Floodplain Administrator	
What are the barriers to running an effective NFIP program in the community, if any?	Floodplain Administrator	
Compliance History		
Is the community in good standing with the NFIP?	State NFIP Coordinator, FEMA NFIP Specialist, community records	
Are there any outstanding compliance issues (i.e., current violations)?		
When was the most recent Community Assistance Visit (CAV) or Community Assistance Contact (CAC)?		
Is a CAV or CAC scheduled or needed?		
Regulation		

NFIP TOPIC	SOURCE OF INFORMATION	COMMENTS
When did the community enter the NFIP?	Community Status Book http://www.fema.gov/national-flood-insurance-program/national-flood-insurance-program-community-status-book	
Are the FIRMs digital or paper?	Floodplain Administrator	
Does the Floodplain Ordinance meet or exceed FEMA or State minimum requirements? If so, in what ways?	Floodplain Administrator	
Provide an explanation of the permitting process and include a copy of floodplain permit.	Community FPA, State, FEMA NFIP Flood Insurance Manual http://www.fema.gov/flood-insurance-manual Community FPA, FEMA CRS Coordinator, ISO representative CRS manual http://www.fema.gov/library/viewRecord.do?id=2434	
Community Rating System (CRS)		
Does the community participate in CRS?	Community FPA, State, FEMA NFIP	
What is the community's CRS Class Ranking?	Flood Insurance Manual http://www.fema.gov/flood-insurance-manual	
What categories and activities provide CRS points and how can the class be improved?		
Does the plan include CRS planning requirements	Community FPA, FEMA CRS Coordinator, ISO representative CRS manual http://www.fema.gov/library/viewRecord.do?id=2434	

Midvale City does not have any repetitive flood loss claims identified under the National Flood Insurance Program (NFIP).

The City's Community Development Director oversees enforcement of floodplain management requirements adopted by the City, including regulating new construction in Special Flood Hazard Areas (SFHAs); Floodplain identification and mapping, including any local requests for map updates; and Description of community assistance and monitoring activities.

5 Vulnerability Assessment

This vulnerability assessment analyzes the population, property, and other assets at risk to hazards.

5.1 Assets at Risk

This section considers Midvale's assets at risk, including values at risk, critical facilities and infrastructure, economic assets, and growth and development trends.

Values at Risk

Table 4 shows the 2014 assessed property data from the State of Utah for Midvale City and includes data for the portions of Midvale in Salt Lake County.

Midvale City	*Real Property Value*	*Personal Property Value*	*Central Assessed Value*	*Total*
TBD				

Table 4. Assessed Property Value Data for Midvale City

Critical Facilities and Infrastructure

A critical facility may be defined as one that is essential in providing utility or direction either during the response to an emergency or during the recovery operation. Essential facilities are those that if damaged would have devastating impacts on disaster response and recovery. High potential loss facilities are those that would have a high loss or impact on the community. Transportation and lifeline facilities are the third category.

Essential Facilities

Figure 12 shows essential facilities that are located within Midvale.

Name of Facility	Address	City
TBD		

Figure 12. Essential Facilities Midvale City

High Potential Loss Facilities

High potential loss facilities as identified by FEMA HAZUS-MH are located throughout Midvale. Midvale works closely other government entities and private property owners in monitoring and assessing facilities that fall into this category that are not owned by the City.

Transportation and Lifeline Facilities

Transportation and lifeline facilities are located within the boundaries of Midvale. I-15 is the major freeway thoroughfare through Midvale that runs north to south through the State of Utah. There are major freight and a passenger rail lines that goes through the City near its west boundary that are used by the Union Pacific Railroad and the Utah Transit Authority. There are two major high-pressure gas lines operated by Questar that are located on the west and east sides of the City. The Salt Lake Aqueduct also resides in the City and is operated by the Metropolitan Water District.

5.1.1– Hazard Descriptions Summary

Hazard	Location (Geographic Area Affected)	Maximum Probable Extent (Magnitude/Strength)	Probability of Future Events	Overall Significance Ranking
Avalanche	N	Weak	Unlikely	Low
Dam Failure	N	Weak	Unlikely	Low
Drought	L	Medium	0	Medium
Earthquake	Significant	Significant	High	High
Problem Soils	Significant	Severe	Low	High
Severe Weather	Low	Medium	0	Medium
Flood	Low	Medium	0	Low
Landslide	N	Weak	Unlikely	Low
Wildfire	N	Weak	Unlikely	Low

Definitions for Classifications

Location (Geographic Area Affected)

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

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

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

Hazard	Scale / Consideration	Limited	Moderate	Severe	Extreme
Drought	Palmer Drought Severity Index[7]	-1.99 to +1.99	-2.00 to -2.99	-3.00 to -3.99	-4.00 and below
Earthquake	Modified Mercalli Scale[8]	I to IV	V to VII	VII	IX to XII
	Richter Magnitude[9]	2, 3	4, 5	6	7, 8
Hurricane Wind/ Storm Surge	Saffir-Simpson Hurricane Wind Scale[10]	1	2	3	4, 5
Tornado	Fujita Tornado Damage Scale[11]	F0	F1, F2	F3	F4, F5

Probability of Future Events

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

Overall Significance

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

5.1.2 – Goals to reduce long-term vulnerabilities

The following plan goals and objectives of the Mitigation plan were maintained from the WFRC plan. These include reducing the risk from natural hazards in Salt Lake County through coordinating with all local governments to develop a countywide planning process. They are shown from highest to lowest priority.

1. Protect life safety.

[1] Cumulative meteorological drought and wet conditions: http://ncdc.noaa.gov/

[2] Earthquake intensity and effect on population and structures: http://earthquake.usgs.gov

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

[4] Hurricane rating based on sustained wind speed: http://nhc.noaa.gov

[5] Tornado rating based on wind speed and associated damage: http://spc.noaa.gov

2. Eliminate and/or reduce property damage.
3. Promote public awareness through education about community hazards and mitigation measures.
4. Protect emergency response services and capabilities, critical infrastructure, critical facilities, communication and warning systems, mobile resources, and other lifelines.
5. Ensure government continuity
6. Protect the cultural fabric of the community, including cultural resources, developed property, homes, businesses, industry, education and other institutions.
7. Combine hazard loss reduction efforts with other environmental, social and economic needs of the community.
8. Preserve and/or restore natural features, natural resources and the environment.
9. Eliminate or reduce long-term risk to human life and property.
10. Aid private and public sectors in understanding the risks they may be exposed to and identify mitigation strategies to reduce those risks.
11. Avoid risk of exposure to natural and technological hazards.
12. Minimize the impacts of risks that cannot be avoided.
13. Mitigate the impacts of damage as a result of identified hazards.
14. Accomplish mitigation strategies in such a way that negative environmental impacts are minimized.
15. Provide a basis for prioritizing and funding mitigation projects.
16. Establish a countywide platform to enable the community to take advantage of shared goals and resources.

Objectives

The following objectives are meant to serve as a measure upon which individual hazard mitigation strategies can be evaluated. These objectives become especially important when two or more projects are competing for limited resources.

1. Address a repetitive problem, or one that has the potential to have a major impact on an area or population.
2. Identify persons, agencies or organizations responsible for implementation.
3. Identify a time frame for implementation.
4. Explain how the project will be financed including the conditions for financing and implementation (as information is available).
5. Identify alternative measures, should financing not be available.
6. Be consistent with, support, and help implement the goals and objectives of hazard mitigation plans already in place.
7. Significantly reduce potential damages to public and/or private property and/or reduce the cost of state and federal recovery for future disasters.
8. Are practical, cost-effective and environmentally and politically sound after consideration of the options.
9. Can meet applicable permit requirements.
10. Benefits should outweigh the costs.

11. Have manageable maintenance and modification costs.
12. Accomplish multiple objectives when possible.
13. Should be implemented using existing resources, agencies and programs when possible.

5.2 Previous Occurrences of Hazardous Events

None

5.3 Regulatory Mitigation Capabilities

Table 5 lists regulatory mitigation capabilities, including planning and land management tools.

Planning and Regulatory

Plans	Yes/No Year	Does the plan address hazards? Does the plan identify projects to include in the mitigation strategy? Can the plan be used to implement mitigation actions?
Comprehensive/Master Plan	Yes X	No
Capital Improvements Plan	Yes X	No
Economic Development Plan	Yes X	No
Local Emergency Operations Plan	Yes X	Yes
Continuity of Operations Plan	No	No
Transportation Plan	Yes	No
Stormwater Management Plan	Yes	No
Community Wildfire Protection Plan	No	No
Other special plans (i.e., brownfields redevelopment, disaster recovery, coastal zone management, climate change adaptation)	Yes	Environmental Hazards & Peripheral Hazards

Building Code, Permitting, and Inspections	Yes/No	Are codes adequately enforced?
Building Code	Yes	Version/Year: Inadequate
Building Code Effectiveness Grading Schedule (BCEGS) Score	Ukn	Score:
Fire department ISO rating	Ukn	Rating:
Site plan review requirements	Yes	Yes
Land Use Planning and Ordinances	**Yes/No**	**Is the ordinance an effective measure for reducing hazard impacts? Is the ordinance adequately administered and enforced?**
Zoning ordinance	No	Codes already incorporate these hazards
Subdivision ordinance	No	Codes already incorporate these hazards
Floodplain ordinance	No	Codes already incorporate these hazards
Natural hazard specific ordinance (stormwater, steep slope, wildfire)	No	Codes already incorporate these hazards
Flood insurance rate maps	Yes	Codes already incorporate these hazards
Acquisition of land for open space and public recreation uses	Yes	Codes already incorporate these hazards
Other		
How can these capabilities be expanded and improved to reduce risk?		

Administrative and Technical

Administration	Yes/No	Describe capability Is coordination effective?
Planning Commission	Yes	None
Mitigation Planning Committee	No	
Maintenance programs to reduce risk, e.g., tree trimming, clearing drainage systems	Yes	Vacuum trucks, backhoes, loaders, TV capability for pipes, snow removal
Mutual aid agreements	Yes	With fire police public works and inspectors
Staff	**Yes/No FT/PT12**	**Is staffing adequate to enforce regulations? Is staff trained on hazards and mitigation? Is coordination between agencies and staff effective?**
Chief Building Official	Yes FT	
Floodplain Administrator	Yes FT	
Emergency Manager	Yes FT	
Community Planner	Yes FT	
Civil Engineer	Yes FT	
GIS Coordinator	Yes FT	
Other	Yes FT	Inspectors and Public Works Staff

[7] Full-time (FT) or part-time (PT) position

Technical	Yes/No	Describe capability Has capability been used to assess/mitigate risk in the past?
Warning systems/services (Reverse 911, outdoor warning signals)	Yes	VECC and been done through group callouts
Hazard data and information	Yes	Maps and Hazus
Grant writing	Yes	EM writes the grants along with contractors
Hazus analysis	Yes	
Other		

How can these capabilities be expanded and improved to reduce risk?
Improvement of GIS equipment and programs

Financial

Funding Resource	Access/ Eligibility (Yes/No)	Has the funding resource been used in past and for what type of activities? Could the resource be used to fund future mitigation actions?
Capital improvements project funding	Yes	
Authority to levy taxes for specific purposes	Yes	
Fees for water, sewer, gas, or electric services	Yes	
Impact fees for new development	Yes	
Storm water utility fee	Yes	
Incur debt through general obligation bonds and/or special tax bonds	No	
Incur debt through private activities	No	
Community Development Block Grant	Yes	
Other federal funding programs	Yes	
State funding programs	Yes	
Other		

How can these capabilities be expanded and improved to reduce risk?

Education and Outreach

Program/Organization	Yes/No	Describe program/organization and how relates to disaster resilience and mitigation? Could the program/organization help implement future mitigation activities?
Local citizen groups or non-profit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc.	Yes	Citizen Corp, Cert, Multi- Ethics
Ongoing public education or information program, e.g., responsible water use, fire safety, household preparedness, environmental education.	Yes	Facebook, Twitter, Newsletters
Natural disaster or safety related school programs	Yes	UFA SafeSchool
StormReady certification	No	
Firewise Communities certification	Yes	UFA
Public-private partnership initiatives addressing disaster-related issues	Yes	Engineering group, Cardwell fuel
Other	Yes	Snow removal program
How can these capabilities be expanded and improved to reduce risk?		
Use the newsletter for public posting of other issues. Preparedness tips, Utopia fiber optics		

5.4 Mitigation Prioritization

Mitigation plans will be prioritized based on several factors:

- Availability of Funds
- Implementation ability with ongoing projects
- Benefit – Cost ratio
- Public input
- Other miscellaneous information that when it becomes available will make certain mitigation plans a high priority.

6 Mitigation Strategy

6.1 Mitigation Actions

6.1.1 Mitigation Action Evaluation and Prioritization

- 1= Highly effective or feasible
- 0=Neutral
- -1=Ineffective or not feasible

Example Evaluation Criteria

1. Life Safety – How effective will the action be at protecting lives and preventing injuries?
2. Property Protection – How significant will the action be at eliminating or reducing damage to structures and infrastructure?
3. Technical – Is the mitigation action technically feasible? Is it a long-term solution? Eliminate actions that, from a technical standpoint, will not meet the goals.
4. Political – Is there overall public support for the mitigation action? Is there the political will to support it?
5. Legal – Does the community have the authority to implement the action?
6. Environmental – What are the potential environmental impacts of the action? Will it comply with environmental regulations?
7. Social – Will the proposed action adversely affect one segment of the population? Will the action disrupt established neighborhoods, break up voting districts, or cause the relocation of lower income people?
8. Administrative – Does the community have the personnel and administrative capabilities to implement the action and maintain it or will outside help be necessary?
9. Local Champion – Is there a strong advocate for the action or project among local departments and agencies that will support the action's implementation?
10. Other Community Objectives – Does the action advance other community objectives, such as capital improvements, economic development, environmental quality, or open space preservation? Does it support the policies of the comprehensive plan?

6.1.2 Actions taken on mitigation strategies proposed in the 2009 Wasatch Front Mitigation Plan

2009 Mitigation Strategies Progress and Summary

The following mitigation strategies were formulated by the Salt Lake County Mitigation Strategies Working Group for inclusion in the 2009 *Wasatch Front Region Natural Hazard Pre-Disaster Mitigation Plan*, which was adopted by the City of Midvale on October 6, 2009. The following summary highlights the City of Midvale efforts to implement those goals where applicable and practical as part of the County's overall mitigation planning efforts.

Category	Goal / Objective	Action	Status	Comments
All Hazards	1 – Improve and maintain communications capabilities for emergency operations 1.1 – Improve communication capabilities	1 – Conduct an inventory and assessment of communications equipment and systems and identify needs	Complete	
All Hazards	1 – Improve and maintain communications capabilities for emergency operations 1.1 – Improve communication capabilities	2 – Conduct Training and awareness activities on communication equipment, tools, and systems	Complete	
All Hazards	1 – Improve and maintain communications capabilities for emergency operations 1.1 – Improve communication capabilities	3 – Establish agreements to share communications equipment between agencies involved in emergency operations	Complete	
All Hazards	1 – Improve and maintain communications capabilities for emergency operations 1.1 – Improve communication capabilities	4 – Establish notification capabilities and procedures for emergency personnel	Complete	Revising
All Hazards	1 – Improve and maintain communications capabilities for emergency operations 1.2 – Maintain communications capabilities for critical facilities	1 – Evaluate vulnerability of critical communications systems	Complete	Revising
All Hazards	1 – Improve and maintain communications capabilities for emergency operations 1.2 – Maintain communications capabilities for critical facilities	2 – Establish redundancy for dispatch centers and other critical communications	Relevant	
All Hazards	1 – Improve and maintain communications capabilities for emergency operations 1.3 – Conduct communications Strategic Planning	1 – Establish a coordinating group to address long-term communication needs and implementation strategies	Complete	

Category	Goal / Objective	Action	Status	Comments
All Hazards	1 – Improve and maintain communications capabilities for emergency operations 1.3 – Conduct communications Strategic Planning	2 – Acquire, upgrade, and/or integrate communications equipment and systems as determined by coordinating group	Incomplete	Seeking new revenue & Funding
All Hazards	2 – Improve awareness and analysis of hazards 2.1 – Improved Quality and Access to digital geographic (GIS) hazards data	1 – Establish a coordinating group to address geographic data issues	Complete	Contract Company
All Hazards	2 – Improve awareness and analysis of hazards 2.1 – Improved Quality and Access to digital geographic (GIS) hazards data	2 – Examine current data availability and sharing capabilities, evaluate needs, and identify shortcomings	Complete	"
All Hazards	2 – Improve awareness and analysis of hazards 2.1 – Improved Quality and Access to digital geographic (GIS) hazards data	3 – Update and expand data on hazards, critical facilities, and critical infrastructure according to assessed needs	Complete	"
All Hazards	2 – Improve awareness and analysis of hazards 2.1 – Improved Quality and Access to digital geographic (GIS) hazards data	4 – Provide centralized access to geographic data to emergency planners and responders	Complete	"
All Hazards	2 – Improve awareness and analysis of hazards 2.2 – Improve and expand hazard monitoring capabilities	1 – Integrate existing hazard monitoring networks in emergency operations centers. Utilize sensors such as weather stations, stream gages, seismograph stations, road conditions, etc.	Complete	Revisions
All Hazards	2 – Improve awareness and analysis of hazards 2.2 – Improve and expand hazard monitoring capabilities	2 – Identify and implement additional hazard monitoring capabilities.	Complete	Revisions
All Hazards	3 – Ensure critical facilities can sustain operations for emergency response and recovery 3.1 – Prevent damage to critical facilities and infrastructure	1 – Utilize GIS to identify facilities and infrastructure at risk	Complete	Contract company

Category	Goal / Objective	Action	Status	Comments
All Hazards	3 – Ensure critical facilities can sustain operations for emergency response and recovery 3.1 – Prevent damage to critical facilities and infrastructure	2 – Assess critical facilities for hazard exposure, structural weaknesses, power, communications and equipment resources and redundancy, and adequate emergency procedures	Complete	Contract company
All Hazards	3 – Ensure critical facilities can sustain operations for emergency response and recovery 3.1 – Prevent damage to critical facilities and infrastructure	3 – Implement improvements to address identified in assessment	Complete	Contract company
All Hazards	4 – Improve response capabilities through mutual-aid agreements 4.1 – Utilize mutual-aid agreements in accordance with National Incident Management System (NIMS) requirements	1 – Compile inventory of mutual-aid agreements and memoranda of understanding (MOU) and identify deficiencies	Complete	Contract company
All Hazards	4 – Improve response capabilities through mutual-aid agreements 4.1 – Utilize mutual-aid agreements in accordance with National Incident Management System (NIMS) requirements	2 – Pursue and implement needed mutual-aid agreements	Complete	Contract company
All Hazards	5 – Increase citizen safety through improved hazard awareness 5.1 – establish a comprehensive public education program	1 – Provide education regarding all natural hazards through live trainings, as well as web-based, print and broadcast media	Relevant	
All Hazards	5 – Increase citizen safety through improved hazard awareness 5.1 – Establish a comprehensive public education program	2 – Incorporate information about cascading effects of hazards in education programs	Relevant	
All Hazards	5 – Increase citizen safety through improved hazard awareness 5.1 – Establish a comprehensive public education program	3 – Develop education programs to target specific groups including homeowners, developers, schools and people with special needs	Relevant	Emergency Manager

Category	Goal / Objective	Action	Status	Comments
All Hazards	5 – Increase citizen safety through improved hazard awareness 5.1 – Establish a comprehensive public education program	4 – Utilize maps and similar products on County EM website and other media to educate public on areas at risk to hazards	Relevant	Engineering
All Hazards	5 – Increase citizen safety through improved hazard awareness 5.1 – Establish a comprehensive public education program	5 – Coordinate with existing public education programs such as the American Red Cross, Utah Living with Fire, be Ready Utah, the National Weather Service, etc.	Relevant	In revision by EM
All Hazards	6 – Improve public safety through preventative regulations 6.1 – Minimize hazard impacts through the adoption of appropriate prevention measures	1 – Establish and enforce appropriate planning, zoning, and building code ordinances	Relevant	Revising plan
All Hazards	6 – Improve public safety through preventative regulations 6.1 – Minimize hazard impacts through the adoption of appropriate prevention measures	2 – Ensure current hazard ordinances are available for viewing online	Incomplete	Revising
Dam Failure	1 – Include dam failure inundation in future County and City planning efforts 1.1 – Review current State dam safety information on all identified high hazard dams in the County	1 – Include dam inundation maps in current County, City and Special Service District Emergency Operations Plans	Not relevant	
Dam Failure	1 – Include dam failure inundation in future County and City planning efforts 1.1 – Review current State dam safety information on all identified high hazard dams in the County	2 – Utilize inundation maps to identify potential evacuation areas and routes	Relevant	Emergency Manager
Drought	1 – Reduce and prevent hardships associated with water shortages 1.1 – Limit unnecessary consumption of water throughout the County	1 – Continue to encourage water conservation utilizing and promoting outreach material from all water districts in the County	Relevant	Water Department

Category	Goal / Objective	Action	Status	Comments
Drought	1 – Reduce and prevent hardships associated with water shortages 1.1 – Limit unnecessary consumption of water throughout the County	2 – Emergency Managers will coordinate with local water districts/public utilities to support ongoing conservation efforts	Relevant	Revising plan
Drought	1 – Reduce and prevent hardships associated with water shortages 1.1 – Limit unnecessary consumption of water throughout the County	3 – Investigate feasibility of implementing an incentive program to encourage the use of low-flow appliances and fixtures in homes and businesses	Relevant	EM and Water department
Drought	1 – Reduce and prevent hardships associated with water shortages 1.1 – Limit unnecessary consumption of water throughout the County	4 – Implement water-saving devices and practices in public facilities	Relevant	Water Department
Drought	1 – Reduce and prevent hardships associated with water shortages 1.1 – Limit unnecessary consumption of water throughout the County	5 – Repair, maintain and improve water distribution infrastructure to prevent loss from leakage, breaks, etc.	Relevant	Water and Sewer Dept.
Drought	1 – Reduce and prevent hardships associated with water shortages 1.1 – Limit unnecessary consumption of water throughout the County	6 – Coordinate public safety water use, such as hydrant testing	Relevant	Water and EM Public Education campaign
Drought	1 – Reduce and prevent hardships associated with water shortages 1.1 – Limit unnecessary consumption of water throughout the County	7 – Provide information on landscaping alternatives for persons subject to green area requirements	Relevant	City mission
Drought	1 – Reduce and prevent hardships associated with water shortages 1.2 – Address agricultural water shortages in the County	1 – Set up livestock water rotation in areas of agricultural use	Not relevant	
Drought	1 – Reduce and prevent hardships associated with water shortages 1.3 – Encourage development of secondary water systems	1 – Coordinate with water districts to plan for, develop and/or expand secondary water	Complete	Water Districts MOU

Category	Goal / Objective	Action	Status	Comments
Earthquake	1 – Reduce earthquakes losses to infrastructure 1.1 – Encourage retrofit and rehabilitation of highly susceptible infrastructure	1 – Identify structures at risk to earthquake damage	Complete	Building department
Earthquake	1 – Reduce earthquakes losses to infrastructure 1.1 – Encourage retrofit and rehabilitation of highly susceptible infrastructure	2 – Research feasibility of an incentive program for retrofitting privately-owned buildings, particularly unreinforced masonry	Incomplete	Redevelopment planning
Earthquake	1 – Reduce earthquakes losses to infrastructure 1.1 – Encourage retrofit and rehabilitation of highly susceptible infrastructure	3 – Complete seismic rehabilitation/retrofitting projects of public buildings at risk	Incomplete	Planning on going
Earthquake	1 – Reduce earthquakes losses to infrastructure 1.2 – Improve public education regarding earthquake risks to unreinforced masonry buildings	1 – Provide educational materials to unreinforced masonry home and business owners	Relevant	Building Dept. educating business' home owners
Earthquake	1 – Reduce earthquakes losses to infrastructure 1.3 – Improve Seismic Hazard understanding and seismic resistance of CUWCD Red Butte Dam in Salt Lake County.	1 – Procure Engineering Consultant to perform the nonstructural design and geotechnical assessment and review.	Relevant	Engineering
Flooding	1 – Protection of life and property before, during and after a flooding event 1.1 – Provide 100% availability of the National Flood Insurance Program	1 – Assist Cities with NFIP application	Relevant	Engineering/ State
Flooding	1 – Protection of life and property before, during and after a flooding event 1.1 – Provide 100% availability of the National Flood Insurance Program	2 – Encourage Communities to actively participate in NFIP	Relevant	Engineering/State
Flooding	1 – Protection of life and property before, during and after a flooding event 1.2 – Encourage appropriate flood control measures, particularly in new developments	1 – Determine potential flood impacts and identify areas in need of additional flood control structures	Complete	Revisions on going with the State

Category	Goal / Objective	Action	Status	Comments
Flooding	1 – Protection of life and property before, during and after a flooding event 1.2 – Encourage appropriate flood control measures, particularly in new developments	2 – Address identified problems through construction of debris basins, flood retention ponds, energy dissipaters or other flood control structures	Complete	SLCo. Public Works/ City PW
Flooding	1 – Protection of life and property before, during and after a flooding event 1.3 – Provide maintenance, repairs and improvements to drainage structures, storm water systems and flood control structures	1 – Establish maintenance and repair programs to remove debris, improve resistance and otherwise maintain effectiveness of storm water and flood control systems	Complete	City PW
Flooding	2 – Reduce threat of unstable or inadequate flood control structures 2.1 – Reduce potential for failure of flood control structures	1 – Identify and assess structures for deficiencies	Relevant	Engineering
Flooding	2 – Reduce threat of unstable or inadequate flood control structures 2.1 – Reduce potential for failure of flood control structures	2 – Modify structures as needed to address deficiencies	Relevant	Building Dept.
Severe Weather	1 – Reduce threat of loss of life or property due to extreme weather events 1.1 – Maintain status as a StormReady Community	1 – Maintain Hazardous Weather Operations Plan according to StormReady requirements	Relevant	Revisions on going
Severe Weather	1 – Reduce threat of loss of life or property due to extreme weather events 1.1 – Maintain status as a StormReady Community	2 – Maintain Contact with NWS prior to re-application in 2010	Relevant	Revising Plan
Severe Weather	1 – Reduce threat of loss of life or property due to extreme weather events 1.2 – Increase awareness of information services provided by NWS	1 – Meet with NWS representative on an annual basis to receive information on new services and alerts available	Relevant	Revising Plan
Severe Weather	1 – Reduce threat of loss of life or property due to extreme weather events 1.2 – Increase awareness of information services provided by NWS	2 – Assist NWS in making other agencies and departments aware of available resources	Relevant	Engineering, Water and City EM

Category	Goal / Objective	Action	Status	Comments
Severe Weather	1 – Reduce threat of loss of life or property due to extreme weather events 1.3 – Encourage safe practices in avalanche prone areas	1 – Assist Forest Service Utah Avalanche Forecast Center and other organizations in promoting avalanche hazard awareness for backcountry users	Not relevant	
Severe Weather	1 – Reduce threat of loss of life or property due to extreme weather events 1.4 – Examine the vulnerability of patrons at large event venues to extreme weather events	1 – Work with NWS to develop large event venue weather safety and evacuation procedures	Relevant	Engineering, Water and City EM
Slope Failure	1 – Reduce or eliminate the threat of slope failure damage 1.1 – Reduce the threat of slope failures following wildfires	1 – Develop protocol for working with State and Federal agencies in reducing the impact of post-fire debris flow hazard	Not Relevant	
Slope Failure	1 – Reduce or eliminate the threat of slope failure damage 1.2 – Monitor historic landslide areas	1 – Coordinate with the Utah Geological Survey and other agencies to understand current slope failure threats/potential	Not Relevant	
Slope Failure	1 – Reduce or eliminate the threat of slope failure damage 1.3 – Address landslide hazards in new sub-divisions	1 – Utilize recommendations provided by the State Geological Hazards Working Group to address land-use and planning for new developments	Not Relevant	
Wildland Fire	1 – Community education on wildfire hazard 1.1 – Reduce risk from wildfire through education programs	1 – Increase public awareness through “Firewise” program	Not relevant	
Wildland Fire	1 – Community education on wildfire hazard 1.1 – Reduce risk from wildfire through education programs	2 – Educate homeowners on the need to create defensible space near structures in WUI	Not Relevant	

Category	Goal / Objective	Action	Status	Comments
Wildland Fire	2 – Improve safety from wildfire hazards through planning, protective actions and improved fire response capabilities 2.1 – Assist homeowners with creating defensible space near structures in WUI areas	1 – Designate and promote county-wide annual initiative for clearing fuels	Not Relevant	
Wildland Fire	2 – Improve safety from wildfire hazards through planning, protective actions and improved fire response capabilities 2.1 – Assist homeowners with creating defensible space near structures in WUI areas	2 – Provide waste removal, such as chipping of green waste by public works, following designated fuel clearing day/week	Not Relevant	
Wildland Fire	2 – Improve safety from wildfire hazards through planning, protective actions and improved fire response capabilities 2.2 – Improve evacuation capabilities for WUI areas	1 – Work with experts and communities to develop or update evacuation plans	Not Relevant	
Wildland Fire	2 – Improve safety from wildfire hazards through planning, protective actions and improved fire response capabilities 2.2 – Improve evacuation capabilities for WUI areas	2 – Evaluate transportation network and address needed improvements to facilitate evacuation and emergency response	Not Relevant	
Wildland Fire	2 – Improve safety from wildfire hazards through planning, protective actions and improved fire response capabilities 2.3 – Improve addressing system in WUI areas to facilitate emergency response	1 – Identify all facilities, businesses, and residences, particularly in the canyons, and assign addresses according to current county addressing standards	Not Relevant	
Wildland Fire	2 – Improve safety from wildfire hazards through planning, protective actions and improved fire response capabilities 2.3 – Improve addressing system in WUI areas to facilitate emergency response	2 – Incorporate improved addresses in fire-dispatch and other databases	Not Relevant	

Category	Goal / Objective	Action	Status	Comments
Wildland Fire	2 – Improve safety from wildfire hazards through planning, protective actions and improved fire response capabilities 2.4 – Complete wildfire protection projects	1 – Reduce fuels around publically owned structures	Not Relevant	
Wildland Fire	2 – Improve safety from wildfire hazards through planning, protective actions and improved fire response capabilities 2.4 – Complete wildfire protection projects	2 – Implement fire breaks and other protective measures	Not Relevant	
Wildland Fire	2 – Improve safety from wildfire hazards through planning, protective actions and improved fire response capabilities 2.4 – Complete wildfire protection projects	3 – Assess existing water flow capabilities, both public and private, and address deficiencies	Not Relevant	
Wildland Fire	2 – Improve safety from wildfire hazards through planning, protective actions and improved fire response capabilities 2.4 – Complete wildfire protection projects	4 – Assist communities in developing Community Wildfire Protection Plans or similar plans	Not relevant	
Wildland Fire	2 – Improve safety from wildfire hazards through planning, protective actions and improved fire response capabilities 2.5 – Encourage proper development practices in the WUI	1 – Adopt the Utah Wildland-Urban Interface Code	Not Relevant	
Wildland Fire	2 – Improve safety from wildfire hazards through planning, protective actions and improved fire response capabilities 2.5 – Encourage proper development practices in the WUI	2 – Define wildland-urban interface and develop digital maps of the WUI	Not Relevant	

6.2 Identification and Analysis of Mitigation Actions:

In order to identify and select mitigation actions to support the mitigation goals, each hazard identified in Section 4.1 Identifying Hazards: Natural Hazards was evaluated. Only those hazards that were determined to be a priority hazard were considered further in the development of hazard-specific mitigation actions.

These priority hazards are listed below. The Mitigation Actions are specified, prioritized and a rough-cost benefit analysis performed.

6.3 Mitigation Strategies Implementation:

Integration of data, information, and mitigation goals and action plans

Midvale will integrate mitigation strategies into its building codes, the planning commission, and the actions of the City Council and other relevant agencies by education by the Emergency Manager during daily, weekly, and monthly city and public meetings.

6.4 Mitigation Action Plan:

Each month a hazard will be discussed in detail, each jurisdiction will distribute their best practices for mitigating that hazard and all jurisdictions will create a new mitigation strategy for dealing with the specific hazard being discussed. This new strategy will be added to the jurisdictions plan as detailed in plan maintenance.

6.4.1 Emergency Managers Mitigation Schedule:

Action Lead—Midvale Emergency Management	
Multi-Hazard Mitigation Actions	
January 2015	Emergency Manager's Meeting/Planning Team Earthquake Mitigation Review (Each Jurisdiction will bring their best mitigation practice and update progress on plans to date. Special emphasis will be based on cost/benefit reviews.)
February 2015	Emergency Manager's Meeting/Planning Team Flood Mitigation Review (Each Jurisdiction will bring their best mitigation practice and update progress on plans to date. Special emphasis will be based on cost/benefit reviews.)

March 2015	Emergency Manager's Meeting/Planning Team Wildland Fire Mitigation Review (Each Jurisdiction will bring their best mitigation practice and update progress on plans to date. Special emphasis will be based on cost/benefit reviews.)
April 2015	Emergency Manager's Meeting/Planning Team Slope Failure Mitigation Review (Each Jurisdiction will bring their best mitigation practice and update progress on plans to date. Special emphasis will be based on cost/benefit reviews.)
May 2015	Emergency Manager's Meeting/Planning Team Severe Weather Mitigation Review (Each Jurisdiction will bring their best mitigation practice and update progress on plans to date. Special emphasis will be based on cost/benefit reviews.)
June 2015	Emergency Manager's Meeting/Planning Team Dam Failure Mitigation Review (Each Jurisdiction will bring their best mitigation practice and update progress on plans to date. Special emphasis will be based on cost/benefit reviews.)
July 2015	Emergency Manager's Meeting/Planning Team Avalanche Mitigation Review (Each Jurisdiction will bring their best mitigation practice and update progress on plans to date. Special emphasis will be based on cost/benefit reviews.)
August 2015	Emergency Manager's Meeting/Planning Team Pandemic Mitigation Review (Each Jurisdiction will bring their best mitigation practice and update progress on plans to date. Special emphasis will be based on cost/benefit reviews.)
September 2015	Emergency Manager's Meeting/Planning Team Drought Mitigation Review (Each Jurisdiction will bring their best mitigation practice and update progress on plans to date. Special emphasis will be based on cost/benefit reviews.)
October 2015	Emergency Manager's Meeting/Planning Team Infestation Mitigation Review (Each Jurisdiction will bring their best mitigation practice and update progress on plans to date. Special emphasis will be based on cost/benefit reviews.)

November 2015	Emergency Manager's Meeting/Planning Team Radon Mitigation Review (Each Jurisdiction will bring their best mitigation practice and update progress on plans to date. Special emphasis will be based on cost/benefit reviews.)
December 2015	Emergency Manager's Meeting/Planning Team Problem Soils Mitigation Review (Each Jurisdiction will bring their best mitigation practice and update progress on plans to date. Special emphasis will be based on cost/benefit reviews.)

Table 6.1.1

6.5 Hazards & Action Items

6.5.1 Firewise:

Midvale will implement the "Firewise" program in conjunction with the UFA.

About the Firewise Communities Program

Brush, grass and forest fires don't have to be disasters. NFPA's Firewise Communities Program encourages local solutions for safety by involving homeowners in taking individual responsibility for preparing their homes from the risk of wildfire. Firewise is a key component of Fire Adapted Communities – a collaborative approach that connects all those who play a role in wildfire education, planning and action with comprehensive resources to help reduce risk.

The program is co-sponsored by the USDA Forest Service, the US Department of the Interior, and the National Association of State Foresters. To save lives and property from wildfire, NFPA's Firewise Communities program teaches people how to adapt to living with wildfire and encourages neighbors to work together and take action now to prevent losses. We all have a role to play in protecting ourselves and each other from the risk of wildfire.

About the National Fire Protection Association (NFPA)

NFPA is a worldwide leader in fire, electrical, building, and life safety. The mission of the international nonprofit organization founded in 1896 is to reduce the worldwide burden of fire and other hazards on the quality of life by providing and advocating consensus codes and standards, research, training, and education. NFPA develops more than 300 codes and standards to minimize the possibility and effects of fire and other hazards. All NFPA codes and standards can be viewed at no cost at www.nfpa.org/freeaccess.

Community Wildfire Protection Plan (CWPP)

A CWPP is a document produced in effort to mitigate the risk of wildfire in at-risk communities. The plan is developed by a community-based citizen group in conjunction with subject matter experts such as local fire departments, State of Utah Wildland/Urban Interface coordinators and partners from the BLM and USFS.

Typically CWPP development entails 4-6 weekly meetings that address the following:

- Community make-up (infrastructure, access & egress, population, # of homes, etc.). This group is made of citizen volunteers who have recognized the need for a plan. We like to get city or community leaders involved as often as possible.
- Areas that pose a risk to the community
- Projects to mitigate the above risk(s)
- Community education
- Needs for local responders (to address wildfire threats; i.e. New PPE, engines, staffing etc.)
- Ongoing maintenance

Every few years it should be revisited and updated as necessary.

One thing unique to Utah, is the CWPP ties in with communities becoming Firewise, which is a prestigious national award given to communities whom have been proactive and taken steps to address and mitigate the issue of wildfire. The UFA is currently working with each community to develop CWPP and work towards Firewise recognition where applicable. Once the CWPP is complete, grants are applied for on their behalf by the SMEs involved and most communities will typically receive a monetary reward to complete the projects identified in the CWPP.

Below are Areas participating in the Firewise Program.

Community Number	Community Name	County	Lat	Long	Fire Occurrence	Fuels Hazards	Values Protected	Fire Protection Capability	Overall Score	Notes
277	Salt Lake City	Salt Lake	40.7627769	-111.8874988	2	3	2	1	8	
278	Sandy	Salt Lake	40.5710733	-111.792188	2	3	2	1	8	
279	Alta	Salt Lake	40.5853222	-111.6518986	1	1	2	2	6	
280	Big Cottonwood	Salt Lake	40.6344202	-111.7083822	1	1	3	2	7	Canyon is designated
281	Bluffdale	Salt Lake	40.4736108	-111.9533369	2	3	2	1	8	
282	Brighton	Salt Lake	40.6013883	-111.5805566	1	1	3	2	7	
283	Copperton	Salt Lake	40.5636127	-112.0977772	2	2	2	1	7	
284	Cottonwood Heights	Salt Lake	40.6073088	-111.7902819	1	2	3	1	7	Renamed from Granit
285	Dimple Dell	Salt Lake	40.5619452	-111.8150019	2	3	3	1	9	
286	Draper	Salt Lake	40.4909247	-111.8540225	2	2	3	1	8	
287	Emigration Canyon	Salt Lake	40.77	-111.7591669	2	3	3	2	10	
288	Herriman	Salt Lake	40.4920486	-112.0380213	2	3	2	1	8	
289	High Country Estates	Salt Lake	40.5008358	-112.087225	2	3	3	1	9	
290	Holladay	Salt Lake	40.674568	-111.7824641	1	2	1	1	5	
291	Lambs Canyon	Salt Lake	40.7084747	-111.6158605	2	2	2	3	9	
292	Little Cottonwood	Salt Lake	40.5738511	-111.6987175	1	1	2	2	6	Canyon is designated
293	Mount Aire	Salt Lake	40.7258336	-111.7169436	2	2	2	3	9	
294	Olympus Cove	Salt Lake	40.6457619	-111.8058963	2	3	2	1	8	

6.5.1.1 The cost for this mitigation effort is minimal.
6.5.1.2 The benefit will range from hundreds of thousands of dollars to millions of dollars.
6.5.1.3 The benefit to cost ratio is almost infinite

6.5.2 Earthquake

6.5.2.1 Problem Statement

Midvale has a large number of unreinforced brick residences poses a large problem in the event of a major earthquake. Midvale Emergency Management will present the "Fix the Bricks" program. This program is part of the Salt Lake City and State of Utah effort to mitigate the effects of a large-scale earthquake by minimizing post earthquake personal injury and requirement for outside assistance.

6.5.2.2 The cost for this mitigation effort is minimal.
6.5.2.3 The benefit will range from hundreds of thousands of dollars to millions of dollars.
6.5.2.4 The benefit to cost ratio is almost infinite

6.5.3 Flood

6.5.3.1 Mitigation Action

Midvale Emergency Management will apply for grants for flood mitigation assistance. As each jurisdiction has already identified their flood prone areas through HAZUS and RiskMAP we will utilize existing reports to help prepare plans for mitigation and application for funding.

Canal Mapping will be discussed at the 2015 Emergency Managers Meeting and a subcommittee will be formed.

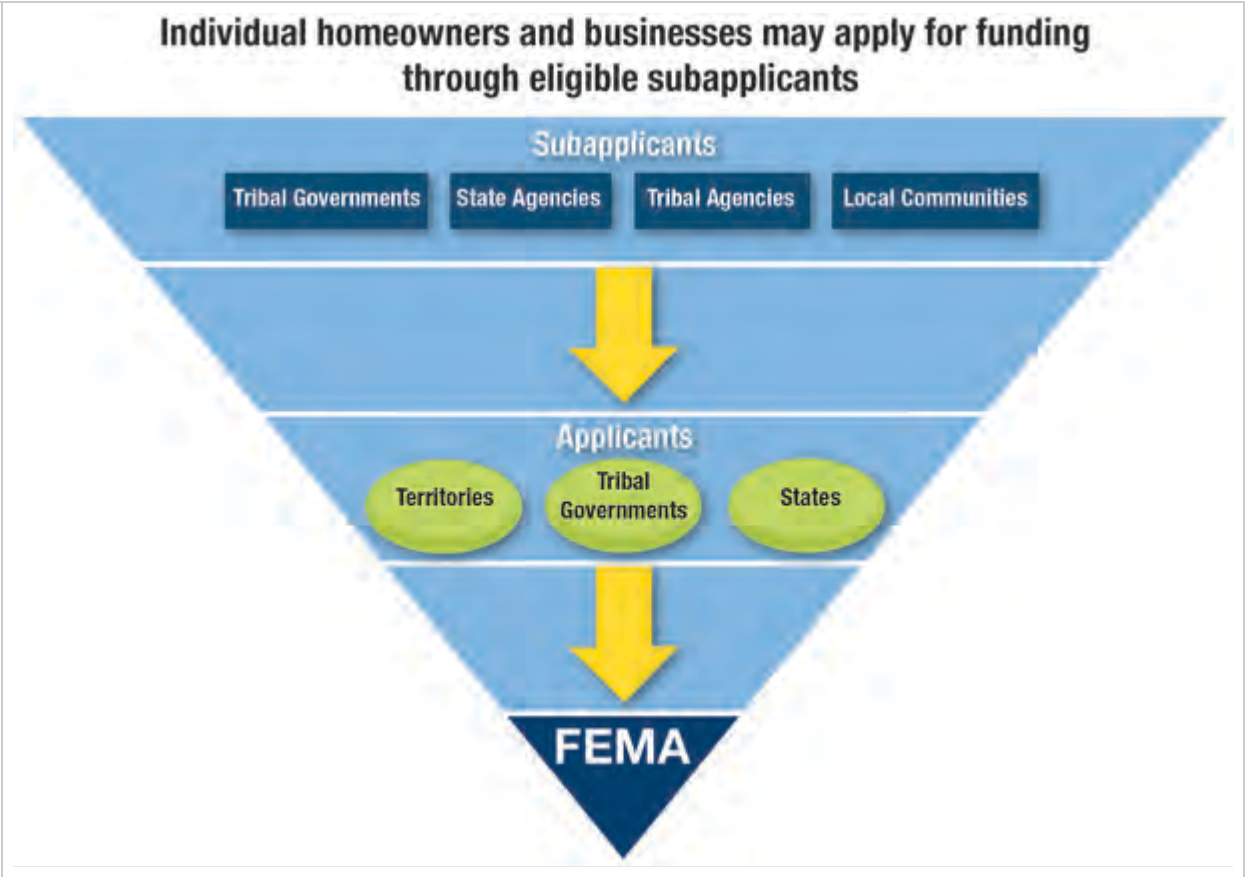
Flood Mitigation Assistance Program

The Flood Mitigation Assistance (FMA) program provides funds for projects to reduce or eliminate risk of flood damage to buildings that are insured under the National Flood Insurance Program (NFIP) on an annual basis.

There are three types of FMA grants available to applicants:

- **Planning Grants** - to prepare flood mitigation plans
- **Project Grants** - to implement measures to reduce flood losses, such as elevation, acquisition or relocation of NFIP-insured structures
- **Management Cost Grants** - for the grantee to help administer the FMA program and activities

Please see the chart below for information on how to apply to the FMA program.



FEMA pyramid flow chart Flood Mitigation Assistance.

6.5.3.2 The cost for this mitigation effort is minimal.
6.5.3.3 The benefit will range from hundreds of thousands of dollars to millions of dollars.
6.5.3.4 The benefit to cost ratio is almost infinite.

6.5.4 Slope Failure:

This is not an issue in Midavle.

6.5.5 Severe Weather

Problem Statement – Severe weather is inevitable. The best mitigation practice is the timely communication of the event and actions that can be taken to minimize the effects. The biggest threat of severe weather is winter storms. Winter storms usually cause power outages that can last up to several days. Home heating becomes a major problem. Each year Midvale has several devastating fires from homeowners using unsafe heating units. Our jurisdiction will implement the "Fire is everyone's Fight" program through community outreach.

6.5.5.1 Fire Is Everyone's Fight™

Fire Is Everyone's Fight™ is a national effort led by the U.S. Fire Administration (USFA) to lower the number of home fires and home fire injuries in America. Along with USFA and partner organizations across the country, the fire community is speaking out with a unified message of fire prevention and safety to the public. The goal is to change how people think about fire and fire prevention using social marketing strategies to address the broadest possible audience.

The fire problem in the United States is an ongoing and continuous battle for the fire service and the public alike. Eighty-one percent of all fire deaths and 76 percent of all fire injuries occur in residential buildings.

Each year there is an estimated:

- 365,500 residential building fires
- 2,560 deaths
- 13,275 injuries
- $6.6 billion in property loss

A call to action

This is a call to action for the USFA, fire and life safety partner organizations and the American public. We must join together to help reduce the number of home fires, and the resulting deaths, injuries and loss of property. We rely on the fire service to fight fires once they occur; however, the prevention of fires is up to all of us… Fire Is Everyone's Fight™. Fire is Everyone's Fight™ is a national effort led by the U.S. Fire Administration (USFA) to lower the number of home fires and home fire injuries in America. Along with USFA and partner organizations across the country, the fire community is speaking out with a unified message of fire prevention and safety to the public. The goal is to change how people think about fire and fire prevention using social marketing strategies to address the broadest possible audience.

As firefighters and emergency responders, you work every day to keep our families and homes safe. Fire is Everyone's Fight™ not only supports your vital mission to protect lives and property, but it also seeks to keep you and the men and women you serve with safer as well. As you and thousands of other members of the fire and emergency services community across the country spread Fire is Everyone's Fight™ to your communities, people will begin to recognize and understand the importance of taking small steps to make their homes and families safer from fire.

There are dozens of ways you can use Fire is Everyone's Fight™ to help teach people in your city or town to be safer. This guide shares just a few ideas to help you get started. It offers suggestions for engaging people in the community. This guide will help you:

- Integrate Fire is Everyone's Fight™ content into your existing media and community outreach programs.
- Reach out to organizations to arrange speaking opportunities.
- Use social media to get the word out about fire safety and prevention.
- Know what to say and how to say it simply and effectively.
- Put together an event that attracts the audience you want to inform.
- Create opportunities to get the word out.

6.5.5.2 The cost for this mitigation effort is minimal.
6.5.5.3 The benefit will range from hundreds of thousands of dollars to millions of dollars.
6.5.5.4 The benefit to cost ratio is almost infinite

6.5.6 Dam Failure

This is not an issue in Midvale

6.5.7 Avalanche

This is not an issue in Midvale

6.5.8 Pandemic

Midvale Emergency Management will work with the County Health Department to assist them in designing their mitigation programs for dealing with pandemics.

> "The Salt Lake County Health Department (SLCo HD) continues to improve its emergency response capacity by planning, training, exercising and working with partners and municipalities throughout the county.
> The SLCoHD Emergency Management Bureau takes the lead within the department and involves all health department staff through planning, training, drills and exercises.
> The health department follows the principles of Emergency Management: to plan for, respond to, recover from, and mitigate natural and manmade emergencies and disasters.
> **Our goal is to do the most good for the most people in the shortest amount of time. "**

6.5.8.2 The cost for this mitigation effort is minimal.
6.5.8.3 The benefit will range from hundreds of thousands of dollars to millions of dollars.
6.5.8.4 The benefit to cost ratio is almost infinite

6.5.9 Drought

6.5.9.1 Problem Statement

Midvale is prone to cyclical droughts. These droughts have been severe enough to require mandatory water rationing. YOUR JURISDICTION NAME GOES HERE Emergency Management will conduct a special presentation on "Slow the Flow" to encourage residents to take advantage of the free "Water Check" program.

What is a water check?
A water check analyzes the efficiency of your automated sprinkler system. Trained workers will perform the water check at your home and provide you with a customized watering schedule.
The tests that will be performed include soil type, grass root depth, sprinkler distribution uniformity and water pressure. The entire process will take approximately one hour.

How much does it cost?
The water check program is a free service sponsored by your water provider.

How do I sign up?
The SL County program will be open until further notice. You can schedule an appointment by signing up using the form below or by calling 877-728-3420. This program is sponsored by: Jordan Valley Water Conservancy District, Central Utah Water Conservancy District, Washington County Water Conservancy District, Sandy City, Murray City, Salt Lake City, Metropolitan Water District of Salt Lake and Sandy, Central Iron County Water Conservancy District and Utah State University.

6.5.9.2 The cost for this mitigation effort is minimal.
6.5.9.3 The benefit will range from hundreds of thousands of dollars to millions of dollars.
6.5.9.4 The benefit to cost ratio is almost infinite

6.5.10 Infestation

Infestation is not relevant in Midvale.

6.5.11 Radon

6.5.11.1 Problem Statement

- Radon kills 21,000 people per year. (American Lung Association)
- Radon is the #1 cause of lung cancer for nonsmokers.

- A radon level of 15 pCi/L is equivalent in lung damage to each person living within a household smoking a pack of cigarettes per day. (Radon Measurement & Elimination Services)
- Utah has one of the lowest rates of smoking in the country, but lung cancer is still the leading cause of cancer death.

When radon becomes trapped in buildings and homes, people breath the radon into their lungs and the gas becomes trapped. The Environmental Protection Agency (EPA) has determined that a level of 4.0 piC/L action level of radon is dangerous for human health. Utah Radon Levels are at or above this level on average. Radon continues to break down over time because of environmental interactions with other chemicals. When radon breaks down it releases harmful cancer causing chemicals into the lungs. The chemicals wear down the lungs over time and cause lung cancer. At a 4.0 piC/L action level or above, the risk increases because of the high concentration of cancer causing chemicals in the home for people to breath in. However, radon exposure is preventable.

Midvale Emergency Management will conduct a half day seminar to educate citizens in procuring radon testing kits. A presentation from the Health department will be made. The course will cover the steps for citizens when they purchase the radon test kit:

Step 1: Purchase a radon test kit. You can purchase a kit from:
- Hardware stores (may have additional lab fee; read label carefully)
- Online from the Utah Department of Environmental Quality

Step 2: Follow the instructions. Place kit in lowest level of your home that you live in.
Close windows and doors for 12 hours before test and limit traffic in the room.
Do not place in rooms like bathrooms, play rooms, kitchens, or laundry rooms.
Step 3: Mail kit to the lab. Please be aware that some kits charge a lab fee. Read the instructions and disclaimer before purchasing.
Step 4: Interpret your results. A level of 4.0 pCi/L or higher is considered harmful to your health. Consult a mitigation professional for prices and ways to fix the problem. The Utah Department of Environmental Quality has this list.

6.5.11.2 The cost for this mitigation effort is minimal.
6.5.11.3 The benefit will range from hundreds of thousands of dollars to millions of dollars in the potential reduction of healthcare costs.
6.5.11.4 The benefit to cost ratio is almost infinite

6.5.12 Problem Soils

6.5.12.1 Problem Statement

Midvale is prone to areas of collapsible soil.
Midvale Emergency Management will participate in a half-day seminar with the authors of the book *Geologic Hazards of the Magna Quadrangle, Utah,* authored Jessica J. Castleton, Ashley Elliott, Greg N. McDonald to determine testing and mitigation techniques that can be implemented.

6.5.12.2 The cost for this mitigation effort is minimal.
6.5.12.3 The benefit will be approximately hundreds of thousands of dollars.
6.5.12.4 The benefit to cost ratio is almost infinite

7 Plan Implementation & Maintenance

7.1 Implementation

Mitigation is most successful when it is incorporated into the day-to-day functions and priorities of government and development Midvale City will utilize the information in the Hazards Mitigation Plan to prepare for future events and plan accordingly. The mitigation strategies will be incorporated into other plans such as development, police and fire requirements, and city policies and agreements. It is essential that the public be involved in this process in every aspect.

7.2 Maintenance Schedule

Periodic monitoring and updates of this Plan are required to ensure that the goals and objectives for the city are kept current and that local mitigation strategies are being carried out. This Plan has been designed to be user-friendly in terms of maintenance and implementation. The Plan will also be revised to reflect lessons learned or to address specific hazard incidents arising out of a disaster as needed.

Annual Review Procedures

Midvale City will be responsible to annually review the mitigation strategies described in this Plan, as required by the Utah Division of Emergency Management (UDEM), or as situations dictate such as following a disaster declaration. The process will include the city organizing a Hazards Mitigation Planning committee comprised of individuals from organizations responsible to implement the described mitigation strategies. Progress toward the completion of the strategies will be assessed and revised as warranted. The city emergency manager will regularly monitor the Plan and is responsible to make revisions and updates.

Five Year Plan Review

The entire Mitigation Plan including any background studies and analysis shall be revised and updated as needed every five years by Midvale City to determine if there have been any significant changes in the city that would affect the Plan. Increased development, increased exposure to certain hazards, the development of new mitigation capabilities or techniques and changes to Federal or State legislation are examples of changes that may affect the condition of the Plan.

7.3 Hazard Mitigation Plan Amendments

Midvale City will amend and update its Hazard Mitigation Plan as needed.

7.4 Maintenance Evaluation Process

It will be the responsibility of the designated Emergency Manager, City Manager, Mayor and City Council Members to ensure these actions are carried out no later than the target dates unless reasonable circumstances prevent their implementation (i.e. lack of funding availability).

Funding Sources

Although all mitigation techniques will likely save money by avoiding losses, many projects are costly to implement. Midvale City shall continue to seek outside funding assistance for mitigation projects in both the pre-disaster and post-disaster environment, subject to budget constraints and available funding sources.

Federal Programs

The following federal grant programs have been identified as funding sources which specifically target hazard mitigation projects:

Future Revisions

Future revisions of the Hazard Mitigation Plan shall include:

- Expanded vulnerability assessments to include flood and dam failure inundation.
- Continue the search for more specific mitigation actions.
- An analysis of progress of the Plan as it is revised.
- Expanded look into how the identified natural hazards will affect certain populations including the young and elderly.

Implementation and maintenance of the plan is critical to the overall success of hazard mitigation planning.

8 Hazard Mitigation Plan Adoption

It is the intent of Midvale City that this Hazard Mitigation Plan will be adopted by resolution once approved by the State of Utah and FEMA, which approval should be within five years of the previous Hazard Mitigation Plan's approval date. This process will be documented through the Midvale City Recorder's office.

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RESOLUTION R 15 .13

A RESOLUTION ADOPTING THE SALT LAKE COUNTY MULTI-JURISDICTIONAL MULTI-HAZARD MITIGATION PLAN

WHEREAS, the Disaster Mitigation Act requires local governments to develop hazard mitigation plans to identify the natural hazards that could impact their jurisdictions, identify actions and activities to mitigate the effects of those hazards, and establish a coordinated process to implement such plans; and

WHEREAS, the City has previously adopted such mitigation plans pursuant to federal requirements which require the plan to be updated and revised no less than every five years; and

WHEREAS, the City was an active participant in the development of *Salt Lake County Multi-Jurisdictional Multi-Hazard Mitigation Plan*, which identifies natural hazards that have the potential to occur in Salt Lake County and the City and establishes mitigation strategies to address these hazards; and

WHEREAS, such *Salt Lake County Multi-Jurisdictional Multi-Hazard Mitigation Plan*, has been approved by the Federal Emergency Management Agency ("FEMA") subject to adoption by all participating jurisdictions in the County; and

WHEREAS, the City has determined that it would be in the best interest of the community to adopt the *Salt Lake County Multi-Jurisdictional Multi-Hazard Mitigation Plan*.

NOW, THEREFORE, BE IT RESOLVED by the Murray City Municipal Council as follows:

It hereby adopts the Salt Lake County Multi-Jurisdictional Multi-Hazard Mitigation Plan, a copy of which is attached.

DATED this 21st day of April, 2015

MURRAY CITY MUNICIPAL COUNCIL

D. Blair Camp, Chair

ATTEST:

Jennifer Kennedy, City Recorder

MURRAY CITY
CITY COUNCIL REPORT

Council Meeting Date: April 21, 2015

Issue: Adoption of the *Salt Lake County Multi Jurisdictional Multi-Hazard Mitigation Plan*

Submitted By: Jon Harris

Department: Fire

First Reading Report Date:

Staff Recommendation (Motion Ready): Approve Resolution R2015-16 adopting the *Salt Lake County Multi-Jurisdictional Multi-Hazard Mitigation Plan.*

BACKGROUND: The Disaster Mitigation Act of 2000 requires communities to have an adopted mitigation plan that meets minimum requirements to be eligible for certain types of federal funding relating to disaster recovery and mitigation. Plans must be maintained and revised on a five year cycle. Murray last adopted a mitigation plan in 2009 and has been working with Salt Lake County Emergency Management and the other jurisdictions in the County to revise and update the new version of the Plan.

Working with the County and others, Murray City participated in several workshops and other planning activities that involved many stakeholders, both public and private in the development of the Plan. Murray City's efforts to develop their portion (Annex M) of the Plan establishes a framework for the community's activities to prepare for and mitigate potential hazards that might pose a significant threat, create an unusual event, and/or result in a major disaster.

The plan provides background information about the community and contains a hazard analysis and risk assessment that outlines the City's previous disaster history, potential disasters, and what is "at risk" in the community. While this plan consists of an "all-hazards" approach and identifies both natural and man-made hazards, the mitigation strategies identified therein focus only on natural hazards.

The plan is not intended to be inclusive of every potential problem or threat that may arise in the community, but serves as a base from which to start the process of mitigating known hazards which have occurred or may occur again. The plan consists of several sections.

The plan has applicability to all City departments, local community organizations, businesses, and residents in the City. All parts of the plan should be reviewed on a regular basis to ensure that those persons designated to implement various aspects of the plan are familiar with their roles and responsibilities, familiarity with identified strategies, as well as modifications based on new information, changes in technology, rotation of staff and other changing factors that occur as the community continues to grow.

TEAM FINDINGS, CONCLUSIONS & RECOMMENDATIONS:

FINDINGS:

The previously adopted mitigation plan "*Wasatch Front Region Natural Hazard Pre-Disaster Mitigation Plan*" was adopted in October 2009 and expired in November of 2014.

Adoption of the revised "*Salt Lake County Multi Jurisdictional Multi-Hazard Plan*" will provide Murray City with an approved plan making it eligible for potential federal funding for disaster recovery and mitigation efforts.

FEMA has given preliminary approval of the Plan indicating that it meets the requirements of the Disaster Mitigation Act, pending its subsequent adoption by each of the covered jurisdictions.

Salt Lake County Emergency Management has asked that all participating jurisdictions pass a resolution adopting the Plan and submit a copy of the resolution by March 6, 2015 to be included in their final submission to FEMA for final approval.

CONCLUSIONS:

Murray City does not have a currently adopted mitigation Plan that meets the requirements of the Disaster Mitigation Act.

FEMA has given preliminary approval of the *Salt Lake County Multi-Jurisdictional Multi-Hazard Mitigation Plan*, if adopted by all of the participating jurisdictions.

RECOMMENDATIONS:

City Staff recommends adoption of the Plan.

FISCAL IMPACT:

- There is no immediate fiscal impact in adopting the Plan.
- Choosing not to adopt the Plan may result in the potential loss of federal monies provided to communities for disaster recovery and/or other pre-disaster and post disaster mitigation projects.
- Implementation of specific mitigation projects identified in the plan have varying costs depending on the type of project.

ALTERNATIVES:

- Do not pass Resolution R2015-16 to adopt the Plan
- Postpone a decision to a later date

SUPPORT MATERIALS:

Due to the large size of the Plan (1421 pages), a copy of the Plan has not been included with this Council Report. However, the Plan, as approved by FEMA pending adoption by all of the participating Jurisdictions, can be found on the South Jordan City's website at: http://www.sjc.utah.gov/pdf/SLCo-MJ-MH-MP.pdf

City Council Action Requested: _____

Department Head

_____

Date

MURRAY

Hazard Mitigation Plan (2014)

ANNEX G: MURRAY CITY
1 Community Profile

Figure 1 displays a map and the location within Salt Lake County of Murray City and its Sphere of Influence.

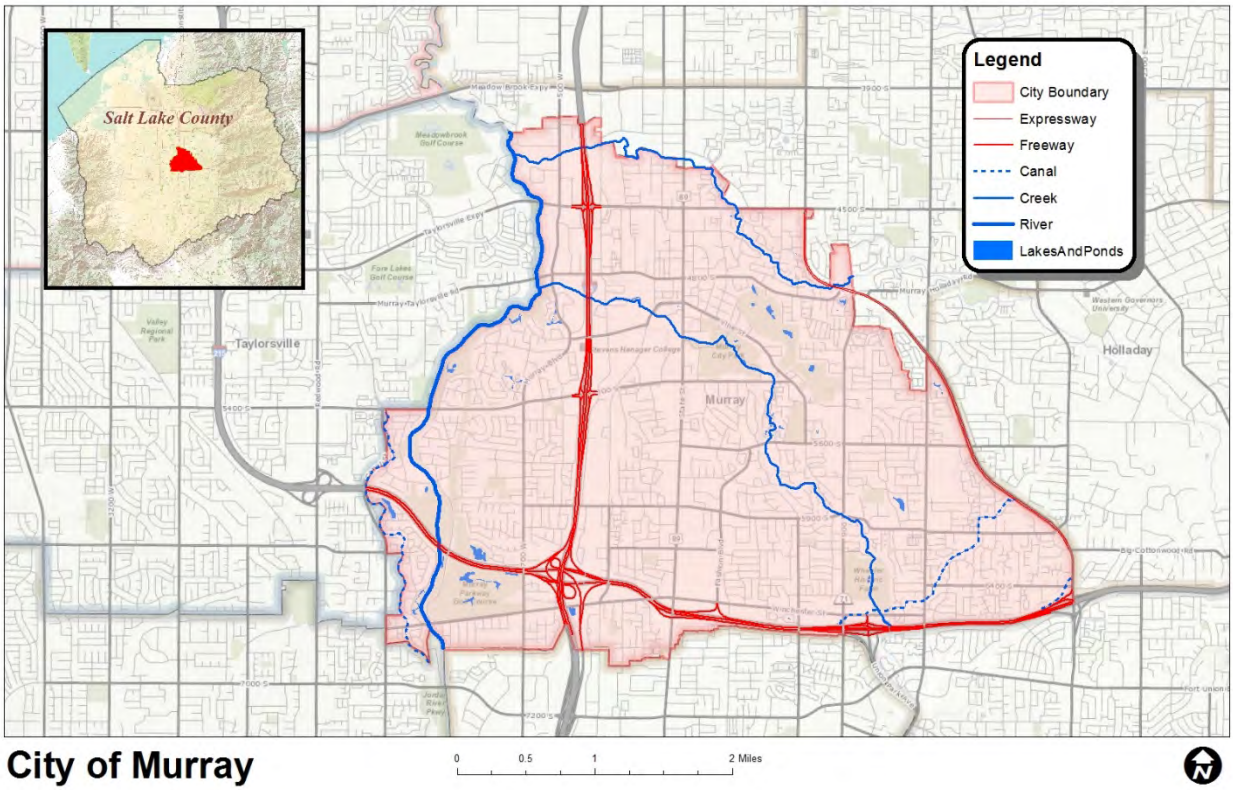


Figure 1. The Murray City

1.1 Geography and Climate

Located on the Wasatch Front in Salt Lake County, Murray covers 12.29 square miles. All lands outside of the City's Sphere of Influence are regulated by Salt Lake County planning and zoning designations.

Murray consists of three distinct geographical areas: the City, which represents the incorporated City within the City limit boundaries; the Sphere of Influence, which corresponds to the City's existing Sphere of Influence; and the study area, which includes unincorporated Salt Lake County lands outside of the City's Sphere of Influence. Murray is characterized by mostly urbanized land uses.

Murray has an average annual temperature of 51.96°F and receives 26.19 inches of rain. While the average is relatively temperate, summer and winter months bring unique weather patterns to the region. During the winter, high temperatures hover around 38°F. During the summer months, the region has extended periods where temperatures exceed 90°F, with occasional days over 100°F. While the average high temperature is 86°F during the summer, these extended heat waves impact the medically fragile, elderly, and animal populations. In addition to heat waves, the Salt Lake County region continues to suffer regular drought due to lower than normal snowpack in the Wasatch Mountains, which supplies water for agricultural use and replenishes the groundwater supply.

1.2 History

Pioneers Settling

The Mormon pioneers came to the Salt Lake Valley in 1847. A pioneer group called the Mississippi Saints arrived one year later and began to develop a scattered settlement in the south end of the valley in the fall of 1848. The area was distinguished by various names such as the Mississippi Ward, Cottonwood, Big Cottonwood, and South Cottonwood. Written history states that at least 20 families were living in the South Cottonwood area in the 1860's. The area remained agricultural until 1869 when a body of ore was found in Park City and additional ore was found in the Little Cottonwood Canyon. Because of its central location and access to the railroad, the first smelter was built in Murray in 1870 and Murray became the home of some of the largest smelters in the region over the next 30 years.

The first official post office was established in 1870 as the South Cottonwood Post Office. The area changed over time as the railroad came in, smelting expanded, the territorial road (later known as State St.) was established, and trolley transportation was developed. A business district also began to develop along the transportation corridor.

The City received its present name from the post office, which officially changed its name from South Cottonwood Post Office to Murray Post Office in 1883 after the territorial governor and civil war general, Eli Murray.

City Incorporation

After a riot and fire started by a rowdy group of smelter workers in a local saloon, the fight for incorporation was begun by a local newspaper editor. The final incorporation committee drafted a petition in 1901 and created an intense campaign on both sides of the incorporation battle. The election took place on November 18, 1902. Those in favor won and C.L. Miller was elected as Mayor by three votes. Salt Lake County recognized the election results as official on November 25,

1902, and the City was officially recognized as a Third Class City by the State of Utah on January 3, 1903.

Cultural Make-Up

The early Mormon settlers were largely from Western Europe and Scandinavian countries. When the smelter operations began in 1870, the ethnic make-up of Murray dramatically changed with large numbers of workers coming from Eastern Europe and Asian countries. Over half of the smelter workers came from Greece. Many came from Armenia, Yugoslavia, Italy, and Japan. These groups brought new religious customs to Murray as well. Methodist, Baptist, Lutheran, and Catholic Church congregations have developed. The ethnic diversity of early Murray is very visible in the Murray City Cemetery.

Form of Government

Murray City initially created a Mayor-Council form of government. In 1911, a State law changed the form of government for cities of the First and Second Class in Utah from the old Council form to the Commission form of government. This form of government was again reversed in 1981. The City adopted the Mayor-Council form of government, which included an elected Mayor and five City Council members. To ensure staggered terms of the Council, an election is held every two years for half the Council members for four-year terms.

1.3 Economy

Murray City is centrally located in the Salt Lake Valley and is easily accessible from I-15, I-215, three TRAX light rail stations and a FrontRunner commuter rail platform. The city is approximately ten miles from the Salt Lake International Airport. With several of the finest medical facilities in Utah, exceptional healthcare contributes to a diverse and stable economy in Murray.

Overall, Murray's population is well educated with 92.6% of its residents graduating from high school and 30.9% having earned a Bachelor's degree or higher. Murray School District educates over six thousand students in grades K – 12 and Granite School District also has three schools located in the City. Access to varied recreational opportunities, including developed parks and recreation programs within the City, contribute to the strong sense of community in Murray City.

The City's economic base consists of health care and social services, strong retail sales and professional services. The following outlines employment by industry for Murray residents over age sixteen (16). Employment may be in Murray or in another city:

Industry	Percent of Workforce
Educational services, and health care and social assistance	18.3%
Retail trade	13.1%
Professional, scientific, and management, and administrative and waste management services	12.3%
Arts, entertainment, recreation, accommodation, food service	9.2%
Manufacturing	8.7%
Construction	8.5%
Finance and insurance, real estate, rental and leasing	8.0%
Other services, except public administration	5.3%
Transportation, warehousing and utilities	5.2%
Public administration	4.9%
Wholesale trade	3.9%
Information	2.1%
Agriculture, forestry, fishing, hunting and mining	0.4%
Total:	**100%**

1.4 Population

In 2013, the total population for the Murray City was estimated at 48,612.

2 Planning Process, Hazard Identification & Summary

This Murray City Mitigation Plan was prepared by Murray City staff members including Jan Wells, Janet Towers, Doug Hill, Tim Tingey, Janie Richardson, Ben Teran, Gilbert Gonzales, Greg Bellon, and Jon Harris. Roger Kehr, along with several other employees of Murray City and members of Salt Lake County Emergency Management provided guidance during the process.

Step 1: Getting Started

In 2012, Salt Lake County applied for and was awarded a Pre-Disaster Mitigation Planning grant. The planning project is to update the Salt Lake County portion of the 2009 Wasatch Front Regional Council Pre-Disaster Mitigation Plan and develop a standalone mitigation plan that will meet the 44CFR 201.6 planning requirements and will result in a FEMA approved mitigation plan. Salt Lake County had oversight of this multi-jurisdictional plan, and prepared a Memorandum of Understanding to obtain a commitment from the cities and special service districts to participate in the planning process.

Step 2: Jordan River Watershed RiskMAP Collaboration

FEMA Region VIII and the Utah Division of Emergency Management initiated a project to identify flood mapping and risk analysis needs in the Jordan River watershed near the same time as the Salt Lake County Mitigation planning project. The flood risk project and mitigation planning project shared the same planning area, participating jurisdictions, local officials, and many common objectives. This presented a unique opportunity to share resources, integrate programs, and implement a more comprehensive approach to risk reduction.

Objectives of the RiskMap project included:

- Assist communities to identify, assess, communicate, and mitigate risk
- Document flood risk issues and floodplain mapping needs within the Jordan River watershed which could potentially initiate a new mapping project in a future year
- Develop non-regulatory flood risk data, analysis, and mapping based on local needs and priorities
- Identify areas of mitigation interest for Salt Lake County, Salt Lake City, local communities and special districts
- Build capabilities of local jurisdictions to create and use risk analysis data, identify mitigation actions, and access resources for implementing projects
- Incorporate a multi-hazard approach into the Risk MAP project by working with local staff and jurisdictions on analyzing and integrating impacts of wildfire, earthquake, and other major hazards in the planning area
- Provide technical assistance as needed to help support a comprehensive and inclusive mitigation planning process and the development of an effective, high quality plan. FEMA planning and GIS Staff provided technical assistance through risk assessment data, analysis and mapping, training to local staff, meeting facilitation, and guidance on meeting federal regulations for plan approval.

Collaboration between the RiskMAP team and county mitigation planning team improved coordination and partnerships between local, state and regional staff used stakeholder time more efficiently by combining meetings and improved the quality of risk analysis by sharing data and technical expertise. This also improved the plan review and approval process through early and consistent involvement and guidance on regulations from FEMA.

Step 3: Organize Resources

Salt Lake County Emergency Management (SLCOEM) assigned a staff member to act as the lead planner throughout the planning process with additional support staff offering assistance as needed.

On September 10, 2014 the Murray City Planning Team met to discuss the status of the mitigation plan and to develop a strategy to complete the document. In attendance were Jan Wells, Janet Towers, Doug Hill, Tim Tingey, Janie Richardson, Ben Teran, Gilbert Gonzales, Greg Bellon, and Jon Harris.

Step 4: Public Officials Outreach

To ensure the public and their officials were supportive of the Plan, the SLCOEM Mitigation Planner presented at the Salt Lake County Council of Governments meeting in March 2013. These public meetings have representation from each chief elected official in each county. The planners also attended other City/County Councils meetings. Additionally, some communities recommended meeting with their city council to better inform the community.

Step 5: Data Review and Acquisition

The 2009 WFRC PDM Plan was reviewed by SLCOEM and the Planning Team to evaluate which portions of the plan required updating and revision. Contact was made with the GIS technician and/or planning commission staff in cities and county departments to assess available data. Mapping data layers obtained included some or all of the following: local roads, plot maps, county tax assessor's data, hazard data, flood maps, topographic data, aerial photographs and land development data. The Planning Team evaluated revised data and maps, and through a consensus process developed the revised mitigation strategies based on current data.

Step 6: County Hazard Identification and Profile

These steps were conducted by gathering data on the hazards that threaten the planning region. This information was gathered from reports and other publications from local, state and federal agencies, organizations, newspapers and other local media accounts, state and local weather records, conversations with the public and local officials, surveys, interviews and meetings with key informants within the planning area. County-level mitigation planning meetings were held during this process. During these meetings, attendees had the opportunity to review hazard information and provide comment. These meetings also provided a forum for discussion on the background information that was needed to gain a general understanding of the geography, geology, recreation and natural resources of the planning region.

Step 7: Vulnerability Assessment

This step was conducted through a review of local hazard maps, topographical maps, floodplain maps, and Utah Geological Survey (UGS) maps, Automated Geographic Reference Center (AGRC) data, FEMA hazard maps and climate maps from the National Climatic Data Center (NCDC). Salt Lake County Assessor data was used to estimate the number of structures and their value within Murray City that could potentially be affected by hazards. Census 2010 data for Murray City were used to estimate the number of residents and households that could be affected by hazards. A detailed vulnerability assessment was completed with the use of GIS software. Vulnerability to earthquakes and floods was provided by analysis from FEMA Region VIII.

In some cases where the values were considered to still be valid, data from the 2009 WFRC PDM plan were carried over into the current plan revision. These items are identified in the current plan as being carried over from the 2009 WFRC PDM plan. More details on the methodology used for these items can be found in the 2009 WFRC PDM plan. In summary, loss estimation methodology was developed by the core planning team, with assistance from the technical team, to determine vulnerability from each identified hazard. The FEMA modeling program Hazards United States – Multi-Hazards (HAZUS-MH) was used to determine earthquake and flood vulnerability. Transportation Analysis Zone (TAZ) and Census 2000 data were used to estimate the number of residents and households that could be affected by the hazard. Utah State sales tax and Equifax Business data were used to find the total number of businesses and annual sales vulnerable to hazards. HAZUS-MH infrastructure data was used to analyze the amount of infrastructure vulnerable to hazards.

Step 8: Capabilities Assessment

Each member of the Planning Team was each given a Capabilities Assessment Worksheet (see Appendix) and Hazard Identification Matrix to complete within their own jurisdiction. These worksheets were designed as an opportunity for the Planning Team to engage others in their community in the planning process. It encouraged them to review existing plans, studies, reports or other technical information with city planners, engineers, administrators and other individuals who contribute to decision making and community planning. The worksheets were also intended to help recognize established goals as well as identify known hazards or problem areas that could potentially be addressed by implementing mitigation actions. The Hazard Identification Matrix allowed each jurisdiction to identify which hazards present the greatest threat locally and are summarized in Table M-1.

Step 9: Risk Assessment Review

Every section of the Plan was updated and revised as part of the planning process. Each completed section of the updated Plan was reviewed and analyzed for accuracy by the Planning Team and county emergency mangers. The Planning Team was tasked with reviewing the county risk assessments for accuracy and completeness and with developing mitigation strategies for all natural hazards threatening their respective jurisdiction. Changes or additions were conveyed to the lead planner for revision.

Step 10: Mitigation Strategy Development

Developing the mitigation strategies was a process in which all of the previous steps were taken into account. Murray City evaluated, identified and profiled the hazards, and completed a vulnerability assessment.

Step 11: Prioritization of Identified Mitigation Strategies

DMA 2000 requires state, tribal, and local governments to show how mitigation actions were evaluated and prioritized. The Planning Team determined which strategies were highest priorities, which jurisdiction was responsible, and evaluated to ensure best action to take given limited budgets allocated to hazard mitigation efforts at the local level. The prioritization process was completed by the Planning Team over a series of planning meetings (workshops). Each action was assigned a responsible party, an anticipated cost, and a timeline. Prioritization was accomplished using the STAPLEE method as explained in the FEMA How to Guide, Document 386-3. This process resulted in each Mitigation Strategy given a High, Medium or Low priority by the local planning teams.

Step 12: Continued outreach and Public Comment

Murray City Council meets twice a week a week with open comment periods. Over the last two years meetings with public comments were conducted on flood, hazard mitigation ordinances, and building ordinance have been held. Murray keeps records on all public comments and agendas.

As an additional opportunity to provide input to the mitigation plan, Murray residents were invited to the City Council meeting on 9/16/14. The city council meeting was advertised via a public announcement that was published in the Salt Lake Tribune and the Deseret News, on the city website, and on the public notice website on 8/31/14. Jon Harris presented the mitigation plan and time was allowed for citizens to provide input. No citizen input was received, although many questions were asked at the conclusion of the meeting.

Step 13: Adoption

Table 3-8 Planning Process Timeline demonstrates the process that Murray City, along with collaboration with Salt Lake County Emergency Management and local jurisdictions, participated in order to obtain the information needed for the mitigation plan.

Year	Date	Activity	Purpose
2012	**September**	Utah Division of Emergency Management designates Salt Lake County Emergency Management/Unified Fire Authority as sub-grantees of the state to revise the Pre Disaster Mitigation Plan.	
	August 7	Memorandum of Understanding	An MOU was signed by participating jurisdictions committing to participate in the planning process.
	September-October	Phone conferences with UDEM and FEMA Region VIII to discuss the planning process, Risk MAP.	Identified planning team and available resources.
	November 7	RiskMAP Discovery, Mitigation Kickoff	Kick off to introduce RiskMAP and Mitigation projects to reduce risk from natural hazards and increase disaster resiliency in the Jordan River Watershed/Salt Lake County
	November-December	Identifying Planning Team Members	Establish a contact person from each jurisdiction to participate in the planning process.
	December		Meeting with Salt Lake County Emergency Services to discuss cooperation with other county agencies and participation in mitigation planning process.
2013	**January-May**	Gather information.	Data collection.
	January 22	Mitigation Planning Team Meeting	Introduce project scope, identified team responsibilities, key terminology, requirements of the planning process, timeline.
	February 11	Mitigation Planning Team Meeting	Review of hazard maps for earthquake, landslide, and dam failure. Worksheets to gather information of areas of concern. Subject matter experts available to answer questions.
	February 27	Sandy City BCDM (Business Continuity Development Meeting)	Outreach effort, presentation/overview of mitigation plan to Sandy City business partners and emergency managers
	March 7	Salt Lake County Council of Government (COG)	Outreach presentation to elected officials to give overview of mitigation planning project.
	March 11	Mitigation Planning Team Meeting	Discussion with subject matter experts on severe weather and wildfire.
	April 8	Mitigation Planning Team Meeting	Presentation on pandemic flu and wildfire public education programs.
	May 16	Mitigation Planning Team, Risk MAP joint meeting	Presentation of flood and earthquake risk analysis from FEMA Region VIII,

Year	Date	Activity	Purpose
			presentation from UDEM regarding community Risk MAP meetings to be held over summer, Mitigation team given Capabilities Assessment worksheets and hazard matrix.
	June-Aug	Community Risk MAP meetings and work on worksheets	Risk MAP representatives met with individual communities to discuss flood study needs and areas of concern.
	Sept 11	Mitigation Team Meeting	Recap of Capabilities Assessment, preparing for next stages of plan.
	Oct 21	Salt Lake County Emergency Manager's meeting	Planner reported on mitigation plan progress to emergency managers. Encouraged completion of capabilities assessment worksheets. Provided copy of 2009 mitigation strategies to review and comment on progress.
	Oct-Nov	Risk Assessment Draft and mitigation strategies preparation	Planner reviewed and summarized Capabilities Assessment and Hazard worksheets. Continued Revising Risk Assessment. Summarized responses to 2009 Strategies Review.
	Nov. 19	Mitigation Planning Team Meeting – Mitigation Strategies Part II	Brainstorming meeting to begin identifying possible mitigation strategies. Hazards discussed were flood, wildfire, earthquake, and avalanche. Rough draft of Risk Assessment made available.
	Nov. 20	Planner meeting with SHMO regarding plan progress	Discussed timeline and planning progress
	December	Reviewed mitigation strategies.	Planner compiled notes from mitigation strategies brainstorm meeting and worksheets
2014	**Jan 14**	Mitigation Planning Team Meeting – Mitigation Strategies Part II	Brainstorming meeting to begin identifying possible mitigation strategies. Hazards discussed were earthquake, pandemic, dams and canals, and drought.
	Feb-Mar	Mitigation strategies draft, update wildfire risk assessment.	Planner compiled notes from mitigation strategies brainstorm sessions, continued revision of Risk Assessment as new data became available for Wildfire.
	Apr-June	Mitigation Strategies review	Create timeline to meet Grant requirements. Complete all elements of Plan.
	June	Review Best Practices SOG for Mitigation	Find a better system for Mitigation planning. Permission to use Pennsylvania's Mitigation SOG
	July 1	Review Progress with EM staff	Prepare Plan for submission to State and FEM review boards

Year	Date	Activity	Purpose
	July 14	Mitigation Planning Team Prioritization Workshop	Planning Team reviews final mitigation strategies to assign responsibility, estimate costs, and define priority
	August 8	Emergency Managers Meeting HMP explanation and scheduling	Have each individual Jurisdiction complete their plan.
	September 8	Emergency Managers Meeting HMP scheduling	Continue One on One Meeting with each Jurisdiction to complete plan
	October 7	Submit final plan from each Jurisdiction	County to review Jurisdiction plans and assemble entire County HMP
	October 20	Submit Plan to State	State Submission requirement prior to FEMA submission
	November 1	State returns Plan for submission to FEMA	Submit Final Plan to FEMA for approval
	November 15	FEMA returns plan for corrections	Correct deficiencies
	November 20	Submit Final Plan to FEMA	Plan complete

Table 3-8 Planning Process Timeline

Information Sources and Revision Process

Background information and data for this Plan was obtained from the sources listed on the following page. From these sources, the WFRC PDM planner extracted relevant information and data. That information and data was subsequently submitted to the County Work Groups for their consideration and approval for inclusion into the Plan. Relevant information gathered from these sources was compiled by the Working Groups and incorporated into this Plan. Based on the large amount of growth in communities throughout the WFRC Region, it was determined by the Working Groups that the entire Plan would be updated.

Sources for Background Information

- Federal Emergency Management Agency (How-to Guides)
- National Weather Service (hazard profile)
- National Climate Data Center (drought, severe weather)
- Utah Division of Emergency Management (Salt Lake City Mitigation Plan, GIS data, flood data, HAZUS data for flood and earthquake)
- Utah Geologic Survey (GIS data, geologic information, various hazard reports)
- Utah Division of Forestry Fire and State Lands (fire data)
- Utah Avalanche Center, Snow and Avalanches, Annual Report 2006-2007 Forest Service
- Utah Department of Transportation (traffic data, avalanche?)
- Utah Automated Geographic Resource Center (GIS data)
- University of Utah Seismic Station (earthquake data)
- Utah State University (climate data)
- Councils or Government
- Association of Governments
- Utah Association of Special Districts
- State Office of Education
- Salt Lake County and municipalities (Emergency Operations Plans, histories, mitigation actions, public input, data: GIS, assessor, transportation, property and infrastructure)
- Earthquake Safety in Utah
- Utah Natural Hazard Handbook 2008
- Utah Statewide Fire Risk Assessment Project
- A Strategic Plan for Earthquake Safety in Utah
- State of Utah Wildfire Plan 2007
- State of Utah Drought Plan 2007
- West Wide Wildfire Assessment 2013

Murray' planning team identified the hazards that affect the City and summarized their frequency of occurrence; spatial extent, potential magnitude, and significance specific to Murray (see Table 1). In the context of the plan's planning area, there are no hazards that are unique to Murray.

Hazard	*Location (Geographic Area Affected)*	*Magnitude, Strength (Maximum Probable Extent)*	*Probability of Future Events*	*Overall Significance*
Avalanche	Negligible	Weak	Unlikely	Low
Dam Failure	Negligible	Weak	Unlikely	Low
Drought	Extensive	Extreme	Likely	Moderate
Earthquake	Extensive	Extreme	Likely	High
Flood	Significant	Moderate	Likely	Moderate
Infestation	Negligible	Weak	Unlikely	Low
Landslide	Negligible	Weak	Unlikely	Low
Pandemic	Negligible	Extreme	Unlikely	Low
Problem Soils	Negligible	Weak	Unlikely	Low
Radon	Negligible	Weak	Unlikely	Low
Severe Weather	Extensive	Severe	High	Moderate
Wildfire	Limited	Weak	Unlikely	Low

Table 1. Murray City—Hazard Summaries

Definitions for Classifications

- Location (Geographic Area Affected)
- Negligible: Less than 10 percent of planning area or isolated single-point occurrences
- Limited: 10 to 25 percent of the planning area or limited single-point occurrences
- Significant: 25 to 75 percent of planning area or frequent single-point occurrences
- Extensive: 75 to 100 percent of planning area or consistent single-point occurrences

- Maximum Probable Extent (Magnitude/Strength based on historic events or future probability)
- Weak: Limited classification on scientific scale, slow speed of onset or short duration of event, resulting in little to no damage
- Moderate: Moderate classification on scientific scale, moderate speed of onset or moderate duration of event, resulting in some damage and loss of services for days
- Severe: Severe classification on scientific scale, fast speed of onset or long duration of event, resulting in devastating damage and loss of services for weeks or months
  Extreme: Extreme classification on scientific scale, immediate onset or extended duration of event, resulting in catastrophic damage and uninhabitable conditions

3 Vulnerability Assessment

The intent of this section is to assess Murray' vulnerability separate from that of the planning area as a whole, which has already been assessed in Section 4.3 Vulnerability Assessment in the main plan. This vulnerability assessment analyzes the population, property, and other assets at risk to hazards ranked of medium or high significance that may vary from other parts of the planning area. For more information about how hazards affect the County as a whole, see Chapter 4 Risk Assessment in the main plan.

3.1 Assets at Risk

This section considers Murray' assets at risk, including values at risk, critical facilities and infrastructure, historic assets, economic assets, and growth and development trends.

3.1.1 Values at Risk

The following data from the Salt Lake County Assessor's Office is based on the certified roll values for 2014. It is also important to note that in the event of a disaster, it is generally the value of the infrastructure or improvements to the land that is of concern or at risk. Generally, the land itself is not a loss. Table H.2 shows the 2014 roll values (e.g., the values at risk) broken down by property type for Murray City

Property Type	Units Improved	Total Improved Value ($)	Total Improved Land Value ($)	Units Unimproved	Total Unimproved Land Value ($)	Grand Totals	
						Units	Value ($)
Office	176	266,711,470	106,448,470	57	5,563,700	233	378,723,640
Commercial	405	353,171,690	270,566,450	182	28,726,600	587	652,464,740
Industrial	371	113,507,390	127,932,890	221	22,815,000	592	264,255,280
Open Space	46	38,621,080	97,916,650	240	68,900,470	286	205,438,200
Residential	10,911	1,787,808,650	1,537,037,340	991	37,841,840	11,902	3,362,687,830
Other	121	719,612,670	126,820,370	173	20,335,600	294	866,768,640
Total	**12,030**	**3,279,432,950**	**2,266,722,170**	**1,864**	**184183210**	**13,894**	**5,730,338,330**

Table 2. 2014 Roll Values for Murray City by Property Type
Source: 2014 Certified Roll Values, Salt Lake County Assessor's Office

According to the report, total valuation of real City property was $21.5 million in 2014. Machinery and equipment values in these facilities were $11.5 million. Murray City has an ordinance to avoid construction within flood plains.

Critical Facilities and Infrastructure

A critical facility may be defined as one that is essential in providing utility or direction either during the response to an emergency or during the recovery operation. FEMA's HAZUS-MH loss estimation software uses three categories of critical assets. Essential facilities are those that if damaged would have devastating impacts on disaster response and recovery. High potential loss facilities are those that would have a high loss or impact on the community. Transportation and lifeline facilities are the third category.

Essential Facilities

Essential facilities as identified by HAZUS-MH are as follows:

- Murray Police Department Headquarters—5025 S State
- Murray Fire Stations
  - 81 – 40 E 4800 S
  - 82 – 996 E Vine
  - 83 – 484 W 5900 S
  - 84 – 163 E 5900 S
- Murray City Hall – 5025 S State
- Murray Power Dispatch – 153 W 4800 S
- Substations
- Murray Public Services – 4646 S 500 W

High Potential Loss Facilities

High potential loss facilities as identified by FEMA HAZUS-MH are located throughout Murray. Murray works closely with the Murray City School District, Salt Lake County Flood Control District, and elder care property owners in monitoring and assessing facilities that fall into this category that are not owned by the City.

Transportation and Lifeline Facilities

Transportation and lifeline facilities are throughout Murray City. Interstate 15 is the major thoroughfare through Murray. State Street is also a major road going north and south. Public transportation such as busses, TRAX and FrontRunner also transport people throughout Murray City. Several canal systems and creeks transport water through Murray.

Major transportation facilities throughout Murray City are listed below.

Roadway	Limits	Volume (2010)
I-15	4500 to 5300 South	202,685
I-15	5300 South to I-215	171,205
I-215	State St. to Union Park (900 E)	115,720
State Street	4500 to 4800 South	29,885
5300 South	700 West to I-15 Interchange	35,410
4500 South	300 E to Main St	34,210
Van Winkle Expressway	6100 to 6200 South	37,195
900 East	Van Winkle Expressway to 5600 South	37,070
1300 East	5600 to 6100 South	21,405
700 East	4500 to 4800 South	35,260
Winchester Street	State St to Fashion Blvd	23,900
Winchester Street	700 West to State St	10,545
700 West	5300 to 5900 South	10,265
Fashion Blvd	5900 South to Winchester Street	10,985
Murray Blvd	4800 to 5300 South	13,325
Murray Parkway Avenue	Winchester Street to 5400 S	6,795
Vine Street	5300 S to 5600 South	13,705
300 West	4500 S to 4800 South	4,215
300 West	4800 S to Vine St	3,790
4800 South	Commerce Drive to State Street	9,410
5300 South	State Street to Vine Street	10,500
5600 South	Fashion Blvd to Vine Street	7,050
5900 South	300 W to State St	11,370
Light Rail Line (TRAX)	North Boundary to South Boundary	
Commuter Rail (Frontrunner)	North Boundary to South Boundary	

State Street is also a major road going north and south. Public transportation such as busses, TRAX and FrontRunner also transport people throughout Murray City. Several

3.1.2 Water and Waste Water

There are three separate entities/systems providing drinking transport water within the Murray City boundaries: 1) Murray City, 2) Jordan Valley Water Conservancy District (JVWCD), and 3) Salt Lake City Public Utilities (SLCPU) through Murray.

The Murray City water system supplies water generally west of 900 East. The Murray City water system relies on well water as its predominant supply source producing about 84 percent of annual system water demand. Water for the water system in Murray City's service area is supplied by 8 springs and 19 wells. Each of these water sources is dependent on pumps and motors to deliver water to the water distribution system. The City has emergency standby generation power at six locations. The City has five tanks or reservoirs within its service area with a combined storage capacity of 12 million gallons to provide operating and emergency storage. In the event of an emergency, Murray City has an exchange agreement with SLCPU to provide water.

The JVWCD and SLCPU water systems supply water generally east of 900 East. There are no water sources for these two entities located within Murray City. Rather, they provide retail delivery only.

3.1.3 Murray City Power

The City of Murray is unique in Salt Lake County as the only city in the county that has a municipally owned power system. Murray City Power is the utility division that operates the power system in the 9.9 square mile service area, which includes 206 miles of transmission and distribution lines and a customer base of approximately 14,000 residential customers and 3,000 commercial customers. The system load peaks in the summer at just over 100 MW and 60 MW in the winter. Providing reliable energy to the homes and businesses of Murray City is important even in times of disaster, so Murray City installed three generators located at the central substation with a generating capacity of approximately 39 MW to help with system reliability. In normal operation these generators are used as a peaking resource mostly in the summer months and remain idle until needed. In an emergency situation these generators can be used to provide emergency power to needed areas of the city as long as the natural gas supply is available.

The critical infrastructure includes five substations:

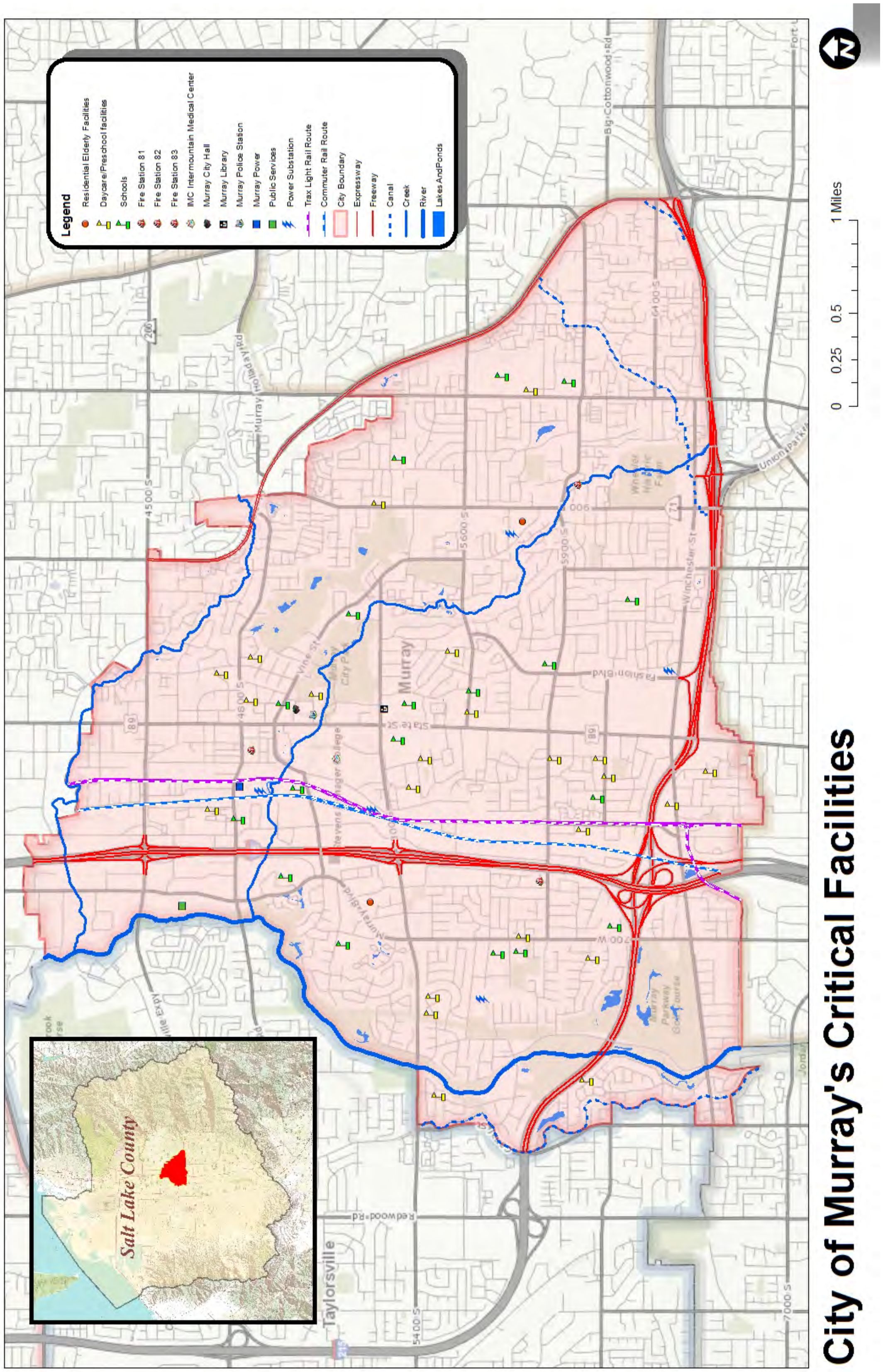
- Riding – 869 West Bullion
- Central – 153 West 4800 South
- Grandview – 5250 South Cottonwood
- Vine Street Substation – 815 East Vine
- Mall – 238 E Winchester

An inventory of critical facilities in the Murray City from Murray City GIS is provided in Table 3 and illustrated in Figure 2.

Critical Facilities Type	Number
Communication Centers	1

Detention Centers	1
Emergency Command Centers	2
Emergency Operations Centers	1
Fire Departments	4
Health Care Facilities	2
Law Enforcement Facilities	1
Maintenance Yards	2
Residential Elderly Facilities	2
Schools and Day Care Facilities	24
Public Utilities—Water/Sewer/Power	2
Totals	**42**

Source: Murray City GIS


City of Murray's Critical Facilities
Legend
Residential Elderly Facilities
Daycare/Preschool facilities
Schools
Fire Station 81
Fire Station 82
Fire Station 83
IMC Intermountain Medical Center
Murray City Hall
Murray Library
Murray Police Station
Murray Power
Public Services
Power Substation
Trax Light Rail Route
Commuter Rail Route
City Boundary
Expressway
Freeway
Canal
Creek
River
LakesAndPonds
0
0.25
0.5
1 Miles
Salt Lake County
Murray
Taylorsville
4500 S
5600 S
5900 S
6400 S
7000 S
5400 S
State St
900 E
700 W
Vine St
Winchester St
Fashion Blvd
Redwood Rd
Big Cottonwood Rd
Union Park

Historic Resources

Local Registry

Created in 1997, the Murray Historic Registry includes local homes, businesses, and districts at least 50 years old, which have maintained their historic character or have significant historic value. They have been nominated and reviewed by the Historic Preservation Board and designated to the Murray Historic Registry. The owner may choose not to be placed on the Registry.

Each historic site receives a special ranking of A (has been well preserved) or B (has had some changes). These designations may be changed higher or lower or removed from the Registry depending on what kinds of changes are made to the home.

The registry is a non-regulatory ordinance (City Code 2.40.020) that requires communication between the owner and the Cultural Arts Division prior to changes in the footprint or original building materials. After communication is complete, the owner may proceed with regular requirements of the City.

Other Designations

Some buildings or districts have been given special designations at the local level or included on the National Registry of Historic Sites. These may be included on our local registry, but have unique characteristics and requirements may differ.

National Register of Historic Places

The National Register does not impose restrictions. Its purpose is to provide recognition and to encourage preservation. Owners of contributing buildings are eligible for potential funding for approved rehabilitation projects; however, local municipalities may impose restrictions on these buildings.

Buildings in Murray listed on the National Register include:

- Individual Buildings
    - Cahoon Mansion
    - Murray Theater
    - Murray Second Ward
    - Warenski-Duvall Building
    - Iris Theater and Apartments
- Historic Downtown Residential District
    - Includes 185 historic structures that extend from Center St. to Atwood and Glen St. and from 4800 S. to Vine St. with a small extension on Vine St. to 451 E. Vine.
    - 13 of the 185 buildings were researched in more detail to illustrate the architectural history of the residential area between 1870 and 1950.
- Murray Downtown Historic District
    - Includes 29 historic structures
    - The District is comprised of mostly the business sector along State St. and the east side of Poplar St., which includes a few residential buildings

Economic Assets

Murray City is home Intermountain Medical Center, which is the largest Intermountain Healthcare facility in the state. Additionally Fashion Place Mall is located within our City and is a significant contributor to sales tax revenue as one of the premier malls in the state. Loss of either of these employers would result in thousands of displaced employees and sales tax revenue in the millions of dollars.

The following table outlines the top ten (10) employers in Murray City based on number of employees:

Employer	Number of Employees
Intermountain Medical Center	4,463
SelectHealth	800
IHC Health Services	757
Sutter Connect, LLC	449
The University of Phoenix	422
3M Health Information Systems	377
Costco Wholesale Corp.	309
Nordstrom (at Fashion Place Mall)	286
The Cheesecake Factory (at Fashion Place Mall)	255
Sorenson Bio Science, Inc.	231

Growth and Development Trends

Over the past five years, Murray City has experienced significant growth in housing and commercial development. This growth is due in part to the City's proximity to light rail transportation and freeway access, the draw of our medical services community and an outstanding school district. The City has a reputation for being a safe, close-knit and friendly community in which to raise a family.

Land within Murray City is becoming short in supply primarily due to land-locked boundaries. Future development will be restricted to infill construction projects and redevelopment of underutilized areas. Recent zoning changes encourage mixed-use projects and increased building height in certain commercial areas.

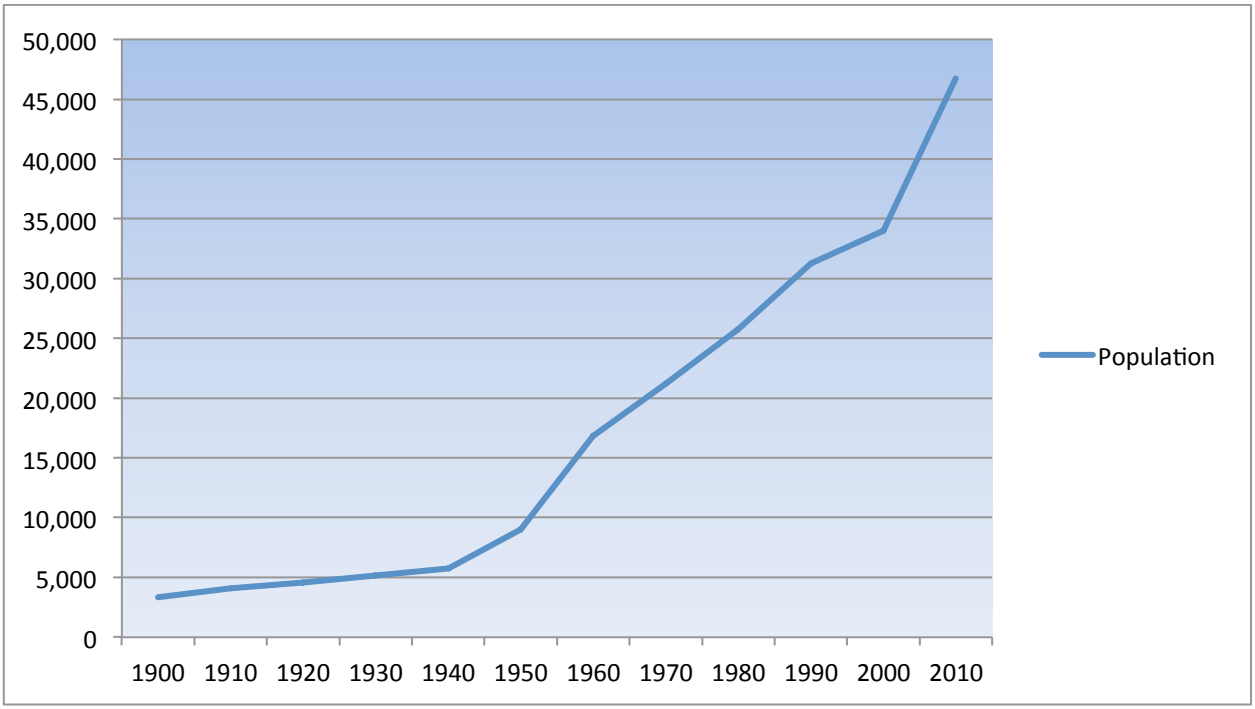
In the fall of 2008, Murray City contracted with BBC Research & Consulting to conduct a citywide hosing needs assessment. The primary purpose of the study was to identify the greatest housing needs in Murray City by household type, housing type and income level. A secondary purpose was to present relevant demographic and economic characteristics to the City. The assessment process included input from focus groups and a resident survey. A Final Report was published in April 2009 and provided recommendations for addressing housing needs.

The 2009 housing study found that of Murray City's 17,411 occupied housing units, 69 percent were owner occupied with an average household size of 2.7 persons. 2010 Census data shows 18,226 occupied housing units in Murray City with 66.8 percent being owner occupied. The data shows an average household size of 2.5 persons. There is a small difference between household size of renters and owners, suggesting that families are distributed throughout housing types. Responses to the resident housing survey indicate that the top three factors affecting housing choice are proximity to shopping and services, home type and proximity to family. The majority of respondents, 61 percent, report living in their current residence for more than ten years.

Table H.4 illustrates how the City has grown in terms of population and number of housing units between 2000 and 2010. As of 2010, the population of Murray was 46,746 with a ten-year change in population of 37.3%.

2000 Population	2010 Population	Percent Change 2000-2010	2000 # of Housing Units	2010 # of Housing Units	Percent Change 2000-2010
34,024	46,746	+37.3%	12,673	18,226	+43.8%

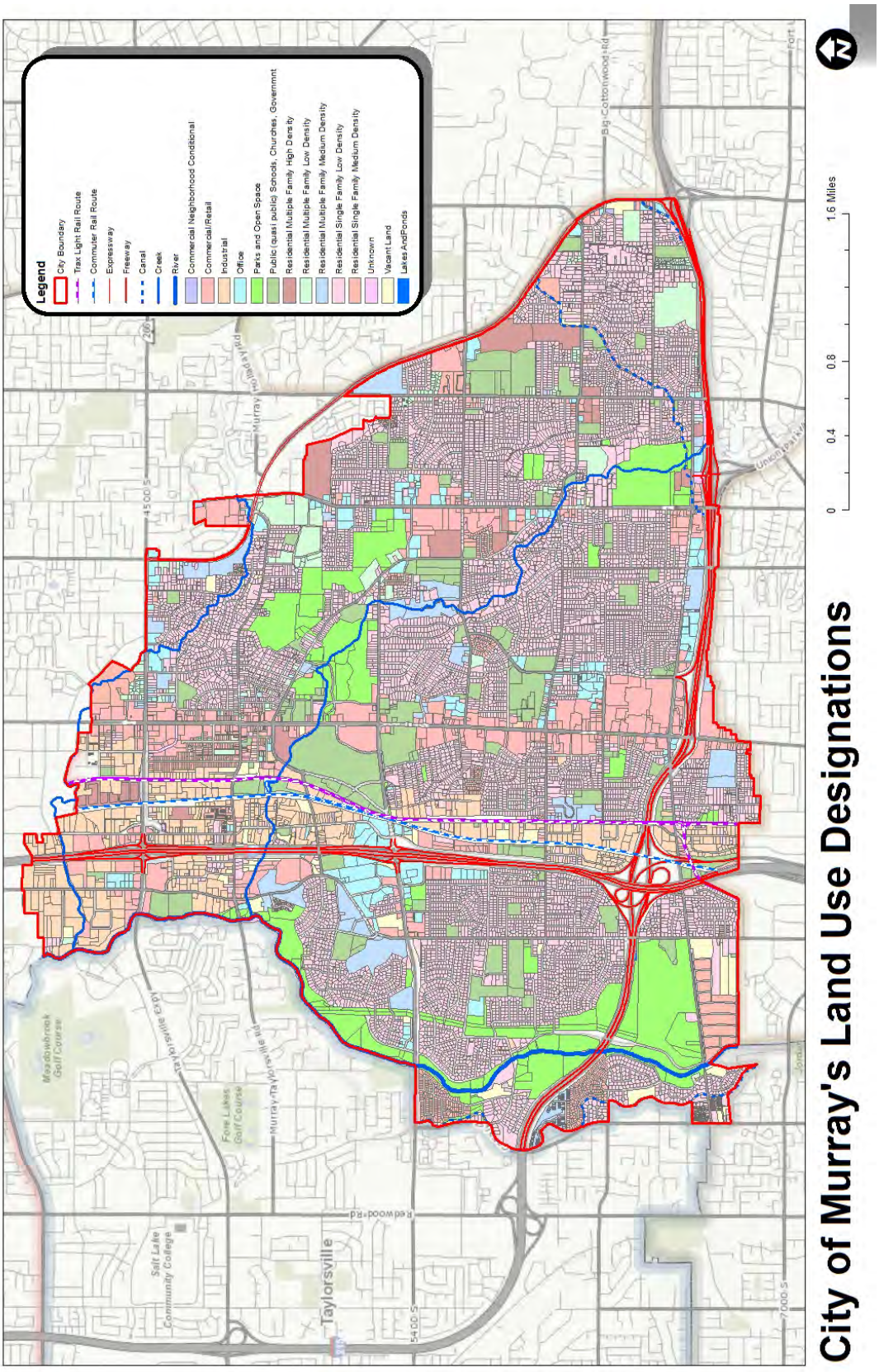
Table 4. Murray City' Change in Population and Housing Units, 2000-2010
Source: U.S. Census Records



Utah Municipal Code 10-9a-401 requires that each municipality shall prepare and adopt a comprehensive, long-range general plan to include present and future needs of the municipality and growth and development for all or any part of the land within the municipality. Adopted in June of 2003, the Murray City General Plan provides comprehensive planning for the future. It encompasses what the City is now, what it intends to be, and provides the overall framework of how to achieve this future vision. The Plan addresses eight issue areas:

- Land Use
- Urban Design and Community Building
- Transportation
- Historic Preservation
- Parks, Recreation and Trails
- Natural and Environmental Conditions
- Economic Development
- Housing

The purpose of the plan is to help decision-makers evaluate development proposals and implement a desired future for the community.


City of Murray's Land Use Designations
Legend
City Boundary
Trax Light Rail Route
Commuter Rail Route
Expressway
Freeway
Canal
Creek
River
Commercial Neighborhood Conditional
Commercial/Retail
Industrial
Office
Parks and Open Space
Public (quasi public) Schools, Churches, Governmnt
Residential Multiple Family High Density
Residential Multiple Family Low Density
Residential Multiple Family Medium Density
Residential Single Family Low Density
Residential Single Family Medium Density
Unknown
Vacant Land
Lakes And Ponds
0
0.4
0.8
1.6 Miles
Big Cottonwood Rd
Murray-Holladay Rd
4500 S
Meadowbrook Golf Course
Fore Lakes Golf Course
Murray-Taylorsville Rd
Redwood Rd
Salt Lake Community College
Taylorsville
5400 S
7000 S

4 Estimating Potential Losses

Table 2 above shows Murray City's exposure to hazards in terms of number and value of structures. Salt Lake County's assessor's data was used to calculate the improved value of parcels. Impacts of past events and vulnerability to specific hazards are further discussed below.

4.1 Drought

Since the commencement of weather measurements, Utah has experienced several noteworthy droughts. Analysis of PDSI data collected in the state's seven climate divisions reveals six significant droughts, during 1898-1905, 1928-1936, 1946-1964, 1976-1979, 1987-1992 and 1999-2004.

4.2 Earthquake

Murray is subject to similar seismic hazards compared to many other parts of the Salt Lake Valley. The primary seismic hazard is ground shaking produced by earthquakes generated on regional faults. The USGS database shows that there is a 47.01% chance of a major earthquake within 50km of Murray, UT within the next 50 years. The largest earthquake within 30 miles of Murray, UT was a 4.7 Magnitude in 1981.

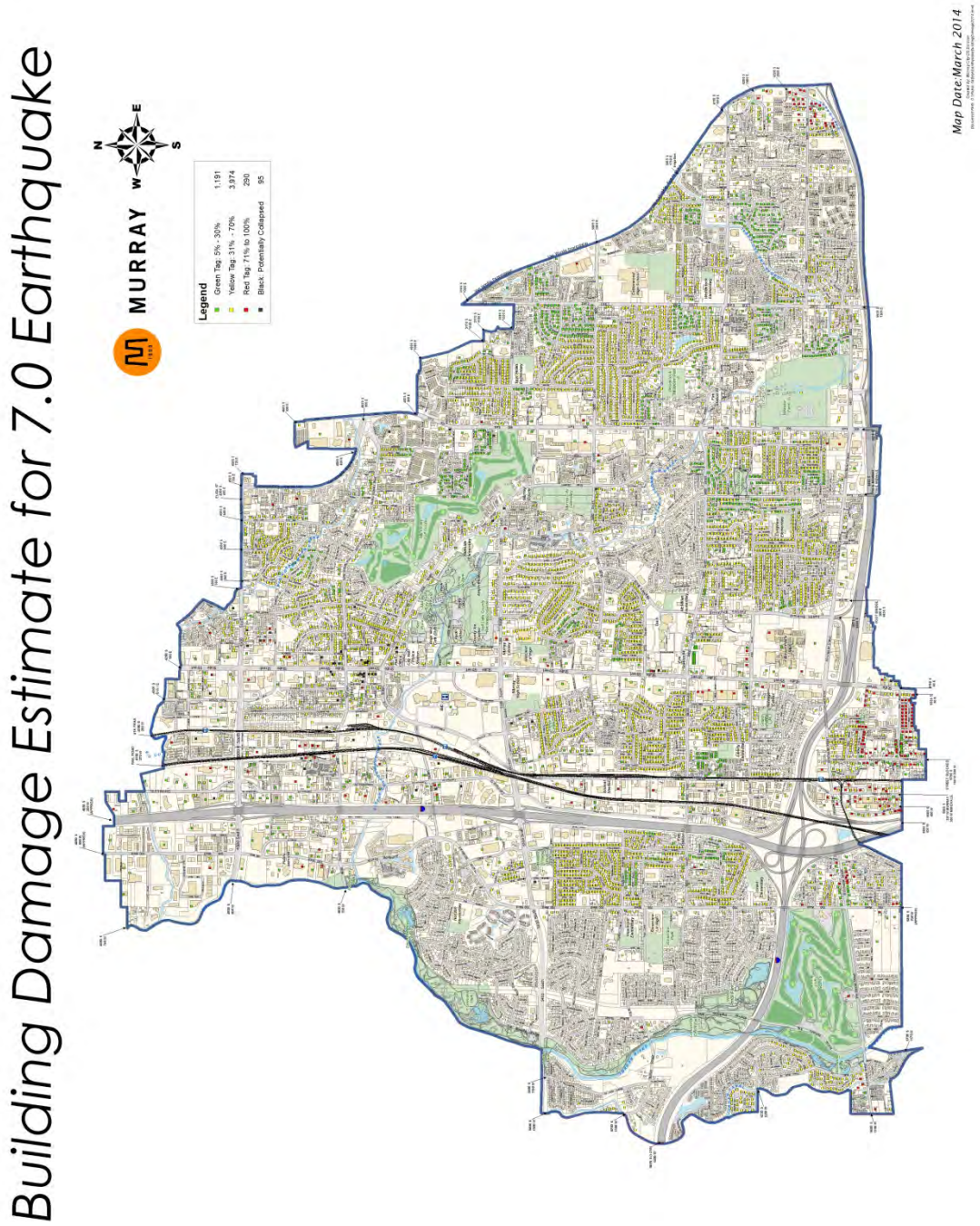
Utah's biggest earthquake fault runs east of Salt Lake City, at the base of the steep Wasatch Mountains. About 75 percent of the state's population lives near the 240-mile-long (385 kilometers) Wasatch Fault, according to the Utah Geological Survey. Its last big earthquake hit in 1600, 247 years before Mormon settlers arrived.

To the west, in urban Salt Lake City, a 4-mile-wide (6 km) zone of fault segments called the West Valley Fault Zone stretches north-northwest for 9 miles (14 km) beneath the valley. Trenches along a portion of the West Valley fault zone, near Salt Lake City's airport, reveal that both the West Valley and Wasatch faults seem to rupture simultaneously during earthquakes,

The Wasatch Fault is divided into 10 segments, which act mostly independently, researchers think. The 25-mile-long (40 km) Salt Lake City segment is thought to be one of the most hazardous, with the probability of a large quake (magnitude 7.0) put at 16.5 percent in the next 100 years, according to the Utah Geological Survey.

Several unreinforced masonry buildings are located in the Murray City. The city hall building is highly vulnerable to earthquakes as well.

Liquefaction is one of the secondary hazards associated with an earthquake and affects nearly all of Salt County. The County is located atop the ancient Lake Bonneville lakebed, which is made up of unconsolidated sandy soils. Much of the valley is also subject to shallow ground water and a relatively high earthquake threat. These three factors are prevalent in the northern quarter of the County.


Building Damage Estimate for 7.0 Earthquake
MURRAY
Legend
Green Tag: 5% - 30%
1,191
Yellow Tag: 31% - 70%
3,974
Red Tag: 71% to 100%
290
Black: Potentially Collapsed
95
Map Date: March 2014

Vulnerability Assessment

Vulnerability of people and infrastructure to earthquake hazards in Salt Lake County was obtained from the modeling program HAZUS-MH, completed by FEMA Region VIII.

Jurisdiction	*Total Building Economic Loss*	*Loss Ratio*	*Total Debris (tons)*
Murray	$ 1,777,099,237	25%	1,223,103

Table 8.

Jurisdiction	*Displaced Households*	*Individuals Seeking Public Shelter*	*Total Casualties*	*Life-Threatening Injuries and Fatalities*	*URM Count*
Murray	6,200	3,448	2,147	217	4,987

Table 9.

Jurisdiction	*Life-Threatening Ratio to Total Pop*	*URM Ratio to Total Structures*
Murray	0.467%	37%

Table 10

4.3 Flood

The natural drainages within Murray City are the Jordan River, Little Cottonwood Creek, and Big Cottonwood Creek. Both of the Cottonwood Creeks flow northwest and join the Jordan River in the northwest region of the City. The Jordan River flows north along the west side of Murray City. The East Canal and Jordan and Salt Lake City Canal cut across the southeast corner of the City and flow to the northeast. Other areas of flooding include Wheeler Farm and Murray City Park.

- **Natural Drainages:**

  - Little Cottonwood Creek
    Little Cottonwood Creek flows through approximately 4.5 miles of Murray City from Union Park Avenue and I-215 to the Jordan River at 4800 S. The creek provides drainage for the Southeast, Central East, Central, and North Basins. It is conveyed through the City by a series of open channels and road crossing structures before discharging to the Jordan River after crossing Murray Boulevard.

  - Big Cottonwood Creek
    Big Cottonwood Creek flows through approximately 4.2 miles of Murray City from 1300 E and 4705 S to the Jordan River at 4200 S. The creek provides drainage for the Northeast, East, and North Basins. It is conveyed through the City by a series of open channels and road crossing structures before discharging to the Jordan River after crossing 500 E.

- Jordan River
  The Jordan River flows through approximately 4.6 miles of Murray City along the western border of the City. The Jordan River provides drainage for the West, Central South, Central West, and North Basins.

- Jordan and Salt Lake City Canal
  The Jordan and Salt Lake City Canal flows through approximately 1.9 miles of Murray City from 900 E and I-215 northeast to Van Winkle. The canal provides drainage for the Southeast and Northeast Basins. The canal is conveyed through a series of open channels and culverts before exiting the City boundary. It must be noted that although the canal currently is part of the storm drainage system, especially for older irrigation pipes that also convey storm drain runoff, the canal cannot be used as an outlet for future storm drain projects.

4.3.1 Vulnerability Assessment

A community assessment exercise was performed at the Risk MAP Discovery Meeting and at several community follow-up meetings. Community representatives worked together to gain a comprehensive understanding of previous flooding events and areas of concern (including future development areas), existing community studies that can be leveraged as part of the Risk MAP project, and the status of flooding mitigation actions from the Wasatch Front Regional Council Natural Hazard Pre-Disaster Mitigation Pan. The assessment exercise also helped to identify vulnerable community assets including critical facilities, socially vulnerable populations, and areas of mitigation interest. The participants identified and prioritized several future flood study needs. A number of potential mitigation actions were identified and will be described in the Mitigation Strategies section.

The following loss estimates were provided by FEMA Region VIII, Sept 2013 as part of the Mitigation Planning/Risk MAP partnership.

	1% Annual Chance			0.2% Annual Chance		
City	Structure Exposure	Building and Contents Loss*	Loss Ratio**	Structure Exposure	Building and Contents Loss	Loss Ratio
Murray	79	$1,382,712	0.020%	412	$23,160,899	0.33%

Structure exposure and Hazmat generated losses

Table 16*Data not available for 1% annual chance loss calculation for x structures. More detail on structures without associated losses available in jurisdictional tables. Structure count is accurate.

****Ratio of damages/losses by hazard and total building inventory.**

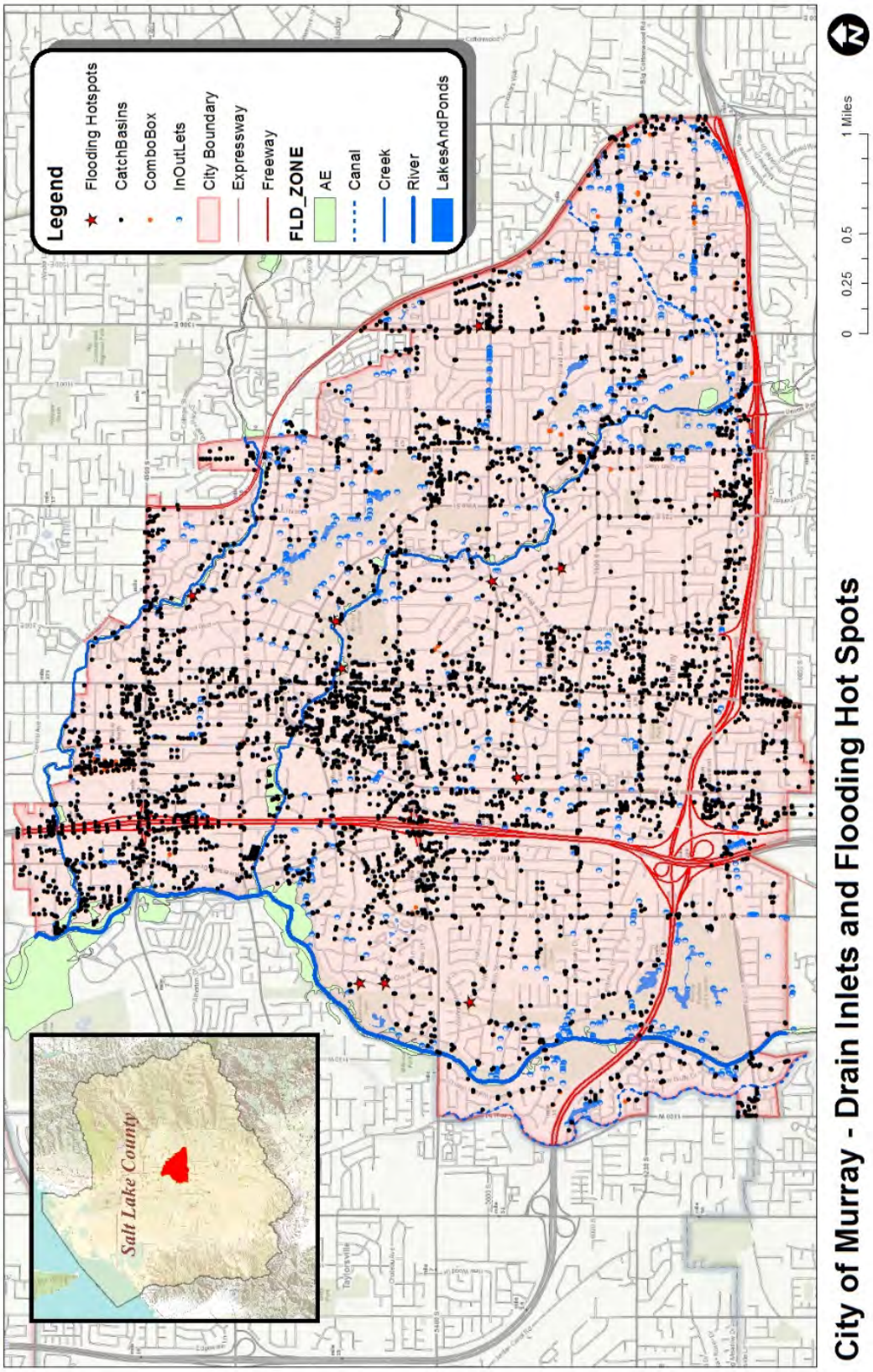


Figure 5. Murray City' Drain Inlet and Flooding Hot Spot Map

Following the rainstorm of September 1982 and the snowmelt floods of 1983, Salt Lake County passed a $33 million bond to combine with mitigation funds from FEMA. With these funds many flood control projects were constructed to repair damage to the creeks and rivers and to protect the citizens from future flooding events. Among the projects constructed was a detention basin at Wheeler Farm on Little Cottonwood Creek and improvements to the Creek Side Park detention Basin on Big Cottonwood Creek. In addition, numerous channel improvement projects were constructed, including, many thousands of feet of gabion baskets installed on Big and Little Cottonwood Creeks and the Jordan River.

Damaging floods occurred in 1983, 2010 and 2011. Listed below is a summary of these events:

- **1983** – Great Salt Lake Tributaries between Ogden and Salt Lake City flooded due to rapid melting of snowpack having maximum-of-record water content on June 1. A disaster was declared by the President with damage at $621 million. Mitigation measures in Murray included modifications to and replacement of several bridges.
- **2010 –** Cool temperatures during early to mid-spring delayed snowmelt runoff from Little and Big Cottonwood Creeks. June rainfall, along with rapidly increasing temperatures, occurred for several days in a row resulting in higher than average spring runoff.
- **2011 –** During water year 2011, Utah experienced its wettest 90-day period in history (1948–2011) from March to May. Runoff for water year 2011 was characterized by a delay in the snowmelt runoff and above average total annual stream flow. Despite the above average snowpack, which lasted into the summer of 2011, runoff from snowmelt in 2011 did not create the widespread damage observed in 1983 and 2005. Cooler than normal temperatures resulted in slower snowmelt rates, which produced a prolonged and elevated runoff.

Figure 6 illustrates precipitation at the Salt Lake International Airport and is representative of Murray City's precipitation.

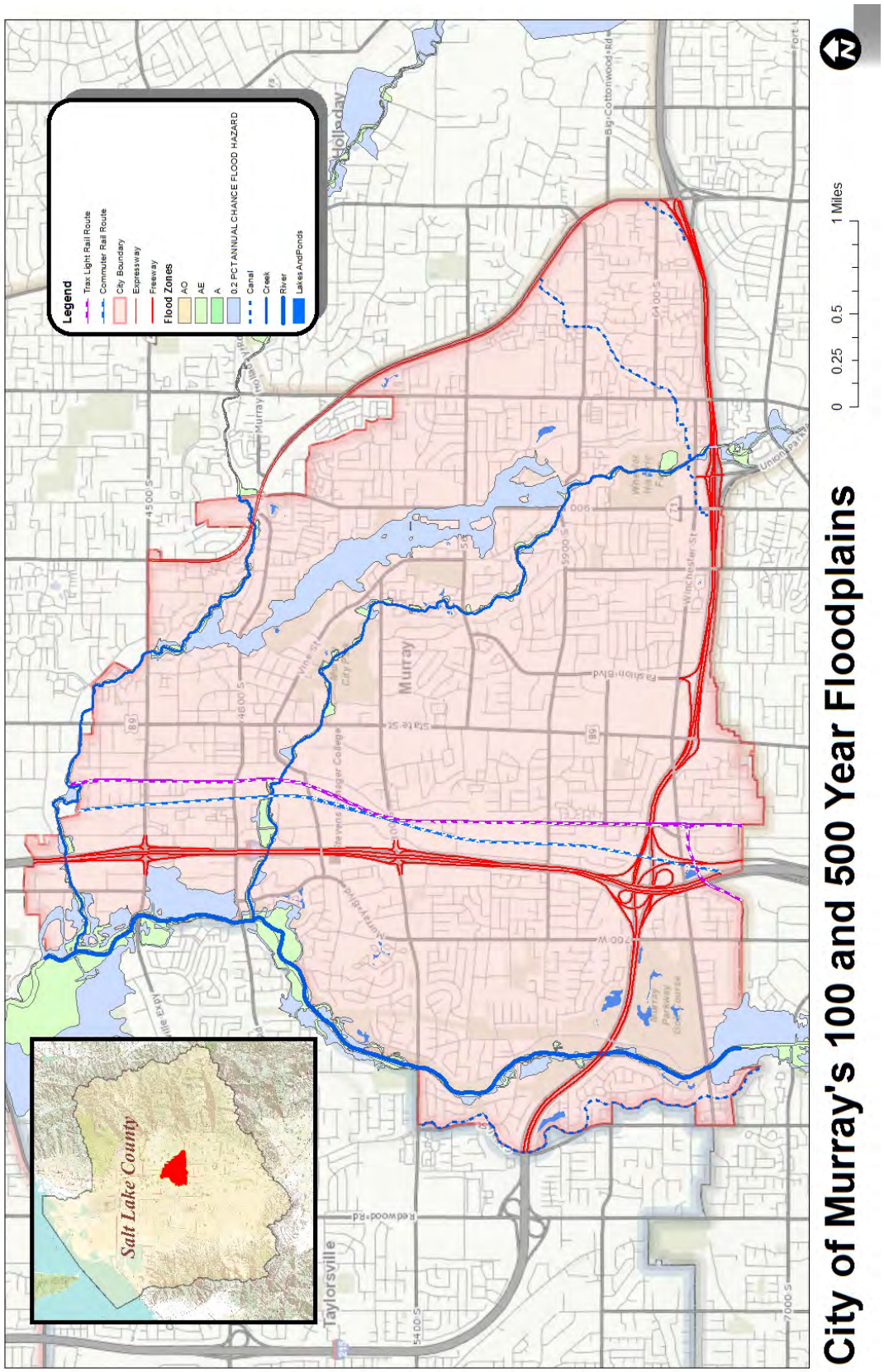
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Record Precipitation	3.23	4.89	3.97	4.90	4.76	3.84	2.57	3.66	7.04	3.91	3.34	4.37
Average Precipitation	1.37	1.33	1.91	2.02	2.09	0.77	0.72	0.76	1.33	1.57	1.40	1.23
Average Snowfall	13.6	9.9	9.1	4.9	0.6	0.0	0.0	0.0	0.1	1.3	7.0	12.0
Record Snowfall	50.3	32.1	41.9	26.4	7.5	0.0	0.0	0.0	4.0	20.4	33.3	35.2

Figure 6. Murray City' Precipitation (in Inches)

For information about flooding related to storm water, see the Other Hazards section below.

4.3.2 Values at Risk

Following the methodology described in Section 4.3.2 Vulnerability of Salt Lake County to Specific Hazards, a flood map for the Murray City was created (see Figure 7). Tables 5-7 summarize the values at risk in the City's floodplain. Table H.5 is a detailed analysis that shows the count and improved value of parcels that fall in a floodplain by flood zone and property type. Table 6 summarizes the information in the first table by the 100-year flood, 500-year flood, and total flood (100-year and 500-year floods combined). And, Table 7 shows loss estimates by flood.


City of Murray's 100 and 500 Year Floodplains
Legend
Trax Light Rail Route
Commuter Rail Route
City Boundary
Expressway
Freeway
Flood Zones
AO
AE
A
0.2 PCT ANNUAL CHANCE FLOOD HAZARD
Canal
Creek
River
Lakes And Ponds
0 0.25 0.5 1 Miles
Salt Lake County
Murray
Taylorsville
Holladay
4500 S
4800 S
5400 S
7000 S
900 W
700 W
State St
Fashion Blvd
Winchester St
Vine St
Redwood Rd
Big Cottonwood Rd
Union Park

Property Type	Zone A # Of Parcels	Zone A Improved Value ($)	Zone AE # Of Parcels	Zone AE Improved Value ($)	0.2 pct. – 500 yr. # Of Parcels	0.2 pct. – 500 yr. Improved Value ($)
Office			10	19,517,800	12	31,213,700
Commercial			18	10,592,790	55	38,290,680
Industrial			44	15,591,980	82	24,406,350
Open Space			-	-	-	-
Residential			214	44,779,690	557	86,444,690
Total			**286**	**90,482,260**	**706**	**180,355,420**

Property Type	Zone AO # Of Parcels	Zone AO Improved Value ($)	Shaded Zone X # Of Parcels	Shaded Zone X Improved Value ($)	Zone X # Of Parcels	Zone X Improved Value ($)
Office	-	-	-	-	-	-
Commercial	-	-	-	-	-	-
Industrial	-	-	-	-	-	-
Open Space	-	-	-	-	-	-
Residential	-	-	-	-	-	-
Total	**-**	**-**	-	-	-	-

Sources: 2014 Certified Roll Values, Salt Lake County Assessor's Office;
Digital Flood Insurance Rate Map Salt Lake County, Utah and Incorporated Areas, 2014, FEMA

Property Type	Total 100-Year Flood* # Of Parcels	Total 100-Year Flood* Improved Value ($)	Total 500-Year Flood # Of Parcels	Total 500-Year Flood Improved Value ($)	Total Flood** # Of Parcels	Total Flood** Improved Value ($)
Office	10	19,517,800	12	31,213,700	22	50,731,500
Commercial	18	10,592,790	55	38,290,680	73	48,883,470
Industrial	44	15,591,980	82	24,406,350	126	39,998,330
Open Space	-	-	2	-	-	-
Residential	214	44,779,690	557	86,444,690	771	131,224,380
Total	**286**	**90,482,260**	**706**	**180,355,420**	992	**270,837,680**

Table 6. Count and Improved Value of Parcels in Floodplain by Type of Flood—Murray City
Sources: 2014 Certified Roll Values, Salt Lake County Assessor's Office;
Digital Flood Insurance Rate Map Salt Lake County, Utah and Incorporated Areas, 2014, FEMA
*Includes Zones A, AE, 0.2 pct., and AO
**Includes Shaded Zone X (500-year) and all 100-year flood zones

# Of Parcels		Improved Value ($)	Estimated Contents Value ($)	Total Value ($)	Loss Estimate ($)
100-Year Flood	286	90,482,260	***	***	***
500-Year Flood	706	270,837,680	***	***	***
Total Flood**	**992**	**361,319,940**	***	***	***

Table H.7. Salt Lake County Flood Loss Estimates—Murray City
Sources: 2014 Certified Roll Values, Salt Lake County Assessor's Office;
Digital Flood Insurance Rate Map Salt Lake County, Utah and Incorporated Areas, 2014, FEMA
*Includes 500-year and 100-year flood data
**Includes Shaded Zone X (500-year) and all 100-year flood zones
*** Data Unavailable

Based on this analysis, the Murray City has assets at risk to the 100-year and greater floods. 286 improved parcels are within the 100-year floodplain for an estimated value of $90 million. An additional 706 improved parcels with an estimated valued of $271 million fall within the 500-year floodplain.

Applying the 20 percent damage factor as previously described, there is a 1 percent chance in any given year of a 100-year flood causing roughly $18 million in damage in the Murray City and a 0.2 percent chance in any given year of a 500-year flood causing roughly $72 million in damage (combined damage from both floods).

Limitations: This model includes many structures in the floodplains that are elevated at or above the level of the base-flood elevation, which will likely mitigate flood damage. Thus, the actual value of assets at risk may be lower than those included herein.

Population at Risk

Based on information from HAZUS-MH (Census 2010) and the digital flood insurance rate map, the following are at risk to flooding in the Murray City:

- 100-year flood—2,727 people
- 500-year flood—6,530 people
- Total flood—9,257 people

4.3.3 National Insurance Flood Program (NFIP)

Insurance Coverage, Claims Paid, and Repetitive Losses

Murray City participates in the National Flood Insurance Program (NFIP). In order to continue to comply with the program, the city adopts floodplain management requirements and enforces those requirements by issuing certificates for new construction. The certificates allow the city to regulate construction in Special Flood Hazard Areas (SFHAs). The GIS and the engineering division department in the city has updated floodplain identification and mapping in order to facilitate issuing certificates or responding to any public requests for information. The city coordinates with Salt County during flood events and monitors current snow pack to evaluate the possibility of flooding conditions.

Murray City joined the National Flood Insurance Program (NFIP) in 1985. NFIP Insurance data indicates that as of June 30, 2014, there were 140 flood insurance policies in force in the City with $24,569,100 of coverage. Of the 140 policies, 89 of the policies were in A zones (the remaining 51 were in B, C, and X zones).

There have been 39 historical claims for flood losses totaling $262,314; most all were for residential properties in A zones but there have been claims in X zones. There were no known repetitive or severe repetitive loss structures.

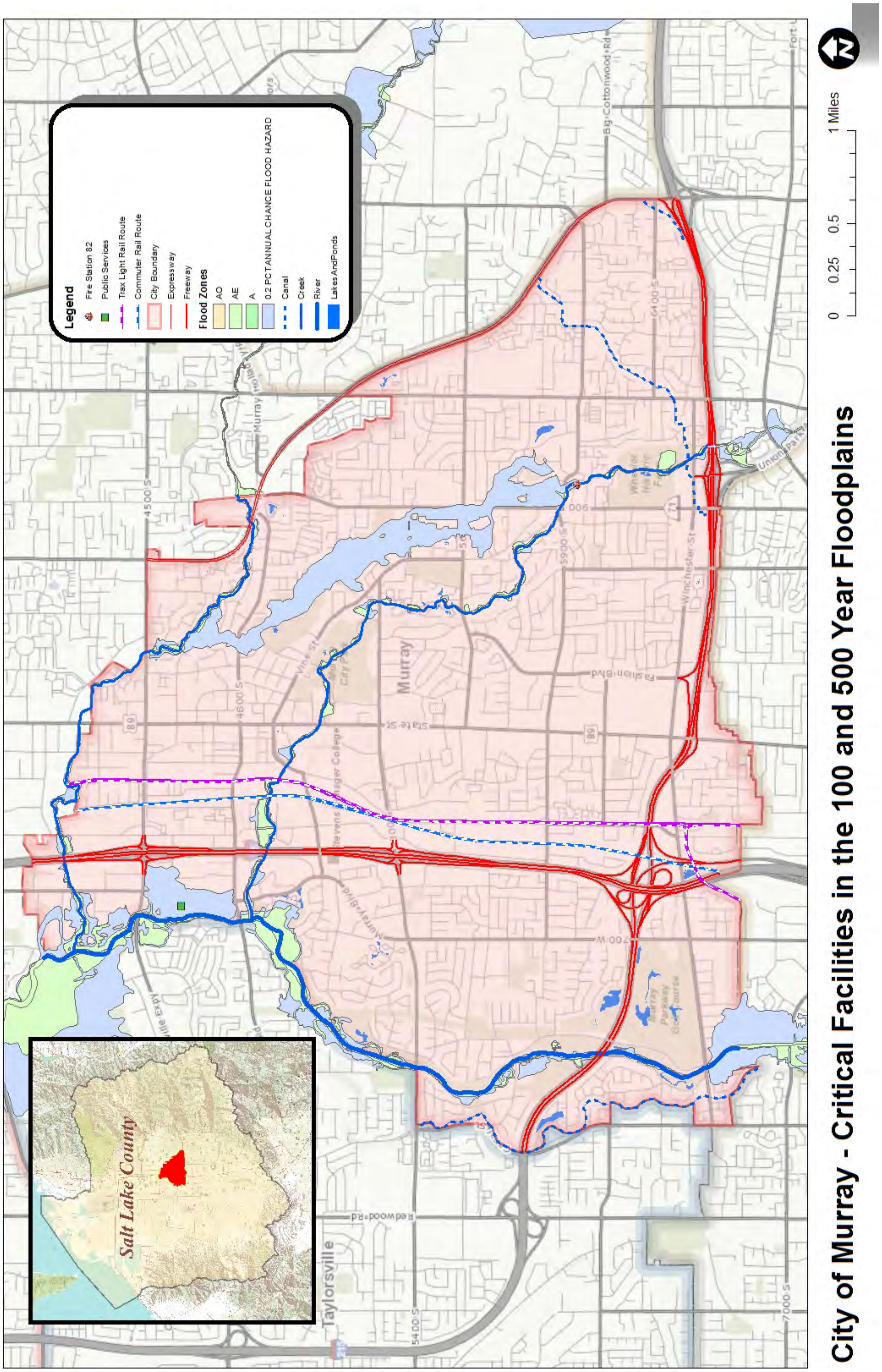
Critical Facilities at Risk

Critical facilities are those community components that are most needed to withstand the impacts of disaster as previously described. Table H.8 lists the critical facilities in the City's 100- and 500-year floodplains, and Figure H.8 illustrates their locations. The impact to the community could be great if these critical facilities are damaged or destroyed during a flood event.

Critical Facility Type	100-Year Floodplain	500-Year Floodplain
Health Care Facilities	0	0
Schools and Day Care Centers	0	0
Residential Elderly Facilities	0	0
Fire Stations	0	1
Public Utilities	0	1
Total	**0**	**2**

Table 8. Critical Facilities in the 100- and 500-Year Floodplains: Murray City
Source: Murray City GIS

There are no critical facilities in the City's 100-year floodplain, but according to the risk assessment for the County, floods in Murray tend to be 500-year events. Thus, it is particularly important to note that the critical facilities in the 500-year floodplain are all facilities that serve vulnerable populations and thus should be given special attention.



City of Murray - Critical Facilities in the 100 and 500 Year Floodplains

4.4 Extreme Temperatures

Temperatures in Utah can reach the extreme ends of the thermometer. Winter months often experience temperatures below zero degrees Fahrenheit. Summer temperatures regularly reach into the nineties with many days above 100 degrees Fahrenheit. Drastic temperature changes also occur, even in matter of hours. Temperature swings in such a short period of time can cause severe emotional stress in people, sometimes resulting in suicide.

Sub-zero temperatures occur during most winters; however, prolonged periods of extremely cold weather are infrequent. An exception was January 2013, the coldest month on record for Salt Lake City since 1949, with a mean temperature of 19.4 degrees (10.1 degrees below normal), average daily maximum temperature of only 26.6 degrees, and extended periods of inversions. January is generally the coldest month of the year. Historically, extreme cold in the region has disrupted agriculture, farming and crops. Especially vulnerable to extreme cold are the young, elderly, homeless and animals. Wind chill can further the effects of extreme cold.

Extreme heat is “summertime weather that is substantially hotter and/or more human than average for a location at that time of year” (EPA 2006). Extreme heat not only causes discomfort, but personal health can be affected through heat cramps, heat exhaustion or heat stroke, particularly affecting vulnerable populations such as the very young, elderly, poor, and homeless. Extreme heat places a substantial burden on power grids through widespread use of evaporative coolers and air conditioning. This strain can lead to brownouts or blackouts leaving many without power.

Freezing Rain: Freezing rain is rare in Salt Lake County, but occurs on occasion. A freezing rain storm occurred along the Wasatch Front in the record cold January of 2013, causing the closure of all runways at the Salt Lake City International Airport and resulting in numerous traffic accidents. (Deseret News Published: Thursday, Jan. 24 2013).

Extreme Temperature Hazard Profile

Potential Magnitude			Probability		
		Catastrophic (>50%)		X	Highly Likely
		Critical (25-50%)			Likely
	X	Limited (10-25%)			Possible
		Negligible (< 10%)			Unlikely

Location	Occur in localized areas throughout the city. Although many severe weather phenomena generally have recognizable patterns of recurrence, it is difficult to identify exactly when and where the next event will take place.
Seasonal Pattern	Year round.
Conditions	Vary based on latitude, elevation, aspect and land forms.
Duration	Severe weather hazards generally last hours, some conditions can persist for days.
Secondary Hazards	Wildfire, flooding.
Analysis Used	National Climate Data Center, National Weather Service, Utah Avalanche Center, UDEM, local input, and review of historic events and scientific records.

Location and Extent

The entire region of Salt Lake County including Murray City is affected by temperature extremes. Valleys and mountains are prone to the highest and lowest temperatures and their effects.

Salt Lake County Weather Damage by Event

Year	Dense Fog	Flash Flood	Flood	Heavy Snow/ Winter Storm	High Wind	Thunderstorm/ Wind	Wildfire	Total
2003	$200,000	$0	$0	$350,000	$200,000	$0	$0	$750,000
2004	$0	$0	$0	$100,000	$0	$0	$0	$100,000
2005	$0	$0	$0	$0	$0	$18,000	$0	$18,000
2006	$0	$35,000	$0	$0	$0	$2,050,000	$0	$2,085,000
2007	$0	$175,000	$0	$0	$0	$10,000	$0	$185,000
2008	$0	$0	$0	$0	$501,000	$0	$0	$501,000
2009	$0	$0	$0	$0	$110,000	$0	$0	$110,000
2010	$0	$150,000	$1,500,000	$0	$60,000	$200,500	$5,000,000	$6,910,500
2011	$0	$350,000	$200,000	$0	$263,000	$42,000	$0	$855,000
2012	$0	$0	$0	$110,000	$25,000	$0	$3,440,000	$3,575,000

Table 27. Provided by National Weather Service Salt Lake City Forecast Office, March 2013

Frequency/Likelihood of Future Occurrence—

– **Highly Likely**—Near 100 percent chance of occurrence in next year or happens every year.

4.4.1 Dam Failure

Dams are usually man-made, and therefore not inherently naturals hazards; however, dam failures can occur by natural hazard loading events. The impacts of a dam failure can also be similar to natural flood events; however, they are often more sudden and violent than normal stream floods (Living with Dams). Causes include breach from flooding or overtopping, ground shaking from earthquakes, settlement from liquefaction, slope failure and slumping, internal erosion from piping, failure of foundations and abutments, outlet leaks or failures, and internal weakening caused by vegetation and rodents. Possible effects include flooding, silting, loss of water resources, loss of property, and loss of life (UNHH 2008).

There are two types of dam failures – "rainy day" and "sunny day" failures. Rainy-day failures occur because floodwaters overstress the dam, spillway, or outlet capacities. The floodwaters eventually flow over the top of the dam and erode the structure from the top down. The breach flows of the dam are added to the floodwaters from the rainstorm to produce a flood of large proportion and destructive power. Sunny-day failure occurs from seepage and erosion inside the dam that removes fine material, creating a large void that can cause the dam to collapse or overtop and wash away. Sunny-day failures can be the most dangerous because they can happen quickly with no warning to owners or downstream residents (UNHH 2008).

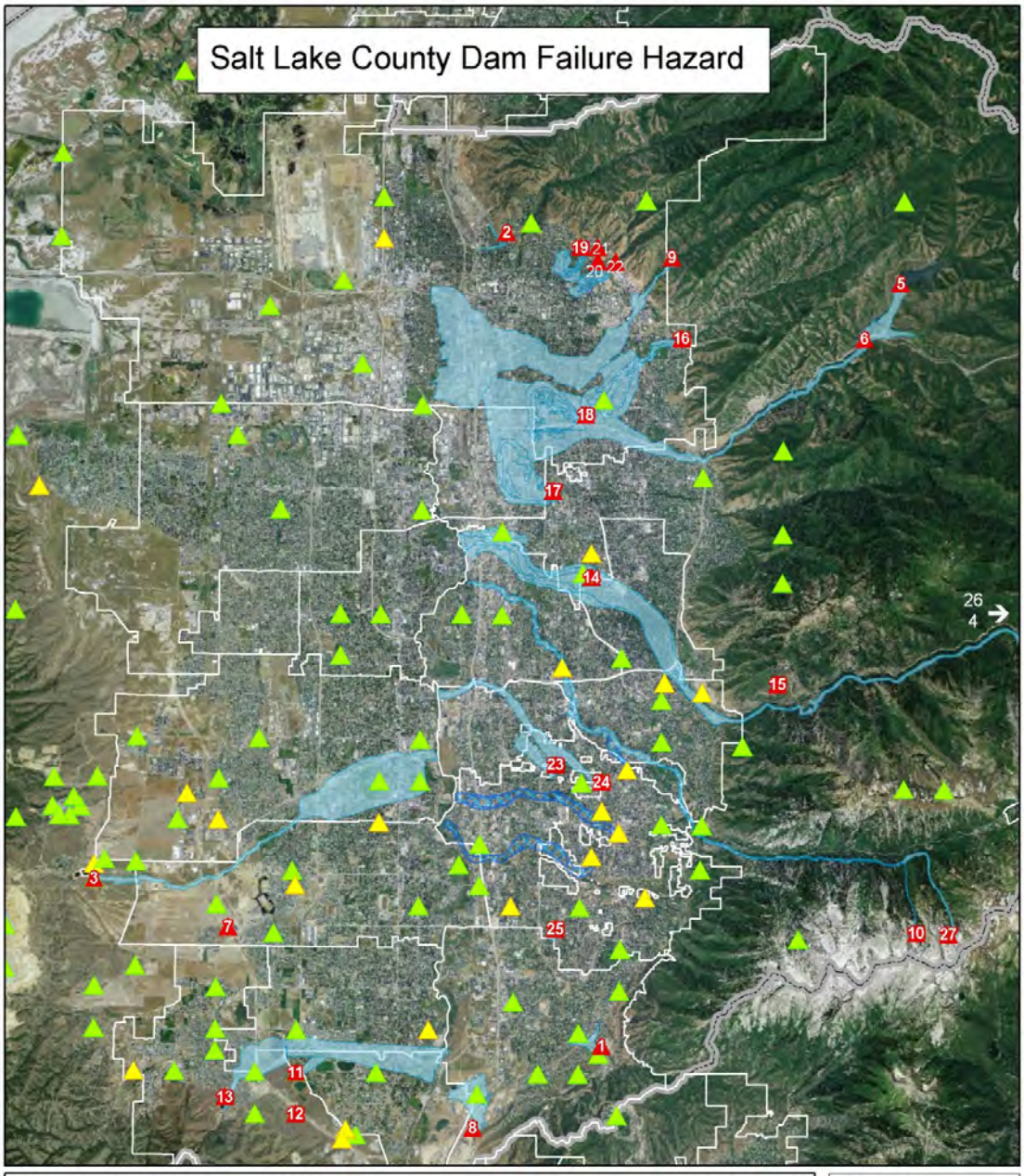
Dam Failure Hazard Profile

Potential Magnitude		**Catastrophic (>50%)**	**Probability**		**Highly Likely**
		Critical (25-50%)			**Likely**
	X	**Limited (10-25%)**		**X**	**Possible**
		Negligible (< 10%)			**Unlikely**
Location	There are no dams located within Murray City. There are several dam locations located throughout the county, with most of the high and moderate hazard dams in the eastern and southern portion of the county (Map 13).				
Seasonal Conditions	*Rainy Day Failure:* Spring, late summer *Sunny Day Failure:* Anytime				
Conditions	*Rainy Day Failure* happens mainly during heavy precipitation events, can have some warning time. *Sunny Day Failure* can happen anytime without warning.				
Duration	Hours or days - depends on spillway type and area, maximum cubic feet per second (cfs) discharge, overflow or breach type and dam type.				
Secondary Hazards	Raw sewage/health risk, electrical fires, gas spills.				
Analysis Used	Review of BOR inundation maps and plans, FIS, Utah Division of Water Rights.				

Location and Extent

While no major dams are located within Murray City, a dam failure nearby could cause property damage within Murray's city limits. There are 233 dams and other impoundments are located in Salt Lake County. These dams are built by different agencies, and may serve various functions such as flood control, water storage, recreation, and power generation. Most are privately owned and are the responsibility of dam owners to maintain, and the state regulates their safety. The dam safety hazard is classified as no threat to high risk by the State Engineer. Hazard ratings are determined by downstream uses; size, height and volume; and incremental risk/damage assessments. This classification is based upon the damage caused if the dam were to fail, not the dam's probability of failure. Therefore, the classification of a high hazard dam does not mean that the dam has a high probability of failure. Utah Division of Water Rights inspects high-hazard dams annually, moderate-hazard dams biennially, and low-hazard dams every five years (Living with Dams, UNHH 2008).

- 27 High-hazard: Risk of loss of life, extensive economic loss
- 27 Moderate: Low probability of loss of life, appreciable property damage
- 135 Low: Minimal threat to life, minor economic loss
- 44 No Hazard Rating: no threat



Map 13. Dam Hazard Map, Salt Lake County (Utah Division of Water Rights 2013)

	Rating	Name	Rating
Draper Pressure Irrigation Project	High	AJ Dean Concrete Sediment Pond	Mod
Ensign Downs DB (AKA Victory Road DB)	High	Barney's Wash Detention Basin (6400 West)	
Kennecott Mine – Bingham Creek	High	Jordan Valley Water Purification Lower	
Lake Mary – Phoebe	High	Jordan Valley Water Purification Upper	Mod
Little Dell	High	Kennecott Mine – 4000 West Pond	Mod
Mountain Dell	High	Kennecott Mine – Small Reservoir	Mod
Oquirrh Lake Dam - Kennecott Daybreak	High	Kennecott Smelter – Kessler Canyon #06	Mod
Point of the Mountain Raw Water Reservoir	High	Kennecott Smelter – Kessler Canyon #10	Mod
Red Butte Dam	High	Kennecott Smelter – Kessler Canyon #11	Mod
Red Pine	High	Kennecott Smelter – Tailings Pond	Mod
Riverton City – 3200 West Pond	High	Magna Water Company & Improvement District	Mod
Riverton City – 4200 West Pond	High	Monroc	Mod
Riverton City – Black Ridge Reservoir	High	Oakridge Development	Mod
Salt Lake County – Big Cottonwood (Spencer's)	High	Riverton Dam (Formerly American Contract)	Mod
Salt Lake County – Creekside Park (Big Cottonwood)	High	Salt Lake County – Wheeler Farm	Mod
Salt Lake County – Rotary Glen Park	High	Salt Lake County –Upper I-9	Mod
Salt Lake County – Scott Ave	High	Sandy City – Alta Canyon	Mod
Salt Lake County – Sugarhouse	High	Sandy City – Aspen Meadows	Mod
Salt Lake County – Chandler Drive (#13)	High	Sandy City – Buttercup	Mod
Salt Lake County – Federal Heights (#1A)	High	Sandy City – Crescent Park	Mod
Salt Lake County – School Pond (#14)	High	Sandy City – Falcon Detention Basin	Mod
Salt Lake County – Shriners (#12)	High	Sandy City – Willow Creek	Mod
Sandy City – East Sandy Elementary	High	Secret Lake (Cecret Lake)	Mod
Sandy City – Flat Iron Mesa	High	South Jordan City	Mod
Sandy City – Storm Mountain DB	High	Utah Dept. of Transportation Basin 1	Mod
Twin Lakes (Salt Lake)	High	Weber/BoxElder Reservoir #3 *(dataset error?)*	Mod
White Pine	High	West Jordan City	Mod

Table 28. High and Moderate Hazard Dams, Salt Lake County *(Source: Utah Division of Water Rights)*

History

No record was found of dam failure incidents within Salt Lake County. However, incidents have occurred in other parts of Utah, including St. George in 1989 and Santa Clara in 2012.

Vulnerability Assessment

According to the 2011 Utah Hazard Mitigation Plan, a hazard evaluation designed by the Federal Energy Regulatory Commission FERC, compiled a ranking of high priority dams based on a number

of variables which include: public access, population at risk, breach flow, inundation depth, and dam type. 8 of the 50 highest priority dams are located within Salt Lake County.

1. Mountain Dell
2. Little Dell
5. Salt Lake County Sugarhouse
10. Red Butte Dam
17. Twin Lakes Salt Lake County
29. Lake Mary-Phoebe
30. Salt Lake County Big Cottonwood Spencer's
36. Kennecott Mine Bingham Creek

From this list, Lake Mary –Phoebe and Salt Lake County Big Cottonwood Spencer's could potentially impact Murray City. The Utah Hazard Mitigation Plan includes additional loss estimates for Murray City based on GIS analysis using dam inundation area shape files from AGRC and the Bureau of Reclamation, and population from LandScan. Table 29 estimates the total area, population and buildings vulnerable to dam failure for Murray City.

City	Acres Affected	Population Affected	Structures in Inundation Areas	
			Residential (Replacement Value)	Commercial (Annual Sales)
Murray	1,066	7,423	3,324 $680,090,400	715 $550,016,335

Table 29. Vulnerability Assessment for Dam Failure, Murray City

Table 30 estimates infrastructure vulnerable to dam failure in Murray City. Provided are the number of units or total length of infrastructure vulnerable and the estimated replacement costs as provided by Murray City Public Services Department.

Item	Length (Miles) or Number of Units	Replacement Cost
Roadways	7.5 miles	$41,435,510
Roadway Bridges	7 bridges	$9,643,120
Railway Segments	2 miles	$2,297,896
Railway Bridges	0 bridges	$0
Water Distribution Lines	2500 feet	$237,500
Gas Lines	0 feet	$0
Sewer Lines	3000 feet	$360,000
Total Estimated Infrastructure Replacement Cost		**$53,974,026**

Table 30. Infrastructure Vulnerable to Dam Failure, Murray City

4.4.2 Wildfire

An analysis was performed using GIS software that determined that there were not any critical facilities in wildfire threat zones in Murray.

4.4.3 Avalanche

An analysis was performed using GIS software that determined that there were not any areas in Murray City subject to avalanches of any significance.

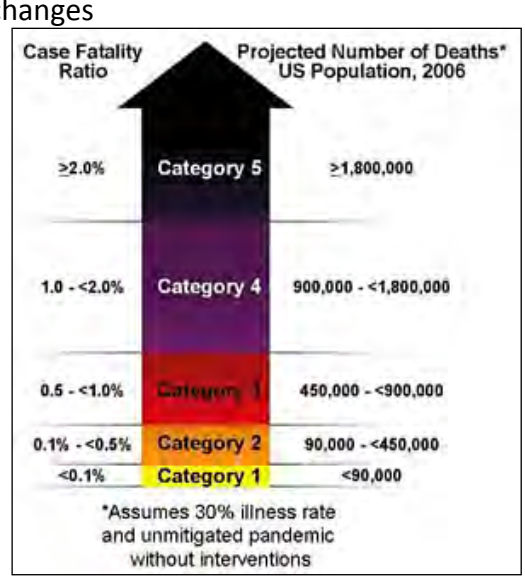
4.4.4 Public Health Epidemic/Pandemic

A pandemic is a worldwide disease outbreak, and has the possibility to impact Murray City. An influenza pandemic occurs when a new Influenza A virus emerges and there is little or no immunity in humans. An influenza pandemic occurs when a new, virulent strain of the influenza virus circulates globally. Because the virus is new, there is little to no immunity among the population, and the virus can be easily transmitted, and has the ability to make many people very sick in a relatively short period of time. A pandemic influenza virus causes serious illness and spreads easily from person-to-person. It could be mild, moderate, or very severe even leading to death (SLVHD Family Emergency Preparedness Guide).

Influenza is caused by a virus that is spread from person-to-person primarily through respiratory droplets generated from coughing or sneezing. Transmission is most efficient among crowded populations in enclosed spaces. The virus may persist in the environment for several hours, particularly in cold and low humidity. It spreads rapidly because it has a short incubation period (period between infection and onset of symptoms) of 1-3 days and because persons are infectious (able to transmit the virus to others) during early illness or even before the onset of symptoms. (SLVHD 2010)

Pandemics are different from other types of natural hazards. They may have a much wider geographic impact, last several months, the evidence tends to be less visible, casualties are predominantly human rather than material or structural, state and federal aid resources may be limited, and the economic impacts may be more widespread.

A widespread outbreak of influenza could require temporary changes in many areas of society, such as schools, work, transportation, and other public services. Although the most effective tool for mitigating a pandemic is a well-matched vaccine, it is likely no perfectly matched vaccine will be available for a new virus for several months. There may also be insufficient quantities of antiviral medications (CDC Pre-Pandemic Planning Guidance: Community Strategy for Pandemic Influenza Mitigation). Therefore, mitigation measures are designed to limit the impact on the community by slowing transmission, limiting opportunities for exposure, and delaying the outbreak peak to lessen the impact on the health care system. (SLVHD 2010) Social distancing measures could be implemented where public gatherings such as sporting events, church meetings, schools, and others would be closed to prevent further spread of the disease. (SLVHD FEPG)



The Pandemic Severity Index is a tool to assess the severity of pandemic illness and appropriate mitigation measures to implement.

	Pandemic Severity Index		
Interventions* by Setting	**1**	**2 and 3**	**4 and 5**
Home			
Voluntary isolation of ill at home (adults and children); combine with use of antiviral treatment as available and indicated	Recommend†§	Recommend†§	Recommend †§
Voluntary quarantine of household members in homes with ill persons¶ (adults and children); consider combining with antiviral prophylaxis if effective, feasible, and quantities sufficient	Generally not recommended	Consider**	Recommend **
School **Child social distancing**			
-dismissal of students from schools and school based activities, and closure of child care programs	Generally not recommended	Consider: ≤4 weeks††	Recommend: ≤12 weeks§§
-reduce out-of school social contacts and community mixing	Generally not recommended	Consider: ≤4 weeks ††	Recommend: ≤12 weeks§§
Workplace / Community **Adult social distancing**			
-decrease number of social contacts (e.g., encourage teleconferences, alternatives to face-to-face meetings)	Generally not recommended	Consider	Recommend
-increase distance between persons (e.g., reduce density in public transit, workplace)	Generally not recommended	Consider	Recommend
-modify, postpone, or cancel selected public gatherings to promote social distance (e.g., stadium events, theater performances)	Generally not recommended	Consider	Recommend
-modify work place schedules and practices (e.g., telework, staggered shifts)	Generally not recommended	Consider	Recommend

Pandemic Hazard Profile

Potential Magnitude			*Probability*		
		Catastrophic (>50%)			**Highly Likely**
	X	**Critical (25-50%)**		**X**	**Likely**
		Limited (10-25%)			**Possible**
		Negligible (< 10%)			**Unlikely**

Location	May occur throughout the city. It is difficult to identify exactly when and where the next event will take place.
Seasonal Pattern	Primarily fall and winter, with potential impacts year round.
Conditions	Variable timeframe and variable severity. Once novel virus is introduced to the area, person-to-person transmission may spread virus rapidly.
Duration	4-6 weeks to several months, possibly up to a year
Secondary Hazards	Social and economic consequences, possible surge on healthcare resources.
Analysis Used	Salt Lake Valley Health Department, Center for Disease Control, UDEM, local input, and review of historic events and scientific records.

Location and Extent

No defined geographic extent. Pandemics can spread throughout the county/region/state & beyond.

History

The Great Pandemic of 1918-1919 was the first reported pandemic in the County. The first cases in Utah undoubtedly appeared in the military camp at Fort Douglas. Like many states with a large rural population, Utah did not provide a report to the Public Health Service in the early weeks of the pandemic. This may have been because they were overwhelmed by the spread of the disease or it may have been because the state did not have enough public health officials available to make the weekly reports the Public Health Service demanded. Utah's Pandemic Preparedness Plan was first released in 2005,
http://health.utah..gov/epi/diseases/flu/ClinicianPublicHealth/pandemic/pandemic influenza plan.pdf

Vulnerability Assessment

Individuals, families, employers, and communities will all experience difficulties dealing with community mitigation measures. Dismissing students from school would directly disrupt the schedule of 30% of the population. Secondary disruptions would occur for parents who would need to balance working with tending their children. Tertiary disruptions would occur for employers with absent employees that must stay home to care for children and could potentially result in workplaces closing or reducing operations and limiting the availability of essential services. Persons who live alone may be unable to follow isolation requirements if they need to acquire medications or shop for other essentials. (SLVHD 2010)

Characteristics	Pandemic Severity Index				
	Category 1	Category 2	Category 3	Category 4	Category 5
Case Fatality Ratio (percentage)	<0.1	0.1-<0.5	0.5-<1.0	1.0-<2.0	>=2.0
Excess Death Rate (per 100,000)	<30	30-<150	150-<300	300-<600	>=600
Illness Rate (percentage	20-40	20-40	20-40	20-40	20-40

of the population)					
Potential Number of Deaths (based on 2008 population estimate*)	<312	312-<1,562	1,562-<3,125	3,125-<6,249	>=6,249
20th Century UT experience	Seasonal Influenza (illness rate 5-20%)	1957, 1968 Pandemic	None	None	1918 Pandemic

Table 31. Community Mitigation Plan, Appendix H to the Salt Lake Valley Health Department Pandemic Influenza Preparedness and Response Plan

*** 1,041,578 = Salt Lake County population, 2008 estimate, Utah Population Estimate Committee and the Governor's Office of Planning and Budget, 2008 Baseline Economic and Demographic Projections.**

4.4.5 Drought

According to the National Drought Mitigation Center, drought is a "deficiency of precipitation over an extended period of time, resulting in a water shortage for some activity, group, or environmental sector." Although variation in the amount of precipitation recorded each year is normal, a drought is beyond these norms in terms of low precipitation for an extended period or over a large area. While most natural hazards are sudden and result in immediate impacts, droughts "sneak up on us quietly disguised as lovely sunny weather" (McKee, Doesken, and Kleist 2005) and can last a long time resulting in significant socioeconomic impacts. Drought can be categorized according to unique characteristics and may be thought of as phases of the same drought (UNHH 2008).

- Meteorological drought: a measure of departure of precipitation from normal for a particular location.
- Agricultural drought: where the amount of moisture in the soil no longer meets the needs of a particular crop.
- Hydrological drought: when surface and subsurface water supplies are below normal.
- Socioeconomic drought: when dry conditions persist long enough and are severe enough to impact sectors beyond the agricultural community, such as community drinking supply and other social and economic enterprises.

Although the agricultural community is usually the most heavily impacted by drought, direct and indirect impacts extend into economic, social, or environmental sectors as well (UNHH 2008).

Palmer Classifications	
4.0 or more	Extremely wet
3.0 to 3.99	Very wet
2.0 to 2.99	Moderately wet
1.0 to 1.99	Slightly wet
0.5 to 0.99	Incipient wet spell
0.49 to -0.49	Near normal
-0.5 to -0.99	Incipient dry spell
-1.0 to -1.99	Mild drought
-2.0 to -2.99	Moderate drought
-3.0 to -3.99	Severe drought
-4.0 or less	Extreme drought

Table 32. Palmer Drought Severity Index (NDMC 2006)

The Palmer Drought Severity Index (PDSI) developed by Wayne Palmer in the 1965, measures drought severity using temperature, precipitation and soil moisture (Utah Division of Water Resources 2007a). The PDSI has become the "semi-official" drought index as it is standardized across various climates. The index uses zero as normal and assigns a number between +6 and -6, with dry periods having negative numbers and wet periods expressed using positive numbers (Table 32).

Times of extended drought can turn into socioeconomic drought, or drought that begins to affect the general population. When this occurs, reservoirs, wells and aquifers are low and conservation measures are required. Some forms of water conservation are water-use restrictions, implementation of secondary water or water recycling and xeriscaping. Other conservation options include emergency water agreements with neighboring water districts or transporting water from elsewhere.

Drought Hazard Profile

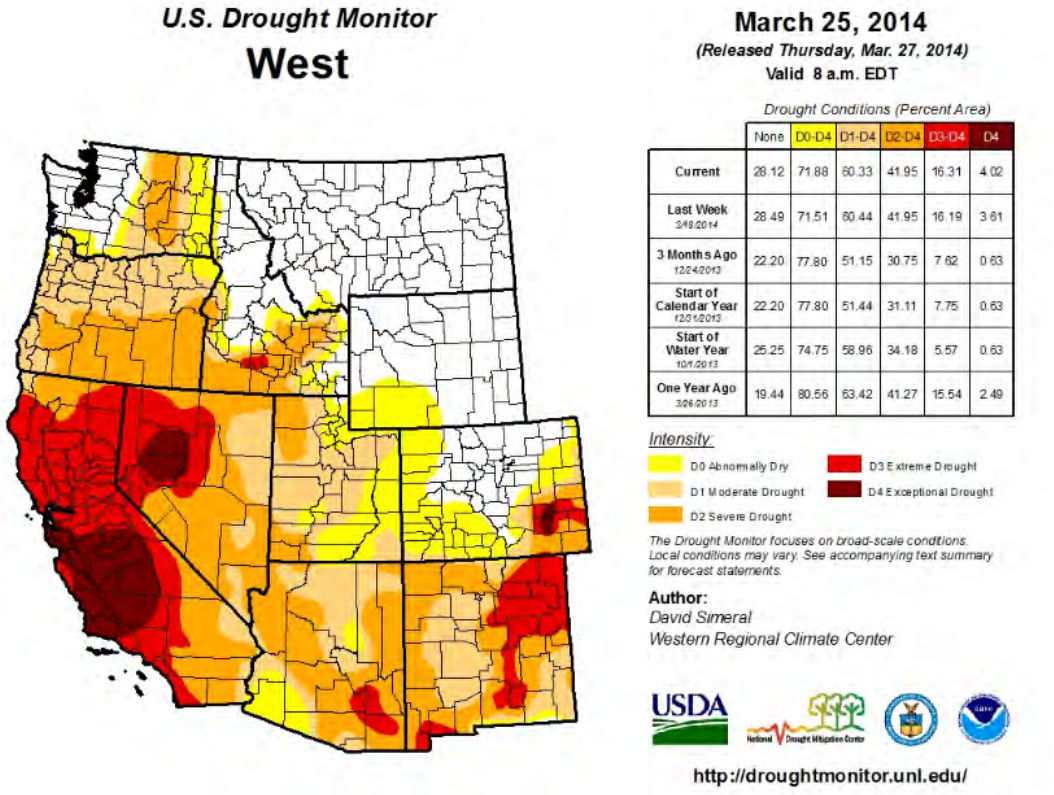
Potential Magnitude		***Catastrophic (>50%)***	***Probability***		***Highly Likely***
	X	***Critical (25-50%)***		***X***	***Likely***
		Limited (10-25%)			***Possible***
		Negligible (< 10%)			***Unlikely***
Location	Citywide.				
Seasonal Pattern	Impacts typically noticeable in summer, conditions can be year round.				
Conditions	*Meteorological Drought:* Lack of precipitation *Agricultural Drought:* Lack of water for crop production *Hydrologic Drought:* Lack of water in the entire water supply *Socioeconomic Drought:* Lack of water sufficient to support population				
Duration	Months, Years				
Secondary Hazards	Wildfire, dust storms, air quality.				
Analysis Used	National Weather Service, Utah Climate Center, Utah Division of Water Resources, Newspapers, Local input.				

Location and Extent

Utah is the second driest state in the nation. Drought dramatically affects this area because of the lack of water for agriculture and industry, which limits economic activity, irrigation and culinary uses. The severity of the drought results in depletion of agriculture lands and deterioration of soils. In the Wasatch Front region, the risk of drought is high.

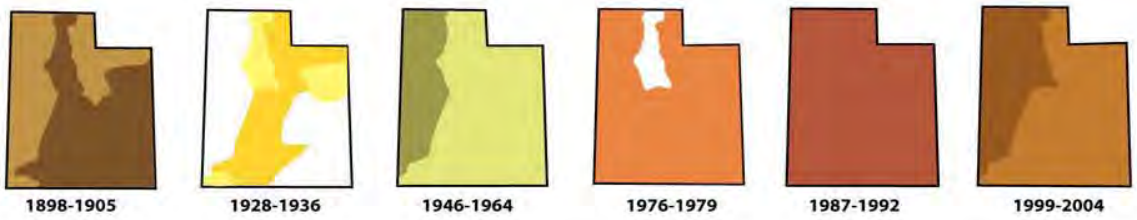
Salt Lake County falls within two climatic regions: the North Central region (3), and the Northern Mountains region (5) Map 15. Each of these regions has differing characteristics, but often experience similar drought periods. The two regions experience mild drought (PDSI ≥ -1) every 2.6-3.3 years, moderate drought (PDSI ≥ -2) every 3.7-5.2 years, and severe drought (PDSI ≥ -3) every 6.9-8.5 years. The Northern Mountain region typically experiences droughts less frequently (Utah Division of Water Resources 2007a). Conversely, the Northern Mountain region averages more severe drought conditions at its peak than the Western region. It may be Northern Mountains region simply has more water to lose as the Wasatch and Uinta Mountains receive much more precipitation on average.

The most severe drought period in recorded history for the North Central and Northern Mountains regions occurred in 1934 at the height of the Great Depression and during the same drought period (1930 to 1936) that caused the “Dust Bowl” on the Great Plains. The longest drought period varies from 11 years for the North Central region (1953-1963), and 6 years for the Northern Mountains (twice; 1900-1905 and 1987-1992) (Utah Division of Water Resources 2007a).

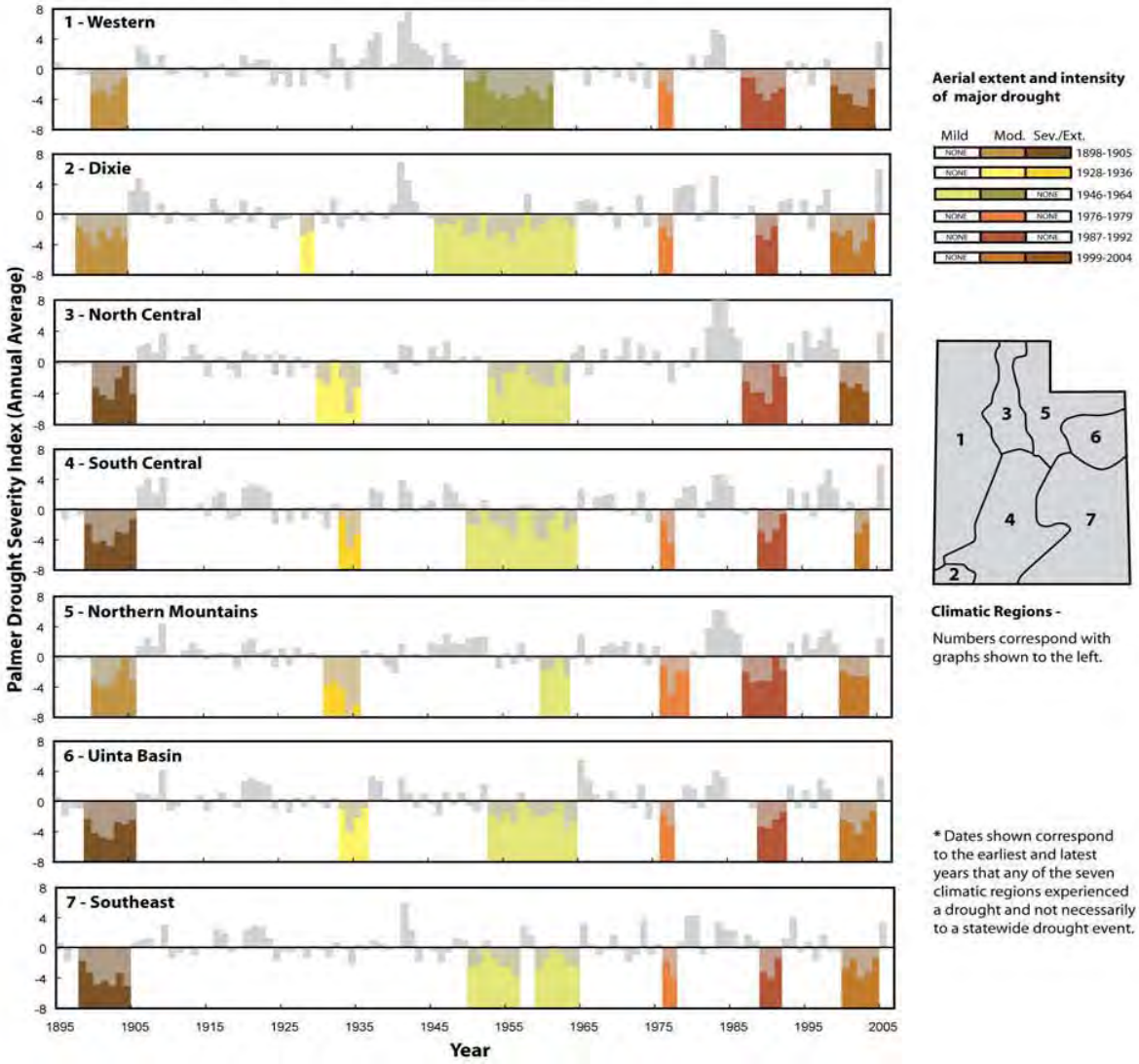

U.S. Drought Monitor
West
March 25, 2014
(Released Thursday, Mar. 27, 2014)
Valid 8 a.m. EDT
Drought Conditions (Percent Area)
None D0-D4 D1-D4 D2-D4 D3-D4 D4
Current 28.12 71.88 60.33 41.95 16.31 4.02
Last Week 3/18/2014 28.49 71.51 60.44 41.95 16.19 3.61
3 Months Ago 12/24/2013 22.20 77.80 51.15 30.75 7.62 0.63
Start of Calendar Year 12/31/2013 22.20 77.80 51.44 31.11 7.75 0.63
Start of Water Year 10/1/2013 25.25 74.75 58.96 34.18 5.57 0.63
One Year Ago 3/26/2013 19.44 80.56 63.42 41.27 15.54 2.49
Intensity:
D0 Abnormally Dry
D1 Moderate Drought
D2 Severe Drought
D3 Extreme Drought
D4 Exceptional Drought
The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.
Author:
David Simeral
Western Regional Climate Center
USDA
http://droughtmonitor.unl.edu/

Map 15.

Areal Extent of Historical Drought Events *



Palmer Drought Severity Index by Region

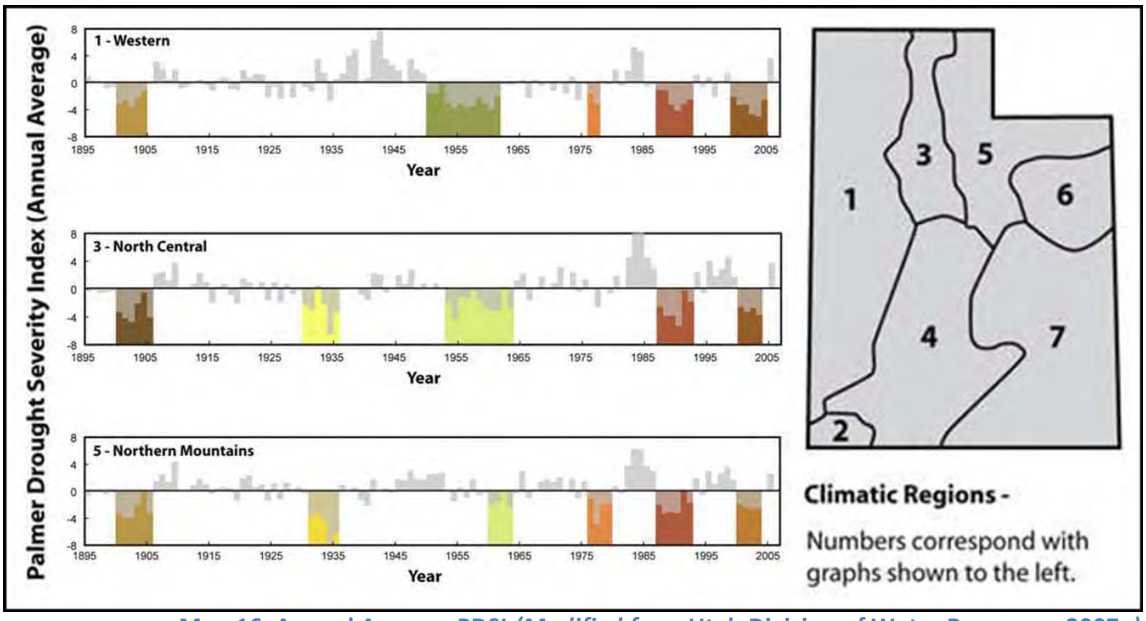


Aerial extent and intensity of major drought

Climatic Regions -

Numbers correspond with graphs shown to the left.

* Dates shown correspond to the earliest and latest years that any of the seven climatic regions experienced a drought and not necessarily to a statewide drought event.



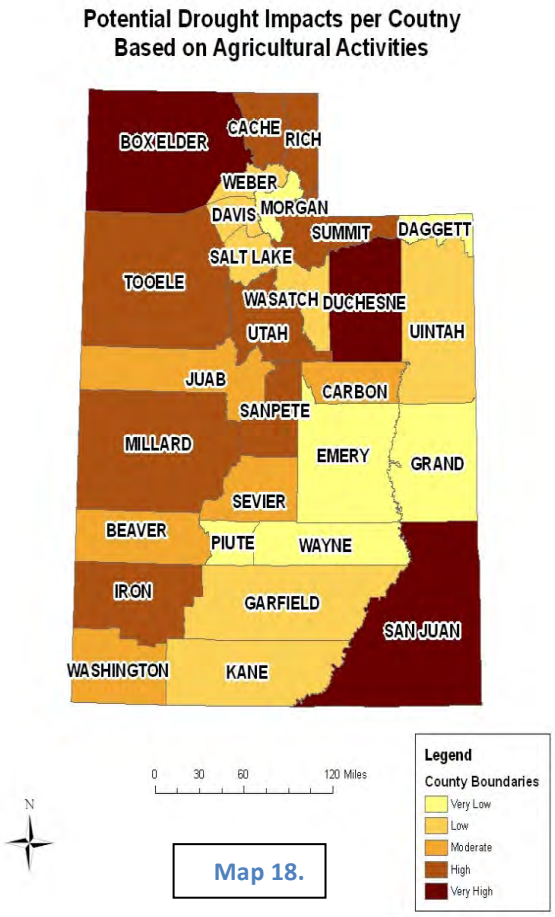
Map 16. Annual Average PDSI *(Modified from* Utah Division of Water Resources 2007a*)*

Vulnerability Assessment

Due to the unpredictability of drought, it is difficult to identify the areas most threatened and to provide loss estimate values. Utah is currently experiencing drought conditions, yet reports are not yet available on the impact of the current drought. However, historical drought records demonstrate that agriculture is typically the economic sector most impacted by drought (UHMP). The 2003 Economic Report to the Governor discusses some of the statewide economic impacts of a drought beginning in 1999. Since it is not known what the local impacts of the current drought will be, this report will serve as the best available loss estimate. It is expected droughts in the future will have similar losses.

The 2003 Economic Report to the Governor suggests the drought has contributed to job change. "During 2002, job change was -1.0%. Without the drought, job change might have been -0.6%, 0.4% higher than what actually occurred. The hardest hit sector was agriculture, where 2,600 jobs and almost $40 million in income were lost." Livestock sales were estimated as down $100 million and hay sales down $50 million due to the drought. Drought related fires are believed to contribute to a decline in tourism sales, also down $50 million. The combined effects of the drought in these three sectors resulted in a loss of over 6,100 jobs and $120 million in lost income during 2002. Construction, manufacturing, and wholesale trade were also impacted by drought.

The Utah Division of Water Resources mentions in their drought report that large and significant data gaps hinder the quantification of drought impacts in all sectors of the economy and society. They suggest that tax revenues and other potential economic indicators of drought impacts be monitored at all levels of government in order to improve evaluation methods and to better understand drought impacts. (UHMP)



Map 18.

The 2011 Utah Hazard Mitigation Plan conducted Drought vulnerability rankings based on agricultural information. Economic indicators include cash receipts per county, personal income from farming, number of acres of farmland per county, number of acres of cropland per county, and number of cattle per county was used to determine a county's vulnerability to drought. This vulnerability assessment resulted in a ranking by county of the potential drought impacts based on Agriculture activities. Salt Lake County was given a moderate ranking. Since Murray City has a low amount of agriculture and livestock, the impact from a drought on farming and its corresponding income would be negligible.

Water supply and water storage in reservoirs is another important indicator of current drought conditions. Salt Lake County receives regular updates on the current water supply and future outlook from the Colorado Basin River Forecast Center.

4.4.6 Infestation

Infestation is caused when a parasite or pest over-populates in quantities large enough to be destructive, threatening or obnoxious. Past infestation events have been devastating enough to lead to presidential disaster declarations because of the destruction to food supplies that affect wildlife, livestock and agricultural lands. Crickets, katydids, grasshoppers, and worms tend to be the most damaging and affect rural areas the most. Drought may exacerbate infestations by resulting in a decrease in predators. Drought also affects food supplies, which may cause insects to begin to search over a wider area for food.

Location and Extent

Insect infestation has been largely kept at bay due to the ongoing efforts of the Utah Department of Agriculture and Food (Table 8-3). Several threats still exist in the Wasatch Front study area, particularly from Cereal Leaf beetles, Japanese beetles, Gypsy moths, Mormon crickets and grasshoppers, and various wood borers and bark beetles.

Infestation Hazard Profile

Potential Magnitude		**Catastrophic (>50%)**	**Probability**		**Highly Likely**
		Critical (25-50%)		**X**	**Likely**
	X	**Limited (10-25%)**			**Possible**
		Negligible (< 10%)			**Unlikely**
Location	Dependent on vegetation and climate preference of individual insect species.				
Seasonal Pattern	Typically spring and summer months.				
Conditions	Varies with insect species.				
Duration	Months, years.				
Secondary Hazards	Wildfire, dust storms, landslides due to dead vegetation.				
Analysis Used	Utah Department of Agriculture and Food (UDAF), United States Forest Service (USFS), Utah Division of Forest, Fire, and State Lands (UDFFSL).				

The Cereal Leaf beetle first appeared in Utah in 1984 in Morgan County. The beetle is currently found in all Wasatch Front counties. Cereal Leaf beetles feed on grains and can cause much damage to these crops. To combat the spread of the Cereal Leaf beetle, the Utah Department of Agriculture and Food (UDAF) has introduced a parasitic wasp. (UDAF 2007a). Currently Murray City has not experienced any issues with the beetle.

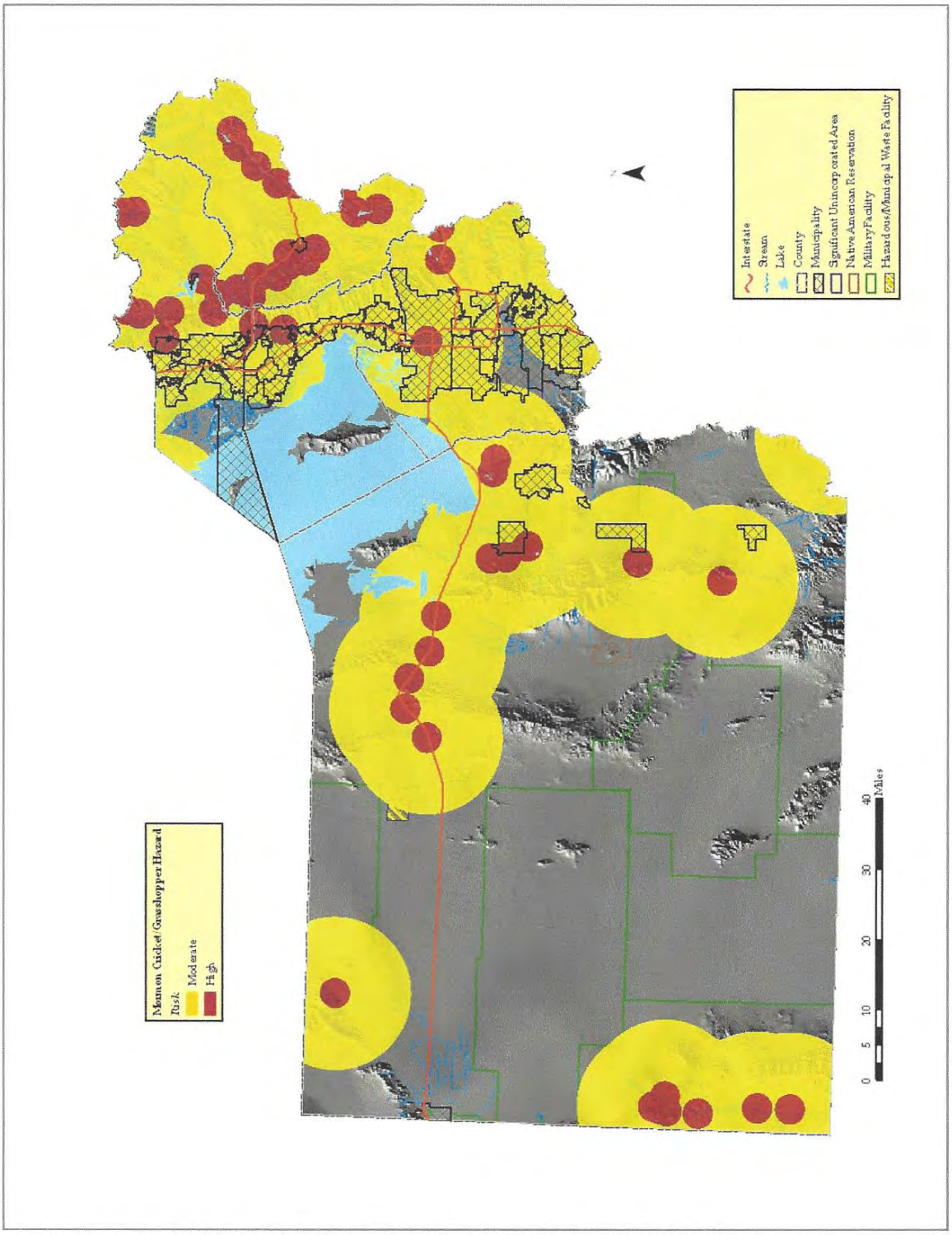
Insects Currently Monitored by Utah Department of Agriculture and Food		
Africanized Honey Bee	European Corn Borer[3]	Grasshopper*[2]
Apple Maggot[1]	Egyptian Cottonworm[2]	Red Imported Fire Ant
Cherry Fruit Fly[1]	Silver Y Moth[2]	Black Imported Fire Ant
Asian Gypsy Moth[1]	False Codling Moth[1]	Mosquito/West Nile Virus*[2]
Rosy (Pink) Gypsy Moth[1]	North American Gypsy Moth*[2]	Woodwasp[4]
Siberian Silk Moth[1]	Japanese Beetle[4]	Exotic Woodborers
Nun Moth[1]	Mormon Cricket*[2]	Exotic Bark Beetles
Cereal Leaf Beetle*[2]	* Detected in Wasatch Front study area, 2007	
[1] Traps in all Wasatch Front counties except Morgan County [2] Traps in all Wasatch Front counties	[3] Traps in Davis and Weber counties only [4] Traps in Davis, Salt Lake and Weber counties only	

Table 33. Insects Currently Monitored by Utah Department of Agriculture and Food (UDAF 2007a)

Mormon crickets and grasshoppers are regularly found in the Wasatch Front study area. In small numbers, these insects do not cause much of a problem—but when their populations explode, great hordes can devastate crops. The following except from the 2007 Annual Insect Report by UDAF outlines how these populations can explode:

"Often the damage done to agricultural commodities is increased by the effects of warmer weather and drought. Mild winters and hot, dry weather speed up the maturation process of these insects and allow more of them and their eggs to survive the cold. Drought also cuts into the population of birds and rodents that prey on them, and the fungal diseases that decrease insect numbers."

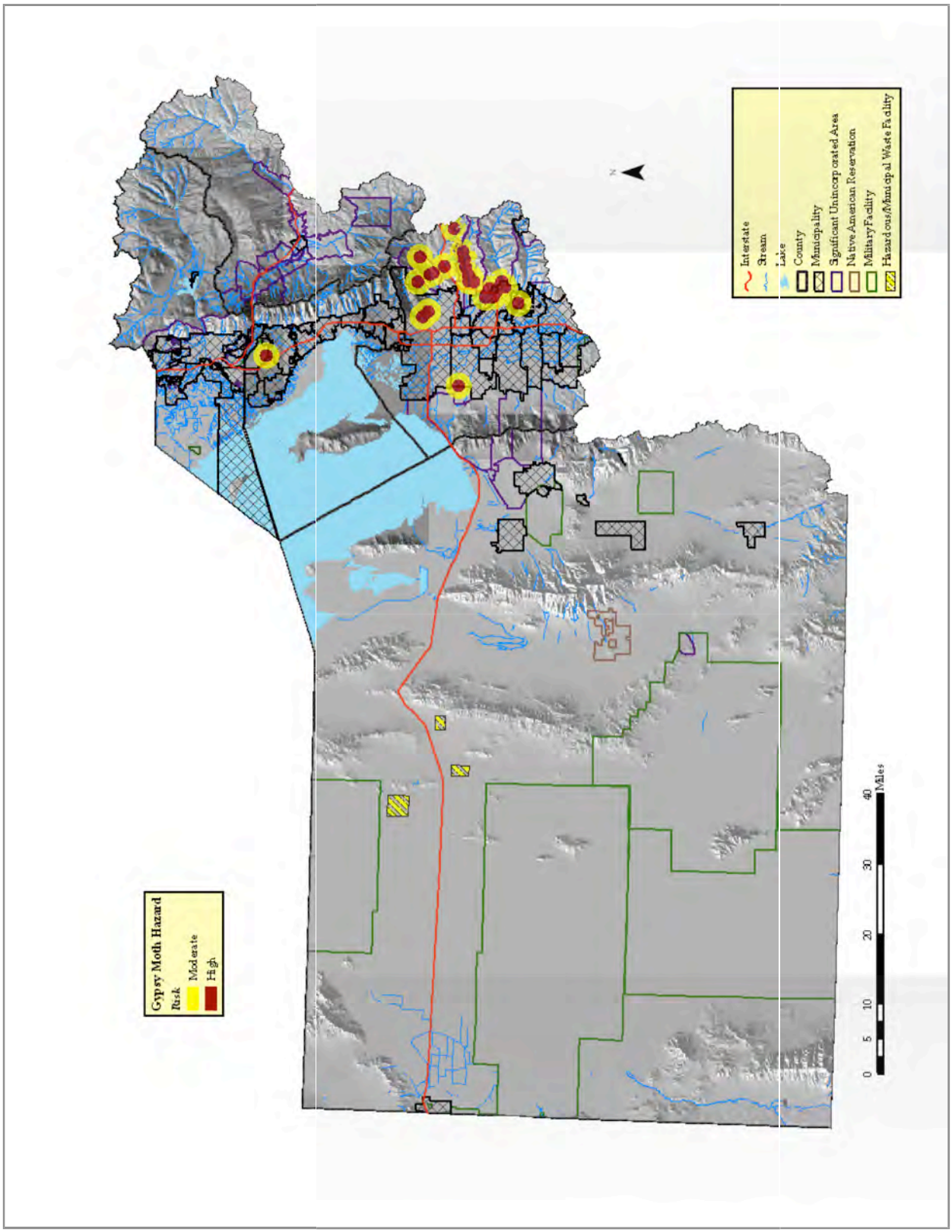
UDAF has used aerial treatment and ground baiting to manage populations of Mormon crickets and grasshoppers with success. Due to this success, no treatment is planned for 2008 (UDAF 2007a). See Map 8-10 for the Mormon cricket and grasshopper hazard potential.



Map 8-10 Mormon Cricket and Grasshopper Hazard Potential (Source: UDAF)

Another insect of concern in the region is the North American Gypsy moth. Utah is an ideal breeding ground for the gypsy moth with an “arid climate, mountainous terrain, and lack of effective natural predators” (Watson 2007). The moths can be very destructive through the defoliation of tree leaves (UDAF 2007a). The Gypsy moth was first found in the state in 1988 with the population rapidly growing the following year.

Treatment programs administered by UDAF using natural bacteria have proven very effective in controlling populations. Less than 3 moths per year have been caught in UDAF traps since 2000 in the entire state. The two moths in 2007 were found in separate locations in Salt Lake County (Watson 2007). See Map 8-11 for Gypsy moth hazard potential. Currently Murray City has not experienced any problems with the moth.



Map 8-11 Gypsy Moth Hazard Potential (Source: Utah Department of Agriculture and Food)

Example of Bark Beetle Infestation – Before and After (UDFFSL 2003)

Wood borers and Bark beetles are a distinct problem for all trees in the Wasatch Front area. Like many other insect hazards in the area, drought has helped Wood borer and Bark beetle populations to grow and expand due to stressed trees (Matthews, et al. 2005). Likewise, overall warming trends in the western United States have allowed these insects to survive the winters promoting multiple reproduction cycles. Insecticides and general thinning of trees has proven to be the most effective methods of control (UDFFSL 2003). See Map 8-12 for damages caused by Wood borers, Bark beetles, and other insects.

History

Year	Acres Infested
1997	1,180
1998	509,800
1999	758,000
2000	658,500
2001	1,894,500
2002	2,450,650

Mormon Crickets increase during drought years according USDA –APHIS survey.
Left unchecked, grasshoppers may destroy rangeland and compete with livestock and wildlife for food. Ranchers and land managers need to first determine if there really is an infestation. The definition of an infestation, though this is not an exact science, is “eight or more grasshoppers per square yard” (your County Extension Agent can help determine the grasshopper count). If there is an infestation, a control plan needs to be devised. The best and most economical way to control infestations on rangeland is aerial spraying. Some years there are government cost share programs to help spray large acres of rangeland. Usually, the land needs to border adjacent to federal or state lands to qualify for government aid. The insecticides most commonly used on rangelands are Malathion ULV and Dimilin. Dimilin spray is proving to be the least expensive and environmentally safe alternative. It is important that spraying takes place early in the grasshoppers’ lives. The younger the grasshoppers and Mormon Crickets are the higher the kill rate. The best time to spray rangeland is usually during the first three stages of the insects’ lives.
Utah State Cooperative Extension
http://extension.usu.edu/files/publications/publication/pub__6510916.pdf

Vulnerability Assessment

There is currently no study being performed in Salt Lake County or Murray City to determine the economic cost or vulnerability for an infestation. Since Murray City has a low amount of agriculture, the impact from infestation would be negligible.

4.4.7 Problem Soils

Problem soils are soils that present problems for engineered structures. Problem soils include expansive soils, collapsible (hydro compactable) soil, limestone and karst terrain, gypsiferous soil, soils subject to piping, active sand dunes, peat, underground mines subject to subsidence, ad sodium sulfate-rich soil. These geologic materials are susceptible to volumetric changes, collapse, subsidence, or other problems, which can damage structures built on top of problem soils. Human activities such as adding water and/or loading can aggravate potentially unstable conditions that induce the majority of damage to structures (UNHH 2008, SHMP 2011).

Most of the hazards created by problem soil and rock can be reduced or avoided if they are understood and their extent is known. Recognizing where problem soil and rock are found and taking precautions to minimize their effects can reduce the need for costly corrective measures after damage to structures and roads has occurred. The majority of damage to structures results from human activities, usually through addition of water or by loading or excavation, which aggravate potentially unstable conditions. (UNHH 2008, SHMP 2011). All new construction typically requires a stamped and sealed soils report from a geo-technical engineer at the time of submittal for a building permit. The soils report will address the soils and outline the measures required for the soils to support the intended structure.

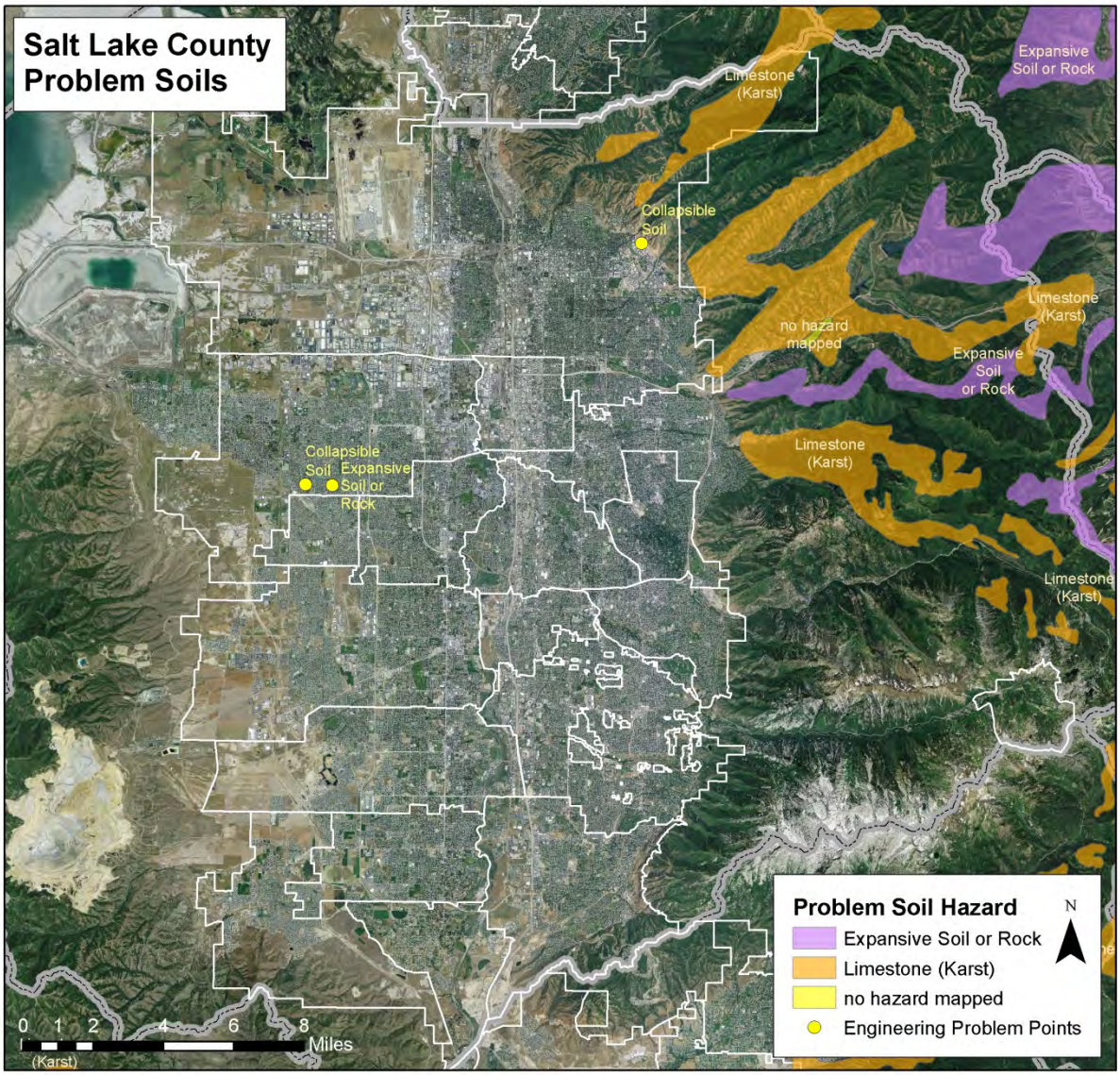
Problem Soil Hazard Profile

Potential Magnitude			**Probability**		
		Catastrophic (>50%)			**Highly Likely**
		Critical (25-50%)			**Likely**
		Limited (10-25%)			**Possible**
	X	**Negligible (< 10%)**		**X**	**Unlikely**
Location	Isolated locations within Murray City Boundary				
Frequency	Variable.				
Conditions	Saturated soil and unconfined fill				
Duration	Minutes to Years.				
Secondary Hazards	Settlement, Flooding (broken water pipes), fire (broken gas pipes).				
Analysis Used	Engineering Assessment				

Location and Extent

There are two types of problem soils are present in Salt Lake County – limestone and expansive soils. Both of these hazards are primarily found in the Wasatch Mountains in the eastern part of the County. See Map 19.

There is no specific data or maps related to problem soils within the Murray City. However, there are isolated locations with high ground water / saturated soils as well as areas that have unconfined fill material. These areas are usually identified in pre-development geotechnical studies and are typically mitigated prior to development. There are also highly corrosive soils in isolated areas of Murray that over time can impact steel water and gas pipelines.



Map 19

Limestone karst structures are easily eroded by water and therefore often form caverns and crevices. If these caverns become large enough, the overlying ground can give way causing sink holes and other forms of subsidence. Structures directly over the karst structure have a high potential for collapse. Ground water contamination is also possible (Mulvey 1992). Fortunately, many of the areas affected by karst structures in Salt Lake County are undeveloped.

Expansive soils can absorb large quantities of water. When a home or road is placed on top of these soils, normal evaporation cannot take place. The clay begins to absorb more water than is evaporated and expands, causing heaving. During especially dry periods, these soils can contract significantly causing subsidence and ground cracking. Residents already living in these areas should avoid excessive watering, make sure sufficient water drainage is in place around the home, and ensure plumbing and irrigation pipes and fixtures are well protected from breakage or leaks (Kaliser 1972).

History

No historical data on impacts of problems soils within Murray City were available at the time of this draft.

Vulnerability Assessment

Table 34 estimates infrastructure vulnerable for the isolated problem soils in Murray City. Provided are the number of units or total length of infrastructure vulnerable and the estimated replacement costs as provided by Murray City Public Services Department. Table 35 estimates the total area, population and buildings vulnerable to problem soils in Murray City.

Item	Length (Miles) or Number of Units	Replacement Cost
Roadways	1.5 miles	$1,000,000
Roadway Bridges	0 bridges	$0
Railway Segments	0 miles	$0
Railway Bridges	0 bridges	$0
Water Distribution Lines	10,000 feet	$1,100,000
Gas Lines	6,500 feet	$750,000
Sewer Lines	5,000 feet	$600,000
Total Estimated Infrastructure Replacement Cost		**$3,450,000**

Table 34. Infrastructure Vulnerable to Problem Soils, Murray City

Incorporated Areas	Acres Affected	Population Affected	Structures in Hazard Areas	
			Residential (Replacement Value)	Commercial (Annual Sales)
Murray	5.5	25	2,350,000	850,000

Table 35. Vulnerability Assessment for Problem Soils, Murray City

4.4.8 Radon

Radon is a radioactive gas released from the nuclear decay process of uranium and radium, which are trace elements of many soils. As radon moves up through the ground it can enter a home through cracks and gaps in walls and floors, cavities inside walls, gaps around service pipes, and water supply connections. Though relatively harmless at low levels, radon is classified by the EPA as a known human carcinogen and is considered the leading cause of non-smoking lung cancer in the United States. Because radon is tasteless, odorless, and invisible, it presents unique challenges in minimizing our daily exposure to this naturally occurring radiation (UNHH 2008).

Radon can be detected through an inexpensive test and can be mitigated through proper ventilation of excessive radon and installation of systems to prevent radon from entering the home.

Currently Murray City is not aware of any issues with Radon. Murray continues to monitor the situation in case any incidents arise. The Division of Air quality is currently working to set up an education program to help homeowners become aware of the issue.

Radon Hazard Profile

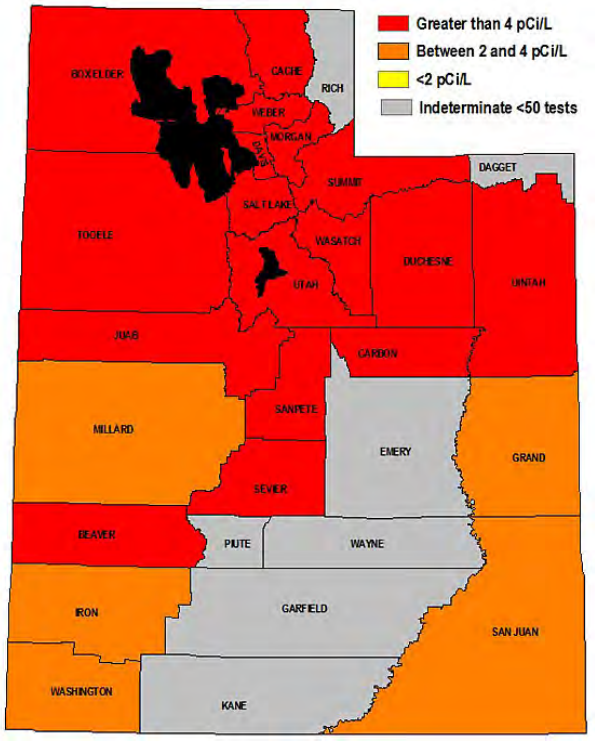
Potential Magnitude			**Probability**		
		Catastrophic (>50%)			**Highly Likely**
		Critical (25-50%)			**Likely**
	X	**Limited (10-25%)**		**X**	**Possible**
		Negligible (< 10%)			**Unlikely**

Location	Region wide
Frequency	Year-round, continuous
Conditions	Buildings over top of soils containing high amounts of decaying uranium, which is commonly found in Utah.
Duration	Years
Secondary Hazards	Unknown
Analysis Used	Information and maps provided by the Utah Geological Survey and the Utah Division of Radiation Control.

Location and Extent

Radon gas can be found in most Utah homes. The gas comes from the small particles of uranium in rocks and soil, which decay, to radium. In turn, the radium breaks down further into radon. As the radon moves up through the ground, it can enter a home through cracks and gaps in walls and floors if not properly vented.

Due to the types of geologic formations found in Salt Lake County, radon gas is likely present in higher concentrations in homes in the Wasatch and Oquirrh Mountains and their foothills. Sites further from the mountains and foothills generally have lower concentrations of radon. Radon does not pose a threat to infrastructure.



Through collections of tests performed by various households in the county, households containing higher levels of radon were found to roughly follow the patterns predicted by geologic formation. One exception is the area just south of Interstate 80 in western Salt Lake City

History

The danger of high exposure to radon in mines was known back in the 1500s. Yet, the presence of radon in indoor air was not documented until 1950. Finally in 1970, research was initiated to address sources of indoor radon, determinants of concentration, health effects, and approaches to mitigation. In 1984, a widely publicized incident in Pennsylvania escalated the problem of indoor radon and investigation intensified, with the EPA taking a strong lead to educate states via its State Indoor Radon Grant (SIRG).

EPA's grant has been partially funding the Utah Division of Radiation Control's (DRC) Indoor Radon Program that enables the Division to respond to a continuous stream of public telephone and email inquiries, provide education to homeowners and professionals, conduct "target area" indoor radon assistance and surveys, and offer individualized assistance to homeowners and public agencies concerning all aspects of the indoor radon hazard problem.

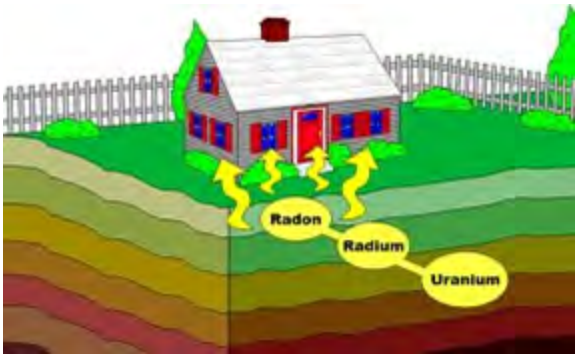
"The Division's primary goal is to assure that radiation exposure to individuals is kept to the lowest practical level," said Lundberg. "A vital mechanism in reducing radiation exposure and potentially saving lives is our Indoor Radon Program."

Radiation risk to the American public from radon gas is undisputed. According to William Field (2011), radon is the leading environmental cause of cancer mortality in the United States and the seventh leading cause of cancer mortality overall. The Harvard School of Public Health, Center for Risk Analysis, has ranked radon as the highest of ten risks of death in homes in the United States, ahead of falls and home fires.

"Radon awareness in Utah has grown steadily the past decade," said Keyser. "Already this year, we have seen the number of radon tests conducted in Utah triple from the previous year."

Vulnerability Assessment

Radon is a **radioactive gas** created by the breakdown of Uranium and is considered radiation.



Uranium is found **naturally** in soil and rocks. Normally, radon emits into the atmosphere and is harmless. Radon is:

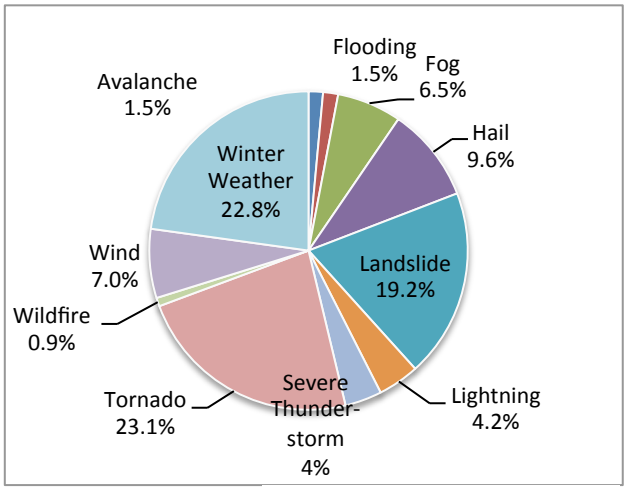
Odorless
Colorless
Tasteless

When radon is released, it goes into the atmosphere or seeps into homes and buildings through cracks in the structure of the house. When this happens, the gas becomes trapped due to poor circulation of indoor and outdoor air. Radiation is measured in curies. A curie is a rate of disintegration of 1 gram of radium. Radon is measured in picocuries per liter, shown as pCi/L.

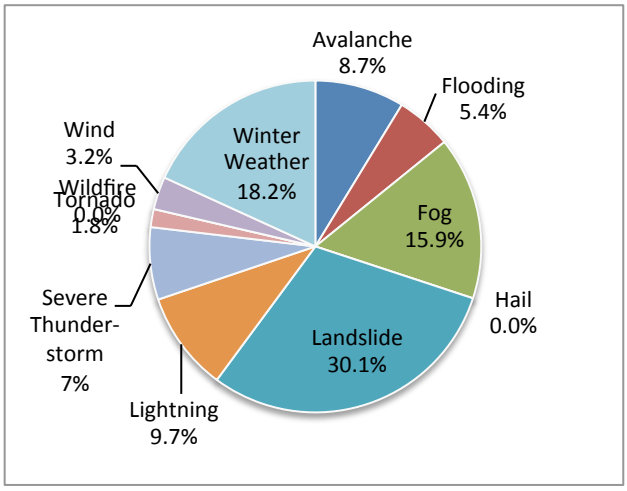
What are the health risks of radon? Radon decays into radioactive particles that can be trapped in the lungs when inhaled. These particles release small bursts of energy that damage lung tissue and may lead to lung cancer. Radon is the second leading cause of lung cancer in the United States. Only smoking causes more lung-cancer deaths, and smoking combined with radon is a particularly serious health risk. Chances of getting lung cancer are higher from the combination of smoking and radon than from either source alone. Not everyone who is exposed to radon develops the disease, but the chances increase with increasing levels of radon and length of exposure. The amount of time between exposure and onset of the disease is usually many years.

4.4.9 Additional Hazard History

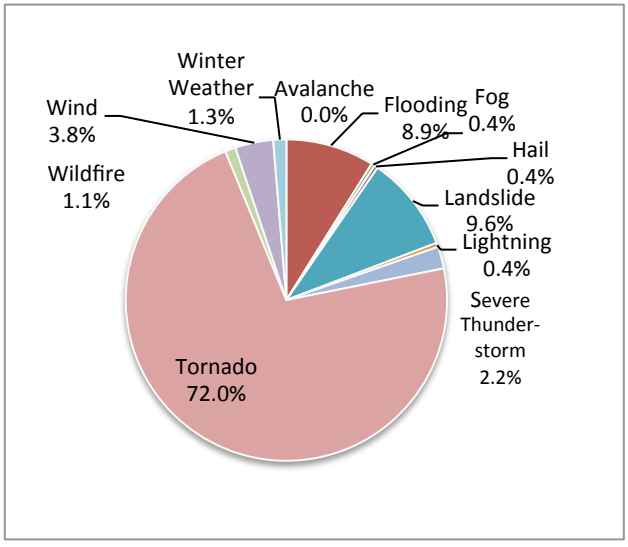
Identifying past hazard events provides a starting point for predicting where future events could potentially occur. The following historical hazard event statistics for Salt Lake County were consolidated from the Spatial Hazard Events and Losses Database for the United States (SHELDUS) of the Hazards and Vulnerability Research Institute (HVRI). There are not any charts available specific to Murray City, however since Murray City resides within Salt Lake County, these charts provide a good point of reference. These charts, tables and graphs give a comparison of the past impacts of various hazards. This database records reported natural hazard events that cause greater than $50,000 in damage. Monetary figures were not adjusted for inflation.



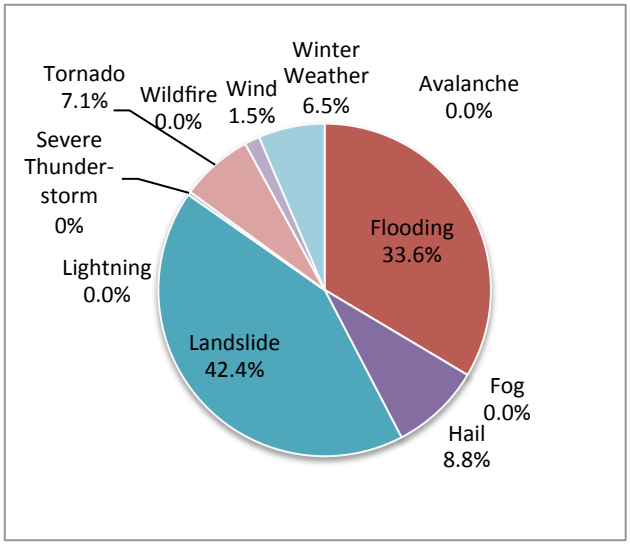
Percent of Total Injuries



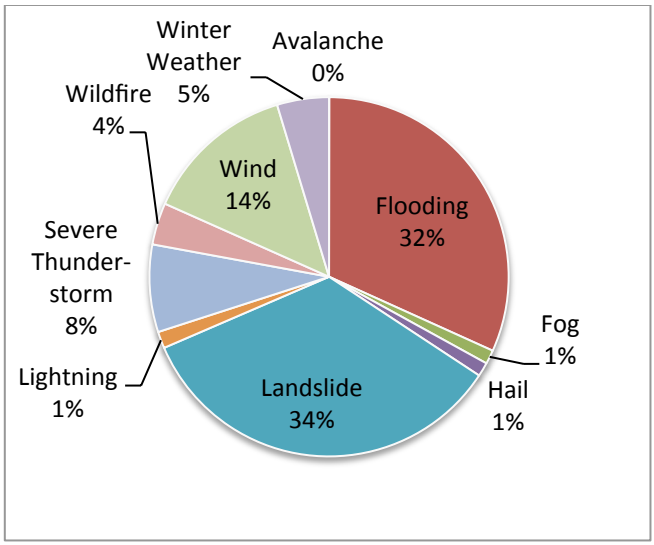
Percent of Total Fatalities



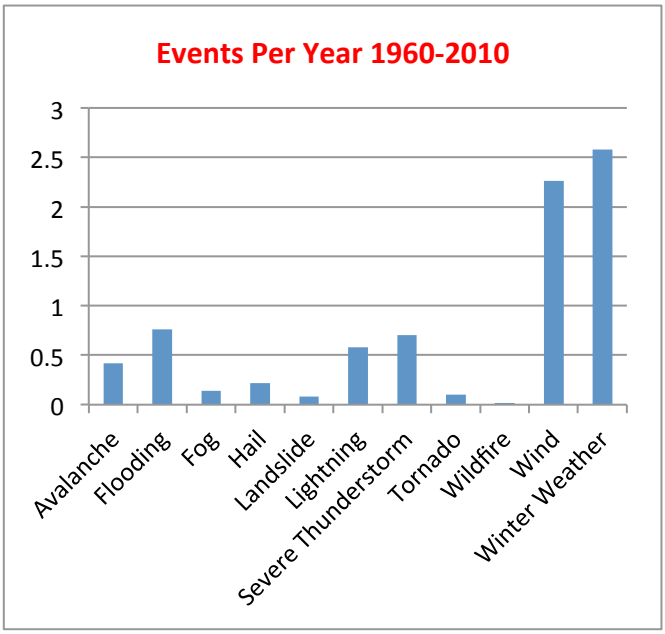
Percent of Total Property Damage

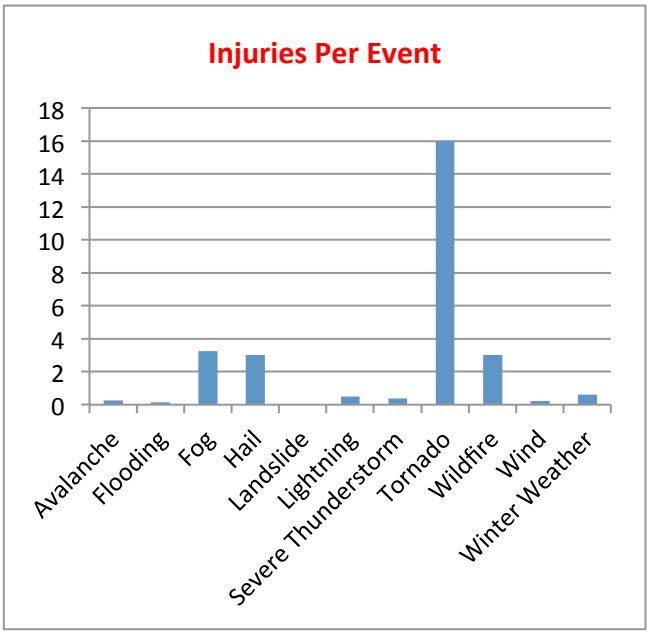


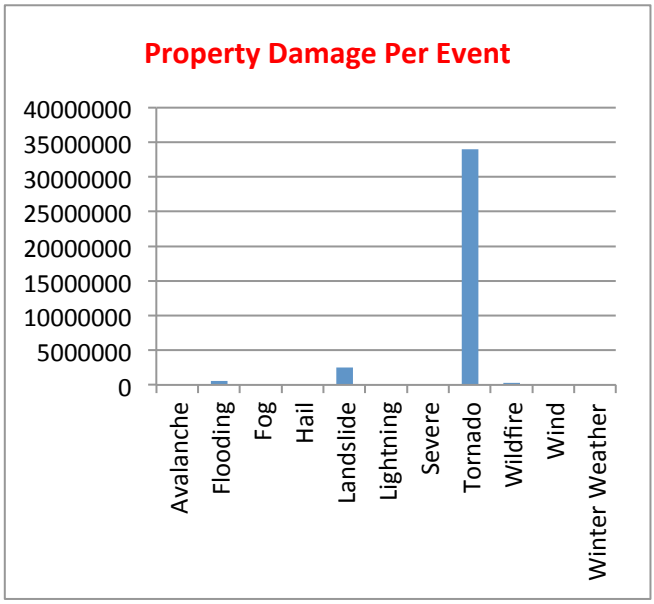
Percent of Total Crop Damage

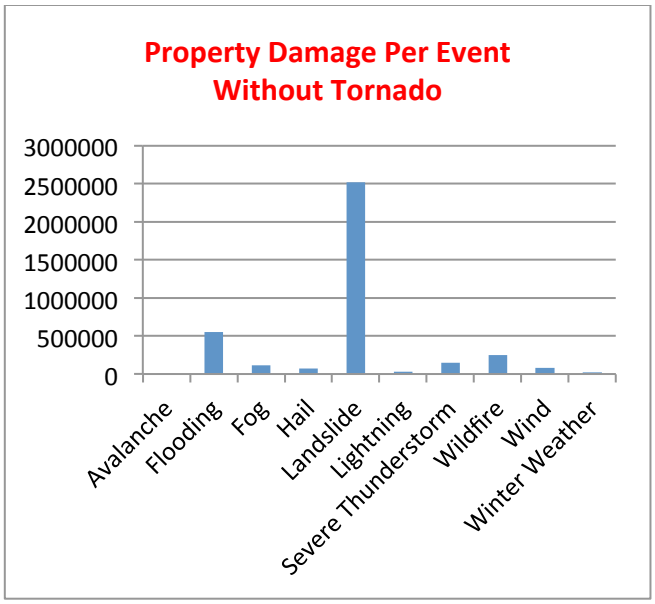


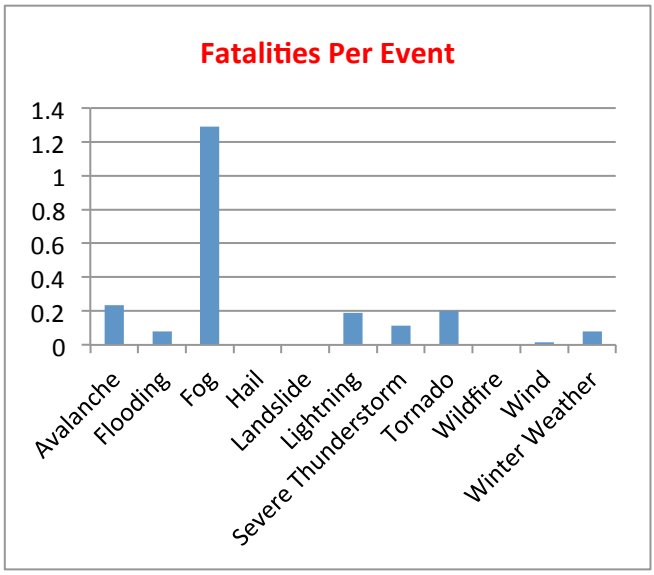
Percent of Total Property Damage without Tornado

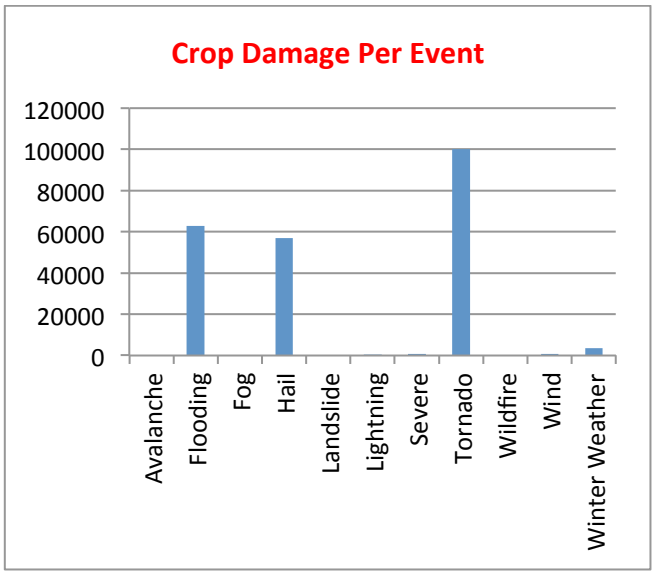












Major Event Annual and Per Event Averages 1960-2010, Salt Lake County (HVRI 2012)

Number of Structures with Moderate or Greater Vulnerability (% of Total)								
Critical Facilities	**Total**	***Dam Failure***	***Flood***	***Ground Shaking***	***Liquefaction***	***Problem Soils***	***Slope Failure***	***Wildfire***
Amateur Radio Repeaters	64	2 (3%)	0 (0%)	64 (100%	5 (8%)	0 (0%)	5 (8%)	10 (16%)
Public Safety Repeaters	11	0 (0%)	0 (0%)	11 (100%	5 (46%)	0 (0%)	3 (33%)	5 (46%)
Electric Generation Facilities	5	2 (40%)	1 (20%)	5 (100%	2 (40%)	0 (0%)	1 (20%)	0 (0%)
Emergency Operations Centers	15	1 (7%)	1 (7%)	15 (100%	10 (67%)	0 (0%)	0 (0%)	0 (0%)
Fire Stations	57	4 (7%)	3 (5%)	57 (100%	26 (46%)	0 (0%)	2 (4%)	1 (2%)
Hospitals	30	2 (7%)	0 (0%)	30 (100%	12 (40%)	0 (0%)	2 (7%)	0 (0%)
Oil Facilities	2	0 (0%)	0 (0%)	2 (100%	2 (100%	0 (0%)	0 (0%)	0 (0%)
Police Stations	25	5 (20%)	1 (4%)	25 (100%	19 (76%)	0 (0%)	0 (0%)	0 (0%)
Schools	246	25 (10%)	0 (0%)	246 (100%	108 (44%)	0 (0%)	0 (0%)	1 (1%)
Water Treatment Facilities	7	2 (29%)	2 (29%)	7 (100%	2 (29%)	1 (14%)	2 (29%)	1 (17%)

Table 37. Critical Facilities Vulnerability Matrix for Local Hazards, Salt Lake County
NA=Not Applicable

3.13 Hazards and Future Development

Population Estimates									
County	**2000 Pop (July 1)**	**2011 Pop (est.)**	**Absolute Change 2000-2011**	**% Change 2000-2011**	**AARC 2000-2011**	**Rank by 2011 Pop**	**Rank by Absolute Change**	**Rank by % Change**	**Rank by AARC**
Salt Lake County	902,777	1,045,829	143,052	15.85%	1.4%	1	1	19	13
Population by County and Multi-County District									
MCD/ County	**1990**	**2000**	**2010**	**2020**	**2030**	**2040**	**2050**	**2060**	**AARC 2000-2050**
Wasatch Front	1,107,570	1,389,210	1,640,814	1,883,072	2,147,752	2,429,672	2,702,404	2,979,319	1.9%
Salt Lake County	728,298	902,777	1,053,274	1,180,859	1,340,665	1,507,997	1,659,566	1,812,819	1.7%
Households by County and Multi-County District									
MCD/ County	**1990**	**2000**	**2010**	**2020**	**2030**	**2040**	**2050**	**2060**	**AARC 2000-2050**
Wasatch Front	360,125	449,359	539,595	645,014	784,829	907,753	1,019,448	1,133,023	2.5%
Salt Lake County	242,401	296,710	343,828	413,941	499,959	574,647	638,950	704,429	2.3%

Table 38. Demographic and Economic Projections (UPEC 2011, all statistics are based on July 1 snapshot.)

Demographic and Economic Projects specific to Murray City were not available at the time of this report.

The mitigation strategies discussed in this plan will be integrated into the following Murray agencies:

- Planning and Zoning: Building codes will reflect the listed mitigation strategies. Our building inspectors will utilize these strategies when performing building inspections in re-models and new construction.
- Economic Development: Mitigation strategies will help with new development to minimalized potential risk.
- Public Works: Streets and water department will use the mitigation strategies to help establish a more resistant infrastructure.
- Public Safety: Police and Fire Departments will utilize these mitigation strategies to develop training and response plans.
- Attorney: Mitigation strategies will be utilized to minimize risk for the city.

Salt Lake County development trends have recently slowed with many new developments stalled. Development that is still occurring will be in the southern and western portions of the County

because housing and land values are slightly lower. Development is tending to occur on agricultural lands. The Wasatch Mountain Range and the Great Salt Lake restrain development in the northern and eastern reaches of Salt Lake County.

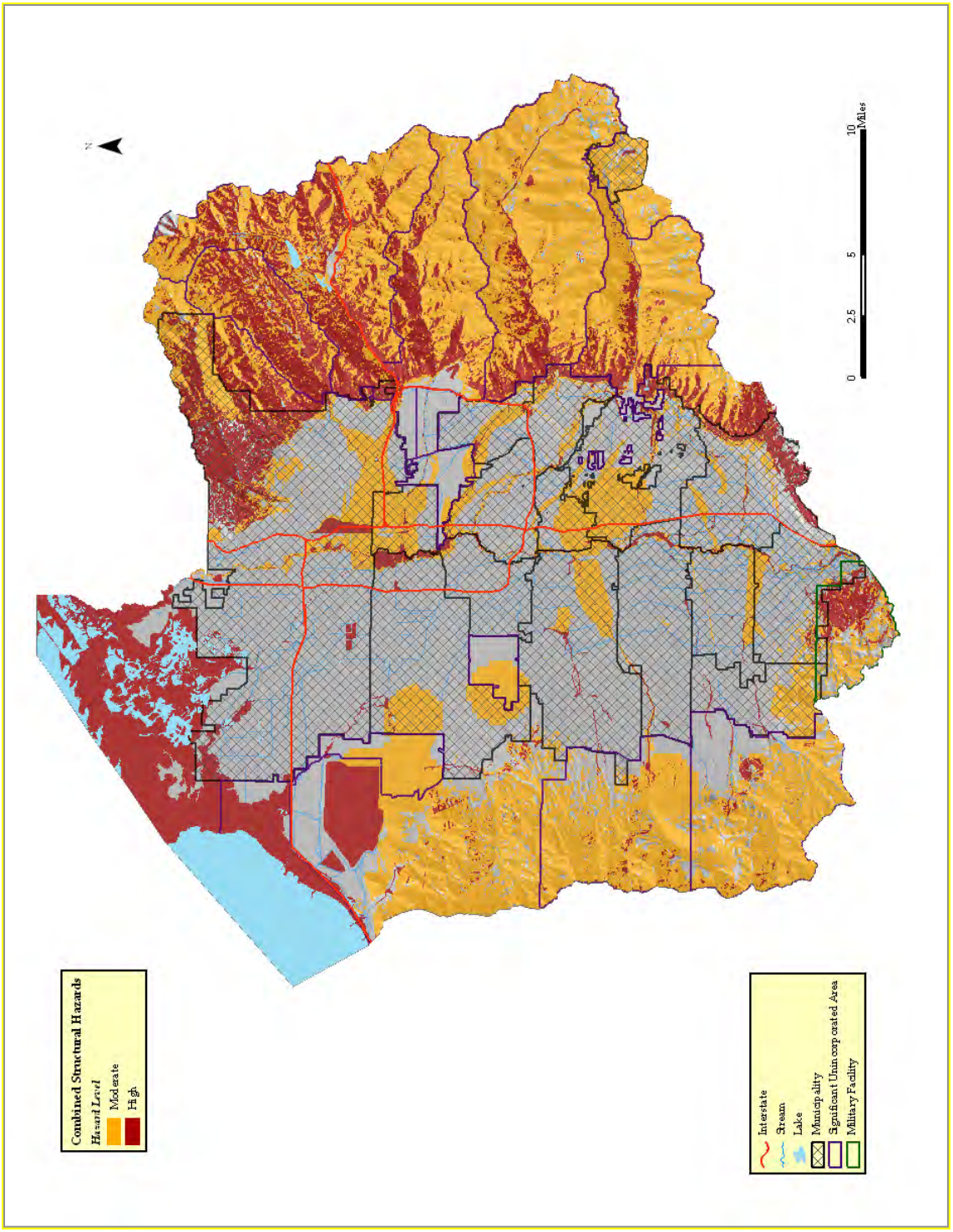
Those portions of the County near the Great Salt Lake and the Jordan River are subject to high liquefaction in the event of an earthquake and therefore pose a risk to incoming residents and new structures. Jurisdictions may mitigate the earthquake threat and its secondary risks through the use of zoning ordinances and building codes that will recognize the threat and reduce its impact. Examples of more appropriate forms of land use along fault lines include “farms, golf courses, parks, and undeveloped open space” (UGS 1996).

Flooding is also possible along the Jordan River. Many new homes have been built along the river’s banks in areas that flooded in 1983-84. Zoning restrictions on building location and building codes preventing basements would be well-suited in these areas.

Wildfire risk is most severe in the foothills of the Wasatch Mountain Range. These areas, known as Wildland-Urban Interface (WUI) zones, are most vulnerable due to the amount and types of vegetation and new structures that act as fuel to a burning fire. This threat may be mitigated by encouraging communities to become “Fire Wise Communities”, continued use of building and zoning codes and increase the public’s awareness.

Landslide/slope failure is another threat near the foothills of the Wasatch Mountains. Many new developments can be found near areas of current landslides. More detailed landslide studies and zoning appropriate for high hazard areas will decrease the likelihood of landslides injuring persons or damaging property.

Map 22 shows the combined risk of nine structurally-threatening hazards (dam failure, earthquake, flood, landslide, lightning, problem soils, tornado, wildland fire and wind) in Salt Lake County. The areas of high hazard (red) are areas of high landslide and flood risk as well as the “extreme” risk wildland fire areas. These areas are best preserved as open space to protect citizens from almost certain disasters. The moderate areas of the map (orange) are those areas having moderate or greater risk from five (5) or more structurally-threatening hazards. These areas should be preserved as open space if not already developed or hazard-appropriate development encouraged. If already developed, these areas should be the initial focus of education campaigns and for regulatory requirements of hazard mitigation techniques by residents.


N
0
2.5
5
10
Miles
Combined Structural Hazards
Hazard Level
Moderate
High
Interstate
Stream
Lake
Municipality
Significant Unincorporated Area
Military Facility

Map 22

5 Capability Assessment

Capabilities are the programs and policies currently in use to reduce hazard impacts or that could be used to implement hazard mitigation activities.

5.1 Planning and Regulatory Capabilities

Table 10 lists regulatory mitigation capabilities, including planning and land management tools, typically used by local jurisdictions to implement hazard mitigation activities and indicates those that are in place in Murray.

Building Code, Permitting, and Inspections	**Yes/No**	
Building Code(s) that reference hazards:	Yes	Version/Year. Are building codes adequate? 2012 International Building Code
Site plan review requirements	Yes	Do site reviews consider natural hazards? Site Plan review process requires identification of Flood hazard areas and hillside areas.

Land Use Planning and Ordinances	**Yes/No**	**Is the ordinance an effective measure for reducing hazard impacts? Are there any weaknesses or gaps in the ordinance to be addressed to better improve hazard risk reduction?**
Zoning ordinance(s)	Yes	
Subdivision ordinance(s)	Yes	**The Subdivision Ordinance is adequate and does address floodplain requirements and other hazards.**
Natural hazard specific ordinances (stormwater, steep slope, wildfire)	Yes	**Storm water, Flood Hazard.**
Floodplain ordinance	Yes	**Flood Damage Prevention Ordinance that regulates development in floodways and floodplains**
Flood insurance rate maps, other floodplain studies	Yes	**FIRM maps Other FEMA Resources**
Policies for acquisition of land for open space and public recreation uses		

Other		
Plans	**Yes/No Year**	**Does the plan address hazards? Does the plan identify projects to include in the mitigation strategies? Can the plan be used to implement mitigation actions?**
Comprehensive/Master Plan	Yes/ 2003	Yes. Chapter 7 of the General Plan includes policies on Earthquakes, Flooding, and environmental hazards.
Capital Improvements Plan	Yes/ 2013	The Storm Water portion of the CIP does identify projects that do mitigate localized flood problems.
Economic Development Plan	Yes/ 2003	Chapter 8 of the General Plan. General Plan includes separate chapter on Natural hazards.
Local Emergency Operations Plan	2013	The plan addresses hazards and mitigation strategies; however it does not address specific mitigation projects.
Recovery Plan	2013	Our recovery plan is part of the EOP; however it is general in nature.
Continuity of Operations Plan	2013	Our recovery plan is part of the EOP, however it is general in nature
Transportation Plan	2013	Our city has identified key transportation routes and has them as a priority to clear of debris and snow removal.
Storm water Management Plan	2009	The plan is water quality based and is intended to limit the discharge of pollutants from the City's storm drain system.
Community Wildfire Protection Plan	No	Not a significant hazard in Murray.
Other plans or hazard studies (brownfields, redevelopment, disaster recovery, climate change adaptation)		
How can these building codes, planning and zoning ordinances, and other community plans be expanded and improved to reduce risk?		

Table H.10. Murray City' Regulatory Mitigation Capabilities

5.2 The Murray City General Plan Program, 2003

The Murray City General Plan Program serves as the blueprint for future growth and development and provides comprehensive planning for the future. It encompasses what the City is now, and what it intends to be, and provides the overall framework of how to achieve this future condition (see the discussion in Section H.3 Growth and Development Trends).

The general plan includes a Safety Element that focuses on safety issues to be considered in planning for the present and future development of the Murray planning area. Identified hazards include fire, geologic/seismic, flooding, and hazardous materials. Mitigation-related goals, policies, and implementation measures are presented below.

Goal	Policy
Evaluate and update, as needed, current regulations and guidelines pertaining to development and building in areas with earthquake potential.	Policy: Regulate future development by following The International Building Code seismic provisions as adopted by the State of Utah.
Evaluate and update, as needed, current regulations and guidelines pertaining to development within "areas of special flood hazard" and "floodways".	Policy: Regulate development in "areas of special flood hazard" and "floodways" by following the guidelines of the Federal Emergency Management Agency and the "Flood Insurance Rate Maps."
Evaluate and update, as needed, current regulations and guidelines pertaining to development within wetland areas.	Policy: Regulate development in wetlands by following the guidelines of the U.S. Army Corp of Engineers.
Protect areas from development that are unsuitable or less suitable for development.	Policy: Recognize the hazards of development on unsuitable and less suitable lands to people and property by adopting guidelines and regulations that will prevent development in areas that cannot be effectively mitigated and insure proper mitigation of site hazards and constraints where feasible.
Utilize unsuitable or less suitable lands for open space and trail corridors throughout the city.	Policy: Incorporate unsuitable and less suitable lands into the Parks, Recreation and Trails element of the General Plan. Implementation Measure: Identify areas of unsuitable or less suitable lands that will be key areas for Parks, Recreation, and Trails corridor development.
Minimize the impacts of growth and development on water quality.	Policy: Regulate the impacts on water quality by adopting guidelines and regulations that will reduce water quality impacts to the maximum extent possible. Implementation Measure: As part of the water quality regulations and guidelines, require a planning review process that addresses site design and engineering controls to reduce water quality impacts.

The Public Facilities Element of the general predefines policy for public facilities and services, including infrastructure, and addresses the issues of providing adequate infrastructure and community services to expanding populations by planning in conjunction with land use. Murray' infrastructure consists of water, wastewater, storm drainage/flood control, and solid waste systems.

5.3 Murray Municipal Code

The following ordinances are used for implementing the general plan and/or are critical to the mitigation of hazards identified in this plan.

5.3.1 Zoning Ordinance (Chapter 17)

This title and related regulations and restrictions are designed and enacted for the purpose of promoting the health, safety, morals, convenience, order, prosperity and general welfare of the present and future inhabitants of the city to:

- Encourage and facilitate the orderly growth and development of the city;
- Provide adequate open space for light and air and prevent overcrowding of the land;
- Secure economy in governmental expenditures, to facilitate adequate provisions for transportation, water, sewerage, schools, parks, and other facilities and services;
- Preserve and create a favorable environment for the citizens and visitors of the city;
- Enhance the economic and cultural well-being of the inhabitants of the city;
- Foster the city's residential, business and industrial development;
- Provide classification of land uses and distribution of land development and utilization;
- Promote the development of a wholesome, serviceable and attractive city resulting from an orderly, planned use of resources. (Ord. 07-30 § 2)

Site Plan Ordinance (Chapter 17.54)

The purpose of the site plan review process is to evaluate new development of permitted uses and certain changes of use from one permitted use to another for conformance with the standards of the zoning ordinance. The site plan review process promotes the health and welfare of residents and business owners of Murray City by allowing for a coordinated review of a development by various city departments. (Ord. 09-20 § 2)

Site plan review shall be required prior to the issuance of a building permit or business license for all permitted uses listed for each zone unless exempted from the requirement by section 17.54.030 of this chapter. The following types of development activities shall require site plan review approval:

A. New construction;
B. Changes of use within an existing building where there is an increase in parking demand, unless the applicant can demonstrate that the site has sufficient parking to meet the requirements of this code;
C. Uses which include outdoor storage;
D. Temporary storage containers;

E. Construction of drive-through windows;
F. Development of new parking lots greater than one thousand (1,000) square feet in size;
G. Major changes to the site, including changes to parking and landscaping layout;
H. Unusual circumstances or issues, as deemed necessary by the community and economic development director [manager]. (Ord. 09-20 § 2)

5.3.2 Subdivision Ordinance (Chapter 16)

The Subdivision Ordinance specifically provides for proper grading and erosion control and prevention of sedimentation or damage to off-site property. Each local agency may by ordinance regulate and control other subdivisions, provided that the regulations are not more restrictive than the regulations commencing in the Land Use, Development and Management Act under Utah Code Annotated 10-9a, and any other relevant Utah statute.

Erosion or Sediment Control Program (Chapter 13.52.030)

Every map approved pursuant to the provisions of the Subdivisions Ordinance are conditioned on compliance with the requirements for grading and erosion control, including the prevention of sedimentation or damage to off-site property, set forth in Appendix Chapter 70 of the Uniform Building Code, current adopted edition, as adopted and amended by the City.

5.3.3 Flood Hazard Ordinance (Chapter 17.20)

Flood losses are caused by uses that are inadequately elevated, flood proofed, or protected from flood damage. The cumulative effect of obstructions in areas of special flood hazards that increase flood heights and velocities also contribute to flood loss. It is the purpose of the Flood Hazard Ordinance to promote the public health, safety, and general welfare and to minimize public and private losses due to flood conditions in specific areas by provisions designed to:

- Protect human life and health;
- Minimize expenditure of public money for costly flood control projects;
- Minimize the need for rescue and relief efforts associated with flooding and generally undertaken at the expense of the general public;
- Minimize prolonged business interruptions;
- Minimize damage to public facilities and utilities such as water and gas mains; electric, telephone, and sewer lines; and streets and bridges located in areas of special flood hazard;
- Help maintain a stable tax base by providing for the sound use and development of areas of special flood hazard so as to minimize future blighted areas caused by flood damage;
- Ensure that potential buyers are notified that property is in an area of special flood hazard; and

- Ensure that those who occupy the areas of special flood hazard assume responsibility for their actions.

- In order to reduce flood losses, the ordinance includes methods and provisions to:

- Restrict or prohibit uses which are dangerous to health, safety, and property due to water or erosion hazards, or which result in damaging increases in erosion or flood heights or velocities;
- Require that uses vulnerable to floods, including facilities which serve such uses, be protected against flood damage at the time of initial construction;
- Control the alteration of natural floodplains, stream channels, and natural protective barriers, which help accommodate or channel floodwaters;
- Control filling, grading, dredging, and other development which may increase flood damage; and
- Prevent or regulate the construction of flood barriers which will unnaturally divert floodwaters or which may increase flood hazards in other areas.

5.3.4 City Emergency Services Policies and Interlocal Agreements

The declared purposes of Emergency Services Policies and Interlocal Agreements of the City are to provide for the preparation and carrying out of plans for the protection of persons and property within the City in the event of an emergency; the direction of the emergency organization; and the coordination of the emergency functions of the City with all other public agencies, corporations, organizations, and affected private persons.

5.4 Stormwater Management Program

Murray City's Stormwater Department has eight full time employees dedicated to flood control and fifteen Street Department employees that will assist to rapidly address flooding throughout the City. Contact information and GIS data is updated regularly, 24hr emergency contact number and an employee that is on call 24-7 to respond after hours.

5.5 Five-Year Capital Improvement Plan

The **Five-Year** Capital Improvement Plan (CIP) represents an effort to identify major capital needs and schedule projects consistent with community priorities and available funding. A major portion of the funding for these projects comes from savings accrued in the General Fund and Enterprise Funds by the various departments and revenue above budgeted sales tax projections. Projects identified in the CIP are broken down as follows:

- **General Government Facilities**— Capital projects for the General Government Facilities program consist of acquisition of new facilities, improvement to existing facilities, and maintenance of existing improvements required by City departments to enable them to adequately carry out their mission.
- **Sewer Capital Projects**—The Enterprise budget includes projects that will repair and/or replace existing sanitary sewer mains that are severely deteriorated or are not adequately sized for the flows being experienced. The Developer budget includes the debt service payments for the 2007 Sewer Revenue Bond for the Sewage Treatment and Water Reuse Facility.
- **Parks Improvements**—These primarily consist of master planning and design and construction of park improvements. Community park improvements are funded by development fees and state grants when available. Neighborhood parks are installed by development. Park fees are paid by all new developments constructed within the Murray City.
- **Street Improvements**—These include traffic signal installation, street repair and improvement, sidewalk installation/modification, and design work throughout the City.
- **Water**—This includes projects that will continue to improve the water distribution system, and improve water quality through the addition of treatment facilities at existing wells, and increase the reliability of the water supply by the addition of auxiliary power generators.
- **Refuse**—This includes regulatory design and maintenance of City-owned landfill and associated projects.
- **Redevelopment Agency of Murray**— An agency authorized under State Law Title 17C, the purpose of this agency is to facilitate redevelopment efforts in a designated community and to administer projects and programs to assist in economic development, community development and renewing urban areas.
- **Police/Fire –** Fire department stations are in satisfactory shape, only regular station maintenance is required. The police headquarters inside of city hall needs to be updated or relocated due to the fact that the building is not currently up to earthquake standards. In addition, the city hall location lacks the indoor storage space necessary for evidence

collection. The police station on 851 West Bullion requires updating. In addition, the bays need to be enlarged to allow for safe parking of the SWAT vehicle.

5.6 Economic Development Strategy

The Mayor and City Council of Murray City embarked on a strategic planning process in the fall of 2011 working with Novak Consulting group. During this five month process, a new Strategic Plan for the City was adopted. The plan identifies a Vision, Mission, Values and Key Performance areas along with goals for each performance area. One of the Key Performance areas is associated with economic development and is identified in the following statements:

Key Performance Area – Welcoming and Thriving Business Climate:
Murray maintains an aesthetically pleasing, efficient, progressive, and business friendly environment through investments in transportation, technology and infrastructure that support quality businesses and jobs in the community. Murray City is home to unique, destination oriented, sustainable commercial development.

Strategic Initiatives
1. Develop a comprehensive economic development policy and incentive plan
2. Aggressively pursue the creation of a vibrant and sustainable Murray City downtown.

Additionally, the following outlines existing Murray City Economic Development Policies adopted in 2003 as part of the General Plan adoption process:

Goal	Policy	Implementation Measure
To expand commercial growth within the commercial core and designated strategic areas of Murray City.	Focus retail and business expansion efforts within the commercial core and strategic areas.	Identify any underutilized or undeveloped parcels located with Murray's commercial core and concentrate economic development strategies on these areas.
To increase the regional draw of Murray's economy.	Take advantage of regional transportation systems by locating major traffic-generating uses at sites served by freeways, major highways and mass transit.	Relocate lower value businesses that are near areas with high amounts of traffic so that these areas will offer opportunities for higher value commercial use.
Promote mixed-use developments that integrate residential, office and retail uses.	Support mixed use development proposals that provide for a well-integrated mix of residential with retail and/or office.	Identify sites that are suitable for mixed-use projects; target transit station areas for transit-oriented, mixed use design.
Advance the economic health of all of Murray City including its commercial AND residential areas.	1. Support existing businesses and established commercial nodes, 2. Enhance the quality of residential neighborhoods.	
To strengthen the City's medical related commercial activity.	Foster the interest and growth of hospital and medical related services and research.	1. Develop a plan that focuses on attracting healthcare and biomedical related businesses that will complement current

		and future medical related developments, 2. Recognize the aging demographics of Murray and assure that a broad range of medical services for the elderly is created, including residential facilities.
To increase the number of consumers of Murray's retail businesses.	Establish a plan to increase the marketability of areas with a strong retail presence.	Identify the areas within Murray that have a strong retail presence. Plans should include the redesign and renovation of each area that is determined to be in need of improvement.
To increase the utilization of land in Murray City.	Combine underused properties to make parcels that are "development ready". Redevelop underused land to make it fit for commercial or industrial use.	Combine properties that are underutilized for commercial development. Replace older residential structures and outdated commercial buildings with commercial developments that allow for higher utilization of the land while maintaining important historic structures.
To retain existing businesses within Murray City.	Improve business expansion and retention efforts.	Identify the areas that may experience high rates of turnover and focus expansion and retention efforts on these areas and offer assistance to businesses in meeting expansion needs.
Expand the types of businesses available in Murray City.	Expand the amount of entertainment, amusement and lodging opportunities in Murray City.	Target regional theaters and cinemas for locations in Murray. Develop a facility to host performing arts productions. Recruit a full service hotel.

5.7 Murray City Emergency Operations Plan

The Murray City Emergency Operations Plan (EOP) will be activated and implemented when the Murray City mayor or designee declares an emergency or when an emergency is considered imminent or probable and the implementation of this plan and the activation of the Murray City Emergency Operations Center is considered a prudent, proactive response.

This EOP is effective for planning and operational purposes under the following conditions:

- An incident occurs or is imminent
- A state of emergency is declared by the mayor or designee
- As directed by the Murray City emergency manager or designee

Familiarity with the EOP components will help users locate guidelines, procedures, and supplemental information in an emergency and complete tasks in a timely manner. The EOP will also provide guidance regarding official records to be kept on file after an emergency response.

The emergency management organizational structure is outlined in Emergency Support Function #5 – Emergency Management. The Murray City Fire Department's Division of Emergency Management is under the immediate operational direction and control of the fire chief, who coordinates interdepartmental emergency operations and is ultimately responsible for resolving conflicts regarding the application of limited resources to a variety of concurrent emergencies.

Saving lives will take precedence over protecting property for decisions involving resource allocation and prioritization.

The Murray City Fire Department's Emergency Manager is responsible for coordinating emergency activities with regional, state, and private partners. Coordination will be accomplished through established liaison roles within the incident or unified command structure as outlined in the National Incident Management System (NIMS).

This plan is promulgated as the Murray City Emergency Operations Plan (EOP). This plan is designed to comply with all applicable Murray City regulations, and provides the policies and procedures to be followed in response to emergencies, disasters, and terrorism events.

The Murray City Building Division is responsible for conducting Rapid Visual Assessments of Damaged Structures in accordance with ATC-20, which entails completing a rapid visual assessment of damaged structures and posting them with a placard as follows: RED= do not enter, Yellow = limited entry and Green = Ok to occupy.

5.8 Murray Unified School District Hazard Mitigation Plan

The Murray and Granite School Districts are part of a K-12 public school system that serves the Cities of Murray and the Salt Lake Valley. The overall goal of the Hazard Mitigation Plan is to reduce or prevent injury and damage from natural hazards in the District by addressing the hazards that present the greatest risk to the District, its students, staff, facilities, infrastructure, properties, and the natural environment. The plan examines past events and hazard mitigation programs already in place and prioritizes additional mitigation activities for the District. Planning goals include facilitating the integration of City and County hazard mitigation planning activities into District efforts.

Salt Lake County is currently embarking on a program called SAFE Neighborhoods. SAFE standing for Schools Aiding Families in Emergencies. The overall concept is that there is an elementary school associated with every neighborhood. In the event of a valley wide catastrophic event the message to families is "grab your 72 hour kit and walk to school". The elementary schools then

become the center of neighborhood response and recovery activities as well as points of distribution, points of communication, reunification centers, initial intake centers and information distribution points. In addition the plan is to create transportation networks within each school district and linking each of the districts together. The idea here is that someone could be working in Murray for example. Get on a bus at the closest elementary school to their work. Ride that bus to an "inter-district" hub, then take a bus from Murray School District to Jordan or Canyons School District then ride the "intra-district" bus to the elementary school closest to their home and either walk home or meet their family at that school. This same concept will work for information distribution, communications, etc. The elementary schools would also be used as an initial intake center for the shelter system using your feeder system to get folks that need temporary shelter to the Jr. Highs and High School that would be used as shelters. The whole program would be administered by the American Red Cross and their existing system. Salt Lake County Emergency Management is running as the lead agency on this project in order to get a valley wide standardized system.

5.9 Administrative/Technical Mitigation Capabilities

Table 11 identifies the personnel responsible for activities related to mitigation and loss prevention in Murray.

Staff	**Yes/No FT/PT**	**Is staff trained on hazards and mitigation?**
Planning Commission	Yes/FT	Staff has limited training. Planning Commission is citizen planners and are not specifically trained on natural hazards.
Zoning Administrator	Yes/ FT	General hazard and mitigation training
Chief Building Official	Yes/FT	Yes, we have had limited training.
Floodplain Administrator	Yes/PT	Yes, some training.
Emergency Manager	Yes	Yes, on general principles.
Community Planner	Yes/FT	General hazard and mitigation training
Civil Engineer	Yes/FT	Yes, limited training.
GIS Coordinator	Yes/FT	
Administration	**Yes/No**	**Describe capability**
Maintenance programs to reduce risk (tree trimming, clearing drainage systems, etc.)		
Mutual aid agreements	Yes	In place and used daily.

Technical	Yes/No	Has capability been used to assess/mitigation risk in the past? If so, were needs for improvement identified?
Warning systems/services (Reverse 911, outdoor warning signals)	Yes	Our dispatch center Valley Emergency Communication Center (VECC) has a program similar to Reverse 911 to notify residents of emergency information.
Hazard data and information	Yes	Hazmat Tier II reports are kept by the fire department and by Salt Lake County.
Grant writing	Yes	We have received grants to install a back-up server for the city and our working on a grant to reduce the hazard of our gas turbines. In addition, two of our schools have received a grant to retrofit their buildings to current earthquake standards.
HAZUS or other GIS analysis tools		

Table 11. Murray City' Administrative and Technical Mitigation Capabilities

5.10 Fiscal Mitigation Capabilities

Table 12 identifies financial tools or resources that the City could potentially use to help fund mitigation activities.

Financial Resources	Accessible/Eligible to Use (Yes/No)
Community Development Block Grants	Yes
Capital improvements project funding	Yes
Authority to levy taxes for specific purposes	Yes
Fees for water, sewer, gas, or electric services	Yes
Impact fees for new development	Yes
Incur debt through general obligation bonds	Yes
Incur debt through special tax bonds	Yes
Incur debt through private activities	No
Withhold spending in hazard prone areas	No

Table 12. Murray City' Fiscal Mitigation Capabilities

5.11 Mitigation Outreach and Partnerships

The Murray City has two full-time and one part-time fire prevention specialists dedicated to public education.

Murray City Fire Department (MCFD) has been teaching Community Emergency Response Teams (CERT) classes since 1996. CERT members are trained to help communities lessen the effects of a disaster during the first 72 hours when roads, communications, power, gas service and other utilities have been disrupted and professional emergency response teams are unable to get to the area.

Murray City Fire Department also teaches first aid on a regular basis. CPR classes are taught the second Tuesday of every month at 5:00pm in the Community Education building just east of the Fire Station at 40 E 4800 S.

Program/Organization	Yes/No	Could the program help implement future mitigation activities?
Local citizen groups, non-profit organizations	Yes	Yes, CERT learns specific tasks to mitigate hazards.
Ongoing public education or information program (e.g. responsible water use, fire safety, household preparedness)	Yes	Yes, CERT learns specific tasks to mitigate hazards.
Natural disaster or safety related school programs	Yes	Fire department participates in yearly safety programs. In addition, two of our schools have received a grant to retrofit their buildings to current earthquake standards.

5.11.1 Mitigation Outreach and Partnerships

Murray City, through its municipal electric utility, offers electrical safety education and materials to nine elementary schools within the city. Electrical safety demonstrations are presented at several large community events each year. In addition, Murray provides a full scope of energy education and materials to students in all schools in the city through a partnership with NEF (National Energy Foundation).

5.11.2 Water Outreach Program

Murray City water uses a multi-faceted outreach program including the following:

Our Message includes:

- Quality of Water
- Quality of Services
- Conservation Activities – WaterSense, Fixture Rebates, Give A-ways, National Energy Foundation
- Importance of what we do
- Project updates and other things we are doing

Our message is communicated different ways, i.e.

The Visual Message:

- Logo
- Slogan - "Tap into Murray Quality"
- Branding Murray water
  a. Vehicles/Trucks/Equipment
  b. Personnel/hats, t-shirts, etc.

In the Community:

- Elementary Schools
  a. Partner with the National Energy Foundation with all fourth grade classes
  b. Earth-Day activities
  c. Annual vehicle/career day
  d. Fix-a-leak week art contest
- 4th of July – Murray Fun Days information booth in park
- Participation in providing drinking water at the local farmers market
- Prize giveaways
- Fixture Rebates

Internet:

- Social Media
  a. Facebook
  b. Twitter
- Murray City Web site & links to EPA and other informational & conservation sites
- Current City projects updates and future plans

Direct Message:

- Consumer Confidence Report (CCR)
- Billing inserts
- Quarterly news letters
- Local newspaper updates articles
- Press releases

5.11.3 Safety Assessment Program

Murray Cities Building Division has 50% of its inspection and plan review staff certified in safety assessment of structures after a natural disaster by the state of Utah Office of emergency management. In order to receive a disaster response card you must attend an 8 hour ATC-20 training course along with a field component and an online incident command system (ICS) course

100-B and be one of the following: ICC certified inspector, or licensed P.E. or Architect. 100 % of the building inspectors and plan reviewers should be certified by the end of 2014.

Murray City has also adopted the Building Occupancy Resumption Program "B.O.R.P", which is a proactive measure for business owners and others to have their buildings evaluated by a design team of professional Architects and engineers prior to a natural disaster.

5.12 Other Mitigation Efforts

The Murray Fire Department's Fire Cadet Program is a career development opportunity aimed at the fire service. The Fire Cadets are comprised of adolescents between 16 and 21 years of age. The Fire Cadet program allows students to gain a better understanding of the fire service and helps guide students interested in possibly pursuing the fire service as a career.

Cadets will complete a training program instructing them in such areas as:

- Fire safety
- Operations
- Fire tactics
- Emergency medical services

6 Mitigation Strategy

6.1 Mitigation Goals and Objectives

The Murray City adopts the hazard mitigation goals and objectives developed by the HMPC and described in Chapter 5 Mitigation Strategy.

6.2 Mitigation Actions

The planning team for the Murray City identified and prioritized the following mitigation actions based on the risk assessment. Background information and information on how each action will be implemented and administered, such as ideas for implementation, responsible office, potential funding, estimated cost, and timeline are also included. Only those hazards that were determined to be a priority hazard were considered further in the development of hazard-specific mitigation actions.

The following mitigation strategies were formulated by the Salt Lake County Mitigation Strategies Working Group on November 20, 2007, at Holladay City Hall. The Working Group sought to refine and expand on efforts already in place. Additional information was provided in October 2008 by the Central Utah Water Conservancy District in regards to the Red Butte Dam in Salt Lake County that was developed through the course of an ongoing Hazard Mitigation Planning effort, which began in July 2007 and is scheduled to be completed in February 2009. Information on Working Group members can be found in Part IV. “Emergency Services” for the purpose of this section is defined as County and City emergency management and may include relevant emergency response agencies.

See section 6.2 Mitigation Strategies for a list of mitigation strategies based on hazards.

6.2.1 Communications and Emergency Operations Center (EOC)

Problem Identification: One of the pivotal aspects of disaster response is communication. Without effective communication, relief and rescue operations become chaotic and disorganized, as evidenced by the 2005 Hurricane Katrina event. During that event, communication systems often were inoperable, incompatible or merely went unused because of lack of training (Peterson 2005).

Goal 1 – Improve and maintain communications capabilities for emergency operations

Cost Estimate: $80,000

Objective 1.1 (Priority HIGH): Improve communications capabilities

- Action 1: Conduct an inventory and assessment of communications equipment and systems and identify needs.

  Complete – Currently working to update the amateur radio equipment.

- Action 2: Conduct training and awareness activities on communications equipment, tools, and systems.

  Ongoing – Need more personnel trained with amateur radio, currently working to try and get fire department members to take amateur radio class at a local university.

- Action 3: Establish agreements to share communications equipment between agencies involved in emergency operations.

  Incomplete

- Action 4: Establish notification capabilities and procedures for emergency personnel.

  Ongoing – Have pager and cell phone information. Needs to be updated annually.

- Action 5: Improve EOC to allow for a more functional working environment during EOC activations.

  Ongoing – Have obtained EMPG Competitive grant which will allow for the purchase of another monitor, a speaker system in the EOC, and table and chairs for an additional work/break area.

Objective 1.2 (Priority HIGH): Maintain communications capabilities for critical facilities

- Action 1: Evaluate vulnerability of critical communications systems.

  Ongoing – Satellite phones have been purchased; need to train more members on their usage.

- Action 2: Establish redundancy for dispatch centers and other critical communications systems.

  Ongoing – Installing back-up server for the city.

Objective 1.3 (Priority HIGH): Conduct Communications Strategic Planning

- Action 1: Establish a coordinating group to address long-term communication needs and implementation strategies.

  Ongoing – The administrative staff of the fire department make up the group. Currently working with amateur radio volunteers to help determine which equipment is still needed.

- Action 2: Acquire, upgrade, and/or integrate communications equipment and systems as determined by coordinating group.

  Ongoing – An EMPG competitive grant has been awarded for 2014 to help update amatuer radio equipment as well as install speakers in EOC.

6.2.2 GIS - Geographic Information System

Problem Identification: Without sufficient knowledge of hazards affecting a jurisdiction, effective and efficient mitigating actions cannot be properly applied. Information on critical and high value infrastructure is also important. Advances in mapping technology and observational techniques have given a significantly clearer vision of hazards and vulnerability. This technology is only effective if utilized with up-to-date data.

Goal 2 – Improve awareness and analysis of hazards

Cost Estimate: $20,000

Objective 2.1 (Priority MEDIUM): Improved quality and access to digital geographic (GIS) hazards data

- Action 1: Establish a coordinating group to address geographic data issues.

Complete – Our GIS department consists of a 4 member team that addresses these issues.

- Action 2: Examine current data availability and sharing capabilities, evaluate needs, and identify shortcomings.

  Complete

- Action 3: Update and expand data on hazards, critical facilities, and critical infrastructure according to assessed needs.
-

  Complete

- Action 4: Provide centralized access to geographic data to emergency planners and responders.

  Complete

Objective 2.2 (Priority MEDIUM): Improve and expand hazard monitoring capabilities.

- Action 1: Integrate existing hazard monitoring networks in emergency operations centers. Utilize sensors such as weather stations, stream gauges, seismograph stations, road conditions, etc.

  Incomplete

- Action 2: Identify and implement additional hazard monitoring capabilities.

  Incomplete

6.2.3 Infrastructure

Problem Identification: Certain infrastructure must be able to withstand the most extreme hazard event expected in order to provide coordinated response operations, shelter, and evacuation, if necessary. Some examples of critical infrastructure include police stations, fire stations, schools, water systems, emergency operations centers and major transportation routes.

Goal 3 – Ensure critical facilities can sustain operations for emergency response and recovery

Cost Estimate: $800,000

Objective 3.1 (Priority HIGH): Prevent damage to critical facilities and infrastructure.

- Action 1: Utilize GIS to identify facilities and infrastructure at risk.

Complete

- Action 2: Assess critical facilities for hazard exposure, structural weaknesses, power, communications and equipment resources and redundancy, and adequate emergency procedures.

  Completed several years ago – needs review.

- Action 3: Implement Improvements to address needs identified in assessment.

  Incomplete – City Hall has been identified as a major risk and a plan is currently in place to raise funds to rebuild or relocate.

6.2.4 Mutual-Aid Agreements

Problem Identification: Hazardous events often overcome the resources of any one jurisdiction. An effective measure which ensures adequate response to a hazardous event is mutual-aid agreements specifying resources and assistance from adjoining jurisdictions or state and federal agencies.

Goal 4 – Improve response capabilities through mutual-aid agreements

Cost Estimate: $10,000

Objective 4.1 (Priority MEDIUM): Utilize mutual-aid agreements in accordance with National Incident Management System (NIMS) requirements.

- Action 1: Compile inventory of current mutual-aid agreements and memoranda of understanding (MOU) and identify deficiencies.

  Incomplete – needs addressing. Mutual agreements are presumably in place but are not located together for easy reference.

- Action 2: Pursue and implement needed mutual-aid agreements.

  Incomplete

6.2.5 Public Education

Problem Identification: One of the most cost-effective means of mitigating hazards is through public education. This allows citizens to make informed choices to themselves mitigate hazards affecting them. Education can be especially effective when tied to grant programs.

Goal 5 – Increase citizen safety through improved hazard awareness

Cost Estimate: $20,000

Objective 5.1 (Priority HIGH): Establish a comprehensive public education program.

- Action 1: Provide education regarding all natural hazards through live trainings, as well as web-based, print and broadcast media.

  Ongoing – Mainly through CERT and Murray Journal Articles

- Action 2: Incorporate information about cascading effects of hazards in education programs.

  Incomplete

- Action 3: Develop education programs to target specific groups including homeowners, developers, schools and people with special needs.

  Ongoing – Yearly health safety fair and CERT program.

- Action 4: Utilize maps and similar products on County EM website and other media to educate public on areas at risk to hazards.

  Incomplete

- Action 5: Coordinate with existing public education programs such as the American Red Cross, Utah Living with Fire, Be Ready Utah, the National Weather Service, etc.

  Incomplete

6.2.6 Codes and Ordinances

Problem Identification: Sometimes hazards require mandated mitigation in the form of ordinances, codes, laws or regulations. Zoning ordinances and building codes are the most common form of mitigation.

Goal 6 – Improve public safety through preventative regulations

Cost Estimate: $20,000

Objective 6.1 (Priority HIGH): Minimize hazard impacts through the adoption of appropriate prevention measures.

- Action 1: Establish and enforce appropriate planning, zoning, and building code ordinances.

  Complete

- Action 2: Ensure current hazard ordinances are available for viewing online.

  Unknown

6.2.7 Dam Failure

Problem Identification: The failure of dams and irrigation impoundments will result in a severe impact on residents and infrastructure in Salt Lake County.

Goal 1 – Include dam failure inundation in future planning efforts.

Cost Estimate: $5,000

Objective 1.1 (Priority MEDIUM): Review current State dam safety information on all identified high hazard dams in the County.

- Action 1: Include dam inundation maps in current County, City and Special Service District Emergency Operations Plans.

  Incomplete

- Action 2: Utilize inundation maps to identify potential evacuation areas and routes.

  Incomplete

6.2.8 Drought

Problem Identification: Because the Great Salt Lake Valley is a desert climate, there have always been periods of intermittent drought. Measures must be taken to conserve water and to address water shortages for both culinary and agricultural use.

Goal 1 – Reduce and prevent hardships associated with water shortages

Cost Estimate: $1,000,000

Objective 1.1 (Priority HIGH): Limit unnecessary consumption of water throughout the County

- Action 1: Continue to encourage water conservation utilizing and promoting outreach material from all water districts in the County.

  Complete – Water department sponsors conservation program.

- Action 2: Emergency Managers will coordinate with local water districts/public utilities to support ongoing conservation efforts.

  Incomplete

- Action 3: Investigate feasibility of implementing an incentive program to encourage the use of low-flow appliances and fixtures in homes and businesses.

  Incomplete

- Action 4: Implement water-saving devices and practices in public facilities.

  Complete – Water department sponsors conservation program.

- Action 5: Repair, maintain and improve water distribution infrastructure to prevent loss from leakage, breaks, etc.

  Complete – Part of master plan.

- Action 6: Coordinate public safety water use, such as hydrant testing.

  Incomplete

- Action 7: Provide information on landscaping alternatives for persons subject to green area requirements.

  Ongoing – Information on Murray Website.

Objective 1.2 (Priority HIGH): Address agricultural water shortages in the County

- Action 1: Set up livestock water rotation in areas of agricultural use.

  Incomplete

Objective 1.3 (Priority MEDIUM): Encourage development of secondary water systems

- Action 1: Coordinate with water districts to plan for, develop and/or expand secondary water systems.

  Incomplete

6.2.9 Earthquake

Problem Identification: Numerous geologic hazards exist in the Salt Lake City metropolitan area which can constrain land use. Active fault zones pose the threat of large earthquakes. The major earthquake risk present throughout the Salt Lake County metropolitan area confronts planners with a variety of safety and economic issues that must always be considered prior to land use development.

Goal 1 **– Reduce earthquakes losses to infrastructure**

Objective 1.1 (Priority HIGH): Encourage retrofit and rehabilitation of highly susceptible infrastructure

Cost Estimate: $3,000,000

- Action 1: Identify structures at risk to earthquake damage.

  Ongoing

- Action 2: Research feasibility of an incentive program for retrofitting privately-owned buildings, particularly unreinforced masonry.

  Unknown

- Action 3: Complete seismic rehabilitation/retrofitting projects of public buildings at risk.

  Ongoing – Currently upgrading 2 schools to earthquake standards.

Objective 1.2 (Priority MEDIUM): Improve public education regarding earthquake risks to unreinforced masonry buildings

- Action 1: Provide educational materials to unreinforced masonry home and business owners.

  Incomplete

Objective 1.3 (Priority MEDIUM): Improve seismic hazard understanding and seismic resistance of Central Utah Water Conservancy District's (CUWCD) Red Butte Dam in Salt Lake County. Perform geotechnical assessment and review of Red Butte Dam to determine seismic hazard risk of slope failure on the outlet control structure and cyclic softening failure in the dam foundation soils. Perform a structural engineering analysis and design of nonstructural bracing/anchoring of piping and ancillary equipment in Red Butte Dam's flow control structure." Improve public education regarding earthquake risks to unreinforced masonry buildings

- Action 1: Procure an Engineering Consultant to perform the nonstructural design and geotechnical assessment and review. CUWCD staff will procure contractor and/or install nonstructural bracing per consultant's design.

  Unknown

6.2.10 Flooding

Problem Identification: Although located in a semi-arid region, Salt Lake City is subject to flash flooding due to heavy rainfall and rapid snowmelt. The Jordan River's four major northern tributaries (City, Red Butte, Emigration and Parley's Creeks) are diverted into storm sewers beneath the city. These storm sewers have sufficient capacity to handle the excessive runoff, but must be continually maintained to prevent debris from accumulating. Public works agencies have built debris basins, installed stream-bank protection, and regularly dredge stream channels to reduce flood hazards. The Federal Emergency Management Agency (FEMA) has rated floodplains along the Jordan River and its tributaries for expected flood heights and areas susceptible to 100-year flood-frequency inundation have been delineated on County-wide FEMA Flood Insurance Rate Maps (FIRMs). Salt Lake County and City ordinances require the lowest flood grades (including basements) in new construction to be a minimum of 1 foot (0.3 m) above the appropriate FEMA flood elevation.

Goal 1 – Protection of life and property before, during and after a flooding event

Cost Estimate: $500,000

Objective 1.1 (Priority MEDIUM): Provide 100% availability of the National Flood Insurance Program (NFIP).

- Action # 1: Assist residents with NFIP application.

  N/A

- Action # 2: Encourage communities to actively participate in NFIP.

  Murray City participates in NFIP.

Objective 1.2 (Priority MEDIUM): Encourage appropriate flood control measures, particularly in new developments.

- Action 1: Determine potential flood impacts and identify areas in need of additional flood control structures.

  Ongoing

- Action 2: Address identified problems through construction of debris basins, flood retention ponds, energy dissipaters or other flood control structures.

  Ongoing

Objective 1.3 (Priority HIGH): Provide maintenance, repairs and improvements to drainage structures, storm water systems and flood control structures.

- Action: Establish maintenance and repair programs to remove debris, improve resistance and otherwise maintain effectiveness of storm water and flood control systems.

  Ongoing

Goal 2 – Reduce threat of unstable or inadequate flood control structures

Cost Estimate: $20,000,000

Objective 2.1 (Priority HIGH): Reduce potential for failure of flood control structures.

- Action 1: Identify and assess structures for deficiencies.

  Complete – We had meetings and identified areas.

- Action 2: Modify/upgrade structures and conveyances as needed to address deficiencies.

  Ongoing – Areas identified with capital improvement plan.

6.2.11 Severe Weather

Problem Identification: Severe weather over northern Utah can have a dramatic impact on regional commerce, transportation and daily activity and is a major forecast challenge for local meteorologists. The region is characterized by intense vertical relief with the Great Salt

Lake and surrounding lowlands located near 4,300 ft above mean sea level (MSL) while the adjoining Wasatch Mountains to the east reach as high as 11,000 ft MSL. This relief has major impact on winter storms and results in large contrasts in average annual precipitation.
Goal 1: Reduce threat of loss of life or property due to extreme weather events

Cost Estimate: $20,000

Objective 1.1 (Priority LOW): Maintain status as a StormReady Community

- Action 1: Maintain Hazardous Weather Operations Plan according to StormReady requirements.

  Incomplete – Not fully documented in a formal plan.

- Action 2: Maintain contact with NWS prior to re-application in 2010.

  Unknown

Objective 1.2 (Priority MEDIUM): Increase awareness of information services provided by NWS.

- Action 1: Meet with NWS representative on an annual basis to receive information on new services and alerts available.

  Incomplete

- Action 2: Assist NWS in making other agencies and departments aware of available resources.

  Incomplete

Objective 1.3 (Priority MEDIUM): Encourage safe practices in avalanche prone areas.

- Action: Assist Forest Service Utah Avalanche Forecast Center (FSUAC) and other organizations in promoting avalanche hazard awareness for backcountry users.

  Not Necessary – No avalanche hazards in our city

Objective 1.4 (Priority HIGH): Examine the vulnerability of patrons at large event venues to extreme weather events.

- Action: Work with the NWS to develop large event venue weather safety and evacuation procedures.

  Incomplete

6.2.12 Gas Turbine Plant

Problem Identification: The gas turbine plant as well as the compressor building for Murray City lack earthquake resistant construction as well as lack several safety systems for first responders.

Cost Estimate: $160,000

Objective 1.1 (Priority HIGH): Install larger vent piping and a remotely activated valve to allow for the release of gas in the system during an emergency.

- Action 1: Install larger and higher vent piping.

  Complete

- Action 2: Install a remotely activated valve.

  Ongoing – Valve has been installed, but wiring to activate the valve is not in place.

Objective 1.2 (Priority HIGH): Install a remotely activated shut-off vlave for the gas suply.

- Action 1: Install a remotely activated shut-off vlave for the gas suply.

  Incomplete – We have applied for a pre-mitigation grant to cover the costs.

Objective 1.3 (Priority HIGH): Install safety equipment inside of both buldings to aid first reponders.

- Action 1: Install a gas monitoring system and explosion proof fans. This system would provide exact gas percentages to the power dispatch center.

  Incomplete – We have applied for a pre-mitigation grant to cover the costs.

Objective 1.4 (Priority HIGH): Fix gas line connections that would be less likley to leak during earthquakes.

- Action 1: Fix exisisting gas line connections that are earthquake resilient.

  Ongoing – Some connections have been improved. We have applied for a pre-mitigation grant to cover the costs.

6.2.13 Slope Failure

Problem Identification: Slope instability has not been a major problem in the Murray City area.

6.2.14 Wildland Fire

Problem Identification: Problem Identification: Wildland Fire has not been a major problem in the Murray City area.

7 Plan Implementation & Maintenance

7.1 Implementation

Mitigation is most successful when it is incorporated into the day-to-day functions and priorities of government and development. Murray City will utilize the information in the Hazards Mitigation Plan to prepare for future events and plan accordingly.

7.1.1 Actions taken from the previous plan (2009 Wasatch Front Natural Hazard Mitigation Plan)

The following mitigation strategies were formulated by the Salt Lake County Mitigation Strategies Working Group for inclusion in the 2009 *Wasatch Front Region Natural Hazard Pre-Disaster Mitigation Plan*, which was adopted by the Murray City in 2009. The following summary highlights the Murray City's efforts to implement those goals where applicable and practical as part of the County's overall mitigation planning efforts.

For actions not completed or implemented by the Murray City, a short description is provided as to why it was not relevant or if it is included as part of the updated plan.

Category	Goal / Objective	Action	Status	Comments
All Hazards	1 – Improve and maintain communications capabilities for emergency operations 1.1 – Improve communication capabilities	1 – Conduct an inventory and assessment of communications equipment and systems and identify needs	Completed / Ongoing	Murray continues to improve and maintain its communication capabilities. Example: upgrade and purchase of 2 satellite phones during the planning period.
All Hazards	1 – Improve and maintain communications capabilities for emergency operations 1.1 – Improve communication capabilities	2 – Conduct Training and awareness activities on communication equipment, tools, and systems	Completed / Ongoing	Murray participates in training and exercises designed to practice using communication tools and equipment. Example: City used its amateur radio volunteers to support an earthquake drill that included several locations and an Emergency Operations Center activation.

Category	Goal / Objective	Action	Status	Comments
All Hazards	1 – Improve and maintain communications capabilities for emergency operations 1.1 – Improve communication capabilities	3 – Establish agreements to share communications equipment between agencies involved in emergency operations	Ongoing	No formal agreements exist to share communications equipment, but communications equipment can be shared as part of other mutual aid agreements that are in place
All Hazards	1 – Improve and maintain communications capabilities for emergency operations 1.1 – Improve communication capabilities	4 – Establish notification capabilities and procedures for emergency personnel	Ongoing	Murray continues to work on notification tools and procedures to be in harmony with changing technology and equipment
All Hazards	1 – Improve and maintain communications capabilities for emergency operations 1.2 – Maintain communications capabilities for critical facilities	1 – Evaluate vulnerability of critical communications systems	Completed	Murray evaluates areas of vulnerability and develops solutions to ensure communication systems or alternate solutions are viable Example: Murray is looking into purchasing portable amateur radios to use in case the main radio system fails.
All Hazards	1 – Improve and maintain communications capabilities for emergency operations 1.2 – Maintain communications capabilities for critical facilities	2 – Establish redundancy for dispatch centers and other critical communications	Ongoing	Murray relies on the Valley Emergency Communications Center (VECC) for dispatch services. They coordinate with other PSAPS to provide redundancy.
All Hazards	1 – Improve and maintain communications capabilities for emergency operations 1.3 – Conduct communications Strategic Planning	1 – Establish a coordinating group to address long-term communication needs and implementation strategies	Ongoing	No formal coordinating group exists yet, but Murray engages in discussions with other jurisdictions and the county regarding this issue
All Hazards	1 – Improve and maintain communications capabilities for emergency operations 1.3 – Conduct communications Strategic Planning	2 – Acquire, upgrade, and/or integrate communications equipment and systems as determined by coordinating group	Ongoing	Murray has upgraded existing equipment and purchased some new equipment to maintain operability. Murray will need to replace all of our existing radios within the next few years.

Category	Goal / Objective	Action	Status	Comments
All Hazards	2 – Improve awareness and analysis of hazards 2.1 – Improved Quality and Access to digital geographic (GIS) hazards data	1 – Establish a coordinating group to address geographic data issues	Completed / Ongoing	Murray GIS personnel actively participate in several coordinating groups that address issues associated with geographic data.
All Hazards	2 – Improve awareness and analysis of hazards 2.1 – Improved Quality and Access to digital geographic (GIS) hazards data	2 – Examine current data availability and sharing capabilities, evaluate needs, and identify shortcomings	Completed / Ongoing	Murray GIS personnel actively participate in several coordinating groups that address issues associated with geographic data.
All Hazards	2 – Improve awareness and analysis of hazards 2.1 – Improved Quality and Access to digital geographic (GIS) hazards data	3 – Update and expand data on hazards, critical facilities, and critical infrastructure according to assessed needs	Completed / Ongoing	Murray GIS personnel continue to develop and add to the geographic data as part of the City's overall geographic information systems.
All Hazards	2 – Improve awareness and analysis of hazards 2.1 – Improved Quality and Access to digital geographic (GIS) hazards data	4 – Provide centralized access to geographic data to emergency planners and responders	Completed / Ongoing	Murray GIS personnel make data available to first responders and others involved in emergency management efforts. Much of the data is available to crews on their mobile data tablets located in their response vehicles.
All Hazards	2 – Improve awareness and analysis of hazards 2.2 – Improve and expand hazard monitoring capabilities	1 – Integrate existing hazard monitoring networks in emergency operations centers. Utilize sensors such as weather stations, stream gages, seismograph stations, road conditions, etc.	Not completed	Murray does not have any of the mentioned specialized sensors. However, The Murray emergency manager receives alerts from the USGS and NWS via text message and email.
All Hazards	2 – Improve awareness and analysis of hazards 2.2 – Improve and expand hazard monitoring capabilities	2 – Identify and implement additional hazard monitoring capabilities.	Completed / Ongoing	Example: The Murray emergency manager receives alerts from the USGS and NWS via text message and email
All Hazards	3 – Ensure critical facilities can sustain operations for emergency response and recovery 3.1 – Prevent damage to critical facilities and infrastructure	1 – Utilize GIS to identify facilities and infrastructure at risk	Completed	In 2012 Murray GIS, Fire and Emergency and Risk Management personnel did an extensive hazard and risk assessment on all structures in the city to evaluate their level of risk.

Category	Goal / Objective	Action	Status	Comments
All Hazards	3 – Ensure critical facilities can sustain operations for emergency response and recovery 3.1 – Prevent damage to critical facilities and infrastructure	2 – Assess critical facilities for hazard exposure, structural weaknesses, power, communications and equipment resources and redundancy, and adequate emergency procedures	Completed	In 2012 Murray GIS, Fire and Emergency and Risk Management personnel did an extensive hazard and risk assessment on all structures in the city to evaluate their level of risk. Example: Routes were established for crews to drive after a disaster in order to evaluate critical areas.
All Hazards	3 – Ensure critical facilities can sustain operations for emergency response and recovery 3.1 – Prevent damage to critical facilities and infrastructure	3 – Implement improvements to address identified in assessment	In Process	Murray is identifying options and opportunities to address issues identified during the risk assessments in 2014.
All Hazards	4 – Improve response capabilities through mutual-aid agreements 4.1 – Utilize mutual-aid agreements in accordance with National Incident Management System (NIMS) requirements	1 – Compile inventory of mutual-aid agreements and memoranda of understanding (MOU) and identify deficiencies	Not completed	Murray needs to gather all MOUs into one location for easy reference.
All Hazards	4 – Improve response capabilities through mutual-aid agreements 4.1 – Utilize mutual-aid agreements in accordance with National Incident Management System (NIMS) requirements	2 – Pursue and implement needed mutual-aid agreements	In Process	Murray City is currently working on interstate and intrastate agreements.
All Hazards	5 – Increase citizen safety through improved hazard awareness 5.1 – establish a comprehensive public education program	1 – Provide education regarding all natural hazards through live trainings, as well as web-based, print and broadcast media	Completed / Ongoing	Murray Emergency Management provides several public education classes for groups to discuss the hazards in the community and what residents can do to be prepared.
All Hazards	5 – Increase citizen safety through improved hazard awareness 5.1 – Establish a comprehensive public education program	2 – Incorporate information about cascading effects of hazards in education programs	Completed	Information is included in all presentations on the effects of cascading hazards.

Category	Goal / Objective	Action	Status	Comments
All Hazards	5 – Increase citizen safety through improved hazard awareness 5.1 – Establish a comprehensive public education program	3 – Develop education programs to target specific groups including homeowners, developers, schools and people with special needs	Completed / Ongoing	Murray's education programs are customizable for all kinds of groups and available to all members of the community.
All Hazards	5 – Increase citizen safety through improved hazard awareness 5.1 – Establish a comprehensive public education program	4 – Utilize maps and similar products on County EM website and other media to educate public on areas at risk to hazards	Completed	Murray GIS personnel have compiled and made available hazard maps to help educate the public on potential hazards in the city.
All Hazards	5 – Increase citizen safety through improved hazard awareness 5.1 – Establish a comprehensive public education program	5 – Coordinate with existing public education programs such as the American Red Cross, Utah Living with Fire, be Ready Utah, the National Weather Service, etc.	Not completed	Murray has attended Be Ready Utah workshops and hopes to provide a presentation in Murray in the future.
All Hazards	6 – Improve public safety through preventative regulations 6.1 – Minimize hazard impacts through the adoption of appropriate prevention measures	1 – Establish and enforce appropriate planning, zoning, and building code ordinances	Completed / Ongoing	Murray enforces all current ordinances and building codes including ordinances like our Flood Damage Prevention and Land Disturbance ordinances.
All Hazards	6 – Improve public safety through preventative regulations 6.1 – Minimize hazard impacts through the adoption of appropriate prevention measures	2 – Ensure current hazard ordinances are available for viewing online	Completed	Murray ordinances are available online at: http://murray.utah.gov/
Dam Failure	1 – Include dam failure inundation in future County and City planning efforts 1.1 – Review current State dam safety information on all identified high hazard dams in the County	1 – Include dam inundation maps in current County, City and Special Service District Emergency Operations Plans	Completed	Dam inundation maps are included in emergency operation plans.
Dam Failure	1 – Include dam failure inundation in future County and City planning efforts 1.1 – Review current State dam safety information on all identified high hazard dams in the County	2 – Utilize inundation maps to identify potential evacuation areas and routes	Not completed.	Dam inundation maps are included in emergency operation plans, however since risk is negligible, no evacuation routes have been identified.
Drought	1 – Reduce and prevent hardships associated with water shortages 1.1 – Limit unnecessary consumption of water throughout the County	1 – Continue to encourage water conservation utilizing and promoting outreach material from all water districts in the County	Completed / Ongoing	Murray Water department sponsors conservation programs.

Category	Goal / Objective	Action	Status	Comments
Drought	1 – Reduce and prevent hardships associated with water shortages 1.1 – Limit unnecessary consumption of water throughout the County	2 – Emergency Managers will coordinate with local water districts/public utilities to support ongoing conservation efforts	Ongoing	Murray Water Department sponsors conservation programs.
Drought	1 – Reduce and prevent hardships associated with water shortages 1.1 – Limit unnecessary consumption of water throughout the County	3 – Investigate feasibility of implementing an incentive program to encourage the use of low-flow appliances and fixtures in homes and businesses	Ongoing	Murray Water Department sponsors conservation programs.
Drought	1 – Reduce and prevent hardships associated with water shortages 1.1 – Limit unnecessary consumption of water throughout the County	4 – Implement water-saving devices and practices in public facilities	Ongoing	Murray Water Department sponsors conservation programs.
Drought	1 – Reduce and prevent hardships associated with water shortages 1.1 – Limit unnecessary consumption of water throughout the County	5 – Repair, maintain and improve water distribution infrastructure to prevent loss from leakage, breaks, etc.	Completed / Ongoing	The Murray Water Department responds immediately to all reports of leaks and performs regular system maintenance, including actively monitoring for leaks, theft of services, etc.
Drought	1 – Reduce and prevent hardships associated with water shortages 1.1 – Limit unnecessary consumption of water throughout the County	6 – Coordinate public safety water use, such as hydrant testing	Completed / Ongoing	The Murray Water Department coordinates all water use, including periodic and flow testing of hydrants.
Drought	1 – Reduce and prevent hardships associated with water shortages 1.1 – Limit unnecessary consumption of water throughout the County	7 – Provide information on landscaping alternatives for persons subject to green area requirements	Completed / Ongoing	Murray City offers landscaping Information on the Murray Website.
Drought	1 – Reduce and prevent hardships associated with water shortages 1.2 – Address agricultural water shortages in the County	1 – Set up livestock water rotation in areas of agricultural use	Not Completed	This is not applicable to Murray.
Drought	1 – Reduce and prevent hardships associated with water shortages 1.3 – Encourage development of secondary water systems	1 – Coordinate with water districts to plan for, develop and/or expand secondary water	Ongoing	Murray continues to encourage the development of secondary water, where feasible. Example: The Murray City Golf Course uses a secondary water system for irrigation.

Category	Goal / Objective	Action	Status	Comments
Earthquake	1 – Reduce earthquakes losses to infrastructure 1.1 – Encourage retrofit and rehabilitation of highly susceptible infrastructure	1 – Identify structures at risk to earthquake damage	Completed	In 2012 Murray GIS, Fire and Emergency and Risk Management personnel did an extensive hazard and risk assessment on all structures in the city to evaluate their level of risk.
Earthquake	1 – Reduce earthquakes losses to infrastructure 1.1 – Encourage retrofit and rehabilitation of highly susceptible infrastructure	2 – Research feasibility of an incentive program for retrofitting privately-owned buildings, particularly unreinforced masonry	Not Completed	Murray does not have funding to support this type of program.
Earthquake	1 – Reduce earthquakes losses to infrastructure 1.1 – Encourage retrofit and rehabilitation of highly susceptible infrastructure	3 – Complete seismic rehabilitation/retrofitting projects of public buildings at risk	Completed / Ongoing	Murray City has retrofitted several schools and is in the process of relocating city hall.
Earthquake	1 – Reduce earthquakes losses to infrastructure 1.2 – Improve public education regarding earthquake risks to unreinforced masonry buildings	1 – Provide educational materials to unreinforced masonry home and business owners	Not Completed	Murray has not participated in this program; however the city supports county level efforts to share this type of information.
Earthquake	1 – Reduce earthquakes losses to infrastructure 1.3 – Improve Seismic Hazard understanding and seismic resistance of CUWCD Red Butte Dam in Salt Lake County.	1 – Procure Engineering Consultant to perform the nonstructural design and geotechnical assessment and review.	Not Completed / Not Applicable	Not applicable to Murray as the referenced dam is located in another jurisdiction.
Flooding	1 – Protection of life and property before, during and after a flooding event 1.1 – Provide 100% availability of the National Flood Insurance Program	1 – Assist Cities with NFIP application	Ongoing	Murray has been a participating community in the NFIP since 1985, and receives information from the State of Utah and Salt Lake County.
Flooding	1 – Protection of life and property before, during and after a flooding event 1.1 – Provide 100% availability of the National Flood Insurance Program	2 – Encourage Communities to actively participate in NFIP	Ongoing	Murray City actively participates in the NFIP. The Salt Lake County encourages all communities in the County to participate.
Flooding	1 – Protection of life and property before, during and after a flooding event 1.2 – Encourage appropriate flood control measures, particularly in new developments	1 – Determine potential flood impacts and identify areas in need of additional flood control structures	Completed / Ongoing	The City Engineer and Public Works Director regularly review the impact of development and the need for flood control infrastructure and make recommendations as needed

Category	Goal / Objective	Action	Status	Comments
Flooding	1 – Protection of life and property before, during and after a flooding event 1.2 – Encourage appropriate flood control measures, particularly in new developments	2 – Address identified problems through construction of debris basins, flood retention ponds, energy dissipaters or other flood control structures	Completed / Ongoing	The City Engineer and Public Works Director oversee the construction of flood control structures.
Flooding	1 – Protection of life and property before, during and after a flooding event 1.3 – Provide maintenance, repairs and improvements to drainage structures, storm water systems and flood control structures	1 – Establish maintenance and repair programs to remove debris, improve resistance and otherwise maintain effectiveness of storm water and flood control systems	Completed / Ongoing	The Public Works Department continues to maintain and repair all drainage systems in the City.
Flooding	2 – Reduce threat of unstable or inadequate flood control structures 2.1 – Reduce potential for failure of flood control structures	1 – Identify and assess structures for deficiencies	Completed / Ongoing	The City Engineering Division in cooperation with the Public Works Department regularly review and inspect City-owned infrastructure and make recommendations as needed
Flooding	2 – Reduce threat of unstable or inadequate flood control structures 2.1 – Reduce potential for failure of flood control structures	2 – Modify structures as needed to address deficiencies	Completed / Ongoing	The City Engineering Division in cooperation with the Public Works Department make repairs as needed to deficient structures
Severe Weather	1 – Reduce threat of loss of life or property due to extreme weather events 1.1 – Maintain status as a StormReady Community	1 – Maintain Hazardous Weather Operations Plan according to StormReady requirements	Not Completed / Not Applicable	Murray does not have a Weather Operations Plan and does not participate in the StormReady program. This is a Salt Lake County level program
Severe Weather	1 – Reduce threat of loss of life or property due to extreme weather events 1.1 – Maintain status as a StormReady Community	2 – Maintain Contact with NWS prior to re-application in 2010	Not Completed / Not Applicable	Murray does not have a Weather Operations Plan and does not participate in the StormReady program. This is a Salt Lake County level program.
Severe Weather	1 – Reduce threat of loss of life or property due to extreme weather events 1.2 – Increase awareness of information services provided by NWS	1 – Meet with NWS representative on an annual basis to receive information on new services and alerts available	Ongoing	Murray participates in briefings provided by NWS representatives on an annual basis.

Category	Goal / Objective	Action	Status	Comments
Severe Weather	1 – Reduce threat of loss of life or property due to extreme weather events 1.2 – Increase awareness of information services provided by NWS	2 – Assist NWS in making other agencies and departments aware of available resources	Ongoing	Murray supports the NWS efforts for education and outreach and makes internal departments aware of NWS resources.
Severe Weather	1 – Reduce threat of loss of life or property due to extreme weather events 1.3 – Encourage safe practices in avalanche prone areas	1 – Assist Forest Service Utah Avalanche Forecast Center and other organizations in promoting avalanche hazard awareness for backcountry users	Ongoing	Murray supports the efforts for education and outreach.
Severe Weather	1 – Reduce threat of loss of life or property due to extreme weather events 1.4 – Examine the vulnerability of patrons at large event venues to extreme weather events	1 – Work with NWS to develop large event venue weather safety and evacuation procedures	Not Completed	Murray has not developed a large event venue weather safety plan and/or evacuation procedures with the NWS
Slope Failure	1 – Reduce or eliminate the threat of slope failure damage 1.1 – Reduce the threat of slope failures following wildfires	1 – Develop protocol for working with State and Federal agencies in reducing the impact of post-fire debris flow hazard	Not Completed / Not Applicable	This is a very low probability event for the City and not applicable.
Slope Failure	1 – Reduce or eliminate the threat of slope failure damage 1.2 – Monitor historic landslide areas	1 – Coordinate with the Utah Geological Survey and other agencies to understand current slope failure threats/potential	Not Completed / Not Applicable	This is a very low probability event for the City and not applicable.
Slope Failure	1 – Reduce or eliminate the threat of slope failure damage 1.3 – Address landslide hazards in new sub-divisions	1 – Utilize recommendations provided by the State Geological Hazards Working Group to address land-use and planning for new developments	Completed / Ongoing	Murray Engineering and Planning reviews recommendations as provided pertaining to development within the City.
Wildland Fire	1 – Community education on wildfire hazard 1.1 – Reduce risk from wildfire through education programs	1 – Increase public awareness through “Firewise” program	Not Completed / Not Applicable	This is a very low probability event for the City and not applicable.
Wildland Fire	1 – Community education on wildfire hazard 1.1 – Reduce risk from wildfire through education programs	2 – Educate homeowners on the need to create defensible space near structures in WUI	Not Completed / Not Applicable	This is a very low probability event for the City and not applicable.

Category	Goal / Objective	Action	Status	Comments
Wildland Fire	2 – Improve safety from wildfire hazards through planning, protective actions and improved fire response capabilities 2.1 – Assist homeowners with creating defensible space near structures in WUI areas	1 – Designate and promote county-wide annual initiative for clearing fuels	Not Completed / Not Applicable	This is a very low probability event for the City and not applicable.
Wildland Fire	2 – Improve safety from wildfire hazards through planning, protective actions and improved fire response capabilities 2.1 – Assist homeowners with creating defensible space near structures in WUI areas	2 – Provide waste removal, such as chipping of green waste by public works, following designated fuel clearing day/week	Not Completed / Not Applicable	This is a very low probability event for the City and not applicable.
Wildland Fire	2 – Improve safety from wildfire hazards through planning, protective actions and improved fire response capabilities 2.2 – Improve evacuation capabilities for WUI areas	1 – Work with experts and communities to develop or update evacuation plans	Not Completed	This is a very low probability event for the City and not applicable.
Wildland Fire	2 – Improve safety from wildfire hazards through planning, protective actions and improved fire response capabilities 2.2 – Improve evacuation capabilities for WUI areas	2 – Evaluate transportation network and address needed improvements to facilitate evacuation and emergency response	Ongoing	Murray has an adequate transportation network to support evacuation and emergency response through the Utah Transit Authority.
Wildland Fire	2 – Improve safety from wildfire hazards through planning, protective actions and improved fire response capabilities 2.3 – Improve addressing system in WUI areas to facilitate emergency response	1 – Identify all facilities, businesses, and residences, particularly in the canyons, and assign addresses according to current county addressing standards	Completed	Addressing of structures in Murray is complete.
Wildland Fire	2 – Improve safety from wildfire hazards through planning, protective actions and improved fire response capabilities 2.3 – Improve addressing system in WUI areas to facilitate emergency response	2 – Incorporate improved addresses in fire-dispatch and other databases	Completed	Addressing of structures in Murray is complete.

Category	Goal / Objective	Action	Status	Comments
Wildland Fire	2 – Improve safety from wildfire hazards through planning, protective actions and improved fire response capabilities 2.4 – Complete wildfire protection projects	1 – Reduce fuels around publically owned structures	Not Completed / Not Applicable	This is a very low probability event for the City and not applicable.
Wildland Fire	2 – Improve safety from wildfire hazards through planning, protective actions and improved fire response capabilities 2.4 – Complete wildfire protection projects	2 – Implement fire breaks and other protective measures	Not Completed / Not Applicable	This is a very low probability event for the City and not applicable.
Wildland Fire	2 – Improve safety from wildfire hazards through planning, protective actions and improved fire response capabilities 2.4 – Complete wildfire protection projects	3 – Assess existing water flow capabilities, both public and private, and address deficiencies	Completed	The Murray water system meets and/or exceeds requirements for providing water flow for firefighting purposes in the City.
Wildland Fire	2 – Improve safety from wildfire hazards through planning, protective actions and improved fire response capabilities 2.4 – Complete wildfire protection projects	4 – Assist communities in developing Community Wildfire Protection Plans or similar plans	Not Completed / Not Applicable	This is a very low probability event for the City and not applicable.
Wildland Fire	2 – Improve safety from wildfire hazards through planning, protective actions and improved fire response capabilities 2.5 – Encourage proper development practices in the WUI	1 – Adopt the Utah Wildland-Urban Interface Code	Not Completed / Not Applicable	This is a very low probability event for the City and not applicable.
Wildland Fire	2 – Improve safety from wildfire hazards through planning, protective actions and improved fire response capabilities 2.5 – Encourage proper development practices in the WUI	2 – Define wildland-urban interface and develop digital maps of the WUI	Not Completed / Not Applicable	This is a very low probability event for the City and not applicable.

7.2 Mitigation Strategies

Hazard	Mitigation Strategy
Avalanche	Assist Forest Service Utah Avalanche Forecast Center (FSUAC) and other organizations in promoting avalanche hazard awareness for backcountry users.

Dam Failure	Include dam failure inundation in future planning efforts.
Drought	Coordinate with public works and develop a plan utilizing current water systems and secondary waters systems to plan for drought.
Earthquake	Improve public education regarding earthquake risks to unreinforced masonry buildings.
Flood	Continue to participate in the National Flood Insurance Program to ensure new construction is built to meet current regulations.
Infestation	Since Murray City has a low amount of agriculture, the impact from infestation would be negligible.
Landslide & Problem Soils	Landslide issues in Murray City are negligible. Murray City will continue to monitor problem soils areas, specifically around or nearby critical infrastructure, and reinforce those areas as needed.
Pandemic	Continue to monitor pandemics with the Salt Lake County Health Department in order to properly protect the public and emergency responders.
Radon	Support the Division of Radiation Control's (DRC) Indoor Radon Program that enables the Division to provide education and offer individualized assistance to homeowners and public agencies.
Severe Weather	Create outreach materials (what to do when severe weather strikes) for the community.
Wildfire	Murray Fire Department is outfitting a new brush truck and training personnel to fight wildfires.

7.3 Integration of Mitigation Strategies into Planning Mechanisms

The mitigation strategies listed above will be utilized by the city during mitigation planning, emergency planning, grant writing, budgeting and public education. In addition, many of the hazards (such as flood) can be incorporated into city codes to increase the resiliency of Murray City.

7.4 Maintenance Schedule

Periodic monitoring and updates of this plan are required to ensure that the goals and objectives for the city are kept current and that local mitigation strategies are being carried out. This plan has been designed to be user-friendly in terms of maintenance and implementation. This portion of the plan outlines the procedures for completing revisions and updates. The plan will also be revised to reflect lessons learned or to address specific hazard incidents arising out of a disaster as needed.

Annual Review Procedures

Murray City will be responsible to review the mitigation strategies described in this plan as required by the Utah Division of Emergency Management (UDEM), or as situations dictate such as following a disaster declaration. The process will include the city organizing a Hazards Mitigation Planning committee comprised of key employees from Murray City. The city emergency manager will regularly monitor the plan and may make revisions and updates as necessary.

Five Year Plan Review

The entire mitigation plan including any background studies and analysis shall be revised and updated as needed every five years by Murray City to determine if there have been any significant changes in the city that would affect the plan. Increased development, increased exposure to certain hazards, the development of new mitigation capabilities or techniques and changes to Federal or State legislation are examples of changes that may affect the condition of the Plan.

8 Hazard Mitigation Plan Adoption

It is the intent of Murray City that this Hazard Mitigation Plan will be adopted by resolution once approved by the State of Utah and FEMA, which approval should be within five years of the previous Hazard Mitigation Plan's approval date. This process will be documented through the Murray City Recorder's office.

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